



WIN!
£2,400 worth of PCs

TV ON YOUR PC
6 FREEVIEW TUNERS ON TEST

PERSONAL

COMPUTER WORLD

BONUS
32 PAGE
SPECIAL!

HOW TO BUILD YOUR DREAM PC

> Components explained > Step-by-step workshop
> Packed with best buy listings

SPEED DEMONS

6 GROUP TESTED The UK's fastest 64bit PCs

PLUS: XP 64bit, Suse Linux 64bit & Tiger reviewed



Reviewed



Gizmondo games console



Antec Truepower 2



Philips Shoqbox

PLUS Fujitsu Scansnap II Plus >> Acecad Digimemo >> Acer Travelmate 3000
>> Abit Fatalty AN8 >> Cyberpatrol 7 >> Bryce 5.5 >> Serif Moviesplus 4
>> Allume Stuffit 9 Deluxe >> HP Laserjet 1020 >> Nebula Digtiv

13 ROUTERS

GROUP TEST Easy Internet sharing for home or office

SMARTPHONE SOFTWARE

104 programs reviewed for all phone models

HOW TO

- >> Put new life into your old PC
- >> Take digital time-lapse photos
- >> Buy a superslim digicam



Dell™

SALE

NOW ON

Offer ends Wednesday 27th July 2005

SAVE YOUR BUSINESS UP TO £100!



Dell™ recommends Microsoft® Windows® XP Professional

Great Business Savings

The Dell Sale is now on with the cost of our latest business systems cut back by up to £100. And because you deal with us direct, online or over the phone, there's no middleman so you get superb value. Value which is better for you and better for your business.

Remember, Dell PCs only come direct from Dell, so call or go online now.

ACCESSORIES²

Dell™ Axim™ X50v Wireless 624MHz

- Intel® XScale™ Processor 624MHz
- 64MB RAM and 128MB Flash ROM memory
- 3.7" VGA, Intel® 2700G multimedia accelerator
- USB Docking, integrated WLAN & Bluetooth™
- 1 Year Next Business Day exchange
- Windows Mobile™ 2003 Second Edition software for Pocket PC
- 1 CF Type II card slot and 1 SD/MM card slot

£239
Excl. VAT.

£281
Incl. VAT.



Dell™ Dimension™ 5100

- Intel® Pentium® 4 Processor 541 With HT Technology (3.20GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB Dual Channel DDR2 RAM
- 160GB Serial ATA Hard Drive (7200 RPM)
- 17" Flat Panel Monitor
- Integrated Intel® Pro 10/100 NIC
- 16x DVD+/-RW Drive¹
- 1 Year Collect And Return service
- Microsoft® Works 7.0

~~£469~~
£399
Excl. Del. & VAT

£526
Incl. Del. & VAT

SAVE £70

E-VALUE Code: PPUK4-D07512

Further enhancements

- Standard Service Package £188 incl. VAT
- Microsoft® Office 2003 Basic Edition² £130 incl. VAT
- Dell All-in-One Photo Printer 922² £69 incl. VAT

Dell™ Inspiron™ 9300

- Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 740 (1.73GHz, 2MB L2 Cache, 533MHz FSB) & Intel® Pro/Wireless 2200 (802.11b/g)
- Microsoft® Windows® XP Home Edition
- 512MB 533MHz DDR2 SDRAM
- 40GB Hard Drive
- 17.0" UltraSharp™ Wide Screen XGA (1440x900) TFT Sharp
- 64MB ATI® Mobility™ Radeon™ X300 Graphics card
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service⁵
- Microsoft® Works 7.0

~~£699~~
£629
Excl. Del. & VAT

£797
Incl. Del. & VAT

SAVE £70

E-VALUE Code: PPUK4-N07931

Further enhancements

- Standard Service Package £329 incl. VAT
- Microsoft® Office 2003 Small Business² £235 incl. VAT
- Logitech® QuickCam Zoom² £36 incl. VAT

0% Finance Available Subject to Status*



Go online for the latest deals Click www.dell.co.uk/business

Business PCs 0870 907 4388 Home PCs 0870 907 4390

Order online or on the phone. Easy as

Great Savings For Your Business



Dell™ Dimension™ 2400

- Intel® Celeron® Processor (2.60GHz, 128KB L2 Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB DDR RAM
- 40GB Hard Drive (7200 RPM)
- 17" CRT Colour Monitor (15.9" v.i.s.0.28 dot pitch)
- Integrated 10/100 NIC
- 16x DVD-ROM
- 90 Day Collect And Return Service
- Microsoft® Works 7.0

~~£249~~
£199
Excl. Del. & VAT

£291
Incl. Del. & VAT

SAVE £50

E-VALUE Code: PPUK4-D07241

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Microsoft® Office 2003 Basic Edition² £130 incl. VAT
- APC Surge Protector² £13 incl. VAT



Dell™ Dimension™ 3000

- Intel® Pentium® 4 Processor With HT Technology (2.8GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM
- 80GB Hard Drive (7200 RPM)
- 15" Flat Panel Monitor
- Integrated 10/100 NIC
- 48x CD-RW Drive
- 90 Day Collect And Return Service
- Microsoft® Works 7.0

~~£309~~
£259
Excl. Del. & VAT

£362
Incl. Del. & VAT

SAVE £50

E-VALUE Code: PPUK4-D07302

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Microsoft® Office 2003 Small Business² £235 incl. VAT
- 17" Flat Panel Monitor² £58 incl. VAT



Dell™ Dimension™ 9100

- Intel® Pentium® 4 Processor 630 With HT Technology (3GHz, 2MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 1024MB Dual Channel DDR2 RAM
- 320GB Serial ATA RAID 0 Stripe (2x160GB 7200rpm drives with DataBurst™ Cache)
- 17" Flat Panel Monitor
- Integrated Intel® Pro 10/100 NIC
- 128MB PCI-Express ATI® Radeon™ X300SE
- 16x DVD+/-RW Drive¹
- 1 Year Collect And Return service

~~£699~~
£599
Excl. Del. & VAT

£761
Incl. Del. & VAT

SAVE £100

E-VALUE Code: PPUK4-D07912

Further enhancements

- Standard Service Package £188 incl. VAT
- Microsoft® Office 2003 Small Business Edition² £235 incl. VAT
- Logitech® LX700 Cordless Keyboard² £59 incl. VAT

ACCESSORIES²

Dell™ 2300MP Micro-portable Projector³

Exceptional features and value. Boasting 2300 Lumens (max), 2100:1 contrast ratio. Just 2.1kg

~~£949~~
£759
Excl. VAT.

£893
Incl. VAT.

20% Off



Dell Laser Printer 1700n

Workgroup printer performance in a small form-factor. A fast and durable monochrome laser printer. Network ready as standard

~~£159~~
£143
Excl. VAT.

£168
Incl. VAT.

10% Off



Dell™ E173FP 17" Monitor

The E173FP incorporates the latest technology to give 250cd/m² brightness¹, 450:1 contrast and 16ms response time. Multimedia capability can be added using the optional AS500PA soundbar.

~~£169~~
£127
Excl. VAT.

£149
Incl. VAT.

25% Off



Dell Laser Printer 3000cn

Entry level colour laser printer great for small offices and personal users.

£229
Excl. VAT.

£269
Incl. VAT.

FREE 3 Yr Next Biz Day Service



Dell W2600 LCD TV³

Enjoy fantastic picture and sound quality from Dell's new 26" widescreen flat LCD TV. Bright, crisp images and powerful stereo sound combine to give a great viewing experience.

£689
Excl. VAT.

£809
Incl. VAT.



Dell Multi-Function Laser Printer 1600n

Print, scan, copy, and stand alone fax. Multifunction performance at a single-function laser printer price. Network as standard.

£229
Excl. VAT.

£269
Incl. VAT.



0% Finance Available Subject to Status*

Call or go online today

Dell™ recommends Microsoft®
Windows® XP Professional



Dell™ Inspiron™ 6000

- Intel® Centrino Mobile Technology with Intel® Pentium® M processor 715A (1.60GHz, 2MB L2 cache, 400MHz FSB) & Intel® Pro/Wireless 2100 (802.11b)
- Microsoft® Windows® XP Home Edition
- 512MB 400MHz DDR SDRAM
- 40GB Hard Drive
- 15.4" Wide Aspect UltraSharp™ WXGA (1280X800) Screen
- Intel® GMA 900 shared graphics memory up to 128MB
- Internal 8X DVD+/-RW Drive¹
- 56K Data Fax Modem
- Microsoft® Works 7.0

~~£539~~
£489
Excl. Del. & VAT

~~£632~~
£632
Incl. Del. & VAT

SAVE £50

E-VALUE Code: PPUK4-N07602

Further enhancements

- Standard Service Package £329 incl. VAT
- Microsoft® Office 2003 Basic² £129 incl. VAT
- Planet 21 Executive Leather Carry Case² £65 incl. VAT

Dell™ Inspiron™ 2200

- Intel® Pentium® M Processor 725 (1.60GHz 2MB, L2 Cache 400MHz FSB & Dell TrueMobile™ 1370 Wireless LAN PC Card 802.11b/g)
- Microsoft® Windows® XP Home Edition
- 256MB 266MHz DDR SDRAM
- 40GB Hard Drive
- 15" XGA TFT (1024x768) Screen
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 90 Day Collect and Return Service
- Microsoft® Works 7.0

~~£429~~
£399
Excl. Del. & VAT

~~£526~~
£526
Incl. Del. & VAT

SAVE £30

E-VALUE Code: PPUK4-N07222

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Deluxe Nylon Carry Case² £29 incl. VAT
- 2nd 8 Cell High Capacity Lithium-Ion Battery² £47 incl. VAT

Dell™ Inspiron™ 1200

- Intel® Celeron® M Processor 350 (1.30GHz, 1MB L2 Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB 266MHz DDR RAM
- 30GB Hard Drive
- 14.1" XGA TFT (1024x768) Screen
- Integrated 24xCD-RW/8xDVD Combo Drive
- 56K Data Fax Modem
- 90 Day Collect and Return Service
- Microsoft® Works 7.0

~~£319~~
£299
Excl. Del. & VAT

~~£409~~
£409
Incl. Del. & VAT

SAVE £20

E-VALUE Code: PPUK4-N07121

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- Deluxe Nylon Carrycase² £29 incl. VAT
- 2nd 8 Cell High Capacity Lithium-Ion Battery² £58 incl. VAT

Dell PC Services

Basic Service Package

Designed to fix problems quickly & protect your system with 1 or 3 Year Next Business Day onsite service plus the added benefit of Online training for 30 days to help you learn how to maximise the multimedia potential of your PC. Prices from **£80.00** ex VAT.

Standard Service Package

As Basic 3 Year Package PLUS Anti-Virus software to help you protect your data, online training for 30 days to show you how to protect your system from unwanted online intruders & viruses

PLUS accidental damage cover to protect your system from most knocks, spills and power surges. Prices from **£140.00** ex VAT.

Premium Service Package

As Standard Package but with the addition of Online Microsoft® Office training for 30 days to help you maximise the benefit of your PC investment. Prices from **£230.00** ex VAT

Please ask our Sales Team to advise you.

For full details go online at www.dell.co.uk/services

Why is Leasing with Dell Financial Services so Good for You and Your Business?*

- Increases your purchasing power
- Preserves your credit lines
- Tax advantaged
- Spreads your payments
- Convenient one stop shop

Dell Products. c/o PO Box 69, Milbanke House, Western Road, Bracknell, Berkshire, RG12 1RD. Terms and Conditions of Sales, Service and Finance apply and are available at www.dell.co.uk or on request. UK Business customers only. Subject to availability, prices and specifications are correct at date of publication and may change without notice. One GB = 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. Dell™ Dimension desktops and Inspiron notebooks include Microsoft Works 7.0 as standard unless otherwise specified. Delivery charge is £49 Ex VAT (£57.58 incl. VAT) per system. ¹Discs burned with DVD+/-RW and DVD+RW drives, where featured, may not be compatible with certain existing drives. ²Delivery charge ranges from £3 (£3.53 incl. VAT) to £13 (£15.28 incl. VAT) per item depending on order size when purchased without a system. ³Dell LCD TV is subject to a delivery charge of £12 excl. VAT (£14.10 incl. VAT) when purchased without a system. ⁴Based on ANSI/NAPM IT7.228-1997 tests (using new bulbs) of between 34-305 units in 2002-4 (dependent on model). Average Lumens at least 90% of max Lumens. Bulb brightness degrades with use - periodic changes recommended. ⁵Euro Collect and Return Service is available in limited countries and places. Dell service offerings do not affect customer's statutory rights.

©2005 Dell Inc. Dell, the Dell logo, Dimension, Inspiron, Axim, PowerEdge, Dell Toner Management and UltraSharp are registered trademarks or trademarks of Dell Inc. Dell disclaims proprietary interest in the trademarks or trade names of other entities used to refer to them or their products. Microsoft, MS and Windows are registered trademarks of Microsoft Corporation. Intel, the Intel Inside logo, Pentium, Intel Xeon, Celeron, Intel Centrino and Intel XScale are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*0% Finance is available from Dell Financial Services (CIT Group (UK) Ltd). Credit is available only to UK body corporate and subject to status. All amounts exclude delivery and VAT. Prices shown may vary without notice. Terms and conditions and written quotations available upon request. Credit scoring used. Those not qualifying for 0% may qualify for other finance offers.

Dell Enterprise Products & Services

Dell™ offers assistance during every stage of your solution's lifetime

- from helping you decide which system and level of support best suits your business, to planning, installation, training and on-site support & service.

Furthermore, by giving you a single point of contact, we save you time and simplify your supply management.

Bronze level of support during business hours and next business day on-site service after telephone based diagnosis, ideal for non-critical systems.

Silver Support 24x7 for telephone troubleshooting, including software assistance. Silver customers benefit from the Enterprise Service Force (ESF), specially trained field-technicians.

Gold In addition to Silver, Gold customers benefit from Dell's most senior 2nd level support engineers. A Technical Account Manager is also available for Gold customers to ensure the highest possible service.



Dell™ recommends Microsoft® Windows® 2003 Server Edition

Servers

Dell™ PowerEdge™ SC420 SATA

- Intel® Pentium® 4 Processor 2.80GHz (For the price of a 2.53GHz Celeron® processor)
- Single Processor Only
- 256MB DDR2 533MHz Memory
- 80GB 7200rpm SATA hard drive
- Optional Software RAID for higher data availability
- Embedded Gigabit NIC
- 1 Year Next Business Day Service



~~£299~~
£219
Excl. Del. & VAT

SAVE
£80

E-VALUE Code: PPUK4- SC74201

Further enhancements

- Upgrade to 250GB IDE HDD £128 excl. VAT
- Upgrade to 1GB ECC DDR2 SDRAM £135 excl. VAT
- 3 Year Bronze Next Business Day Support £75 excl. VAT

Dell™ PowerEdge™ 1800 Improved Server Performance

- 64-bit Intel® Xeon™ Processor 3.20GHz for price of 2.80GHz
- Dual Processor Support with 800MHz FSB
- 256MB DDR2 SDRAM (upgradeable to 8GB)
- 80GB 7200rpm SATA hard drive
- Optional CERC SATA RAID Controller
- Single embedded Gigabit NIC
- 3 Year Bronze Next Business Day Support



~~£539~~
£469
Excl. Del. & VAT

SAVE
£70

E-VALUE Code: PPUK4-PE718002

Further enhancements

- Upgrade to 1GB £169 excl. VAT
- 3 Year, 4 Hour Response 24/7 £175 excl. VAT
- ***Add 768MB memory & Microsoft SBS 2003 Std Edition (with 5 CALs) £505 excl. VAT

Dell™ PowerEdge™ 750 Cel IDE

- Intel® Pentium® 4 Processor 2.80GHz (for the price of 2.40GHz Celeron)
- Single Processor Only
- 256MB ECC DDR SDRAM (max 4GB)
- 80GB 7200rpm SATA hard drive
- Optional Software or Hardware SCSI or SATA RAID (0,1)
- Dual Embedded Gigabit NIC
- 3 Year Bronze Next Business Day Support



~~£439~~
£389
Excl. Del. & VAT

SAVE
£50

E-VALUE Code: PPUK4-PE77501

Further enhancements

- Upgrade to 1GB ECC DDR SDRAM £169 excl. VAT
- Upgrade to a 250GB SATA HDD £128 excl. VAT
- CERC SATA RAID Controller £176 excl. VAT



Go online for the latest deals Click www.dell.co.uk/business

Business PCs 0870 907 4388 Home PCs 0870 907 4390

Order online or on the phone. Easy as



Contents



For daily news updates, reviews and downloads go to www.pcw.co.uk

AUGUST 2005

Regulars

9 Editorial 10 Contact us 12 How we test
42 Letters 47 Inside information
48 Kewney @ large 49 Straight talking
80 Best buys 214 Micromart
233 Index of advertisers 234 Special offers
243 In the next issue 244 Flashback

News

16 Mac-PC marriage sensation
Athlon X2 thrashes Intel
34 Four-page report from Computex
38 Fashion shapes IT
39 Pirates ride spam wave

Features

85 Recycle your PC

Don't throw away your old PC just yet. Here's how you can re-use those ancient parts and help the environment at the same time

95 Join the smart set

Make the most of your smartphone with our round-up of 104 software packages for the four top platforms

Group tests

109 Compact digital cameras

You don't have to compromise on picture quality if you buy a small camera. Check out nine of the best pocket-sized snappers

121 Battle of the Titans

Find out how 64bit processors from AMD and Intel fared in these very fast PCs

Build your PC

32-page special

Build your ultimate system with our help

Network

165 News

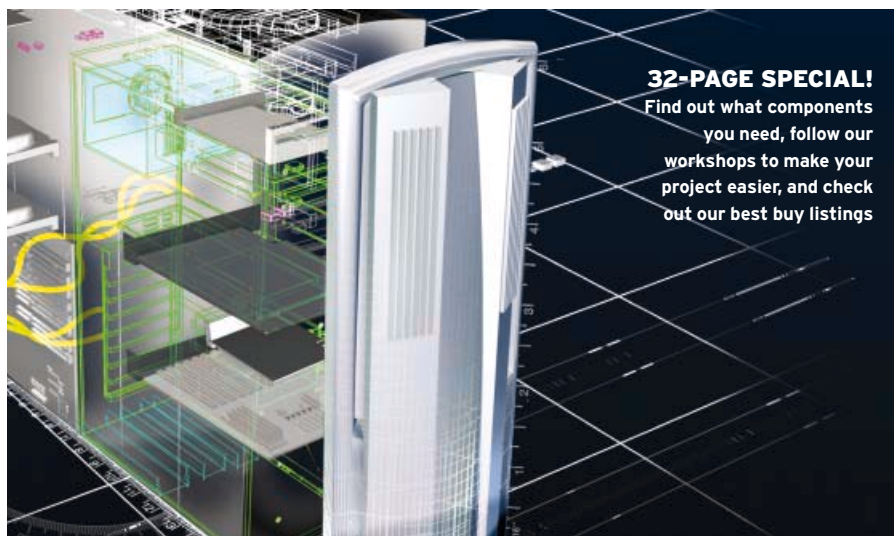
166 Martin Courtney explains why we shouldn't lose touch with our human side



169 Soho connections

Easy-to-use routers are making networking easier for small-business and home users. We test 13 devices

Cover feature How to build your dream PC



32-PAGE SPECIAL!

Find out what components you need, follow our workshops to make your project easier, and check out our best buy listings



121 AMD v Intel in 64bit fight

The fastest PCs around show what these speedy AMD and Intel processors are capable of

95 Smartphone software

104 programs to help you make the most of your smartphone



109 Snap happy

Pocket-sized digital cameras put to the test



Competitions 230 Two Jal PCs and a Shuttle system

Don't miss out on your chance to win one of these PCs.



Reviews

50 Will Stapley on dual-core processors and other highlights in this month's section

Hardware

- 51** Mesh Titan Dual X2 Pro
- 52** Advent T9504
- Acer Travelmate 3000
- 53** Mesh Pegasus 3700+

Mini round-up

- 58** External digital TV tuners

Peripherals

- 54** Gizmondo
- Viewsonic PJ400
- 55** HP Laserjet 1020
- 56** Acecad Digimemo
- Fujitsu-Siemens P20-2
- 60** A4tech NB-30 battery-free mouse
- Fujitsu Scansnap II Plus
- Philips Shoqbox
- Plantronics CS60-USB

Overclocking

- 62** Asus Vento 3600
- Scythe Samurai RevB
- Sapphire Radeon X800XL Ultimate
- Nexus H20-2000 Water Block
- 63** Powercooler X800 256MB Game FX
- Nexus Dampdex Block Kit
- Antec Truepower 2 480W
- Toshiba MK1032 GAX

Components

- 64** ECS PF88 Extreme
- 65** Abit Fatal1ty AN8

Software

- 66** Allume Stuffit 9 Deluxe
- 67** Bryce 5.5
- 68** Microsoft Windows XP Professional x64 Edition
- 72** Suse Linux 9.3 Professional 9.3 64bit
- 73** Mac OS 10.4 Tiger
- 76** Serif Movieplus 4
- 77** Photo Explosion Deluxe 2
- 79** Spy Cleaner Gold 9.3
- Bitdefender 8 Professional Plus
- Lifethemes
- Cyberpatrol 7



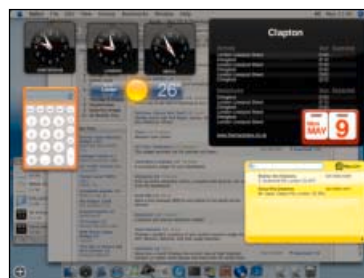
p52



p54



p62



p73

Leisure

228 Games **230** Competitions **232** Retro

Cover Disc 15 & 237 Four full versions

Readiris Pro 7, ACDSee 7 PE, Serif Photoplug 7 and loads more



Hands on

181 Contents

182 Question time

Our team of experts answer your queries

186 Hardware

Mobile processors in desktops are tested to the limit

188 Overclocking

Find out if you need to upgrade when processor manufacturers launch new sockets

190 Windows

An irritating error explained, and we show you how to make the most of your Internet cache

192 Linux/Unix

How to connect to other systems without compromising security

196 Word processing

Here's how to split a Word page into separate, equally sized sections

197 Spreadsheets

A Pivot Table can be used to analyse data in a list – find out how

198 Digital imaging & video

Master the techniques of time-lapse photography with our step-by-step guide

200 Sound

Discover the pros and cons of buying a 3G mobile

203 Networks

Take the pain out of updating software security patches

205 Databases

Tame annoying Access controls

207 Visual programming

Moving to faster chips and an in-depth look at Visual Studio 2005

209 Keeping intruders out

Prevent unauthorised entry to your wireless network



Upgrade or
overclock?
p188

If you work for you, this package will too.



It's something specially for the self-employed. Our BusinessTime price plan means you pay one flat rate from as little as 10p/min whenever and wherever you call in the UK. Which means no nasty surprises when you get your bill. We'll also give you a free box of kit to keep you in touch on the move, including a Bluetooth™ headset, a car cradle and car charger.

If this works for you, call us on 08080 741 741, drop in to your nearest Vodafone retailer or visit www.vodafone.co.uk/businessTime





rob_jones@vnu.co.uk

Old meets new in a massage shop

Computex, held in IT-savvy Taipei, offers glimpses of how technology is evolving, says Rob Jones

Computex has just finished, and this year I've stayed on after the event to spend some time visiting various companies. Taiwan is home to the headquarters for many component manufacturers, with global US giants also taking major offices in the city, making it a great opportunity to see companies in their own environment. This gives you a better feel for them and their status.

The centre of Taipei, where Computex is held, is a hot, humid and very western city, boasting the tallest building in the world, Taipei 101. A fantastic feat of engineering and technology, it holds a number of records, including the fastest elevator, which takes just 36 seconds to travel 84 of its 101 floors. Your ears pop at least twice on the ascent. This year, we had the added excitement of an earthquake and the threat of a typhoon.

As you head towards the city's outskirts, the traditional becomes more evident, but it's a great setting for the show because the people here, especially the young, are so at ease with technology. A great example of this happened when I went with a friend for a massage in a drop-in centre – a tiny shop – where all the masseurs are blind. They are trained from when they are young, extremely skilled at their art and renowned for the quality of their work. My masseur fell into the 'you couldn't make it up' bracket, as he was a blind, Taiwanese Elvis lookalike. Sitting in the corner was a PC with a TFT screen and broadband access, and the owner's kids sat the whole time playing games, instant messaging their friends and, in between, texting others using their smartphones. It was a scene from both the old and modern worlds in one small, sparse shop.

The Computex exhibition covers four halls plus various buildings and hotels in the immediate vicinity. Sex still sells, and in the product-packed halls many stands use scantily clad women accompanied by an intense level of noise to attract attention. By the day's end, the atmosphere is solid human tides moving in opposing directions and the noise so loud you can't hear the people standing next to you.

With Computex growing in size and importance, you would expect the Taiwanese manufacturers to make their major announcements or showcase innovations at the exhibition, but there was less of this than expected, despite the organisers claiming it is now the second biggest IT show in the world.

On the components front, loads of graphics cards were on show – some interesting, others just updates to existing products. MSI displayed a couple of concept cards (see page 37), and ECS added to its Sima Intel/AMD converter cards, where you can swap from one CPU to another without changing your motherboard (page 34).

One interesting aspect of the show that you can also read about in this issue was the changing focus of many of the component manufacturers. It was clear that many are moving more into consumer electronics, as they expect this area's growth to outperform that of their original business.

Much of it has been a natural progression. We've spent years staring at Benq flat-screen TFTs, so it's not a huge leap to see monitor makers producing large-screen LCD TVs. Many companies were making similar moves, concentrating not just on LCDs but mp3 players, portable media players and laptops – the latter was a considered consumer electronics product by those I spoke to.

We can expect to see more unfamiliar names from familiar brands, but that doesn't mean they are dropping the products that are the foundation of their success. New chipsets will continue to create a wave of motherboards, even faster graphics cards are on the horizon and old enemies will continue to battle each other and play leapfrog.

'Many component manufacturers are changing focus and moving more into consumer electronics'



»» **Recycling PCs**
How to make good use of your old PC's hardware – see page 85



»» **Intel vs AMD PCs**
Find out which high-end, 64bit system was the fastest – see page 121

PERSONAL COMPUTER WORLD

Personal Computer World, VNU House,
32-34 Broadwick Street, London W1A 2HG
Main switchboard 020 7316 9000
Anna Lagerkvist, Group Editorial Assistant:
020 7316 9852

Subscription Enquiries

Contact us for information
about existing or new
subscriptions

ONLINE via our secure website:
www.subscription.co.uk/help/vnu

EMAIL vnu@subscription.co.uk

TEL 01858 438 881

(Weekdays 8am - 9.30pm
Saturdays 8am - 4pm)

FAX 01858 468 969

POST *Personal Computer World*,
Tower House, Sovereign Park,
Market Harborough,
Leicestershire LE16 9EF

BENEFITS OF SUBSCRIBING

- » Save money on the cover price
- » Special subscriber discounts on all PCW Direct products
www.direct-pcw.co.uk
- » Receive your issue before the on-sale date
- » Money back guarantee – if you're not 100% satisfied with your subscription, we will refund the cost of any unmailed issues – no questions asked

MANAGE YOUR SUBSCRIPTION ONLINE

Just visit
www.subscription.co.uk/help/vnu
for instant access to your
subscription account

Use the above email address to check
your current subscription – see how
many issues you have left, or find out
our publication dates



READERS AND SUBSCRIBERS

Register your email address with us to
receive information about PCW special
offers. Just visit:

www.subscription.co.uk/vnu/email

EDITORIAL

TEL 020 7316 9000

FAX 020 7316 9313 [WWW.PCW.CO.UK](http://www.pcw.co.uk)

Rob Jones **EDITOR**

Kelvyn Taylor **DEPUTY EDITOR**

Clive Akass **ASSOCIATE EDITOR (NEWS)**

Will Stapley **REVIEWS EDITOR**

Rory Reid **STAFF WRITER**

Anna Lagerkvist **GROUP EDITORIAL ASSISTANT**

Alex Arias **LABS PROJECT MANAGER**

Simon Crisp **LABS PROJECT MANAGER**

EDITORIAL CONTRIBUTORS

Tim Anderson, Chris Cain, Martin Courtney, Barry Fox,
Rene Grau, Laura Jones, Cliff Joseph, Guy Kewney,
Gordon Laing, Niall Magennis, Emilie Martin, Manuel Masiero,
Ken McMahon, Tim Nott, Jonathan Parkyn, José Plata
Mario, Daniel Robinson, Eduardo Sánchez Rojo,
Oliver Schwede, Barry Shilliday, Alan Stevens, Stephen Wells,
Mark Whitehorn, Nigel Whitfield

PRODUCTION

Debbie Oliver **PRODUCTION EDITOR**

Kathryn Twyford **DEPUTY PRODUCTION EDITOR**

Maddy Kent **SUB-EDITOR**

ART

Jonathan Ross **ART EDITOR**

ART & PRODUCTION CONTRIBUTORS

Vincent Fraser, Bruce Mackie, Susie Norris,
Salvatore Spagnuolo

PUBLISHING

Richard Wilson **PUBLISHER**

Anita van der Aa **PUBLISHING DIRECTOR**

Ruud Bakker **MANAGING DIRECTOR & CHIEF EXECUTIVE**

Paul Skelly **FINANCE DIRECTOR**

Angelo Zgorelec **FOUNDER**

MARKETING & CIRCULATION

Mark Judd **HEAD OF CIRCULATION**

Timothy Webb **GROUP MARKETING MANAGER**

Kieran Proverbs **MARKETING EXECUTIVE**

Harriet Cumming **SUBSCRIPTIONS CONTROLLER**

Chris Wiles **NEW MEDIA MANAGER (CB/DVD)**

ADVERTISING

ADVERTISEMENT SALES HOTLINE 020 7316 9465

Jonathan Busse **SALES MANAGER** 020 7316 9773

Paul Harvey **MAJOR CLIENT MANAGER** 020 7316 9465

Alan Loader **CLIENT MANAGER** 020 7316 9733

Vanja Vizin **SALES EXECUTIVE** 020 7316 9144

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

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

TAIWAN SALES REPRESENTATIVES Transaction Media Ltd,
7th floor, Suite 7, 2 Fu Hsing North Road, Taipei, Taiwan
00 886 2 8772 5145. Contacts: Nitin Joshi, Lilly Mao

CENTRAL PRODUCTION

Joanne Hurst **PRODUCTION DIRECTOR** 020 7316 9227

Cathy Mahoney **PRODUCTION MANAGER** 020 7316 9486

Idil Buralah **PRODUCTION CONTROLLER** 020 7316 9671



VNU's European Labs fulfil the testing needs of
VNU's portfolio of magazines. The labs in London,
Amsterdam, Milan, Brussels, Paris, Munich and Madrid
provide testing for all VNU's European titles.

To email any PCW staff member use the following:
firstname_surname@vnu.co.uk, substituting the
person's name as it appears on this page

CUSTOMER SERVICES

Enquiries or complaints regarding any advertiser in this magazine
should be emailed to julie_pickess@vnu.co.uk, or sent to: Julie Pickess at
32 Broadwick Street, London W1A 2HG Tel: 020 7316 9614

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. For orders, call Natalie Lue on 020 7316 9208. We are happy for
people to use quotations and segments for internal or promotional purposes.

No material may be reproduced in whole or in part without
written consent from the copyright holder
© VNU Business Publications 2005

LICENSING

Personal Computer World is available for international licensing.
Please contact Joanna Mitchell at joanna_mitchell@vnu.co.uk
for more information.

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 MOPS scheme, qualify for
compensation, providing:

1. You have not received the goods or had your money returned.
2. The goods ordered were as depicted/described in a display advertisement.
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 Julie Pickess 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
MOPS scheme.

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 MOPS scheme 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 MOPS scheme is

designed to safeguard the PRIVATE individual
reader. It does not provide protection to any
companies, societies, organisations,
unincorporated bodies or any other
commercially oriented 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.

FOR BACK ISSUE AND COVER DISC ORDERS

Tel: 01858 438 883 **Fax:** 01858 468 969

Personal Computer World, Tower House, Sovereign Park,
Market Harborough, Leicestershire LE16 9EF

Back issues/cover discs UK prices (inc P&P)

Back issue (CD version) £5 (€8 Europe*, €10 ROW)

Back issue (DVD version) £7 (€9 Europe*, €11 ROW)

Back issue prices for current subscribers: CD version £3.75 (€6 Europe*,
€8 ROW); DVD version £5.49 (€7 Europe, €9 ROW)

* Europe includes the Republic of Ireland

For faulty or damaged CDs please ring 08700 885 995 between
9.30am and 5pm weekdays, except Wednesday when lines are open
until 8pm, and between 10am and 2pm Saturdays.
Email: pcw@vnusupport.co.uk, quoting the issue date.

Printed and bound by St Ives (Roche) Ltd
Distributed Marketforce (UK) Ltd, 5th Floor, Low Rise Building, King's
Reach Tower, Stamford Street, London SE1 9LS



vnu business publications



The Epson AcuLaser convertible mono printer.
Because one day your business may need colour.



Now there's a revolutionary new high speed, mono laser printer that you can upgrade to colour simply by changing the toners: the Epson AcuLaser 2600N*. There are no extra hardware costs involved, mono prints cost the same as a standard mono laser printer and it has the flexibility to change back at any time. So you can plan for tomorrow without stretching your budget today.
www.epson.co.uk *Also available as a colour printer with colour toners.

EPSON[®]
EXCEED YOUR VISION

Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.



PCW's tests are carried out by VNU Labs, the best PC testing labs in the UK

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At PCW we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many possible combinations of components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – a PC might have a lot of bells and whistles, but if the core system is underperforming compared to the rest of the group, you need to know about it before you part with your hard-earned cash.

In VNU's UK Labs, which is part of a network of European VNU Labs we call upon, our staff have over 20 years of combined testing experience and have tested thousands of hardware products in every conceivable category. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Below you'll find short descriptions of the main benchmarks we use for testing PC systems and components.

Sysmark 2004

Sysmark 2004 is a system productivity benchmark, designed to reflect system performance when running the most popular application software in real-world scenarios with real-world workloads.

Sysmark 2004 uses 15 full applications, plus anti-virus and compression software, divided into two categories: Office Productivity and Internet Content Creation.

It runs through predefined scripts that include concurrent running of applications to test multitasking capabilities.

Scores are calculated for each category based on the scores for various sub-tasks. Individual tasks are scored based on 'response time' – the time the system takes to complete a task initiated by the user. Responsiveness to the user is scored more highly than the total time taken to complete a number of tasks.

These scores are based on a comparison between the test system and a Bapco reference PC with a 2GHz Pentium 4 processor, an Intel D845GBV-based motherboard, 512MB of DDR266 CL2.5 Ram, a 64MB ATI Radeon 9700 Pro graphics card, an 80GB IBM 2MB cache, 7,200rpm hard drive formatted with the NTFS file system and Windows XP SP1. A score of 100 indicates that the system has a performance equal to the reference PC, 200 indicates twice the performance and so on. We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category.

When testing PCs and notebooks, we first configure them automatically with standard desktop settings. This includes removing all startup programs, automatic updates, desktop wallpaper, screensavers and proprietary system tray utilities. This is done in order to ensure the repeatability of tests.

The applications within each category of Sysmark 2004 are as follows:

Office Productivity

Adobe Acrobat 5.0.5, Microsoft Access 2002 SP2, Microsoft Excel 2002 SP2, Microsoft Outlook 2002 SP2, Microsoft Powerpoint 2002 SP2, Microsoft Word 2002 SP2, Microsoft Internet Explorer 6 SP1, Scansoft Dragon Naturally Speaking 6 Preferred, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

Internet Content Creation

Adobe After Effects 5.5, Adobe Photoshop 7.01, Adobe Premiere 6.5, Discreet 3ds Max, Macromedia Dreamweaver MX, Macromedia Flash MX, Microsoft Windows Media Encoder 9 Series, Network Associates McAfee Virus Scan 7, Winzip Computing Winzip 8.1

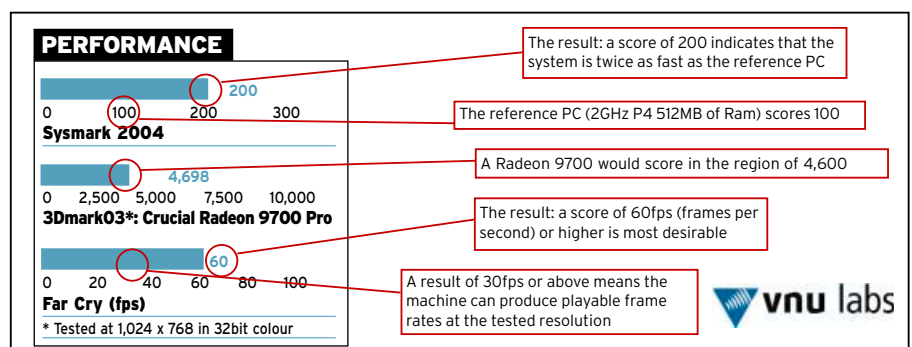
See www.bapco.com for pricing information and full details of testing strategies and methodologies.

3Dmark03

3Dmark03 consists of four tests. The first examines DirectX 7 performance; the following two are DirectX 8 and the final test is DirectX 9.

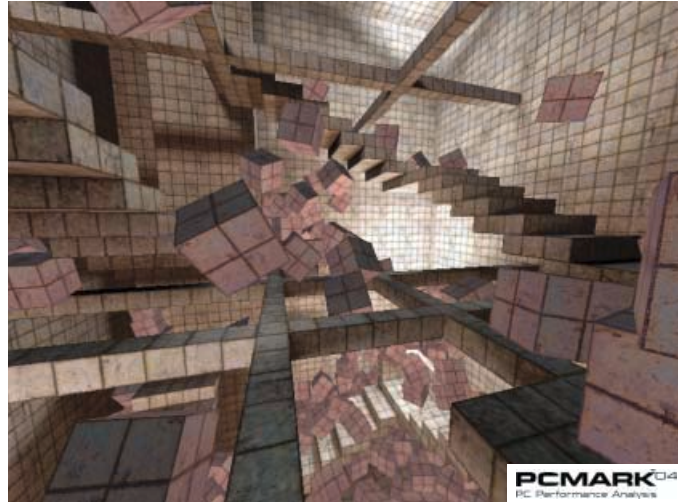
The result is calculated by taking an average of the frame rates from the first three tests. The results from the fourth test are included, but have a lesser bearing on the final score.

This version will only run fully on DirectX 9 compliant cards. 3Dmark03 is suitable for modern cards in the budget to mid-price





Far Cry is a real challenge for modern graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

ranges. For the latest cards, we use 3Dmark05. 3Dmark 2001 has now been officially retired by VNU Labs.

3Dmark05

3Dmark05 is a demanding test designed to stress the latest generation of DirectX 9-compliant cards and will only work with models that support Pixel Shaders 2 and have DirectX 9c installed.

Using the same interface as 3Dmark03, the main benchmark consists of three simulated game tests. These are designed to load the graphics subsystem as much as possible, although the CPU and other components can have an effect on the overall score, which is why 128MB of video Ram and a 2GHz CPU are part of the minimum system requirements for running the tests. For systems using older graphics cards that don't meet the 3Dmark05 requirements, we will use 3Dmark03.

Far Cry

We use the Far Cry game from Ubisoft for testing DirectX 9 gaming performance. The default demo we use is timedemo on the 'Fort' level. Far Cry's game engine is very graphics-intensive, so it presents a real

challenge to modern graphics cards. For PC and notebook testing we test at 1,024 x 768 pixels, 32bit colour, 75Hz refresh and default settings for both anti-aliasing (AA) and anisotropic filtering (AF).

When it comes to testing graphics cards, in addition to the standard test, the card is also tested at 1,024 x 768 with 4x AA and 4x AF; 1,600 x 1,200 with 4x AA and 4x AF and 1,600 x 1,200 with maximum quality settings.

PCmark04

Part-way between application-based and entirely synthetic benchmarks, PCmark04 uses a hybrid technology, employing portions of real applications to produce realistic performance results without the overhead of installing complete software packages.

It has four main suites of tests for measuring memory, processor, graphics and hard drive performance, as well as that of the overall system. For more information on PCmark and 3Dmark, visit www.futuremark.com.

Battery test

To get a feeling for the minimum length of time a notebook battery will last, we run a specific test. Based on a looping Excel Visual

Basic application, the test opens worksheets, generates random numbers and pivot tables, then zooms, and adjusts the brightness and contrast of an image. The running time is recorded to disk every 30 seconds until the battery power diminishes.

Test beds

When testing components and peripherals, we use several standard Intel and AMD-based test rigs. These are as follows:

- CPUs and memory: 3.4GHz Intel Pentium 4 Extreme Edition, AMD Athlon 64 4000+, AMD Athlon 64 3400+
- Memory: 1GB of Crucial PC5300 DDR2 Ram (Intel) or PC3200 (DDR1-400) (AMD)
- Motherboards: Asus P5AD2-E Premium (Intel); ECS KN-1 (AMD)
- Hard drive: 120GB Western Digital EIDE model with an 8MB buffer
- Graphics card: ATI Radeon X850XT PCI Express
- Operating system: Windows XP SP2

For hard drive testing, we use a dedicated Intel P4 3.4GHz system with 512MB of Buffalo PC5300 DDR2 Ram, an Nvidia Geforce 6800 PCI Express graphics card and an Intel D925XECV2 motherboard.



3Dmark05 pushes modern graphics cards to their limits



3Dmark03 is used to test DirectX 7/8 graphics cards

Intelligence for Easier Computing

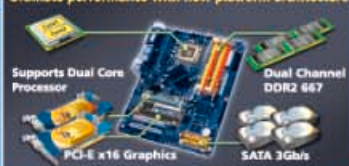
GIGABYTE i-DNA series Motherboards

synergize Performance DNA with Security DNA into fundamental intelligence technologies for the digital lifestyle.



Performance DNA

Ultimate performance with new platform architecture



Intel® EM64T Ready
Intel® Extended Memory 64 Technology
Doubles data access with 64 bits.

CPU Intelligent Accelerator 2

The most intelligent accelerator for your PC.



Memory Intelligent Booster 2

Boost memory performance to its limits



U-Plus D.P.S.*

Enhance system cooling & overclocking capability



RAIDS

Smart protection & improved data access



Intel® Execute Disable Bit
Protects system from virus attacks

Xpress Recovery
Instantly recovers system files back to normal

* Not all models support the features above

GA-8I955X Royal



- Intel® 955X Express Chipset + ICH 7R
- Optimized for Intel® Pentium® Processor Extreme Edition
- Supports dual channel DDR2 667 with ECC up to 8GB
- Features GIGABYTE exclusive U-P us Dual Power System
- Features dual Gigabit Ethernet port connection
- Integrated new generation SATA 3Gbps storage interface
- Features with Intel Matrix Storage Technology
- Designed for Dolby Master Studio

Free!
GIGABYTE Patented
USB Dongle included!!

Free!
GIGABYTE Patented
U-Plus D.P.S. included!!

GA-8N-SLI Royal



- NVIDIA® nForce™ 4 SLI™ Intel® Edition + MCP04
- Features GIGABYTE exclusive U-Plus Dual Power System
- Supports FSB1066 Intel® Pentium® D processor
- Supports Dual Channel DDR2 667 memory
- SLI™ Supports two SLI™-Ready GPUs to scale gaming performance
- Supports NVIDIA® SATA 3Gbps and RAID for advanced storage application
- Features dual Gigabit Ethernet connection with NV firewall
- Features PCI-Express x1 and IEEE1394b interface
- Integrated high quality 8 channel Audio Codec

Free!
GIGABYTE Patented
USB Dongle included!!

Free!
GIGABYTE Patented
U-Plus D.P.S. included!!



For more information, please contact our dealer :

<http://www.3bsystems.co.uk/>
<http://www.a2zcomputers.co.uk/>
<http://www.ambros.co.uk/>
<http://www.aria.co.uk/>
<http://www.asiweb.co.uk/>
<http://www.ballicom.co.uk/>
<http://www.computerorb.it.co.uk/>
www.ctech2000.co.uk
<http://www.cubsuk.com/>
<http://www.dabs.com/>
<http://www.eclipse-computers.com/>

<http://www.etec-solutions.co.uk/>
<http://www.indywareltd.co.uk/>
<http://www.fastekcomputers.co.uk/>
<http://www.gliadiatorcomputers.com/>
<http://www.idealcomputing.co.uk/>
<http://www.micro-logic.com/>
<http://www.microdirect.co.uk/>
<http://www.overclock.co.uk/>
<http://www.overclockers.co.uk/>
<http://www.planetmicro.co.uk/>
<http://www.rsupplies.co.uk/>

<http://www.scan.co.uk/>
<http://www.simply.co.uk/>
<http://www.stak.com/>
<http://www.taitcomponents.co.uk/>
<http://www.thepcbusiness.com/>
<http://www.xtreme-hardware.co.uk/>
Computashop 0207 2553255
Northants Computers 01536 522466



G.B.T. TECH CO. LTD.(UK)
<http://www.gbt-tech.co.uk>

Specifications and pictures are subject to change without notice. All brand names and products are registered trademarks of their respective companies.

Upgrade Your Life™ www.gigabyte.com.tw

GIGABYTE™
TECHNOLOGY

August Cover Disc



Let our workshops show you how to use some of the full versions on the CD. See p237>>

2 EXCLUSIVE PROGRAMS

Featured software on the CD

Readiris Pro 7

Recognises and converts scanned documents into editable text

Page 238

ACDSee 7 PE

This photo-management software helps you find, share, edit and publish your digital photos

Page 240

Serif PhotoPlus 7

Correct and adjust your digital images, and get creative with a variety of special effects

Page 241

Dan Elwell's Broadband Speed Test

Measure the speed of your broadband connection and monitor its performance over time

Page 242



Featured software on the DVD

Backup4all 1.5

A quick and simple way to back up and store all your valuable data and files

Page 242



Other highlights

Freeware tool and utilities CD & DVD

There's loads of useful software for you to try on our CD and DVD

Linux and open source DVD

Try the following Linux distributions: Ubuntu 5.04, Slax 5.055, Knoppix 3.8.2 and Austrumi 0.9.5

Adobe Photoshop CS2 DVD

This trial version gives you the chance to try the latest Photoshop before you buy

Games demos DVD



Contents

News

- 20 Latest on Tablets
Palm organises portable media player
- 21 Scansoft rivals Acrobat
- 22 Home computing drive
- 39 Pirates ride spam wave
- 40 New games consoles

Computex

Four-page special report from Rob Jones in Taiwan

- 34 Vendors woo consumer market
Skype unchained
New Via mobile chip
- 35 Latest motherboards
- 36 Crossfire dual duel with SLI
- 37 New graphics cards

Focus on

38 Fashion shapes IT

It may not be the sort of picture you expect to see in a PC magazine but there is something very special about this dress.



Mac in PC marriage shock

Apple is to switch from IBM-made PowerPC processors to Intel in its most sensational move since the launch of the Mac graphical interface. The change promises cheaper Macs but it will not be popular among the many Apple users with an aversion to Wintel. It also entails an expensive effort by developers to recompile their applications.

But it seems that the MacOS has been compiled and tested secretly on Intel chips for five years. Selected developers will get a 'Mactel' PC running a 3.6GHz Pentium within days and the first x86 Mac will be available in 2006, with the entire range switching in 2007.

The move could have a huge impact on Microsoft. The MacOS X was completely rebuilt around an enterprise-class Unix kernel, so that it can slot easily into corporate systems. And the latest version, Tiger (see review on page 73), is arguably better for family users than XP because it comes with an excellent set of

multimedia applications.

Microsoft scores on the breadth of XP applications and support for peripherals.

But Apple seems to have pulled back from challenging Microsoft head-on. Executives said it will not allow the MacOS to be put on any PC: Apple will try to continue being the sole source for both Mac hardware and operating software.

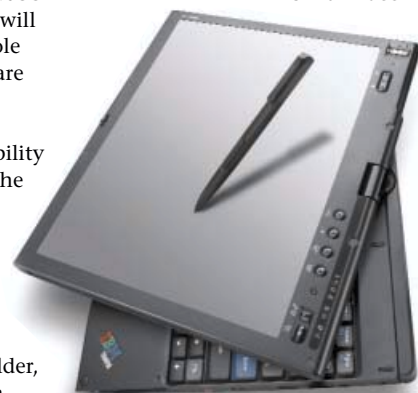
This policy helped build Apple's reputation for reliability because, unlike Windows, the MacOS did not have to be compatible with just about every device sold. But Mac users also had less choice and higher prices.

Making the MacOS available to any system builder, as Windows is, would mean abandoning hardware profits in the hope of boosting software revenues. But it would be more dangerous for Microsoft and more interesting for users.

The loss to IBM is offset by the fact that it makes the Cell processor powering Sony's new

Playstation (see page 40). A major reason for the Intel choice, according to Apple chief executive Steve Jobs, was that it offered better power efficiency for notebooks. For more on this story see www.pcw.co.uk/2137576.

Clive Akass



The sale of IBM's PC division to the China-based Lenovo was another sign of major change. The Thinkpad X41 Tablet PC, unveiled this month, is Lenovo's first big launch into the UK. There's more tablet news on page 22.

Athlon thrashes Pentium as Intel moves goalposts

A new 64bit dual-core desktop chip from AMD has thrashed Intel's rival dual-core Pentium Extreme Edition (PEE) 840 in PCW Labs tests (see box) despite a clock rate 25 per cent slower.

The Athlon 64 X2 4800+ is the fastest of four AMDs launched at Computex. The



For more from Computex, see Rob Jones' special report on pages 34-37

4800+ and 4600+ run at 2.4GHz, and the 4400+ and 4200+ clock 2.2GHz; the higher-numbered of each pair have a 1MB cache and the others have 512KB.

Their launch overshadowed that of three dual-core Intel Pentium D chips, the 820, 830 and 840 clocking 2.8GHz, 3GHz and 3.2GHz respectively. These do not support Hyperthreading, which treats a single processor as two virtual ones, and so are less efficient than the PEE 840. However, the 820 costs just £130

compared with about £300 for AMD's cheapest Athlon X2.

AMD and Intel have dropped clock rates as a performance measure: the point of dual core is to get more work done at a lower, cooler frequency. Intel has also shifted focus from processors to platforms, a term that embraces support chips and other features as well as the CPU.

Critics say this is because Intel has lost the speed race; but the approach began with the mobile Centrino platform, now in its second generation. Intel launched sister business and home platforms last month with rather more publicity than it gave its new processors. Both platforms use the 945 chipset, which has two flavours: the

945G with integrated graphics and the 945P, without. Raid 0, 1, 5 and 10 are also supported, giving PCs the option of instant recovery from disk failure.

The home platform uses Pentium D chips; the business one uses the single-core 600-series. The latter conform to Intel's stable-image platform program, which limits technology changes.

AMD trumps that because its new X2 chips can be swapped straight into single-core Athlon 64 sockets, almost doubling the performance at a stroke, with the need only for a Bios upgrade. But there are doubts as to whether AMD could keep up with heavy demand for the X2s.

Clive Akass

X2 marks spot on

The X2 4800+ scored 11.01 per cent more than the 3.2GHz PEE overall on the PCMark CPU test - 6,747 compared with 6,068. Only on file encryption was it slower. For full results and Pentium D tests, see the Testbed blog at www.pcw.co.uk.



Visit the test bed and get the latest news and results from PCW's Labs <http://labs.pcw.co.uk>



Pocket-sized digicams
We test nine of the latest compact digital cameras to see how they measure up



Office ducks from .doc

Microsoft is standardising on Extensible Markup Language (XML) as the file format for Office 12, the next version of its office suite, which is due for release late next year.

You will still be able to use the .doc, .xls and .ppt formats but XML will be the default. Free upgrades will provide the XML functionality in Office 2000 and later versions but earlier releases will not be able to read the format.

Microsoft has kept the .doc spec stable in recent Office releases after complaints of incompatibility with previous versions. Mike Pryke-Smith, Head of Information Work at Microsoft UK, said he did not anticipate similar problems with the move to Office 12. 'We have learned a lot from our mistakes,' he said.

XML will make the innards of Office documents more accessible, especially if you are familiar with HTML. The big advantage of XML is that it includes metadata. A name and address in HTML is a set of words and formatting. XML can label each component, such as a first name, surname and street, so it can be used to exchange structured information and it allows applications to extract data easily from files.

Files will be smaller and less vulnerable to corruption. Pryke-Smith said: 'They have a modular structure so if, for instance, a table in a file becomes corrupted you will still be able to read the rest.'

Microsoft's use of an open standard has met scepticism. It was granted a US patent last month for a process converting

data in a program 'object' into XML and vice versa. Critics argued this was a case of 'prior use', with Microsoft claiming ownership of something that was already basic to the use of XML.

Pryke-Smith said Microsoft was not trying to patent XML, and the specifications for the Office Open XML Format would be published as part of an open and royalty-free licence.

Microsoft's problem with Office 12 will be persuading people to upgrade from versions already considered feature-heavy. New collaboration features could attract corporates but deter small firms and private users. But Pryke-Smith said small firms will benefit as XML will facilitate the use of services like credit checks from within Office applications.

Crusoe beaches

Chipmaker Transmeta has sold its Crusoe processor to Hong Kong-based Culturecom Technology, which also purchased a licence for its 130nm Efficeon technology.

Transmeta, whose low-drain chips forced AMD and Intel to place a higher priority on power efficiency, recently changed its focus to licensing its Longrun2 power-saving technology. It will keep making 90nm Efficeons.

Broadband deals

Cable company NTL is offering 1MB broadband access for just £9.99 a month to people applying between June 1 and July 11. The pricing lasts for a year, after which it goes up to £17.99 a month, but there are no start-up charges. The service is capped at 3GB a month.

Bulldog is offering 8Mbits/sec links for £15.50 for eight hours per month – any extra is charged a 2.5p a minute. An unlimited 8Mbit service is £29.50 per month. There are introductory discounts on both offers.

PC appeal

Computer Aid, which refurbishes PCs for schools in developing countries, has appealed for donations to help cover the £49 cost of adapting each machine. The cash is needed for a project to equip schools in Kenya.

www.computeraid.org

Nokia webpad could do better

Nokia's 770 Internet Tablet has a USB port, a browser and an Internet radio and media player that can stream content via Bluetooth or 11g Wifi. But it won't support Voice over IP (VoIP) or instant messaging until a new version of its Linux Internet Tablet operating system is released next year. The 230g, 141 x 79 x 19mm device has an 800 x 480 touchscreen.



The 770 will not be available until later this year so the specs may change. But as it stands it has a limited market unless it comes at a compelling price. It would be more interesting if it had GSM or 3G links, a universal infra-red controller for the TV and recorder, access to an electronic programming guide and smart-display functionality allowing it to act as the front end for a remote PC. Clive Akass

Module DRMs up support for Radio Luxembourg

Radio Luxembourg, which was required listening for Britain's early rock-n-roll generation, could make a comeback thanks to an extension of digital broadcasting into the medium, long and short wavebands. It is one of several stations that own slots in this portion of the radio spectrum but have let them go silent because conventional analogue broadcasting cannot match FM quality, according to Andrew

Maloney, marketing manager for digital radio specialist Radioscope.

They can get near-FM quality using a technology called Digital Radio Mondiale, a new standard for LW, MW and SW digital broadcasting. Existing Dab (digital audio broadcasting) uses higher frequencies with a shorter range, whereas a single DRM transmitter can reach an entire country.

This is why stations such as Radio Luxembourg are looking at

DRM. Maloney says many are interested in using it for multimedia broadcasts.

Affordable DRM receivers have yet to hit the market, but Radioscope says its RS500 module could change that; it supports DRM, Dab and FM and will go into receivers costing much the same as existing Dab/FM models.

Maloney admits DRM broadcasts won't take off until there are enough receivers and

people won't buy receivers until there are broadcasts. But Virgin is broadcasting DRM experimentally for three hours a day and the BBC World Service is doing pilots.

Meanwhile, Radioscope's great rival Frontier announced a new version of its Venice module giving Dab similar features to personal video recorders. Users will be able to summon a seven-day programme guide and choose which to record.



A little family of intrusions that spell doom for your business computer network

Hackers, congestion, viruses, internet and e-mail abuse. With all of the problems that you and your business network face today, you've probably purchased a number of different software packages and appliances to protect your data. Prodigy is the first Internet Security

Management device to truly combine the fundamental elements of your security policy into a single device, offering your network a high level of security and guarantees peace of mind.



Every activated Prodigy comes with 6 months FREE Business broadband connection. Plus Indemnified Data Protection of up to £150,000. Backed by Lloyds of London, IDP gives you total insurance – and total reassurance that Prodigy works.



Mr Congestion
the father-in-law



Miss E-mail Moore
the sister-in-law



The Hacker
the brother-in-law



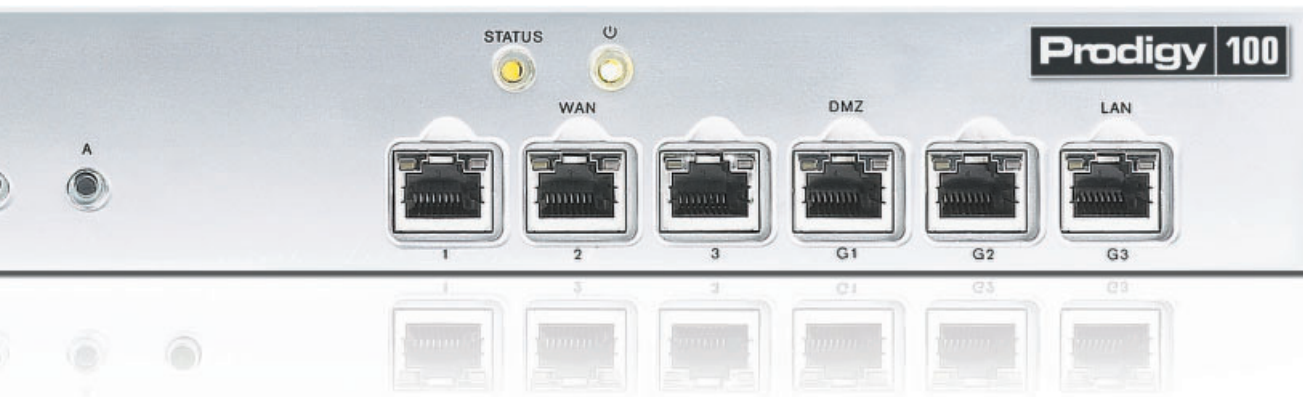
The Mother-in-law
the internet abuser



Mr Virus
Uncle Fester

Prodigy - The Next Generation

Visit www.GSEC1.com or call 0870 164 4010



Sonoma boost for tablets



Tosh shows off new Libretto

Toshiba has unveiled the new Libretto ultra-portable it is re-launching in the Britain to mark the 20th anniversary of its first notebook. The original Libretto caused a stir as it was the first notebook to come close to the size of a handheld.

When PCW previewed the original, before it was out in the UK, the office of a famous film director rang to ask when they would be available as they wanted to get their hands on 50. For some reason it was far more popular in Asia than the West and Toshiba pulled it from the market.

The new Libretto U100 has a 7.2in screen and is about the size of a paperback (8.3 x 5.7 x 1.2in), weighing a smidgeon under 1kg. It is powered by a low-voltage 1.2GHz Pentium M processor and the battery lasts a claimed 4.5 hours. It will be available soon for £1249 ex VAT.

Toshiba also launched a new Satellite M40 notebook with a 15.4in screen, a 1.73GHz Pentium M processor and a 60GB hard drive. It costs £999 inc VAT complete with a CD/DVD burner.

Aiming for the high end of the consumer market is the new Qosmio G20, with a 17in screen, built in TV and 160GB hard disk. It costs £1,699 inc VAT.

The first tablet PCs to use Intel's latest Sonoma mobile platform are beginning to hit the market. Sonoma offers more processing power than earlier Centrino models for the same battery life – a welcome boost for tablets, which have the added overhead of a pen interface.

Tablet specialist Motion Computing introduced the LE1600, which is slimmer and lighter than last year's M1400. Both models are 'slates' – they don't have an attached keyboard, but they do have an optional lid that can double as one.

Motion says the LE1600 about 20 per cent faster, thanks to its low voltage 1.5GHz Pentium M processor. It retains the M1400's fingerprint scanner and View Anywhere display



that is readable in daylight. But it has the added strength of a new magnesium alloy case, with a carbon-fibre bezel to protect the screen. An lithium-polymer battery, which clips to the underside, offers of seven hours of use but brings the weight up to 1.4kg.

The LE1600 packs an Infineon Trusted Platform Module (TPM) to secure access

More power: Motion Computing's LE1600 slimmer tablet

codes, user fingerprints and signatures, and support hardware encryption. Motion Computing targets markets like healthcare, fieldwork, and campus sites that were using tablet computers long before Microsoft launched the Tablet PC. The LE1600 costs £1,295 ex VAT or £1,095 with a 1GHz Celeron M processor.

Toshiba announced its first Tecra-branded Tablet, the M4, with a swivel-lid that allows it to be used as a standard keyboard notebook. It has a 14in SVGA+ screen, a robust magnesium body and disk shock absorber. It costs £1,349.

HP is also launching a swivel-lid 14in that we plan to review next month.

Palm organises multimedia Ipod rival

Palmone's latest product, the Lifedrive, is a bid to crack the Ipod paradox, by which people insist on paying more for devices with less functionality. The Ipod may be a triumph of style but it is basically a portable hard drive restricted to the storage and delivery of music and buying one is akin to paying a premium for an elegant car that will only travel north.

Portable media players extend the concept to viewing photos and videos on the move but they lack organiser functions, even though they are capable of supporting them.

Palmone claims the Lifedrive defines a new 'mobile manager'



A challenger to the Ipod: Palmone's Lifedrive plays music and more

category. In fact it is an organiser built round a 4GB Hitachi microdrive, but styled like a media player with all the functions.

The audio player supports mp3 format, but the bundled PC software will translate major video formats to be viewed on the 320 x 480 transfective screen.

Palmone claims the battery will last more than two days. The Lifedrive packs both Bluetooth 1.1 and Wifi for connecting wirelessly to a PC or network and is available now for £325 inc VAT.

Watch out for a full review coming soon in PCW.

Open source gets a gander as Palm name is handed back

It seems that we can now talk about Palm handhelds again following a deal between Palmone, which makes the devices, and Palmsource which owns the Palm OS software and its derivatives.

The two companies were formed in late 2003 when the

original companies split its hardware and software arms into separate entities after buying Handspring – founded by former Palm executives, but there was no agreement on who should use the Palm brand.

Palmsource has found it hard to compete against Symbian

and Microsoft, and Sony recently announced that it was discontinuing the Palm OS-based Clie handheld. Chief executive Dave Nagel unexpectedly quit the company last month, almost at the same time news broke that it has sold its share of the Palm brand to

Palmone for \$30m. Palmone also announced that it has renewed its licence for the Palm OS, but the days look numbered for this in its present form. Interim Palmsource CEO Patrick McVeigh was quoted as saying the company would 'move to open source'.

HP goes quiet in colour

HP's latest range of printers includes its first all-in-one laser to support colour. The Laserjet 2800 supports printing, copying, scanning and faxing with prices starting at £599 (all prices here include VAT).

The company is plugging quietness and low cost per page as selling points for the colour Laserjet 2600n, prices start at £279. It supports networking as standard and HP says it is the first of this class to be offered at this price point.

Cheaper still are the mono Laserjet 1020, starting at £79, and the faster 19ppm (page per minute) 1022, starting at £105.

New inkjets include the Business Inkjet 1000, designed



for print loads of up to 6,250 pages a month printing 4,800 x 1,200dpi colour at up to 18ppm. Prices start at £99. The Deskjet 1280, which supports sizes from A6 to A3

HP hopes the Laserjet 2600n's quiet operation and low running costs will appeal

posters, starts at £199; the faster £379 Business Inkjet 2800 also supports wide formats.

The £279 HP Officejet 7210 all-in-one prints and copies at up to a claimed 30ppm mono and 20ppm in colour. For the same price you can get the wide-format HP Deskjet 9803, with similar print speeds and flexible paper handling. For very heavy-duty work there is the Laserjet 9040/9050 series, which offers sophisticated paper handling, two-sided printing and batch-handling. Prices start at £1,937.

Lost-cost rival for Acrobat

Scansoft is pitching the latest version of its portable document format (pdf) software as a low-cost alternative to Adobe's Acrobat Professional.

The free Acrobat Reader installed on most PCs does little beyond reading or printing pdf files. If you want more functions, you have to buy the full Acrobat Professional with a street price of around £240.

Scansoft says its £69.99 (inc VAT) PDF Converter Professional 3 benefits from page-analysis technology imported from Omnipage text-recognition software. It imports .pdf files directly into Word as formatted editable documents.

Scansoft strategist Robert Weiderman said: 'I don't think either Adobe or Microsoft saw it as in their interests to do this.'

The Scansoft product is available for £59.99 until 1 July.

DrayTek Broadband Firewall/Routers



WDS (Wireless Distribution System) & Enhanced WLAN Security

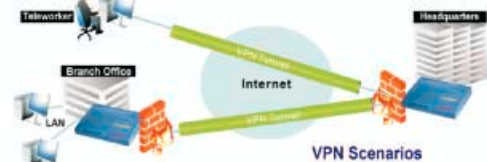
With the convenience of a wireless LAN you still want to protect both your data and your bandwidth. DrayTek Vigor wireless routers provide several independent methods of wireless security for encryption and client authentication, including WPA/WPA2 and 802.1x.

Various of our models now support WDS (Wireless Distribution System), allowing you to use your router as a wireless bridge or repeater, increasing the range of your primary wireless base. For details of DrayTek's wireless LAN solutions, visit our web site.



Firewall & VPN Facilities

The Vigor's famous Virtual Private Network (VPN) facilities enable you to link branch offices together or teleworkers to head office, easily, simply and securely. You can run up to 16 tunnels simultaneously, allowing remote users to access shared drives, data and other resources using your broadband connection. DrayTek VPNs use industry standard encryption systems, compatible with most other vendor's products.



Voice-over-IP (VoIP)

DrayTek VoIP-equipped routers enable you to use your broadband line to provide additional phone lines to make and receive voice calls. Calls to/from other VoIP-equipped users are completely free, and you can make low cost calls to regular phone lines too, using the DrayTEL PSTN gateway. DrayTek VoIP routers are available for both ADSL and cable-modem broadband.

The phones connected to your Vigor can receive incoming calls via their SIP address from other Internet users or from the PSTN (the regular phone network) via your own DrayTEL telephone number.



DrayTek's firewall facilities help defend your network and PCs not only against intrusion but also Denial-of-Service attacks and can block specific web site (by URL keyword), ActiveX components and other potentially harmful web content. Flexible IP filtering is also provided as well as comprehensive reporting facilities. See the DrayTek web site for details of all firewall and other features.



Available from
SEG
020 8381 5500
VoIP : 800800@draytel.org

For full details of all models visit
www.draytek.co.uk

Specification subject to change. Facilities vary with model.

Future un-PC homes are unveiled

Microsoft and Intel staged separate events last month to promote the digital home, which both companies see as a way to grab a greater share of the lucrative consumer-electronics market.

Intel's approach was to demonstrate a PC pretending it was not a PC, in the hope it might attract the kind of people who are scared of computing. There is a certain logic in this as such people use computers all the time, with devices such as washing machines, video recorders or mobile phones. Yet while they will persevere using a VHS recorder with the worst interface in techno-history, they balk at using something looking like a PC that allows you to record a programme simply by clicking a listing.

A couple of years back when Intel first demonstrated its Entertainment PC (ePC), we were confused as to how it differed from machines built to Microsoft's Media Center PC spec, especially as an ePC could run XP Media Center edition.



Intel's ePC (below left) is designed to look like a hi-fi unit. It can be hidden inside the e-Shell (top left)

We were told then that the ePC could be also used as a reference design by manufacturers who wanted to offer the functionality of a home entertainment centre without using Microsoft's Media Center.

Now it seems that an ePC is a PC-based entertainment centre that looks like a hi-fi module.

And just in case that isn't un-PC enough for you, Intel wrapped it in what it called an e-Shell designed by award-winning Ryan McElhinney and, in the words of the blurb, 'inspired by Eero Aarnio's iconic bubble and ball chairs of the early 1960s.'

No-one at the Intel demonstration seemed clear

whether the e-Shell was supposed to be a table, a chair or just a piece of packaging weird enough to wow them at the Tate Modern. 'Don't sit on it,' said a minder as your weary reporter went to try. 'The designer says it is strong enough but I wouldn't risk it.'

Meanwhile, at a house in one of the posher roads in Notting Hill, Microsoft was announcing it had nothing new to show. 'Everything you see here is available now,' said a minder. 'We just wanted you to see our vision of how it can all work together.'

It was clear that, given a couple of million, you too could live in a house with rooms festooned with gadgets, shuttling multimedia from room to room on your high-speed home network.

The one detail new to me was an item on the Media Center that lets you control everything from switching on the central heating to drawing the curtains. 'Er... that is not connected to anything,' said the minder. When they get that one sorted out, we will hardly need to get out of bed. **Clive Akass**

Paintshop 'upgrade'

British developer Digital Workshop has said that Paintshop Pro, the popular graphics product, will be 'upgraded' whatever new owner Corel decides to do with it.

The company distributed Paintshop in Britain and helped develop it when it was owned by Jasc. Corel terminated the arrangement late last year when it bought Jasc, effectively putting Digital Workshop out of business according to founder Paul Harris.

'Fortunately, with the help of some of the employees, I was able to buy out the development portion of the business,' he said. 'Now Digital Workshop is back from the dead with a vengeance.'

Harris has launched four new plug-ins that he says effectively constitute a Paintshop Pro upgrade: Textart, Blender, Elemental and Splatter.

The first three cost £22.95 each and Splatter costs £19.95

or you can buy the lot for £59.95 – all prices include VAT. The plug-ins can also be used with Adobe Photoshop or any other compatible product.

Paintshop Pro is one of the select band of former shareware products to make it into the shrink-wrapped mainstream. Corel still sells the final version 9 although it must compete in some market segments with Corel Draw. A spokeswoman for Corel said she was not aware of any plans to discontinue it.

Adobe's purchase of Macromedia has produced some uncertainty over the future of its products. Harris said this has led to enquiries about Opus Pro 05, his multimedia authoring tool competing with Macromedia Director. 'I think a lot of people got the impression Macromedia was concentrating on products such as Dreamweaver and Flash at the expense of Director.'

Clock this little GPS system...

There was a touching echo of history when we were trying out this neat little GPS system late last month. We got it to direct us to the beautiful Bedfordshire village of Ickwell, which turned out to be where a certain Thomas Tompion began his working life as an apprentice blacksmith in the mid-17th Century.

Tompion, who is buried in Westminster Abbey, has been called the father of British clockmaking – and a mechanical clock is of course an analogue computer modelling the earth's rotation. A generation after Tompion's death, clocks were used to calculate longitude. In other words, he pioneered the global positioning system.

So we couldn't help but wonder what he would have made of a device that could talk us to within a few yards of where we wanted to go.

Navicore says the device, which links to Symbian-based phones using Bluetooth, is the cheapest on the market. It costs £199.99 for Series 60 models and £249.99 for Series 80. The price includes a UK map and a 256MB memory card, half of which is free for other uses. Watch out for a review in PCW. www.navicoretech.com **CA**





MESH recommends Microsoft® Windows® XP Professional for Business

Dual-Core Power has Arrived

The Matrix X2 includes Windows XP Professional x64 Edition, the platform for the next generation of applications.



All pictures for illustration purposes only.

Matrix X2 Featuring the latest
in Technology including:

- AMD Athlon™ X2 Dual-Core CPU 4200+ with HyperTransport™ &
- Microsoft® Windows® XP Professional 64-bit Edition

only £999 inc. VAT
- see the full specification on-line now.



Microsoft
Windows^{XP}
Professional x64 Edition

**BUY NOW,
PAY IN 6 MONTHS**
see terms†

Unbeatable Offers on PCs & Accessories...



Award Winning Products since 1987 | Excellent Service | Competitive Prices | **BUY NOW, PAY DEC 2005** see terms†



• ASUS K8V-MX Mainboard, 1600MHz System Bus, SATA • Logitech Internet Keyboard & Optical mouse
• Direct 2D/3D Graphics (SMA*) • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • Mini Tower Case & 550W PSU
• **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • DDR 400 • 10/100 Ethernet LAN • 6 USB 2.0 ports • 2x Serial ATA connectors • Serial port • Parallel port • Audio I/O & RJ-45 jack • Slots include 3x PCI & 1x AGP 8x
• (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Matrix Inspire

E-Direct e1010

The Ultimate Best Buy TFT Flat Panel PC Offer

- AMD Athlon™ 64 CPU 3000+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 512MB DDR 400 Memory
- 160GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 17" TFT Analogue Flat Panel Monitor
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- Creative Sound Blaster SBS260 Speakers
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£499 INC.VAT £424.68 EX.VAT BUY NOW PAY DEC 2005†

Matrix Inspire Plus

E-Direct e1015

- AMD Athlon™ 64 CPU 3200+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 250GB Serial ATA (150MBps) Ultra Fast Hard Drive
- Sony Multi-Format 16x Dual Layer DVD Writer**
- **FREE** Double Memory (1GB - 2x512MB) - First 200 Orders Only

£599 INC.VAT £509.79 EX.VAT BUY NOW PAY DEC 2005†

"It packs enough punch in the power stakes to stand out from the crowd"

PC Plus | May 2005



• ASUS A8NE-FM NForce4 939 Pin PCI Express Mainboard • Logitech Cordless Desktop Keyboard and Optical Mouse • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • Mini Tower Case & 550W PSU
• **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • DDR 400 • 10/100 Ethernet LAN • 6 USB 2.0 ports
• Serial port • Parallel port • Audio I/O & RJ-45 jack • Slots include 3x PCI • Slot PCI-EX
• (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Matrix Premier

E-Direct e1020

Great Value PCI Express enabled System

- AMD Athlon™ 64 CPU 3500+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 200GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce 6600 PCI Express - DVI & TV Out
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Sound Blaster SBS260 Speakers
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£699 INC.VAT £594.89 EX.VAT BUY NOW PAY DEC 2005†

Matrix Premier Plus

E-Direct e1025

- Microsoft® Windows® XP Home Edition
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 128MB ATI Radeon X700 Pro - DVI & TV Out
- **FREE** Upgrade to Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer - First 200 Orders Only

£799 INC.VAT £680.00 EX.VAT BUY NOW PAY DEC 2005†

All pictures for illustration purposes only. *Shared Memory Architecture. **Sony Multi-burners R/W all standard formats Except DVD-RAM



Software included on all advertised MESH PCs • 60 Day Trial Microsoft® Office
• MS Works 8 • eTrust Antivirus v.7 - 90 day Trial
• Plus Cyberlink Software (right)





AMD and Microsoft strongly recommend that users continue to use third party anti-virus software as part of their security strategy.



Optical Storage Technology by Sony | MESH recommends Microsoft® Windows® XP

Matrix Prestige



Multi-media rich PC with PCI Express Technology

- AMD Athlon™ 64 CPU 3800+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce 6600GT PCI Express - DVI & TV Out
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£899 INC.VAT £765.11 EX.VAT BUY NOW PAY DEC 2005†

Matrix Prestige Plus



- AMD Athlon™ 64 CPU 4000+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 128MB ATI X800 PCI Express - DVI & TV Out
- 19" TFT DVI Flat Panel Monitor
- **FREE** Upgrade to Creative Labs SoundBlaster Audigy 2 ZS

£1099 INC.VAT £935.32 EX.VAT BUY NOW PAY DEC 2005†

FREE
AUDIGY2 ZS ON THE
PRESTIGE PLUS



- ASUS A8NE-FM NForce4 939 Pin PCI Express Mainboard • Logitech Cordless Desktop Keyboard and Optical Mouse • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • Mini Tower Case & 550W PSU
- **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • DDR 400 • 10/100 Ethernet LAN • 6 USB 2.0 ports • Serial port • Parallel port • Audio I/O & RJ-45 jack • Slots include 3x PCI • Slot PCI-EX • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

“A good choice for gaming on a tight budget - incredible value for money”

PC Pro | April 2005

Upgrade to the latest 64-bit OS

Raise the Speed limit with
Windows XP Professional x64 Edition

Buy any MESH PC this month & Upgrade to the latest 64-bit OS
Microsoft's Windows XP Professional x64 Edition



• **High performance platform for the next generation of applications**
Windows XP Professional x64 Edition enables the next generation of high-performance computing. 64-bit native applications can deliver more data per clock cycle, making them run faster and more efficiently.

• **Multiprocessing & multicore**
Windows XP Professional x64 Edition is designed to support up to two single or multicore x64 processors such as our Matrix range of single & dual core AMD Athlon 64-bit range of PCs, delivering maximum performance and scalability.

Dual-Core has arrived with MESH

Multi-Core Technology



Get the Multi-core advantage with AMDs Athlon™ X2 Dual-Core range of CPUs with MESH this month. For a smarter PC, that deals with multiple tasks simultaneously, see our featured

Matrix X2 & Eclipse PCs, OR go on-line now to see our full range of Matrix X2 Dual-Core PCs.

Improve system efficiency whilst running multiple applications

Just Need a Tower System?

Check out our Build to Order section on our website to view our latest 'upgrader' units, including our latest AMD Dual-Core and PCI-e systems.

Prices start from **£359** INC.VAT



08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • email: sales@meshcomputers.com

MESH
computers plc

**BUY NOW,
PAY IN 6 MONTHS**
see terms†

Get the Latest Technology in the PC Market...

Award Winning Products since 1987 | Excellent Service | Competitive Prices | **BUY NOW, PAY DEC 2005** see terms†



- ASUS A8N-E PCI Express 939 Mainboard • Logitech Cordless Desktop Keyboard and Optical Mouse
- Creative Labs Sound Blaster Audigy 2 ZS • Internet Ready V.92 56Kbps data/fax/voice modem
- Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • NEW Black & Silver Midi Tower Case & 550W PSU
- **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • DDR 400 • 10/100/1000 Ethernet LAN • 6 USB 2.0 ports • Serial port
• Parallel port • Audio I/O & RJ-45 jack • Slots include 3x PCI • Slot PCI-EX 16x1
• (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Matrix Vector



Best Buy AMD Athlon™ 64 PCI Express PC

- AMD Athlon™ 64 CPU 3800+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 250GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce 6600GT PCI Express - DVI & TV Out
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£999 INC.VAT **£850.21** EX.VAT | **BUY NOW**
PAY DEC 2005†

Matrix Vector Plus



- AMD Athlon™ 64 CPU 4000+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 256MB NVIDIA 6800LE PCI Express - DVI & TV Out

£1099 INC.VAT **£935.32** EX.VAT | **BUY NOW**
PAY DEC 2005†

"The devil's in the detail - and the Matrix has plenty going for it"

PC Advisor | July 2005



- ASUS A8N-SLI Deluxe PCI Express 939 Mainboard • Logitech Cordless Desktop Keyboard and Optical Mouse
- Creative Labs Sound Blaster Audigy 2 ZS • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready
- Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • NEW Black & Silver Midi Tower Case & 550W PSU • **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • SATA 3Gb/s • Dual RAID • Dual Gigabit LAN & AI NET2 • Memory - support max. 4GB DDR400 • Expansion Slots - 2 x PCI Express x16 slot • 2 x PCI Express x1 • 3 x PCI • Serial port
• Parallel port • 2 x RJ45 • 2 x 1394 • 6 x USB 2.0/1.1 • 8x Serial ATA connectors supports Raid 0/1
• Audio 8-Channel I/O & 2x RJ-45 jack • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Matrix Eclipse



New AMD Athlon™ Dual Core CPU, SLI Ready PC

- AMD Athlon™ X2 Dual-Core CPU 4200+ with HyperTransport™
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 256MB NVIDIA GeForce 6800 PCI Express - SLI Ready
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£1299 INC.VAT **£1105.53** EX.VAT | **BUY NOW**
PAY DEC 2005†

Matrix Eclipse Plus



- AMD Athlon™ X2 Dual-Core CPU 4600+ with HyperTransport™
- Microsoft® Windows® XP Home Edition
- 256MB ATI 6800GT PCI Express - DVI & TV Out
- Creative Labs Sound Blaster Audigy 2 ZS Platinum

£1549 INC.VAT **£1318.30** EX.VAT | **BUY NOW**
PAY DEC 2005†

All pictures for illustration purposes only. *Shared Memory Architecture. **Sony Multi-burners R/W all standard formats Except DVD-RAM



08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • fax. 08700 62 21 80



AMD and Microsoft strongly recommend that users continue to use third party anti-virus software as part of their security strategy.



Optical Storage Technology by Sony | MESH recommends Microsoft® Windows® XP

Matrix Titan

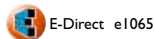


The Ultimate Dual VGA PCI Express Experience

- AMD Athlon™ 64 FX 55 CPU with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 2x256MB NVIDIA GeForce 6800GT (SLI Tech Dual VGA Cards)
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£1799 INC.VAT **£1531.06** EX.VAT | BUY NOW PAY DEC 2005†

Matrix Titan Plus



- Microsoft® Windows® XP Home Edition
- 2GB DDR 400 Memory (2x1024MB)
- 600GB (2x300GB) Serial ATA (150MBps) Ultra Fast Hard Drive
- **FREE** Upgrade to 20" TFT DVI Flat Panel Monitor

£2299 INC.VAT **£1956.60** EX.VAT | BUY NOW PAY DEC 2005†



• ASUS A8N-SLI Deluxe PCI Express 939 Mainboard • WiFi 802.11G Card • Logitech Cordless Desktop Keyboard and Re-chargeable Optical Mouse • Creative Labs Sound Blaster Audigy 2 ZS • Internet Ready V92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • NEW Black & Silver Midi Tower Case & 350W PSU • **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • SATA 3Gb/s • Dual RAID • Dual Gigabit LAN & AI NET2 • Memory - support max. 4GB DDR400 • Expansion Slots - 2 x PCI Express x16 slot • 2 x PCI Express x1 • 3 x PCI • Serial port • Parallel port • 2 x RJ45 • 2 x 1394 • 6 x USB 2.0/1.1 • 8x Serial ATA connectors supports Raid 0/1 • Audio 8-Channel I/O & 2x RJ-45 jack • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

"if you want the SLi performance & kudos without the cost, call MESH"

Trusted Reviews | March 2005

Recommended Best Buys | Go on-line or call for further details

Logitech USB Headset 30

PC Headset with microphone and volume control - includes access to 120 minutes FREE calls using the SKYPEOUT service



£29 INC VAT

Belkin USB 2.0 7-Port Hub

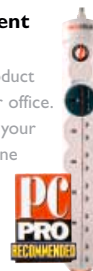
Connect up to 7 Hi-speed USB devices, 2 easy access top loading ports, 5 horizontally mounted ports.



£34 INC VAT

OneClick Intelligent Mains Panel

An innovative new product for use in the home or office. Control the power to your peripherals with just one click.



£35.25 INC VAT

Norton Internet Security™ 2005 (includes Norton AntiVirus)

Essential protection from viruses, hackers and privacy threats. (Full version - OEM)



£39 INC VAT

Belkin UPS 500VA Battery Backup

The most complete protection from damage to home or office systems caused by power disturbances. 6 sockets, USB & Serial Ports, Phone, Fax & Modem Ports



£49 INC VAT

Logitech Cordless Keyboard & Re-chargeable Optical Mouse

Delivers exceptional comfort & control



£59 INC VAT

Inovix Portable DVD Player - DivX compatible

Compact & portable DVD player complete with mini remote control. Also includes car charger, carry case/ car head-rest holder & TV input cables



£129 INC VAT

Sony 19" Flat Panel LCD PC/TV Display MFM-HT95

Sony bring you an integrated TV tuner, HDTV connectivity, SRS WOW™ 3D Audio Technology & flexible TV/PC connectivity.



£549 INC VAT

08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • email: sales@meshcomputers.com

MESH
computers plc

See Our New
Server Range
@www.meshcomputers.com

New Home and Business Solutions...

Award Winning Products since 1987 | Excellent Service | Competitive Prices | **BUY NOW, PAY DEC 2005** see terms†



FREE
17" TFT FLAT PANEL
MONITOR WITH THE A3 PRO

• ASUS P5GDI-VM 775 Socket Mainboard HT Ready • Intel® Graphics Media Accelerator 900 224MB Max (SMA*) • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • Mini Tower Case & 550W PSU • **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • 800MHz FSB • Supports Dual Channel DDR 400 • L2 Cache • Intel 10/100Mbps Ethernet LAN • 6 USB 2.0 ports • 1 Audio I/O • 1 S/PDIF output & 1 VGA port • parallel port • 2x PCI & 1x PCI Express slots • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Elite A3

E-Direct e2010

Amazing Value Intel® PCI Express based PC

- Intel® Pentium® 4 Processor 530 with HT Technology (3.0GHz Prescott 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Home Edition
- 512MB DDR 400 Memory
- 80GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 15" TFT Flat Panel Monitor
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£499 INC.VAT **£424.68** EX.VAT | BUY NOW PAY DEC 2005†

Elite A3 Pro

E-Direct e2015

- Intel® Pentium® 4 Processor 630 with HT Technology (3.2GHz Prescott 64-bit CPU, 800MHz FSB, 2MB L2 Cache+HT)
- Microsoft® Windows® XP Home Edition
- 160GB Serial ATA (150MBps) Ultra Fast Hard Drive
- **FREE** Upgrade to 17" TFT Monitor - First 200 Orders Only

£599 INC.VAT **£509.79** EX.VAT | BUY NOW PAY DEC 2005†

• for the latest PCs & Accessories visit www.meshcomputers.com • for the latest PCs &



FREE
300GB HDD UPGRADE
WITH THE A6 PRO

• ASUS P5GDI-VM 775 Socket Mainboard HT Ready • Intel® Graphics Media Accelerator 900 224MB Max (SMA*) • 5.1 Surround Sound 6 Channel Audio • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink PowerDVD, Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • Mini Tower Case & 550W PSU • **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • 800MHz FSB • Supports Dual Channel DDR 400 • L2 Cache • Intel 10/100Mbps Ethernet LAN • 6 USB 2.0 ports • 1 Audio I/O • 1 S/PDIF output & 1 VGA port • parallel port • 2x PCI & 1x PCI Express slots • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Elite A6

E-Direct e2020

High Performance Elite PCI Express 915G PC

- Intel® Pentium® 4 Processor 550 with HT Technology (3.4GHz Prescott 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 200GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£699 INC.VAT **£594.89** EX.VAT | BUY NOW PAY DEC 2005†

Elite A6 Pro

E-Direct e2025

- Intel® Pentium® 4 Processor 650 with HT Technology (3.4GHz Prescott 64-bit CPU, 800MHz FSB, 2MB L2 Cache+HT)
- Microsoft® Windows® XP Home Edition
- 19" TFT DVI Flat Panel Monitor
- **FREE** Upgrade to 300GB Serial ATA HDD - First 200 Orders Only

£899 INC.VAT **£765.11** EX.VAT | BUY NOW PAY DEC 2005†

All pictures for illustration purposes only. *Shared Memory Architecture. **Sony Multi-burners R/W all standard formats Except DVD-RAM



08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • fax. 08700 62 21 80



Optical Storage Technology by Sony | MESH recommends Microsoft® Windows® XP Professional for Business

Elite A8



Leading Edge PCI Express 915G PC

- Intel® Pentium® 4 Processor 560 with HT Technology (3.6GHz Prescott 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Home Edition
- 1GB DDR 400 Memory (2x512MB)
- 300GB Serial ATA (150MBps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce 6600 PCI Express - DVI & TV Out
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer
- Microsoft Works 8.0 +60 Day Microsoft Office Trial

£1099 INC.VAT **£935.32** EX.VAT | BUY NOW PAY DEC 2005†

Elite A8 Pro



- Intel® Pentium® 4 Processor 660 with HT Technology (3.6GHz Prescott 64-bit CPU, 800MHz FSB, 2MB L2 Cache+HT)
- Microsoft® Windows® XP Home Edition
- 256MB NVIDIA 6800LE PCI Express - DVI & TV Out
- **FREE** Upgrade to Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer - First 200 Orders Only

£1299 INC.VAT **£1105.53** EX.VAT | BUY NOW PAY DEC 2005†



FREE
CREATIVE INSPIRE 7.1s
WITH THE A8 PRO

- ASUS P5GDC Deluxe PCI Express Mainboard, Audio, GB LAN, 2x FireWire • Logitech Cordless Desktop Keyboard and Optical Mouse • Creative Labs Sound Blaster Audigy 2 ZS • 3.5" Floppy Drive • Internet Ready V.92 56Kbps data/fax/voice modem • Network Ready • Software: CyberLink Power2Go, PowerProducer3, PowerDirector3, PowerBackup, MediaShowSE, PowerCinema4 • NEW Black & Silver Midi Tower Case & 550W PSU • **MESH Classic Warranty** (12 month back-to-base, see terms)

On-Board features include • Intel 915P chipset • 800MHz Front Side Bus • 10/100/1000 Ethernet LAN • Supports Dual Channel DDR/DDR2 400/533 • 4x SATA, Raid 0 • 6 USB 2.0 ports • Parallel port • VGA port • 1 Audio I/O & RJ-45 jack • Slots include 3x PCI, 2x PCI-X x1 & PCI-X x16 • (Model shown with 6 in 1 Card Reader, add £10 inc. vat)

Accessories visit www.meshcomputers.com • for the latest PCs & Accessories visit www.meshcomputers.com

Upgrade to the Support Package right for you

MESH Extended Desktop Options

All Warranties subject to terms and conditions

Every PC is provided with the **MESH Classic Warranty**, which includes a 12 months back-to-base term, 24x7 on-line support, free parts and labour, system restore facility and national rate hardware support.

However you might prefer a more comprehensive support package for the life of your PC. MESH also offers Extended Service Plans covering everything from on-site service and software support, to PC health checks and priority replace and repair.

- For more details on the Support Package best suited to your needs, call or click on the "Warranty" button on each system page of our website

MESH Advantage Warranty

As *Classic*, but includes;

- 1 Yr On-site + 2 Yr Back-to-Base (UK mainland)
- A single PC health check during the period of cover

Cover cost: **£99 inc. Vat**

MESH Premiere Warranty

As *Advantage*, but includes;

- "Total Cover", unlimited parts & labour 3 Year On-site (UK mainland)
- Priority Repair or Replace Policy
- 3 Month National Rate Software Support

Cover cost: **£199 inc. Vat**

Get free phone service over your broadband

Free VoIP Phone Service on your PC



Get your 60 FREE minutes to UK Landlines & FREE phone service over your broadband link, with this MESH promotion this summer.

Brought to you in association with Sipgate, the leading European Voice over IP service, all PCs shipped from this issues (August) advertising

will be provided with free phone service over your broadband links.

With sipgate, VoIP is just like a regular phone service, but a whole lot better: Get your free real geographic 01 or 02 British telephone number & free voicemail. (Limited offer - see terms for details)

Make VoIP Internet calls with the... GrandStream BT-101

Features 10Mbit/s ethernet port, SIP & STUN, Caller ID Disp, Speaker phone, Handsfree dialing, Mute, Redial. Includes ethernet cable and universal switching power adapter.



£59 INC VAT

Requires broadband connection, router & 10Mbit/s connection

08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • email: sales@meshcomputers.com

MESH
computers plc

**BUY NOW,
PAY IN 6 MONTHS**
see terms†

Mobile Computing at its best...

Award Winning Products since 1987 | Excellent Service | Competitive Prices | **BUY NOW, PAY DEC 2005** see terms†



Pegasus 15"

E-Direct e3010

Power and Mobility at a very affordable price

- AMD Sempron™ Mobile Processor 3000+, PowerNow Tech
- Microsoft® Windows® XP Home Edition
- 15.1" TFT SXGA+ Active Colour Screen (1400x1050)
- 512MB DDR 400 (2x256MB)
- 40GB ATA-100 EIDE
- 64MB Integrated graphics memory
- Combo DVD-ROM/CDRW
- Built-in Video Camera
- Full size keyboard with numeric pad + 3 hot keys

£599 INC.VAT £509.78 EX.VAT BUY NOW
PAY DEC 2005†

- System includes Works 8.0 - Full specification details are available on-line



Pegasus Turion

E-Direct e3015

Latest Mobile Technology for your Notebook

- AMD Turion64™ Mobile ML-28 Processor, PowerNow Tech
- Microsoft® Windows® XP Home Edition
- 17.1" TFT WXGA+ Active Colour Screen (1440x900)
- 512MB DDR 400 (2x256MB)
- 60GB ATA-100 EIDE
- 128MB DDR ATI Radeon M11 9700 Graphics
- **FREE** Upgrade to Sony Multi-Format 16x Dual Layer DVD Writer**
- Built-in Video Camera
- Built-in Subwoofer and 5x speakers plus FireWire output

£979 INC.VAT £833.19 EX.VAT BUY NOW
PAY DEC 2005†

- System includes Works 8.0 - Full specification details are available on-line

• Latest Notebook Summer Deals Now Available • **FREE Upgrades and New Low Prices** • L



Ultima Pro

E-Direct e3020

17" Power PCI-e Notebook with ALL the extra's!

- **NEW** Intel® Pentium® 4 Processor 550 with HT Technology (3.4GHz Prescott 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Pro
- 17.1" TFT WSXGA+ with X-Glass Screen (1680x1050)
- **FREE** Upgrade to 1GB DDR2 533MHz
- 80GB Ultra DMA-100
- **FREE** 2nd 40GB ATA-100 EIDE with RAID0 & RAID1 support
- 256MB NVIDIA GeForce Go 6800 PCI-Express
- Sony Multi-Format 8x Dual Layer DVD/CD Writer
- Built-in Video Camera
- Network Ready Internal 10/100/1000 Giga Ethernet LAN
- Built-in 7 in 1 Memory Card Reader
- **FREE** Internal TV Tuner with remote control
- Bluetooth & Wireless LAN Card 802.11g

£1559 INC.VAT £1326.81 EX.VAT BUY NOW
PAY DEC 2005†

Ultima Pro features • Additional Bay for 2nd HDD supports RAID0/1 • Intel Azalia sound with virtual 8 Channel output • Built-in Subwoofer with 4x internal speakers • USB Floppy Drive • Software: Microsoft Works 8.0 +60 Day Microsoft Office Trial, Pinnacle Studio 9 SE • Internet Ready Internal 56kpbs Fax Modem (V90/V92) • **FREE** Carry Case • 4x USB 2.0 • TV/HDTV output • 2x FireWire • PS/2 • Parallel • Serial • IrDA • 1x PC card slot • S/P DIF & DVI output • Fullsize Keyboard with 3 hot keys • Kensington Lock Facility • 3 Year Back-to-Base Warranty - see terms • Weight: 5.2Kg (excluding battery) • Dimensions: 397(W) x 298(D) x 49.5(H)mm

Please Read: †Interest is calculated from day of purchase. No deposit required. Credit supplied by GE Capital Bank Ltd, 6 Agar Street, London.WC2N 4HR. Goods provided by MESH Computers, 1 Oxgate Centre, Oxgate Lane, London, NW2 7JA. Credit is subject to status and available only to UK residents aged 18 years or over. Sales subject to terms & conditions (copy available on request). Pictures shown for illustration purposes only - colours may vary. Operating System supplied is an OEM product - Full version. VM/Micro Case's purchased with internal Card Reader benefit from only 4 free USB 2.0 ports. *SMA (Shared Memory Architecture) allows for memory to be taken from RAM to supplement the graphics card requirements. **Sony Multi-burner R/W all standard formats Except DVD-RAM. MESH Standard Warranty (Classic) - All PCs carry a 12 Month Back-to-base, Parts & Labour Warranty as standard (MESH standard terms and conditions apply). Pick up & collection is available from MESH at £50 inc. VAT. Warranty upgrades & extensions are available and full terms are provided separately. Notebook Warranty 3 Year back-to-base Warranty covering parts & labour in the 1st year - labour only in years 2 & 3 - warranty excludes battery. Non-BT customers please check that the modem will work on your line before ordering. Prices quoted for calls to MESH are based on a BT landline - other carriers may charge you more. Siggate Promotion, 60 free minutes - one minute billing increments, only for calls to 01 or 02 landlines in UK. Valid in 1st month after registration, one account per person, no refunds, promotion limited to all PCs/Desktops ordered during August magazine issues (15.06 - 15.07). MESH reserves the right to cease the promotion at anytime. Registration must take place on, or before 1st August. Technical and connection support in association with this promotion is the responsibility of Siggate. On-line support is available at www.siggate.co.uk/faq/index.php. Our minimum standard delivery charge is £45.83 inc (UK Mainland Only). Please call for a written quotation. ©2004 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof, are trademarks of Advanced Micro Devices, Inc. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries. All trademarks are acknowledged. E&OE. Prices correct at time of going to press (27/5/05). Business hours Mon-Fri 9am-6pm; Sat 10am-5pm. Typical 29.8% APR (variable)



Optical Storage Technology by Sony | MESH recommends Microsoft® Windows® XP Professional for Business



Venture NC

E-Direct e3030

Unbeatable Value Notebook Offer

- **FREE** Upgrade to Intel® Celeron™ Processor 2.66GHz
- Microsoft® Windows® XP Home Edition
- 15.1" TFT XGA Active Colour Screen (1024x768)
- 256MB DDR Memory
- 40GB ATA-100 EIDE
- 64MB Integrated graphics memory
- Combo DVD-ROM/CDRW
- 3D Stereo Sound with internal Speakers

£499 INC.VAT £424.68 EX.VAT BUY NOW PAY DEC 2005†

Also available - Venture CAM Notebook which includes Video Camera, Combo Drive, Wireless LAN and Pentium 4 3GHz Processor for £658 Inc.Vat



Up to 8 hours with 2nd Battery

Dynamo Plus

E-Direct e3050

15.4" 'Sonoma' Centrino PCI-e Notebook

- Intel® Mobile Centrino™ 730 Dothan 533FSB Processor (2MB Cache) with new Intel XD Technology (execute disable)
- Microsoft® Windows® XP Home Edition
- 15.4" TFT WSXGA+ Colour Screen (1680x1050) Intel Sonoma
- 512MB DDR2 533MHz (Upgrade to 2GB)
- 60GB Ultra DMA-100 (Upgrade to 200GB with 2nd HDD)
- 128MB NVIDIA GeForce Go 6600 PCI-Express
- 8x Dual Layer DVD Writer (swappable 2nd battery or HDD)
- Built-in Intel Mobile Caexico Wireless LAN Card 802.11a/b/g

£899 INC.VAT £765.13 EX.VAT BUY NOW PAY DEC 2005†

- System includes Works 8.0. Upgrade with a Video Camera is available
- Full specification details are available on-line

Latest Notebook Summer Deals Now Available • **FREE Upgrades and Low Prices** • Latest Notebooks

Ultima 15"

E-Direct e3025

New Unbeatable Value 15" Notebook

- Intel® Pentium® 4 Processor 530 with HT Technology (3.0GHz Prescott 1MB L2 Cache, 800 FSB)
- Microsoft® Windows® XP Home Edition
- 15.1" TFT SXGA Active Colour Screen (1400x1050)
- **FREE** Upgrade to 1GB DDR 400 (2x512MB)
- 60GB ATA-100 EIDE
- 128MB DDR ATI Radeon M11 AGP 8x Graphics
- **FREE** Upgrade to Sony Multi-Format 16x Dual Layer DVD Writer**
- Built-in Video Camera & **FREE** Wireless LAN

£899 INC.VAT £765.11 EX.VAT BUY NOW PAY DEC 2005†

Ultima 17" Plus

E-Direct e3035

- 17.1" TFT WXGA Active Colour Screen (1440x900)
- Microsoft® Windows® XP Home Edition
- 256MB DDR ATI Radeon M11 AGP 8x Graphics
- Built-in 7 in 1 Memory Card Reader & **FREE** Bluetooth
- Dimensions: 393(W) x 275(D) x 37.5(H)mm - Weight: 3.6KG

£1129 INC.VAT £977.87 EX.VAT BUY NOW PAY DEC 2005†



- Systems include Works 8.0 & Pinnacle Studio 9.
For full details on both notebooks go on-line.

08700 46 47 47 www.meshcomputers.com

showroom & sales • Mon-Fri 9-6pm, Sat 10-5pm • MESH House, 1 Oxgate Centre, London NW2 7JA • email: sales@meshcomputers.com

MESH
computers plc



Award winning Products since 1972

Comprehensive 6-Year warranty



From £468.08 EX VAT
ariespc.com/10281913



ATI Xpress 200 PCI Express Motherboard, 1600GHz HyperTransport System Bus, Embedded ATI Radeon X300 PCI Express Graphics, Onboard SATA and RAID support, 7.1 Surround Sound 8 Channel Audio, Broadband/LAN Ready, Software (Microsoft Works 8.0, Panda Antivirus 2004 Titanium inc. 1 year FREE virus update subscription, Cyberlink PowerDVD 5, Roxio Easy CD Creator 7), Microsoft Keyboard & Optical Mouse

Model shown with 1.44MB Floppy Drive & 7-in-1 Multimedia Card Reader +£15 ex VAT, Wireless Logitech Keyboard and Optical Mouse +£20 ex VAT, Creative Speakers +£20 ex VAT, 19" Viewsonic TFT Analogue Flat Panel Monitor +£100 ex VAT

Performa 7250 ariespc.com/10281913
A great all-rounder at a perfect price

- AMD Athlon 64 Processor 3000+ with HyperTransport Technology
- 512MB Dual DDR 400 Branded* Memory
- 128MB ATI Radeon X300 SMA PCI Express Graphics
- 200GB ATA (133Mbps) 7200rpm HDD
- Sony 16x Multi-Format Dual Layer DVD Writer
- Microsoft Windows XP Home Edition
- Microsoft Works 8.0 + Antivirus Software
- 17" TFT 16ms Analogue Flat Panel Monitor

£549.99 INC VAT **£468.08** EX VAT

Performa 7250 Pro ariespc.com/10281914
for only £100 more

- 300GB ATA (133Mbps) RAID 7200rpm HDD
- 1GB (1024MB) Dual DDR 400 Branded Memory
- 5.1 Surround Sound Speakers
- FREE 802.11b/g 54Mbps Wireless Networking

£649.99 INC VAT **£553.19** EX VAT

'the Performa is the best choice for most people' – PC Pro, June 2005 (Performa 9220)



From £638.29 EX VAT
ariespc.com/10281915



ATI Xpress 200 PCI Express Motherboard, 2000GHz HyperTransport System Bus, 128MB ATI Radeon X800 PCI Express Graphics, Onboard SATA and RAID support, 7.1 Surround Sound 8 Channel Audio, Broadband/LAN Ready, Software (Microsoft Works 8.0, Panda Antivirus 2004 Titanium inc. 1 year FREE virus update subscription, Cyberlink PowerDVD 5, Roxio Easy CD Creator 7), Microsoft Keyboard & Optical Mouse

Model shown with 1.44MB Floppy Drive & 7-in-1 Multimedia Card Reader +£15 ex VAT, Wireless Logitech Keyboard and Optical Mouse +£20 ex VAT, Creative Speakers +£20 ex VAT, 19" Viewsonic TFT Analogue Flat Panel Monitor +£100 ex VAT

Performa 8100 ariespc.com/10281915
Designed for the gamer and power-user

- AMD Athlon 64 Processor 3200+ with HyperTransport Technology
- 1GB (1024MB) Dual DDR 400 Branded* Memory
- 128MB ATI Radeon X800 PCI Express Graphics
- 250GB ATA (133Mbps) 7200rpm Hard Disk Drive
- Sony 16x Multi-Format Dual Layer DVD Writer
- Microsoft Windows XP Home Edition
- Microsoft Works 8.0 + Antivirus Software
- 17" TFT 16ms Analogue Flat Panel Monitor

£749.99 INC VAT **£638.29** EX VAT

Performa 8100 Pro ariespc.com/10281916
for only £100 more

- AMD Athlon 64 Processor 3500+ with HTT
- 256MB ATI Radeon X800 PCI Express Graphics
- 5.1 Surround Sound Speakers
- FREE Floppy Drive & 7-in-1 Memory Card Reader

£849.99 INC VAT **£723.40** EX VAT



NO Commitment PC Advice Line
0871 666 1818



FREE BELKIN
Surge Protector
Worth **£4.99!**
First 100 Orders



BUY NOW
PAY 2006

0871 666 1818

www.ariespc.com

All prices exclude carriage. E&OE. All pictures are for illustrative purposes only. Calls may be monitored for training purposes and to ensure a high level of service. Aries, Performa and Perfecta are all registered trademarks of Watford Electronics Ltd.

Aries, you can't buy better for less

Built with the latest technology at the most affordable price



Serving the Information Technology Market
1972 Est
 No.1 FOR OVER 30 YEARS

Buy Now Pay 2006

Advanced Online Order Tracking



PCI EXPRESS

From **£502.12** EX VAT
ariespc.com/10281296



Perfecta 7200 ariespc.com/10281296
 The Ultimate blend – performance & reliability

- Intel Pentium 4 Processor 530J with HT Technology
- 512MB Dual DDR 400 Branded* Memory
- 128MB Intel GMA 900 PCI Express Graphics
- 200GB ATA (133Mbps) 7200rpm Hard Disk Drive
- Sony 16x Multi-Format Dual Layer DVD Writer
- Microsoft Windows XP Home Edition
- Microsoft Works 8.0 + Antivirus Software
- 17" TFT Analogue Flat Panel Monitor

£589.99 INC VAT **£502.12** EX VAT

Perfecta 7200 Pro ariespc.com/10281303
 for only £100 more

- 19" TFT 16ms Analogue Flat Panel Monitor
- 400GB ATA (133Mbps) RAID 7200rpm Hard Disk Drive
- 1GB (1024MB) Dual DDR 400 Branded* Memory
- 5.1 SS-Speakers & 802.11b/g 54Mbps Wireless Networking

£689.99 INC VAT **£587.23** EX VAT

Intel 915G Motherboard, 1MB Cache Prescott CPU with 800MHz System Bus, Embedded Intel GMA 900 PCI Express Graphics, Onboard SATA and RAID support, 5.1 Surround Sound 6 Channel Audio, Broadband/LAN Ready, Software (Microsoft Works 8.0, Panda Antivirus 2004 Titanium inc. 1 year FREE virus update subscription, Cyberlink PowerDVD 5, Roxio Easy CD Creator 7), Microsoft Keyboard & Optical Mouse

Model shown with 1.44MB Floppy Drive & 7-in-1 Multimedia Card Reader +£15 ex VAT, Wireless Logitech Keyboard and Optical Mouse +£20 ex VAT, Creative Speakers +£20 ex VAT, 19" Viewsonic TFT Analogue Flat Panel Monitor +£100 ex VAT

'Readers who would buy again: 93% – Computer Shopper, Customer Survey



PCI EXPRESS

From **£595.74** EX VAT
ariespc.com/10281918



Perfecta 8100 ariespc.com/10281918
 Designed for the professional PC user

- Intel Pentium 4 Processor 550J with HT Technology
- 512MB Dual DDR 400 Branded* Memory
- 128MB Intel GMA 900 PCI Express Graphics
- 250GB ATA (133Mbps) 7200rpm Hard Disk Drive
- Sony 16x Multi-Format Dual Layer DVD Writer
- Microsoft Windows XP Home Edition
- Microsoft Works 8.0 + Antivirus Software
- 17" TFT Analogue Flat Panel Monitor

£699.99 INC VAT **£595.74** EX VAT

Perfecta 8100 Pro ariespc.com/10281919
 for only £100 more

- Intel Pentium 4 64BIT Processor 650J with HT Technology
- 300GB ATA (133Mbps) 7200rpm Hard Disk Drive
- 1GB (1024MB) Dual DDR 400 Branded* Memory
- FREE 802.11b/g 54Mbps Wireless Networking

£799.99 INC VAT **£680.85** EX VAT

Intel 915G Motherboard, 1MB Cache Prescott CPU with 800MHz System Bus, Embedded Intel GMA 900 PCI Express Graphics, Onboard SATA and RAID support, 5.1 Surround Sound 6 Channel Audio, Broadband/LAN Ready, Software (Microsoft Works 8.0, Panda Antivirus 2004 Titanium inc. 1 year FREE virus update subscription, Cyberlink PowerDVD 5, Roxio Easy CD Creator 7), Microsoft Keyboard & Optical Mouse

Model shown with 1.44MB Floppy Drive & 7-in-1 Multimedia Card Reader +£15 ex VAT, Wireless Logitech Keyboard and Optical Mouse +£20 ex VAT, Creative Speakers +£20 ex VAT, 19" Viewsonic TFT Analogue Flat Panel Monitor +£100 ex VAT

Software INCLUDED Worth Over
Winning Awards since 1972 **£200**



0871 666 1818

www.ariespc.com

**BUY NOW
 PAY 2006**

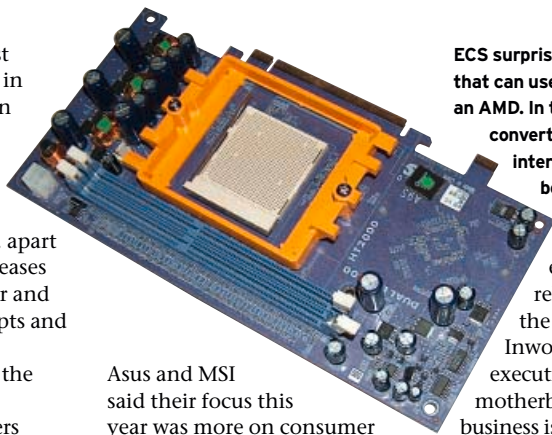
Intel, Intel logo, Intel Pentium and Intel Inside are registered trademarks of Intel Corporation. AMD, AMD logo, AMD Athlon and AMD Sempron are registered trademarks of Advanced Micro Devices Inc. Microsoft and Windows XP are registered trademarks of Microsoft Corporation.

Vendors woo consumer market

Computex is now the second biggest technology show in the world, behind Cebit in Germany. This year more than 28,000 people visited the exhibition over its four days. There was little real innovation, apart from some interesting releases in the graphics card sector and some eye-catching concepts and pre-production devices.

One obvious trend was the shift being made by components manufacturers towards consumer electronics products. Cary Chao, a specialist from the marketing department at the Taipei Computer Association, which organises Computex and represents most of the Taiwanese companies exhibiting, said: 'The line is starting to blur between IT companies and consumer electronics companies.'

This was evident throughout, with the likes of monitor makers Benq showing off its large screen LCD TVs and MSI packing its stand with mp3 players and portable multimedia players. Laptops among this group were also on the rise, with ECS, MSI and Asus, among others, heavily pushing them. Both



ECS surprised the market recently with the PF88 Extreme H motherboard that can use either an Intel processor or, with this Sima A9S daughter card, an AMD. In the next few weeks ECS will release a similar card, the A4S, to convert a Pentium M desktop board to a Turion. There is likely to be more interest in a parallel launch, the I9S, which lets a desktop Pentium board run a low-drain Pentium M, making for a cooler, quieter system with ample processing power

Asus and MSI said their focus this year was more on consumer electronics including laptops, which are seen as having greater growth potential than components.

Michael Chaun, a product manager at Asus, explained: 'People are moving to mobility because prices are getting lower. We see two big markets [for laptops] – digital home and office. The shift is inevitable; we believe notebooks will be preferred by first- and second-time buyers, so our emphasis is on this market.'

Asus is building its reputation as a laptop supplier, and is opening Asus shops to boost its sales and brand image. MSI now sells laptops under its own name, having made them for other suppliers for several years. It

expects to have released 20 models by the end of this year. John Inwood, product marketing executive at MSI, said: 'The motherboard and VGA business is stable but it's not a growing market. Notebooks are showing a 20 per cent growth in the UK, so it's an area we want to be part of.'

There were also plenty of small-form factor (SFF) PCs on display. Aopen grabbed attention with Pandora, a tiny pre-built PC that looks like a Mac Mini, but smaller. It is due out this September. Based around a Pentium M, making it quiet but with decent performance, it uses the 915GM chipset and comes with a slot-loading optical drive, Wifi, two USB ports and Firewire.

Aopen also had the XC Cube M2855-11, due out in July, which is half the size of standard SFF cases and comes either as a single

optical-drive PC or with a two optical-drive extension unit. It is based around Intel's 855GME chipset and a Celeron processor, 1GB of DDR400 Ram, an 80GB hard drive and a 17in TFT display. The extension box can be hooked to any PC via a USB link.

All SFF makers, including Shuttle, MSI, Biostar and Asus, had new or updated models planned for the next couple of months, because of the new chipsets from Intel, and Nvidia's upcoming C51 chipset for AMD boards.

MSI has dropped the hifi element from its Intel- and AMD-based Mega mPC915 and Mega mPC800K SFF barebones, which come out in August, making them far cheaper than its current products. Biostar is adding to its Ideq range, with products again due out in July and August using the Intel and Nvidia chipsets costing from around £235.

Skype wins its freedom

Skype is now a major Voice over IP system, but its biggest restriction is that, unless you are using the client for Pocket PC handhelds, it ties you to your computer, because you must use headphones, or at best a Bluetooth headset, to make and receive calls.

There were a few companies claiming to get around this problem at Computex, with phones that could be used independently of your computer, although they still require your PC to be switched on. None had a live demo.

The most interesting idea came from Netvox Technology. It had a Dect phone and a

base station that plugs into your PC; the wireless handset looks like an ordinary phone and can be carried anywhere in the house.

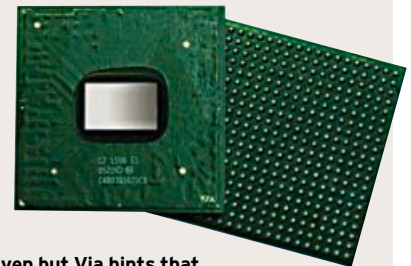
Your contact book can be downloaded to the phone and you just scroll to a person's name to make a call to them. If you are phoned, the handset will ring and you can conduct a free telephone call.

Kent Shen, vice president of Netvox, said: 'People don't want to stay by the PC all the time; they want to have mobility and be free to get around.'

The phone is expected to be available in the UK from the third quarter. Prices are not yet known.

Via promises cheaper laptops

Via has launched a mobile processor that it claims will help drive down the cost of notebooks. The C7-M goes into production this summer and will be available initially in a 1.5GHz version, with a roadmap going up to 2GHz.



No prices have yet been given but Via hints that they will be competitive. The company claims that the 2GHz part draws just 100mw idling and has a thermal design power (TDP) of just 20w – the maximum it could draw going flat out. It comes with a suite of hardware-enhanced security features.

The tiny 30 square mm die is made on a 90nm system-on-insulator (SOI) process and, like its AMD and Intel rivals, it saves power by clocking up or down to match the tasks in hand.

Known for its chipsets, Via has been making low-drain processors and eco-friendly small-format motherboards for some time. It bought the Cyrix and Centaur divisions of National Semiconductor in 1999.

Quieter motherboards snub fans

Intel's new 945P, 945G and 955X chipsets have resulted a rash of new motherboards and faster memory modules (see page 37). Asus worked closely with Corsair to develop its 955X-based P5WD2 Premium range, which can cope with 800MHz DDR2 memory and includes a TV tuner and an 802.11a/b/g wireless router. The latter is software-based, so the PC needs to be on for linked computers to access the web.

Several vendors offered fanless boards using heatpipes

to control temperature and reduce noise.

Gigabyte's new iDNA range is ready for dual core, with 8GB of 667MHz DDR2 memory and high-definition audio. Its flagship GA-81955X Royal is bundled with a Bluetooth adapter and can handle Raid 5, which increases fault tolerance and access speeds on PCs with three or more drives. It has a dual power system, which product manager Thomas Chang says makes the system more stable. An Xpress



Asus is one of many vendors to offer fanless motherboards such as this A8N-SLI

maker of motherboards sold under other brands, is branching out under its own. It hopes to sell up to 300,000 this year, challenging Asus for the number one spot.

It offers a range of Intel and AMD boards (under its Winfast brand) using the latest Intel chipsets. It also has Nvidia SLI-ready boards, but has no plans to add ATI to its range.

Abit may delay the release of its Fatal1ty N18 SLI motherboard until Nvidia updates the chipset. It comes bundled with the Audiomax soundcard, which marketing

Recovery feature backs up system files to a hidden area of the disk.

One 945P-based ECS motherboard is the company's first to use BTX (Balanced Technology Extended) form factor, which allows systems to run quieter. Intel has been promoting BTX for a year but manufacturers have only just begun to adopt it.

Foxconn, an established

Try before you buy games

Sapphire is changing the way it bundles games with graphics cards, offering eight to 11 titles on two DVDs, each of which can be tried out for one hour. Sapphire Select gamers are then allowed to activate one or two of the games over the web, depending on the card they've bought. The other games can be bought at a discount.



WWW.ZOOM.COM

Zoom X6 ADSL Wireless Modem Gateway/Router/Firewall/Switch

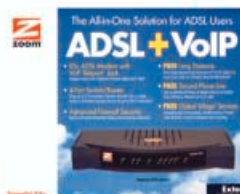


The X6 is equipped with Prism™ Nitro Mode technology to minimize collision problem created with a mixed network and maximize network performance. Prism Nitro Mode also includes packet bursting technology to deliver up to a 140Mbps throughput for 802.11g only networks and up to a tripling of speed in a network with both 802.11b and 802.11g devices. Wireless security includes the newer Wi-Fi Protected Access (WPA) protocol as well as Wired Equivalency Protection (WEP).

Features:

- * ADSL2/2+ compliant modem for faster ADSL speeds
- * Prism Nitro technology offering up to 140Mbps
- * 802.11 (g) and (b) Wireless Access Point
- * Non-blocking mixed network wireless connection
- * High-performance antennas for superior wireless range
- * Advanced SPI & NAT Firewall with DOS and PortScan protection
- * Built-in 10/100 four port Ethernet switch supports upto 253 computers
- * Wi-Fi Protected Access (WPA) and Wired Equivalency Protection (WEP)
- * Supports Universal Plug and Play (UPnP)
- * Two year warranty

Zoom X5v VoIP ADSL Modem Gateway/Router/Firewall/Switch



Features:

- * VoIP ATA with ZoomTeleport™
- * Use your standard phone to make VoIP Calls inc; Analogue, DECT and Wireless.
- * FREE VoIP to VoIP calls
- * 10mins FREE VoIP to PSTN calls
- * PSTN fail-safe for power cuts and emergency
- * True SPI & NAT firewall with DOS protection
- * 4 port 10/100Mbps Switch and USB Port

VoIP enables you to turn voice in to data and send it over your broadband line.

You can make three different types of calls:

- 1, Dial your call normally and this will go out over the traditional PSTN telephone network. (Billed by your standard telephone company)
- 2, When you want to make a VoIP call, dial a # then the persons VoIP number. This call is FREE with no limits on length or distance.
- 3, Sign up for the Enhanced Global Village service or any other VoIP service provider, to let your call go over a special Internet gateway and out on to the PSTN telephone network. (Billed by Global Village or chosen SIP provider)



Please visit www.globalvillage.com for more information



Zoom USB ADSL Modem

ADSL No External Power Supply Compact Design



Zoom X3 ADSL Ethernet Modem

ADSL Gateway Router SPI Firewall



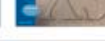
Zoom X4 ADSL Ethernet + USB Modem

ADSL Gateway Router SPI Firewall



Zoom X5 ADSL Ethernet + USB Modem

ADSL Gateway Router SPI Firewall Four port 10/100 Switch



Zoom Preferred Resellers

broadband-buyer.co.uk
WWW.BROADBANDBUYER.CO.UK

ebuyer
WWW.EBUYER.CO.UK

ariaPC
WWW.ARIA.CO.UK

MISCO
WWW.MISCO.COM

PC WORLD
WWW.PCWORLD.COM

Insight
UK.INSIGHT.COM



Speed boost for DDR2 memory

Intel's new 945P and 945G chipsets (see page 16), and the 955X launched with the dual-core Pentium Extreme Edition last month, herald the arrival of faster DDR2 memory. It also means that the latest motherboards now natively support a faster front-side bus (FSB).

Memory makers at Computex talked up the faster frequencies, with 800MHz DDR2 on the horizon or, in some cases, already available. Kingmax had 800MHz DDR2 memory but it was hard to buy because it was not in mass production at the time of writing.

Kingston 750MHz HyperX DDR2 modules will be available soon and Veritech's 800MHz DDR2 memory will be launched next month. Just prior to the exhibition, Corsair announced its XMS-8000UL, which can be overclocked to 1,066MHz.

Few boards on the market at the moment can take advantage of an 800MHz FSB without overclocking. Asus and Abit both had motherboards with native 800MHz support. The faster speed was not down to overclocking, they said, although how this was achieved was kept under wraps.

Most of the motherboards on show had an FSB of 667MHz, so anyone using faster memory would have to overclock their system to get the full benefits.

Motherboard makers gave mixed replies as to when native support for 800MHz would appear, with some saying they wouldn't have boards available until early next year. Memory makers were more upbeat and believed they will be widely available in the third quarter of this year.

But it does mean that DDR2 400MHz will become less popular, with 533MHz taking over as the base level in the near future.

Crossfire in dual duel

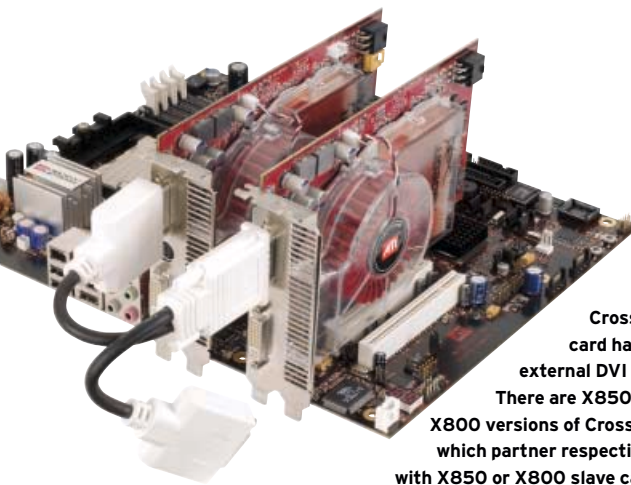
ATI chose Computex to launch its answer to arch-rival Nvidia's Scalable Link Interface (SLI), which enables two graphics cards to work in parallel to boost performance to almost twice that of a single card.

The ATI version uses a special Crossfire card that can be paired with any Radeon X850 or X800 board, enabling it to be used as an upgrade to many existing cards, whereas its rival will work only with two SLI-ready cards. Both technologies require compatible motherboards.

Crossfire has an exterior connection between the two cards (see picture); the Radeon slave card pumps its output via a DVI line to the Crossfire card, which pushes a combined feed through its DVI-out port.

SLI cards, by contrast, are linked inside the system case by a daughter card that straddles the gap between adjacent card slots.

ATI claims that a major advantage of Crossfire is that it



The Crossfire card has an external DVI link. There are X850 and X800 versions of Crossfire, which partner respectively with X850 or X800 slave cards

will work with any games that run on single cards, whereas only a limited number of titles will run on the Nvidia card.

It seems both technologies can be scaled to multiple cards, if and when motherboards arrive with enough PCI Express slots to support them. Crossfire also supports multiple monitors.

Adam Foat, UK product PR manager for Nvidia, pointed

out that Crossfire has come to market much later than SLI, which has already attracted a lot of interest and sales from gamers. 'SLI is proven now. One million SLI motherboards have been sold since December. SLI had been in development for two and a half years before we launched it - it was built into the architecture.'

Boards and cards set for new graphics

ATI managed to make itself the centre of attention at Computex, even if it was just by playing catch-up with Nvidia, which had caught its rival on the hop with its SLI technology. Crossfire (see above) caused a lot of excitement among motherboard and graphics card manufacturers, who could smell the profit from a market made popular by Nvidia.

The core market for dual graphics may be the relatively small one for hard-core enthusiasts, but the technology was exciting enough to have a chance of interesting others.

HIS was showing a pair of new X850 Crossfire Edition cards running on an AMD-based RD480 motherboard, which should be out late June or early July, and which claimed a 3Dmark05 score of 9,643 - high compared to single-card systems.

The score was a touch higher than the Nvidia SLI configurations tested in PCW's



ECS showed the AMD-based KA1 Extreme (pictured top left) and the Intel-based PA1 Extreme (bottom)

the new cards were for high-definition games players and others who wanted high graphics performance.

ECS was one of the manufacturers showing motherboards for Crossfire; it offered the Intel-based PA1 Extreme and the AMD-based KA1 Extreme. Sapphire's rival range will be called Crossfire Pure Performance, and both will be released around July.

Andrew Tseng, UK marketing manager at ECS, said that although Crossfire was new, ATI's name should attract attention from enthusiasts. 'A lot of people are looking forward to this, but how much of the market the boards get depends on their quality. After the KN1 [ECS' cards for Nvidia Nforce SLI] a lot of people asked if we'd be doing the same for ATI.'

Labs, but the two can be compared properly only by using similar configurations, so no real conclusion can be drawn from this.

Patrick Chang, assistant marketing manager for HIS, said

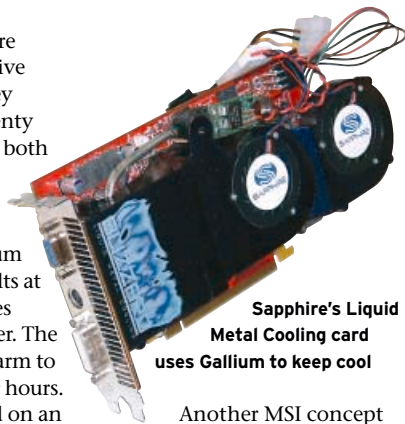
Card swings both ways

Graphics cards manufacturers were expected to be active around Computex and they didn't disappoint, with plenty of new cards based around both Nvidia and ATI processors.

Sapphire was showing its Liquid Metal Cooling graphics card. It uses Gallium to cool the card, which melts at around 30°C and is 65 times more conductive than water. The card's pipe was only just warm to the touch after running for hours.

But the prototype, based on an ATI X850XT, still needed a lot of development work. It used two fans to shift the hot air and was pretty noisy, but Sapphire said these issues were being ironed out before its launch late this year.

MSI had several cards coming out based around the Nvidia graphics processor, plus an ATI Radeon X800-based concept card with different connectors on the top and bottom, allowing it to be housed in either a PCI-Express or AGP slot by flipping it around. The card uses a bridge to move it from AGP or PCIe mode, depending on the slot being used.



Sapphire's Liquid Metal Cooling card uses Gallium to keep cool

Another MSI concept card was the fast NX6800Ultra dual GPU graphics card with 1GB of G-DDR3 memory. MSI was unsure whether either card would attract enough demand to justify taking them to market.

Of the cards it is releasing, the NX6600-TD128EZ is overclocked by default, so guaranteed by MSI. It is similar to a 6600GT, but will be much cheaper when it comes out this summer.

Other new dual-GPU cards on show included Gigabyte's SLI-ready GV-3D1-68GT, due out this month, which uses two Geforce 6800 GPUs. The company was

claiming some aggressive performance figures for it, but these were not independently verified. Leadtek claimed its twin GPU Winfast Duo PX6600GT Extreme is also quiet because of its heatsink. Both have dual DVI sockets; Gigabyte's can run four displays, and both should be available now.

Sparkle has a new range of cards, called Calibre, which comprises four products. The 6600 and 6600GT AGP cards have 256MB of GDDR3 memory with a 1.6nanosecond cycle time, and are available now. The P600 and P610 launch in July, have dual DVI sockets, a 1.6ns cycle time and HDTV capabilities. It also has a 6800 SLI card, the SP-PX42DH Extreme Edition, out in July.

Abit's latest Fatal1ty card, the X800XL 512MB, comes with a turbo button that boosts the card's voltage, core frequency and fan speed. It also sports a huge heatsink to cope with the heat generated when working at its maximum capacity. The card is Crossfire-ready and will be out in July.

Zalman silent on barebones

Zalman is launching new fans aimed at overclockers and a totally silent barebones case for anyone who wants to build their own multimedia PC for the living room.

The new products all have that unique Zalman look and are designed for power users who don't want noisy cooling fans.

The latest in its 'super flower' range of silent fans is the CNPS9500LED. Young Chan Choi, assistant manager for overseas marketing, said it is designed for maximum heat dispersion, with its three heatpipes working as if they were six because of their shape. Its vertical fan, which glows blue when it spins thanks to its LEDs, also forces hot air straight out of the case.

It supports both AMD and Intel processors across their ranges of sockets and will cost around £40 when it comes out in early July. 'It can cool the hottest CPU on the market in silent mode at 1,350rpm,' Choi said.

Zalman also launched the TNN300 silent barebones PC for the living room. 'A lot of companies focus on multimedia PCs, but the problem is noise. This is totally silent,' said Choi.

Available with only the heat plug and power supply, it will be launched in July, costing around £385. Choi said they recommend people use it with an AMD 3500+, because the processor generates less heat than equivalent alternatives.

Versatile mp3

Transcend followed the trend of packing more features into an mp3 player. Its T.sonic Photo has a 640 x 240 2in display, a jpeg viewer and an FM radio with a 10-station memory. It can also act as a USB flash drive, with 512MB of memory expandable via an SD card slot. It measures 88 x 70 x 22mm and weighs 145g including a long-life Li-ion polymer rechargeable battery, and supports USB2 for swapping data at high-speed with a PC. Prices and availability were not announced.

Water is so cool for hot PCs

Water is becoming a popular coolant for PCs, although the idea of it flowing so close to expensive electrical components is uncomfortable.

Components manufacturers argue that water provides an efficient way of drawing heat away from components that are getting hotter as they become more powerful. And they have worked hard to prove that water and electricity can mix.

Gigabyte's 3D Galaxy comes out at the end of June and, once in place and running, it looks stylish. Its aluminium radiator bolts onto the outside of the case, and can be used on any Pentium 4 and AMD K8 processors.

Foxconn is also getting into the act, shipping its first water cooler in the third quarter. The



Keeping cool: Foxconn's water cooler (left) and Gigabyte's 3D Galaxy (right)

NBT-CM17752W-C was a prototype, with Foxconn planning to change the way its plate is secured and add it to its existing range of fans.

Zalman's Reserator 1 Plus external fanless water cooler came out last month. The huge heatsink sits beside your PC,

uses a blue coolant and means the computer can run silently. It is aimed at hardcore enthusiasts, as anyone that has seen the product will testify. Its

price, at about £175, is not for the fainthearted.

Young Chan Choi, assistant manager for overseas marketing, admitted Zalman worked hard to overcome fears users might have of pumping water around the internals of their PC. 'We originally had some problems with leakages but changed the installation method. We now use bolts instead of twisting it [secure] and have tested it over 100 times and had no leakages.'

Fashioning the future

Clive Akass reports on an improbable meeting of fashion and IT, where a BT futurologist got carried away at the prospect of being able to design both his lover and his clothes

Fashion is to geeks as kippers are to custard, judging from the traditional image of the computer nerd. Yet, arguably, fashion has played a crucial role in the evolution of smart devices, partly by embracing the Ipod, but mostly by making the use of headsets acceptable.

The Ipod is surely an elegant dinosaur, due to go the way of all fashion (see page 20), but the latest Bluetooth headsets could turn out to be a major advance in the human-machine interface. They support both stereo audio and telephony, eliminating any lingering rationale for having a separate phone and mp3 player. They also allow you to interact with a device without looking at it, which means you can leave it in your pocket or bag.

This in turn means devices do not need to be palm sized and can have bigger screens for viewing text, video and still images. Which raises other fashionable questions: do you design your machine to fit your clothes or the other way

Below:
Notional
'active contact
lens' would use
micromirrors
and a laser
to scan an
alternative
reality onto
your retina



round? Can you integrate your computer into your clothes?

BT futurologist Ian Pearson foresees clothes with embedded solar cells or mechanical generators to power mobiles. Emerging polymer light-emitters could allow clothes to change colour and even act as displays. Tiny microprocessors built into fabrics



Above: A smart mirror would allow you to try on virtual clothes... another idea from BT futurologist Ian Pearson

could act as grid computers; sensors could report signs of medical malfunction.

Smart fabrics could produce tactile sensations under remote control, allowing 'touching' at a distance (this is a family magazine, so we won't go too far with that one).

The downside is that we will be in a state of data overload,

Pearson warned in a London College of Fashion briefing on the future of fashion and technology. The smart environment will log where we are and marketers could note our every whim to bombard us with targeted advertising.

To protect ourselves we will need 'digital bubbles' with personal firewalls to filter out unwanted data. Pearson, never one to let a possibility go unexplored, said this filter could even exclude the 'real' world. 'Active contact lenses' (see left) could superimpose alternative views, so that you could make your boyfriend or girlfriend look like anyone.

Pearson said, warming to his theme: 'We could design virtual partners to match our wildest fantasies.'

You could even radiate an alternative image of yourself. 'Our appearance could be different to each viewer and different each time they look at us. So fashion designers will need to design virtual fashions and these will need to be dynamic and context sensitive,' he said.

Chain dress shows how you could print machines

The dress pictured here brings a new meaning to the phrase 'printed fabric'. The whole garment was literally printed out by a Dutch company called Freedom of Creation (FoC). 'If we had the right materials we could have printed the box round it, too,' said spokesman Janne Kytanen.

The company uses a 3D printer called a sintering laser from a German company called Electro-Optical Systems, which has a subsidiary in Birmingham. The device lays down a layer of a powdery base material which is selectively fused by a laser scan and then dusted off. The process is repeated until the full product is printed out.

Most 3D printing produces monolithic objects but, as the close-up of the material shows, FoC has produced a kind of chained mail consisting of discrete interlocking links. Kytanen agrees that in theory the same technique could be used to print out a machine.

Sintering laser printers are usually used for prototyping, or for the creation of casts for use in more conventional production processes. But the search is on for materials that will make them even more versatile.

Sandy Black, reader in fashion and textiles at the London of College of Fashion, foresees a time when you could have a 3D body scan at a shop and a new set of clothes printed for you.



The dress above was printed, comprising of a series of interlocking links

She said the day was approaching when you could get clothes that would change their colour or form throughout the day.

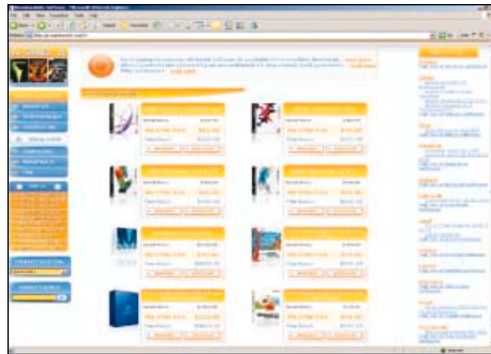
Nanotechnology could also produce textiles that can control body temperature by opening and closing their fibres like pine cones.

Software pirates ride spam wave

Pirates are increasingly using spam to sell dodgy software, according to the anti-piracy Business Software Alliance (BSA). The code is presented as legitimate, in contrast to that sold on illegal 'warez' sites and 'compilation CDs' at car boot sales.

Buyers include businesses, which ask no questions in return for a cheap deal. 'There are many people who are more than happy to keep half an eye closed,' said Mike Newton, BSA campaign manager.

One spam email received at PCW linked to an apparently legitimate ecommerce site offering software at suspiciously low prices: \$69 (£38 approx) for Office Professional or the latest CS2 version of Adobe Photoshop, and \$49 (£27 approx) for what was described as Windows XP



Professional, or Longhorn – the next generation of Windows, which is not due for release until next year.

The site claimed it could offer low prices because its code was available only by download, but also said users could not register the software or get support from the manufacturer.

It asked for payment by

credit card and so could equally have been 'phishing' for the bank details of anyone reckless enough to provide them

to a site whose only registered address is a PO Box in Tahiti. Pirates get round product activation, by which software is tied to a particular machine, by using enterprise editions that do not implement it. They also employ hackers to get round other security measures.

Newton said a two per cent drop in the UK piracy rate last

year was misleading because the market grew, so that the value of the pirated software actually rose to \$33bn at a time when the dollar plummeted against the pound.

This valuation does not equate to lost revenue because only a proportion of pirated code represents lost sales. Industry critics argue that pirates flourish because software is overpriced, so people cannot afford to buy it legitimately.

Newton says the fact that more than one in three applications (35 per cent) used in Britain is illegal, showed people had a 'complete disregard of the value of IP [intellectual property]'. He said Britain, in particular, needs to instil a respect for IP 'in order to survive' because it is a major source of income.

ZyXEL

www.zyxel.co.uk

Routers from A to ZyXEL.

Now you've got a new level of choice in the UK router market, no matter the size of your business.

We're ZyXEL, the world's leading designer and manufacturer of DSL and VDSL routers (*Gartner 2004*). And with outstanding ease of installation, attractive pricing and award-winning, feature-rich product line-up, we're the only name you need to know for all your router needs.

For more information on ZyXEL routers visit:

www.broadbandbuyer.co.uk/pcw
www.insight.com/uk

**broadband
buyer.co.uk**



ZyXEL routers for:

- Advanced technology
- Market-leading performance
- Comprehensive range
- Great pricing
- Two-year warranty protection

Games boxes get serious



>> Golf to a tee

PC Golf simulations tend to be unsatisfactory, as you don't do any actual thwacking, but the £199.99 inc VAT Golf Launchpad has a physical ball you can hit. The EA Sports Tiger Woods PGA Tour Golf 2004 software is bundled and you play using your own clubs. It is available at high street shops and www.firebox.com.

>> HD-DVD boost

Developers of next-generation HD-DVD storage got closer to the capacity of rival Blu-ray drives and media to be used in Sony's Playstation 3.

Toshiba has unveiled a single-sided, triple-layer disk that can store 45GB, and a disk with 30GB dual-layer HD storage on one side and DVD on the other. A Blu-ray dual-layer disk can store 50GB; Sony says it's achieved 200GB in the labs.

>> Fastest drives

Hard drives running at 15,000 rpm are the fastest yet released by Hitachi Global Storage Technologies. With capacities up to 147GB, the Ultrastar 15K147 drives have claimed average seeks times of 3.3 milliseconds and are said to perform 33 per cent faster than 10,000rpm drives.

HGST says they are the first to offer a 4Gbits/sec fibre-channel interface. SATA and SCSI links are also supported. www.hitachigst.com.

>> Prize course

Queen Mary University London has set an online quiz and programming challenge with a fully funded degree course and postgraduate bursaries as a 'prize'. The winners will also have to pass an interview. Entries close on 14 September. www.brainacademy.qmul.ac.uk

America's biggest games show provided tantalising glimpses of next-generation games consoles from Sony, Microsoft and Nintendo. They promise even greater performance than their predecessors, with high-definition gaming being a strong focus. Each is set to feature wireless networking, Internet browsing, DVD playback and online multiplayer gaming.

Sony's Playstation 3 looks the most powerful of the three consoles unveiled at the Electronics Entertainment Expo 2005 (E3) in Los Angeles. It is based on a Cell processor (see below) capable of over two trillion floating point operations per second – 10 times faster than current PC CPUs. Jointly developed by Sony, IBM and Toshiba, the Cell is designed to process 10 instruction sequences simultaneously, compared to two for current Hyperthreading-enabled Pentium 4s. The console is set for release early next year.

Microsoft's Xbox 360 uses what is considered to be a substantially less powerful 3.2GHz IBM Power PC processor with three cores capable of running six threads simultaneously. It contains 512MB of GDDR3 SD-Ram shared between the processors and a 500MHz ATI graphics chip.

The console uses a liquid

Xbox site open to phishers

A Microsoft website dedicated to the Xbox gaming platform could have leaked banking details to phishers, according to security specialist Finjan Specialist.

A 'cross-site scripting vulnerability' could have been exploited to gather personal information from people wishing to pre-order the new Xbox, due for release later this year, the company said.

Finjan's Malicious Code Research Centre alerted Microsoft, who promptly fixed the problem, said Finjan chief executive Shlomo Touboul.

cooling system and has removable front fascias for personalisation. Xbox 360 will be backwards-compatible with some 'top-selling' Xbox games, which will be re-released on a demand-driven basis. The console is expected to be available worldwide late this year.

Nintendo revealed little about its offering, codenamed Revolution, beyond showing a stylish preliminary design. It is traditionally reserved about its plans and gave no firm specifications, but it promised high performance and said it plans to 'revolutionise' the home

console industry by changing the way games are played.

But the Revolution will be backwards-compatible with Gamecube software, as well as Nintendo 64, Super NES and NES games, downloadable via an accompanying online service.

Nintendo also debuted the Game Boy Micro, a miniature version of its Game Boy Advance portable and outlined future plans for its so-called 'third pillar' of gaming – the Nintendo DS, which looks set to incorporate PDA-like functionality.

Also on show at E3 were forthcoming games for the PC, including Aftermath, the forthcoming expansion pack for Half-Life 2. Also on display was Quake IV, Black & White 2 and F.E.A.R (First Encounter Assault and Recon). The latter is a promising first-person combat title that pushes current PC hardware to its limits.

Rory Reid



Left to right: Xbox 360 with controller, Revolution and Playstation 3

Open source key to soft Cell success

Specifications and software libraries relating to the Cell processor at the heart of the Playstation 3 are to be released in a bid to encourage open-source developers to write applications for it.

The Cell, jointly developed by IBM, Toshiba and Sony, is the latest processor to be touted as a candidate to break the

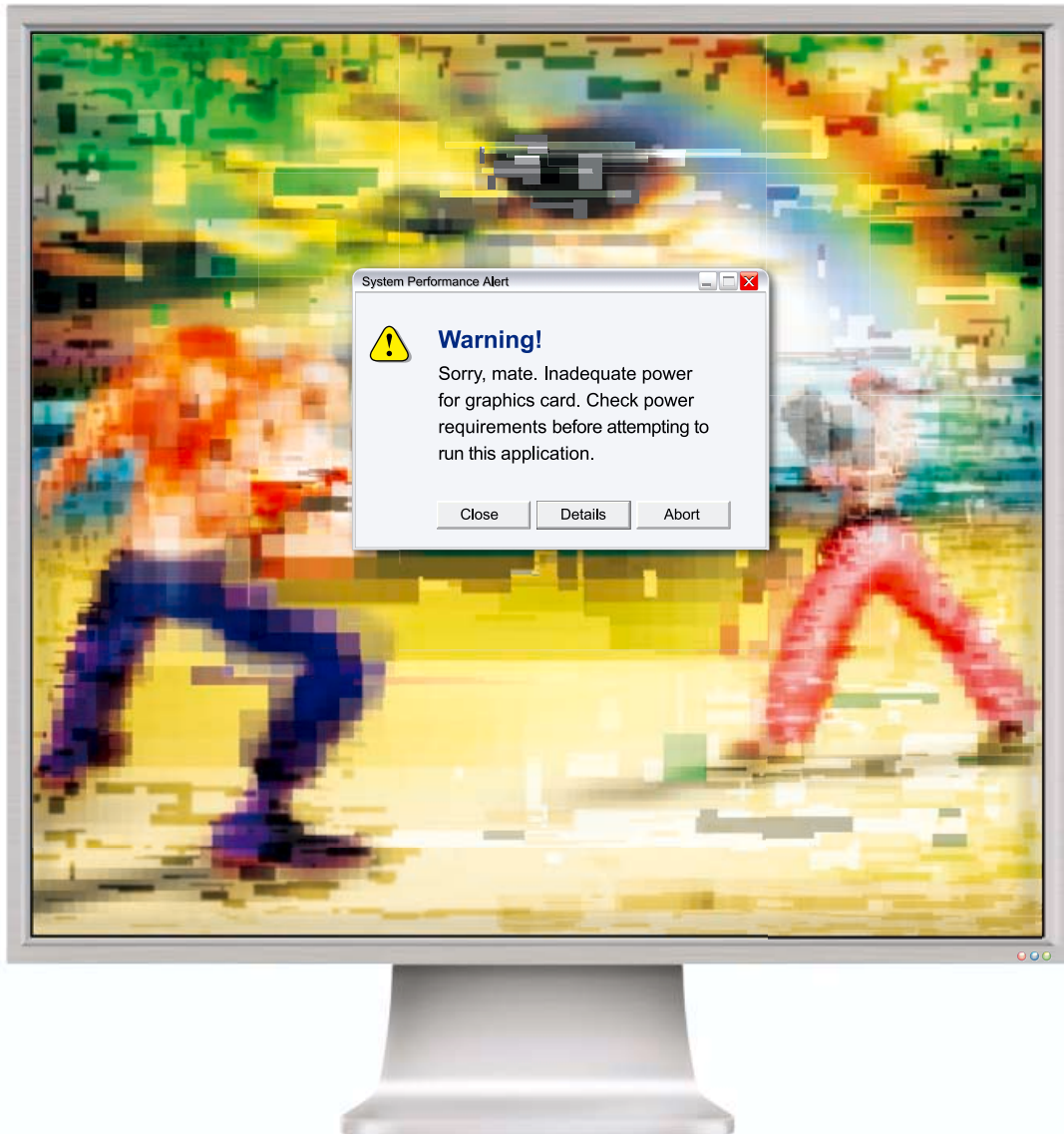
dominance of Intel's x86 architecture. But it is said to be tricky to program and the power consumption is high, limiting its potential.

IBM has built an experimental workstation round the chip and Toshiba plans to release a software developments platform and hardware reference designs

that can be used as a basis for products.

The three companies behind it hope the open-source community will help realise its potential. Linux is not yet available for the processor.

The Cell has a flexible architecture and there may be different versions for different applications.



Don't forget to upgrade before you upgrade



With new graphics cards and high-capacity hard drives, you're ready to take your system to a whole new level. But beware! What happens when you power up these new components could be underwhelming - especially without enough cool, stable power to drive them. That's where Antec comes in - the upgrade before your upgrade. Our power supplies give you the edge you need to get your money's worth from the latest PC technologies. Find out how to take full advantage of today's incredible high-performance computing power at www.antec.com.

Antec
The Power of You



Send your letters to:
The Editor, PCW, VNU Business Publications,
32-34 Broadwick Street, London W1A 2HG



Send your emails to:
letters@pcw.co.uk

Letters

Software Raid sceptic >

I was intrigued to read your feature on software Raid 5 for Windows XP (PCW June 2005). Unusually for a college environment, my media department has to assume responsibility for the security of our 10 XP-based video-editors. This is because the demands for speed, storage and stability are in excess of what our network can offer.

Our solution has been to add inexpensive Raid controllers to the editors in order to stripe and mirror in a rebuildable Raid 0+1 array should any of the drives go down. While these hardware-based Raid arrays have proved rock solid, the Windows XP installations, by contrast, have regularly collapsed, dropping system files on bootup in a way that requires the installation either to be repaired (we have made use of the

Erunt freeware for this) or, in some cases, rebuilt from scratch.

While I am impressed by the elegance of the Raid 5 solution you propose and the additional storage it permits, I am somewhat more sceptical about the likely reliability of an XP-based software solution under intensive use.

John Higgins

Discless XP woes >

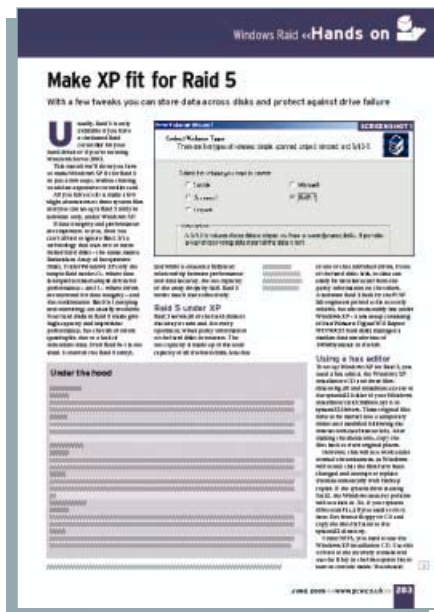
Could you nod in the direction of people who, like me, have been misguided enough to buy a Windows XP computer from a 'big-name builder' that installs an OEM version of the OS and sends it out with only a hidden 'recovery partition' and a recovery disc? My recovery disc is shrinkwrapped and bears the message that it can only be used after getting clearance from the system builder – presumably ignoring this instruction invalidates the warranty. They have also passworded the hidden Administrator account!

The problem this creates can be illustrated with trying to load Ntbackup into XP Home; I don't have a Windows XP disc from which to pull it. Why should we pay twice for the OS by having to buy a retail version? Making an up-to-date backup of the OS is clearly better than using a compromised version, which then requires you to spend ages downloading all the patches issued in the meantime.

Please can you add to the pressure on system builders to only preload full versions of the OS intended for private rather than business customers, and to include the disc?

Chris Cox

Kelvyn Taylor replies > You'll probably find the supplied recovery disc is a full OEM Windows XP disc. Explore the disc from within Windows – hold down the Shift key while inserting it into your CD drive to prevent any autoplay files running. You should request clarification from the vendor about your warranty concerns.



Is a software Raid 5 solution the best one?

The author of the Letter of the Month will win a Trust Bluetooth Wireless Tablet BT446.



With a stylish and ergonomic design, the tablet can be used for activities such as drawing, sketching, picture editing and handwriting. The tablet connects via Bluetooth (adapter not included), so you won't have any trailing wires getting in the way. You can find out more about the Bluetooth Wireless Tablet and other Trust products at www.trust.com or by calling 0845 609 0036.



Why I like Linux >

I was disappointed to see that in the May issue you published the letter 'Penguinspeak' (page 41). By including such a letter, surely you are not suggesting that more idiots run Linux than run Windows? I suggest that the minority of unreasonable Linux users represented in the letter should be ignored in the hope that they go away.

I am trying to think why I like Linux. I suppose I am the sort of person who likes trying out new (free) programs – there are more for Linux than Windows, and they are of a better quality. When I was first exposed



Letter of the month

Stop the DVD spam >

The film industry would have a lot of more chance of my being sympathetic to its restrictive copying laws if it did not supply what is, in effect, spam on every DVD.

We've all been there. Shove in the DVD to be greeted by about 15 minutes of advertising drivel. Worse still, more and more DVDs come up with the 'action disabled' icon when you try to fast-forward through it.

If there was ever a 'feature' of a legitimate DVD seemingly designed to push folks in the direction of ripped-off versions,

I can't think of it. While, for me, watching a film is pretty much a one-shot deal, my nine-year-old grandson's sizeable collection of VHS (and lately DVD) films do get used repeatedly.

We recently settled down to watch his latest addition. After giving up trying to FF to the start of the film he looked across and said: 'I'm going to be as old as you by the time this film starts.'

He's exhorting me to buy a DVD burner to make copies of his legitimate DVDs with no ads. Apparently a nine-year-old just doesn't have the time to wait for the ads and trailers to roll by.

DJ Reynolds

to computers, they were Unix workstations. Linux is an updated version of those, and Windows seems very limited in comparison. I can't believe that XP comes without a built-in programming language.

The reason my wife switched to Linux is far simpler. Her XP box kept telling her that she was not connected to the Internet while she was trying to read webmail. She would have believed it if she was not listening to BBC radio over the computer at the same time. Clearly the problem was with the OS, but neither of us had any idea of how to start troubleshooting it. Installing Linux (Ubuntu, if you are interested) was a far easier option, and it does everything she wants.

Paul Houghton

Crime but no punishment >

Having just read *PCW* July's Letters, one in particular touched upon something that has niggled me for a long time.

Paul Farrell ('Spy vs Spy') asked 'why can't we call the police or some authority to stop computer spyware?'

As a company, we support many small to medium-sized businesses around the UK, and in recent years a great proportion of our time has been spent cleaning up systems that have become infected with spyware and viruses; time that our customers have to pay us for.

I have yet to see an author of malicious software, when brought to justice, made liable to compensate the companies who are out of pocket as a direct result of their actions.

If I were to go on a destructive spree in my local shopping centre, smashing all the windows, I would be up before m'lud, probably incarcerated and fined heavily with compensation to pay. And rightly so. So why do we treat virus/spyware authors differently?

If a high-profile precedent was set that a virus author had to repay the hundreds of thousands of pounds worth of damage they cause, maybe it would deter others.

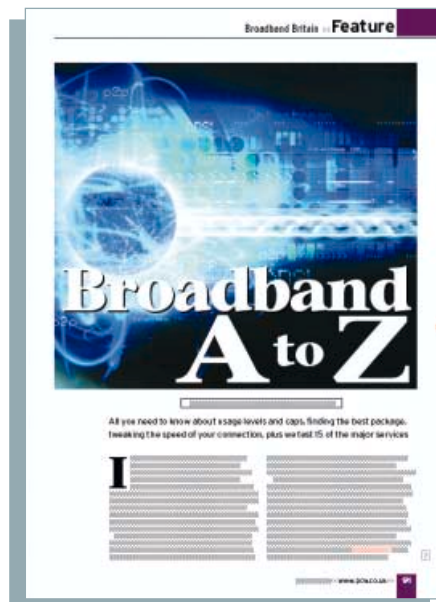
Nigel Johnston

Broadband capping >

It's all very well to cover the debate over capping broadband services (Broadband group test, July 2005), but it would have been helpful to give some background about why so many IP stream-based ISPs are going down this route in one way or another.

BT Wholesale is now offering ISPs different charging models. Instead of a flat monthly rental fee that varies depending on the line speed and includes unlimited use, users can now pay a reduced rental fee. This fee is the same for any line speed up to 2Mbps/sec, but users pay for how much data is transferred. To take this route, ISPs have to switch their entire customer base to this pricing model – they can't have some on one and some on another.

This pricing model allows ISPs to upgrade all their customer circuits to 2Mbps/sec 'for free', but in doing so they will have to introduce some capping or they will leave themselves vulnerable to incurring huge usage charges from BT Wholesale. Even downloading just



Caps on broadband are the cause of debate

10GB could cost some ISPs more than the monthly fee they would get from the end user; they're relying on the low-volume users balancing out the high-volume ones.

That's not to say I agree with the situation, but it helps to be aware of it.

Phil Stanton

Open to open source? >

I read with interest your reply to Mike Lucas (Letters, July 2005) explaining that Scribus was not included in your review of DTP software because 'there's no Windows port of Scribus available – which was one of the requirements for our group test'. What sort of an answer is that? Why was it one of the requirements for your group test?

In the old days of *PCW*, you used to give equal weighting to Spectrums, Atari, MSX, Commodore and so on. Gradually, and not surprisingly given the collapse of all those wonderful companies, you became a Wintel magazine – the 'Personal Computer' in your name became the IBM PC (and its clones). But now it's time to expand again. Linux is a very real alternative to Windows (personally I've used virtually nothing but Linux since 1993!). So stop creating arbitrary excuses for not reviewing Linux software in your group tests – or change the name of those tests to: 'Windows-software-group-tests-because-we-deliberately-exclude-software-for-Linux' Hey – and with Linux running on an IBM PC clone, your magazine name would still fit!

Andrew Martin

Kelvyn Taylor replies > You seem to be confusing open-source and Linux – after all, if we did a group test of Linux-only applications, there would be little point including any Windows programs. We certainly support the open-source movement and specifically wanted to include an open-source alternative in the

DTP group test but, as I stated we couldn't find any that have been ported to Windows.

To err isn't human >

I read with interest your article 'Making Speeches is big business' in July 2005's News section (page 36). I wonder if the article was created using speech recognition software? There are several references to Steven Hawkins and his voice. I assume that the reference should be to the famous scientist Dr Stephen Hawking? Obviously only a piece of software could have made such a mistake!

Stuart Squibb

Clive Akass replies > I haven't been replaced by software yet, but apologies for the mistake that slipped through our production net.

HP happy

I was unsurprised to read in *PCW*'s July 2005 issue about the poor customer service experienced by two of your readers, and even less surprised that *PCW*'s intervention resulted in a happy ending – it's a shame that some companies don't appear to value their customers until there's a risk of bad publicity. However, as cynical as I've become, I have recently been pleasantly surprised by the quality of service I received from HP after buying a new Media Center PC.

While it would be preferable to receive a system without any faults, HP has been quick to resolve every issue I have encountered and has done so each time with courtesy and consideration, treating me as a valued customer. The benefits to HP in dealing with customers in this way are plain to see – here I am writing praise for a company I would previously have assumed to be as poor on customer service as any other. And the icing on the cake – I paid 35 per cent less than the high-street price by buying directly from HP via its Ebay auctions.

Tom Calverley



HP reaps benefits of offering good service

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.

Designed exclusively for the enthusiast who demands the ultimate in performance and style.



The Axis 64 Decimator SLI systems include a PCI Express motherboard that supports two physical connectors that are capable of having two NVIDIA-based PCI Express graphics cards plugged into them. Joined by the NVIDIA SLI connector, the two graphics cards power one monitor, delivering earth-shattering PC performance.

LCD console
Display of chassis temperature, fan speeds, HDD activity, date and time



All systems now with 3 year warranty as standard



Axis 64 KD

Great Value PC - Now with PCI Express graphics

- AMD Athlon 64 processor 3200+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce4 motherboard with dual channel DDR
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 160GB Serial ATA 7200rpm hard drive with 8MB buffer
- 256MB NVIDIA® GeForce™ 6200 w/TurboCache™ technology*
- 17" (16" visible) Viewsonic E72f+SB PerfectFlat (CRT) monitor
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Altec Lansing 121 2.1 speakers
- Microsoft keyboard and optical wheel mouse (black)

10/100 network connection - v92 56k modem - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB) **Floppy drive is optional**

£699^{inc VAT} (£594.89 ex VAT)

Also available with 17" viewsonic VX715 TFT:

£809^{inc VAT} (£688.51 ex VAT)



Axis 64 MKR

"Packed with features... a great choice"
PC Pro, Recommended

- AMD Athlon 64 processor 3500+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce4 motherboard with dual channel DDR
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA hard drive with 8MB buffer
- 256MB ATI Radeon X700 PCI Express graphics
- 17" (16" visible) Viewsonic E72f+SB PerfectFlat (CRT) monitor
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- Microsoft® cordless keyboard and cordless optical tilt mouse
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft® cordless keyboard and cordless optical tilt mouse

10/100 network connection - v92 56k modem - Firewire port - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB) **Floppy drive is optional**

£849^{inc VAT} (£722.55 ex VAT)

Also available with 17" viewsonic VX715 TFT:

£959^{inc VAT} (£816.17 ex VAT)



Axis 64 Dominator

"An absolute bargain"
Trusted Reviews, Recommended

- AMD Athlon™ 64 processor 3700+ with HyperTransport technology
- Microsoft® Windows® XP Home Edition
- NVIDIA nForce 4 motherboard with dual channel DDR
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA hard drive with 8MB buffer
- 256MB DDR3 ATI Radeon X800 PCI Express graphics
- 17" Viewsonic VX715 DVI TFT display (16ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft® cordless keyboard and cordless optical tilt mouse

10/100/1000 network connection - v92 56k modem - Firewire port - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software. **Floppy drive is optional**

£1049^{inc VAT} (£892.77 ex VAT)

Also available with 19" viewsonic VX912 TFT:

£1134^{inc VAT} (£965.11 ex VAT)

MICROSOFT ESSENTIALS - OVER £200 WORTH OF SOFTWARE FOR ONLY £40!

MS Autoroute 2005 worth £35.69 - MS Money 2005 worth £17.99 - MS Encarta 2005 Encyclopedia Standard Edition worth £16.45 - MS Word 2002 worth £84.99 - MS Works 8 worth £31.48 - MS Photo Premium 10 worth £26.99.

Only available at the time of purchase of a new Evesham system. RRP's taken from www.amazon.co.uk on 16/02/05. Supplied software titles are OEM versions not full retail versions. Product pictures are for illustrative purposes only.





Best PC Firm
2004



Best PC Manufacturer 2001-2003
Company of the Year 2004



Best Computer
Manufacturer 2001-2003



Best Laptop Performance
Award 2003 & 2004



Best PC Service &
Reliability 2001-2003



Brand of the Year
2003 & 2004

Axis 64 Decimator SLI-X2

Style and performance that knows no bounds

- AMD Athlon 64 X2 processor 4400+
- Microsoft® Windows® XP Home Edition
- nForce4 SLI motherboard
- 1GB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB, Serial ATA hard drive with 8MB buffer
- 2x 256MB GDDR3 NVIDIA 6800 PCI Express graphics
- 17" Viewsonic VX715 DVI TFT monitor (16ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft® cordless keyboard and optical tilt mouse
- EXCLUSIVE Brushed Aluminium fronted case 205x485x570mm with colour LCD console and tagan 420w PSU

£1599^{inc VAT} (£1360.85 ex VAT)

Also available with 19" viewsonic VX912 TFT: £1684^{inc VAT} (£1433.19 ex VAT)

Standard Features

10/100/1000 network connection - v92 56k or ADSL modem - Firewire port - 6xUSB2.0 - NEW Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB)



Evolution GT Wonder

"Packed with features & offering great performance, great buy for the price" Computer Buyer

- Intel Pentium 4 processor 630 (3GHz, 2MB cache, 800MHz) supporting Hyper-Threading Technology
- Microsoft® Windows® XP Home Edition
- Intel 915P chipset motherboard with PCI Express, 1Gb LAN, dual channel DDR and Hyper-Threading support
- 512MB dual channel DDR RAM (PC3200) 400MHz (2x256MB)
- 200GB Serial ATA 7200rpm hard drive with 8MB buffer
- 128MB GDDR3 NVIDIA 6600 GT PCI Express graphics with TV-out & DVI
- 17" Viewsonic VX715 TFT monitor (16ms response)
- DVD-ROM (16x) drive
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Inspire P5800 5.1 or Creative I-Trigue 3200 speakers
- Microsoft cordless keyboard and cordless optical tilt mouse

10/100 network connection - v92 56k modem - 6xUSB2.0 - Tool free case (Xpider or SLeek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty (2 years on-site, 1 year RTB) **Floppy drive is optional**

£999^{inc VAT} (£850.21 ex VAT)

Also available with 19" viewsonic VX912 TFT:

£1084^{inc VAT} (£922.55 ex VAT)



Voyager A410 MT-28

"Next generation AMD based notebook... the ULTIMATE desktop replacement"

- AMD Turion™ 64 Mobile Technology MT-28
- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM, 333MHz
- 60GB 5400rpm hard drive
- 15.4" WXGA widescreen TFT display (1280x800)
- 128MB ATI Mobility Radeon X700 graphics
- DVD/CD-RW/Dual Layer DVD-RW drive
- 8 cell Li-Ion battery (life up to 2.5hrs approx.)
- Wireless Mini PCI 802.11bg (54Mbps) LAN
- Bluetooth
- Built in media card reader (MMS, MS, SD)
- Weight - 2.8kg
- Dimensions - 355mmx255mmx30mm

4xUSB2.0, Firewire, VGA, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty - 1 year on-site, 2 years RTB.

£899^{inc VAT} (£765.11 ex VAT)

- AMD Turion™ 64 Mobile Technology MT-37
- 1GB DDR RAM, 333MHz
- 80GB, 5400rpm hard drive

£1099^{inc VAT} (£935.32 ex VAT)



Voyager C510

"Highly recommended. Great performance"

- Intel Pentium M processor 730 - 1.6GHz, 2MB L2 cache, 533MHz
- Microsoft® Windows® XP Home Edition
- 512MB DDR2 RAM 533MHz
- 60GB Serial ATA 5400rpm hard drive
- 15.4" WXGA widescreen display (1280x800) (Upgrade to WSXGA 1680x1050 for only £49.99)
- 128MB NVIDIA GeForce Go 6600 PCI Express graphics
- DVD/CD-RW/Dual layer DVD-RW drive
- 8 cell Li-Ion battery (life up to 4hrs approx.)
- Wireless Mini PCI 802.11abg (54Mbps) LAN
- Built in media card reader (MMC, SD, MS-Pro)
- Weight - 2.9kg
- Dimensions - 357mmx276mmx35mm

5xUSB2.0, Firewire, VGA, TV-out, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Audio DJ music control buttons - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - eTrust Antivirus software including 3 months virus updates - 3 year warranty - 1 year on-site, 2 years RTB.

£999^{inc VAT} (£850.21 ex VAT)

- Intel Pentium M processor 750 - 1.86GHz, 2MB L2 cache, 533MHz
- 80GB, Serial ATA 5400rpm hard drive

£1056^{inc VAT} (£898.727 ex VAT)

Call 0870 160 9530

To contact your nearest store call 0870 160 9800

Click www.evesham.com

Altrincham | Birmingham | Bournemouth | Bristol | Cambridge | Evesham | Glasgow | Leeds | London | Norwich
Milton Keynes | Nottingham | Peterborough | Reading | Southampton | Swansea | Tunbridge Wells

active Home

PLAIN ENGLISH AND JARGON FREE!

Only
£3.99

**OUT
NOW!**

- The latest home entertainment product reviews
- The ultimate buyer's guide
- Easy to follow step-by-step guides

www.activehome.co.uk



**active
Home**

Available at **WHSmith**
and all good bookstores



gordonl@pcw.co.uk

Wait and see is best policy in format war

Consumers will be the main casualties in the battle to find a natural successor to DVD, thinks Gordon Laing

The battle for DVD's successor heated up this month. As arch rivals Blu-ray and HD-DVD spoke of the possibility of unification, backers of each played games of 'mine's bigger than yours'. And all this over the backdrop of E3, the world's biggest games show, where the first official glimpses of the Playstation 3 and Xbox 360 consoles resulted in at least one big surprise.

If you're happy with your current DVD player, you'll be wondering why we need a successor at all. The technical reason is to support High Definition video, whether its pre-recorded movies or recording HD broadcasts. HD video is at least four times more detailed than standard DVDs.

Of course, the commercial reason for a successor to DVD is to sell new hardware and copies of films we already own. It happened when CDs took over from tapes and vinyl, DVDs from VHS and now the industry wants another reason to sell us its back-catalogue once again.

The most money will be made by the company or coalition whose format becomes the true successor to DVD. Anyone who presses a disc, produces a blank or manufactures compatible hardware will need to pay a licensing fee. The trouble for consumers is there's currently two rival camps fighting it out.

In one corner is HD-DVD, developed by Toshiba and NEC and backed by the DVD Forum. In the other corner is Blu-ray, developed by the Blu-ray association which has Sony, Philips, Pioneer, Sharp, Hitachi, LG, Matsushita, Samsung and Thomson as founding members. Both camps have touted backing from various movie studios, although I wouldn't bet on any deals being exclusive.

Technically speaking, Blu-ray has the edge with larger capacities: 25GB or 50GB on single and dual-layer discs respectively, compared to 15GB and 30GB for single and dual-layer HD-DVD. But it's not just about specs: HD-DVD's physical characteristics are closer to normal DVDs and therefore require less investment to manufacture.

While the HD-DVD camp touts the manufacturing angle, people are clearly swayed by numbers and, for storage, capacity is king. Clearly losing out on this game, Toshiba recently announced a triple-layer HD-DVD, which could store 45GB, although a week later TDK trumped it with a four-layer Blu-ray boasting 100GB.

This is little more than playground scrapping though. When DVD was being developed, eight-layer discs were shown to be possible, but no more than two layers came to market. The fact is two layers are more than sufficient for storing a long movie in High Definition.

So, if both are good enough, the success of one over the other boils down to genuinely exclusive commitment from big industry names along with well-placed Trojan horses; after all, if you can get more of your format out there than your rival, you're well on the way to winning the hearts and minds of consumers.

PCs can be valuable allies in gaining market share. Every PC has an optical drive and these have pretty much launched DVD and its rewritable variants. Blu-ray's looking strong here with Sony, Dell, HP and even Apple committing to use the drives in future computers.

Games consoles are another great way for propagating your technology. Sony confirmed its forthcoming PS3 console would feature a Blu-ray drive, but it was surprising to learn that Microsoft would equip its Xbox 360 with a standard DVD drive and not HD-DVD.

Either way, this Trojan horse strategy is terrible for consumers. We're being used as pawns and find ourselves unwittingly committing to a format that may not be around in the long run. Format wars of this magnitude

should not be fought in the market and while I'd like a High Definition movie player in my home, I'm not going to buy until there's a clear winner.

And there must be a single format. Blu-ray versus HD-DVD is not the same as DVD+RW versus DVD-RW. While it's annoying for retailers to stock multiple blanks, the rewritable DVD formats can co-exist. Both will playback on virtually all DVD drives and domestic players, and most writers will happily record on

either type of blank these days. The difference now is that Blu-ray and HD-DVD are fundamentally incompatible.

I can only hope Sony and Toshiba can find some way to produce and back a unified format, although it may require the might of Hollywood to force the issue. Otherwise, both will launch incompatible formats and we, as consumers, will have to vote with our wallets – and it could take some time to resolve a winner.

By that time, there could be a large installed base of effectively redundant hardware. Sony might be bullish enough to launch the PS3 with Blu-ray, but if it's beaten by HD-DVD or replaced by an incompatible unified solution, owners of the new console may find themselves with a severely limited number of HD movies to watch.

If unification proves impossible and it comes to war in the marketplace, I don't actually care which format eventually wins – my wallet's not coming out until there's only one HD format, supported by the entire consumer electronics, PC and movie industries. It happened with DVD and it can happen again now. ■

'I don't care which format eventually wins - my wallet's not coming out until there's only one HD format'



guyk@pcw.co.uk

Our present is their future

It's easy to be seduced by newer and faster equipment, but most of us really don't need it, argues Guy Kewney

Having burned out my graphics card, I thought I'd get a new one. An interesting experience (rather like the 'interesting' in: 'May you live in interesting times' – a traditional Chinese curse) at the end of which, I've been struck by the similarity between modern graphics cards and toasters.

No, I don't just mean the temperature they run at or the speed they burn themselves out. I mean the disparity between what most users want and what most graphics card makers are building.

Have you ever been in one of those hotels where you make your own toast at the breakfast buffet? The problem with making toast is that it takes time and gets cold if you don't eat it straight away which, for those who like hot buttered toast, is a pain. If you get your own toaster, everybody else has to wait for you. If you get a hotel toaster, it makes more toast than anybody can eat and so it's all cold.

So you get weird toast-making contraptions that have a conveyor belt and you put your piece of toast on the belt and in it goes and out it comes and then all the guests fight over whether this is their piece of bread. This is the best toaster in the world and yet nobody would want one in their own kitchen.

To walk into the rarified world of the hard-core gamer and say graphics card is like walking into the makers of catering equipment and saying toaster.

What counts in games is high resolution realism. Watching Half Life 2 is more like viewing the Sci-Fi channel; the impression that you're watching a movie is hard to shake. And yet, to the ordinary home user, the difference between Half Life on a standard desktop machine with a standard integrated display chip and a top of the range graphics card is going to be invisible.

'Well, obviously, if you're running your game at a low resolution,' said the man from ATI dismissively, 'you're hardly going to get the benefit of these new generation display cards.' Low resolution? 'Around 1,280 x 1,024,' he said, as if it was obvious.

For hard-core game players, of course, it is obvious. They have displays capable of resolving twice the pixel count, at high refresh rates. My own workaday display is a rather lovely IBM TFT panel, which people look at it, and say: 'Wow, what lovely high resolution – isn't that expensive?' And yes, it is a bit. But it's running at 1,280 x 1,024, so to the graphics card enthusiast, it's hardly worth thinking about.

The card in my machine isn't a slouch. It's an Athlon 64 computer, which is pretty quick and it was the then top-of-range Nvidia Geforce 6600. Six months into its life it started showing acceleration faults and, in order to watch ordinary AVI files, I had to turn almost all acceleration features off.

Don't ask me why I decided to contact Nvidia and ask what should I replace it with, but that's what I did.

What a product manager should do, at this point, is invite you around to their office and show you the range, demonstrate them and explain why their products are superior. What Nvidia actually did was to say: 'An Athlon 64? How old?' When I said it was nearly nine months old, there was an ominous pause. 'Oh, an AGP system,' said the scornful voice.

As far as Nvidia is concerned, it's not worth calling me back to discuss AGP cards. I've now spoken to three Nvidia card makers and each of them has taken the view that, if sometime in the next two or three months they can find someone junior enough to go through the

lumber room and find something with an AGP connector, they might perhaps see if the Post Office will send it to me for evaluation. PCI Express, is what is worth having, worth talking about and if you're not there, you might as well go and look on Ebay.

There are two official reasons for this: the first is that AGP is obsolete, and nobody needs to think about it any more. The second is that Nvidia has rather lost its grip on the leading edge.

The truth of the matter is that, of course, these technology companies have to live in the future. What we users have on our desks is, for them, already history. But another look at reality suggests that people will carry on buying cards for AGP graphics systems for some months.

Of course, Nvidia may prefer not to sell to that market. But some people – like myself – who have reasonably fast machines, but an out-of-date card, will definitely, consider spending money on an upgrade. And the way to sell us an upgrade is not to look down your nose and suggest that you are wasting their time buying a better card until you can afford a better PC.

So I've gone for an ATI Radeon-based card from Sapphire – an AGP 8x model – and, frankly, until I get a new machine with a new motherboard, I'm simply going to ignore what seems to me to be marketing jargon about SLI (it isn't Scan Line Interleave as 3dfx originally offered on my two classic Voodoo cards, but scalable link interface and is, frankly, a bodge) and regard it as far more toasting power than I'll ever need.

'Companies have to live in the future. What we users have on our desks is, for them, already history'



barryf@pcw.co.uk

Can't know what you don't know

Users do not know enough about the dangers of viruses and spyware to do anything about them, argues Barry Fox

During a recent security conference, a Microsoft suit popped up on TV and advised how people could tell when they have been infected with a virus or spyware. The computer slows down and acts sluggish, he explained. Which is rather like telling people that the telltale signs of anthrax poisoning are a slight sore throat and dull headache followed by death.

There are lots of reasons why a PC slows down and acts sluggish and only some of them have anything to do with infection. The problem is that we have no easy way of diagnosing PC problems.

I am even more obsessive about virus and spyware protection than most people. I force Norton Anti-virus and Webroot Spysweeper into continually updating their definitions and scanning for malware. I dutifully download all the new critical updates for Windows as soon as Microsoft posts them. So I know first-hand that however good these systems may be, they assume far too much user knowledge and offer pitifully little help for those who don't have that knowledge.

After installing the latest version of Norton Systemworks and Antivirus, I tried to install a new version of the Norton Internet Security (NIS) firewall. NIS told me that I first had to uninstall Anti-virus, thereby wasting a year's subscription.

Because AOL gives away a free subscription to McAfee's Personal Firewall, I let the Norton Internet subscription lapse and installed McAfee.

The first thing McAfee did was to ask a string of questions about Internet programs that it did not recognise. Click Yes to allow them to do whatever they want to do or No to stop them doing anything and probably stop functioning properly. There was no plain English advice on how to choose Yes or No. Several of the programs that McAfee didn't recognise were part of Windows, Office or Norton. McAfee didn't even recognise AOL. So AOL is giving away a free subscription to a Windows firewall that does not recognise Windows and AOL.

The easy answer is just to click 'Yes' to all those 'do you want to allow this' questions that keep coming up. It's the shortcut to a quiet life, but could also be the shortcut to infection. Legally it will all be your fault if you get infected because you clicked Yes instead of No.

When the boss of a hi-fi company recently said he was thinking about selling a Windows Media Center PC, I suggested he ask himself a simple question. How much free support can he afford to give customers who have crashed their PCs by adding third-party hardware and

software, and been infected by viruses, spyware and dialers? On the face of things, the best way out would be for Microsoft to build virus and spyware protection into Windows, along with a much tougher firewall than the existing XP freebee. But if that happened, the US government and European Commission would be jumping all over Microsoft for unfair competition.

Something has to be done, though, because infected PCs are like people with infectious diseases. They spread the diseases to cause an epidemic. With PCs, the epidemic can be an orchestrated Denial of Service attack, with strategically infected PCs programmed to bring down target websites out of malice or for cyber-blackmail or cyber-warfare. It already happens to online bookies on the day of a big race – 'Pay up or we shut you down'.

What's needed is online diagnosis, a bit like NHS Direct, the medical help line that lets people get medical advice before making a doctor's appointment (www.nhsdirect.nhs.uk). Connection to a secure, trusted site, with digital signature protection and data privacy guarantees, would scan a PC and diagnose infection, conflicts and general faults.

The technology to do this already exists. Try running the latest version of the Sonic Stage software that comes with Sony's Network Walkman (v3.0.03.02220). When the PC crashes – as it very likely will – and Windows asks permission to send an automated error report, click Yes and check out the automated reply – 'Error Caused By Sony Corporation: No Specific Solution

Found... An analyst at Microsoft has investigated this problem and determined that an unknown error occurred in OpenMG-Sonicstage Jukebox. This software was created by Sony Corporation... Microsoft has researched this problem with Sony Corporation, and they do not currently have a solution for the problem...'

From here, it is a short technical step to voluntarily logging onto a diagnostics site, with the instruction 'please go through my system with a fine tooth comb, report errors and suggest fixes'.

I'd pay to use a service like this. It might encourage us to upgrade to a new version of Windows if Microsoft bundled online diagnosis for free. Using an online health check could flag virus infection, worms and security loopholes. It could identify programs that are running in the background and slowing things down. It could even give independent advice on whether a sluggish PC would benefit from a bigger hard drive, more Ram or faster graphics card or processor. So who will be first to offer an NHS Direct for PCs? ■

'They assume far too much user knowledge and offer little help for those who don't have it'

Reviews

EDITED BY WILL STAPLEY

EXCELLENT ★★★★★ VERY GOOD ★★★★★ GOOD ★★★★★ BELOW AVERAGE ★★★★★ POOR ★★★★★

Contents

Mini round-up

58 External digital tuners

Hardware

- 51 Mesh Titan Dual X2 Pro
- 52 Advent T9504
Acer Travelmate 3000
- 53 Mesh Pegasus 3700+

Peripherals

- 54 Gizmondo
Viewsonic PJ400
- 55 HP Laserjet 1020
- 56 Acecad Digimemo
Fujitsu-Siemens P20-2
- 60 A4tech NB-30 battery free mouse
Fujitsu Scansnap II Plus
Philips Shoqbox
Plantronics CS60-USB

Overclocking

- 62 Asus Vento 3600
Scythe Samurai RevB
Sapphire Radeon X800XL Ultimate
Nexus H20-2000 Water Block
- 63 Powercooler X800 256MB Game FX
Nexus Dampdex Block Kit
Antec Truepower 2 480W
Toshiba MK1032 GAX

Components

- 64 ECS PF88 Extreme
- 65 Abit Fatalty AN8

Software

- 66 Allume Stuffit 9 Deluxe
- 67 Bryce 5.5
- 68 Microsoft Windows XP
Professional x64 Edition
- 72 Suse Linux 9.3 Professional 9.3 64bit
- 73 Mac OS 10.4 Tiger
- 76 Serif Movieplus 4
- 77 Photo Explosion Deluxe 2
- 79 Spy Cleaner Gold 9.3
Bitdefender 8 Professional Plus
Lifethemes
Cyberpatrol 7



PAGE 52

The Advent T9504 is an imposing system with plenty of power to back it up



PAGE 62

The larger than life Asus Vento 3600 has advanced cooling for processors



PAGE 73

A major update for Mac OS X adds greater functionality and security

If there's a sure-fire way of boosting your appeal to high-performance PC enthusiasts, it's to add the word 'dual' to whatever it is you're selling. Just a few months ago we saw dual graphics cards, and now we have dual-core processors. It's not a new idea (dual-processor workstations with two individual chips have been around for many years), but dual-core processors house both cores on the same chip. This has the advantage of allowing them to run quieter, with just the one fan required and also use less power.

AMD is the first to debut its dual-core processors in the form of the Athlon64 X2 range and Mesh wasted no time in supplying us with the Titan Dual X2 Pro system. Cast your eyes to the right to find out what we thought of Mesh's dual-core effort. Of course, Intel isn't far off the pace and you can expect to see a dual-core Pentium review next month.

Moving back to single-core PCs, Advent's T9504 will no doubt appeal to the style-conscious. Although Advent isn't a brand you'd usually associate with high-performance gaming PCs, it has pulled out all the stops to bring you the T9504. The chassis may be a classic case of style over functionality, but it definitely stands out from the crowd.

With E4 now joining the Freeview line-up and other channels rumoured to follow suit, there's never been a better time to buy a digital TV tuner for your PC. Sure, you can pick up a set-top box for your TV for around £40, but a PC version is far more versatile. You can pause live TV, schedule recordings, view extended programme information and much more. Plus, with an external tuner, installation and set up couldn't be easier. We round up four on page 58.

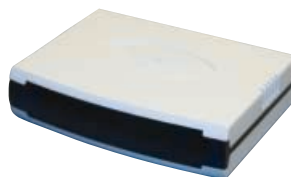
It's not just dual-core CPUs stealing the headlines, 64bit operating systems are also claiming their share of the glory. We've got full in-depth reviews of Windows XP Professional x64, Mac OS 10.4 (aka Tiger) and, to ensure Linux aficionados don't feel left out, Suse Linux Professional 9.3.

Finally, for those of you who are into portable gaming, we've managed to track down the illusive Gizmondo. Although supposedly available since March, a late switch to 3D graphics resulted in limited availability and few games to back it up. Ultimately, its success will depend on support from the major software publishers.





Gizmondo
Watch movies, listen to music, or just play games with this portable multimedia console - see page 54



Freeview digital tuners
Step into the world of digital TV - check out our mini round-up of tuners on page 58

DUAL-CORE PC

Mesh Titan Dual X2 Pro

Groundbreaking performance at a great price



If you've been keeping up with the latest technology developments on the PCW Test Bed (<http://labs.pcw.co.uk>) you'll already be aware of the new Athlon 64 X2 - a range of AMD processors with two cores on a single die.

The Matrix Titan X2 is the first consumer PC to make use of an X2 processor, in this case the 4800+ model. This CPU has 2MB of L2 cache. Mainstream versions of the X2 have 512KB of L2 cache per core.

Unlike Intel, AMD has not had to reduce clock speeds in order to operate two cores on a single die. Both cores in the 4800+ run at 2.4GHz. In contrast, the fastest single-core Intel CPU runs at 3.8GHz, whereas its fastest dual-core CPU peaks at just 3.2GHz.

This affords the Matrix Titan X2 performance far in advance of any desktop computer we've seen to date. Clearly, multi-core processors won't help you type Word documents any quicker, but they provide several benefits over their single-core counterparts - primarily in

processor-intensive applications or when multitasking.

Similar performance can be achieved by using a pair of (single core) CPUs, but this causes higher power consumption, greater heat generation and increased noise from multiple cooling fans. Dual-core CPUs promise similar performance benefits without the aforementioned drawbacks.

Aside from its evolutionary new CPU, the rest of the PC is quite ordinary. Its X2 processor has the same socket 939 connector as a standard Athlon 64 CPU. This has allowed Mesh to use the familiar Asus A8N SLI Deluxe motherboard.

Like all Athlon-based PCs, this gives the Titan X2 a performance disadvantage when running applications such as video editing. Mesh has supplied 2GB of PC3200 Ram in a dual-channel configuration, but this is no real substitute to DDR2.

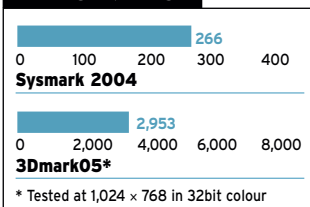
Mesh has not fully exploited the performance potential of this PC by using a single 300GB Maxtor 6L300S0 hard drive. More demanding users may

wish to upgrade the PC with a Raid 0 hard disk configuration, which provides faster disk access.

Despite this drawback, the Titan Dual X2 Pro delivered excellent performance. Its Sysmark 2004 score of 266 is around 35 percent faster than a similarly equipped PC running an Athlon 64 4000+ CPU. It also encoded our 1GB mpeg4 test video in 10 minutes, 19 seconds.

The majority of this performance increase can be seen in the Internet Content Creation section of our tests, where the X2 processor performed more than 20 per cent faster than anything previously reviewed in PCW and 34 per cent faster than the quickest Athlon FX-55-based PC in our group test (see page 121).

PERFORMANCE



In contrast, this PC's graphics performance was somewhat disappointing. Mesh has installed a pair of 128MB Geforce 6600GT graphics cards working in a Scalable Link Interface (SLI) configuration. Individually, these cards are aimed at mainstream users but, even when working in tandem, they're not as potent in some games as a single 256MB Radeon X850 XT.

Other features include the impressive 19in Viewsonic VX912 monitor and a host of software for video editing and DVD authoring. Mesh has also provided a OneClick Intelligent Mains Panel, which switches off the mains power to all your PC peripherals whenever the PC is shut down.

In trying to keep the Matrix Dual X2 Pro affordable, Mesh has failed to fully exploit the performance potential of its dual-core CPU. It is still extremely fast though and even greater performance can be extracted should you wish to upgrade. On the whole, this PC is a shining example that brand new technology with groundbreaking performance doesn't have to cost the earth.

Rory Reid

DETAILS

RRP £1,655.17 (£1,408.65 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Mesh Computers 0870 046 4747

www.meshcomputers.com

SPECIFICATIONS

Athlon X2 4800+ dual-core • 2GB of PC3200 Ram • 300GB hard drive • 2x Geforce 6800 GT • Viewsonic VX912 • Asus A8N-SLI Deluxe motherboard • Sony dual layer DVD • Soundblaster Audigy 2 ZS • 3yrs on-site warranty • Software bundle

PROS Core performance; price

CONS Graphics cards; no Raid setup

VERDICT

Affordable, but doesn't make full use of the dual-core processor

FEATURES

★★★★★

PERFORMANCE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

PENTIUM 4 PC

Advent T9504

An imposing system for gaming and more



One look at the Advent T9504's imposing Coolermaster chassis was enough to convince us that this isn't your average PC.

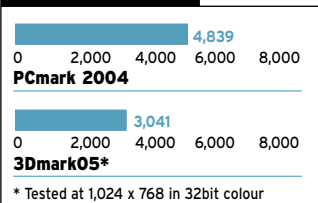
This was mostly thanks to the Coolermaster Musketeer front panel that features displays to monitor voltage, CPU temperature and even internal sound pressure. Below the panel sits a card reader, AV sockets and USB and Firewire ports.

There's a 3.2GHz Pentium 4 640 processor, which uses 64bit extensions, making it an ideal accompaniment to Windows XP Professional x64 Edition.

The T9504 ships with Windows XP Home Edition, but its CPU is still capable of running 32bit applications faster than an ordinary 3.2GHz Pentium 4.

Advent has installed four PC3200 Dimms for a total of 2GB of Ram and uses a single 256MB Geforce 6800 GT graphics card. This offers fairly impressive performance, as proven by the 53.5fps (frames per second) Doom 3 benchmark result.

PERFORMANCE



The Samsung Syncmaster 913N TFT performs well, but has a native resolution of 1,280 x 1,024. Serious gamers will prefer a 20in display with a native resolution of 1,600 x 1,200, but they won't appreciate the ball mouse. Shipping a new PC without an optical or laser mouse is daft, especially with a gaming system. Other features include a digital TV tuner and two 250GB hard disks. The T9504 looks great, performs well and offers good value.

Rory Reid

DETAILS

RRP £1,399 (€1,190.63 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

PC World 08702 420 444

www.pcworld.co.uk

SPECIFICATIONS

Intel Pentium 4 640 (3.2GHz) • 2GB

PC3200 Ram • 2x 250GB hard drives

• 19in Samsung Syncmaster 913N •

Geforce 6800 GT graphics card •

Pioneer DVR-109 dual-layer DVD-RW •

Philips digital TV tuner • Windows XP

Home Edition

PROS Stylish; value; performance

CONS 19in screen; memory; mouse

VERDICT

An affordable gaming PC with solid all-round performance, but gamers will want a 20in screen

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

ULTRAPORTABLE NOTEBOOK

Acer Travelmate 3000

Small and light, with plenty of connectivity



With a footprint smaller than the full-size edition of PCW and weighing just 1.45kg, the Acer Travelmate 3000 is designed with portability in mind.

Despite the compact size, there's a 12.1in widescreen display along with a reasonably-sized keyboard. You'll notice some flexibility to the keyboard when typing, but it's the cramped touchpad that's the biggest let-down, making it tricky to move the cursor around the screen quickly.

There are various versions of the Travelmate 3000 series; this being the 3004WTMi model. Its core components are impressive, with a 2GHz Intel Pentium M processor, 1GB of DDR2 memory and a 100GB hard disk.

It took just one hour and 40 minutes to drain the battery in our tests, but you may well get more than two hours using power saving settings. A second smaller battery is supplied that runs for just over an hour, but you can't hot-swap the two.

An external dual-layer DVD writer compensates for the lack

of a built-in optical disc drive and connects to the notebook's single Firewire port. Wireless options come in the form of infrared, Bluetooth and 802.11b/g, and the four-in-one memory card reader is a useful inclusion.

The Travelmate's price tag and small size make it seem like the ideal travelling companion, but we expected to see longer battery life. Acer tries to combat this by including two batteries, but it's not an ideal solution.

Emilie Martin

DETAILS

RRP £1,399 (€1,190.64 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Acer 0870 853 1005

www.acer.co.uk

SPECIFICATIONS

2GHz Intel Pentium M • 1GB DDR2

memory • 100GB hard disk • Intel

915GM PCI Express graphics •

External dual-layer DVD writer •

12.1in screen (1,280 x 800) • Second

battery • 1.46kg • 297.5 x 210 x 25mm

(w x d x h) • One-year warranty

PROS Small and light; connectivity

CONS Disappointing battery life

VERDICT

Compact and easily portable, providing you can top up the battery at regular intervals

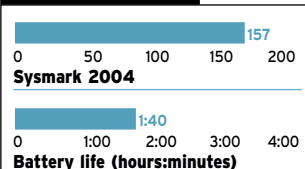
FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PERFORMANCE



DESKTOP REPLACEMENT

Mesh Pegasus 3700+

Powerful, good value desktop replacement



Notebooks are usually considered to be inferior to their desktop counterparts. The Mesh Pegasus 17.1in 3700+ aims to change this perception with a high specification that wouldn't look out of place inside a full-sized home PC.

Alongside an Athlon 3700+ CPU, there's 1GB of DDR memory and a 128MB Radeon 9700 graphics card. Together, these allow the notebook to run at a good pace. It achieved a Sysmark 2004 score of 171, and was able to run most games at high resolution without compromising frame rates.

One of the notebook's best features is its 17.1in widescreen TFT display. This has a native resolution of 1,440 x 900, making it ideal for watching DVD movies in a 16:9 aspect ratio and for viewing two or more documents side by side on your Windows desktop.

Mesh has included a 60-day trial version of Microsoft Office, as well as full versions of Microsoft Works 8, Pinnacle Studio 9 SE and a couple of

CD writing and DVD authoring applications to complement the eight-speed Sony DW-D56A dual-layer DVD rewriter.

We were also pleased with the inclusion of a 100GB hard drive, which is generous storage for a notebook. Mesh has supplied an integrated webcam and a 6-in-1 memory card reader that supports most popular formats.

The Pegasus 17.1in 3700+ has a good range of features. Given its competitive price, it is an ideal alternative to a full-sized desktop system.

Rory Reid

DETAILS

RRP £1,219.65 (£1,083 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION

Mesh 0870 046 4747
www.meshcomputers.com

SPECIFICATIONS
AMD Athlon 64 3700+ • 1GB of Ram
• 100GB hard drive • DVD-RW • 128MB
Ati M11 graphics • XP Home • Webcam
• Bluetooth • 802.11b/g • Three-years
RTB warranty (two years labour only)

PROS Good performance;
widescreen display

CONS Not the fastest

VERDICT

A good value notebook that makes a strong alternative to desktop PC

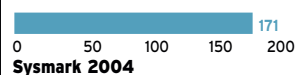
FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PERFORMANCE



Captivated?

Discover The Big Picture™

The global best-selling InFocus® X™ Series projectors.

Your wildest dreams come true... It is all part of the magic of an InFocus® X™ Series projector. Now introducing the new InFocus® X3 featuring XGA resolution - an absolutely superb value for your money. No wonder hundreds of thousands have already fallen for the worldwide best-selling InFocus® X™ Series*.

The InFocus® X™ Series
-- for business and pleasure.
www.infocus.com/x-series



Buy an InFocus® X™ Series

– starting from **£599** – and add
an InFocus accessories pack
for only **£49.99**

All prices include VAT.



0800 0388880 - www.misco.co.uk



01189 313 611 - www.reflex.co.uk



0800 333 333 - www.insight.co.uk



08701 664 664 - www.pcw.co.uk

2005 InFocus Corporation. All rights reserved. InFocus® X1a™, X2™, and X3™ are registered trademarks of InFocus Corporation. DLP™, the DLP™ logo, and the DLP™ medallion are trademarks of Texas Instruments. All other trademarks are the property of their respective owners in this and any other country. * Data provided by Pacific Media Associates, an independent industry analyst. Price and specifications can be subject to change without notice. Subject to availability.

PORTABLE GAMING

Gizmondo

A versatile multimedia console



Although officially available to buy since March, the Gizmondo portable games console has been ridiculously hard to get hold of until now.

This appears, in part, to be down to a late, but significant, alteration to the specification – a 3D Nvidia chip instead of the 2D graphics originally planned. Consequently, the Gizmondo has arrived with few decent titles to support it. Nevertheless, it has an exciting release schedule with titles on the way from Ubisoft, EA Games and Microsoft. The latter is particularly interesting, with the gossip mill already churning out rumours of a Halo 2 conversion and even a possible Xbox Portable makeover.

As it stands, the Gizmondo already has plenty to offer. The console is designed as a multi-function system and has support for movies (mpeg4) and music (mp3 and wav) playback along with web browsing, text and multimedia messaging. Games and other media are fed to the device via its SD card slot.

More unusual is the inclusion of a built-in VGA camera and GPS. These can be used for taking snaps and finding your way around, but they also have the potential to be incorporated into gameplay. Colors, for example, is a turf war game that plays a little like Grand Theft

Auto, but employs GPS to allow players to take control of real places in the virtual world.

All of this is wrapped up in a neat little matte-black package with a bright backlit 2.8in TFT screen, while the Windows CE-based operating system is straightforward to use and easy to navigate. If you buy the Smart Ads-enabled version, which subsidises the price of the unit by accepting 'targeted' advertising in a reasonably unobtrusive manner, you can knock £100 off the asking price.

Jonathan Parkyn

DETAILS

RRP £229 (£194.89 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Tiger Telematics 0800 7311278

www.gizmondo.com

SPECIFICATIONS

400MHz processor • 128bit Nvidia Goforce 4500 • 2.8in TFT (240 × 320) • Bluetooth • GPS • mp3, midi, wav, mpeg4 • Built-in camera • GSM tri-band • GPRS • Wap 2

PROS Loads of features; GPS

CONS Limited range of software

VERDICT

The Gizmondo has great potential, but it remains to be seen whether game publishers take it to heart

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

PROJECTOR

Viewsonic PJ400

Ideal for home entertainment enthusiasts



Projectors are increasingly popular, with several manufacturers driving down prices in order to get a foot into the home entertainment market. Viewsonic's PJ400 continues the trend and is one of the most affordable models we've seen so far.

At just under £550, the PJ400 will appeal to home users who don't want to buy an expensive large-screen TV. The low price is reflected in the relatively low maximum resolution of 800 × 600, so business users looking for a high-quality projector for their presentations might want to go for a slightly higher specification model. However, this resolution is fine for home users who just want to watch TV or DVD films.

The unit's design is fairly bland. It's simply a matt-black box measuring 285mm wide, 202mm deep and 73mm high. It weighs just 2.2kg, so is small and light enough that you can easily set it up at home.

The image is clear and bright, and there are VGA, S-video and composite video connectors on the back of the unit so you can connect it either to a computer or various types of home video equipment.

We were slightly disappointed by the lack of a DVI interface, but that's forgivable given the low cost of the projector. The controls are very simple, with

just a single button that activates and controls the on-screen menu. There's also a handheld remote control that allows you to quickly alter settings, such as aspect ratio, without having to move from your seat.

We've seen similar projectors that cost the best part of £1,000, so, at this price, the PJ400 is definitely worth considering as an alternative to a large-screen TV as part of your home entertainment system.

Cliff Joseph

DETAILS

RRP £539 (£458.72 ex.VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Viewsonic 01293 643 900

www.viewsoniceurope.com

SPECIFICATIONS

LCD projector with 800 × 600 maximum resolution • 165w lamp • 1,600 lumens • 4:3 and 16:9 display formats • VGA, composite video, S-Video • Handheld remote control • 2.2kg • 285 × 202 × 73mm (w × d × h)

PROS Small; lightweight; affordable

CONS Lacks DVI input; relatively low resolution

VERDICT

Good for home entertainment enthusiasts who don't want a bulky large-screen TV

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

LASER PRINTER

HP Laserjet 1020

Fast, economical and great for home users



It's no secret that if you want the best bang for your buck when it comes to printing, laser printers offer great value. They may not produce photo-quality images like their inkjet counterparts, but if you just want to print monochrome office documents, the Laserjet 1020 is a solid choice.

HP's latest printer costs just over £100 and comes with a full toner cartridge that will run off around 2,000 pages of text (at five per cent coverage). Replacement toner costs £50.53, which equates to approximately 2.5p per page.

At 600dpi, print quality is very good and text is just about readable down to font sizes of 2pt. Upping the resolution to Fastres 1,200dpi (what HP refers to as 1,200dpi-like quality) didn't make any noticeable difference to images or text.

The printer's real selling point, though, is its speed. It doesn't need to warm up after being switched on, so your first page will emerge 11 seconds after hitting the print button. We managed to get 14 pages of text per minute out of the 1020, exactly what HP claims. On the highest print quality setting, the overall time increased by a couple of seconds.

The unit has two paper trays, one with a 150-sheet input capacity and the other designed to hold single sheets. There are

manual duplex print options and it can support the usual array of media types such as envelopes, transparencies, postcards and labels. The only small annoyance is the omission of any control buttons on the printer, so everything has to be operated through software.

No USB cable is provided, so you'll have to factor another £5 into the cost unless you have one spare. Nevertheless, this is a very fast and cost-effective home laser printer.

Luke Peters

DETAILS

RRP £104.58 (£89 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

HP 0800 038 8889

SPECIFICATIONS

Laser printer • Two input trays (150 sheets and one sheet) • 14ppm • 600dpi resolution • 2MB memory • USB • 5kg • 370 x 242 x 209mm (w x d x h)

PROS Fast printing; economical

CONS No control buttons on printer

VERDICT

A great home laser printer that spits out pages fast, has good print quality and will save you much more money than an inkjet if you're printing basic office documents

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Captivate your audience.

Discover The Big Picture™

The global best-selling InFocus® X™ Series projectors.

You'll find that your messages and meetings have more impact when you present with any InFocus® X™ Series projector. Now introducing the new InFocus® X3 with XGA resolution, a superb value for your money. No wonder hundreds of thousands have already purchased an InFocus® X™ Series, making it the world's best-selling projector series*.

The InFocus® X™ Series
-- for business and pleasure.
www.infocus.com/x-series



Buy an InFocus® X™ Series

– starting from **£599** – and add
an InFocus accessories pack
for only **£49.99**

All prices include VAT.



0800 0388880 - www.misco.co.uk



01189 313 611 - www.reflex.co.uk



0800 333 333 - www.insight.co.uk



08701 664 664 - www.pcw.co.uk

2005 InFocus Corporation. All rights reserved. InFocus® X1a™, X2™, and X3™ are registered trademarks of InFocus Corporation. DLP™, the DLP™ logo, and the DLP™ medallion are trademarks of Texas Instruments. All other trademarks are the property of their respective owners in this and any other country. *Data provided by Pacific Media Associates, an independent industry analyst. Price and specifications can be subject to change without notice. Subject to availability.

DIGITAL PAD

Acecad Digimemo

Digitally store your writing or drawing



This is the latest of several products we've seen that attempt to marry the convenience of paper to the power of the PC. Acecad's Digimemo differs from the most common of these, the various incarnations of the Anoto smart pen, in that it does not need special paper. You can slot in any A5 notepad and it will digitally record anything you write or draw.

The 8MB of memory will store up to a claimed 66 pages, but a Compact Flash slot gives you the option of storing much more for transferring to a PC at your convenience via a USB link.

The device looks much like an ordinary paper clipboard, except that what appears to be a clip at the top is, in fact, the cover for the four AAA batteries. It comes with what is described as a 'magnetic' pen, which contains a ballpoint pen so you can also write normally. One design fault is that there is no way to attach the pen securely to the pad, virtually ensuring that it will get lost. Replacements cost £15 each.

The thumbnail status screen and four control buttons (up page, down page, next blank and delete page) have to be used with care. You will get into an awful mess if you do not number your 'real' pages in tandem

with the digital versions to avoid overwriting material.

The Digimemo comes with a trial version of Vision Objects' Myscript handwriting-recognition utility. This works quite well if you write clearly, but it is not viable as an alternative keyboard. With the bundled management utility, it is useful for anyone who wishes to file sketches and handwritten notes. There are also potential business and legal uses, such as form filling and witness statements.

Clive Akass

DETAILS

RRP £94 (€80 inc VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Selwyn Electronics 01732 765 105

www.selwyn.co.uk

SPECIFICATIONS

309 x 209 x 15.7mm (w x d x h) • 500g with batteries (claimed 100 hours) • Pen uses a button cell • 8MB internal plus CF slot • Requires 500MHz PIII running Windows 2000 or XP • 128MB of Ram • USB and CD drive

PROS Simple and effective

CONS Too heavy to carry for long; no secure penholder

VERDICT

Has many potential applications if used with care, but is no substitute for a keyboard

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

20IN MONITOR

Fujitsu-Siemens P20-2

Adjustable monitor ideal for movie lovers



The Scenicview P20-2 is part of Fujitsu-Siemens's Premium Line; a range of monitors dedicated to users of professional graphics applications.

One of the monitor's strongest features is its adjustability. A dual-hinged stand lets you alter the height and tilt, while the screen can be rotated by 90°, allowing you to use it in portrait or landscape orientations. However, unlike the Magicstand hinge seen on some Samsung monitors, the mechanism is rather stiff.

Initial impressions of the picture quality were positive, but after closer inspection we noticed several flaws. It reproduced images with good clarity, but lacked the ability to accurately render some near-white tones. In other words, off white hues simply appeared as white. We also noted that some high-intensity colour hues were tinted incorrectly. This indicates the review screen had some colour tracking errors, which can result in lost detail. Considering the P20-2 is aimed at users of professional graphics applications, this is not an encouraging result.

The monitor fared better in movie tests. It is one of the brightest displays we've seen, which makes it ideal for watching films with dark scenes. However, some movies appeared rather harsh.

Although the P20-2 has a fairly average black-to-black response time of 16ms and a grey-to-grey response time of 11ms (the latest displays are as quick as 4ms), we found no evidence of ghosting or jagged pixels when playing fast-moving games or films.

Given that this monitor is aimed at professional users who would be more concerned with good colour reproduction than watching movies, the P20-2 is difficult to recommend.

Rory Reid

DETAILS

RRP £492.32 (€419 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Tracline

020 8952 7770

www.tracline.co.uk

SPECIFICATIONS

20in screen • 1,600 x 1,200 native resolution • VGA/DVI input • USB hub • 700:1 contrast ratio • 178 degrees horizontal/vertical viewing angle • 16ms black-to-black response time • 11ms grey-to-grey response time

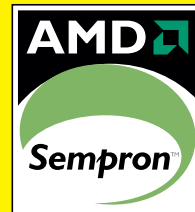
PROS Reasonably priced

CONS Average performance

VERDICT

A fairly good all-rounder and a good choice for novice users

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Ultimate 15.1" Wi-Fi Notebook Package with DVD Burner & 80GB for £499

SPECIALS	HOME PCs	POWER PCs	HOME LAPTOPS	POWER LAPTOPS	BASE UNITS
----------	----------	-----------	--------------	---------------	------------

- ▶ HOME LAPTOPS
- £499 Laptop Deal
 - £599 Laptop Deal
 - £699 Laptop Deal
 - £799 Laptop Deal

▶ POPULAR OPTIONS

All this for just £89 extra Complete Package



with carry case, Lexmark X1180 All-in-One Printer, Scanner, Photocopier, external keyboard and external mouse. (Printer cable not included)

FREE DELIVERY
Only when you order online. Limited Offer

How Do Tiny.COM Offer The UK's Lowest Prices?

Tiny.COM are in a unique position that allows us to save on costs. We have low overheads because we sell direct, we have huge buying power and we don't advertise on TV. Simply put, we cut out costs and pass these savings directly on to you.

TINY MEDIABOOK MA 360S

AMD Sempron 2600+ Mobile Processor
with PowerNow! technology (Sempron 3000+ in HP Model.)

512MB DDR RAM
Massive 512MB of high speed RAM increases performance and allows multiple applications to run at the same time.

80GB Hard Disk
80GB hard disk provides massive capacity for large amounts of photos, music albums, videos and other files.

DVD-Rw Multiformat
Sony DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes**. Also acts as a DVD drive allowing you to watch the latest movies.

Wi-Fi
Allows you to connect wirelessly to the internet and other computers in your home or office**

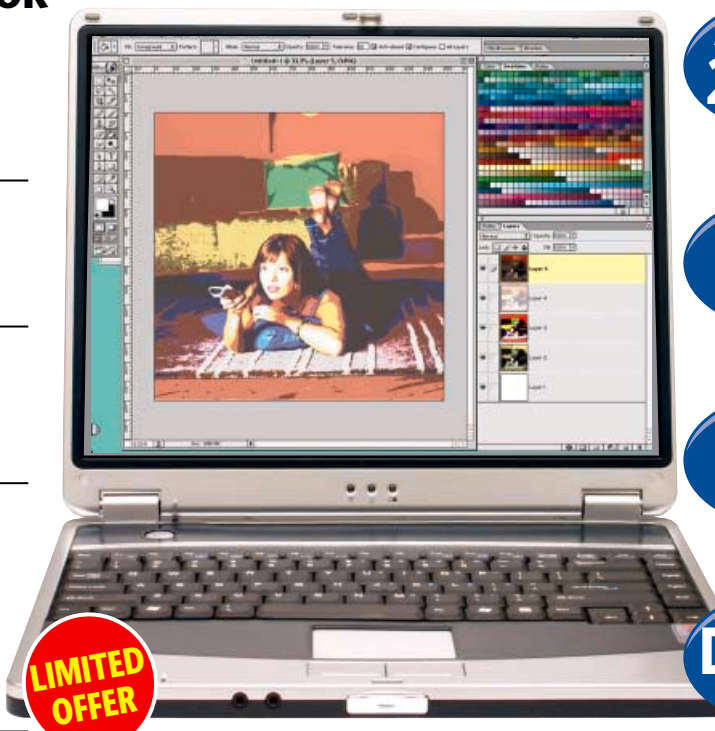
15.1" TFT
Superb 15.1" XGA TFT Screen with high contrast ratio and dual display facility. (15.4 TFT in HP Model.)

64MB Graphics
Built-in 64MB AGP x8 GP Graphics provides ample power for general use and games.

Massive Connectivity
Includes PCMCIA, microphone, Audio ports, USB2.0 x4, TV-out. Also includes 56K Modem (Wanadoo broadband upgrades available), Li-ion long life battery and A/C adaptor/charger, ergonomic keyboard and glide pad

Microsoft Software
Microsoft Windows XP**, Microsoft Office 60 days trial# and Microsoft Works 7. Model No: N2225

CyberLink Software Suite
Four top Cyberlink software packages are pre-loaded.



LIMITED OFFER

AMD SEMPRON 2600+

512MB RAM

80GB HARD DISK

DVD-Rw DVD BURNER

PLUS DESKSTATION PACK



15.1" TFT SCREEN

PLUS NOTEBOOK CARRY CASE



Wi-Fi WIRELESS

£499 BUY
inc vat PLUS DELIVERY† E-Code:01569

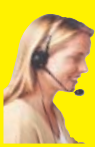
64MB AGP GRAPHICS

▶ BEST BUY

Power Model from our Brand Partner HP.
As above but with: more powerful 3000+ mobile processor, faster ATI Radeon IGP 128MB graphics, better 15.4" 'BRIGHT' glare type Widescreen, 40GB Hard Disk. Excludes Deskstation Pack and Carry Case. **ONLY £49 extra**
E-code: 01651



tiny.com
FREE DELIVERY For a limited period when you order online
THE LOW COST PC COMPANY



ORDER HOTLINE
0870 830 3127
or visit www.tiny.com to see the full range
Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

3 YEAR Extracare Extended Warranty £129 APR 19.9%
†Courier Delivery £39.99. Pay courier delivery by credit card. Free delivery for online orders only. Time Plan Finance Example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected models. Written details on request. These deals are not available from our partner firm The Computer Shop. **Back-up CDs available at extra cost. #Special permission is required to copy CDs/DVDs that are copyright. #The 60 day trial version - option to purchase extended version for special price - ask for details. ••Suitable broadband router required. 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, AMD Arrow logo, AMD Athlon, AMD PowerNow!, AMD Athlon 64 and relative combination, are trademarks of Advanced Micro Devices, Inc. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 770701. Licensed credit brokers. Offer extended. E&OE.

MINI ROUND-UP

External digital tuners

If you're thinking of entering the world of digital TV viewing, then take a look at what these four USB Freeview boxes have to offer

Although standard set-top Freeview boxes are now available for less than £40, if you pay a little more for a PC version you will benefit from far greater functionality. External PC Freeview boxes, such as the four featured here, allow you to schedule

recordings, view enhanced EPG (electronic program guide) information, pause live TV and much more. If you're new to digital terrestrial TV, be sure to check you're in a Freeview area at www.freeview.co.uk before you purchase.

▼ Avermedia Avertv DVB-T USB2

Avermedia kicks off this roundup with a slim and portable digital receiver that requires no external power supply. In a move that makes the Avertv even more attractive to notebook users, a mini antenna has been included in the package. Small yet effective, this antenna is a decent inclusion.

The software is stylishly designed and relatively easy to use. As with all the other tuners featured here, access to digital radio broadcasts via the Freeview network is available – these digital radio channels shouldn't be confused with DAB (digital audio broadcast), which require a special DAB radio.

If you're looking for a future-proof tuner, you'll be pleased to hear the Avertv DVB-T is HDTV ready so, when HDTV eventually reaches us, it will be able to receive high definition broadcasts. Although Sky is looking to introduce HDTV next year over its satellite network, a date hasn't been set for Freeview HDTV broadcasts – it could be a good few years before we see it in the UK.

Being Media Center 2005-certified, this tuner will happily integrate with Microsoft's entertainment operating system. With a bit of tinkering, uncertified tuners may still work with Media Center, but it's best to stick with Microsoft approved ones for hassle-free integration.

The Avertv impressed us with its sheer simplicity – the set up and installation process was no problem. The software is well designed and intuitive, while its small dimensions and bundled antenna make it perfect for notebook users.



▲ Nebula Digitv

Nebula's Digitv is another portable digital tuner that's powered directly through the USB cable. The rear of the case features RF-in and RF-out sockets. Since it's a loop through connector, the RF-out won't feed broadcasts direct to a TV set. Instead, it simply lets you continue the analogue signal through to your TV set.

The installation didn't throw up any problems and we were impressed with the speed of the initial channel tuning process. In an interesting move, Nebula has built a web server in to the Digitv. As well as being able to share digital broadcasts over your private network, you can also schedule recordings via the web. You'll need to have your PC turned on and a broadband connection to take advantage of this, but it's still a very useful feature.

The latest version of the Digitv software supports Topup TV premium channels (www.topuptv.co.uk). If you want to take advantage of this, you'll need to have a Topup TV subscription, smartcard and card reader known as a Cam (conditional access module), costing around £50. The process of adding Topup TV capabilities to the Digitv is a bit fiddly, but a full guide is available from Nebula's website.

Nebula has clearly worked hard to provide the Digitv with quality features to make it stand out from the crowd, while allowing it to perform well as a standard digital tuner. The interface might be a little jumbled, but the Digitv definitely warrants a Recommended award.

▼ **Hauppauge DEC-2000T**

Unlike the other tuners featured here, the DEC-2000T requires an external power source. This gives you the option of bypassing your PC and connecting it directly to your TV via the included Scart cable, but its bulky design and power requirements reduce its appeal as a portable digital tuner. The tuner features an RF-out socket that allows you to connect it to a non-Scart TV.

The software installation was unnecessarily hampered by poor translation and bizarre prompts, while misspelled words in the interface contributed to the sloppy appearance. The DEC-2000T also appeared to struggle more than the others when it comes to operating in poor reception areas, something you might want to keep in mind if you're a long way from the nearest digital transmitter.

Despite this, and the slapdash nature of the interface, if you want a versatile digital tuner that can be used with your PC and TV, the Hauppauge DEC-2000T will no doubt appeal.



▲ **Twinhan Magic Box**

The Magic Box is stylishly designed in a black casing with a large infrared receiver sitting at the front of the unit. Just two connections sit on the rear of the box in the form of an RF-in and a USB port. As with the Avermedia and Nebula tuners, the Magic Box draws all the power it needs through the USB connection, so no external PSU is required.

The bundled software works well, although it takes some time to get used to the various options, and the installation process didn't cause us any problems.

It might not have the same advanced features as the Digitv from Nebula, but the Magic Box is still a good performing, compact digital tuner at a reasonable price. Furthermore, Twinhan has a good record of releasing software updates for the Magic Box so, if you decide to buy this model, it's worth keeping an eye on the Twinhan site for new releases.

Conclusion

All these tuners are capable of providing excellent quality digital TV broadcasts, so what we were looking for was something that offered extra functionality. With this in mind, there could only be one winner – the **Nebula Digitv**. With the ability to broadcast transmissions over a network, schedule recordings via the Internet and the Topup TV functionality, the Digitv surpassed the competition in terms of features. What's more, it is small, runs off USB power and is easy to set up and use. The Digitv, therefore, scoops our **Recommended** award.

With all of these products, we were disappointed not to see any decent built-in video compression techniques. Although you can't argue with the quality of mpeg2 recordings, they take up a lot of disk space. It's a real shame none of these tuners feature direct Divx or Xvid encoding – something we'd like to see appearing in the near future. ■

MANUFACTURER	AVERMEDIA	HAUPPAUGE	NEBULA	TWINHAN
MODEL NAME	AVERTV DVB-T USB2	DEC-2000T	DIGITV	MAGIC BOX
Price inc VAT (ex VAT)	£84.99 (£72.33)	£129.99 (£110.63)	£99.95 (£85.06)	£69.99 (£59.57)
Sales telephone	01782 566 600 (Mitek)	020 7378 1997	01689 897 090	0870 429 6000 (Maplin)
URL	www.averm.co.uk	www.hauppauge.co.uk	www.nebula-electronics.com	www.twinhan.com
SPECS				
HDTV ready	✓	✗	✗	✗
Digital text	✗	✗	✓	✗
Inputs	RF-in	RF-in	RF-in	RF-in
Outputs	N/A	Scart, RF-out, audio	RF-out (loop through)	N/A
Web server	✗	✗	✓	✗
Media Center certified	✓	✗	✗	✓
Remote control (power)	✓ (2 x AA)	✓ (2 x AA)	✓ (2 x AA)	✓ (3 x AAA)
Cables included	USB	USB, Scart, RF	USB	USB
Other supplied acc	Mini-antenna	N/A	N/A	N/A
Power supply	USB	External PSU	USB	USB
OS	Windows 2000/XP	Windows 98SE/ME/2000/XP	Windows 2000/XP	Windows 2000/XP
Dimensions (w x d x h mm)	101 x 71 x 23	207 x 153 x 38	118 x 86 x 29	33 x 125 x 84
Weight (g)	120	438	130	103
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★



A4tech NB-30 battery free mouse

Wireless mice are nothing new, but most require batteries or regular recharges to operate. This one is different. The NB-30 comes with a 'magic' pad that powers the mouse via electromagnetic induction. The mousepad draws power from a USB port.

The pad itself is very good, with a smooth surface and a nice finish. It's comfortable to use and talks to its smaller counterpart via radio waves. That said, anyone already using an ergonomic handrest may find it annoying to have two pads at once.

The mouse fits neatly into the palm of your hand and lights up in use. The scroll wheel is responsive and only needs minimal pressure to operate. Browsing buttons would have been useful, but, in all, this is a very good mouse for gaming and general computing tasks.

Anna Lagerkvist

RRP £14.99 (£12.76 ex VAT)

PRODUCT INFORMATION A4tech 01923 236 560 www.a4tech.com

PROS Very responsive; fits nicely into your hand; good value

CONS Supplied mousepad must be used

★★★★★



Philips Shoqbox

The eye-catching Shoqbox from Philips offers mp3 and wma playback, FM tuning and an alarm clock function along with two miniature speakers that deliver remarkable sound quality. The 256MB of built-in flash memory allows for 120 64bit wma tracks or 60 128bit mp3s. Philips really missed a trick by not including an SD card reader to add extra storage space, but a line-in socket lets you attach the Shoqbox to another music source if required. The unit comes with a detachable aerial for the radio, USB cable for music transfer and a power supply to charge the internal battery, which lasts for up to 10 hours.

Despite the non-expandable memory, the Shoqbox is a quality piece of kit. It's portable and delivers impressive sound quality.

Will Stapley

RRP £99.99 (£85.10 ex VAT)

PRODUCT INFORMATION Philips 0906 101 0016 www.philips.co.uk

PROS Portable; good sound quality; stylish

CONS Non-expandable memory

★★★★★



Fujitsu Scansnap II Plus

The original Scansnap was a triumph of simplicity, offering a quick way to clear your desk of paper clutter. This update continues the tradition, but with improved intelligence, 15ppm (pages per minute) 600dpi duplex scan engine and stylish black and silver chassis. The main change from the previous model is that now you get Acrobat 7 Standard bundled (worth £296 inc VAT), plus a plastic carrier sheet for scanning undersized or oversized documents.

In addition to the software gems of Cardminder (for business card scanning) and Abbyy Finereader OCR, you now get the Scansnap Organizer, a very basic document management tool.

If you're thinking of buying Acrobat Standard, don't bother – buy the Scansnap II Plus instead and get a wonderful desktop tool for just a few pounds more.

Kelvyn Taylor

RRP £360 (£306.38 ex VAT)

PRODUCT INFORMATION Fujitsu 020 8573 4444 www.fel.fujitsu.com

PROS Compact; fast; easy to use

CONS No Twain or Isis drivers

★★★★★



Plantronics CS60-USB

Internet telephony can come close to the quality of standard calls, but cannot match them for convenience. The Plantronics CS60-USB wireless headset serves at least to release you from your PC when using Voice over IP (VoIP). It uses the same Dect wireless technology as home hands-free phones, with a similar base station that doubles as a charger for the headset, but the CS60-USB version plugs into a USB port rather than a phone socket. You have the choice of an ear clip or a headband to attach the headset.

During testing, the CS60-USB worked well with Skype's VoIP service and involved minimal set-up. You need to be at your PC to launch a call, but not to receive one, with incoming calls sounding a beep on the headset. It's expensive, but it gets the job done.

Clive Akass

RRP £211.49 (£179.99 ex VAT)

PRODUCT INFORMATION Plantronics 0800 410 014 www.plantronics.com

PROS Hassle-free setup; works well

CONS Volume a little low; pricey

★★★★★



KONICA MINOLTA

Get Ultimate Compatibility & Supreme Power...

...with the fast New **magicolor 5450** A4 PostScript colour laser



Special Offer

Get an extra 2 years warranty worth £294 absolutely free



- A4 colour laser printer
- 25 ppm monochrome
- 25 ppm colour
- 600 x 600 x 4 dpi Photo ART contone
- Ethernet, USB 2 & Parallel
- 256 MB RAM
- PostScript Level 3, PDF and PCL
- Optional duplex
- Camera-direct photo printing - PictBridge
- Mac & Windows compatible

£1169_{ex VAT}

MAGICOLOR 5450 OVER THE UK

The magicolor 5450 is a high-end colour and mono PostScript compatible printer with the ability to print from virtually any application and operating system. Its outstanding power ensures great print speed, flexibility, cost effectiveness, and above all, superb print quality - making it the undisputed printer for large and varied workgroups and graphics professionals alike.

Contact us today!

Phone : 01784 44 22 55

Web : www.konicaminolta.co.uk/printer

*Terms and conditions apply. Offer ends 30th June 2005. The The Konica Minolta logo, Crown, Photo ART and magicolor are trademarks or registered trademarks of Konica Minolta, Inc. All other trademarks are the property of their respective manufacturers. All specifications are subject to change without notice. E&OE.

Konica Minolta Business Technologies, INC.

The essentials of imaging

▼ Asus Vento 3600

Larger than the average midi tower, the Vento comes in blue, red or green. The four 5.25in and single 3.5in external drive bays are hidden behind a springloaded cover. Inside, the external 5.25in and 3.5in drive bays have tool-free locking mounts, while the expansion plates are kept in place by plastic locks. Another plastic lock holds the removable internal 3.5in drive cage, and the drives are mounted using rubber to reduce vibration noise. The motherboard backplate is fixed.

The Vento has a rubber-mounted cooling fan, and a 120mm fan sits on the rear panel. There's a vent in the side-panel with a duct on the inside to direct airflow onto the processor heatsink fan.

RRP £96.53 (£82 ex VAT)

PRODUCT INFORMATION Aria Technology www.aria.co.uk

★★★★★



▼ Sapphire Radeon X800XL Ultimate

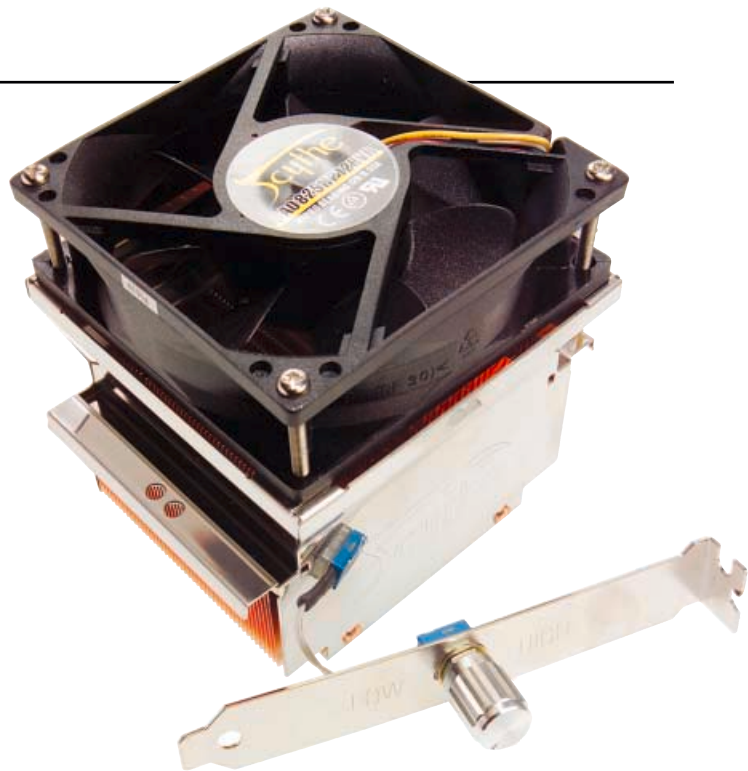
With a number of manufacturers now offering graphics cards based around ATI's X800XL GPU, new products need something extra to stand out. Sapphire's X800XL Ultimate has a Zalman VF-700 heatsink. As with most Zalman products, this is a work of art, and in this case it is sprayed blue to match the printed circuit board. The result is an attractive and quiet card.

Underneath this the processor has a core clock speed of 425MHz and is combined with 256MB of DDR memory clocked at 520MHz DDR (effective 1,040MHz). In tests, the Sapphire managed a 3Dmark05 score of 5,232 and an average of 73.4fps in Far Cry at a resolution of 1,024 x 768.

RRP £229 (£194.90 ex VAT)

PRODUCT INFORMATION Scan www.scan.co.uk

★★★★★



▲ Scythe Samurai RevB

Yet another huge CPU cooler from Scythe, revision B of the Samurai fits AMD's 745 and 940 sockets, as well as Socket A and Intel's 370, 478 and 775 designs. The heatsink is made from copper and the whole thing weighs a hefty 600g.

It also comes with a variable speed controller built into an PCI expansion plate, which allows the 8cm fan to be adjusted according to what you have your PC doing. At its lowest setting the fan spins at 1,300rpm (16dBA), while at full tilt it spins at 3,400rpm, with the noise rising to a quoted 37dBA.

RRP £24.68 (£21 ex VAT)

PRODUCT INFORMATION Quiet PC www.quietpc.com

★★★★★



▲ Nexus H2O-2000 Water Block

Watercooling and extreme overclocking go hand in hand, and the Nexus is designed to help keep your processor as cool as possible. Built to fit any Socket A, 754 or 748 chip, it boasts an extremely high flow rate and even comes with a transparent top so you can see coolant rushing through the block.

To make sure that the H2O-2000's base plate has the best possible contact with the top of the chip, Nexus has not polished the base plate but has left it completely flat.

RRP £58.74 (£49.99 ex VAT)

PRODUCT INFORMATION Novatech www.novatech.co.uk

★★★★★

▼ **Powercolor X800 256MB Game FX**

If you are looking for a reasonably priced graphics card that can play most top-end games at a respectable frame rate and resolution, Powercolor's X800 Game FX is worth a closer look. For your money you get 256MB of memory running at an effective 700MHz and a 392MHz core clock, all of which produces a 3Dmark05 score of 3,932 and an average Far Cry frame rate of 72fps at a resolution of 1,024 x 768.

The card comes with the usual bundle of cables and a full version of Hitman: Contracts, plus Cyberlink's DVD 5-in-1 Solutions bundle. **RRP** £158.57 (£134.95 ex VAT)

PRODUCT INFORMATION Overclockers www.overclockers.co.uk
★★★★★



▲ **Nexus Dampstek Block Kit**

The Dampstek Block Kit from Nexus comprises four pieces of soundproofing material designed to fit into any spare drive bays you may have. The idea is that these help to reduce the amount of vibration, and two 3.5in and two 5.25in blocks are provided.

RRP £8.18 (£6.96 ex VAT)

PRODUCT INFORMATION Novatech www.novatech.co.uk
★★★★★

▼ **Antec Truepower 2 480W**

Antec's original Truepower line of PC power supplies picked up a number of awards for performance and build quality. The latest range has a horde of new features. Version 2 PSUs include a single 120mm quiet cooling fan, dual 12v outputs, an ATX12v 2.01 24pin motherboard connector, four Sata (Serial ATA) power connectors and dual PCI-E graphics power connectors.

The range starts at 380w and includes 430w, 480w and 550w supplies in the line-up; we tested a 480w unit.

RRP £96.35 (£82.50 ex VAT)

PRODUCT INFORMATION Overclock www.overclock.co.uk
★★★★★



▲ **Toshiba MK1032 GAX**

Looking for a larger, faster hard drive for your notebook, or fancy making a small footprint Raid array? If so, Toshiba's latest 2.5in drive could be just what you need.

Using two platters to get to its 100GB capacity, the ATA100 MK1032GAX has a spin speed of 5,400rpm and an incredible 16MB cache to give an average quoted seek time of 12 milliseconds. Excellent stuff.

RRP £129.25 (£110 ex VAT)

PRODUCT INFORMATION Span www.span.com
★★★★★



KONICA MINOLTA

The essentials of imaging

Network ready premium colour laser for power users

Special Offer

Get an extra 2 years warranty worth £274 absolutely free

magicolor 2450

£449 ex VAT



Phone : 01784 44 22 55

Web : www.konicaminolta.co.uk/printer

DUAL PLATFORM MOTHERBOARD

ECS PF88 Extreme

At last, a way to combine CPU technologies



When building a PC, the motherboard will depend on whether you use Intel or AMD. Intel CPUs won't run on AMD motherboards and vice versa. That's all about to change with the ECS PF88 Extreme – an Intel-based motherboard that uses an AMD riser board, enabling it to run either CPU.

The board looks like an Intel Socket 775-based SLI board, but the give away is the long port separating the two graphics slots, which is where the A9S SIMA converter board sits.

The mainboard comes with four Dimm slots supporting up to 4GB of either dual-channel DDR2 533 or DDR2 667 memory. Two ATA/133 ports are available, which lets you make use of your old hard and optical drives. There are also four SATA and two SATA II ports, three PCI slots, Firewire, eight-channel audio and Gigabit Ethernet.

The A9S Sima converter card comes with an SIS756 PCI Express-compatible northbridge to control the two DDR400

Dimm slots. Space is limited between the memory slots and CPU socket, which makes it impossible to use the standard cooler supplied with larger 939 CPUs. This means you'll have to use either the older AMD cooler or a third-party cooler.

When tested with an AMD Athlon 64 4000+ it clocked up a Sysmark 2004 score of 207 and a 3DMark05 score of 6,159. With an Intel 660 processor it achieved 218 on Sysmark 2004 and 6,033 for 3DMark05.

Simon Crisp

DETAILS

RRP £64.63 (£55 ex VAT)

Sima card £31.73 (£27 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

ECS www.ecs.uk.com

SPECIFICATIONS

Motherboard: Intel Socket 775 • SIS 656/965 chipset • 4 memory slots • 2.16x graphics slot • 1 PCI slot • 3 PCI slots • 2 ATA/133 ports • 4 SATA ports • 2 SATA II ports • 6 USB • Gigabit Lan • A9S SIMA card: Socket 939-based AMD Athlon 64 • SIS756 chipset • 2 memory slots

PROS CPU support, cheap

CONS Can't use some AMD coolers

VERDICT

Good implementation of an innovative motherboard for AMD and Intel CPUs

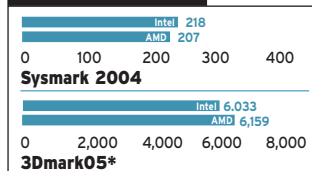
FEATURES

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PERFORMANCE



* Tested at 1,024 x 768 in 32bit colour

AMD MOTHERBOARD

Abit Fatal1ty AN8

A stylish board with overclocking potential



What do you get when you mix a motherboard manufacturer known for tweakable boards and champion gamer Fatal1ty? In Abit's case, you get the Fatal1ty AN8.

Based around AMD's Socket 939 and Nvidia's Nforce4 Ultra chipset, the Fatal1ty AN8 has high-end Abit goodies such as OTEs (outside thermal exhaust system) cooling, Uguru Bios and enough LEDs to sate most modders. With a red PCB that has a mixture of red and black slots, the board really stands out.

At first glance, the board seems a little light on features, but the chipset has much of what you need. PCI Express slots come in the form of a x16 graphics slot and two x1 slots and there are three standard PCI slots.

The chipset has good options for storage. Two ATA133 and four Serial ATA (Sata) ports can be combined into Raid arrays, and the Sata ports are Sata II, meaning the board supports NCQ (native command queuing) and Western Digital's TCQ

(tagged command queuing) for better hard drive performance.

Unlike high-end motherboards that have dual Gigabit Ethernet capability and Wifi, the Fatal1ty AN8 has a single integrated Gigabit Ethernet controller.

The chipset cooler is active, but it's a low-profile unit and sits out of the way between the CPU socket and the PCI Express slot. Two fans on the rear panel mean there's no room for audio, serial or parallel ports, although Abit supplies an Audiomax riser card.

Simon Crisp

DETAILS

RRP £119.80 (£101.96 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Abit

www.abit.com.tw

SPECIFICATIONS

Socket 939 AMD Athlon 64 • Nvidia Nforce4 Ultra chipset • 4 memory slots (4GB max) • 1 x 16 graphics slot • 2 x 1 PCI Express slots • 3 PCI slots • 2 ATA/133 ports • 4 Sata II ports • 10 USB • 1 Gigabit Lan

PROS Extensive Bios options

CONS Lacks advanced features

VERDICT

A stylish board with enough Bios features to keep the majority of overclockers happy

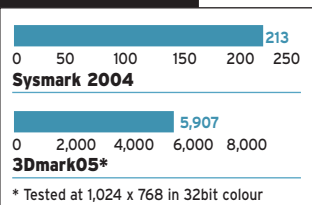
FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PERFORMANCE



KONICA MINOLTA

The essentials of imaging

Fast colour printing for workgroups



Special Offer

Get an extra 2 years warranty worth £294 absolutely free

magicolor 5440DL

£799 ex VAT



Phone : 01784 44 22 55

Web : www.konicaminolta.co.uk/printer

CD-ROM 5 OUT NOW!



Enjoy all 2004's issues of PCW in a format that is

- ✓ Searchable
- ✓ Browsable
- ✓ Printable

To order call
01858 438 883

Or visit
www.direct-pcw.co.uk

COMPRESSION UTILITY

Allume Stuffit 9 Deluxe

Useful tool with a new 'Zipfolders' feature

Now on version 9, Allume's Stuffit has established itself as a credible alternative to the zip standard for file compression. The new Deluxe edition offers a number of enhancements, including tighter integration with applications and the option to schedule compressed backups of your documents.

The Stuffit 9 engine lets you work with files in over 20 different compressed formats, including the new Stuffit X (sixt). This offers around 40 per cent more compression than traditional zip files, plus the option of 512bit encryption for sensitive data.

Stuffit X can compress jpeg files, something we were keen to test; and, sure enough, the package managed to reduce a 1.07MB photo to 832KB.

Also new in the Deluxe version is a technology called Zipfolders. Formerly Ontrack's Zipmagic, this lets you work with zipped files as if they were standard folders – even in application file dialogue boxes.

You can also load and save compressed files directly from Microsoft Office, and Stuffit now works in conjunction with anti-virus software to scan archives before opening them.

There's no doubt that Stuffit 9 Deluxe is a genuinely useful tool, and all its features are easy to get to grips with. However, at £40, it's only for users who want to do more than compress the odd email attachment. If you don't, sticking to the standard version or free alternatives makes more sense. The program also caused a problem with renaming folders on our server, which was only resolved by uninstalling it.

Chris Cain

DETAILS

RRP £39.99 (€34 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Koch Media

0870 027 0985

www.allume.com

SYSTEM REQUIREMENTS

Windows 98SE, ME, 2000, XP or

2003 Server • 64MB Ram • 40MB

hard disk space

PROS Speed; excellent

compression; Zipfolders

CONS Only for those who really

need the new features

VERDICT

The latest version of Stuffit is the best yet, but not everyone will need the new features

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Stuffit's latest version contains some useful features, but not everyone will find the upgrade is essential

3D LANDSCAPING

Bryce 5.5

Create complex and artistic 3D scenes

In order to appeal to the lucrative Cad market, most 3D graphics programs concentrate on modelling – designing complex 3D objects such as buildings and cars.

The developers of Bryce, in their wonderfully eccentric way, have always gone in a different direction. The software concentrates almost entirely on creating 3D landscapes full of trees, hills, fluffy clouds and snowy mountaintops. In other words, it is targeted at those who are more interested in art than the stuffy old Cad market, which is probably why it's spent the past few years being passed from one developer to another.

Thankfully, it has now found a home with 3D specialist Daz, which has upgraded it and cut the price. This isn't a massive upgrade, but it does have at least one feature that is long overdue.

Bryce can create very complex 3D scenes but, in the past, previewing options have always been slow and limited. This version uses the OpenGL features of your PC's graphics card to provide faster and more realistic previews, so you can see materials, such as rocks and snow, as you apply them to objects within scenes. Rendering times for finished scenes have

also been improved, and there's a new option that allows you to import additional 3D objects, such as human figures, that have been created with any of Daz's other 3D programs.

Best of all is the low price. It means anyone interested in 3D graphics can buy Bryce and spend hours doodling around with its amazing tools.

Cliff Joseph

DETAILS

RRP £82.20 (£69.95 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Computers Unlimited

020 8200 8282

www.daz3d.com

SYSTEM REQUIREMENTS

Windows NT, 2000 and XP •

500MHz processor • 512MB

Ram • 100MB hard disk

PROS Powerful and professional; affordable price

CONS Something of a niche product

VERDICT

A professional and powerful 3D graphics program that's also fun for beginners and comes at an affordable price

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Bryce 5.5 is a powerful landscaping program that helps beginners and professionals create immensely complex 3D scenes



KONICA MINOLTA

The essentials of imaging

**Oversize A3
colour laser printing**
with the
magicolor 7300

Special Offer
of your choice!



Get either a **Dimage Z3** or
a **Toner Value Pack** for free
when you buy a **magicolor 7300**

£2495 ex VAT



MacUser



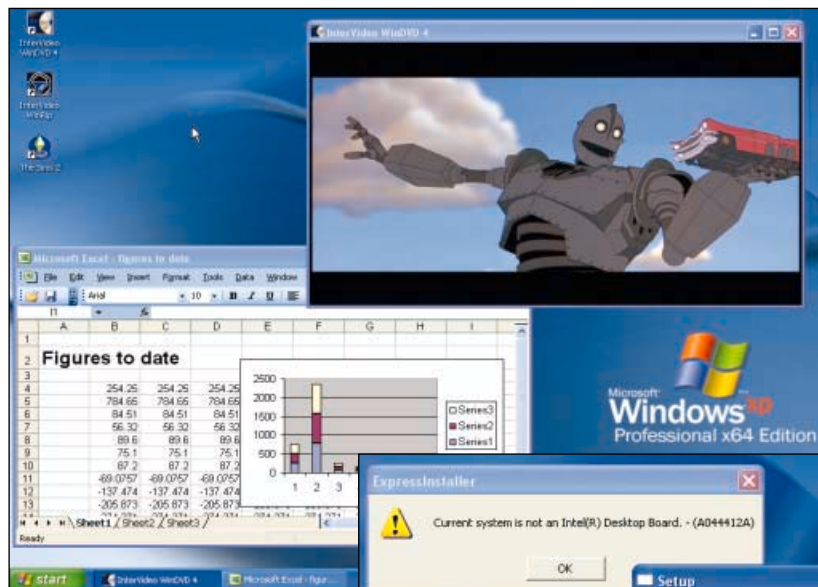
Phone : 01784 44 22 55

Web : www.konicaminolta.co.uk/printer

64BIT OPERATING SYSTEM

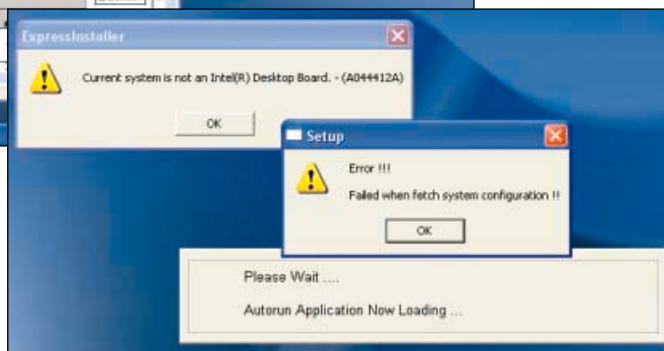
Microsoft Windows XP Professional x64 Edition

Speed and security benefits arrive for desktop users



Left: Most applications run smoothly in XP Professional x64, even WinDVD

Below: Be prepared for a few compatibility problems with 64bit Windows



The launch of Windows XP Professional x64 means that 64bit Windows has finally arrived on the desktop. This is the same XP that you know, but compiled for processors that support the AMD64 extensions, created by AMD and licensed by Intel in the form of EM64T. Major new features and an updated user interface are reserved for 'Longhorn', promised next year in both 32bit and 64bit editions. Most applications today are 32bit and in 64bit Windows these run in a compatibility layer called Windows on Windows (WOW64).

The 64bit advantage is simple. On a 32bit system, there is a natural 4GB limit to amount of memory an application process can address, since this is the largest number than can be stored in a 32bit pointer. This 4GB limit becomes 2GB once you take account of the shared and operating system addresses also available to each process. 64bit systems lift this limit exponentially, to an arbitrary limit of 16TB (terabytes) on Windows x64. This makes a big difference to server performance, since servers deal with large amounts

of data, which can be cached and sorted in Ram. Whether it benefits the desktop is less clear, at least until we start installing huge amounts of Ram. In fact, it can make things worse, since 64bit applications use more memory. There are some benefits, such as 64bit arithmetic along with extra CPU registers, but nothing spectacular. On the other hand, it's likely that high-memory systems will become common within the next few years, so the move to 64bit is inevitable. That's the theory, but there are other factors. There are two different Windows code bases used by Microsoft, one for XP and the other for Windows 2003. Windows x64 uses the 2003 code base, incorporating a large number of improvements under the hood. Provided you do not run with administrator rights, this is an operating system with a good reputation for security. If you can cope with a few

compatibility obstacles, it is the best version of Windows to run. Compatibility of course is the main downside. Microsoft is only selling Window x64 to vendors of new systems, to discourage people from attempting upgrades that will likely fail. If you want to install this on your existing PC, you may qualify for Microsoft's free exchange offer, which lets you obtain the x64 edition at nominal cost. Otherwise, you need to obtain the OEM edition or sign up as a developer. In addition, you cannot upgrade an existing 32bit installation, you have to reinstall from scratch. Finally, even if you can find drivers for all your hardware, there are software issues. In particular, any 16bit application such as those built with Visual Basic 3 will not run. Two versions of Internet Explorer are supplied, one 64bit and one 32bit for compatibility with existing ActiveX controls.

We installed Windows x64 on an Intel EM64T system with 4GB of Ram and Nvidia Geforce PCI Express graphics. Installation was smooth, although we had to download drivers from Intel and Nvidia. Intel's useful system monitoring tools failed to install, as did the CD supplied with our graphics card. On the other hand, the overall compatibility story is encouraging. Office works well, the games we tried were smooth and Intervideo's WinDVD runs flawlessly. An Iriver mp3 player and a Canon Ixus camera connected first time via USB2. The most significant failure though, was Apple's Ipod. Although Itunes installed, the Ipod doesn't connect - Apple's site has stayed silent on this issue. That aside, this is impressive for the first release of the next-generation Windows XP.

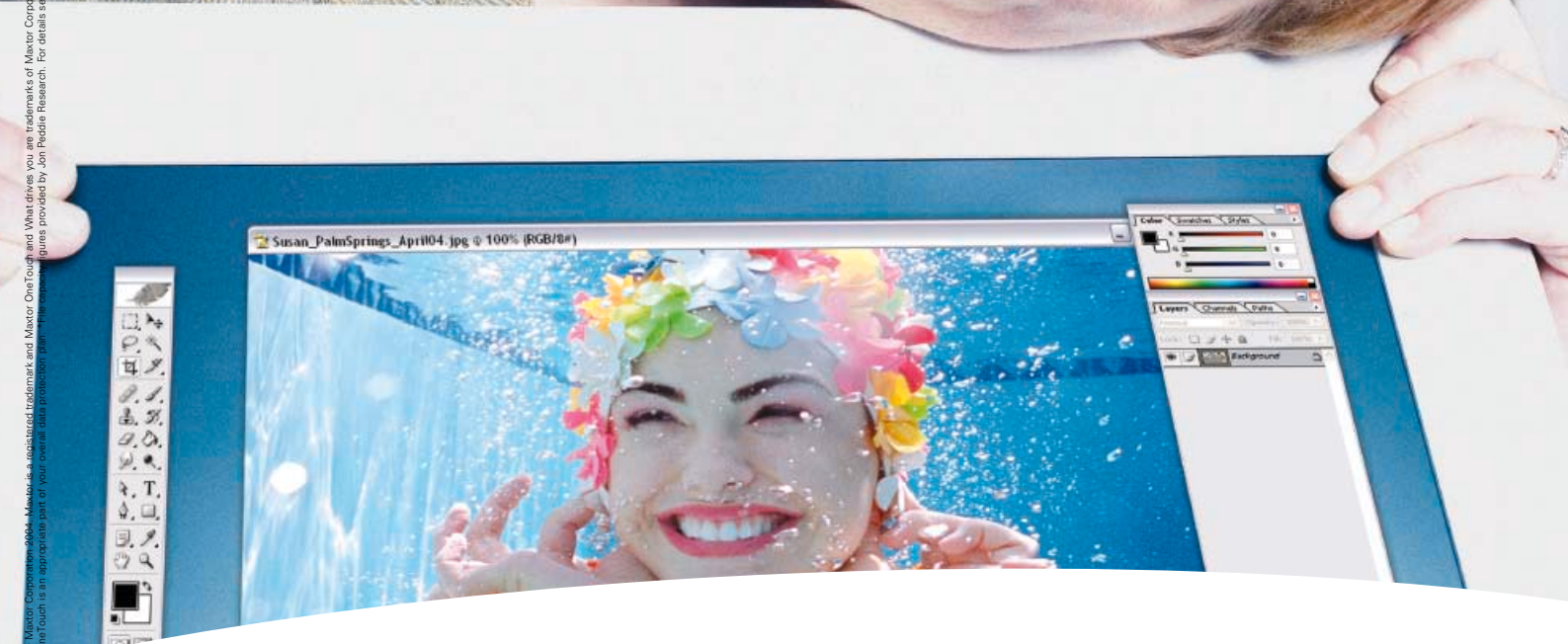
If your hardware and software supports it, Windows XP x64 runs smoothly and offers better performance and security than before. Upgrading is not for the fainthearted, but for new systems with plenty of Ram Windows x64 is well worthwhile.

Tim Anderson

DETAILS

RRP Only available with new systems or as a free upgrade
PRODUCT INFORMATION
 Microsoft 0870 601 0100
www.microsoft.co.uk
SYSTEM REQUIREMENTS
 733MHz or higher processor or with AMD64 or EM64T extensions
 • Compatible motherboard and devices • 1GB of Ram
PROS Lifts 32bit memory limits; Windows 2003 code boosts performance and security
CONS Hardware compatibility issues; still the same XP interface
VERDICT
This is a better version of Windows, but check for compatibility problems before you install

FEATURES ★★★★★
EASE OF USE ★★★★★
VALUE FOR MONEY N/A
OVERALL ★★★★★



© Maxtor Corporation 2008. Maxtor, the Maxtor logo, and What drives you are trademarks of Maxtor Corporation. All other trademarks are the property of their respective owners. GB means 1 billion bytes. Total accessible capacity varies depending on operating environment. Maxtor OneTouch is an appropriate part of your overall data protection strategy. For more information, please visit www.maxtor.com.

It's your favourite shot. Keep it safe.

Your stuff is important. Save it, store it, back it up with the push of a button. The Maxtor OneTouch II is the only external hard drive with room for up to 200,000 photos*, industry leading software that lets you easily retrieve lost files, and Maxtor DriveLock™ for added security. Think of it as your computer's new best friend.



Maxtor OneTouch™ II EXTERNAL HARD DRIVE

The perfect place for all the things you love

up to 300GB • FireWire • USB 2.0

Available at leading Retailers and Online Retailers. For details please visit www.maxtor.com

Maxtor®

What drives you.®



Huge Savings this July

Have your business pick up on our brilliant Sale offers. That means you could walk off with a Dell notebook that lets you work where you want - and a saving of up to £70. With prices like these you could easily get carried away.

Just remember, you won't find Dell in the shops, so call or go online directly to Dell now.



Dell recommends Microsoft® Windows® XP Professional

Dell™ Inspiron™ 9300

- Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 740 (1.73GHz, 2MB L2 Cache, 533MHz FSB) & Intel® Pro/Wireless 2200 (802.11b/g)
- Microsoft® Windows® XP Home Edition
- 512MB 533MHz DDR2 SDRAM
- 40GB Hard Drive
- 17.0" UltraSharp™ Wide Screen XGA (1440x900) TFT Sharp
- 64MB ATI® Mobility™ Radeon™ X300 Graphics card
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service³
- Microsoft® Works 7.0

~~£699~~
£629
Excl. Del. & VAT

NOW
£797
Incl. Del. & VAT

SAVE
£70
Excl. VAT

E-VALUE Code: PPUK4-N07931

Further enhancements

- Standard Service Package £329 incl. VAT
- Microsoft® Office 2003 Small Business⁴ £235 incl. VAT
- Logitech® QuickCam Zoom⁵ £36 incl. VAT

0% Finance Available Subject to Status*

Accessories¹

Dell W2600 LCD TV

Bright, crisp images and powerful stereo sound combine to give a great viewing experience.



£689
Excl. VAT

£810
Incl. VAT

Dell Laser Printer 1700n

The Dell™ Laser Printer 1700n offers brilliant quality and affordable monochrome printing in a compact design. With fast printing speeds of up to 25 pages per minute.



~~£159~~
£144
Excl. VAT

~~£187~~
£170
Incl. VAT

10% OFF

Dell 2300MP Micro-portable Projector

The Dell™ 2300MP Projector is an ideal combination of high brightness and XGA resolution. With 2300 ANSI lumens (max)² brightness and a super high 2100:1 (full on/full off) contrast ratio, the Dell™ 2300MP projects bright, captivating and stunning images from anywhere in a mid-sized room.



~~£949~~
£759
Excl. VAT

~~£1116~~
£892
Incl. VAT

20% OFF

Offer ends Wednesday 27th July 2005

Save up to £70 in the Dell Business Summer Sale!



Dell Inspiron™ 6000

- Intel® Centrino™ Mobile Technology with Intel® Pentium® M processor 715A (1.6GHz, 2MB L2 cache, 400MHz FSB) & Intel® Pro/Wireless 2200 (802.11b)
- Microsoft® Windows® XP Home Edition
- 512MB 400MHz DDR SDRAM
- 40GB Hard Drive
- 15.4" Wide Aspect UltraSharp™ WXGA (1280x800) Screen
- Intel® GMA 900 shared graphics memory up to 128MB
- Internal 8X DVD+/-RW Drive²
- 56K Data Fax Modem
- 1 Year Euro Collect and Return Service³
- Microsoft® Works 7.0

~~£539~~
£489
Excl. Del. & VAT

NOW £632
Incl. Del. & VAT

SAVE £50
Excl. VAT

E-VALUE Code: PPUK4-N07602

Further enhancements

- Standard Service Package £329 incl. VAT
- Microsoft® Office 2003 Basic¹ £130 incl. VAT
- Planet 21 Executive Leather Carry Case £65 incl. VAT

Dell Inspiron™ 2200

- Intel® Pentium® M Processor 725 (1.60GHz 2MB, L2 Cache 400MHz FSB) & Dell TrueMobile™ 1370 Wireless LAN PC Card 802.11b/g
- Microsoft® Windows® XP Home Edition
- 256MB 266MHz DDR SDRAM
- 40GB Hard Drive
- 15" XGA TFT (1024x768) Screen
- Integrated Direct AGP Graphics
- Integrated 8x DVD-ROM/24x CDRW Combo Drive
- 56K Data Fax Modem
- 90 Day Collect and Return Service⁴
- Microsoft® Works 7.0

~~£429~~
£399
Excl. Del. & VAT

NOW £526
Incl. Del. & VAT

SAVE £30
Excl. VAT

E-VALUE Code: PPUK4-N07222

Further enhancements

- 3 Year Basic Services Package £94 excl. VAT
- Deluxe Nylon Carrycase⁵ £29 incl. VAT
- 2nd 8 Cell High Capacity Lithium-Ion Battery⁶ £58 incl. VAT

Dell Inspiron™ 1200

- Intel® Celeron® M Processor 350 (1.30GHz, 1MB L2 cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB 266MHz DDR RAM
- 30GB Hard Drive
- 14.1" XGA TFT (1024x768) Screen
- Integrated Direct AGP Graphics
- Integrated 24xCD-RW/8xDVD Combo Drive
- 56K Data Fax Modem
- 90 Day Collect and Return Service⁴
- Microsoft® Works 7.0

~~£319~~
£299
Excl. Del. & VAT

NOW £409
Incl. Del. & VAT

SAVE £20
Excl. VAT

E-VALUE Code: PPUK4-N07121

Further enhancements

- 3 Year Basic Services Package £94 incl. VAT
- 2nd 8 Cell High Capacity Lithium-Ion Battery⁷ £47 incl. VAT
- Targus Style and Comfort Backpack⁸ £39 incl. VAT



Go online for the latest deals Click www.dell.co.uk/business

Business PCs 0870 907 4465 Home PCs 0870 907 4473

Order online or on the phone. Easy as



MOBILE TECHNOLOGY

Dell Products, c/o PO Box 69, Milbanke House, Western Road, Bracknell, Berkshire, RG12 1RD. Subject to availability, prices and specifications are correct at date of publication and may change without notice. UK Business customers only. Terms and Conditions of Sales, Service and Finance apply and are available on request or at www.dell.co.uk. Delivery charge is £49 excl. VAT (£57.58 incl. VAT) per system. One GB = 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. ¹Delivery charges range from £3 Excl. VAT (£3.53 Incl. VAT) to £13 Excl. VAT (£15.28 Incl. VAT) per item when purchased without a system. ²Discs burned with DVD+/-RW and DVD+ RW drives, where featured, may not be compatible with certain existing drives. ³Euro Collect and Return Service is available in limited countries and places. ⁴90 day Collect and Return service does not affect statutory rights. ⁵Based on ANSI/NAPM IT7.228-1997 tests (using new bulbs) of between 34-305 units in 2002-4 (dependent on model). Average Lumens at least 90% of max Lumens. Bulb brightness degrades with use - periodic changes recommended. Dell Inspiron notebooks include Microsoft Works 7.0 as standard unless otherwise specified.

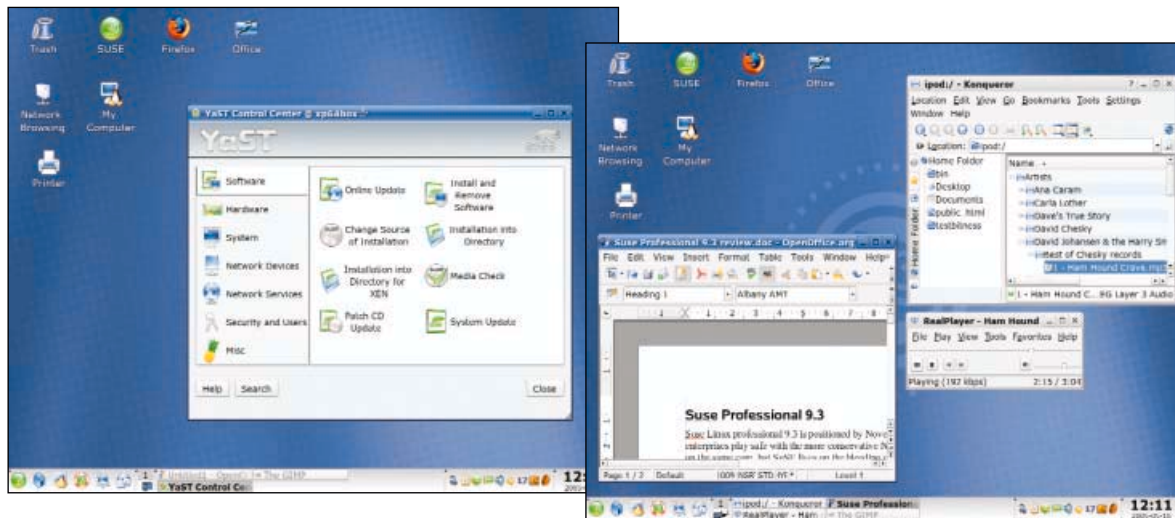
©2005 Dell Inc. Dell, the Dell logo, Ultrasharp, TrueMobile and Inspiron are registered trademarks or trademarks of Dell Inc. Dell disclaims proprietary interest in the trademarks or trade names of other entities used to refer to them or their products. Microsoft, MS and Windows are registered trademarks of Microsoft Corporation. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

*0% Finance is available from Dell Financial Services (CIT Group (UK) Ltd). Credit is available only to UK body corporate and subject to status. All amounts exclude delivery and VAT. Prices shown may vary without notice. Terms and conditions and written quotations available upon request. Credit scoring used. Those not qualifying for 0% may qualify for other finance offers.

64BIT OPERATING SYSTEM

Suse Linux Professional 9.3 64bit

Novell's distribution aimed at 'power users' rather than companies



Far left: System setup is through Yast, with smooth online integration

Left: We plugged in an Ipod and it sort of worked, but forget about playing any iTunes purchases

Suse Linux Professional 9.3 is positioned by Novell as its 'power user' distribution. Enterprises are meant to play safe with the more conservative Novell Linux Desktop. The two products are based on the same core, but Suse lives closer to the bleeding edge with a more up-to-date bundle of applications, some of them beta releases.

Despite these cautionary notes, Suse is just as usable and stable as other popular distributions. Version 9.3 uses the 2.6 kernel, and comes with lots of applications, including a pre-release Open Office 2, Linphone Voice over IP, and Bluetooth and wireless networking support.

Suse's 64bit edition is included along with the standard 32bit build. The 64bit edition is installed by default on systems that support it. When you install, the only 64bit indication is a tiny '64bit' caption on the very first screen. It's easy to miss and you could install the 64bit edition without realising. Only the presence of the lib64 directories show that you have entered the world of 64bit computing.

On the surface, most things work the same as on 32bit systems and existing programs execute seamlessly. Linux has

an advantage over proprietary operating systems, in that most software is distributed as source code. Provided that the developers take care to make their code 64bit compatible, the software compiles equally well for either platform. The result is that most packages in Suse Linux are true 64bit. There are some important exceptions, such as Open Office and Adobe Acrobat, but thanks to the flexibility of the hybrid AMD and Intel processors, 32bit code also runs with full performance.

It turns out that Suse Linux is an excellent platform for 64bit computing. On our Intel EM64T system, everything worked more or less immediately, including USB, Intel Hi-definition audio, and the Nvidia Geforce 5900 PCI Express graphics. We could compile and run 64bit applications, while 32bit applications such as Open Office ran fine as well.

Having said that, 64bit involves some risks and compromises. Driver support is the main issue. AMD has a handy table of current 64bit device driver support for Linux and Windows. Some drivers have fewer features in their 64bit versions, or are still in beta and may cause problems. Even if you are downloading and compiling software from source,

you may run into configuration issues or compatibility problems. As with all 64bit systems, applications will typically consume more Ram, because every variable that addresses memory has to allow for larger numbers.

If you have more than 4GB of Ram installed, 64bit is worthwhile since the system will be able to run more applications simultaneously, or applications that deal with very large documents or data structures. Another advantage is that 64bit processors perform some calculations faster, and the AMD64 extensions include extra registers that enhance performance.

Games, Cad systems, statistical processing and large databases are good candidates for 64bits. However, few desktop systems currently have this much Ram. As yet, 64bit is not truly compelling on the desktop, but soon will be as hardware advances.

More generally, Suse 9.3 is an impressive package but not flawless. When you install, you choose between the default KDE, or the Gnome desktop environment. It's not an easy decision since you get a different set of applications as well as different desktops. We ran into minor problems with

both. On Gnome there was an empty floating window called Suseplugger that should have been invisible, while the KDE installation failed to mount the Windows NTFS drives on our dual-boot system and we had to edit the fstab configuration file manually. These are small quirks in an otherwise positive experience, but reinforce the view that Linux is still more suitable for enthusiasts than for everyday users, unless suitable support is at hand.

Tim Anderson

DETAILS

RRP £65 (£55.28 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Novell www.novell.com

SYSTEM REQUIREMENTS

Pentium or Athlon with AMD64/EM64T for 64bit (Not Itanium) • 256MB of Ram or higher • 2.5GB of disk space

PROS Easy 64bit computing;

rich features; easy to set up

CONS Unstable beta applications;

problems can be complex to fix

VERDICT

Excellent Linux distribution and a great way into 64bit computing, but best suited to enthusiasts

FEATURES ★★★★★

EASE OF USE ★★★★★

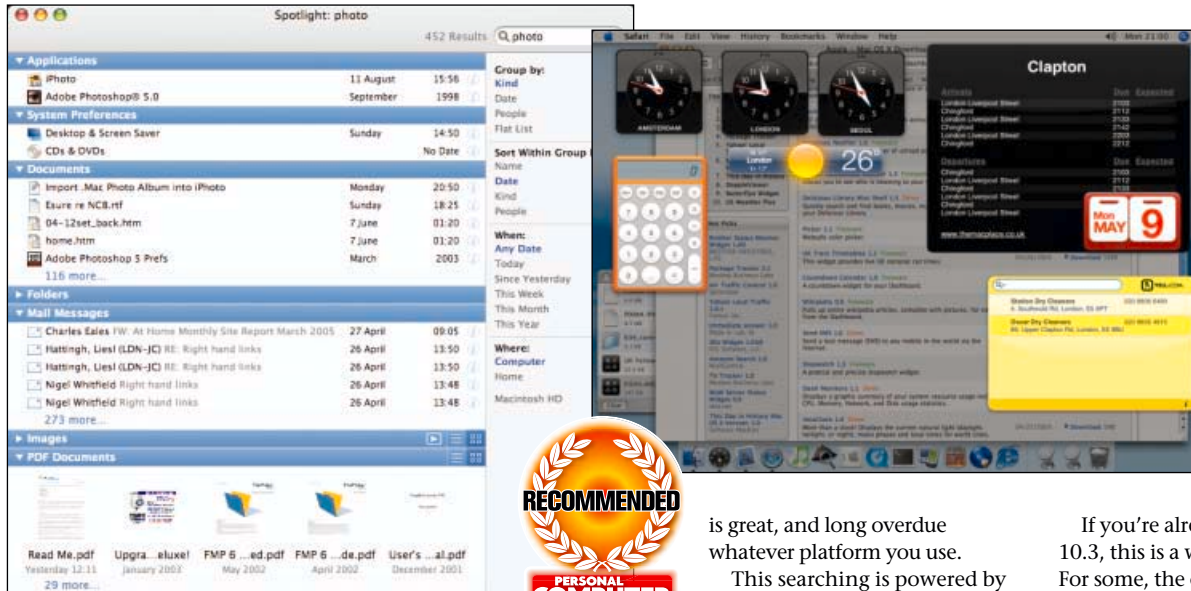
VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

MAC OPERATING SYSTEM

Apple Mac OS 10.4

Improved security, searching and speed capabilities



Far left: Spotlight can find anything, almost instantly, and you can see details of documents in the results window

Left: There are already UK widgets, such as train information

The latest release of Apple's OSX, version 10.4, or 'Tiger', has taken longer to arrive than previous ones, which appeared more or less annually. It's 18 months since the last update, and Apple's engineers have certainly been busy. The headline features in the new release are: Spotlight, a powerful search and indexing tool; Dashboard, which provides easy access to desktop widgets; and Automator, which makes it easy to automate routine tasks.

Installation is straightforward; you can upgrade, opting to keep settings, or simply re-install everything after wiping your disk. We'd probably opt for the latter if we did it again – on our very old G4/400 with OS 10.2, we had a problem with an old application crashing just as we shut down. But aside from that, the system's performance was noticeably boosted in normal use. Where you will need a faster machine is when using some of the additions – Automator seemed a little sluggish on the G4/400 although, once Spotlight had built an index, it was very speedy.

There are various neat touches across the operating system. If

you download a disk image that contains an application, a warning appears. Also, when you choose the Print dialogue, there's a handy option to save a page as a pdf to a Web Receipts folder, or to email a pdf. You can also view the image results of any search as a slideshow and easily import them into Iphoto.

Many of the applications have had a makeover. In the Safari web browser there's built-in RSS support so, on sites with an RSS button appears in the address bar automatically, and you can choose how much of each item to view.

Mail has had an update with a cleaner interface and the addition of Smart Folders. These work like the one in iTunes, so you can create a folder for invoices or receipts and they'll all appear there, whichever email folder you stored them in – a little like Gmail, but on your machine. We were sceptical at first, since we don't store mail on our Mac, but on an Imap server. However, the system did index all 7,000-odd messages, amounting to around half a gigabyte. Admittedly, it rather hammered the Imap server during that process, but being able to track down mail so easily

is great, and long overdue whatever platform you use.

This searching is powered by Spotlight, arguably the star of the update, which you can access from a menu at the top-right of the screen or by pressing Apple & Space. On installation, your existing documents are indexed in the background and, after that, everything happens automatically. Almost everything can be searched, with a plug-in architecture allowing new applications to be included. You can even search, for example, for photographs taken with a Fujifilm camera – all the metadata is indexed.

Another top feature of Tiger is the Dashboard: pop-up widgets that appear and disappear with a click, giving fast access to clocks, calculators, translation tools, flight information and so on. Although most standard widgets are US-centric, there are already lots of extra ones, such as UK train times or Yell.com searches.

The last of the major new features is Automator, which is used to provide functions such as the Web Receipt folder mentioned earlier. It's a type of drag-and-drop programming tool, and it lets you put together common sequences of actions you can repeat easily. You can add them to the context menus in the Finder, for example.

If you're already running OS 10.3, this is a worthy upgrade. For some, the convenience of Spotlight or Automator alone will make it worthwhile, and it's streets ahead of what Windows can offer in those areas. If you're running an even earlier version of OSX, this is a must-have upgrade; it really will transform your old system into something much, much better.

Nigel Whitfield

DETAILS

RRP £88.99 (£75.74 ex VAT); £139.99 (£119.14) for five-machine 'family pack'

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Apple 0800 039 1010

www.apple.com/uk

SYSTEM REQUIREMENTS

G3, G4 or G5 processor and built-in Firewire • 256MB memory • Approx 3GB disk space • DVD drive

PROS Incredible search tools; straightforward automation

CONS Needs more memory than previous versions; extra charge for CD version

VERDICT

A great update that's more security conscious, speeds up many Macs and makes searching your documents simple

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

**ARE YOU A
TARGET
FOR SPIES?**

THE HIGHEST LEVEL OF PROTECTION NOW INCLUDES QUARANTINED SECURITY

The new F-Secure® Anti-Virus™ Client Security 6.0 makes life difficult for spies and other criminals – but easy for the IT administrator. Not only does it include integrated and effective spyware and hacker-protection, as well as proven fast response to new viruses, but it also quarantines client devices where the security level is lower than required. The protection adapts to how people use their computers, how they use their networks and how IT administrators manage the company's security.

F-Secure® Anti-Virus™ Client Security 6.0 gives you seamless protection by integrating the key elements of IT Security into a single, centrally managed solution.

- > Antivirus with real-time protection
- > Firewall with Intrusion Prevention
- > Antispyware with real-time protection
- > Network Quarantine to isolate computers with outdated virus definitions
- > System monitoring against zero-day attacks

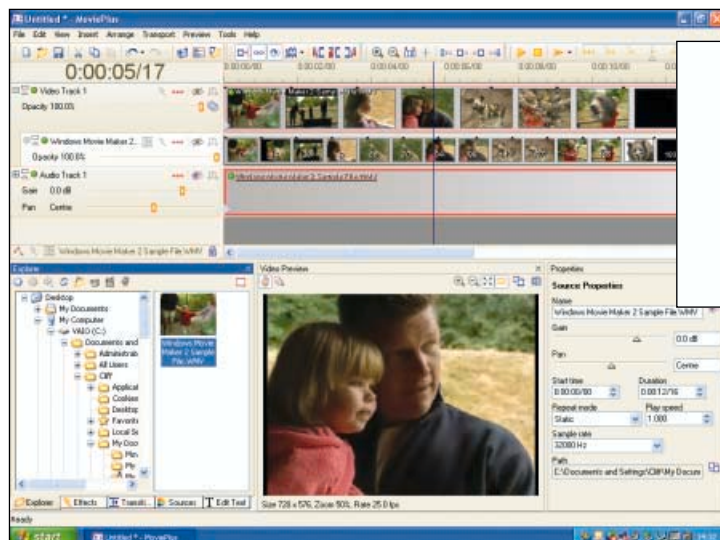


Learn more about how F-Secure can
keep you one step ahead of the threat:
www.f-secure.co.uk/besure/
Tel: 0845 890 3300
uk@f-secure.com

VIDEO-EDITING

Serif Movieplus 4

Powerful features at an attractive price for budding film editors



Above: There are some good tools for creating effects such as animated titles

Left: Movieplus 4 provides a wide range of editing features, but its interface can appear a bit crowded at times

The release of Adobe's Premiere Elements last year gave the video-editing market a shake-up, challenging vendors of other entry-level packages to get their acts together. Serif's response has been to give Movieplus a major upgrade, overhauling most aspects of the program as well as adding a number of powerful new features.

One of the main areas of improvement is the redesigned interface, although it's probably best described as functional rather than elegant. It looks a bit crowded at times, being split into a series of separate panels and a toolbar crammed with unfamiliar icons.

The Timeline panel occupies the top half of the screen, and is where you arrange your audio and video clips in a series of horizontal tracks. Unlike some low-cost editors, Movieplus allows you to create an unlimited number of tracks, so you can experiment with complex multi-track edits.

The bottom half of the screen contains three smaller panels. Chief among these is the Explorer, a browser that allows you to locate audio, video or graphics files stored on your hard disk. Most video editors provide a similar feature for

sorting through your media, but we like the clever preview option that Movieplus provides here. You can play any audio or video clip within the Explorer simply by placing your mouse over it. This makes it easy to quickly preview multiple clips, and you can then get straight down to editing by dragging and dropping clips into the Timeline.

You can also preview the automatic scene detection by clicking the Show/Hide Scene button. This opens a smaller window that shows your chosen clip split into scenes, allowing you to choose one specific scene and then drop that straight onto the Timeline. It's a clever and very efficient way of handling audio and video. Underneath the Explorer is a series of small tabs for accessing various special effects and transitions, and you can preview these in a similar fashion by pointing the mouse at them.

Next to the Explorer is a larger Preview window that lets you view your edited project. The third panel is the Properties pane, which provides detailed information about each clip and can be used to alter settings such as transparency and playback speed.

This interface arrangement initially seems a little odd,

since most video editors put their timeline at the bottom of the screen, and many people will instinctively look at the upper half of the screen to preview their clips. However, there's no law that says all video-editing programs have to work the same way, so this is more of an oddity than a major weakness.

Most of the other main features can be found in the Timeline window. The toolbar running across the top of it allows you to activate features such as the timesaving 'auto-transition' option, which automatically inserts a transition whenever you make two clips overlap. Double-clicking on any video track will also cause the track to expand, displaying additional features, such as the 'key frame' controls.

Key frames are a very powerful tool, and aren't usually found in low-cost editors such as this, so Movieplus certainly gets points for providing good value for money. Key frames allow you to modify various properties over time, perhaps creating a customised fade effect by setting key frames at specific times and then making the video clip fade by different amounts at each one. You can also produce animation or pans

by using key frames to alter the size or position of a video clip, or of a graphic object that has been superimposed over your footage.

Unfortunately, the key frame features aren't explained particularly well, either by the program's manual, or its online Help files. The same thing applies to other powerful features such as the picture-in-picture effects and the ability to create animated titles. So while Movieplus 4 provides a great deal of editing power at a very competitive price, Serif could still do a bit more to make that power accessible to new users.

Cliff Joseph

DETAILS

RRP £59.99 (£51.06 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Serif 0800 376 7070

www.serif.com

SYSTEM REQUIREMENTS

Windows 98 SE or later • 500MHz processor • 128MB of Ram • 400MB hard disk • DV camcorder or analogue video capture capability

PROS Powerful editing features, including key frames and picture-in-picture at a very affordable price
CONS Some of the more powerful features are poorly explained

VERDICT

Movieplus 4 is certainly a powerful editing program, but needs to provide a bit more help for first-time users

FEATURES ★★★★★

EASE OF USE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

DIGITAL IMAGING

Photo Explosion Deluxe 2

Comprehensive, yet cheap photo-editing tools for the novice user



Left: From the main window you can access the three main features of the software, photo browsing, editing and projects

Below: Use the Projects tool to create greetings or business cards, personalised stationery and many more objects from your images

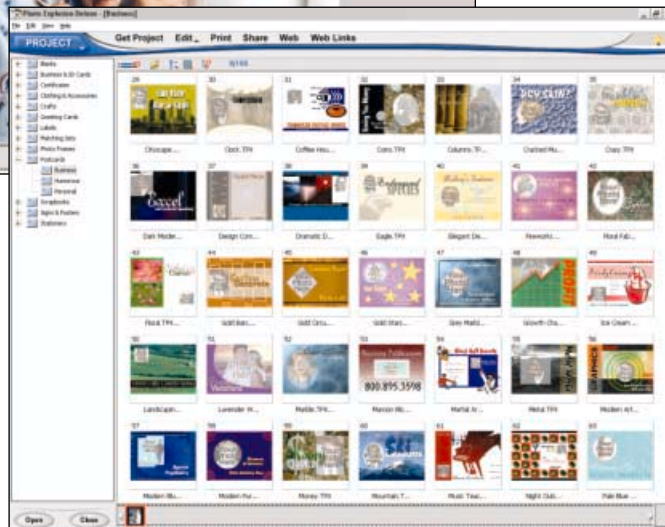


Photo Explosion Deluxe 2 is a comprehensive suite of tools designed to help you get the most from your digital images. It can help you manage your collection, edit and enhance photos and share them via the Internet, email or on a CD.

Since it contains so many tools, the package takes a while to install and comes on four discs – three full of programs and another with stock photography. Once installed, it made a noticeable impact on the performance of our test PC. This is often true of processor-hungry image-editing software, but that doesn't make it any less annoying. It's also worth noting that, while the box boasts about the option to produce photo-based gifts, these are not available to order outside the US.

The main interface is quite basic, reflecting the novice market Guildsoft is aiming at. On startup you're provided with options to browse or edit your images or create a project. If you want to use any of the other extras provided, such as the photo montage or panorama

tools, these have to be started independently.

If you choose to browse your images you can view all the pictures stored on your PC. From here you can perform batch conversions on a folder of images, acquire new ones from a scanner, digital camera or video camera and print or share images via the Internet. Unfortunately, we found this area of the software unstable, as every time we switched from one window to another it crashed. Downloading the latest patches didn't help the situation.

From the editing window you can access the enhancement tools, for removing errors such as red eye, as well as adding special effects, text and borders.

The menu system here can be rather awkward. You have to click on the Edit button to reveal a toolbar of options and then click on each of these to view a dropdown menu of choices – not the most intuitive system. Finally, the projects area allows you to create items from your images, such as postcards, calendars, stationery and so on.

Third-party developers provide all the main new additions in Photo Explosion 2. These include a morphing tool, Morpheus, which allows you to transform one image into another – for example, you could have your child morph into the family pet. This is effective yet difficult to use, but it does come with a tutorial.

Other new features include Serif Montage Plus, which lets you create collages from your images, a Skin Filter to improve skin tones, a stamping tool and almost 1,000 extra photo projects and props.

We reviewed the Deluxe edition of the package, which means that alongside all the standard tools you get Ulead's Cool 360, which allows you to stitch together images into a 360° or wide-angle panorama.

Anyone who has tried to do this with standard image-editing software will know how difficult this is to achieve, but this tool takes all the hard work out of the process. It uses a wizard-led approach and automatically aligns and colour-blends images to create a natural effect.

Another extra in the Deluxe version is Art Explosion Picture-to-TV. This allows you to create and burn a picture CD that can be shared with friends and family using a DVD player.

Laura Jones

DETAILS

RRP £39.95 (£34 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Guildsoft 01752 895100

www.guildsoft.co.uk

SYSTEM REQUIREMENTS

Windows 98/ME/2000/XP

• 300MHz Pentium processor

• 64MB of Ram required

PROS Value for money;

wide range of tools

CONS Poor presentation and

interface; can slow down PC;

some tools unstable

VERDICT

Photo Explosion Deluxe 2 is good value for money but its low price tag is betrayed by the poor performance, unintuitive interface and clumsy presentation

FEATURES

★★★★★

EASE OF USE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

P4N Diamond

First Digital SLI Switch for P4; Extreme Memory Performance
nVIDIA® nForce4 SLI Intel Edition



EXTREME 3D PERFORMANCE



DUAL CORE

Diamond

MSI P4N Diamond, Another Shining Diamond on MSI's Crown

925XE Neo Platinum

- Intel® 925XE+ICH6R chipset delivering excellent performance
- Supports new Intel® LGA Socket 775 CPU
- FSB: 1066MHz, Intel® Hyper-Threading Technology Support
- 4 DIMM Dual Channel DDR2 - 533 Support
- PCI Express x16 support
- 3x PCI and 2x PCI Express x1 support
- Support Intel 24 Bit High definition 7.1 Channel audio
- Dual Gigabit LAN
- 4x SATA + 2x ATA133 W/ RAID, Support Intel® Matrix Storage Technology



915P Neo2 Platinum

- Intel® 915P+ICH6R chipset delivering excellent performance
- Supports new Intel® LGA Socket 775 CPU
- FSB: 800MHz
- 4 DIMM Dual Channel DDR2 - 533 Support
- PCI Express x16 support
- Support Intel 24 Bit High definition 7.1 Channel audio
- Gigabit LAN
- Prescott Ready, DOT & DigiCell support!
- 4x SATA + 2x ATA133 W/ RAID, Support Intel® Matrix Storage Technology
- Wireless 802.11g PCI Card bundle, upto 54Mbps (Optional)



915P Combo - FR

- Intel® 915P+ICH6 chipset delivering excellent performance
- Supports new Intel® LGA Socket 775 CPU
- FSB: 800MHz, Intel® Hyper-Threading Technology Support
- Supports Dual Channel DDR1 & DDR2 - 533 Support
- PCI Express x16 support
- 3x PCI and 2x PCI Express x1 support
- Support Intel 24 Bit High definition 7.1 Channel audio
- Gigabit LAN
- 4x SATA + 2x ATA133 W/ RAID
- Prescott Ready, DOT & DigiCell Support!



Where to buy

3D Computers Systems
www.3dinhome.com
CCL Computers
www.cclcomputers.co.uk
Dabs
www.dabs.com
EasyTrader
www.easytrader.com
ebuyer
www.ebuyer.com
Eclipse Computer Supplies
www.eclipse-computers.com

Kotech
www.kotech.co.uk
Micro Direct
www.microdirect.co.uk
Micro-Logic
www.micro-logic.com
Microstar Computer Services
www.microstarcomputers.co.uk
MPC
www.mpc-direct.co.uk
Novatech
www.novatech.co.uk

Overclockers
www.overclockers.co.uk
PC Component Centre
www.pcwcomponentcentre.co.uk
PC Ideas
www.pcideas.co.uk
Power Computers
www.powerc.com
Refresh
www.refreshcomputers.com
RL Supplies
www.rlsupplies.co.uk

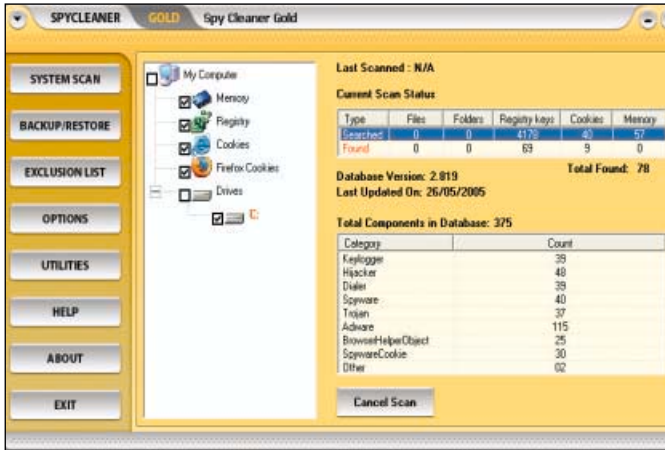
Savastore
www.savastore.com
Scan
www.scan.co.uk
Simply
www.simply.co.uk
Stak Trading
www.staktrading.com
Tekheads
www.tekheads.co.uk
THX Trade
www.thx-trade.com

VGI Computers
www.vgicomputers.com



MSI
MICRO-STAR INTERNATIONAL

For product information please refer to www.msicomputer.co.uk



Spy Cleaner Gold 9.3

Spy Cleaner Gold isn't one of the better anti-spyware programs we've seen. On our test PC it flagged the Windows Security Centre service as a trojan, suggesting that its database isn't particularly intelligent. It discovered many suspicious cookies, but you'll need to trawl through the list to make sure you don't delete any you need.

Overall, the program has a rather unfinished feel to it. There's a basic real-time protection applet, but this doesn't remember your choices. This type of program should try and reassure you, not scare you. There are much better solutions available.

Kelvyn Taylor

RRP £16.59 (£14.12 ex VAT)

PRODUCT INFORMATION Spycleaner www.spycleaner-gold.com

PROS Low price; free database updates

CONS Slow scanning; some spurious detections

★★★★★



Bitdefender 8 Professional Plus

On the surface, Bitdefender is just another integrated security suite offering anti-virus, anti-spam and firewall facilities. What sets this package apart is that it includes two years of product updates, two-user licences and 24/7 live online assistance.

This latest version boasts a new interface designed to be easier for home users. The anti-spam and anti-virus modules worked seamlessly with our email accounts and Bitdefender's virus database is updated every three hours. While Norton Internet Security is still our favourite, this latest version of Bitdefender is a quality package.

Chris Cain

RRP £39.99 (£34.03 ex VAT)

PRODUCT INFORMATION Editions-Profil 01922 649 868 www.bitdefender.com

PROS Easy to use; two-year subscription; frequent updates

CONS Lacks Firewall presets for popular programs

★★★★★



Lifethemes

Lifethemes aims to help you organise your schedule and serves as a way of creating a lasting record of you and your family for future generations. The colourful interface is a little garish, but it's easy to navigate. Details about everything from people and places right through to pets and food can be stored and then linked together.

Slideshows of photos can be exported, but the whole application is desktop-based, which restricts sharing somewhat. Lifethemes is great for those who like to detail every aspect of their lives, but the amount of work involved and the high price will deter many.

Will Stapley

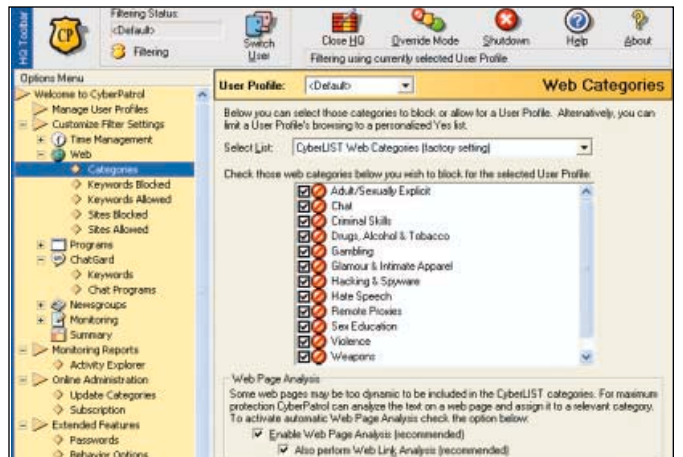
RRP £49.95 (£42.51 ex VAT)

PRODUCT INFORMATION Lifestyle 0845 226 3341 www.lifethemes.com

PROS Easy to use; well designed

CONS Expensive; involves a lot of work

★★★★★



Cyberpatrol 7

Cyberpatrol 7 is aimed at protecting children from inappropriate Internet content. This update allows you to add customisable profiles for each person that uses the PC. These are integrated with Windows user accounts, so protection is available the minute you log on.

The software also blocks chat rooms, monitors instant messaging conversations and lets you view which websites have been accessed over a two-week period. Anti-spyware and anti-phishing protection is also included, but unfortunately, the software lacks a live technical support line.

Rory Reid

RRP £25.79 (£21.95 ex VAT)

PRODUCT INFORMATION Cyberpatrol www.cyberpatrol.com

PROS Good content filtering

CONS Limited technical support

★★★★★

GO TO
www.pcw.co.uk/bestprices
FOR THE LATEST
BEST PRICES

Best Buys



YOUR GUIDE TO TODAY'S TOP PRODUCTS >>

HIGH-END PC

Mesh Elite Extreme PBX

REVIEW August 2005, p124 RRP £1,983.40

(£1,688 ex VAT) **PRODUCT INFORMATION**

Mesh 0870 04604747 www.meshcomputers.com

The most powerful system we've seen, thanks mainly to its use of a P4 Extreme Edition 600 series processor clocked at 3.73GHz. It also features a Radeon X850XT and whopping 600GB of storage space.



SLI PC

Evesham Evolution Decimator

REVIEW August 2005, p123 RRP £2,199

(£1,871.48 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com

Using Nvidia's SLI Nforce 4 chipset, this PC from Evesham houses not one but two ultra-fast Geforce 6800GTs. This is backed up by a 3.73GHz Pentium 4 Extreme Edition processor and 1GB of Ram.



DUAL-CORE PC

Mesh Titan Dual X2 Pro

REVIEW August 2005, p51 RRP £1,599

(£1,360.85 ex VAT) **PRODUCT INFORMATION**

Mesh 0870 04604747 www.meshcomputers.com

If it's power you're after, then this is for you. Featuring AMD's new Athlon 64 X2 4800+ dual-core processor, it stormed through our benchmarks. It also comes with 2GB of Ram and SLI graphics.



BUSINESS NOTEBOOK

Acer Travelmate 8104 WLMI

REVIEW June 2005, p104 RRP £1,499

(£1,276 ex VAT) **PRODUCT INFORMATION**

Acer 0870 900 2237 www.acer.co.uk

With a 2GHz Pentium M and 1GB of Ram, this Travelmate provides excellent performance, portability and usability. It's designed primarily for business, but has no trouble attracting home users.



SONOMA NOTEBOOK

Evesham Voyager C510

REVIEW May 2005, p54 RRP £1,173.83

(£999 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com

This is the fastest Sonoma notebook we've seen and it blazed through our benchmarks. If you want a portable PC that lets you play the latest 3D games, this Evesham is well worth the money.



DESKTOP REPLACEMENT

Mesh Pegasus 17.1in 3700+

REVIEW August 2005, p53 RRP £1,219.65

(£1,083 ex VAT) **PRODUCT INFORMATION**

Mesh 0870 04604747 www.meshcomputers.com

This features an Athlon 3700+ processor, 1GB of DDR memory and a 128MB Radeon 9700 graphics card. Combined with a 100GB hard drive and dual layer DVD rewriter, it's a great desktop replacement.



PROJECTOR

Infocus X2

REVIEW September 2004, p51 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Infocus 08000 286 470 www.infocus.com

It might be a bit on the heavy side, but considering the price tag of just £799, the Infocus X2 impressed us a great deal. Colours were well represented and text was superbly crisp.



PORTABLE MEDIA PLAYER

Archos AV400

REVIEW June 2005, p54 RRP £314.99

(£268.07 ex VAT) **PRODUCT INFORMATION**

Datamind 0870 770 0848 www.datamind.co.uk

Capable of playing back all manner of video and audio formats, the AV400 from Archos is also able to record video and audio directly as well as function as a fully-fledged personal video recorder.



19IN FLAT-PANEL MONITOR

Viewsonic VP191b

REVIEW July 2005, p68 RRP £349

(£297.86 ex VAT) **PRODUCT INFORMATION**

Lowest On Web www.lowestonweb.com

The 19in VP191b features a pivoting screen with super-slim bezel, crystal clear 1,280 x 1,024 image, strong colour and impressive 170-degree viewing angle. The only omission is a set of internal speakers.



PDA

Palmone Zire 72

REVIEW September 2004, p106 **RRP** £199

(£170 ex VAT) **PRODUCT INFORMATION**

Palmone 0118 974 2700 www.palmone.com/uk



We weren't expecting much from the Zire 72, but were pleasantly surprised by its excellent picture quality, the 1.2megapixel camera and great performance.

POCKET PC

T-Mobile MDA Compact

REVIEW July 2005, p67 **RRP** £209.99

(£178.71 ex VAT) **PRODUCT INFORMATION**

T-Mobile 0800 956 5001 www.t-mobile.co.uk



The MDA Compact offers an extra-large screen, Bluetooth connectivity and comes with Pocket versions of popular Microsoft products. A great Pocket PC and mobile phone package.

MULTIFUNCTION DEVICE

Brother DCP-310CN

REVIEW February 2005, p54 **RRP** £119.99

(£102.12 ex VAT) **PRODUCT INFORMATION**

Brother 0870 830 4037 www.brother.co.uk



Although print quality isn't the best we've seen, the DCP-310CN is a good compact all-in-one unit, has the added benefit of being able to hook up to a network and comes at a decent price.

MP3 PLAYER

Apple Ipod

REVIEW January 2005, p129 **RRP** £207.99

(£176.17 ex VAT) **PRODUCT INFORMATION**

Apple 0800 039 1010 www.apple.com



Easy to use and undeniably stylish, the Ipod sets the standard which all other mp3 players follow. Available in a variety of storage options, the only factor that lets it down is battery life.

LASER PRINTER

HP Laserjet 1320nw

REVIEW January 2005, p66 **RRP** £368.95

(£314 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.com



There are cheaper personal printers, but with excellent build quality, top performance and wireless support, the 1320nw impressed us a great deal. It comes with a duplex feature as standard.

INKJET PRINTER

Canon Pixma IP5000

REVIEW June 2005, p60 **RRP** £169

(£143.83 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



The new Pixma IP5000 fires out 1picolitre drops of ink, enabling it to reach new levels of detail. It takes just 35 seconds to print a 6 x 4 inch photo and, thanks to an extra black ink, they look great too.

MOTHERBOARD

ECS 915-A

REVIEW June 2005, p70 **RRP** £61.81

(£52.50 ex VAT) **PRODUCT INFORMATION**

ECS 0870 4000 111 www.directfrom.com



The Intel-based 915-A offers three types of graphics: integrated, AGP and PCI-Express. The board is well designed and allows for a wide range of upgrades. At just £61, it's a real bargain.

HIGH-END SPEAKERS

Creative Gigaworks S750

REVIEW April 2004, p48 **RRP** £330

(£280.77 ex VAT) **PRODUCT INFORMATION**

Creative www.creative.com



Coming with a wireless remote control, 210w sub-woofer and seven satellites at 70w each, these THX-certified speakers from Creative can completely immerse you in sound.

SOUNDCARD

Creative Audigy 4 Pro

REVIEW July 2005, p110 **RRP** £179.99

(£153.18 ex VAT) **PRODUCT INFORMATION**

Creative <http://europe.creative.com>



The Audigy 4 Pro is an upgrade of the impressive Audigy 2 series. The main difference is the new digital to audio converters, which provide a better signal to noise ratio. The price reflects the quality.

KEYBOARD AND MOUSE

Microsoft Optical Comfort Edition

REVIEW April 2005, p74 **RRP** £79.99 (£68.07 ex VAT)

PRODUCT INFORMATION Microsoft 0870 601 0100

www.microsoft.com/uk



This wireless keyboard from Microsoft has a comfortable ergonomic design and comes with a quick-zoom control and an impressive wireless optical mouse.

DIGITAL TUNER

Nebula Digitiv

REVIEW August 2005, p58 **RRP** £99.95

(£85.06 ex VAT) **PRODUCT INFORMATION**

Nebula 01689 897 090 www.nebulaelectronics.com



The Digitiv is more than just a Freeview receiver for your PC. It also includes a built-in web server so you can schedule recordings remotely as well as stream broadcasts across your local network.

GRAPHICS CARD

Powercolor X850XT Platinum Edition

REVIEW July 2005, p70 **RRP** £370.07

(£314.95 ex VAT) **PRODUCT INFORMATION**

Overclockers www.overclockers.co.uk



This ATI card features a 540MHz core clock, 590MHz DDR memory clock and 256MB of DDR3 Ram running through a 256bit memory bus. In short, it's one of the fastest cards around.

DIGITAL VIDEO CAMERA

Sony Handycam DCR-HC1000E

REVIEW November 2004, p68 RRP £1,300

(£1,106.38 ex VAT) **PRODUCT INFORMATION**

Sony 08705 111999 www.sony.co.uk



If your budget can stretch to £1,300, this is a great camcorder. Not only are its three CCD sensors capable of capturing stunning footage, but it's also very easy to use. Expensive, but well worth the money.

DIGITAL CAMERA

Nikon Coolpix S1

REVIEW August 2005, p111 RRP £279.99

(£238.29 ex VAT) **PRODUCT INFORMATION**

Nikon 0845 4500 155 www.nikon.co.uk



The Coolpix S1 is not only a very small camera, but it's also capable of taking detailed, high-quality shots. It also features a 5megapixel CCD, 3x optical zoom and comes at a decent price.

HIGH-END DIGITAL CAMERA

Canon Powershot Pro1

REVIEW July 2004, p62 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



This well-designed 8megapixel prosumer digital camera is loaded with features, including a 7x optical zoom and remote control. It also takes stunning photos.

DVD-RW

NEC ND-2510A

REVIEW November 2004, p75 RRP £49.93

(£41.91 ex VAT) **PRODUCT INFORMATION**

NEC 020 8752 3665 www.nec.co.uk



The NEC ND-2510A doesn't come with any bundled software or free discs, but this 8.5GB dual-layer DVD is great value for money. At under £50, it's a real steal.

MEDIA CREATION SOFTWARE

Roxio Easy Media Creator 7.5

REVIEW July 2005, p72 RRP £69.99

(£59.57 ex VAT) **PRODUCT INFORMATION**

Roxio www.roxio.co.uk



With a wide range of audio, video, photo and DVD tools, this package represents excellent value for money and would suit those in need of a complete multimedia suite.

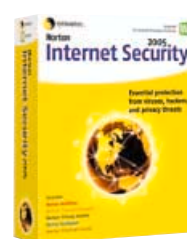
PC SECURITY SOFTWARE

Norton Internet Security 2005

REVIEW February 2005, p80 RRP £54.99

(£46.80 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



Providing protection from viruses, hackers and other privacy threats, as well as parental controls and anti-spam features, this is one of the best products to ensure your PC is both safe and secure.

OFFICE SOFTWARE

Microsoft Office Professional 2003

REVIEW May 2004, p150 RRP £459 (£390.64 ex VAT)

PRODUCT INFORMATION Microsoft 0870 501 0100

www.microsoft.com



This office suite offers a host of features, including a revamped version of Outlook. There are cheaper options available, but Microsoft's Office 2003 is the clear market leader.

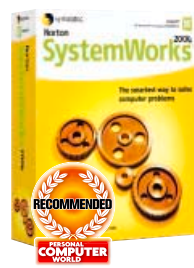
PC MAINTENANCE SOFTWARE

Norton Systemworks 2004

REVIEW March 2004, p68 RRP £64.99

(£55.31 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



If you want to keep your PC healthy and safe, Norton Systemworks 2004 certainly gets the job done, and at the reasonable price of a penny short of £65 to boot.

BACKUP SOFTWARE

Roxio Backup My PC Deluxe 6

REVIEW June 2005, p82 RRP £34.99

(£29.78 ex VAT) **PRODUCT INFORMATION**

Roxio 01908 278100 www.roxio.co.uk



Take the pain out of securing the data stored on your PC. Thanks to a clean and usable interface, and the help of various wizards, Backup My PC Deluxe 6 simplifies the whole process.

IMAGE-EDITING SOFTWARE

Adobe Photoshop Elements 3

REVIEW January 2005, p83 RRP £69.33

(£59 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



If you can't afford the full version of Photoshop, Elements 3 is a good alternative. Building on the huge success of Elements 2, it's loaded with features and is great value for money.

VIDEO-EDITING SOFTWARE

Adobe Premiere Elements

REVIEW January 2005, p148 RRP £69.33

(£59.00 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



Based on Adobe Premiere, the industry standard video-editing package, Premiere Elements is perfect for home users who want to edit their videos quickly and effectively without spending a fortune.

MUSIC CREATION SOFTWARE

Steinberg Cubasis VST 5

REVIEW March 2004, p67 PRICE £59.95

(£51.02 ex VAT) **PRODUCT INFORMATION**

Pinnacle Systems www.pinnaclesys.com



This sound-editing tool takes a bit of getting used to, but with a huge range of plug-in effects and a decent collection of virtual instruments, you'd be hard pushed to find a better package at this price.

Canon

LASER MULTIFUNCTIONALS • OFFICE PERSONAL COPIERS • PORTABLE PERSONAL COPIERS



Strengthen your sales with Canon's extensive flatbed range



Meet your customer's needs with Canon's comprehensive flatbed range. From portable personal copiers, to office personal copiers, to laser multifunctionals, there's a smart solution. Thanks to Canon's advanced technologies, each model offers superior quality, fast print speed and exceptional ease of use. Continual advances in Canon innovation ensure that you can always offer the most up-to-date models.

www.canon.co.uk

you can
Canon



The PC-D320 and PC-D340 are not available in the UK.

Intel Thin & Light Notebook With Wi-Fi For Only £499



SPECIALS HOME PCS POWER PCs **HOME LAPTOPS** POWER LAPTOPS BASE UNITS

▷ POWER LAPTOPS

£399
Laptop Deal

£499
Laptop Deal

£599
Laptop Deal

▷ POPULAR OPTIONS

ALL THIS for just £89 extra Complete Package



with carry case, Lexmark X1180 All-in-One Printer, Scanner, Photocopier, external keyboard and external mouse. (Printer cable not included)

FREE DELIVERY
Only when you order online. Limited Offer

How Do Tiny.COM Offer The UK's Lowest Prices?

Tiny.COM are in a unique position that allows us to save on costs. We have low overheads because we sell direct, we have huge buying power and we don't advertise on TV. Simply put, we cut out costs and pass these savings directly on to you.

Tiny Powerlite C750

E-Code: 01636

The Tiny Powerlite C750 is the very best Intel thin & light Notebook with wireless technology you can buy for £499. But hurry, stocks are limited.

INTEL MOBILE PROCESSOR The latest Intel Celeron M 350 processor with low power consumption and extended battery life.

512 MB DDR RAM Massive 512MB of high speed DDR RAM increases performance and allows multiple applications to run at the same time – double the size of other notebooks!

80 GB HARD DISK Large 80GB hard disk (double that of most notebooks) provides massive capacity for large amounts of photos, music albums, videos and other files.

64 MB AGP GRAPHICS Built-in 64MB AGP x8 GP graphics provides ample power for general use and games.

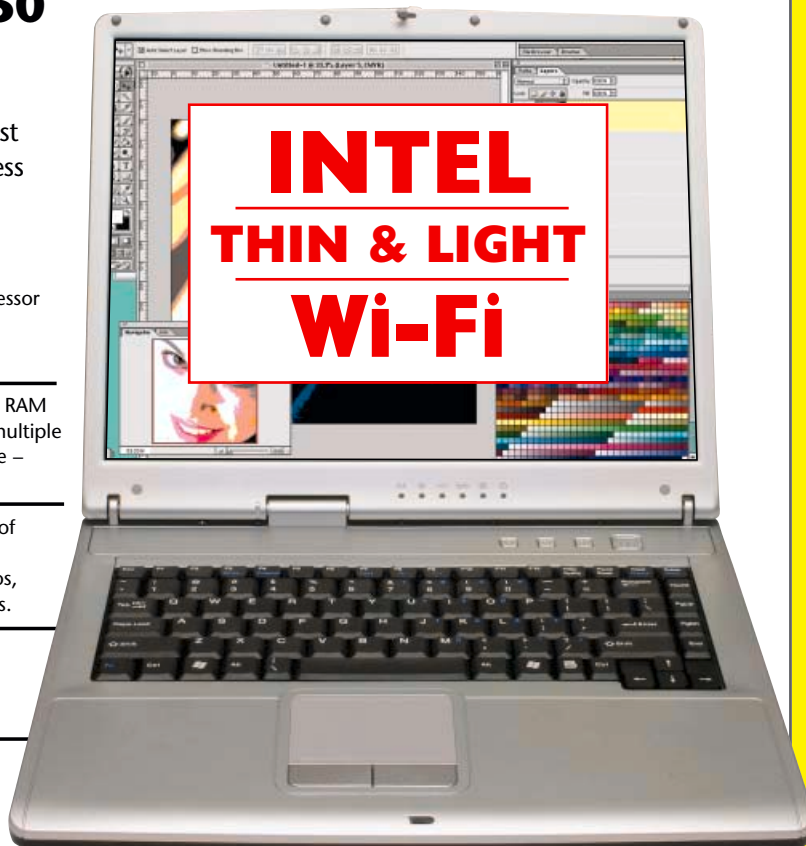
DVD-Rw Multiformat Multiformat Panasonic DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes*. Also acts as a DVD movie player.

15.1" XGA Screen Superb 15.1" XGA TFT Screen with high contrast ratio and dual display facility.

WI-FI Wireless Built-in 802.11B Wireless module and antenna allows you to connect wirelessly to the Internet and other computers in the house or office**. Hotspot compatible with hotels, airports, universities – access the Internet and your office on the move!

Massive Connectivity Includes microphone, Audio ports, USB2.0 x4, TV-out. Also includes 56K Modem (Wanadoo broadband upgrades available), Li-ion long life battery and A/C adaptor/charger, ergonomic keyboard and glide pad

OFFER ENDS 31st JULY



£499 **BUY**
inc vat PLUS DELIVERY†
E-Code:01636

▷ PRO MODEL

750 Pro Model: with FireWire, Card Reader, PCMCIA and Notebook Carry Case. **ONLY £39 extra**
E-code: 01637

▷ BEST BUY

Power Model from our Brand Partner HP. As C750 above but with: more powerful 3000+ mobile processor, faster ATI Radeon IGP 128MB graphics, better 15.4" 'BRIGHT' glare type Widescreen, 40GB Hard Disk, Microsoft WorksSuite 2005. (Excludes Carry Case). **ONLY £49 extra**
E-code: 01651



tiny.com

FREE DELIVERY For a limited period when you order online

THE LOW COST PC COMPANY

ORDER HOTLINE

0870 830 3127

or visit www.tiny.com to see the full range

Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

TVM102 (FCV08)

3 YEAR Extracare Extended Warranty
£129

19.9% APR

†Courier Delivery £39.99. Pay courier delivery by credit card. Free delivery for online orders only. Time Plan Finance Example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected models. Written details on request. These deals are not available from our partner firm The Computer Shop. ##Special permission is required to copy CDs/DVDs that are copyright. **Suitable broadband router required. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 770701. Licensed credit brokers. Offer extended. E&OE.



WORDS: RENE GRAU, MANUEL MASIERO, OLIVER SCHWEDE

There's life in the old PC yet

There are plenty of ways you can make good use of your old PC's hardware, which could save you money and protect the environment at the same time

Every year millions of tonnes of electronic scrap accumulate all over Europe, and the amount is growing. Part of this heap consists of PCs and components, which have been taken out of use simply because they no longer perform well enough to run new programs and games. However, not every old PC has to end up at the local dump. Older hardware is ideal for a range of specialised tasks, saving you the expense of purchasing the latest equipment. On the following pages we'll show you how to make the best use of your old system.

Your old PC can be used as a gateway to connect your other home or office computers to the Internet, act as a network file server, or host your website as a web server. More and more music and video fans are constructing

their own multimedia servers to make songs and movies in digital form accessible from anywhere on the network.

As a central monitoring point, an old PC can undertake security tasks and control several webcams simultaneously, as a measuring device it can replace several expensive oscilloscopes, or it can be used as a weather station to measure and report on meteorological data. The possibilities are almost endless and not difficult to set up. The instructions on the following pages will give you some practical tips.

Modifying the function of an old PC doesn't have to cost much either, especially if freeware or low-cost shareware applications are suitable. The PC hardware should, if possible, be modified as little as possible to keep expenditure to a minimum. An exception might be the



cost of fitting a larger hard disk, for example, if you're going to use the PC as a multimedia server and will need to store large amounts of audio and video data. Also, you might need to fit a network card, but these only cost a few pounds nowadays.

That's progress for you

If you need to add more memory or want to install other expansion cards, be aware that not all hardware components are mutually compatible and that what was once 'standard' may now have changed.

Since 1996, the standard for graphics cards has been the AGP bus, but if your old PC doesn't have an AGP slot that's not necessarily a problem when upgrading, as all the graphics card manufacturers still offer at least one PCI model.

The change in motherboard form factor from AT to ATX in 1999 is more problematic. It involved not only a new case layout, but also different power components. Attempting to upgrade an old AT PC with a new motherboard will fail, as the new board will not fit in the case and will have the wrong connectors for the power supply unit. The keyboard socket, which on the AT was a 5pin Din type, also changed to the new PS/2 (mini-Din) type.

If you are going to spend money, then memory is the best place to invest it, but you need to check carefully when adding more Ram. Since 2000 the DDR memory standard has been used. Its 184pin Dimms obviously do



More and more music and video enthusiasts are constructing their own multimedia servers to share digital media

not fit in the 168pin socket used by its predecessor, SD-Ram. The sockets are designed to prevent you using the wrong module. SD-Ram is still available – although often at a premium price. Since the middle of 2004 the new standard, DDR2, which uses 240 pins, has steadily become more popular.

It isn't worth thinking about upgrading the processor for really old systems, as the performance differences between the models, which fit in the same sockets, are usually too small to justify the expense. After all, we're talking about a PC that you would otherwise be throwing away, so you don't want to spend any more on it than is absolutely necessary.

Don't forget that most of the projects here will work equally well on an old laptop – and for some uses, such as a router or file server, even possibly one with a broken screen. As long as you can connect a monitor to it, you can configure it and then disconnect the monitor. You'll be able to perform most of the admin remotely from a networked PC. The only problem with laptops is that you're limited in upgrade options, and extra parts will probably be expensive.

Tips on buying used equipment

A possible alternative to upgrading an old system is to buy used hardware. However, you need to be particularly careful to avoid what you thought was a bargain turning out to be useless junk. A thorough visual check of the components is a good start. Check whether any of the contacts in the I/O and memory slots are corroded, or the connecting pins are bent. Blackened areas on the

motherboard or peripherals point to overheating caused by a short circuit. On used motherboards and expansion cards it is a good idea to look at the electrolytic capacitors. These components are particularly sensitive to overheating, which can be caused by tuning or inadequate case ventilation, and as a result their life expectancy is reduced. Deformations or leaky joints should sound the alarm bells and are best avoided.

A clogged-up fan can also be an indication that the ventilation isn't as efficient as it should be, and there might have been heat damage to some components.

It's difficult to determine whether or not a hard disk is mechanically sound. However, you can use the utility Everest from Lavalys (www.lavalys.com) to read the diagnostic Smart values that are stored in the drive's firmware. One of these, the Power On Time Count, shows how long the disk has run in total, and you should compare this with the manufacturer's MTBF (Mean time between failures) figure.

Drivers can be difficult to find for used parts. When you make your purchase be careful to ensure that not only the hardware changes hands, but also any related driver CDs or disks. If that is not possible then there are several websites to help track down 'fossilised' drivers, such as www.driverguide.com, which requires registration but costs nothing to use.

Networked audio and video

The hi-fi's days are numbered. PC enthusiasts are building multimedia networks at home, which distribute music and video to playback devices anywhere in the home from a central server.

Multimedia servers - minimum specs

Server with Nero Mediahome:

Windows 98, Pentium III/700MHz or Athlon 700MHz, 128MB of Ram, 40GB hard disk, network card.

Server with VLC Media Player:

Windows 95, Linux, Mac OSX, Pentium III/700MHz or Athlon 700MHz, 128MB of Ram, 40GB hard disk, network card.

Shoutcast radio station:

Windows 95, Pentium/100MHz or AMD K6, 64MB of Ram, 10GB hard disk, network card or Wifi.

Low-cost media centres

Until recently, MyHTPC (www.myhtpc.net) was an excellent free application to transform a PC into a media centre. Now it's gone commercial and is called Meedio (www.meedio.com). It's still highly affordable (£31.85 download), and a free 30-day trial version is available. Meedio is not too demanding on hardware: a system with a 1.5GHz processor is quite sufficient.

Meedio also plays DVD, DivX and Xvid movies as well as audio files, plus there's a slideshow feature for still images. Want to keep up with the weather? No problem, the software will fetch all the data and even a matching satellite picture.

Meedio Essentials doesn't include TV/PVR functionality, although a separate Meedio TV application is under development and can be tried out from www.meedio.com/download/meedio.

A more comprehensive application with fairly low system requirements (1GHz Pentium III) is Showshifter (www.showshifter.com, £29.99 download). This has the advantage of supporting either analogue or digital (DVB) TV cards out of the box.



Meedio is a highly customisable media centre application

A multimedia server using Nero

If you've got doubts about converting a PC to a multimedia server because you think your PC's too slow, have a closer look at Nero Mediahome (www.nero.com). In our experience, a 700MHz Pentium III was more than adequate to stream video files to clients over the network, as the decoding is done on the client. Supported file types include DivX, mpeg2 and mpeg4. Mediahome is bundled with Nero 6 Reloaded (£40 to download). A time-limited trial version can be downloaded from

www.nero.com/eng/Demo_Versions.html. The installation requires Nero Mediahome to be installed on the server and the Nero Showtime DVD player software to be installed on the clients – both are included in the Reloaded package.

Nero Mediahome organises audio, video and picture files into playlists and catalogues different media types automatically. So, for example, you could display all the music tracks of a specific genre on the client PC. As well as the software, you only need a network card to get going, preferably a 100Mbps/sec model to give you plenty of bandwidth. Just a few mouse clicks are needed to start the server. After starting Nero Mediahome, you specify those multimedia files, which are to be made available to all clients. Then you simply have to click on the Start Server button. You can then use the Nero Showtime player software to start any of the shared files from a client computer, by choosing Select source, Media Files, Media Home (Network) from the context menu.

Freeware streaming with VLC

Videos and music files can also be distributed using the powerful freeware program VLC Media Player (www.videolan.org/vlc). Mpeg1, mpeg2, mpeg4 and DivX movies can be transmitted over a local network by the VLC multimedia server, and if you have a TV card, even live television programmes can be streamed. As well as



Nero Mediahome is very easy to set up

this, the software supports audio formats like mp3 and Ogg Vorbis. The VLC Media Player is available for Windows and numerous Linux distributions such as Debian, Mandrake and Suse as well as Mac OSX. As these versions are cross-compatible with each other, the server and the client computers do not have to be running the same operating system. The multimedia server can, like Nero Mediahome, be controlled from the client using a web interface. This means that you can put the server out of sight in a bedroom or even the garage.

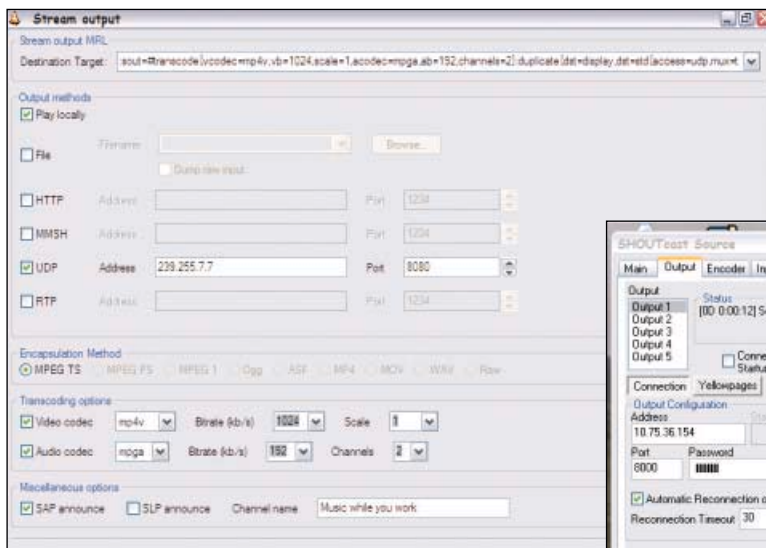
Setting up the server and the client doesn't take long. Start the VLC Media Player by selecting Open file from the File menu and choosing the UDP/RTP option from the Network section. When this has been done, udp:// appears in the client's playback window. You can then select the audio and video files to be streamed from the server via a web interface.

The server has to be prepared to send the data. On the server, select the file to be streamed by selecting Open File from the File menu and clicking on the Browse button. If you wish to stream a DVD video, audio CD or VCD, let the software know by making the appropriate selection in the Volume section. This is where you specify the CD or DVD drive letter and the type of content. Select Streaming

Take care upgrading hard disks

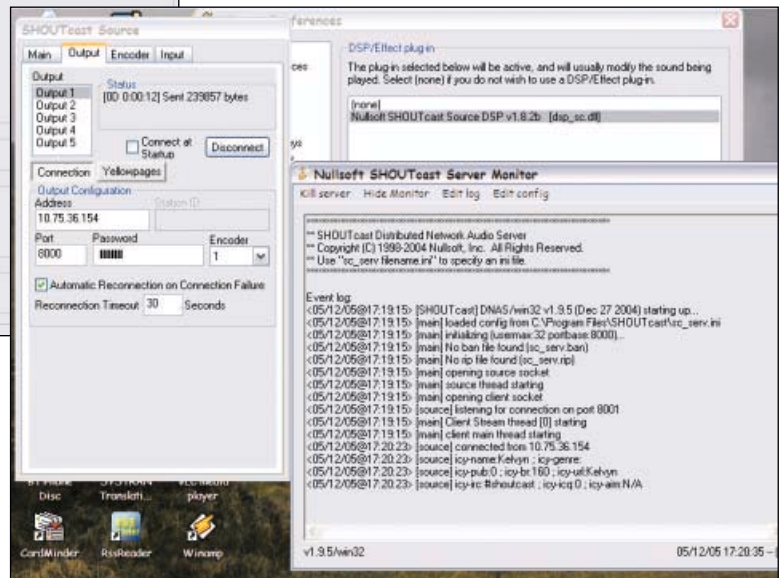
If you are going to use a PC as a multimedia server the hard disk capacity will often be inadequate for large amounts of audio and/or content. Usually, this means that you'll need to install a new hard disk. However, its full capacity might not be usable with all combinations of operating system, motherboard and Bios. Motherboards dating from before 2002 used the old 28bit LBA (logical block addressing) system and will not recognise hard disks with more than 128GB capacity, if at all. Only products manufactured from 2002 onwards support 48bit LBA and capacities of up to 128 Petabytes. If a Bios update does not do the trick then you need to buy a PCI hard disk controller (around £15).

Windows 98SE does support hard disks larger than 128GB, but the capacity may be displayed incorrectly. If you're running Windows 2000, 48bit addressing only works properly in Service Pack 3 and above with a Registry patch. After installing SP3, create a REG_DWORD entry called EnableBigLba, with a value of seven, under HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\atapi\Parameters. Under Windows XP, 48bit support is available only after installing SP1.



Left: VLC is a free, cross-platform way of streaming media across your network to multiple clients

Below: Shoutcast lets you create your own network radio station for free



Output in the Network section, set the output method to UDP and enter the IP address of the client, which is to receive the video stream.

You can put together a playlist by selecting Playlist from the View menu. Clicking on OK transmits the material over the network and displays it on the client. If you want to multicast multimedia files – that is, send them to all the clients on the network, not just one – then the server has to use a different range of IP addresses.

Use the settings above, but if you select UDP as the output method then specify the IP address as, for example, 239.255.7.7 (the address range 239.255.xxx.xxx is specially reserved for multicasting) and choose a suitable port such as 8080. The clients then have to be configured. Under Network, select the UDP/RTPMulticast option and specify the server IP address 239.255.7.7 with the appropriate port. Click OK and the client is ready.

If you are not sitting in front of the server, give remote control via the web interface a try. In VLC Media Player, select Add Interface, Web Interface from the Settings menu. In the browser enter the IP address of the server with the port number 8080, for example, <http://239.255.7.7:8080>. This URL will access a web interface where you can fast forward the content or adjust the volume. The playlist is also available here.

If several files are being streamed at once, or the network is carrying large amounts of other data, you might need to adjust the data bandwidth options. To do this, open the streaming output settings, click the 'Video codec' or 'Audio codec' checkboxes in the Transcoding section and use the dropdown boxes to specify the audio and video data rates in Kbits/sec. You may need to

experiment before you reach an acceptable compromise between bit rate and quality.

Your own radio station

You can use Nullsoft's Shoutcast (www.shoutcast.com) to put your own radio programmes together and broadcast them on your network. The software, which is free, requires that you have the Shoutcast DNAS server, Winamp (also free from www.winamp.com) and the Shoutcast Plug-in installed (www.shoutcast.com/download/broadcast.phtml).

First, install the Shoutcast DNAS server – it normally needs no configuration. It opens, and shows the Monitor status window or runs in the System Tray if minimised.

After installing Winamp and the Shoutcast DSP plug-in, use Winamp to create a playlist of the titles you want to broadcast. Open the playlist using Alt & E and add more music files to it with the 'L' key.

Once you have put the radio show together, open the Options/Preferences menu and select Plugins, DSP/Effect then choose the Nullsoft Shoutcast Source DSP entry.

In the Shoutcast Source window that appears, first choose the Output tab to enter the details of your Shoutcast server – the Address is the IP address of your PC. Leave the port setting at 8000. You can leave the default password ('changeme') unchanged, but if you really do want to change it you'll need to edit the Shoutcast server's .ini file to reflect this. Click on the Yellowpages button and uncheck the 'Make this server public' button to prevent the server broadcasting to the Internet. Now type in a suitable name for your server (for example, 'Home Radio').

In the Encoder tab, you can specify the transmission quality. It's preset to Encoder 1 and Encoder Type to mp3. Encoder Settings lets you specify the audio bit rate. Now click the Input tab and make sure it's set to Winamp. Start playing your playlist in Winamp.

Finally, go back to the output tab and click the Connect button. If all's well, the data will start streaming to the Shoutcast server. Now on another PC on the

Communications centre - minimum specs

Fax and answering machine:

Windows 95, Pentium III 700MHz or Athlon 700MHz, 1GB hard disk, 56K modem, network card.

Gateway to the Internet:

Windows 95, Pentium II 300MHz or AMD K6-2/300MHz, 128MB of Ram, 2GB hard disk, two network cards.

Host your own website:

Windows 95, Pentium II 300MHz or K6-2/300MHz, 128MB of Ram, 2GB hard disk, network card.

Scanner as a fax

If you have a scanner, then you can turn it into a fax machine. Windows' built-in fax service has been around since Windows 95, but in the older versions it's not particularly user-friendly to install or use (there's a walkthrough at www.slipstick.com/addins/services/msfax.htm). Windows 2000 or XP is much simpler, and you can use XP's Camera and Scanner wizard to scan your files, then 'print' them to the Fax driver using the Photo Printing wizard (right-click the scanned image file and choose Print). Additionally, any printable document can be faxed from within most Windows applications.

network, you can connect to the broadcast stream by opening Winamp and choosing File/Play from URL. Enter the server PC's IP address and port in the format XXX.XXX.XXX.XXX:8000. The client will connect to the server and start playing the broadcast audio. The only sticking point is that to broadcast non-PCM based files (such as wma), you'll need to set the Input options in the plug-in to 'Soundcard input' and choose the line input, then press the 'Open Mixer' button to select the correct output on your soundcard.

Communications centre

The following tips show you how to convert a PC into a communications centre, which serves as an easy-to-use fax and answering machine. With a little more work, the computer can also be used as an Internet gateway, or even a web server.

Fax and answering machine

Even in the age of broadband connections, 56K modems have a use as cheap fax and answering machines. Even if your PC has no modem, analogue fax modems with voice capability can be bought for a few pounds. The PC does not even have to be on all the time – many external modems are capable of receiving faxes and storing them in internal memory or recording voice messages even if the PC is off.

There are plenty of software solutions for analogue and ISDN modems. For \$30 (£16), Center Pro from V3 (www.v3fax.com) lets you easily set up a communications centre based on an analogue modem. A free version is also available with more limited functionality. Don't forget the bundled software: most modem manufacturers include basic fax and call-answering software with their hardware.

Two network cards (or a network card and a modem), plus a switch or hub are all you need to make an Internet gateway for your home network. Normally you would use an external router with an integrated switch, but you can construct a gateway using built-in Windows XP functions and some third-party software. Network cards, hubs and switches can now be bought very cheaply either new or even second-hand from Ebay. The only proviso, if you want a simple life, is that the machine with the Internet connection should be running Windows XP – it's possible to use Windows 98 onwards, but the ICS wizard isn't as reliable and you might have to do the final tweaking manually.

Install the second network card and connect it to the switch or hub. The original network card (or modem) goes to your existing Internet connection (DSL or dial-up). Run the Network Setup wizard (Windows XP) or the Internet Sharing Setup wizard (Windows 98SE upwards) to configure the host PC to allow other PCs on the network to connect to it. Windows XP has plenty of information

With an analogue modem and Callcenter Pro you can turn your PC into a communications centre



on the wizard in its Help and Support Centre, and there's more information on the Windows 98SE procedures on Microsoft's Knowledgebase (<http://support.microsoft.com/kb/238135/EN-US/>).

A standalone router will usually provide your network clients with a dynamic IP address allocation service (DHCP), and you can add this feature to your home-made router with third-party software. Weird Solutions' DHCP-Turbo 3 (www.weird-solutions.com) provides a DHCP server, which is free for use with up to five clients. After installation DHCP-Turbo allocates client IP addresses in the private range 192.168.0.1 to 192.168.0.255 to devices on the network.

Web server

Converting your old PC into a web server in minutes is easy, using Aprelium's Abyss PC server software. This free, tiny (112KB) program allows you to quickly and easily put your web pages on the Internet.

First, you must ensure that HTTP requests from the Internet land on the computer, which is to host your future web server. This means that the web server requires a static IP address on the network. Also, you'll need to set the port forwarding on your router so that port 80 points to the web server's IP address.

Next, download and run the Abyss web server from www.aprelium.com. After installation, the page <http://127.0.0.1:9999> opens automatically. This is the server administration page. Enter a login and password there. After doing so, log in and modify the path where

Router tips and tricks

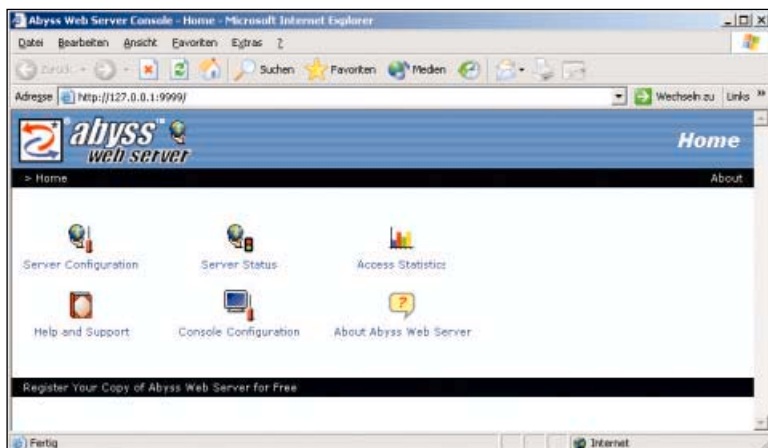
Depending on how your router works when processing web requests to your web server from local IP addresses, you might not be able to access your own web server from your own network. You can get around this by using a proxy server to obscure your own IP address.

The Dresden Technical University makes a free proxy server, Jap, available (Java Anon Proxy, anon.inf.tu-dresden.de). It is intended to enable anonymous web surfing by hiding your IP address from the web server you are connected to, but it's useful if you have this problem with your router. In this way it serves up a different IP address to the router. This is achieved by not connecting you directly to the web server, but by sending the communication, encrypted, via multiple intermediate points.

After installing Jap, start the program and select the Allow anonymous access box. If you enter your web server's IP address, your web page should now appear.



Anonymous: JAP hides your IP address from the web server



you will later put your web pages. For testing, create a web page and save it as index.html in the web server's document path. You can get the web server's Lan IP address by running ipconfig in a command window. Enter this address into a browser and the index.html page from the htdocs directory should appear.

Now you need to make your web page available to the wider Internet. To find out the IP address, which you are allocated to by your ISP, go to www.grc.com and choose Shields Up. Enter the discovered IP address shown there into a browser window (<http://youripaddress>) and your index.html should be visible. However, this doesn't always work, depending on how your router handles local requests – sometimes you'll find that you can't access your own web server from within your own network. You can work round this by using a proxy server to obscure your client PC's IP address (see box on previous page).

With many ISP connections, problems can be caused by dynamic IP address allocation. Every time a new connection is established you are allocated a new IP address, chosen at random. This isn't very practical if you want your website to be available all the time. The solution is a dynamic DNS (DDNS) service. You choose a permanent domain name and when your provider allocates an IP address, it is immediately passed to the Domain Name Server (DNS) service and associated there with the domain name. Most newer standalone routers have built-in support for DDNS, just requiring it to be set up in the router's configuration console.

If you are using a PC as your router then DDNS support can be added using a software client. There are various software tools that work with the DDNS service, which can be found at www.dyndns.org.

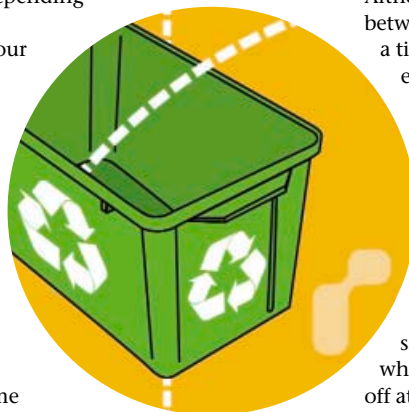
Monitor, control and measure

An old PC can be used for some quite specialised tasks. For example, as an electronic test and measurement station, surveillance, home automation or even as a weather station.

Setting up a surveillance camera

An older PC, some suitable software and a webcam is all you need for video surveillance at home or work. Up-to-date USB webcams are available for £20 and upwards. For surveillance purposes, you should go for a model, which supports at least VGA (640 × 480) resolution to give a decent level of detail.

The Abyss web server admin menu has a clear and easy-to-use user interface



The decisive element in surveillance use is the software used. The software bundled with webcams is usually rather spartan and not very user-friendly. However, for as little as £15 you can get webcam software with all the important features like compensation for glare, automatic brightness adjustment, a time stamp and image uploads via FTP. Most of this software is shareware, allowing you to test it before you buy.

Of note are Supervisioncam (www.supervisioncam.com, €25 – approx £17), Willing Webcam (www.willingsoftware.com, \$30 – approx £16) and Vintasoft Webcam (<http://www.vintasoft.com>, €20 – approx £14). You can either save the pictures locally on the computer or send them over the Internet to your web page. Some of the software has motion detection built in and can even send a text message to your mobile phone if movement is detected.

Active Webcam (\$30 – approx £16), includes its own web server so that you can easily call up the pictures over the Internet, and it can also stream video at up to 20fps (frames per second).

Supervisioncam and Vintasoft Webcam also allow compression of the videos to avi, mpeg or DivX format. With 1-More-Webcam (www.1-more.com, €19) you can at least convert the pictures to an mpeg movie later. Willing Webcam lets you display the live digital image as desktop wallpaper.

The field of webcam software thins out when it comes to managing several cameras in parallel. Only a few products can do this. Supervisioncam manages each camera in its own window, and each can be configured separately. Although the Willing Webcam software can be switched between several camera sources, only one remains visible at a time. Webcam Spy makes it possible to manage up to eight cameras. Only one picture at a time is visible, but it's easier and quicker to switch between cameras than with the Willing software. Alternatively, you can display the camera view on which motion has been detected, or change between cameras at predetermined intervals.

Simple home automation

A surplus PC can still give good service if it's used, say, to turn on the garage fan heater at the same time every morning or to put off burglars when you're on holiday by turning the lights on and off at irregular intervals.

By using X10 control devices around your home and installing controller software on your PC, you can use your old low-spec PC as a control centre. Suitable software includes Meedio Housebot (www.meedio.com/whatismeedio/housebot, £54), or the free X10 Controller program (www.x10controller.com) that even supports voice commands.

A range of X10 hardware and control software is available from Simply Automate (www.simplyautomate.co.uk).

Communications centre – specs in brief

Setting up a webcam:

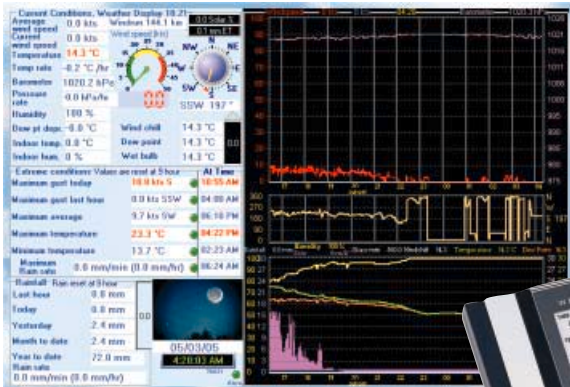
Windows 95, Pentium II/300MHz or AMD K6-2/300MHz, 32MB of Ram, 1GB hard disk, USB interface, network card.

Controller for home automation:

Windows 95, Pentium M/300MHz or AMD K6-2/300MHz, 32MB of Ram, 400MB hard disk.

Measuring station:

Windows 95, Pentium M/700MHz or Athlon 700MHz, 64MB of Ram, 400MB hard disk.



Create your own private PC weather station

recorder. The price, depending on the maximum sampling speed, is between €700 (5MHz) and €1,350 (100MHz).

Linux: a cheap router and server
Older PCs are often not powerful enough for Windows, but can run advanced functions when running the less demanding Linux operating system. Here we show you how to build a Linux-based router and a multipurpose server for next to nothing.

An alternative to a hardware router is the software router Fli4l (www.fli4l.de/e_index.htm). This free mini-Linux fits on a single disk and does not even require a hard disk. It will work on a 486 PC with just 16MB of Ram. This is the cheapest possible way to connect a home network to the Internet.

Apart from the computer, you need a DSL modem with an Ethernet interface, two network cards and a hub or switch. Thanks to its

modular nature, Linux can be customised for every computer configuration.

To install Fli4l connect one of the two network cards to the DSL modem and the other to the network hub. The actual configuration of the router is done not on the PC running Fli4l, but from a graphical client utility, Imonc, running on a PC on the Windows network. Imonc is available from www.imonc.de/e_index.shtml. The router also supports ISDN dial-up as well as DSL, and it acts as a DHCP server. These individual functions are provided in separate software modules. The basic system is the file fh4l-2.0.8.tar.gz. If you are using Winzip then you must make sure that in Options/Configuration/Other the setting Convert LF to CR/LF in TAR archives is not enabled.

Simple configuration

You can set up the router software easily, using the Fliwiz utility. After starting Fliwiz, choose Open and select the file base.txt from the config folder's fli4l directory. Activate the DSL checkbox and enter the number of computers on the network. For the subnet enter, for example, the address 192.768.1.0. Next, enter a name for the router, a password and the name of your domain.

Private weather reports

If you don't trust the weather forecast on television, you can use a PC to set up your own weather station, although the equipment itself isn't particularly cheap. One specialist retailer in the UK is the UK Weather Shop (www.ukweathershop.co.uk), which offers a wide range of automatic weather station equipment at prices from £200 upwards. Software that interfaces with a wide range of electronic weather stations and sensors is available from vendors such as Weather Display (www.weather-display.com, \$70) or PC-Wetterstation (www.pc-wetterstation.de/enindex, €25).

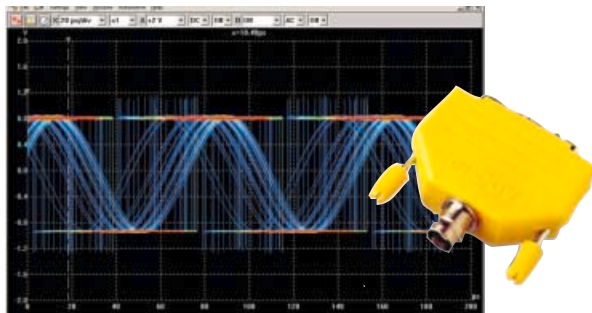
Electronic test station

If you like experimenting, then this is for you, but be prepared to spend a lot of money depending on how exotic your needs are. With the help of special expansion cards, or external instrumentation accessories, you can easily turn a PC into a digital measuring lab. In comparison with standalone measuring instruments, you can often save a lot of money with a PC-based solution.

The most useful applications for PC-based measurement are in the areas of electronics. For monitoring and logging voltages of up to 30v, the Velleman PCS10 four-channel USB signal recorder (www.velleman.be, €50) is a good choice.

An old PC can also be handy for more difficult measurement tasks, such as a digital storage oscilloscope, which does not even require an expansion card: for £59 you can buy the Pico ADC-10 (www.picotech.com) single-channel data logger that plugs into your PC's parallel port. In conjunction with the bundled Pico Scope software, you can use the PC for spectrum analysis, as a single-channel oscilloscope, a multimeter, or a frequency measuring device.

For more complex work, Tie Pie (www.tiepie.nl/uk/home) offers a do-it-all USB device. The Handyscope 3 combines five measurement instruments and simulators for electrical engineers in one case: oscilloscope, function generator, spectral analyser, two-channel voltmeter and a transient



A PC can easily become a high-quality measuring instrument using simple adapters or USB devices

Star gazing

Observations of a completely different sort are made possible by the Acuter Digital Imager special camera, which you can buy from Ace Cameras (www.acecameras.co.uk) for £69. You attach it to a telescope with a standard 1.25in ocular, and it enables you to take photographs of all kinds of celestial phenomena. You can use it, for example, to observe the moon on your PC monitor.

The specially developed CCD camera, with an infra-red blocking filter, fits in the place of the telescope's original optical eyepiece. The images are sent via the USB interface to the computer at a resolution of 640 x 480 pixels, either as individual images, or as a video stream at up to 15fps (frames per second) in VGA format.

Control software for Windows 98 and above is bundled with the camera. It will run on a modest 233MHz Pentium II with 32MB of Ram.

Acuter Digital Imager fits standard-sized astronomical telescopes





Linux router and server – minimum specs

Linux router on a disk:

Intel 486/100MHz, 16MB of Ram, DSL modem, two network cards.

File server using Ben Hur 2:

Pentium II/300MHz or AMD K6-2/300MHz, 256MB of Ram, 4GB hard disk, bootable CD-Rom, network card.

The next step is to select the network card, which is connected to the Lan from the upper list box, and give it the IP address 192.168.1.1. For the second card, which is connected to the DSL modem, choose the type of card and, if need be, enter the additional hardware parameters.

You can skip the next two steps in the wizard as they relate to configuring ISDN access.

For the DSL connection, select the appropriate protocol using PPPOE and enter your ISP access details. Finally, save your configuration details in the base.txt file. Format a disk by clicking on the corresponding button, create the router disk and then boot from that disk.

Router fine tuning

As soon as the router is running you can make further adjustments to the settings, which are hidden behind the expert mode buttons. For example, using the Forwarding tab, you can block specific ports and IP addresses to protect the Lan from infiltration. With Network Address Translation (Nat) the router hides the PCs on your network and only shows the IP address allocated by your ISP to the wider Internet. Applications like FTP and IRC require special settings for use in this environment, controlled under the heading of Masquerading. By default, only FTP Masquerading is active.

Once the router is configured, you can hide it in a corner if you wish – remote control and administration can be done from a Windows PC using the Imonc utility. After starting it, Imonc automatically opens a connection to the DSL router and issues a status query. Apart from monitoring network activity it is possible to remotely configure the router from the Imonc interface.

A server in minutes

Using the powerful Ben Hur 2 operating system from Pyramid (www.pyramid.de/e/), free for up to five non-commercial users) you can set up a Linux file server in just 10 minutes.

You could even use the Ben Hur server as a complete replacement for an Exchange server, as a five-user licence for Exchange 4 Linux from Neuberger & Hughes is offered for free on its website www.n-h.com.

Ben Hur 2 installation is straightforward



Installing Ben Hur 2 is straightforward. Just boot from the CD, select the location you want to install it to and enter the requested network information. Enter the IP address you want to use for the server, the subnet mask and Fully Qualified Domain Name (FQDN). The FQDN consists of the hostname and the domain, for example, `benhur.discworld.local`. For our example we are using an IP address of 192.168.10.30, and 255.255.255.0 as the subnet mask. The installation starts when you click the 'Next' button. When it's completed the server will reboot – when it reaches the login prompt you can disconnect the monitor as the rest of the configuration can be done remotely.

Configure the server

You can now access the server configuration menu from Windows clients on the local network using a browser. Enter the URL `https://192.168.10.30:8001` (substitute the IP address you configured during setup) into the browser, read the licence terms, then proceed to setting up passwords for both the root and admin users. Now you can log in to the GUI with the admin account and proceed to the System Information homepage.

From this browser-based GUI you can now configure users, groups, security and any other networking parameters and server features on the Ben Hur 2 server. We don't have the space to walk you through all the options here, but you'll find a superb administrator's guide in the Manuals folder of the installation CD, which we'd recommend you read before starting installation if you want to brush up on your networking knowledge. This pdf manual is also launched automatically via Autorun if you insert the CD into a Windows PC.

Ben Hur 2 offers many other advanced server features, such as a mail server, stateful packet inspection firewall, web proxy and even a fax/SMS server. You can obviously use as many or as few of these features as you require.



File4i packs a complete Linux router onto just one floppy disk

Minimum hardware requirements for Linux

For Office-type applications, Linux requires fewer resources than Windows. However, both systems are equally resource-hungry when it comes to multimedia. Command-line-based Linux will run with as little as 128MB of Ram, but needs at least 256MB to perform smoothly.

A bare installation of Linux takes up about 500MB of hard disk, but adding Office or multimedia software can quickly take this to 2.5GB or more. A Pentium II/350MHz with 256MB of Ram is quick enough for Linux office applications.

A file or music server requires a Pentium III-class machine, with at least 512MB of Ram. Video editing and manipulating large images needs at least a Pentium 4 or AMD Athlon 64, preferably with more than 1GB of Ram.

Platinum
up to 2Mbps*
£29.99

fast just
got faster
with AOL
Broadband

We've doubled the speed of our premium broadband service -
at up to 2Mbps for just £29.99, it's now better value than ever.

Call 0800 376 6606
or visit www.aol.co.uk/platinum



Conditions apply. BT line required. Some alternative broadband products also available in ntl broadband enabled areas. Subject to availability and survey. 12 month minimum contract.
*Platinum packages previously up to 1Mbps now available to new subscribers at up to 2Mbps. See online for details.



1024MB, 80GB, Widescreen Thin & Light Notebook

SPECIALS	HOME PCS	POWER PCs	HOME LAPTOPS	POWER LAPTOPS	BASE UNITS
----------	----------	-----------	--------------	---------------	------------

Tiny PowerLite C780 E-Code: 01578

The Tiny PowerLite C780 is the highest specification Intel thin and light widescreen notebook you can buy for £599. This notebook comes with superb 15.4" WXGA screen, massive 1024MB RAM memory, 80GB hard disk and DVD burner drive. All this at a sensational £599 including VAT!



POWER LAPTOPS

£499
Laptop Deal

£599
Laptop Deal

£699
Laptop Deal

INTEL MOBILE PROCESSOR

The latest Intel Celeron M 350 Mobile processor with low power consumption and extended battery life.

1024MB DDR RAM

Massive 1024MB of high speed DDR RAM increases performance and allows multiple applications to run at the same time – double the size of other notebooks!

80 GB HARD DISK

Large 80GB hard disk (double that of most notebooks) provides massive capacity for large amounts of photos, music albums, videos and other files.

DVD-Rw Multiformat

Multiformat Panasonic DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes^{##}. Also acts as a DVD movie player.

15.4" WXGA Screen

Ultra high definition 15.4" WXGA TFT screen, superb brightness, high contrast ratio, and dual display facility (1280x800).

WI-FI Wireless

Built-in Intel 802.11B/G Wireless module and antenna allows you to connect wirelessly to the Internet and other computers in the house or office^{••}. Hotspot compatible with hotels, airports, universities – access the Internet and your office on the move!

64 MB AGP GRAPHICS

Built-in 64MB AGP x8 GP graphics provides ample power for general use and games

FREE DELIVERY
Only when you order online. Limited Offer

POPULAR OPTIONS

All this for just **£89 extra**

Complete Package



with carry case, Lexmark X1180 All-in-One Printer, Scanner, Photocopier, external keyboard and external mouse (Printer cable not included)

PLUS ADVANCED FEATURES

- USB 2.0 x 3 ports for a multitude of devices and peripherals – connect to virtually anything
- PCMCIA Type II card slot with cardbus
- 56K Modem including telephone cable. Wanadoo Broadband upgrade available.
- 6 Cell Li-ion long life (normally 2 hrs) battery
- Ergonomic keyboard, Glide pad and 4 direction scroll
- SVGA-Out (projectors), 10/100 Ethernet for Broadband, Networking, Audio and Mic
- S-Video TV-out connections for large screen TVs
- Dimension 354x250x32mm; 3Kg. Model (N2514)

PLUS MICROSOFT® SOFTWARE

- Microsoft Windows XP**
- Microsoft Office 2003 60 day trial[#]. Microsoft Word, Microsoft Excel, Microsoft Powerpoint, Microsoft Outlook.
- Microsoft Works 7 – Six integrated applications

SENSATIONAL PRICE

£599 **BUY**

inc vat PLUS DELIVERY†

Power Deal E-Code: 01658

OFFER ENDS 31st JULY

BEST BUY

Power Model from our Brand Partner HP.
As above but with: more powerful Athlon 64 3400+ mobile processor, faster nVidia GeForce 4 440 64MB graphics, better 15.4" "BRIGHT" glare type screen, 60GB Hard Disk, 5 in 1 Card Reader, Firewire, Microsoft WorksSuite 2005. **ONLY £99 extra**

E-code: 01634

tiny.com

FREE DELIVERY For a limited period when you order online

THE LOW COST PC COMPANY

ORDER HOTLINE

0870 830 3127

or visit www.tiny.com to see the full range

Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

TINY103/IN55 (PCW/08)

3 YEAR
Extracare
Extended
Warranty
£129

19.9%
APR

†**Courier Delivery £39.99.** Pay courier delivery by credit card. Free delivery for online orders only. Time Plan Finance Example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected models. Written details on request. These deals are not available from our partner firm The Computer Shop. **Back-up CDs available at extra cost. ##Special permission is required to copy CDs/DVDs that are copyright. #The 60 day trial version - option to purchase extended version for special price - ask for details. ••Suitable broadband router required. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 770701. Licensed credit brokers. Offer extended. E&OE.



WORDS: ANNA LAGERKVIST, RORY REID & WILL STAPLEY

Join the smart set

Make your smartphone even smarter as we round up 104 of the best programs available for the four top platforms

Sales of handheld mobile devices are growing rapidly at the moment, fuelled largely by the demand for smartphones. No matter what make or model of device takes your fancy, there's a massive amount of add-on programs available to download from the Internet. This month, we've focused on finding the best, most useful, interesting smartphone software available for the four main operating systems: Symbian, Microsoft, Palmone and Rim's Blackberry.

We've concentrated mainly on freeware and low-cost shareware – programs that often offer free trials of up to a month – to get a good mix of useful and fun applications. The feature is split into four sections, one per platform, featuring some of our favourite applications. Please note that if a program is mentioned under one platform, that

doesn't mean it won't work on any of the others as many programs are available for multiple platforms – check out the product's website for more information.

At the end of the feature, you'll find a table containing information and short descriptions of lots more selected programs that we didn't have space to review in further detail. An interactive list of URLs where you can download many of the programs mentioned in this feature is on our website at <http://labs.pcw.co.uk>. If you've bought the CD or DVD edition of *PCW*, you'll also find the list on the disc. We've made every effort to make sure all programs featured are free of viruses, adware and spyware, but we'd still recommend backing up your data before installing any third-party software. Also, always read the licence agreements of programs to find out any specific terms.

SYMBIAN

With a complex history going all the way back to the Psion Organiser of 1984, the current Symbian OS is probably the most well-provisioned platform in terms of third-party applications, with an active developer community ensuring some great programs. There are three main Symbian platforms – Series 60, Series 90 and UIQ, with Series 60 devices the most numerous.

Azure

Freeware

<http://web.vee.net/projects/azure>

Blogging is everywhere, and for those that are serious about sharing everything that happens in an instant, Azure is a free blog client. It runs on your phone and allows you to create and edit posts for your weblog. Entries for one or more blogs can be entered, on the same or different servers. Previous entries can also be edited and republished if you want to add something. Even if you're not connected to the Internet, you can edit entries offline. It's intuitive and simple to use, so now you can be blogging wherever you can get mobile reception.

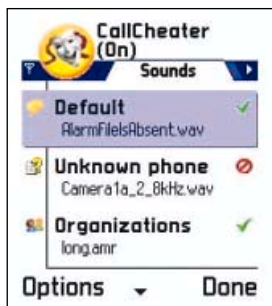
Callcheater 1.02

€9.95 (£6.84 approx) (15-day free trial available)

www.symbianware.com/product.php?id=callcheater60&pl=

Sometimes little white lies are needed – like when you're late for a meeting and want to make out as if you've been stuck in a major traffic jam.

Enter Callcheater, a program that acts as an alibi to save users from delicate situations. It is able to play different sounds during a phone conversation, eg sounds of streets, traffic jams, building site, garden or airport noise. Settings can be altered so all unknown numbers receive the same sound or if you're eager to get rid of unwanted callers from a particular number, then it's possible to set that up too.



BPS Spyware and Adware Remover 9.2.0.6

Freeware

www.bulletproofsoft.com/spyware-remover.html

Unfortunately, the internet is not a safe place to visit, with many unscrupulous people just waiting to steal your personal details and start applying for credit cards in your name and so on. You will need to take precautions, so your identity doesn't end up in anyone's hands but your own.

A spyware and adware remover is a must and this free program scans the memory, registry and drives on your smartphone for known adware modules and spyware parasites and lets you remove them safely from your system. It's easy to use and once installed, runs quietly in the background until it detects malicious programs.

It will then allow you to ignore programs found that you might not want to delete. It has multi-language support and has plenty of useful features such as a popup blocker.

Documents To Go 2

\$49.99 (£27.26 approx)

www.dataviz.com/products/documentstogo/uiq

Mobile professionals need to be able to update presentations and documents instantly whilst on the move. Wherever you go, this program will do the trick for you.

It allows you to use, edit and create actual Word, Excel and Powerpoint files on your smartphone. Whether you prefer to receive files via email attachments, Bluetooth, IR, MMS or external memory cards, you can stay truly productive. It works with a technology called Intact which keeps all original formatting intact, whatever you do with the file. It's also reassuring to be working on the actual Word or Excel file on your smartphone, rather than on a copy of a converted document.

	A	B	C	D	E
1	Worldwide Unit Sales				
2	Part#	Jan	Feb	Mar	Q1 T03
3	Widgets				
4	A15001	443	565	731	1739
5	A16002	131	332	56	509
6	A17003	29	102	78	209
7	A18004	78	345	34	457
8	A19005	34	7	78	119
9	A19006	345	6766	453	7564
10	A19007	678	999	453	2130
11	A19008	456	356	561	1373
12	A19009	890	7657	125	8672
13	Total	3074	17129	2569	22772
14	Gadgets				
15	E21005	45	87	43	175
16	E22006	3	56	43	102
17	E23007	34	31	98	153
18	E24008	13	67	35	104
19	E25009	14	3	3	19
20	E25010	345	6766	453	7564
21	E25011	678	999	453	2130
22	E25012	456	356	561	1373
23	E25013	890	7657	125	8672
24	Total	2477	16012	1803	20292
25	Do Not Know				
26	B4001-F	900	1001	445	2346
27	B5002-F	456	454	765	1675

Jabp Lite

Freeware

www.freepoc.org/viewapp.php?id=58

Keeping track of your finances isn't particularly fun, but if your budget's tight it's always a good idea to keep track of your outgoings. This neat freeware does pretty much everything you need when it comes to personal finance – you can save information about regular transactions, tracks investments, view standing orders and transactions and even calculate if

you will have enough money until pay day.

One useful feature is the Top 10 expense categories, which will give you a clearer picture of exactly where your hard-earned cash is going. Multiple accounts can be created and managed and foreign currency accounts will be automatically revalued when exchange rates change.

Its sister program, JabpBT, allows users to exchange data with a PC via Bluetooth, if you also use PC-based financial programs.



Ogg Play

Freeware

<http://symbianoggplay.sourceforge.net/OggPlayMain.htm>

Ogg Play is an open source audio player for Symbian series 60 and 80 phones. Ogg format audio files are a lot smaller than mp3s of similar quality, making them ideal for smartphone use.

The player's features do vary a little depending on the particular model you have, but in all cases it also plays any other audio formats supported by your phone, such as mp3, aac, mp4 and m4a.

The interface can be skinned, either by designing your own or downloading one of the many available on the web. It supports hot-key assignments, allowing you to customise its operation. On some phones you can even use the Ogg files as ringtones.

Navicore Personal

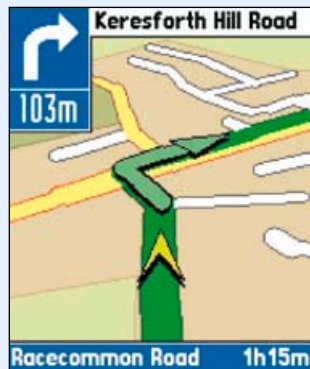
Commercial £199.99

www.navicore.fi/en_GB

Now you can plan your route with the help of your smartphone. Navicore Personal has all its info supplied on a memory card, so navigation and route planning is quicker as map information is stored locally and doesn't depend on network availability.

Currently only available on Symbian's 60 or 80 series,

Navicore consists of a GPS receiver and an MMC memory card containing vector maps covering all of the UK, along with the application itself. Road and place names are displayed and you can change the settings to include other places of interest. The maps and the application take up about 160MB of the 256MB memory card, so there is plenty of space left for additional maps.



The GPS receiver can be placed almost anywhere in your car - the transmission between the receiver and handset is made via Bluetooth. The navigation software can also be used without the GPS receiver as a map database. Roads or places of interest can either be located through manual scrolling and zooming in or by searching using postcodes or address details. Route planning and navigation is quick and easy. Calculating a route takes a few seconds and, if you digress from the course, new directions are suggested. Navicore doesn't disappoint under stressful conditions; it is quick and accurate so you can drive without looking at the map, listen to the instructions and still reach your destination.

Trivopaedia

Freeware

<http://3lib.ukonline.co.uk/trivopaedia.htm>

Whether you're taking part in a pub quiz or simply getting into an argument about who won the Nobel Peace Prize in 1975, the freeware Trivopaedia could be a lifesaver. It's a fun program featuring a mountain of information, including airline codes, Oscars, the Periodic table, wonders of the world, bible versions, football world cups, musical terms, vitamins, kings and queens, longest rivers and some 200 other categories. It's a useful tool to have if you ever get stuck on a crossword or simply a fun knowledge database for looking up new pieces of trivia if you're slightly bored.

Métro 5.3.1

Freeware

<http://nanika.net/Metro>

When you're in a new city, it always takes a few days to get to grips with its public transport systems. Some underground systems around the world are more user-friendly and intuitive than others, but it always helps to have a map to hand. Métro does the job for you.

Select the relevant city and two underground stations you wish to travel in between and Métro will work out the easiest and quickest way to get there or, if you'd rather work the route out yourself, just tap on the map button and the network map will be displayed. It will tell you approximate travel time and information about lines changes and so on. Places of interest near your destination are also displayed, along with contact information. The best bit about this program is that it remembers the stations you last travelled to in its history, which saves time on searches if you're prone to travelling from a particular departure point.

Smartanswer 2.04

Shareware €9.95 (£6.84 approx) (15 day trial available)

www.symbianware.com/product.php?id=sanswer60

If your mobile operator's voicemail system costs you money or you simply don't like its features, Smartanswer is a replacement answering machine for your smartphone.

There are two views in the program, the answering machine and a message player. You can switch between them with left and right navigation keys. The display will reveal the status of your answerphone, whether it is turned on or playing or recording a new message. In this view, message statistics will also be displayed; how many unheard messages are stored and an approximate number of messages that can be recorded.

Time Log

Freeware

<http://3lib.ukonline.co.uk/timelog.htm>

This application is a really useful tool for freelancers or project managers who are working on several projects at once, where the need for time management is crucial to them completing tasks to deadline.

Time Log helps your smartphone keep minute-by-minute track of time you spend working on different projects and for a number of customers.

Start and stop timers for up to 12 different projects are available, with time for the current period shown while total time spent shown at all times.

Stop/start times and optional comments are logged for each project into separate delimited text files (with a choice of delimiters), for direct import into Excel or similar.

Project Name	Status	Start Time	End Time
John Doe Inc	GO	0:06	4:17
Palmtop Pubs	STOP		0:00
David Bizzell	STOP		1:00
Swingler	STOP		0:52
Clove	STOP		0:25
Customer 6	STOP		0:07
Customer 7	GO	0:01	239:39
Customer 8	STOP		0:29
Customer 9	STOP		1:00
Customer AB	STOP		0:05
Customer 11	STOP		0:00
Customer 12	STOP		0:00



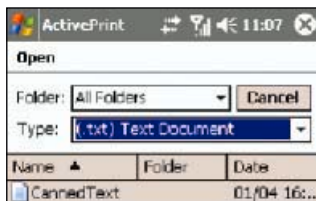
WINDOWS MOBILE

Microsoft's smartphone platform is part of the Windows Mobile family and shares application support with most Pocket PCs. In the past software was dogged by the need for developers to provide separate applications for each different processor, but these days you don't need to worry about this.

Activeprint

Commercial 15 free uses, then \$39.99 (£21.92 approx)
<http://activeprint.pocketwatchsoftware.com>

Getting documents from your smartphone to a desktop printer usually involves investing in a Wifi or Bluetooth adapter. Activeprint is a software package that lets you print out documents by hooking your device up to your desktop computer. Whenever you want to print a document, place it in the Activeprint queue on your smartphone. Then, when you connect it to your desktop via Activesync, it will communicate with Activeprint and send all queued documents to your desktop's default printer. You can download a trial of Activeprint, but if you want to carry on using it after 15 uses you'll have to pay for the full version.



Handyconverter

Free
www.modaco.com

It's not exactly pretty, but Handyconverter does exactly what it sets out to do – convert various imperial and metric measurements. Once you've installed the software, simply enter a type of measurement, then the original value and finally choose what you want to convert it to.

Handyconverter will then present you with the converted measurement. If you want your applications to be stylish as well as functional, this isn't for you, but it's a useful application to have and is totally free.

Magic Button

Freeware
www.trancreative.com

If you often load up multiple programs on your smartphone, you'll know how hard it is to find out exactly what is currently running. Magic Button is a simple yet incredibly useful utility that allows you to see exactly what applications are taking up system memory and, if necessary, close them down with the minimum of fuss.



Similar to the standard Windows XP taskbar, Magic Button displays all active programs in the form of icons. You can quickly switch between applications and even close them all down with just one command.

Magic Button isn't the only taskbar application for Windows Mobile, but in our view it's one of the best and something users have been crying out for.

Agile Messenger

Freeware
www.agilemobile.com

Agile Messenger lets you sign-in to your instant messaging program using your Pocket PC or smartphone. Instead of using its own instant messaging system, Agile Messenger supports six of the major messaging applications. With a clean interface, Agile Messenger makes it easy to send messages to your contacts and includes features such as smiley support and a split screen interface. You can also add or remove contacts, keep track of how much data you're transferring and both send and receive images.

Intelligolf

Par edition \$29.95 (£16.50 approx)
www.intelligolf.com

If you're a keen golfer, Intelligolf lets you keep record of everyone's scores in one, easy to reference place. One you've played a few rounds, it's possible to bring up a range of statistics and trends, while each scorecard is also available for printing. Intelligolf will even work out your handicap for you.



If you have a GPS receiver attached to your Pocket PC, you can also get highly accurate distance information. When you purchase the full version, you're given free access to Intelligolf's database of courses, which contains over 20,000 highly detailed maps, hole handicaps and par ratings. The demo version will work for three rounds of golf.

Dava Image Viewer

Freeware
www.dicesoft.com



Image viewers for Windows handhelds aren't exactly in short supply, but Dava Image Viewer is one of the most fully featured and, more importantly, is totally free to download and use.

Supporting most popular image formats, jpeg, bmp, gif and png, Dava Image Viewer is also able to fire up a slideshow of your favourite photos. More advanced features such as zoom, rotate, full-screen as well as colour correction and contrast functions allow you to get your photos looking just the way you want them to.

Furthermore, Dava can convert images to either bmp or jpeg formats as well as extract images even when embedded in compressed zip folders.



Pocket TV Classic

Freeware
www.pockettv.com
 Although Windows Mobile handhelds come complete with a cut-down version of Windows Media Player, there are plenty of alternatives available to rival it.

One of the most popular is Pocket TV, the Classic version of which is totally free for personal use. If you've

got a smartphone with an ATI Imageon 3200 series video accelerator, such as the O2 XDA II, Pocket TV will make full use of it. It also supports jpeg screenshot capture and can handle streaming video making this a must for all those who want to watch movies on the road.

Nice Start

Commercial \$9.90 (£5.43 approx) (demo available)

www.trancreative.com

Despite the rather dubious name, Nice Start is a great piece of security software. Windows Mobile devices come with a password management feature as standard, but it's no way near as useful or easily accessible as the Windows XP version.

Nice Start aims to make password management easy with a number of features. Most useful is the ability to start your smartphone with a Windows style log-in screen.

All logon and logoff attempts are recorded and, if you have particularly sensitive information stored on your device, you can elect to perform a hard reset if too many incorrect attempts to logon are made.

Other features include customizable skins and a screensaver that displays information such as time, date and owner information.



Pocketclock

Freeware
www.megasoft2000.com

Pocketclock is much more than just a simple stopwatch application. As well as having a stylish design, features include four countdown timers, which can be run independently of each other and a grand total of 20 individual alarms.

Further functionality is available in the form of sunrise and sunset times and world clocks for major

cities. The interface can be tailored to match your needs, including setting a home town and there are a variety of different styles of stopwatch available.

Wordnet CE-SP

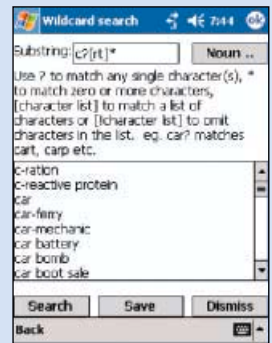
Freeware/Donateware

www.ebswift.com

If you've ever had to slowly back out of a discussion due to an unfamiliar word cropping up, Wordnet CE could well be your saviour.

Based on Princeton University's Wordnet database, Wordnet CE acts as both a dictionary and thesaurus.

Easy to use and featuring both British and US spelling, it's a tremendously useful application to have and houses a powerful search facility. Although it's free, Paypal donations of any size are accepted if you like the program.



Onspeed

£24.99 per year

www.onspeed.com

Onspeed allows users to browse the web and use web based email much faster, using clever software that compresses text and images. It's already available as a utility software for browsing the web on your PC and here is the smartphone version.

It only takes about two minutes to download, and can be used anywhere in the world. It sites quietly in the background and kicks into action when you start browsing. It can be used on any Pocket PC internet connection – including GSM, UMTS, 3G and GPRS. If you're billed by the amount of data you download, you should be able to reduce your telephone bills significantly using Onspeed.



Translator+

Commercial - 5-day trial, then \$9.95 (£5.46 approx)

www.shapeservices.com/eng/im/TRANSLATORPLUS/translator_ppc.php

Translator+ gives you the power to translate to and from languages including English, Dutch, French, German, Italian,

Japanese, Korean and Chinese. What makes Translator+ different is that it doesn't actually house the language databases on the PDA, accessing an online database instead.

Although this means you'll have to incur data transfer costs when you perform a translation, it does allow for a far greater database of words.

The trial version gives you five days of unlimited use.





PALMONE

Palm is the second-oldest platform represented here, and so has the benefit of many years of developer input and hundreds of third-party programs. All Palm OS-based Treo smartphones use version 5.x of the OS, but in some cases programs written for older versions will still work. All the applications here are Palm OS 5.x-compatible.

Bugme Classic/ Bugme Notepad

Commercial \$19.95 (£10.94 approx) (Free trial available)
www.electricpocket.com/bugme-palm

Bugme is the digital equivalent to yellow Post-it notes. Although your Palm device contains a digital organiser, those of us who respond better to visual reminders that bear a physical resemblance to familiar every-day items such as a Post-it note will find this hugely appealing. Enter your reminder text onto the virtual notepad, set an alarm date and time and sit back, safe in the



knowledge that you'll never forget another appointment.

As useful as it is, Bugme Classic (which runs on all versions of Palm OS) isn't free, but the purchase price includes an unlock key for Bugme Notepad, which is a multimedia version that requires Palm OS 5 or above.

Bugme Notepad supports audio alarms and lets you send notes via email, MMS, Bluetooth or infrared.

Busker MP3

\$19 (£10.42 approx)

<http://electricpocket.com/products/busker.html>

Lugging your smartphone around as well as a portable audio player can be very inconvenient. Busker MP3 aims to solve this problem by allowing you to play audio files on your Palm handheld. Copy your music files onto an SD memory card, plug it in and away you go. Busker MP3 has an easy to use interface, supports album cover art, and you can even browse music by artist or the directory your songs are stored in, but unfortunately Busker doesn't allow you to record audio. If you want a few extra features, and are willing to pay the \$19 license fee, it could be just what you need to stave off your Ipod envy.



Money Magazine Financial Assistant

Commercial \$19.95 (£10.94 approx)

www.landware.com

If your money management skills aren't up to par, your next investment should probably be in Financial Assistant. This helps you calculate all manner of cash conundrums, such working out which loan is the best for you, the future value of your money or whether to lease or buy. The software is fairly easy to use too. Some sections are quite jargon heavy, but if your needs are basic you can just concentrate on the more practical sections.

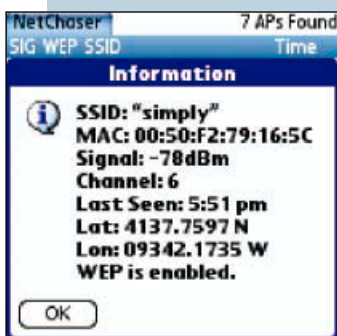
Netchaser

Commercial \$12 (£6.58 approx)

www.bitsnbolts.com/netchaser.html

Finding out if you're in wireless hotspot isn't always easy. It normally involves getting your laptop out, power it up and checking manually - not really the most convenient of methods if you have a large notebook which you have to keep setting up.

Netchaser aims to simplify this by letting you find wireless access points using your Palm handheld. It conveniently displays information such as access point SSID, Wep status, signal strength and AP Mac addresses.



MileageX

Freeware

www.pdasoftnet.com/mileagex/index.htm

Keeping track of your business mileage is one of those simple tasks that few people do well, but MileageX makes the chore a little easier. Not only will it calculate your mileage, but you can assign trips to categories and even individual cars.

You can also add descriptive notes to each trip. If you want to also keep this data on your PC, you'll need the separate MobileX Desktop application (\$13.50 download (£7.40approx)) that synchs with your smartphone and lets you export mileage data to a spreadsheet file.



Small Talk

Commercial \$19.95 (£10.94 approx)

www.landware.com

An ideal substitute for a pocket translator is the Small Talk two-way translator for Palm.

Choose your country of origin, then select the language you'd like translated and off you go. Small Talk is divided into

nine sections covering the greetings, transportation, lodging, money, emergencies, business, entertainment and social topics.

Unfortunately, the program is designed to be used by two people in turn, so you have to hand your Palm handheld to the person you're talking to and wait for them to click on a response. This poses all sorts of security issues, but if you feel you can trust strangers with your brand new Palm, it is a handy piece of software.

GET ONLINE WITH TISCALI TODAY!

CD MISSING?
CALL 0800 111 210

- Fast and reliable Internet access
- No monthly fee on Pay As You Go
- Free email
- Free web space
- Choice of great value Internet packages
- Free video mail
- Free online support
- Easy to join!

**BOOST YOUR
INTERNET SPEED**

NEW! Tiscali Accelerator

Surf up to 5 times faster with **NEW Tiscali Accelerator**. This amazing product boosts your dial up connection by cleverly compressing web pages as you browse, enabling you to surf the Internet at broadband speed. Register with any Tiscali dial up product today and enjoy **New Tiscali Accelerator** absolutely **FREE!**

tiscali.

Ultimate Centrino Notebook with 512MB, 80GB & 15.4" Screen



SPECIALS | HOME PCS | POWER PCs | HOME LAPTOPS | POWER LAPTOPS | BASE UNITS



Tiny PowerLite C835E

E-Code: 01537

The Tiny PowerLite C835E is the highest specification Intel Centrino notebook you can buy for £699. This notebook comes with superb 15.4" WXGA screen, massive 512MB RAM memory, 80GB hard disk, built-in 2.1 subwoofer sound system, multi-card reader, and Wi-Fi wireless. All this at a sensational £699 Including VAT!

PLUS ADVANCED FEATURES

- ✓ Firewire 1394 port for digital camcorders and iPod etc
- ✓ USB 2.0 x 3 ports for a multitude of devices and peripherals – connect to virtually anything
- ✓ PCMCIA Type II card slot with cardbus
- ✓ S-video TV-out connections for large screen TVs
- ✓ 56K Modem including telephone cable. Wanadoo Broadband upgrade available.
- ✓ 6 Cell Li-ion long life (normally 2 hrs) battery
- ✓ Ergonomic keyboard, Glide pad and 4 direction scroll
- ✓ SVGA-Out (projectors), 10/100 Ethernet for Broadband, Networking, Audio and Mic
- ✓ Dimension 354x250x32mm; 3Kg. Model (N2514)

PLUS MICROSOFT® SOFTWARE

- ✓ Microsoft Windows XP**
- ✓ Microsoft Office 2003 60 day trial#. Microsoft Word, Microsoft Excel, Microsoft Powerpoint, Microsoft Outlook.
- ✓ Microsoft Works 7 – Six integrated applications

PLUS CYBERLINK POWER SUITES**

- ✓ Cyberlink PowerDVD 5 with DivX, the world's no.1 DVD software player.
- ✓ Cyberlink PowerProducer 2 Gold: full-feature authoring package allows you to copy DVDs.
- ✓ Cyberlink Power2Go: powerful and easy to use data burning suite. Create your own CDs and DVDs.
- ✓ Cyberlink Music Match: play back audio music and copy to CDs.

SENSATIONAL PRICE

£699 **BUY**

inc vat
PLUS DELIVERY†

Power Deal E-Code: 01537

OFFER ENDS 31st JULY

POWER LAPTOPS

£599
Laptop Deal

£699
Laptop Deal

£799
Laptop Deal

FREE DELIVERY
Only when you order online. Limited Offer

POPULAR OPTIONS

All this for just £89 extra Complete Package



with carry case, Lexmark X1180 All-in-One Printer, Scanner, Photocopier, external keyboard and external mouse (Printer cable not included)

INTEL 735 MOBILE PROCESSOR

The latest Intel Pentium M 735 (1.7GHz, 2MB Cache) processor with low power consumption and extended battery life.

512MB DDR RAM

Massive 512MB of high speed DDR RAM increases performance and allows multiple applications to run at the same time – double the size of other notebooks!

80GB HARD DISK

Large 80GB hard disk (double that of most notebooks) provides massive capacity for large amounts of photos, music albums, videos and other files.

DVD-Rw Multiformat

Multiformat Panasonic DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes**. Also acts as a DVD movie player.

15.4" WXGA Screen

Ultra high definition 15.4" WXGA TFT screen, superb brightness, high contrast ratio, and dual display facility (1280x800).

WI-FI Wireless

Built-in Intel 802.11B/G Wireless module and antenna allows you to connect wirelessly to the Internet and other computers in the house or office**. Hotspot compatible with hotels, airports, universities – access the Internet and your office on the move!

ATI Radeon 128MB GRAPHICS

Built-in 128MB ATI Radeon 9700 dedicated graphics provides ample power for general use and games.

3-in-1 Card Reader

Multi format memory/flash card reader and writer with support for SD, MMC and MS memory cards. Use with digital cameras and printers.

2.1 Subwoofer System

Includes built-in subwoofer with 2.1 advanced sound system and built-in microphone.

OTHER 15.4" THIN & LIGHT

"15.4" widescreen thin and light DVD Burner Notebook for £549"



CM3400 with Intel Celeron M 350, 256MB, 15.4" TFT, DVD-Rw multiformat, 40GB, 64MB graphics, Wi-Fi wireless. (N2214) **£549**
E-Code 01203

"15.4" Centrino Notebook with DVD-Rw for £649"



Intel Pentium 1.5GHz, Intel Centrino Technology, 256MB, 15.4" TFT, 40GB, DVD-Rw, 64MB graphics, Wi-Fi. (N2514) **£649**
E-Code 01545

"£649 15.4" Notebook with 128MB ATI 9700 graphics"



CM3400 Pro with Intel Celeron M 350, 512MB, 40GB, 15.4" TFT, DVD-Rw, ATI 9700 128MB graphics, Wi-Fi, card reader. (N2517) **£649**
E-Code 01313

"15.4" Centrino Notebook with ATI 9700 128MB for £799"



Intel Pentium M735, Intel Centrino Technology, 1024MB, 15.4" TFT, DVD-Rw, 80GB, 128MB ATI 9700 graphics, Wi-Fi, card reader. (N2517) **£799**
E-Code 01312

tiny.com

FREE DELIVERY For a limited period when you order online

THE LOW COST PC COMPANY

ORDER HOTLINE **0870 830 3127**

or visit www.tiny.com to see the full range

Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

3 YEAR Extracare Extended Warranty **£129** **19.9%** APR

†Courier Delivery £39.99. Pay courier delivery by credit card. Free delivery for online orders only. Time Plan Finance Example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected models. Written details on request. These deals are not available from our partner firm The Computer Shop. **Back-up CDs available at extra cost. #Special permission is required to copy CDs/DVDs that are copyright. #The 60 day trial version - option to purchase extended version for special price - ask for details. **Suitable broadband router required. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 770701. Licensed credit brokers. Offer extended. E&OE.

Softtick Card Export II 2.19



Commercial \$14.95 (£8.19 approx)
www.softtick.com

The addition of a removable memory card on your Palm handheld is a very useful feature – but you'll need a separate memory card reader if you want to access any files you've stored on it.

Softtick Card Export II solves this problem by letting you use your Palm as a USB memory card reader.

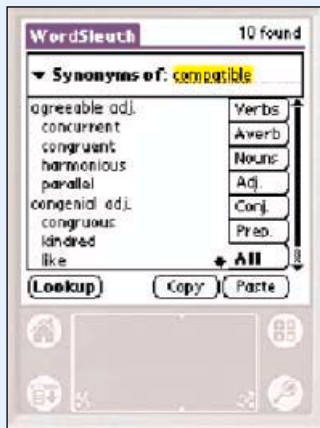
Just launch the program and Windows detects the memory card as an additional hard drive – allowing you to move files to and from the device with ease.

Wordsleuth

Commercial \$14 (£7.67 approx)
www.landware.com

Writing documents on your Palm handheld is very convenient, but its standard text editors lack thesaurus functionality. Wordsleuth provides over 210,000 synonyms at the tap of a stylus, so you'll never be stuck for words again.

Unfortunately it doesn't integrate itself with other text applications, but it is quick easy to use. Just enter a word you'd like to find a synonym for, tap the 'Lookup' button and Wordsleuth does the rest. Results are conveniently divided into sections so you easily identify verbs, adverbs and nouns. It is a little pricey at \$14, but if you don't want to carry a thesaurus around with you, then it's worth the money.



Splashwallet

Commercial \$59.95 (£32.86 approx)
www.splashdata.com

Splashwallet from Splashdata is a collection of programs that lets you keep all your valuable information in one place.

SplashID stores all your pin numbers, usernames and passwords and Splashmoney is a personal finance manager that lets you record all your transactions, Splashphoto lets

you keep and view images on the go and Splashshopper is a handy digital shopping list that can help you remember your weekly grocery items (including prices).

If you're the type of person that would lose your head if it wasn't screwed on then this is just what you need.



Tip Assistant

Freeware

www.landware.com

Going to dinner with a large group of people is never easy. Not only do you have to ensure you match the right cutlery with the right course, but at the end of it, you also have to figure out exactly how to split the bill and what to tip the serving staff. Money Magazine Tip Assistant does all this for you.

Enter the total amount of your bill, the number of people who took joined you for dinner and enter the amount you'd like to tip. Default options of between 10-20 per cent are given, but you can manually enter any tip percentage you'd like and the correct sums are given to you.

You can also beam a copy of Tip Assistant to another handheld device. Unfortunately, only US dollars are catered for, but this is still a time-saving and useful, free application.

Wine Enthusiast Guide

Commercial \$19.95 (£10.94 approx)

www.landware.com

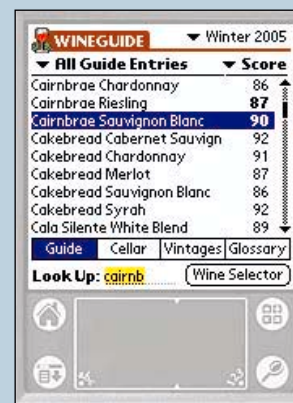
If you've ever found yourself in a restaurant or wine cellar utterly baffled about what wine to order an ideal solution to your problems could be the Wine Guide from Landware.

Developed in conjunction with Wine Enthusiast Magazine, the software has a comprehensive list wines, each with up-to-date

details, reviews, ratings and retail prices (in USD) for over 12,600 wines worldwide. Simply scroll through the list or enter a manual search for the wine of your choice.

As well as a wine guide, there is also a vintage key that lets you know whether a particular wine is at its peak, past its prime, or completely undrinkable.

The Wine 101 section is a useful accompaniment, offering tips on wine etiquette, wine and health, and pairing wine with food.



Treo Voice Dialing

Commercial \$19.95 (£10.93 approx)
www.voicesignal.com

The buttons on the Treo 650 are somewhat small, so if you've got large fingers, making calls can prove tricky.

Treo Voice dialing aims to solve this problem by allowing you to place calls with the sound of your voice.

Some phones place limits on the number of entries in your contacts that can be dialed via voice, but with Treo Voice dialing, you can call everyone in this manner.

Usefully, you don't have to train the program to recognise your voice – so there's no lengthy setup procedure.





BLACKBERRY

Blackberry has stormed into Europe over the last couple of years, after many years of success in the US. Popularity has bloomed since Rim added phone capabilities to its email-only devices and, after a relatively slow start, there are now lots of add-on applications available for this platform. Although they're mainly business-focussed, there are a few more fun titles around.

Abidia Wireless 2.5.3

\$29.99 (£16.37 approx) licence; \$3.99 (£2.18 approx) monthly sub
www.abidia.com/p2-87.html

Buying and selling on Ebay is getting more popular every day, but it can be difficult to keep up with the end of a listing if you're not in front of your computer day and night.

Abidia Wireless gives you the freedom to use Ebay on the road, in meetings or simply when you're away from your computer. Search, browse, bid and monitor active auctions directly on your Blackberry, anytime, anywhere. Abidia's Bidsync technology performs searches quickly and displays your items including images.

Watching [18]	
\$239.95	Motorola MPX200 MPX 200
\$51.00	NEW UNLOCKED BLACKBERRY
\$94.00	RIM Blackberry 6210 AT&T
\$85.00	NEW SEALED BLACKBERRY 5
\$162.50	NEXTEL BLACKBERRY 6510
\$127.50	TOSHIBA/AUDIOVOX 2032
\$106.99	RIM BLACKBERRY 6710 WI
\$95.00	RIM BLACKBERRY 6710 WIR
\$2.99	PALM M100 M125 M130 LEA
\$65.55	NEW SEALED BLACKBERRY 5

Searching is as easy as on a PC and all items are synchronized with your My Ebay account, where you can check the status of your bids and purchases.

Eoffice Basic Edition

Commercial \$119.95 (£65.44 approx)
www.dynoplex.com/eOffice.shtml

Eoffice is an integrated suite of productivity applications for Blackberry devices. It lets users edit, create and access Word and Excel files straight on their handset. There are three versions of the program available – the Basic Edition enables you to edit existing and create new Excel and Word compatible documents.

It includes Eword, a word processor, Ecell, a spreadsheet editor and Efile, a file management utility, which allows you to take full control of all files, folders and documents stored on your device. Moving your files to and from the device is easily done with a one step synchronisation process using the Efile Desktop manager.

Golf Scorecard 2.0.1

Bossenstein Golf & Country Club				
TEE: NORMAL				
PAR: 71				
DIST: 4905				
H	P	SI	DIS	
1	4	18	260	
2	4	8	320	
3	3	16	117	
4	4	12	324	
5	3	10	159	

Freeware

www.wireless18.com

Instead of fiddling around with bits of paper when you're out on the golf course, calculate all your round statistics with an electronic scorecard. This one provides an easy way to store your golfing

memories for the future, for reference and comparison (and hopefully, improvement).

You can keep track of the scores of up to four players, informing on everyone's gross, net, par and points as well as playing statistics. It also contains downloadable information about any golf course in the world, which would be useful if you a keen player wishing to do a few rounds when you're out travelling.

Berry Bloglines RSS Reader 1

Freeware

www.thebogles.com/berry_bloglines.html

This is a free RSS reader for reading news feeds and blogs. It offers full PC integration and reformats full pages from news websites eliminating unnecessary menus so they can be read on your handset. You can read not just the blog entries but also the full articles they link to.

You can manage your RSS subscriptions either on the Blackberry or your PC and when you read a message on one it will be marked as read on the other.



Dictomail 3.1c

Freeware

www.dictomail.com

This is a clever freeware program that converts your voicemails into text messages. If you spend a lot of time and money retrieving your voicemail messages one by one, how about getting your messages sent to your Blackberry as text messages instead? It will make it easier to prioritise urgent calls and have a text reference if you need to refer back to a message later.

If you prefer, you can respond to calls via email instead. It's also useful if you're in quiet environments as you can retrieve the message without disturbing anyone.

Another clever feature is the special information tone, which can be set to be played to incoming calls from telemarketers. The predictive dialer at the other end will then believe your number is no longer in use. A quick way to ensure the calls you do get are genuine.

Expenseminder

Commercial \$20 (£11 approx) (trial version available)

<http://resources.rimdev.com/expenseminder.htm>

Expenseminder is a powerful expense tracking application with a simple interface. It allows you to record individual expense entries into reports and then calculates a running total for each report. The list of entries can easily be customised to feature common expense categories and entries and it also recognises each piece of information entered to save you having to type the same entries in over and over again.

The reports can be sent via email in an easy to read format. The program can also track submitted and reimbursed reports so they do not get lost. The Description, Location, People and Purpose fields have customisable, multi-select lists of common phrases and there are numerous subcategories under these sections. You can also link people from your Blackberry address book into expense reports. In addition, the common selections for Description are different for nearly every expense type.

Newsberry RSS reader 1.1

Commercial \$9.95 (£5.42 approx)

www.79bmedia.de/content/view/16/48

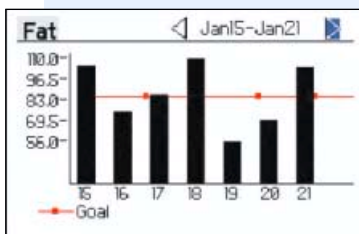
Let your Blackberry keep you up to date with Newsberry, an RSS news reader that will keep you abreast of breaking news from news sources all over the world.

It's been developed with ease of use in mind and supports a multitude of news feeds, whilst also retaining a well-designed user interface. It already comes equipped with a number of news feeds ranging from the most investigative politically minded broadsheets to more tabloid-style publications. The rest is up to you.

Total Fitness 1.5

\$29.99 (£16.30 approx) (Four-day free trial)

www.b4technology.com/TotalFitness.html



Keep track of your fitness regime with the help of Total Fitness - it contains a database listing some 5,000 food items and their nutrition information, which makes it easier to track your daily intake of these food groups.

The program can keep a log of your exercise - enter the type of

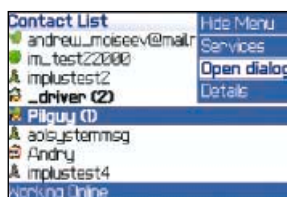
exercise and information like duration, distance and course and it will display your progress in a graph. It also contains a database of some 60 weight training exercises sorted by body part, where you can enter weight and repetition information. Other health information is also featured.

IM+ Blackberry Instant Messenger 2.2

\$44.95 (£24.49 approx) (Five-day free trial)

www.shapeservices.com/eng/im/blackberry

Rather than emailing or talking, instant messaging is a handy way to keep in touch. This nifty little application supports the most popular instant messaging systems and allows the always-on exchange of instant messages easily, cost-effectively and in real-time straight to your Blackberry. Your contacts will be listed under the various servers and all contact info is synchronised with your desktop computer instantly.



Worldmate Professional

\$59.95 (approx. £33 approx) (1 year subscription, trial available)

www.mobimate.com

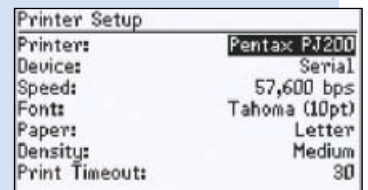
This is the perfect application for travellers, offering everything you'll need to do your globetrotting without stress. Worldmate offers you subscription-based access to airline schedules, currency converters, a world map, hotel and car hire information and weather reports. There's also a world time display and listings of International and US phone dialling prefixes. It's not cheap, but it's indispensable if you're on the move. The program connects to the Mobimate servers either via your corporate Blackberry Enterprise Server or normal Wap.

In Step Print 1.1

Commercial \$29.95 (£16.32 approx) (30-day free trial)

www.instepgroup.com

Let's face it - most people won't do any major printing whilst out and about, but for mobile professionals who spend their days driving between meetings and seldom venture into an office, it's useful to have a



mobile printer to hand. In Step Print proves a useful application for printing important email messages and other documents. Setup and configuration of printers is done via the options manager and most laserjet, deskjet, postscript and portable battery-operated printers are supported. It requires less than 120KB of storage, so it's definitely one to install just in case.

Mini Safe

Commercial \$29.75 (£16.20 approx) (30-day free trial)

www.simpritt.com/minisafe_bb

As the number of passwords and PINs that the average person carries with them increases almost on a daily basis, it can be a real struggle remembering them all, so why not store them all safely and securely on your Blackberry?

The information is there to be accessed wherever you are and yet the security is not compromised. Mini Safe protects and encrypts your information by using an encryption algorithm, called advanced encryption standard (AES). It is designed specially for Blackberry, so is optimized for best performance and has an intuitive interface.

Shop Magic 1.0.2

Commercial \$12.95 (£10.85 approx) (14-day free trial)

www.software-for-blackberry.com

Doing the weekly shop is a real bore for some and if you haven't yet discovered the wonders of online grocery shopping, then at least this can make your trawl through the supermarket less tedious. Shop Magic lets you create a mobile shopping list on your Blackberry in order to keep forgotten items to a minimum. The program contains some 400 food items, so just select the items you're running short of in these health-conscious times, creating a shopping list before you head off for the shops and sticking to it, should help you save both time and money, as well restricting impulse shopping.





More useful software

NAME	URL	PRICE	DESCRIPTION
BLACKBERRY			
Datemathica 1	www.shrunkenhead.biz	4-day free trial, then \$9.99 (£5.43 approx)	Date calculator for working out deadlines etc
Espell	www.dynoplex.com	\$29.95 (£16.30 approx)	Spellchecker when you're on the road
Explorer Pro	www.pdatopsoft.com	\$5.99 (£3.26 approx)	View memory usage and how much signal you have
Ezcase Secure Data	www.dynoplex.com	\$29.95 (£16.30 approx)	Data storage application
Globetrack	http://globetrack.dnsalias.com	Freeware	Retrieve GPS data and send it to your desktop computer
Idokorro Mobile Admin 2.9.26	www.idokorro.com	30-day free trial then \$245/server (£133.23 approx)	Administrate computers and networks anywhere
Minixel	www.simprit.com/minixel	30-day free trial then \$19.75 (£10.74 approx)	Portable spreadsheet program
Pocketadmin 2.3	www.xb.com/products/pocketadmin	30-day trial demo	Server/database/network/application management
Pocketmac	www.eaccess-estore.com	\$29.95 (£16.30)	Mac desktop application
Pocketmetro 2.16	www.clocklabs.com	5 searches then £3.94	Route planning between two tube or rail stations
Searchmagic	www.software-for-blackberry.com	7-day trial then \$12.95 (£7.05 approx)	Search for calendar events, address book entries and tasks
Sparrow (Email) 1.9.6	http://rallypilot.sourceforge.net/bb	Freeware	Application to replace the built-in messaging software
MICROSOFT WINDOWS MOBILE			
Attachsmart Classic 0.0.10	www.smartphone.net	Freeware	Send documents as mail attachments
Bluetunes	www.modaco.com	Freeware	Listen to mp3s with Windows Media player
Bugme Office 3	www.electricpocket.com/bugme-ppc	\$29.95 (£16.34 approx)	Note taker and 50 productivity note templates
IM+	www.shapeservices.com/eng/im/PPC	\$29.95 (£16.34 approx)	IM+ for Pocket PC supports MSN, ICQ, AOL and Yahoo
Jeyo Mobile Companion 1.1	www.jeyo.com/companion.asp	15-day free trial then \$14.95 (£8.14 approx)	Operate your Pocket PC from a Windows PC
Jeyo Remote	www.jeyo.com/remote.asp	15-day free trial then \$14.95 (£8.14 approx)	Remote for your PC on your Pocket PC
John Cody's Vnotes 1.0.7	www.omnisoft.com/vnotes/default.asp	28-day free trial then \$11.95 (£6.51 approx)	Audio recording of notes and information
MagicSS	www.louterrailoune.com	Freeware	Screen capture utility
Omnisolve	www.landware.com	\$19.95 (£10.87)	Financial problem solver
Pocketxchange	www.bbpcsoftware.co.uk	Freeware	Currency converter
Smart Explorer 2.0.2	www.binarys.com/SmartExplorer_en.asp	Freeware	Manage the files and folder on your phone
Smart Hiker	www.bbpcsoftware.co.uk	Freeware	GPS software for walkers, hikers and mountaineers
Smartphonenotes 1.2	www.syncdata.it/sphnotes.html	30-day free trial then \$12.95 (£7.05 approx)	Synch Microsoft Outlook text notes
PALM OS			
Backupman 1.53	www.bitsbolts.com/backupman.html	\$10 (£5.47 approx)	Backup application
Butler 2.86	www.hobbyistsoftware.com	\$11.95 (£6.54 approx)	Alarms, attention grabbers and navigation
FastCPU 3	www.megasoft2000.com	\$14.95 (£8.18 approx)	Control your device speed parameters
Leonard Maltin 2005 Movie Guide 1.4	www.landware.com/movieguide/palmos/index.html	\$19.95 (£10.91 approx)	Portable movie guide
Megacalc 3	www.megasoft2000.com	\$14.95 (£8.18 approx)	Calculator
Neatfreak Pack 2.70	www.northglide.com/products.html	\$18.50 (£10.12 approx)	Spring clean your handheld
Nexus Dictionary 1.5	www.pocketsensei.com/nexus.php	21-day free trial then \$19.95 (£10.91 approx)	English dictionary
Noviiremote 2.6	www.novii.tv	\$24.99 (£13.67 approx)	Control allof your home entertainment equipment
Pocket Tunes	www.pocket-tunes.com	15-day free trial then \$14.95 (£8.18 approx)	mp3/wma player
PowerRun 1.3	http://simple-palm.com/index-e.html	\$15 (£8.21 approx)	Run applications from the memory card
Snailmailer	www.stevenscreek.com	14-day free trial then \$19.95 (£10.91 approx)	Mail merge application
Splashblog	www.splashdata.com/splashblog	30-day free trial then \$19.95 (£10.91 approx)	Publish photos to an online album and share with others
Voice Dialer Std 2	www.groverind.com	\$24.95 (£13.65 approx)	Voice dialing application
SYMBIAN OS			
Callrecorder 1.03	www.symbianware.com	€9.95 (£6.84 approx)	Record incoming and outgoing phone calls
Fastbackup	www.freepoc.org	Freeware	Backup program
Freecrypt	www.freepoc.org	Freeware	Encrypt sensitive files
Juiqidz 3.30	http://jumpjack.altervista.org	Freeware	Freeware dictionary
Mapper	http://3lib.ukonline.co.uk/mapper.htm	Freeware	The classic Psion mapping system
Microcalc	http://mixa.dev.juga.ru	Freeware	Spreadsheet application for Java-enabled devices
Opera	www.opera.com	Freeware	Handheld version of the popular browser
Powercar 1.03	www.symbianware.com	€9.95 (£6.84 approx)	Personal car manager
Quirc 1.10	http://quirc.rtfm.se	Freeware	Internet relay chat client
Splashphoto	www.splashdata.com	30-day free trial then \$29.95 (£16.31 approx)	Mobile digital picture frame
Travelclock 1	www.megasoft2000.com	\$14.95 (£8.14 approx)	Multifunctional clock
Tuberoute	www.freepoc.org/viewapp.php?id=60	Freeware	Find the best route between two stations

One board fits all



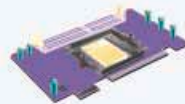
PF88 EXTREME Hybrid



■ Are CPU and memory type your concerns when purchasing a motherboard? With ECS's innovative PF88 it's no problem at all: The innovative PF88 motherboard with patented EliteBus design -- plus all the latest advanced technology -- lets you utilize the features of AMD K8 architecture on an Intel LGA775 platform with a SIMA card inserted.



■ This unique slot is designed to accommodate SIMA card. With EliteBus, users can now enjoy both Intel and AMD technology on one motherboard plus simultaneously experience desktop and mobile CPUs on a single motherboard.



■ SIMA card (platform converter card)



■ Easy installation



www.redstore.com

sales@redstore.com
0870 870 4457

directfrom.com

www.directfrom.com
0870 870 4457

MAPLIN
ELECTRONICS

www.maplin.co.uk
0870 429 6000

MD

www.microdirect.co.uk
0870 444 4456

pnexday

www.pnexday.co.uk

Ultimate 17" Widescreen Media Centre Notebook



SPECIALS

HOME PCS

POWER PCs

HOME LAPTOPS

POWER LAPTOPS

BASE UNITS

Tiny PowerLite G935

E-Code: 01538

The Tiny PowerLite G9 series notebook uses the new Intel Pentium 4 630 64bit processor with 2MB cache and comes with superb 17" WXGA screen, massive 1024MB RAM memory, 80GB hard disk, 6-in-1 reader, and the fastest ATI Radeon 9700 Pro (M11) 128MB graphics. It is also a powerful entertainment system and includes a PC-TV system, built-in 5.1 subwoofer sound system, and Microsoft Windows XP. All this at a sensational £999 Including VAT!



NOW EVEN HIGHER PERFORMANCE

POWER LAPTOPS

£899

Laptop Deal

£999

Laptop Deal

£1099

Laptop Deal

FREE DELIVERY
Only when you order online. Limited Offer

POPULAR OPTIONS

ALL THIS for just £89 extra Complete Package



with carry case, Lexmark X1180 All-in-One Printer, Scanner, Photocopier, external keyboard and external mouse. (Printer cable not included)

INTEL PENTIUM 4 630

The latest Intel Pentium 4 Processor with HT Technology 3.0GHz. The latest processor with 2MB Cache and 800MHz bus speed. More power per MHz.

1024MB DDR RAM

Massive 1024MB of high speed RAM increases performance and allows multiple applications to run at the same time.

80 GB HARD DISK

Seagate 80GB hard disk provides massive capacity for large amounts of photos, music albums, videos and other files.

DVD-Rw Multiformat

Panasonic DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes. Also acts as a DVD drive allowing you to watch the latest movies.

17" TFT Widescreen

Superb 17" Widescreen WXGA TFT Screen with high contrast ratio and dual display facility (1440 x 900).

ATI 9700 128MB Graphics

ATI Radeon 9700 8x AGP Graphics card (ATI M11) with 128MB DDR RAM Memory - The fastest mobile graphics we have seen.

PC-TV System

Mini-PC TV tuner fitted as standard. Capture and record onto hard disk and burn onto DVD. Multi-function remote control for power-on, TV, DVD and music.

WI-FI Wireless

Wi-Fi Wireless module and antenna built-in allows you to connect wirelessly to the Internet and other computers in your home or office. Hotspot compatible with hotels, airports, universities, restaurants - Access the Internet and your office on the move!

6-in-1 Card Reader

6-in-1 Multi-format memory/flash card reader and writer with support for SD, SM, MMC and MS memory cards. Use with digital cameras and printers.

Audio DJ

Play music CDs without powering on the system. Control panel with LED display.

5.1 Sound System

5.1 surround sound built-in with built-in stereo speakers and jacks for 5.1 external speaker system

PLUS MASSIVE CONNECTIVITY

- Gigabit LAN - 10/100/1000 Gigabit Ethernet on-board as well as Wi-Fi
- Firewire 1394 port for digital camcorders and iPod etc
- USB 2.0 x 4 for a multitude of devices and peripherals - connect to virtually anything
- PCMCIA Type II card slot with cardbus
- S-Video TV-Out for large screen TVs
- 56K modem including telephone cable. Wanadoo broadband upgrade available
- Li-ion long life 12 cell battery (approx. 2hrs battery life) and AC adaptor/charger
- SVGA-Out (projectors), microphone, Infra Red, Audio ports and MCE port
- Ergonomic keyboard and glide pad. Launch hotkeys for DVD, TV, Music, E-Mail, and Internet.
- Dimensions; 395x 285 x 39 mm. Weight; 4.5kg

PLUS MICROSOFT® SOFTWARE

- Microsoft Windows XP Home Preloaded**.
- Microsoft Office 60 day trial#, Microsoft Works 7 and Cyberlink 4 pack Suite.

Model N2919

AMAZING PRICE BUY

£999 inc vat PLUS DELIVERY†

Power Laptop E-Code: 01538

POWERLITE G945
with Intel Pentium4 640 Processor
£1099 E-code 01539

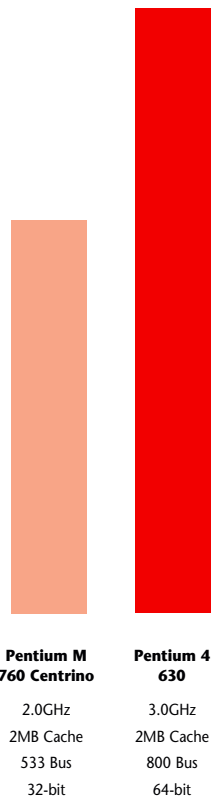
POWERLITE G955
with Intel Pentium4 650 Processor
£1199 E-code 01543

OFFER ENDS 31st JULY

NEW INTEL PENTIUM 4 630 PROCESSOR

Intel Centrino is great for long battery life and mobility, but for ultimate speed and performance we recommend Intel Pentium 4 630 processor. This includes 64-bit technology, massive 2MB cache, faster 3.0GHz clock and faster 800 Bus.

Relative Performance





CONTENTS

- 110** Canon Ixus i5
Canon Ixus 50
Casio Exilim Zoom EX-Z57
- 111** Fujifilm Finepix F10 Zoom
Kodak Easyshare LS753
Nikon Coolpix S1
- 112** Olympus Mju-Mini S
Pentax Optio S5n
Sony Cybershot DSC-T33
- 114** Table of features
Jargon explained
- 116** How we tested
Editor's Choice

Snap happy

WORDS: WILL STAPLEY PHOTOS: BRUCE MACKIE

If you need a compact digicam you can slip in your pocket and take anywhere, without compromising on picture quality, look no further, as we road test nine of the latest models

Cumberseme semi-professional digicams and digital SLRs are all well and good, but if you're going on holiday, to a party or just out on a country walk, the last thing you want is to have to drag around a bulky camera case. What you need is a camera you can stick in your pocket and forget about until a photo opportunity presents itself.

Although compact digicams can't match the quality and features of bulkier and more expensive models, they're still capable of taking startlingly good photos. As you'll see from the entries this month, manufacturers are able to cram zoom lenses into cases barely 2cm thick. It's also possible to pick

up compacts that house an impressively advanced set of features. Don't expect to see professional features, such as shutter and aperture priority modes, but most will offer manual white balance, a variety of ISO settings and exposure compensation. Some even include live histograms and manual focus tools.

In this test we take a look at a selection of the latest compact digital cameras. Aside from the 6megapixel Fujifilm entry, all the models have 5megapixel sensors. If you're unsure what to look for in a digital camera, head to the penultimate page where you'll find explanations of the jargon, to help you make sense of it all. If you've bought the CD or DVD issue of *PCW*, you'll also find test shots from each camera on this month's cover disc. >



Canon Ixus i5

You don't get much more pocket-sized than the Ixus i5 from Canon. At less than 5cm tall, it should fit in the smallest of pockets, although it does have a strap holder that juts out rather annoyingly from the case and can't be removed.

Small dimensions usually mean reduced functionality and the most notable omission is an optical zoom. As expected, a digital alternative is offered, but we'd recommend you leave it well alone.

The Ixus i5 performed reasonably well in our tests. We noticed some softening in the focus towards the edges, especially in close-up shots. Chromatic aberrations also hampered overall quality in high-contrast shots, but we've seen far worse and it doesn't hold back the Ixus i5 too much.

A 640 x 480 movie mode is available, but a paltry 10fps (frames per second) and 30-second maximum recording length makes it a pretty pointless feature.

With no optical zoom, the i5's focal length is set to 39mm, which is restrictive when framing shots.

Although photo quality isn't perfect, we still feel the Ixus i5 is worthy of an award. If you don't mind losing out on an optical zoom and aren't bothered about taking movies, this is a great little camera.

DETAILS

RRP £279 (£237.45 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Canon 08705 143 723 www.canon.co.uk

PROS Compact and stylish

CONS Slight image issues; poor movies

VERDICT

Despite a few issues surrounding the image quality, this is another great compact digital camera from Canon

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



Canon Ixus 50

Canon's second entry in this month's group test is the Ixus 50. It's a fair bit taller than the Ixus i5 and offers an enhanced set of features. The most obvious improvement is the inclusion of a 3x optical zoom lens.

Image quality is similar to the Ixus i5, but its macro mode wasn't capable of detecting the same high level of detail. A similar softening in focus was apparent at the edges of close-up photos and some chromatic aberrations were also visible.

The video mode has been given a much needed shot in the arm. As well as being able to record at 30fps at 640 x 480, the amount of recording time is only limited to the size of the memory card.

Although the cheaper Ixus i5 comes with a 32MB SD (Secure Digital) card, for some reason Canon has decided a 16MB version is appropriate for the Ixus 50. However, the fact that you'll probably end up buying a 256MB or 512MB memory card means it's not a massive problem.

At £319, the Ixus 50 is the second most expensive camera in this group test. Considering its performance, the price is high but, as ever, you'll be able to find it far cheaper on the street – you can check www.pcw.co.uk/bestprices for the latest deals.

DETAILS

RRP £319 (£271.49 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Canon 08705 143 723 www.canon.co.uk

PROS Good set of features

CONS Some image quality issues; expensive

VERDICT

The image quality problems aren't serious; it's the price that stops the Ixus 50 scoring higher marks

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



Casio Exilim Zoom EX-Z57

Models from Casio's Exilim range have always been based around compact designs and the EX-Z57 is no different. Turn the camera round and you're presented with a stunning 2.7in LCD monitor. Not only is it the biggest screen in this group test, but it's also of a very high quality, making it perfect for composing and reviewing your shots. The various controls have been squashed down to accommodate the screen, so if you've got large hands you could find operating this camera difficult.

A decent range of manual features is offered and this Casio is just one of two models in this group test to provide a manual focus function.

Casio hasn't spent much time on the movie function, which can only record at 320 x 240 with a frame rate of 15fps.

The Exilim Zoom EX-Z57 fared very well in our tests and performed almost identically to the two Canon models. Colours were vibrant in outdoor shots and plenty of detail was visible in macro mode.

Although small, this Casio camera is by no means the most compact camera here. But a combination of good image quality and well thought-out design makes it worthy of a Highly Commended award.

DETAILS

RRP £279.99 (£238.29 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Casio 020 8208 9447 www.casio.co.uk

PROS Compact; large screen

CONS Low-resolution 15fps movies

VERDICT

Poor movie mode, but the EX-Z57 is a quality compact with a large 2.7in LCD screen

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL





Fujifilm Finepix F10 Zoom

In terms of size and weight, the Finepix F10 Zoom is at the wrong end of the scale, but the extra millimetres and grammes give you a few added features that you won't find in the other models here.

First, is the 6megapixel CCD – all the other models have a 5megapixel sensor. Megapixel count has little to do with image quality, but the extra pixels mean you can either print larger photos or crop in further on detail without losing out on quality.

While most pocket digital cameras are capable of shooting at ISO100-400, the F10 Zoom can go up to ISO1600. The ISO rating determines how sensitive the camera is to light, so having an ISO1600 is a bonus if you are shooting in low light. There is a trade-off with high ISO ratings though – you'll find image noise is greatly increased. Sure enough, when shooting at ISO1600, photos are particularly grainy.

Although the 6megapixel sensor ensured this Fujifilm camera came out on top in our resolution test, the top 5megapixel models weren't far behind. What's more, it couldn't pick up as much fine detail as the Nikon in our macro shot.

The Finepix F10 Zoom scores highly in terms of features, but its bulky nature prevents it from topping the table.

DETAILS

RRP £299.99 (£255.31 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Fujifilm 020 7586 1477 www.fujifilm.co.uk

PROS Good ISO range; 6megapixels

CONS Bulky; heavy

VERDICT

Good range of features and quality photos, but the large dimensions and weight work against it

FEATURES

★★★★★

PERFORMANCE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★



Kodak Easyshare LS753

Despite sitting in Kodak's Pocket Series range, the Easyshare LS753 isn't particularly compact. Like the rest of the Easyshare range, the LS753 is easy to use. A mode dial cycles through the five shooting modes, while a simple and intuitive menu system lets you quickly adjust the various settings without fuss.

Although the LS753 is easy to use, you do lose out a little on functionality. Three white balance presets are available, but there's no manual white balance setting, which can result in an odd colour cast when shooting in unusual lighting conditions. The movie mode is also disappointing, offering just 13fps at 640 x 480.

If there's one thing that makes Kodak cameras stand out from the crowd, it's their tendency to oversaturate colours. This means you lose a fair amount of fine detail, but it's not necessarily a bad feature and many professional photo labs will apply a similar effect to make photos more vivid. That said, if you're after photos with plenty of detail you'll want to steer clear of this camera.

The Easyshare LS753 is for those who want vibrant photos and a camera that's easy to use. However, although it's the cheapest camera here, its size and lack of fine detail hold it back.

DETAILS

RRP £199 (£169.36 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Kodak 0870 243 0270 www.kodak.co.uk

PROS Easy to use; cheap

CONS Lacks fine detail

VERDICT

A typical 'easy-to-use' Kodak, but it's bulky and detail is sacrificed in favour of vivid colours

FEATURES

★★★★★

PERFORMANCE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★



Nikon Coolpix S1

Looking very similar to the Sony Cybershot DSC-T33 reviewed on the next page the Coolpix S1 from Nikon is an incredibly slim. A good-sized LCD monitor takes up the majority of the space on the rear, leaving little room for zoom, mode and other option buttons. Despite its thin dimensions, Nikon has still managed to fit in a 3x optical zoom.

The Coolpix S1 did reasonably well in our resolution benchmark and excelled in the macro test. For a camera this small, we were astounded at how much detail it picked up. Even the 6megapixel Fujifilm couldn't match the fine detail the Coolpix S1 captured in the macro shot.

The movie mode is let down by offering just 15fps and not 30fps, which is a real shame given the quality of this camera. Movies at 15fps are bearable, but they don't compare well to 30fps versions.

Nikon's Coolpix S1 fits this group test perfectly. It's incredibly thin, easy to use, packed with features and, best of all, takes high-quality and well-detailed photos.

The 15fps movie mode is a disappointment, but we can't fault it in any other area and it certainly doesn't stop the Coolpix S1 picking up the Editor's Choice award.

DETAILS

RRP £279.99 (£238.29 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Nikon 0845 4500 155 www.nikon.co.uk

PROS Quality photos; ultra-slim

CONS 15fps movie mode

VERDICT

The perfect model if you want a quality digicam you can take wherever you go

FEATURES

★★★★★

PERFORMANCE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★



Olympus Mju-Mini S

The Mju-Mini S is the follow-up to Olympus' popular Mju-Mini released earlier this year. The unmistakable design is the same and it still houses a 2x optical zoom lens. The major difference is the sensor, which has been increased from a 4 megapixel to a 5 megapixel model.

Whether or not you like the unusual design is a matter of personal taste. During testing, we found it was one of the more awkward cameras to hold. There's nothing wrong with the menu navigation, but the curved design of the casing leaves you with little to get a good grip on.

Image quality is acceptable, but it doesn't fare well against the others in this group test. In our resolution test shots the camera struggled to keep up with the front runners, while close-up shots lacked fine detail.

If you're after a camera that's not only small, but stylish as well, the Mju-Mini S will certainly appeal. Although image quality can't match other similar models, it's capable of delivering perfectly adequate photos for the happy snapper. Essentially the Mju-Mini S is a quality camera for the style-conscious and, following the Mju ethos, it's available in a choice of three colours – lagoon blue, enamel black and champagne.

DETAILS

RRP £259.99 (£221.27 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Olympus 0800 072 0070 www.olympus.co.uk

PROS Stylish; easy to use

CONS Image quality; awkward design

VERDICT

Definitely one for those who want to stand out from the crowd, but image quality is disappointing

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



Pentax Optio S5n

In 2003, Pentax released the 3 megapixel Optio S. Smaller than a pack of playing cards and capable of taking decent photos, it was an instant success and paved the way for a new generation of quality compact digicams. Two years on, and thanks to the competition from similar-sized models, it's gone through a series of revisions. The Optio S5n is roughly the same size, but houses a 5 megapixel CCD, 2in LCD monitor, lots of features and improved ease of use.

A live histogram feature isn't something you usually see in a pocket digicam, but Pentax found room for one in the Optio S5n, allowing you to expose your shots with greater accuracy. Pentax has also included a manual focus feature and a useful 'rule of thirds' grid option to help you frame the perfect shot.

Image quality is good, but it can't match the front runners here. Soft edges were apparent in the resolution tests and we found the nine-second lag between flash shots an annoyance.

The Optio S5n is a solid effort from Pentax. It houses a range of useful advanced features, all squeezed into an incredibly small casing, but overall image quality lets it down and there are better alternatives available.

DETAILS

RRP £249.99 (£212.76 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Pentax 01753 792 731 www.pentax.co.uk

PROS Advanced features; small

CONS Flash recharge time; image quality

VERDICT

Small and loaded with features, but long flash recharges are annoying and image quality isn't as good as we hoped

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



Sony Cyber-shot DSC-T33

Sony's Cyber-shot DSC-T33 is just a little bit larger than the Nikon Coolpix S1, but looks very similar.

Speed-wise, the Cyber-shot DSC-T33 doesn't hang around. You can take a photo (with flash) just 1.8 seconds after you turn it on. Flash recharge times are also impressive, requiring just over 4.5 seconds before it's ready to fire again.

Despite a 1cm macro mode, the Sony struggled to capture a huge amount of detail in our close-up test and, compared to the other models here, the DSC-T33 was at the bottom end of the scale.

A decent 640 x 480 at 30fps movie mode allows this model to double up as a pocket-sized digital camcorder. If you want to decrease the file size of your movies, a 17fps mode at the same resolution is also available. Given the usefulness of a tripod, even a small portable one, it's surprising there's no attachment. This omission also meant we had to hold the camera to take the resolution tests, which isn't ideal.

As with most things Sony, you end up paying a reasonably hefty style premium. With an RRP of almost £350, it's a fair bit more expensive than the other models. If you like the slim design, we'd recommend opting for the cheaper, and better performing, Nikon Coolpix S1.

DETAILS

RRP £349 (£297.02 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Sony 08705 424 424 www.sony.co.uk

PROS Slim design; fast power-up

CONS Average image quality; expensive

VERDICT

A good design and impressive response times, but it's expensive and image quality is disappointing

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



STAY AS LONG
AS YOU WANT

Unlimited Broadband

from only

£14.99 a month






- Download as much as you want
- Free modem and free connection
- Choice of speeds available up to 2Mbps
- No 12 month contract*







visit: www.pipex.com



Table of features

					
MANUFACTURER	CANON	CANON	CASIO	FUJIFILM	KODAK
MODEL NAME	IXUS 15	IXUS 50	EXILIM ZOOM EX-Z57	FINEPIX F10 ZOOM	EASYSHARE LS753
Price inc VAT (ex VAT)	£279 (£237.45)	£319 (£271.49)	£279.99 (£238.29)	£299.99 (£255.31)	£199 (£169.36)
Sales telephone	08705 143 723	08705 143 723	020 8208 9447	020 7586 1477	0870 243 0270
URL	www.canon.co.uk	www.canon.co.uk	www.casio.co.uk	www.fujifilm.co.uk	www.kodak.co.uk
SPECIFICATIONS					
Megapixels (total/effective)	5.2/5	5.2/5	5.2/5	6.63/6.3	5.36/5
Max resolution	2,592 x 1,944	2,592 x 1,944	2,560 x 1,920	2,848 x 2,136	2,569 x 1,929
Sensor	1/2.5in CCD	1/2.5in CCD	1/2.5in CCD	1/1.7in CCD	1/2.5in CCD
Optical zoom	N/A	3x	3x	3x	2.8x
Digital zoom	6.5x	4x	4x	6.2x	3.6x
Focal length (35mm equiv)	39mm	35-105mm	35-105mm	36-108mm	36-100mm
Macro focus	3cm	3cm	6cm	7.5cm	5cm
Max aperture (wide angle/telephoto)	f2.8	f2.8-4.9	f2.6-4.8	f2.8-5	f3-4.9
Shutter speeds	15-1/500sec	15-1/500sec	1/8-1/2,000sec	3-1/2,000sec	1/2-1/1,400sec
Manual focus	x	x	✓	x	x
Manual ISO settings	50-400	50-400	50-400	80-1,600	80-800
White balance (preset/manual)	✓/✓	✓/✓	✓/✓	✓/✓	✓/✗
Flash distance (max at wide angle)	2m	3.5m	2.6m	6.5m	3m
Auto focus assist lamp	✓	✓	✓	✓	x
OTHER					
Movie modes	640 x 480 (10fps), 320 x 240 (15fps), 160 x 120 (15fps)	640 x 480 (30/15fps), 320 x 240 (60/30/15fps), 160 x 120 (15fps)	320 x 240 (15fps)	640 x 480 (30fps), 320 x 240 (30fps)	640 x 480 (13fps), 320 x 240 (20fps)
Movie length (max resolution)	30sec 640 x 480, 3mins at other resolutions	Unlimited	Unlimited	Unlimited	Unlimited
Memory format (size of card included)	SD (32MB)	SD (16MB)	SD (9.3MB internal)	XD Picturecard (16MB)	SD (32MB internal)
Tiff mode	x	x	x	x	x
LCD screen	1.5in	2in	2.7in	2.5in	1.8in
Video out	✓	✓	✓	✓	✓
Cradle	x	x	✓	x	option
Power	Li-ion	Li-ion	Li-ion	Li-ion	Li-ion
Dimensions (w x h x d) mm (lens retracted)	91 x 47 x 24	85 x 57 x 21	92 x 59 x 23	95 x 61 x 31	110 x 50 x 30
Weight (g)	123	151	158	201	182
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

For the best digital camera prices go to www.pcw.co.uk/bestprices

			
NIKON	OLYMPUS	PENTAX	SONY
COOLPIX S1	MJU-MINI S	OPTIO S5N	CYBERSHOT DSC-T33N
£279.99 (€238.29)	£259.99 (€221.27)	£249.99 (€212.76)	£349 (€297.02)
0845 4500 155	0800 072 0070	01753 792 731	08705 424 424
www.nikon.co.uk	www.olympus.co.uk	www.pentax.co.uk	www.sony.co.uk
5.2/5.1	5.4/5	5.25/5	5.2/5.1
2,592 x 1,944	2,560 x 1,920	2,560 x 1,920	2,592 x 1,944
1/2.5in CCD	1/2.5in CCD	1/2.5in CCD	1/2.4in CCD
3x	2x	3x	3x
4x	4x	4x	6x
35-105mm	35-70mm	36-107mm	38-114
4cm	8cm	6cm	1cm
f3-5.4	f3.5-4.9	f2.6-4.8	f3.5-4.4
2-1/350	1/2-1/1,000sec	4-1/2,000sec	1-1/1,000sec
x	x	✓	x
50-400	64-100	80-400	100-400
✓/✓	✓/x	✓/✓	✓/x
2.5m	3m	3.5m	1.7m
✓	x	✓	✓
640 x 480 (15fps), 320 x 240 (15fps), 160 x 120 (15fps)	320 x 240 (15fps), 160 x 120 (15fps)	640 x 480 (30fps)	640 x 480 (30fps), 640 x 480 (17fps), 160 x 112 (8fps)
Unlimited	Unlimited	Unlimited	Unlimited
SD (12MB internal)	XD Picturecard (16MB)	SD (9.3MB internal)	Memory Stick Duo/Pro (32MB Duo)
x	x	x	x
2.5in	1.8in	2in	2.5in
✓	✓	✓	✓
✓	x	✓	✓
Li-ion	Li-ion	Li-ion	Li-ion
91 x 58 x 19	95 x 55 x 21	87 x 53 x 20	110 x 61 x 20
137	130	121	150
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★

Jargon explained

Megapixels

Don't assume more megapixels means greater quality. However, a higher megapixel camera will be able to print larger photos and let you perform cropping without losing out on detail.

Zoom

Ignore any digital zoom claims and concentrate on the optical zoom rating.

Focal length

Shorter (wide-angle) focal lengths result in a greater field of view and are good for landscape shots, while longer (telephoto) focal lengths let you zoom further in on your subject.

Macro focus

Determines how close to your subject you can get.

ISO settings

Adjusts the camera's sensitivity to light. Low ISO settings require longer shutter speeds, but higher ISO settings result in grainy images.

White balance

Compensates for different lighting conditions. Manual white balance mode allows you to specify a white reference point – the camera will then adjust all colours in relation to that reference point.

Movies

If you want to take decent movies, be sure to get a camera that records at 640 x 480 with 30fps and a movie length that's only limited by the memory card.

Memory

Don't worry too much about the size of memory included. You can pick up a 512MB card for around £30, so getting a 16MB or 32MB card bundled shouldn't affect your buying decision.

Megapixels and print quality

If you're looking to print your digital photos, the table below shows you what quality you can expect, depending on the megapixel (MP) rating of your camera. Quality also depends on your printer, ink and paper.

	2MP	3MP	4MP	5MP	6MP	8MP
6x4in	4	5	5	5	5	5
8x6in	3	4	4	5	5	5
10x8in	2	3	3	4	4	5
A4	1	2	2	3	3	4

1 Poor 2 Acceptable 3 Good 4 Very good 5 Excellent

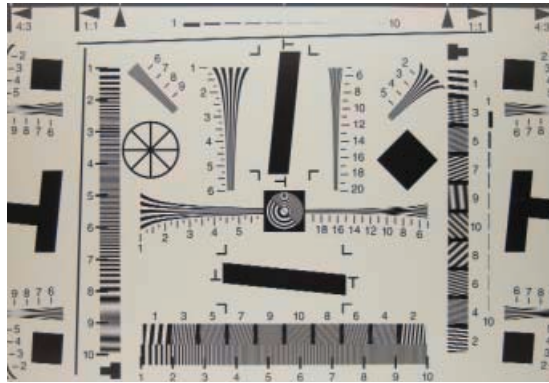


How we tested

Deciding which camera produces the best pictures is very much a personal choice. While some people prefer to see natural colours and a high level of detail, others will be enticed by saturated colours, even though the photos don't exhibit the huge amounts of fine detail.

If you've bought the CD edition of *PCW*, you'll find resolution test shots from each of the nine cameras to help you decide what type of photo you prefer. If you've bought the DVD, you'll also find, along with the resolution shots, outdoor and macro samples. When comparing resolution test card shots, open the photos and zoom them in to the same area. Don't worry about zooming further than 100 per cent – you'll need to get up to around 300 per cent to be able to spot the difference between some of the shots.

Although we took note of the results produced by each camera in the resolution test, it was only part of the review process.



Above: An ISO12233 resolution test



Right: The Nikon (top right) was able to pick up far more detail than the Olympus (bottom right)



When it comes to compact digital cameras, features such as size, design, ease of use and, of course, price are just as important. A digicam with a particularly compact design may well be worth a small drop in image quality.

Editor's Choice

One camera in particular stood out from the pack this month, namely the **Nikon Coolpix S1**. Despite having a 3x optical zoom, it measures just 19mm thick and is the kind of camera you can put in your pocket wherever you go and not even realise it is there. What surprised us the most was its excellent image quality. If you have the CD or

'What surprised us was its excellent image quality'

DVD issue of *PCW*, take a look at the resolution test shots on the cover disc and you can see for yourself just how well it did. Of course, resolution tests don't tell the whole story – it's real-life performance that counts and both indoor and outdoor shots were well exposed with vivid, yet



Nikon Coolpix S1

realistic colours. The 15fps movie mode is a bit of a letdown, but if you're not overly concerned about taking videos, the Coolpix S1 is well worth considering and is a deserving winner of this month's **Editor's Choice** award.

The first **Highly Commended** award goes to the **Canon Ixus i5**. The lack of an optical zoom doesn't help when it comes to framing shots, but it's an incredibly small camera that's capable of decent photos. A slight softening in focus towards the edges of photos was apparent and the time-limited movie mode is next to useless, but on the whole it's an impressive and stylish compact digicam from Canon.

The **Casio Exilim Zoom EX-Z57** picks up the second **Highly Commended** award. The EX-Z57 is a quality compact camera that captures fine detail in close-ups and features an impressive 2.7in LCD monitor. Despite the 320 x 240 movie mode at 15fps, the EX-Z57 a genuine contender in the pocket digital camera market. ■

TINY.com

Built in Britain, the key to low cost computing

18 Months has now passed since Tiny.com launched and it's well known for having the lowest PC prices. We talk to Mozie Mafi manufacturing director at Tiny.com to see how things have progressed and how he contributes to keeping costs low and quality high



Tiny.com's manufacturing facilities have produced half a million PC system since launch



Mozie Mafi
Manufacturing
Director
at Tiny.com

How have the first 18 months of Tiny.com gone?

MM: Very well indeed, we have built half a million PC systems and Notebooks. We have also assembled some 150,000 TFT monitors. Quality standards have remained high and we have achieved a 'PC failure rate' rate under 2%. We believe this is the lowest in the industry. With production at these levels we continue to be the UK's largest PC manufacturer.

Producing all these PCs in the UK must be expensive, how do you compete with other parts of the world like China?

MM: Surprisingly, labour costs account for a very small percentage of the cost of the PC. In fact, in our factory labour costs are on average just 2% of the selling price of the PC. There are more important factors that effect the costs like depreciation and transport costs.

Plus we have the ability to react quickly to customer needs. Even if labour costs in China are half the costs in the UK, the savings that Tiny.com make on these other elements are much more significant and overall we can be more cost-effective than companies that subcontract manufacturing to China.

How do you monitor quality?

MM: We have several levels of quality testing. Firstly, all components are individually evaluated for compatibility, reliability and CE. Our development labs are testing sites for all major component and software suppliers and all of our systems are 100% Microsoft WHQL compliant. Secondly, there are several levels of quality checking on the production lines including special software for "burn-in" and system compatibility testing. Finally, every PC undergoes a manual quality check prior to dispatch. We also liaise with our service department to monitor support calls and long-term component failure rates on each model.

Do you manufacture to order?

MM: Our most popular models are batch built which reduces our manufacturing cost. We monitor sales on a daily basis and plan production to build just-in-time. We aim to have no finished stock in our warehouse as finished stock will very quickly start to depreciate in value.

What's the secret of Tiny.COM's low prices?

MM: The whole philosophy of the company is to keep overheads and unnecessary costs to a minimum. We don't advertise on TV and we don't have retail stores. This way, we can use the money we save to provide much higher specification systems at the UK's lowest prices.



The UK's largest PC manufacturing facility

We have seen you advertising Plasma Televisions, do you produce these as well?

MM: Yes, we launched them in November last year and have been assembling them in this factory. It was the next logical step from TFT monitor production. We have applied the same cost saving philosophy to produce TV screens for less than the big brands using the same quality component parts. We buy the glass panels direct from the manufacturer in the far east and cut out a number of middlemen to sell them direct to our customers.

To find out more about **TINY.com** and their impressive product range, visit www.tiny.com or call 0870 830 3127

TINY TORNADO

3000+ PCI EXPRESS



Tiny Tornado PCI Express 64-3000+ For Just £499!

E-Code: 01653

- AMD Athlon 64 3000+ Processor with HyperTransport Technology. AMD's latest 939 pin processor ready for the next generation of 64-bit applications. (3500+, 3800+ and 4000+ models also available.)
- MSI 7093 Socket 939 PCI Express motherboard with ATi RS480 chipset.
- 512MB Micron DDR400 RAM.
- 250GB Maxtor Serial ATA 7200RPM Hard Disk.
- 16x Sony Dual layer multi-format DVD Re-Writer drive.
- 16x Sony DVD-ROM drive.
- ATi Radeon 128MB graphics for accelerated 3D performance.
- Digital Freeview PC-TV System with remote control. Record live TV, time shift, burn the best bits to DVD!
- Digital Radio System. Listen to your favourite radio stations in crystal clear digital quality!††
- Wi-Fi Wireless 802.11G adaptor. Create your own home wireless network with ease.
- Multi-format card reader/writer panel for all popular memory/flash cards.
- Cordless Keyboard and Cordless Optical Mouse
- Coolermaster Musketeer PC monitoring system
- Plus advanced features as standard: USB 2.0 x6 ports, IEEE 1394 Firewire port, 10/100 Lan, 6 Channel Audio, 56k Supanet dedicated modem* (Wanadoo broadband upgrade available on request). Microsoft Windows XP Home Edition‡, Microsoft Office 60 day trial version** and 4 Cyberlink software packs.

Model: S2436

**ATHLON 64
3000+**

**512MB
DDR 400 RAM**

**250GB
SERIAL ATA HARD DISK**

**DIGITAL
PC-TV**

**DVD-Rw
16x DUAL LAYER**

**DVD
16x DVD ROM**

**WI-FI
WIRELESS**

**MULTI
CARD
READER**

**CORDLESS
KEYBOARD
& MOUSE**

**MUSKETEER
PC
MONITORING**

**USB
2.0**

**FIREWIRE
IEEE 1394**

**ONLY
£499!**



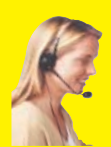
**FREE
DELIVERY
WHEN YOU
ORDER ONLINE
LIMITED OFFER**

**3000
£499**
E-Code: 01653, 17" Model - E-Code: 01654

The Award-winning Power Range



tiny.com
FREE DELIVERY For a limited period when you order online
**THE LOW COST
PC COMPANY**



ORDER HOTLINE
0870 830 3127
or visit www.tiny.com to see the full range
Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

†Courier Delivery £39.99. *Pay courier delivery by credit card. Time Plan finance example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status. Written details on request. †Tiny desktop PCs are set up with supanet which is the only ISP available as default. Customers can use any other ISP upon request. ‡Printer cable and back-up CDs are available at extra cost. These deals are not available from our partner firm The Computer Shop. **The 60 day trial version - option to purchase extended version for special price - ask staff for details. 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, AMD Arrow logo, AMD Athlon, AMD PowerNow!, AMD Athlon 64 and relative combination, are trademarks of Advanced Micro Devices, Inc. *AMD and Microsoft strongly recommend that users continue to use third party anti-virus software as part of their security strategy. Tiny.com PCs are preloaded with XPSP1. XPSP2 downloads available from Microsoft. ††Not DAB. Free-to-air only. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 77 07 01. Licensed credit brokers. E&OE

**19.9%
APR**
**3 YEAR
Extracare
Extended
Warranty
£129**

TYM107AMD
(PCW/08/02)



ULTIMATE POWER

X700 256MB

3500+ PCI EXPRESS

AMD AMD64 Technology Enables incredible performance for today's and tomorrow's software	AMD Cool 'n' Quiet™ Technology Enables a quieter PC while utilizing less energy
AMD Enhanced Virus Protection Enables safer surfing with Microsoft's Windows® XPSp2-	AMD HyperTransport™ Technology Reduces I/O bottlenecks and increases bandwidth

HOME PCs

POWER PCs

HOME LAPTOPS

POWER LAPTOPS

SPECIALS

**ATHLON 64
3500+**

**1024MB
DDR 400 RAM**

**500GB
SERIAL ATA HARD DISK**

**ATI X700
256MB GRAPHICS**

**DIGITAL
PC-TV**

**DIGITAL
RADIO**

**DVD-Rw
16x DUAL LAYER**

**DVD
16x DVD ROM**

**WI-FI
WIRELESS**

**MULTI
CARD
READER**

**CORDLESS
KEYBOARD
& MOUSE**

**MUSKETEER
PC
MONITORING**

"The Tornado PCI Express special is Tiny.com's most powerful PC ever! This system combines the latest PCI Express chipset with a powerful Athlon 64-3500+ processor."

£699

▷ SPECIALS

£699
Base Unit

£799
Base Unit

£899
Base Unit

Tiny Tornado PCI Express 64-3500+ E-Code: 01507

- AMD Athlon 3500+ Processor with HyperTransport Technology. AMD's latest 64-bit processor delivers cutting edge performance in existing 32-bit applications and is ready for future 64-bit applications. 3800+ and 4000+ models also available.
- 1024MB (1 Gigabyte) of high speed Micron DDR400 (PC3200) RAM increases system performance allowing multiple applications to run at the same time.
- Radeon X700 PCI Express x16 graphics card with dedicated 256MB DDR memory – one of the fastest PCI Express cards. ATI RADEON X850 XT Platinum on 4000+ ultimate model – the most powerful graphics card in the world.
- Dual layer 16 speed DVD-RW, multi-format DVD burner drive. Dual layer is the latest in DVD technology which effectively doubles the capacity over normal DVD disks from 4.7GB to 8.5GB.
- Wi-Fi Wireless with Built-in 802.11G Wireless networking – connect to internet and networking without wires.
- MSI 7093 RX480 Motherboard Socket 939 Microstar PCI Express board with ATI RX480 chipset and featuring PCI Express x16 slot. Supports up to 4 SATA devices and 2 IDE channels.
- 500GB Serial ATA WD hard disk space, (2x250GB Western Digital drives) 7200RPM utilising ultra fast SATA interface. Provides huge storage space for data, photos and other files.
- Digital Freeview PC-TV card with remote control, which allows you to watch, record and time shift live TV. Burn the best bits in high quality onto DVD. Includes digital radio††.
- Additional DVD-ROM drive to run DVD movies and make one step DVD to DVD copying easy.**
- Multi-format reader and writer panel allows the use of virtually any memory/flash card. Case also includes front audio, microphone and USB 2.0 connectors.
- LAN support with 10/100 MB/sec networking
- Musketeer PC monitoring system
- Cordless Keyboard and Mouse

(Model: S2836)

PLUS All standard features including: Expandable ATX case, floppy drive, USB 2.0 x6 ports, LAN, 6 channel audio, Firewire, 56K Supanet dedicated modem* (Wanadoo Broadband upgrade available on request) Microsoft® Windows® XP®, Microsoft® Office 60 day trial**, 4 Cyberlink software packs.

17" TFT Systems



Includes 17" ultra high resolution TFT flat panel screen and 2.1 subwoofer speaker system

ONLY £200 EXTRA

19" TFT Flat Panel Screen Upgrade from 17"

£99

5.1 Surround Sound Subwoofer & Speaker System from 2.1

£40

FREE DELIVERY
WHEN YOU ORDER ONLINE
LIMITED OFFER

TIME PLAN MONTHLY FINANCE AVAILABLE*
- ask for details

When you buy a complete package with TFT Screen

3500 POWER

£699

E-Code: 01507, 17" Model - E-Code: 01517

3800 POWER

£799

E-Code: 01508, 17" Model - E-Code: 01518

4000 POWER

£899

E-Code: 01509, 17" Model - E-Code: 01519

4000+ ULTIMATE
with ATI 850XT PE

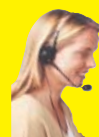
£1099

E-Code: 01510, 17" Model - E-Code: 01520

tiny.com

FREE DELIVERY For a limited period when you order online

THE LOW COST PC COMPANY



ORDER HOTLINE

0870 830 3127

or visit www.tiny.com to see the full range

Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

†Courier Delivery £39.99. *Pay courier delivery by credit card. Time Plan finance example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status. Written details on request. **Tiny desktop PCs are set up with supanet which is the only ISP available as default. Customers can use any other ISP upon request. (Printer cable and back-up CDs are available at extra cost. These deals are not available from our partner firm The Computer Shop. **The 60 day trial version – option to purchase extended version for special price – ask staff for details. 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, AMD Arrow logo, AMD Athlon, AMD PowerNow!, AMD Athlon 64 and relative combination, are trademarks of Advanced Micro Devices, Inc. *AMD and Microsoft® strongly recommend that users continue to use third party anti-virus software as part of their security strategy. Tiny.com PCs are preloaded with XPSp1. XPSp2 downloads available from Microsoft. ††Not DAB. Free-to-air only. Prices, specifications and offers subject to change, availability and our conditions of sale – copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 77 07 01. Licensed credit brokers. E&OE

19.9%
APR

3 YEAR
Extracare
Extended
Warranty
£129

TVM107AMD
(PCV/083)

BUY NOW PAY LATER WITH 0% FINANCE
 Subject to status
When question on request

AWARD WINNING PC'S AT UNBEATABLE PRICES

PC'S FROM ONLY £399 OR LAPTOPS FROM £580

JAL Titania

- AMD Athlon 64Bit 3000 Processor
- 1GB DDR PC3200 Memory
- 160GB SATA Hard Drive
- NVIDIA GeForce 6600GT 128MB Graphics Card
- Viewsonic VX912S 19" TFT Screen
- 16x DVD-Rom Drive
- 16x Dual Layer +/- DVDRW
- Logitech Multimedia Keyboard
- Logitech Optical Rechargeable Mouse
- Altec Lansing 3151R Remote Control Speakers
- Windows XP Home Edition
- Works Suite 2005, Nero Burning Rom, DVD Software, FAX/Answer phone software
- All original CD's are shipped with the system.



"The JAL combines a great display with a good balance of features and performance. It's a Best Buy"

Ben Henley,
 Labs Writer, Computer Buyer,
 April 2005'

£899.00 inc VAT

JAL Gemma

- AMD 64 2800 Processor
- 512Mb PC 3200 DDR Memory
- 120Gb 7,200rpm Hard Drive
- SIS Mirage-2 Graphics
- Intel Hardware PCI V92 56K Modem
- 8x DVD/RW, integrated 7 in 1 card reader
- Altec Lansing 220 Speaker System
- ViewSonic VE510 15" TFT Monitor
- Logitech Multimedia Keyboard
- Logitech Optical Wheel Mouse
- Windows XP Home Edition, Fax/Answerphone software, Nero Burning Rom, InterVideo DVD Software, all original CD's are shipped with the System



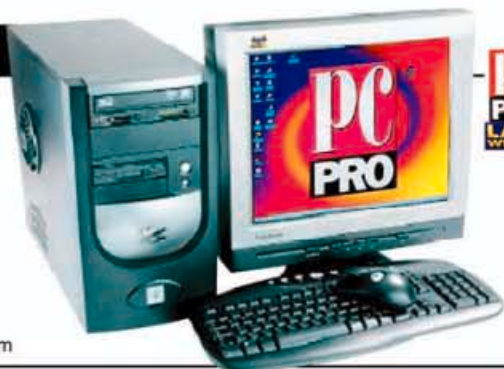
"The JAL Gemma is a more complete system than its competitors and has a lot more upgrade potential."

Ben Henley, Labs Writer,
 Computer Buyer
 January 2005 Issue

£599.00 inc VAT

JAL Constance

- AMD Sempron 3100 Processor
- 512mb PC 3200 DDR Memory
- 160Gb SATA 150Mb/s 7,200rpm Hard Drive
- SIS Mirage-2 128Mb Graphics
- Intel Hardware PCI V92 56K Modem
- 6x DVD/RW, integrated 7 in 1 card reader
- ViewSonic E72f+ SB Monitor
- Logitech Multimedia Keyboard
- Logitech Optical Wheel Mouse
- Windows XP Home Edition, Nero Burning Rom, DVD Software, all original CD's are shipped with the System



"The superb upgrade potential makes the JAL a worthy winner."

Jim Martin, Labs Editor, PC Pro,
 March 2005 Issue

£469.00 inc VAT

Design & Configure your own computer or Laptop online



All JAL PC's use genuine Microsoft® Windows®



Telephones/Showroom open Monday to Saturday 9:30 - 5:30pm or buy online via our secure server

All systems come with a 2 Year On-Site Parts & Labour Warranty

Call 08707 525 810 or visit online at www.jal.co.uk



CONTENTS

- 122** Chillblast Fusion FX55 SLI
Demonite Ultimate SLI Pro
- 123** Evesham Evolution Decimator
Jal Adhira
- 124** Mesh Elite Extreme PBX
Watford Aries Titanium 6851
- 128** Table of features
Intel v AMD: your choice
- 130** Performance results
- 131** Editor's Choice

Battle of the Titans

WORDS: RORY REID PHOTOS: BRUCE MACKIE

Your need for speed could be satiated with one of these systems based around very fast 64bit processors from AMD and Intel

We know both the AMD Athlon FX-55 processor and the latest 3.73GHz Pentium 4 Extreme Edition from Intel are fast. But which of these high-end flagship 64bit-ready CPUs makes the ideal foundation for a 32bit Windows XP PC designed specifically for high performance?

We asked six PC manufacturers to throw caution to the wind and supply systems designed with one thing in mind: speed. Forget the cost, and toss aside the cooling and noise implications of a computer that generates enough heat to cook a Sunday roast. We want to discover which platform, AMD or Intel, is the out-and-out speed king.

As this is *PCW*'s first head-to-head comparison of Intel and AMD systems, we've taken an in-depth look at which configurations provide the best performance, highest value for money, and whether either has an edge in any specific area. Does DDR2 memory really help? Are SLI graphics cards worth the extra cost? Will you benefit from having your hard drives configured in a Raid array?

These questions can be baffling to the average PC user, so it's high time we laid any doubts to rest. We've specified no price limits for this group test, so if money is no object and you're interested in finding out which of the two 64bit behemoths is right for you, then you should enjoy reading the following pages.





AMD



Chillblast Fusion FX55 SLI

Chillblast is a well-known reseller of overclocking components, so we were eager to see how it used its experience to build a fast PC. Technically, the Fusion FX55 SLI Ultra doesn't disappoint. Our Labs team was almost lost for words when they saw how many components Chillblast had managed to cram inside the case.

It is full to the brim, thanks mostly to a pair of Nvidia Geforce 6800 Ultra graphics cards arranged in an SLI (serial link interface) configuration. Also battling for space are three hard drives. A 300GB Seagate disk provides the main storage, and two 74GB Western Digital Raptor drives in a striped Raid 0 array (with a fast 10,000rpm spin speed) ensure this PC has the fastest disk access times in the group.

They helped the Fusion FX55 SLI Ultra encode our test video in 13 minutes, 37 seconds and notch up a Sysmark 2004 score of 220. Like several PCs here, this one uses non-Windows Hardware Quality Labs-certified drivers (WHQL) for some components, which could also contribute to its high performance.

These drivers aren't approved by Microsoft, so the PC does not carry the 'Designed for Windows XP' logo. Any subsequent use of the latest (official) drivers –

particularly those of the Nvidia graphics cards – is likely to produce a different performance to that seen here.

Chillblast says the Fusion FX55 SLI Ultra is the fastest gaming PC available. It achieved the highest 3Dmark score we've ever seen and the Doom 3 result of 75.5 frames per second (fps) was also impressive. The 20in Sharp LL-2015B monitor has a native resolution of 1,600 x 1,200, which gamers should appreciate.

We were tempted to give the Fusion FX55 SLI Ultra an award, but we feel the high price isn't justified, and the warranty is short compared to most here. However, if money is no object, it is one of the fastest, most striking PCs available.

DETAILS

RRP £3,758.83 (£3,199 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Chillblast 0845 456 7830
www.chillblast.com

PROS Graphics performance; storage; great monitor
CONS Hefty price; limited warranty
VERDICT

The fastest gaming PC we've ever seen, but it is pricey and has a short warranty

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

AMD



Demonite Ultimate SLI Pro

We haven't seen a Demonite PC since its manufacturer Carrera SSC went into liquidation. Its brands were bought by Watford around six months ago. The Ultimate SLI Pro has the same fairly stylish, if somewhat plasticky) ATX case as other Demonite PCs we've reviewed in the past.

Whereas previous Demonite submissions have been overclocked, the Athlon FX55 at the heart of this PC arrived in standard form, clocked at 2.4GHz. That's not to say it can't be ramped up – the MSI K8N SLI Platinum motherboard is well suited to overclocking. It has lots of memory and voltage settings that can be tweaked manually, or if you're less confident you can dynamically overclock by a specified percentage.

We were pleased to see a pair of 512MB DDR440 Ram modules from Kingston included. This memory uses a heatsink to reduce the chance of damage or system instability as a result of overheating when being overclocked.

The Ultimate SLI Pro sent in for review was poorly configured and gave an average performance. Whereas Chillblast adjusted the Bios memory settings, the Demonite PC relied on the motherboard to automatically assign its own

Bios values. It received a Sysmark 2004 score of 206.

This memory configuration also proved detrimental to 3D performance. Despite having a pair of Nvidia Geforce 6800 Ultra cards in an SLI configuration, potentially the most powerful graphics solution in the group, this PC only managed a 3Dmark05 score of 5,332. Plus, with a monitor that has a slow 25ms response time, it could struggle with fast 3D games or movies.

It is a shame that the Demonite PC was not optimised – especially as it costs £2,466. There's nothing inherently wrong with its specification, but we think the company should have put more effort into building this system.

DETAILS

RRP £2,466 (£2,099 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Savastore 0871 66 66 600
www.savastore.com

PROS Graphics cards; value
CONS Case quality; sloppy configuration
VERDICT

Full of high-performance components, but has a disappointing configuration

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

INTEL



AMD



Evesham Evolution Decimator

From an aesthetic point of view, the Evolution Decimator SLI is arguably the most desirable PC of the group. Its brushed aluminium case is certainly a talking point, thanks to an enormous LED instrument panel that displays system fan speeds, internal temperature, disk activity and the time and date.

Inside, MSI's P4N Diamond motherboard uses the Intel edition of Nvidia's Nforce 4 chipset. This is the only chipset to support SLI, where twin graphics cards work in tandem to produce better performance in high-resolution gaming. The use of this chipset has enabled Evesham to submit the first SLI graphics solution we've seen in an Intel PC.

The Geforce 6800 GT cards used here usually return good results on AMD64-based PCs, and they also did so here with a 3Dmark05 score of 5,992. Far Cry results were also commendable. The cards can't match the 6800 Ultras in the Chillblast PC, but rival the Demonite, proving that a system with well-configured mid-range components can compete with higher-end offerings. But it's a pity the 19in Viewsonic monitor only supports 1,280 x 1,024 resolutions.

We were also impressed by this PC's speed in everyday applications. It achieved a high

Sysmark 2004 score of 237 and encoded our 1GB test video in 12 minutes, 10 seconds, helping confirm that the Hyperthreaded 3.73GHz Pentium 4 Extreme Edition CPU packs a meaner punch than its Athlon FX55 counterparts in everyday desktop applications.

One worrying aspect of the Decimator SLI is its high power consumption. It uses more electricity when idling than the Jal Adhira does during video encoding (if you've bought the CD or DVD edition of *PCW*, you'll find the full results on the cover disc). There is room for improvement, but Evesham has done well to deliver this spec at this price, and wins our Highly Commended award.

DETAILS

RRP £2,199 (£1,871.48 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Evesham 0870 160 9500
www.evesham.com

PROS Very fast; attractive price

CONS Monitor doesn't do justice to the graphics subsystem

VERDICT

The Decimator lives up to its name and is one of the fastest all-round PCs we've ever seen

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★

Jal Adhira

Moving away from the rather bland ATX cases used by most Jal PCs, the top-of-the-range Adhira is housed in a striking Thermaltake Shark ATX chassis.

The blue LEDs and glow-in-the-dark IDE cables make it even more attractive. It has a mostly screwless design, making it easy to add or remove components, as many are simply held in place with clips.

Although this design is fine in everyday use, it is more susceptible to damage in rough transit than standard cases where components are secured with screws. Through no fault of Jal's, the Adhira had taken a bit of a beating en route to our Labs, and arrived with its components dangling from the motherboard. After some reconstructive surgery, we got it up and running.

Jal has used the DFI NF4 SLI DR motherboard, which is only compatible with standard DDR memory. This is slower than DDR2, but a total of 2GB has been included – twice as much as its nearest rival.

This is the only PC here with Windows XP x64 Edition. We tested its video-encoding performance with both 32bit and 64bit Windows, with good results. In 64bit mode, it encoded our test video in 13 minutes, 10 seconds, and in 32bit mode it was around 30 seconds slower.

The Adhira's SLI-linked Geforce 6600 GT cards are better than the single Radeon X850 in the Watford system for some games, but they suffer in titles that need a lot of video memory. Doom 3, for example, refuses to run with full anti-aliasing and anisotropic filtering enabled.

The 19in Viewsonic VX924 has a 4ms response time, so the likelihood of ghosting effects in games is very low. The Adhira isn't the fastest PC here, but it deserves our Highly Commended award as it is a good all-rounder. Do bear in mind, though, that 64bit Windows doesn't support every 32bit application, and device driver support for older peripherals can be patchy.

DETAILS

RRP £1,995 (£1,697.87 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Jal Computers 08707 525 810
www.jal.co.uk

PROS 64bit Windows; fast monitor

CONS Sturdiness of screwless design in rough transit

VERDICT

Good for gamers and anyone wanting a PC with the 64bit edition of Windows

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Mesh Elite Extreme PBX

The Elite Extreme PBX first made an appearance in our July 2005 issue (page 56), where it scored an impressive five stars in all our categories. We wanted to see how it coped in the company of similarly specified PCs, and in this group test it comes up against some stiff competition.

Like the Evesham and Watford submissions, it uses an Intel Pentium 4 Extreme Edition CPU, clocked at the default 3.73GHz. Mesh has complemented this with a pair of 512MB DDR2 533MHz Dimms installed on an Asus P5AD2 motherboard, but you won't see any flashy heatsinks covering the memory – this PC isn't really aimed at overclockers.

This configuration helped propel the Elite Extreme PBX to achieve PCW's highest ever Sysmark 2004 benchmark score last month. It manages to keep its lead this month, even against rivals using the same CPU. This is partly due to excellent configuration by the Mesh technicians but, like the Chillblast entry, the Elite Extreme PBX uses unofficial non-WHQL drivers for some of its components, which could contribute to its performance. The final retail version of this PC will use official WHQL drivers, but its performance may be affected positively or

negatively depending on the driver certification process.

The PC's single Radeon X850 XT Platinum Edition graphics card is very fast, but it loses out to the twin Geforce 6800 GT cards in the Evesham PC when running games at high resolution with high levels of graphic detail. In addition, the limited resolution of the 19in Viewsonic VX912 monitor doesn't lend itself to high-resolution gaming.

However a 1GB USB key is included, together with a seven-port USB hub and an 8-in-1 card reader, all of which are provided without pushing the cost of the PC above £2,000. Overall, the Elite Extreme PBX is worthy of our Editor's Choice award.

DETAILS

RRP £1,983.40 (£1,688 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Mesh 0870 046 47 47

www.mesh.com

PROS Performance; good value

CONS Quite noisy; 19in TFT

VERDICT

The Elite Extreme PBX proves itself yet again as a fast home PC, but we would have preferred a 20in screen

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Watford Aries Titanium 6851

Our final entry in the group test is Watford's Aries PowerXS Titanium 6851. Our first impressions of this PC were very positive as it is well-constructed and has a promising all-round specification.

Its silver case accommodates one of the most ingenious CPU cooling systems we've seen. A sizeable Thermaltake heatsink resembling a turbine rests on top of the Pentium 4 Extreme Edition processor, with a large fan which is mounted on the side, rather than the top, of the CPU heatsink, and blows air towards the rear of the computer. The entire assembly is housed inside a translucent tube with front- and rear-facing case fans providing extra ventilation. The overall effect is reminiscent of a wind tunnel, but is quieter than the Mesh cooling solution.

A cable to the CPU fan on our review sample of the Titanium 6851 was disconnected, making the PC prone to overheating. Watford tells us the cable became dislodged during transit.

After resolving this, we expected the Titanium 6851 to produce performance in line with the similarly equipped Mesh and Evesham PCs. It was around eight per cent slower when performing some tasks (including games), but achieved a good result in our video-encoding tests.

Watford has included several games and a 20in Acer 2021 LCD monitor. This has a good maximum resolution of 1,600 x 1,200, so it could be ideal for anyone who likes running multiple windows side by side. However, its 25ms response time isn't up to the standard of most of the competition.

The Titanium 6851 is one of the most expensive PCs in the group. It costs around £1,000 more than the Mesh Elite Extreme PBX, yet is outclassed in nearly every area of its specification. Watford has included an Iomega Rev drive that accepts 35GB removable hard disk cartridges, but we fail to see why anyone would spend nearly £3,000 on this PC.

DETAILS

RRP £2,937 (£2,500 ex VAT)

BEST PRICE & PRODUCT INFORMATION

Watford 0871 666 6600

www.savastore.com

PROS Ingenious cooling system

CONS Price; performance

VERDICT

Has a good specification and some cool extras, but is slow for a system that costs nearly £3,000

FEATURES ★★★★★
PERFORMANCE ★★★★★
VALUE FOR MONEY ★★★★★
OVERALL ★★★★★



Create. Store. Backup. Go.



250GB USB2
Only £116
Inc. VAT

LaCie USB or FireWire Hard Drives

- Portable & stackable - only 11.2 x 18.8 x 3.5cm
- Sleek, robust enclosure - design by F.A. Porsche
- Silent no-fan operation with metal base cooling
- 7200rpm ideal for DV Video or multitrack audio
- FireWire or USB2.0 versions - cables included
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
FireWire - 80GB, 160GB, 200GB, 250GB
USB2.0 - 80GB, 160GB, 200GB, 250GB



40GB USB2
Only £65
Inc. VAT



LaCie USB/FireWire 2.5" Mobile Drives

- Ultra-portable - only 7.6 x 12.9 x 1.7cm & 200g
- USB 2.0 and/or FireWire interface - cables included
- AC adapter-free, powered by USB or FireWire
- Ideal for notebook/laptop users as mobile storage
- Sleek, robust enclosure - design by F.A. Porsche
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
USB2.0 - 30GB, 40GB, 60GB, 80GB, 100GB
FireWire & USB2.0 - 40GB, 60GB, 80GB, 100GB



USB2.0
Only £92
Inc. VAT

LaCie Triple Interface, FireWire 800/400 & USB2.0 'd2' Hard Drives

- Sleek, aluminium heat dissipating robust case
- 7200rpm ideal for DV Video - silent operation
- Fast FireWire 800 'Extreme' up to 80MB/s sustained
- FW 400, USB2.0 & FW800 (all cables included)
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
160GB, 200GB, 250GB, 320GB, 400GB,
500GB, 1000GB, 1600GB, 2000GB



Photon 19"
Only £352
Inc. VAT

LaCie Photon LCD Monitors

- DVI and VGA connectors
- Highest specification LCD monitors, IPS technology
- Photon 20 - resolution 1600x1200
- Photon 20 - response time 16ms
- Photon 20 - dot pitch 0.25
- Photon 20 - 176 degrees viewing angle (IPS)
- 3-year replacement warranty

Available Models:
Photon LCD/TFT 19"; Photon LCD/TFT 20.1"
NEW 300 Series - LCD/TFT 321 - 21.3"



NEW! LaCie Serial ATA External 'd2' Hard Drives

- Revolutionary SATA interface transfers up to 150MB/s
- Alternative to costly SCSI and Fibre channel systems
- Increased performance, reliability and scalability
- Drives ship with SATA PCI card as standard
- Drive powered via PCI card - no need to use PSU
- Classic 'd2' design with no fan for silent operation
- Includes LaCie RAID 0/1 utilities for multiple drive configurations

Available Models:
250GB, 400GB



NEW! LaCie 'Biggest Disk' FireWire 800 & USB2.0 RAID

- Up to 2000GB, RAID 0, 0+1, 5, 5+ hot spare
- Exceptionally high transfer rates of 80MB/s FW 800
- Sturdy aluminium enclosure & ultra quiet operation
- Compact - only 15.3 x 29.8 x 17.6 cm
- Affordable RAID starting at 1000GB, SRP £877+VAT
- Hot swappable hard disk; superior RAID security
- Automatic online rebuilding with RAID 5
- 2 years manufacturer's warranty as standard

Available Models:
1000GB, 1600GB, 2000GB



NEW! LaCie Silverscreen Portable TV Movie Playback Drive

- Playback your photo's and movies **directly** on any TV
- Plug into any PC via USB2.0 to copy your multimedia
- Acts as a portable datashuttle/back-up USB2.0 HDD
- Ultra-small, quiet, USB powered, 2.5" mobile drive
- Ships with remote control, power unit and all cables
- Store 20,000 MP3's, 15 MPEG-2 or 80 DivX movies, 1,000,000 photo's in VGA, or up to 80GB of data

Available Models:
USB2.0 - 40GB, 80GB



NAS 250GB
Only £192
Inc. VAT

NEW! LaCie d2 'Ethernet Disk mini' Network Hard Drives (NAS) and USB2.0

- Share data across a network by unlimited users
- Easily administered via any web-browser
- Quick and simple installation - no drivers needed
- No Server required, NAS hard drive
- Fast ethernet connection or USB2.0 direct attach
- For Windows®, Mac OS® and Linux
- 2 years manufacturer's warranty as standard

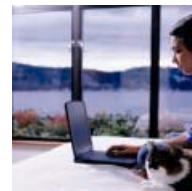
Available Models:
'd2' mini NAS & USB2.0 - 250GB, 400GB, 500GB
Ethernet Disk XP embedded - 800GB, 1000GB

For latest pricing please visit www.lacie.com/uk

E-mail: info.uk@lacie.com

E&OE May 05

WORK. PLAY. COMMUNICATE. ALL WITHOUT WIRES.



AJP Z71A and AJP Z71V - The New Centrino: Sonomafrom £ 575 + vat

The AJP Z71A and AJP Z71V feature Intel® Centrino™ Mobile Technology. The new AJP Z71A and AJP Z71V features the latest and the best in mobile technology. Supports dedicated PCI express NVidia Geforce graphics and Intel's enhanced processor with 533MHz FSB, XD Technology & PCI Express. Get the performance you want, the battery life you demand and the integrated WLAN capability you need to email friends and family thanks to Intel Centrino Mobile Technology. The inclusion of integrated Wireless technology enables you to live wireless at your office or home, whilst allowing you more flexibility to stay connected. With Wireless hotspots found at airports, railway stations, coffee shops and hotels you can get straight onto the internet and your home or corporate network. Experience breakthrough mobile technology with superior mobile performance and enhanced battery longevity with up to 4 hours life. All within a slim, light (from 2.1Kg) wireless solution.

AJP Z71A

ECode: e024

- 15.4" TFT WXGA (1280x800) Widescreen
- **DOTHAN** Intel Pentium M Processor 730/740/750/760/770/780
Processor speed from 1.6GHz up to 2.26GHz
Supports Intel XD Technology
2MB CPU Level 2 Cache and 533MHz FSB
- **Intel 915GM chipset (PCI Express)**
- Intel Integrated Wireless LAN (802.11a/b/g) card
- **256/512/1024/2048 MB DDR400 RAM**
- **40/60/80/100 GB HDD - 5400rpm**
- **8xDVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)**
(HotSwappable with 2nd Battery)
- **PCI Express x 16 Embedded Alviso-915GM graphics**
up to 64MB video RAM

AJP Z71V

ECode: e034

- 15.4" TFT WSXGA+ (1680x1050) Widescreen
- **DOTHAN** Intel Pentium M Processor 730/740/750/760/770/780
Processor speed from 1.6GHz up to 2.26GHz
Supports Intel XD Technology
2MB CPU Level 2 CPU Cache and 533MHz FSB
- **Intel 915PM chipset (PCI Express)**
- Intel Integrated Wireless LAN (802.11a/b/g) card
- **512/1024/2048MB DDR2-533 RAM**
- **60/80/100GB HDD - 5400 rpm Optional S-ATA HDD**
- **8xDVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)**
(HotSwappable with 2nd HDD or 2nd Battery)
- **PCI Express x 16 nVidia Geforce Go 6600 (MEP 43)**
- **128MB discrete DDR Video RAM & Direct X9 support**



Recommended Award
Dec 2004



May 05

"Enough power and performance to make it a trustworthy business laptop. Designed for daily use."

Other Features common to both the AJP Z71A / AJP Z71V :- ● Built in 56K fax/modem & 10/100/1000-Giga LAN Ethernet Adapter ● Audio DJ and Built-in Azalia High Definition sound ● Ports: 5xUSB 2.0, IEEE Firewire, TV-Out, Monitor, S/P DIF output (coaxial) ● Built in 3-in-1 Card Reader (Supports MMC/SD/MS-Pro) ● Up to 4 Hours Battery Life (up to 8 Hours with 2nd Battery option) ● Built in 3D Sound with virtual 6 channel output. ● Ambient light sensor to control LCD brightness, ● 1x PC Card Slot, ● Smart Li-Ion Battery** ● 5 Hot Keys (Email, Web Browser, Application), ● External USB FDD (Optional), ● Bluetooth module (Optional)* ● 356.5(W)x275.5(D)x34.5mm (H) / Weight: 2.9Kg ● 3 Year RTB Warranty*** ● Carry case ● **Windows XP Home** with CD & Manual ● **Nero software** ● **Virgin.net** - Internet access, NO 12 mth contract

AJP Z71A - E

- 15.4" TFT WXGA
- Intel Celeron M 360 (1.4GHZ)
- 256 MB DDR2 RAM
- 40Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 575.00 exc Vat
£ 675.63 inc Vat

AJP Z71A-M

- 15.4" TFT WXGA
- Intel Pentium M 730 (1.6GHZ)
- 512 MB DDR400 RAM
- 60Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 649.00 exc Vat
£ 762.58 inc Vat

AJP Z71V - E

- 15.4" TFT WSXGA+
- Intel Pentium M 730 (1.6GHZ)
- 512 MB DDR2 RAM
- 60Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 749.00 exc Vat
£ 880.08 inc Vat

AJP Z71V - M

- 15.4" TFT WSXGA+
- Intel Pentium M 740 (1.73GHZ)
- 512 MB DDR2 RAM
- 80Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 799.00 exc Vat
£ 939.83 inc Vat

For online configurator, full range of products and specifications visit www.ajp.co.uk

Contact Us



AJP Computers Plc. 152-154 Coles Green Rd, London, NW2 7HD

General: 020 8208 9700
Fax: 020 8208 9701
Customer Care: 020 8208 9788
Technical: 020 8208 9799
Email: sales@ajp.co.uk

Showroom hours: Mon-Fri 9.00-5.30, Sat 9.00-2.00

TERMS - 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. ***3 Years Return to Base Warranty: 1st Year, Parts & Labour, following 2nd & 3rd Year, Labour Only. *1 Module Optional. Pictures are for illustration purposes only.

Buy Now Pay 6 Months Later! *2

Order an AJP Notebook today with just a 10% deposit, then pay nothing for 6 months! In the 5th month choose to settle in full at the original cash price (no interest) or start a repayment plan over 42 months 29.8% APR.

See terms for more information**

*2 - Buy Now Pay Later typical example based on £1000 purchase price. 10% deposit required at point of purchase (£100) then pay nothing for 6 months. In the 5th month choose to settle the balance in full of £900 (no interest) or start a 42 month repayment plan (interest calculated from date of ordering) of £36.83, total amount payable £1646.86 - 29.8% APR. Finance is subject to status. Terms & Conditions apply. Written quotations available on request. Applicants must be over 18, under 75 and in full time employment. Additional fee of £25 may apply on approval.

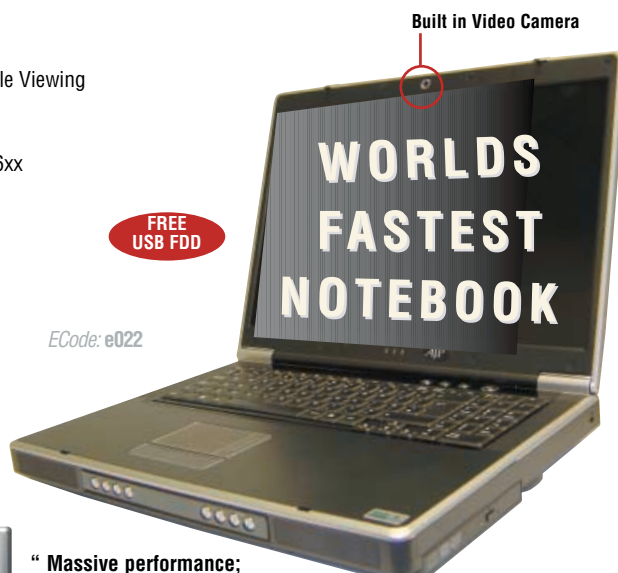


AJP are the proud winners of What Laptops UK BEST SERVICE Award - December 2004

AJP D900T

An unprecedented addition to AJP, is the D900T series, a five-spindle notebook of 'firsts' incorporating the latest advances in mobile technology. Including the six series Intel processor, DDR2 dual channel RAM, a revolutionary memory breakthrough, plus the option for the user to select between the fastest mobile graphics cards, nVidia Geforce Go 6800 or the ATI Mobility Radeon X800, both with PCI Express and 256MB VRAM. Teamed with a superior 17" widescreen, and support for S-ATA hard disk drives, RAID 0 or RAID 1 technology (available by adding a 2nd hard disk), the AJP D900T is unrivalled as the supreme desktop replacement, matching the most powerful desktop performance in a versatile solution.

- 17" TFT WXGA (1440x900) Widescreen or 17" TFT WSXGA+ (1680x1050) Widescreen Glossy with Wide Angle Viewing
- **Intel® Pentium 4 Processor 540/550/560/570/640/650/660**
 Processor speed from 3.2GHz up to 3.8GHz with 800MHz FSB, Hyper-Threading and 1MB/2MB Cache for 5xx/6xx
- **Intel 915P chipset (PCI Express)**
- **512/1024/2048/2816 MB DDR2-533 RAM**
- **80/100 GB HDD - 5400 rpm** (Additional bay for 2nd HDD option with RAID 0 & RAID 1 support, *Optional S-ATA HDD*)
- **8 X DVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)**
- Additional bay for optional 2nd Optical Drive (fast copy facility)
- **PCI Express x 16 nVidia GeForce Go 6800 (NV41GLM-12 layer)**
Optional PCI Express ATI Mobility Radeon X800 (M28)
- **256MB DDR3 Video RAM & DirectX 9 support**
- **Built in Wireless LAN 802.11b/g card and bluetooth**
- **Windows XP Home** with CD & Manual



ECode: e022



"Massive performance; generous memory"

Call: 020 8208 9755

Additional features: Integrated 7 in 1 smart card reader, Built in 10/100/1000-Giga Lan Ethernet adaptor, 56k fax/modem, video camera, Audio DJ CD and MP3 player, Intel Azalia high definition sound with virtual 8 channel output, 4x built in speakers and subwoofer. Full size keyboard with separate numeric keypad, Optional built-in TV tuner and remote control. Ports: 2x IEEE 1394 Firewire 400Mbps, 4x USB 2.0, IrDA, TV/HDTV-Out, Video In (with TV Tuner only), Parallel, Serial, DVI out, PS/2, S/P DIF output (coaxial), 1x PC card slot, Smart Li-Ion battery, 3 hotkeys (email, Web browser, applications.) Carry case, Nero software, Virgin.net internet access, 36 months return to base warranty***, 397 (W)x298(D)x49.5mm (H) / Weight: 5.2Kg

AJP D900T- E

- 17" TFT WXGA
- Intel Pentium 4 540 (3.2GHZ)
- 512 MB DDR2 RAM
- 80Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 1199.00 exc Vat

£ 1408.83 inc Vat

AJP D900T- M

- 17" TFT WSXGA+
- Intel Pentium 4 550 (3.4GHZ)
- 1024 MB DDR2 RAM
- 80Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 1375.00 exc Vat

£ 1615.63 inc Vat

AJP D900T- H

- 17" TFT WSXGA+
- Intel Pentium 4 650 (3.4GHZ)
- 1024 MB DDR2 RAM
- 100Gb 5400 rpm HDD
- 8 x Dual Layer DVD Writer

£ 1499.00 exc Vat

£ 1761.33 inc Vat

(New Intel Processor with 2MB cache)

For online configurator, full range of products and specifications visit www.ajp.co.uk

AJP Business Achievements

- 2004 - UK Best Service Award Winner Dec 2004 What Laptop
- 2004 - Computer Shopper Awards 2004 Notebooks Shortlist
- 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

Buy With Confidence

1. Notebook Specialists, 19 years experience
2. Value for Money
3. Excellent Magazine Reviews
4. State of the Art Technology
5. 2-3 Days Delivery³
6. Quick & Efficient after Sales Service
7. Buy Now Pay Later Option
8. Successful Organisation with Secure Financial Status

AJP™
 Making IT Happen

www.ajp.co.uk



Table of features

MANUFACTURER	CHILLBLAST	DEMONITE	EVESHAM	JAL	
MODEL NAME	FUSION FX55 SLI	ULTIMATE SLI PRO	EVOLUTION DECIMATOR SLI	ADHIRA	
Price inc VAT (ex VAT)	£3,758.83 (£3,199)	£2,466 (£2,099)	£2,199 (£1,871.48)	£1,995 (£1,697.87)	
Sales telephone	0845 456 7830	0871 66 66 600	0870 160 9500	08707 525 810	
URL	www.chillblast.com	www.savastore.com	www.evesham.com	www.jal.co.uk	
HARDWARE, EXPANSION, I/O AND MULTIMEDIA					
Processor	AMD Athlon FX55	AMD Athlon FX55	Intel Pentium 4 EE 3.73	AMD Athlon FX55	
Motherboard	Asus A8N-SLI Deluxe	MSI K8N SLI Platinum	MSI P4N Diamond	DFI Lanparty Infinity NF4 SLI DR	
Chipset	Nforce 4 SLI	Nvidia Nforce4 SLI	Nvidia Nforce 4 SLI Intel Edition	Nvidia Nforce 4	
Available memory/type	OCZ PC-3200 EL-DDR Dual Channel Platinum Rev2 1,024MB	2 512MB DDR440 Kingston HyperX	1GB DDR400 PC3200	2GB DDR400 PC3200	
Occupied/spare memory slots	2/2	2/2	2/2	2/2	
Max memory in this configuration	3GB	3GB	3GB	4GB	
Max memory supported by mbd	4GB	4GB	16GB	4GB	
Hard disk manufacturer and model	2 Western Digital Raptor 74GB 10,000rpm, 8MB cache (Raid 0)	2 Maxtor Maxline + 2 250, 250GB (Raid 0)	2 Western Digital 250GB (Raid 0)	2 Maxtor Diamondmax 10 250GB (Raid 0)	
Secondary hard drive	Seagate 7200.8 300GB SATA 8MB cache	N/A	N/A	N/A	
Total storage space	448GB	500GB	500GB	500GB	
No of 3.5/5.25in bays	6/4	6/5	5/5	5/5	
No of free 3.5/5.25in bays	3/2	3/2	1/3	3/3	
No of PCI/PCI-E-x16/PCI-E-x1 ports	3/2/2	3/2/0	2/2/1	2/2/2	
No of free PCI/PCI-E-x16/PCI-E-x1 ports	3/0/2	3/0/0	2/0/1	2/0/2	
No of USB2/Firewire ports	4/2	8/1	6/1	6/1	
No of Serial/parallel/PS/2 ports	0/1/2	1/1/2	1/1/2	0/0/2	
Primary optical drive	LG GSA-4163B	NEC ND-2520A	Sony DW-D23A	Benq DD DW-1620	
Optical drive formats and speed (max)	DVD+R: 16x, DVD+RW: 8x, DVD+R DL: 4x, DVD-R: 16x, DVD-RW: 6x, DVD-Ram: 5x (v2.2), CD-R: 40x, CD-RW: 24x	CD-R: 48x, CD-R: 16x, DVD-Rom: 16x, DVD+/-R: 4x, DVD+/-DL: 48x, CD-R: 8x, DVD+/-RW: 24x	DVD+R: 16x, DVD-R: 8x, DVD-R9: 4x, DVD+R9: 4x, DVD-R: 16x, CD-R: 48x, DVD-Rom: 16x	CD-Rom: 40x, CD-RW: 24x, DVD+R: 16x, DVD-R: 16x	
Secondary optical drive	Sony CRX320E	Sony CRX320E	Sony DDU-1613	Generic DVD 16x	
Optical drive formats and speed (max)	CD-R: 52x, DVD-R: 16x, CD-RW: 24x	CD-RW/DVD-Rom (combo), DVD-Rom: 16x, CD-Rom: 52x, CD-R: 52x, CD-RW: 24x	DVD-Rom: 16x CD-Rom: 40x	DVD-R: 16x, CD-R: 4x	
Soundcard	Creative Soundblaster Audigy 2 ZS	Onboard Soundblaster Live	Onboard	Onboard	
Speakers	N/A	Creative Inspire P5800	Creative Inspire T7900	Altec Lansing MX5021 / 5100	
Graphics chip/memory	2x Nvidia Geforce 6800 Ultra 256MB	256MB Nvidia Geforce 6800 Ultra (SLI)	128MB Nvidia Geforce 6800 GT (SLI)	128MB Nvidia 6600 GT	
Screen type, size, response time, and maximum resolution	Sharp LL-2015B 20.1in, 16ms, 1,600 x 1,200	Acer AL2021, 20in, 25ms, 1,600 x 1,024	Viewsonic VX912, 19in, 8ms, 1,280 x 1,024	Viewsonic VX924, 19in, 4ms, 1,280 x 1,024	
OTHER INFORMATION					
Modem/Other hardware	Logitech Dinovo keyboard and mouse, V.90 modem	V.90 modem, Logitech Attack 3 Joystick, Headset, Iomega Rev drive	V.90 modem	V.90 modem, DFI Transpo harness, Terratec Mystify Claw, Terratec Gaming mouse, Icemat gaming mat, Logitech cordless keyboard and rechargeable mouse	
Network	Dual 10/100/1,000 Lan	10/100/1,000	10/100/1,000 Lan	10/100/1,000	
Operating system	Windows XP Professional	Windows XP Home	Windows XP Home	Windows X64 Edition	
Bundled software	Norton Antivirus, Microsoft Antispyware, Nero Burning Rom	Games Pack, Microsoft Works Suite 2005	E-trust AV	Selection of Games, PC-Cillin Anti Virus, Nero Burning Rom	
Standard warranty (RTB = return to base, C&R = collect and return)	1yr C&R	1yr on-site parts and labour, 5yrs RTB labour only	2yrs on-site, 1yr RTB	2yrs on-site, lifetime labour RTB	
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	
Performance	★★★★★	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	
Overall	★★★★★	★★★★★	★★★★★	★★★★★	



	MESH	WATFORD
	ELITE EXTREME PBX	ARIES TITANIUM 6851
	£1,983.40 (£1,688)	£2,937 (£2,500)
	0870 046 47 47	0871 66 66 600
	www.meshcomputers.com	www.savastore.com
	Intel Pentium 4 EE 3.73	Intel Pentium 4 EE 3.73
	Asus P5AD2	MSI 925X Neo Platinum
	Intel 925XE	Intel 925XE
	1GB DDR2 533MHz	1GB DDR2 533MHz
	2/2	2/2
	3GB	3GB
	4GB	4GB
	2 Maxtor Diamondmax 10, 300GB (Raid 0)	2 Maxtor Maxline Plus II, 250GB (Raid 0)
	N/A	N/A
	600GB	500GB
	4/3	8/5
	1/1	4/2
	3/1/2	3/1/1
	3/0/2	2/0/1
	6/1	4/2
	0/1/2	1/1/2
	Sony DVD-RW DW-D22A 16x dual layer	NEC ND-3520A
	DVD+R: 16x, DVD-R: 8x, DVD-R9: 4x, DVD+R9: 4x, DVD-R: 16x, CD-R: 48x, DVD-Rom: 16x	DVD+R DL: 4x, DVD-Rom: 16x, DVD+R: 16x, DVD-Rom DL: 7.3x, DVD+RW: 8x, DVD+/-R: 16x, DVD-R: 16x, DVD-R DL 4x CLV DVD+/-RW: 8x
	Sony DVD-Rom DDU16I2	Sony CRX320E
	DVD-Rom: 16x CD-Rom: 40x	CD-R: 52x, DVD-R: 16x, CD-RW: 24x
	Onboard	Creative Soundblaster Audigy 2 ZS
	Creative Inspire T7900	Creative Inspire P5800
	256MB ATI Radeon X850XT PCI-E	256MB ATI Radeon X850 XT
	ViewSonic VX912, 19in, 8ms, 12,80 x 1,024	Acer AL2021, 20in, 25ms, 1,600 x 1,024
	V.90 modem, Belkin Hi-Speed USB2 seven-port hub, external USB2 8-in-1 card reader, 1GB pen drive	V.90 modem, Logitech Attack 3 Joystick, Headset, Iomega Rev drive
	Dual 10/100/1,000 Lan	Dual 10/100/1,000
	Windows XP Home	Windows XP Professional
	Microsoft Works 8, Cyberlink PowerDVD 5, Power2Go 4, Power Producer 3, Power Director 3, Mediashow SE, PowerDVD Copy Powercinema 4, Microsoft Office Trial	Games Pack, Microsoft Works Suite 2005
	3yr on-site hardware warranty (UK only) – parts and labour	1yr onsite parts and labour, 5yrs RTB labour only
	★★★★★	★★★★★
	★★★★★	★★★★★
	★★★★★	★★★★★
	★★★★★	★★★★★

Intel v AMD: your choice

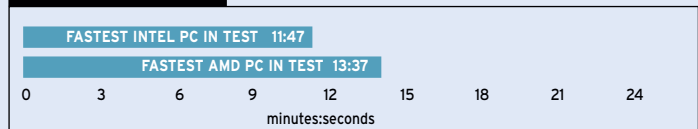
Choosing between the Intel and AMD platforms can be difficult, but both are worthy of your consideration. Each has its advantages in different areas, so deciding which is right depends entirely on what you intend to use it for.

In the Sysmark 2004 benchmark results for the systems in this test, the three PCs using an Intel motherboard and processor have a distinct advantage over their Athlon FX-55 counterparts.

Closer inspection of the Internet content creation and Office productivity scores suggest that if you use a PC predominantly for creating websites, spreadsheets and databases, the Pentium 4 Extreme Edition is by far your best bet.

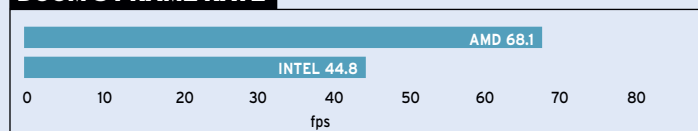
A real-world example of the Pentium 4's superiority in this area can be seen in our video-encoding tests. The fastest Intel PC encoded our 1GB video less than two minutes faster than the fastest AMD PC (see graph below). This may not seem like a great difference, but if you plan to encode large videos of up to 30GB, you could save yourself around two hours of encoding time by choosing the Intel Pentium 4 Extreme Edition 3.73GHz CPU rather than the Athlon FX55.

VIDEO ENCODING



The AMD64 platform makes up for this shortfall with excellent gaming abilities. AMD has long ruled the roost in this arena and the difference between the two platforms becomes clear when playing demanding 3D titles. The following graph illustrates the difference in performance between similarly configured Intel and AMD PCs using the same graphics card.

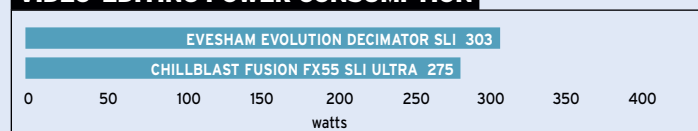
DOOM 3 FRAME RATE



Intel has closed the gap in gaming performance between these platforms by adopting Nvidia's nForce 4 chipset for Intel motherboards. This brings SLI gaming to Intel PCs, and offers similar performance to equivalent AMD systems, but you will pay slightly more for the privilege.

Another major consideration is power consumption. PCs using Intel's Pentium 4 Extreme Edition CPUs require significantly more electrical power than their Athlon FX55 counterparts. Lower thermal requirements mean Athlon FX55-equipped PCs could provide an approximate 20 per cent electrical saving every month in comparison to a P4 Extreme Edition-equipped PC. Athlons also use AMD's Cool 'N'Quiet technology, which can reduce or increase power on demand to conserve energy. Power savings can vary (the more components you have in your PC the more electrical power it is likely to consume), but in general, AMD has a strong advantage in this area. The graph below compares how two similarly specced PCs performed in our power consumption test.

VIDEO-EDITING POWER CONSUMPTION



If you've bought the DVD or CD edition of PCW, see the cover disc for more detailed results showing how the power demands of these PCs compare. Or visit <http://tinyurl.com/9Inv4>.

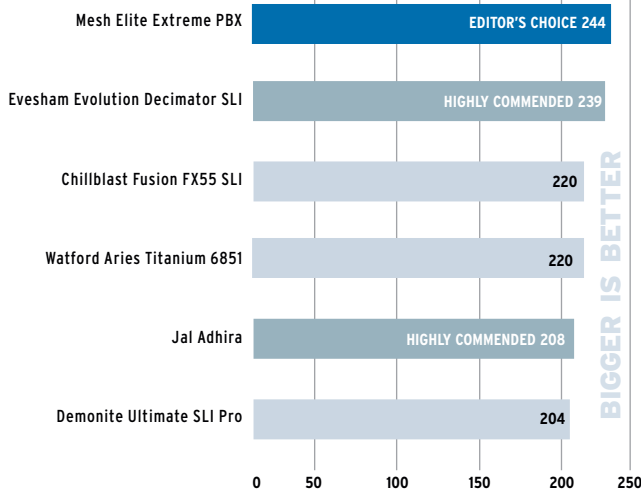


Lab results

For full results go to <http://tinyurl.com/9Inv4>

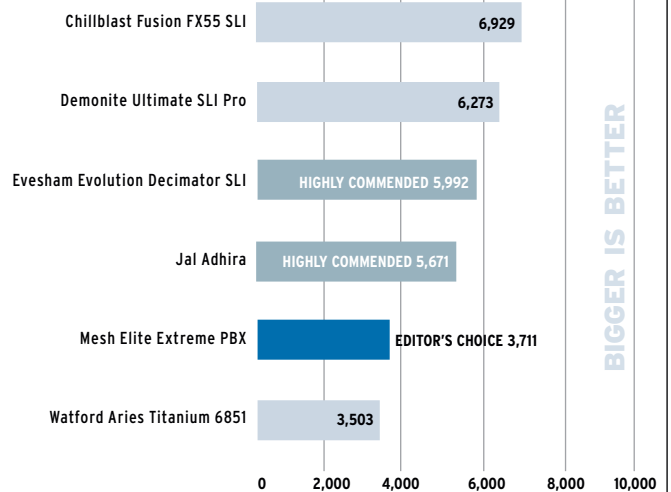


Sysmark 2004

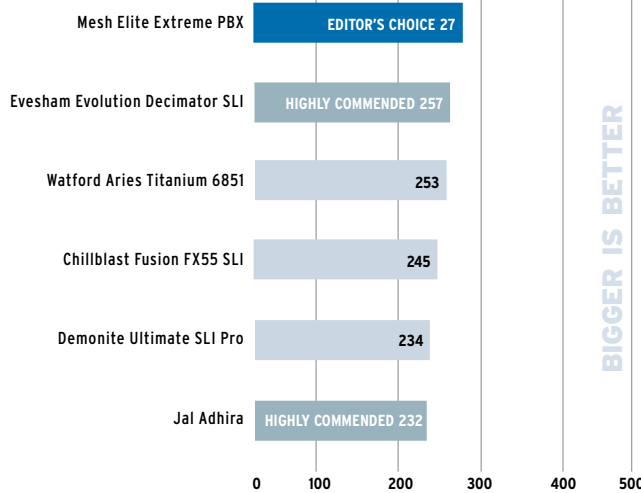


3Dmark05

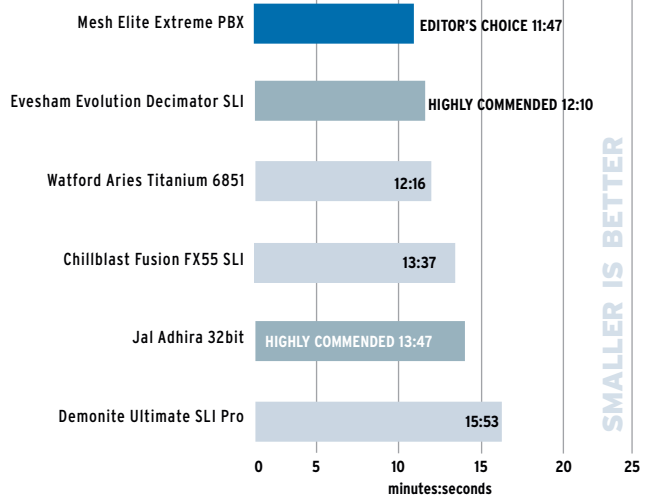
(1,600 x 1,200 2 x anti-aliasing 2 x anisotropic filtering)



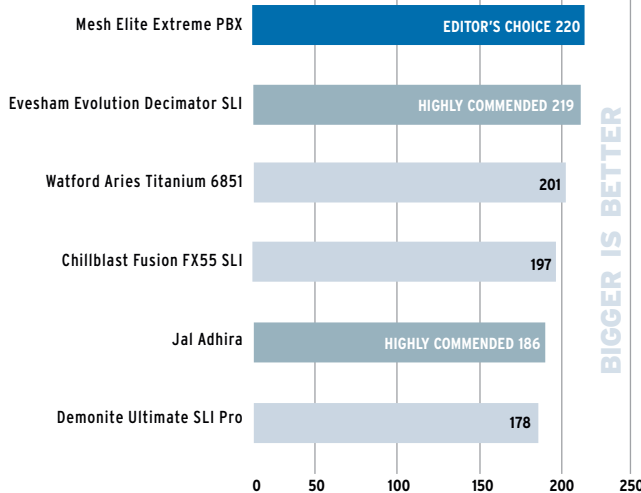
Sysmark 2004 Internet content creation



Time taken to encode 1GB video using xmpeg

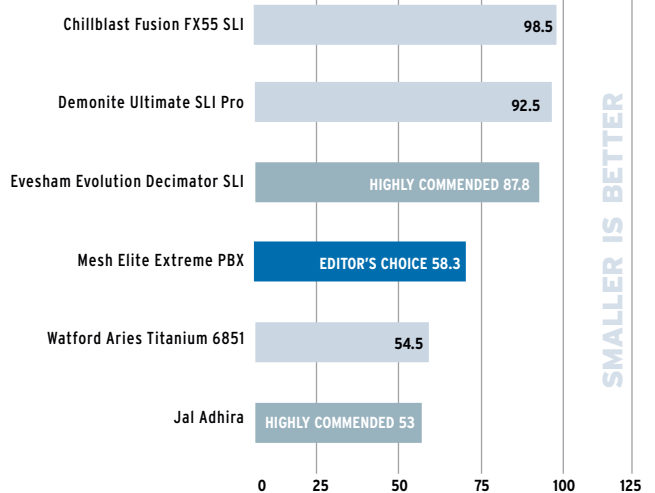


Sysmark 2004 office productivity



Doom 3

(1,600 x 1,200 2 x anti-aliasing 2 x anisotropic filtering)



Please see page 12 for an explanation of how we tested the PCs

Editor's Choice

It's always interesting to see how different manufacturers react to a group test invitation that specifies no upper price limit. Some, such as PCW newcomers Chillblast, throw caution to the wind and produce systems that pull no punches whatsoever. Others, such as Jal, are more reserved.

Judging the winners of this group test was quite easy, for a change. Whether you should choose an AMD or Intel-based PC ultimately depends on what you want to use it for. The differences between the two platforms are minimal and won't even be noticeable to the average user, but if you're more demanding you should remember that Intel's strength is in 'desktop' applications such as video editing and encoding. Their performance in this area is helped by DDR2 memory. AMD's strength, meanwhile, lies in gaming, with computers that use SLI graphics configurations having a significant edge over their single-card counterparts in 3D applications. It's not always as simple as this, however, as not all PCs are created equal. The Watford Aries PowerXS Titanium 6851, for example, has a similar specification to that of the Mesh Elite Extreme PBX, but was soundly beaten in just about every area.

Likewise, the Demonite Ultimate SLI Pro has an almost identical core specification to the Chillblast Fusion FX55 SLI Ultra, but the difference in performance between these

'This performance in a PC costing under £2,000 is hugely impressive'

entries is vast. This serves as a stark reminder that not all manufacturers are able to get the most from a given specification.

The winners

Our **Editor's Choice** award goes to the **Mesh Elite Extreme PBX**. Last month this PC impressed us in the Sysmark 2004 tests and, despite stiff competition from Evesham here, it held on to the top position.

This was largely due to its use of an Intel Pentium 4 Extreme Edition CPU and the Asus P5AD2 motherboard. This combination is fast establishing itself as one of the best foundations for any Intel-based PC.

Ordinarily, we'd be impressed by the ATI Radeon X850 XT Platinum Edition



Mesh Elite Extreme PBX



Evesham Evolution Decimator SLI



Jal Adhira

graphics card used in this PC. It achieved a great result in both 3Dmark05 and Doom 3 tests, but this 3D performance pales in comparison to that achieved by entries with dual graphics cards in an SLI configuration.

Where the Elite Extreme PBX comes into its own is during demanding desktop computing tasks. It was the fastest to encode our 1GB test video and it achieved the highest Sysmark 2004 score we've ever recorded. The fact that Mesh has managed to deliver this level of performance and features in a PC costing under £2,000 is hugely impressive.

Our first **Highly Commended** award winner is the **Evesham Evolution Decimator SLI**. Evesham has managed to deliver one of the best all-round PCs in the group. It was 23 seconds slower than the Mesh Elite Extreme PBX when encoding our 1GB test video, but it makes up for this with strong graphics performance.

It uses an SLI graphics configuration – the first we've seen in an Intel PC. Its Geforce 6800 GT graphics cards outperformed the Radeon X850 XT Platinum Edition in the Mesh submission, and was right on the heels of the twin Geforce 6800 Ultras used by the Demonite Ultimate SLI Pro. Like the Mesh Elite Extreme PBX, it uses a 19in monitor, which doesn't make the most of its impressive gaming ability. However, if you're not an avid gamer, its Viewsonic VX912 is very attractive.

Our second **Highly Commended** award goes to the **Jal Adhira** – the only Athlon FX55-based submission among our award winners. Our first impressions of this PC weren't very positive, as it had taken a beating during transit and arrived with its components strewn all over the inside of the case, but we soon warmed to it. It wasn't as fast as the Chillblast Fusion FX55 SLI Ultra, but it was marginally quicker than the Demonite in day-to-day applications. Understandably, its 3D performance was slow in comparison to its rivals, but the Adhira can be upgraded with a pair of Geforce 6800 Ultra graphics and will still cost less than the Demonite PC. The Adhira is the only entry in this group test that uses Windows XP X64 Edition. This gives it a marginal performance benefit in standard 32bit applications, but users will begin to recognise performance benefits as fully 64bit-compliant software is released.

Both Intel and AMD have their strong points, but your requirements will dictate which is the best option for you.

tiscali.

Broadband
speed

Dial-up
price

up to **1Mb**
Broadband
£15⁹⁹
PER MONTH

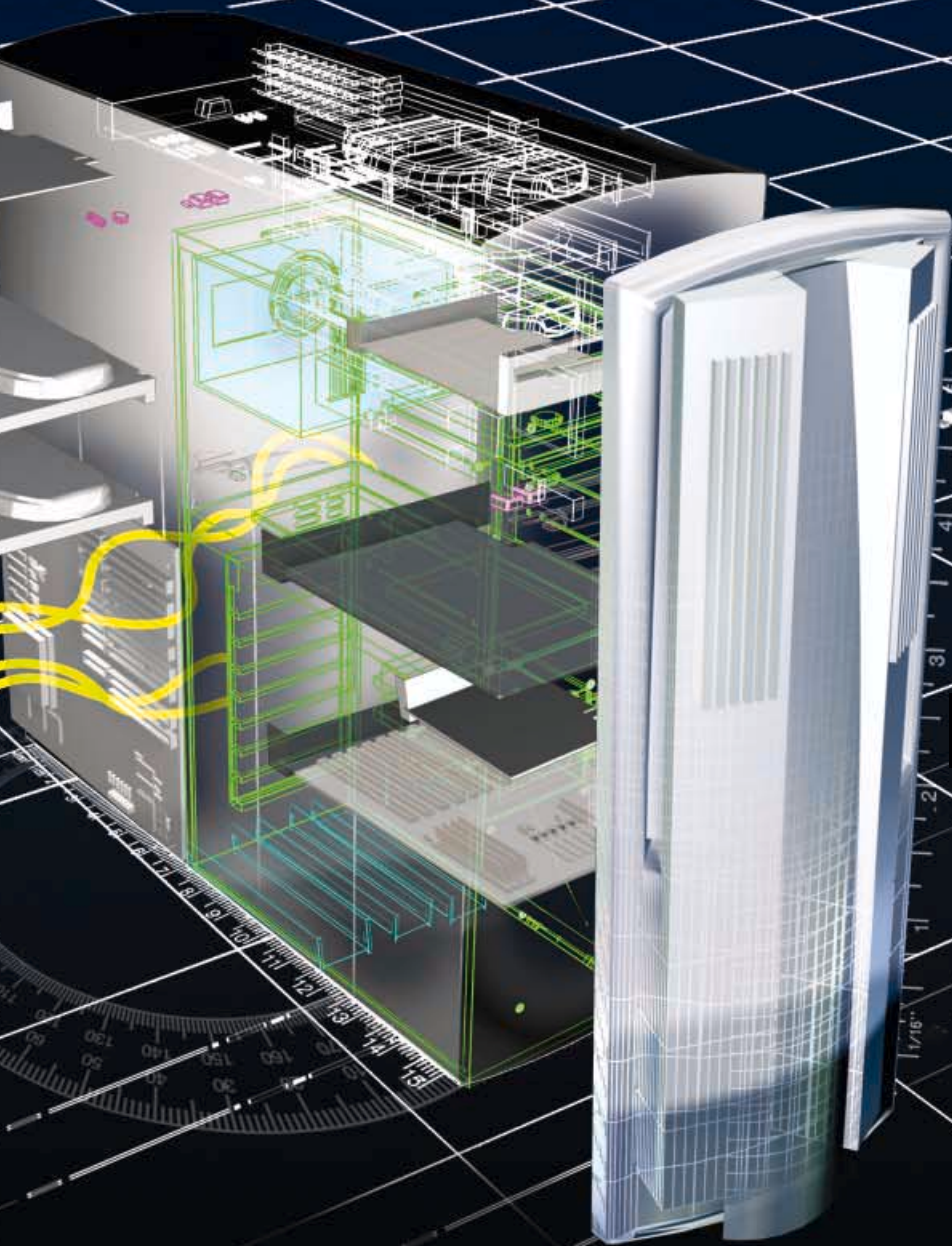
- Free Modem
- Free Set-up
- Free Anti-spam & Anti-virus
- Choice of speeds available

Call 0800 107 9000 or visit www.tiscali.co.uk

BT line required. Subject to availability. Terms and conditions apply. 2GB usage allowance per month on 1Mb at £15.99. Prices correct at time of print.
TISC 1562

32-PAGE SUPPLEMENT

Build the ultimate PC



Components explained
Step-by-step workshop
Includes best buy tables

**PERSONAL
COMPUTER
WORLD**

Sponsored by





All-In-One solution for first-time PC DIY users

Cooling Kit

The Cooling Kit is a great solution suitable for today's generation of PC's. It is designed with silence and cooling in mind.

The Cooling Kit includes a 400W power supply (Maximum output 450W) with high quality dual colour coating, golden coloured fan guard and also incorporates the innovative FSP 120mm fan illuminated with red, green and blue LED's.

The Cooling Kit consists of a 400W 120mmfan power supply with two 80mm system fans available for both Intel and AMD compatibility.

Where to buy
 MicroDirect www.microdirect.co.uk
 Special Reserve specialreserve.co.uk
 Opal Computers www.opalcomputers.com



Silent Solution Kit

The silent solution package consists of a power supply, CPU cooler and system fan, fully compatible with Intel Pentium 4 (Socket 478) or AMD Athlon/ Duron/ Athlon XP (Socket 462) systems.

Where to buy
 Maplin or Maplin stores www.maplin.co.uk
 MicroDirect www.microdirect.co.uk
 Misco www.misco.co.uk



AMACROX Rubber Suspension Kit

Fan mounts/ Vibration isolators/ Fan guard mount



- Designed to mount your case fan, dampen vibration between case and fan
- Reduce system noise effectively (particularly when there is more than one fan)
- Each package contains 8 pieces of fan mount that work with 8cm to 12cm fans
- Compatible with standard fan screw holes
- Compatible with system fans with different depth - from 0.4cm to 2.5cm cases with housing thickness from 0.4mm to 1.5mm
- Can be used to mount fan guard

Where to buy
 Maplin or Maplin stores www.maplin.co.uk

Introduction

■ SUPPLEMENT

Contents

4 Cases

How do you choose the right case for your needs? We take a look at your options

6 Processors

Making sense of processor jargon can be a nightmare, so let us help you understand all you need to know

9 Motherboards

Choosing the right motherboard is crucial to your new system. We check out what's important

12 Graphics cards

The key factors for choosing the right graphics card

14 Hard drives

Get your head around hard disk storage with our useful guide

16 Soundcards & speakers

How to ensure your system produces the best audio and enhance your listening pleasure

18 Monitors

Whether you are looking for a CRT or TFT, we help you understand exactly what you need

21 Build your own PC

Follow our step-by-step guide to building either the Intel or AMD system of your dreams

26 Checklist for a Media Centre and quiet PC

All the information you need to build either a Media Centre or a quiet PC

CREDITS

Supplement Editor **Rob Jones**
Writers **Alex Arias, Simon Crisp, Rory Reid & Will Stapley**
Production Editor **Kathryn Twyford**
Art Editor **Susie Norris**
Cover illustration **Vincent Fraser**
Brand Marketing Manager **Tim Webb**
Production Manager **Idil Buraleh**
Publisher **Richard Wilson**

 **vnu business publications**

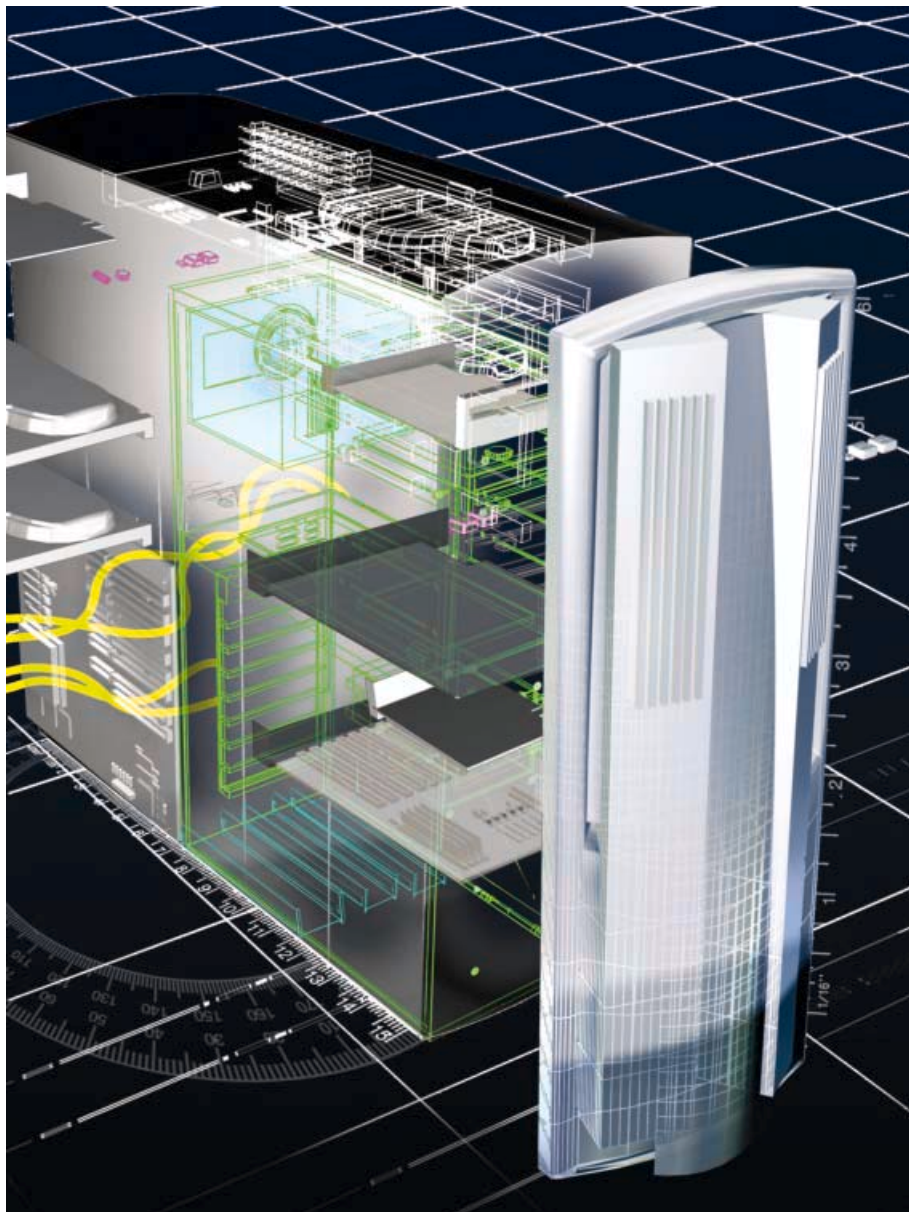
Building the dream

When we decided to produce a supplement on building a PC, we talked long and hard about the angle we would take. With so much activity in the market at the moment, especially around the CPU, we had to choose between building a mid or low performance PC, or instead get the latest available processors from AMD and Intel and build the fastest possible system that we could.

Given such a choice it wasn't a difficult decision – it had to be the fastest performance possible and that's what we achieved. Our benchmarks placed it among the fastest we have tested, although as ever in this area, it won't be long before there are far faster.

We have recognised that not everyone would want to build such a system though, so you can use the workshop to guide you through building a PC and the buyer's guides to help you choose the right components for your needs.

Rob Jones



A case in point

Choosing the right case for your computer, and for your needs, can be more complicated than it looks. We check out the different options available for those who want to do it themselves

Perhaps the most obvious aspect of a computer is the bit that's visible to the world – the case.

People refer to the case in a variety of ways, but it only serves one specific purpose: to act as a container for the components that snap together to make a PC.

However, don't be fooled into thinking that the simplicity of its function means that choosing the case for an embryonic computer is as straightforward as picking the prettiest. When building a PC from scratch, the case throws up almost as many considerations as any other part of the procedure.

First and foremost, is whether or not the case you like can accommodate all the components inside. The most popular size options include tall cases (known as towers), small cases (mini- or midi-tower), small form factor and flat cases (desktop). The last of these is commonplace in corporate environments, where space is limited and the horizontal orientation can be exploited to serve as a monitor plinth.

However, a tower-type case is likely to prove a better bet for the PC-builder: vertical designs are generally better equipped, with 3.5in and 5.25in drive bays. It's important then, to tot up the total number of drive-bay devices you intend to install. It's also wise to plan for later improvements or additions, as



Small form factor cases are ideal for situations when space is a problem

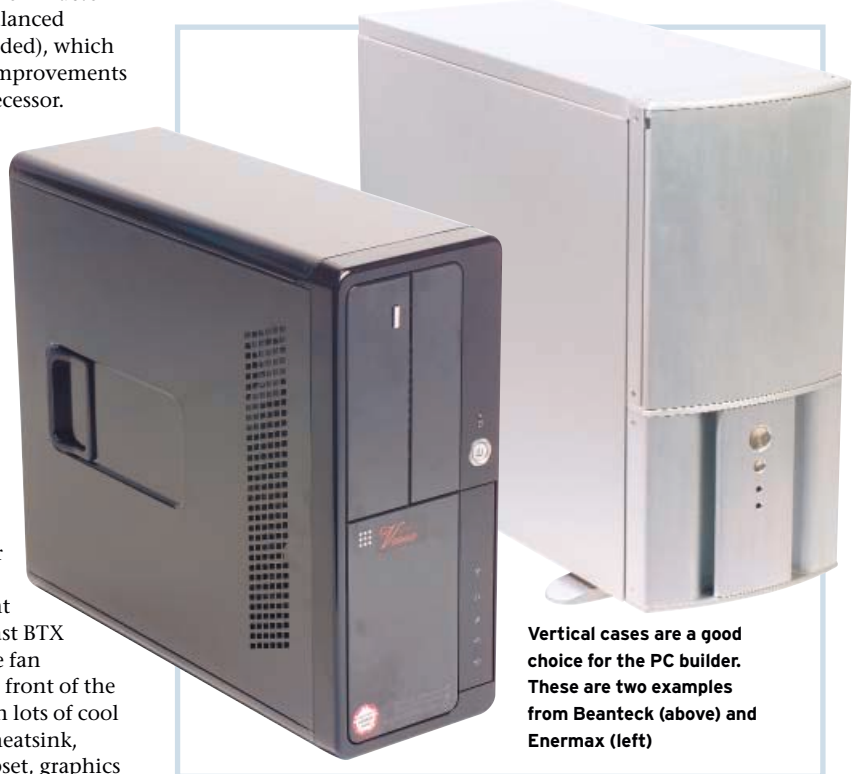
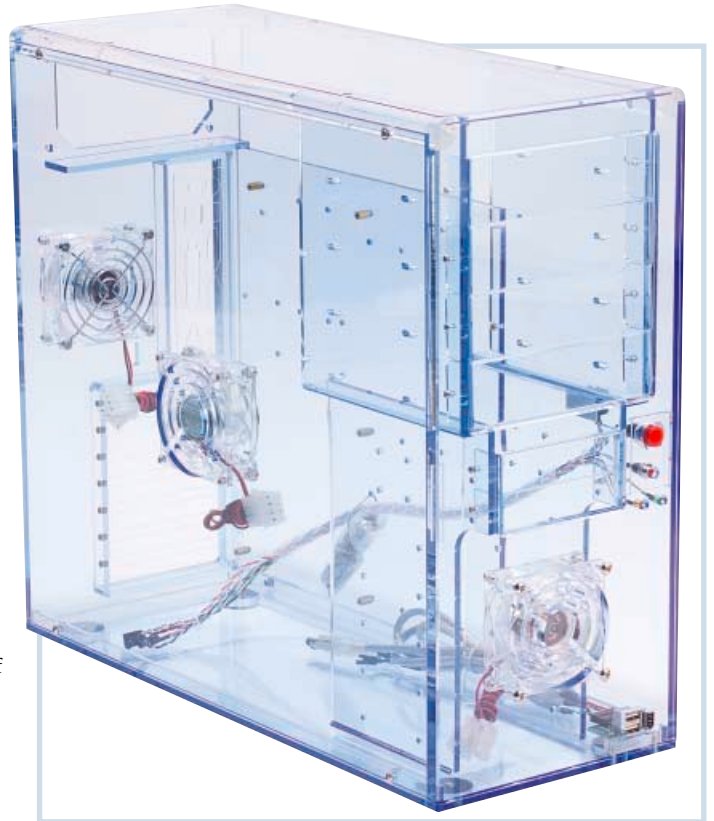
Before you fall for a flash-looking case, make sure it can house all your components first

this tally will dictate the size of case you need.

Board talk

In addition to the physical dimensions, there are plenty of other considerations. Of paramount concern is that a chosen case (or chassis) should accommodate the motherboard: don't buy one without cross-referencing the specifications of the other first. However, it's pretty simple: the majority of cases conform to a standard called ATX. It's no coincidence that this matches with the most popular type of motherboard (see page 9 of this guide for more on motherboards). Most of the time, an ATX case is what's needed, so target motherboards sporting this three-letter suffix. If you want to look at more modern designs, Intel recently introduced a new form factor known as BTX (Balanced Technology Extended), which has a number of improvements over its ATX predecessor.

The BTX form factor was developed due to the increasing problem of heat and noise in modern PCs. As processors and graphics cards get faster, they require more cooling, which in the ATX form factor is provided by numerous fans – each of which uses a lot of power and generates a significant amount of noise. In contrast BTX cases use one large fan mounted near the front of the system, drawing in lots of cool air over the CPU heatsink, motherboard chipset, graphics



Vertical cases are a good choice for the PC builder. These are two examples from Beanteck (above) and Enermax (left)



BTX cases are growing in popularity

card, and power regulation circuits using what is known as a Thermal Module Assembly (TMA).

Flexibility in BTX case designs can be achieved by air ducts, which can draw air from the rear, top or side of a case. Two BTX designs are available; Type II for thin and light systems, and Type I for taller standard-sized desktop designs. Type II designs will tend to be noisier than Type I, as they use a smaller heatsink and fan, but even these will tend to be quieter than their ATX counterparts, as the total number of fans use inside the case is greatly reduced. Motherboard chipsets and even most graphics cards, for example, will no longer require active cooling fans.

The Thermal Module Assembly in a BTX case will also benefit other components inside

the PC. Memory modules and hard drives will also be kept far cooler, which should ultimately result in a more reliable PC.

The only current limitation in a BTX case is its power supply. Most BTX power supplies provide less than 300w of power, so running a huge number of components could result in system instability.

BTX cases are currently thin on the ground, but expect their popularity to increase in the coming months.

Power games

When shopping for a chassis, be aware that you'll have to make the choice between those that include ready-fitted power-supply units (PSUs) and those that don't. Common sense suggests that a case with a pre-installed PSU is more economical, not to mention

providing an advanced base from which to proceed, but price and preparedness are only part of the story.

The PSU is one of the most overlooked components, yet it's central to the reliable running of a completed machine.

Cut corners here and you could be lining yourself up for unexpected system resets and, in extreme circumstances, melted wires and connectors. If your plan is to build a power PC, then we'd recommend investing in a 300w-rated PSU that meets the latest ATX12V specification from Intel. A basic 250-300w-rated ATX PSU will suffice, but if buying a motherboard that includes an ATX12V connector, be sure to buy a matching power supply.

Though we have only a limited amount of space in this guide to discuss such matters, it's

worth knowing that there's a huge choice in the computer case market. The basic tower and desktop designs discussed here represent only a fraction of all the available options. More to the point, it's imperative that PC-builders with specialist requirements do investigate some of the niche chassis product lines.

If you're set on crafting a super-computer, for example, then expect the necessary components to generate a lot of heat – energy that must be dissipated if your PC isn't going go up in smoke.

Speed-obsessed computer constructors should consider investing in specialist cooling apparatus of some kind: an outfit like Cooler Master (www.coolermaster.co.uk) will kit you out with all the gear needed to prevent a hyperactive PC from blowing a gasket.

Silence is golden

Similarly, some people might prefer to avoid the possibility of being driven to distraction by the constant hum emitted by the average PC. Souped-up or not, all modern computers have a fan or two hidden away inside.

However, some are noisier operators than others and a shaky fan coupled with ill-fitting case panels leads to rattles and squeaks aplenty. In short, if you want to keep things quiet, then plumping for a standard ATX case and PSU is unlikely to make for a quiet life.

If you're prepared to pay a premium for peace, however, then you could consider a chassis like the Acoustica from QuietPC (www.quietpc.com). ■

A good PSU is essential to the reliable running of your machine



Investing in a good fan is essential to keep your PC cool

The brains of your PC

The choice of processors available is massive, as is the price range, but it's hard to make a decision when you're surrounded by all that jargon. We explain what it all means

The CPU (central processing unit or processor) is the brains of your PC; everything that happens inside your PC has to interact with it.

There's a bewildering number of processors out there for all budgets – prices range from around £25 for low-end CPUs to £700 or more for the fastest models. But with an equally bewildering amount of names and numbers, things aren't as simple as they once were. In this guide, we'll look at mainstream desktop and mobile processors – we're not looking at specialised server or workstation models.

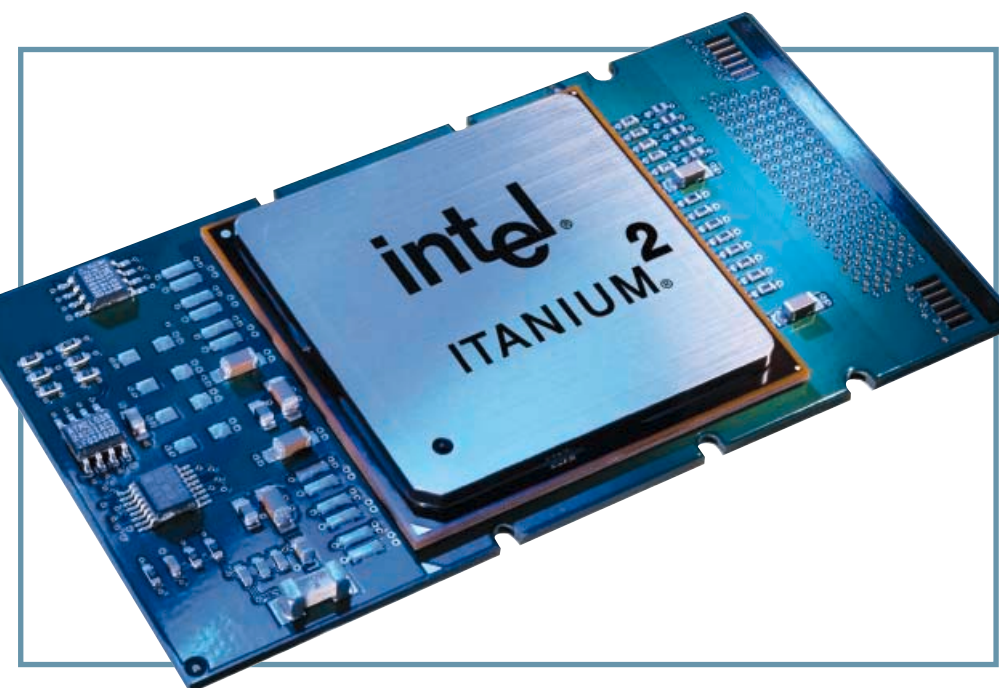
AMD vs Intel

Both Intel and AMD offer a wide range of CPUs. The two companies' products are in direct competition and are both capable of running any current PC software – the differences are in technical details that, although they may be used for marketing, don't necessarily mean much to the end user. Pricing is also very competitive, with AMD's products being generally cheaper than comparable Intel models.

At the budget end of the market, Intel's offering is the Celeron which is a cut-down version of the Pentium 4. AMD's latest budget processor, the Sempron, has replaced the older Duron processor.

In the mainstream desktop market it's Intel's Pentium 4 versus AMD's Athlon XP and Athlon 64. The chief difference between the two is that most of the Pentium 4 and Athlon XP models are 32bit CPUs while the Athlon 64 is a 64bit model (see next page for more explanation).

Both AMD and Intel offer high-end processors in the form of the Pentium 4 Extreme Edition and the Athlon FX55,



both of which are aimed at the hardcore gaming market. Just recently, both companies have announced new ranges of processors – Intel with the dual core version of the Pentium 4 840 Extreme Edition and AMD with the Athlon 64 X2.

These processors effectively act as two CPUs in one and offer superior performance to their single core counterparts. Ordinary users won't notice all their advantages but they provide dazzling performance for demanding users such as digital media enthusiasts and those who run many applications simultaneously.

Other choices

If you are looking to build a very small system from scratch, then Via's Epia platform is worthy of your attention. This platform consists of tiny (17 x 17cm) motherboards with the Via C3 processor already fitted – you can't upgrade the CPU. At 1.5GHz, the fastest C3 may not be able

to match its bigger desktop cousins in performance terms, but it allows you to build low-cost, space-saving systems.

What's in a number?

Processor naming can be highly confusing. Until recently Intel simply used the clock speed of the processor – for example, 3.2GHz Pentium 4 – while AMD uses names based on the processor's alleged capabilities. For example, an AMD XP3000+ may have a clock speed of 2.16GHz but in practice it performs more like a 3GHz processor.

Intel has now changed the way it names processors. The new names consist of the processor family (such as Pentium 4) and a three-digit number as follows:

- Pentium 4 desktop and Mobile Pentium 4 use 5xx or 6xx
- Celeron and the mobile Celerons use 3xx
- Mobile Pentium Ms use 7xx
- Pentium Extreme Editions use 8xx.

The other two digits refer to the

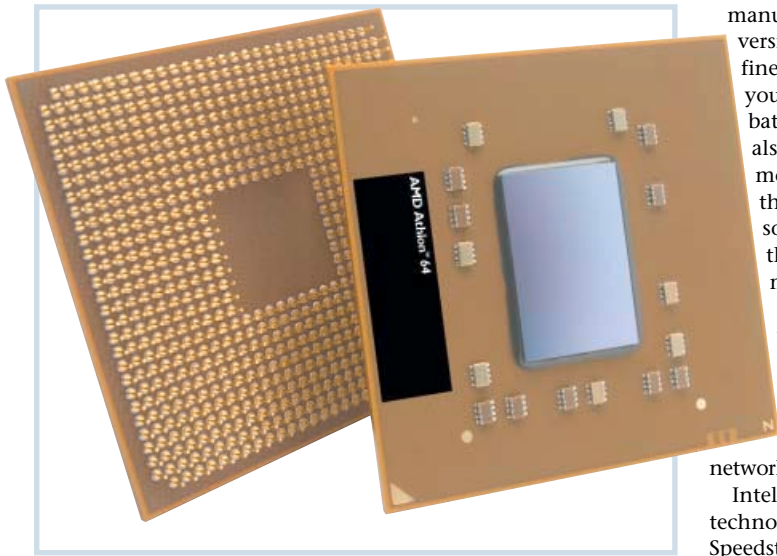
features and technical specifications of the processor – for example the 2GHz Pentium M processor is the 755 model. In practice, many vendors are still printing the actual speeds to avoid confusion.

Sockets and pins

When you see the description of any processor you will see the socket type mentioned, either as a name or a number. This is simply the socket on the motherboard the processors were designed to fit and you should ensure the CPU you buy is compatible with your motherboard. Socket 775 is the latest Intel standard, but you'll still find older Socket 478 products for sale. AMD has Socket A, Socket 740, Socket 939 and Socket 940.

Front-side what?

The front-side bus (FSB) is the interface between the CPU and the main system memory, and determines the fastest type of memory your system can use. The faster the FSB, the quicker data can be



passed between the CPU and the memory. Current Pentium 4s use a 200MHz FSB, but use 'quad-pumped' technology to enable data transfers to run at 800MHz. The latest Athlon XP 3200+ also uses a 200MHz FSB but doubled, to allow 400MHz data transfers.

Cache memory

Cache memory in a CPU helps eliminate data bottlenecks. The Level 2 (L2) cache is extra-fast memory built into the processor itself, and is used to store frequently accessed data so that the CPU isn't held up waiting for data to arrive. In general, the larger and faster the cache, the more efficient the processor. There's also a Level 1 (L1) cache on most processors that is smaller and is used for caching the processor's internal instructions. You can't upgrade cache memory.

Hyperthreading

All of Intel's current Pentium 4s and some of the Mobile Pentium 4s support Hyperthreading (HT). Put simply, HT technology gives you two virtual processors for the price of one.

Using an HT-aware operating system such as Windows XP can give you a noticeable performance boost by allowing applications to use either or both of the two virtual CPUs, hence making the system much more responsive when running lots of applications at the same time. It's not quite as good as running a system with dual

CPUs, but it's a lot cheaper until multi-code CPUs become more widely available.

64bit v 32bit

AMD was the first to market a consumer processor with 64bit capability, with the launch of the Athlon 64 range. Intel has only recently caught up with its newest Pentium 4 CPUs offering the EM64T (Extended Memory 64 Technology) 64bit extensions.

To take full advantage of 64bit processing you need a 64bit operating system and applications: Windows XP x64 Edition has recently appeared and supports AMD and Intel 64bit technology, but applications are still fairly thin on the ground.

The chief advantage of 64bit systems is that they can support a lot more memory – 32bit Windows systems are limited to 4GB of Ram, whereas a 64bit Windows system can support up to 32GB.

Data is also moved around in larger chunks, allowing a theoretical speed advantage for suitable applications.

There are also several Linux distributions available that support AMD and Intel 64bit CPUs.

Mobile processors

Intel and AMD both offer mobile versions of their processors, incorporating special power-saving features in order to maximise battery life and reduce the heat generated. Some

manufacturers use the desktop versions in laptops, which is fine but this often means that you don't get very good battery life. These systems also usually need more cooling to get rid of the extra heat generated, so can be noisier than laptops using true mobile processors.

Intel Centrino systems use the Mobile Pentium-M processor, but the label Centrino is only applied to systems that also use Intel's wireless networking chipset.

Intel's battery-saving technology is known as Speedstep, AMD's as PowerNow. Both try and save power by reducing the processor's speed when there's not much processing work being done by the system.

What's best for you?

Before you rush out and buy the fastest CPU you can afford, decide what you need it for. If you only want to use basic applications such as email and web browsing, then there's no point buying the fastest one out there. On the other hand, if you do a lot of gaming or use demanding applications such as audio or video editing, then you should look for things such as large amounts of L2 cache and fast FSB speeds. If you regularly have lots of applications running at the same time, you will see benefits from Intel's HT technology or dual-core CPUs.

Codes and roadmaps

Intel and AMD give codenames to the various versions of their chips and you'll often hear them being called by these.

The first Pentium 4 was known as Willamette, which was followed by the Northwood version. The latest Pentium 4s are Prescotts. Using a 0.13micron fabrication technology, Northwood chips crammed more transistors into the same volume, offering 512KB of L2 cache and faster clock speeds than the previous generation. Prescotts use an even finer 0.09micron (90nanometre) fabrication process with an FSB of 800MHz or 1066MHz and have 1MB or 2MB of L2 cache, giving a boost to performance over other versions.

Intel's latest Pentium mobile processor is the Dothan Pentium-M, found in Sonoma laptops. It boasts 2MB of L2 cache, a 533MHz FSB and a maximum speed of 2.13GHz.

AMD's Thoroughbred version of the Athlon XP, a 0.13micron processor with 256KB of L2 cache, superseded the original AthlonXP, Palomino. Next came Barton, still built on a 0.13micron process, but with improved L2 cache of 512KB.

AMD continues to manufacture Barton Athlon XP processors. It now also has the Athlon 64, mobile Athlon 64, the Athlon 64 FX and the dual-core Athlon 64 X2 aimed at high-end gaming. The budget Sempron is also available in a mobile version, as is the Athlon 64. AMD is moving to a 0.09micron process for its next generations of products. ■





THREE QUESTIONS YOU SHOULD ASK BEFORE YOU DECIDE WHERE TO BUY RAM...

Can you guarantee your RAM will be compatible with my system?

Use the Crucial® Memory Advisor™ tool, and we guarantee that our memory will be compatible with your system, or your money back.

The Memory Advisor is a one-of-a-kind online tool that contains detailed information about more than 110,000 upgrades for more than 20,000 PCs, including many older systems. Our database is so specific that we know more about the memory in your PC than your computer manufacturer does. The information comes from our close working relationship with computer manufacturers and from the Crucial Compatibility Lab, where seven certified lab technicians perform tests on nearly 3,000 different motherboards.

Even though it contains so much complex information, the Memory Advisor is surprisingly easy to use. Simply tell us the make and model of your system, and in just three clicks you'll know exactly what kind of RAM you need.



Exclusive offers for PC World readers!

Visit Crucial today, and in just three mouse clicks, get your FREE memory upgrade advisor report for your specific computer, including specific performance recommendations, the most popular upgrades, and the best upgrade value for you. And, for a limited time, **Crucial is offering PC World readers a special DISCOUNT coupon.** Find the right memory for your system in just seconds (and get a great deal) by visiting:

**www.crucial.com/uk/pcworld
or Freephone: 0800 013 7395 to talk to a memory advisor.**

Do you actually make the memory chips you sell?

Other memory companies may claim to manufacture memory, but what they actually do is just attach chips to a memory module—someone else makes the chips.

Why does it matter? Quality. Those other guys buy the cheapest chips they can find—often chips that haven't even been individually tested to make sure they'll work in your PC. If you install inferior memory, your computer might not boot. Or it might seem to work fine at first, but later experience mysterious crashes and error messages.

Crucial is the only consumer memory upgrade supplier that's part of a major DRAM manufacturer, Micron. We actually make (and test) our own chips—100 percent of them! In fact, because the world's leading computer manufacturers rely on our high-quality RAM, chances are good that the OEM memory in your system came from Micron. Crucial brings this same high-quality memory directly to you. It just costs less because you don't pay middleman mark-up fees.

What kind of support do you offer if I have questions?

We offer superior customer service right from the start. The Memory Advisor tool is so easy to use that most customers find exactly what they need on their own, but if you ever do have a question, we make it easy to find fast, free answers. You can call us directly, e-mail us, chat with a live Expert Online, or learn on your own with our 3,000 articles and FAQs.

And our free tech support really is free. Our certified support agents are true Memory Experts™, averaging 15 hours of technical training each month and 20 hours a month "hands-on" in the Crucial Performance Lab. We don't keep you waiting when you have a problem—the average hold time (over a six-month period) is just over one minute, and the average time spent resolving an issue by phone is about three minutes.

Crucial is the answer.

When you compare Crucial's quality, low prices, and superior support to our competitors, it's no surprise that for the second year in a row, PC PRO magazine readers have voted Crucial as "Online Vendor of the Year." Join the millions of customers we've successfully served over the Internet!

crucial[™]
TECHNOLOGY
A Division of Micron

The Memory ExpertsSM

Get the right board

If you're building a new PC or just upgrading your current system, choosing the right motherboard is crucial. So here's an in-depth look at the things you need to know

Motherboard prices can range from around £35 to over £400 depending on the features. Choosing the right board will dictate the type of processor you can use, how well the other components communicate, the features on offer and future upgrade potential.

Cheaper boards can save you money but will limit processor support, graphics and expansion options. Spending around £70-£100 will get you a good mix of features and the latest technologies, so it's worth shopping around to get the best deals – especially online.

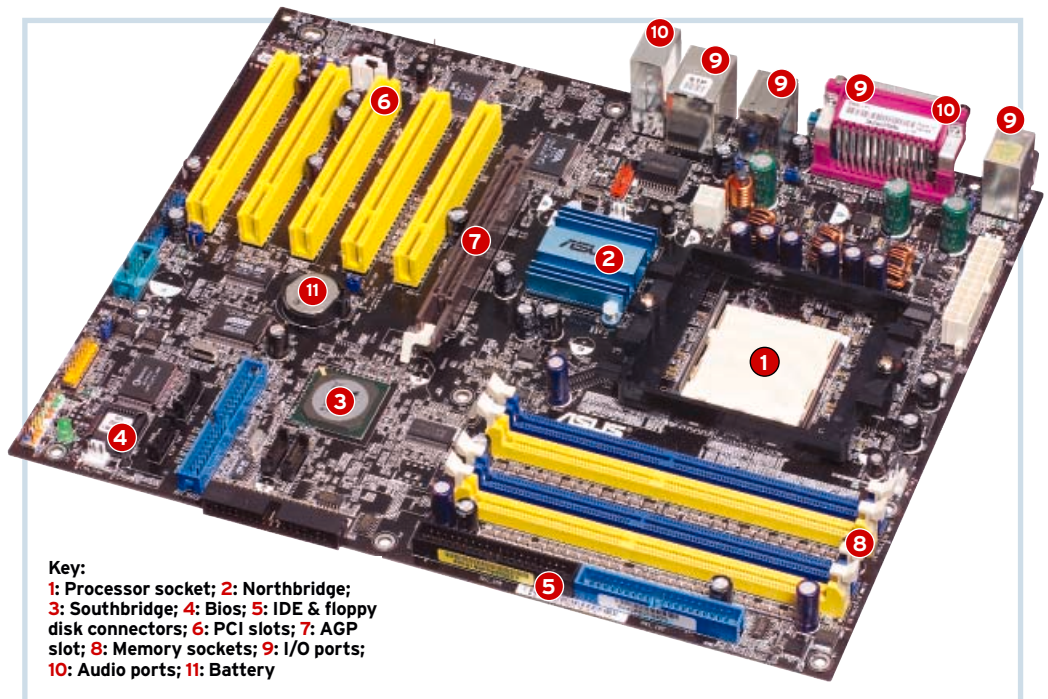
Size matters

Most desktop and tower cases are designed to use a standard ATX size motherboard, but if you plan to build a small system you'll need to look at more compact MiniATX or MicroATX designs. If you plan to use an existing case, make sure you buy the right form factor.

Once you know the size, your choice can be narrowed by the type of processor you want to use. You'll need a Socket 478 for current Intel processors, a Socket A design for an AMD Athlon XP or Duron, and a Socket 754 for an Athlon 64. The Athlon 64 FX series requires Socket 940. Check the board's spec to see what processor speeds are supported.

While Celeron or Duron are fine for general tasks, we'd recommend an Intel P4 or Athlon XP for a good all-round system. AMD's chips give excellent performance and are usually cheaper than equivalent Intel designs, but the P4 can have the edge with multimedia/video applications.

Dedicated gamers looking for speed and future performance may want to choose one of the Athlon 64 chips, but at the moment, the price is still at a premium.



Key:
 1: Processor socket; 2: Northbridge;
 3: Southbridge; 4: Bios; 5: IDE & floppy
 disk connectors; 6: PCI slots; 7: AGP
 slot; 8: Memory sockets; 9: I/O ports;
 10: Audio ports; 11: Battery

The Athlon 64 can address one terabyte of Ram (1,000GB) and handle difficult calculations with relative ease. Demanding games require a lot of processing power and are designed to run more efficiently on a 64bit platform.

This new generation of processors also changes the way data is transferred. Whereas P4s rely on the motherboard chipset to shuttle data between processor and memory, Athlon 64s avoid this bottleneck by integrating the memory controller onto the CPU die.

This does away with the traditional front-side bus (FSB) design favoured by Intel, and allows the processor to communicate directly with the physical memory through a two-way Hyper-transport link.

The full benefits of a 64bit system cannot be realised until 64bit operating systems become more common.

Current options include Windows XP 64bit Edition or Suse Linux, but even these won't use the Athlon 64's full

potential until new software and up-to-date device drivers become available. For more, read the Processors section on page 6 of this guide.

Chipsets

Divided into northbridge and southbridge, the chipset handles the communication between all the components and dictates the features on offer.

Today's leading chipset manufacturers include Via, Silicon Integrated Systems (Sis), ATI, Nvidia and Intel. It would take far more space than is available to go into the merits of each and performance varies depending on implementation – PCW runs regular group tests, so be sure to check back regularly for more information.

Chipsets can include integrated graphics facilities, which are fine for office tasks, but for games and video work you'll want a dedicated graphics card.

Some motherboards incorporate chipset fans to keep

things stable, though these can increase system noise.

Memory

Today's motherboards mainly use DDR-Ram, available in 200, 266, 333 and 400MHz modules. Faster DDR2-Ram has been developed and compatible products are now available.

When fitting memory you should match it to work best with your chosen processor's FSB speed. Opting for the fastest speed supported should still work.

It's also important to consider the number of slots available – some motherboards limit you to two, while others provide up to four slots.

Fit dual in-line memory modules (Dimms) in pairs if the chipset supports dual-channel operation for maximum performance and remember that adding extra memory can make all the difference.

Memory manufacturer Crucial (www.crucial.com) offers keen prices and can help find the right Ram for a particular



motherboard or computer model number.

Storage

The latest boards support both older IDE and new, faster Serial ATA (Sata) hard disks. Check the number of connectors available for both, especially if you plan to use existing hard disks.

Some chipsets provide Raid support, allowing data to be spread across two drives for extra performance or backups. SCSI controllers can be found on more expensive boards, but it's easy to add these with expansion cards.

Expansion

Unless you're sticking with integrated graphics to keep costs down, choose a motherboard with an 8x AGP/AGP Pro slot.

PCI slots are a must for expansion cards but the number isn't as important as it used to be, thanks to integrated

PCW BEST BUYS - INTEL



MSI 925X Neo Platinum ★★★★★ £114.99

Reviewed PCW November 2004 p80

The Neo Platinum was the first retail board we saw that featured the Intel 925 chipset. It is well laid-out and supports Raid, 16x PCI Express (PCX) graphics, and is reasonably priced. It is also ideal for use with the latest Intel Pentium 4 CPUs.



ECS PF88 ★★★★★ £64.63

Reviewed PCW August 2005 p55

The PF88 is a feature-packed and compatible with both Intel and AMD processors.



Aopem i915Gm-HFS ★★★★★ £152.49

Reviewed PCW July 2005 p69

The HFS makes the ideal platform for building a quiet, power-conscious PC



Soltek SL865Pro FGR ★★★★★ £63.47

Reviewed PCW June 2004

One of the best-looking boards we've seen, backed up by a good range of features and decent performance.



Aopen AX4SPE Max II ★★★★★ £111.63

Reviewed PCW June 2004

Despite being based on Intel's 865PE (Springdale) chipset, this is a capable board with a good feature list.

ABIT

Efficient. Silent.

Silence is Power

Don't get caught dead in the water.

Silent OTES - The silent advantage.

devices. Arguably more important is the number of USB2 and Firewire sockets for external add-ons.

You may need serial, parallel and PS/2 interfaces if you plan to use older legacy peripherals.

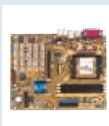
Look out, too, for onboard Ethernet networking, a built-in 56K modem and onboard sound. The latter is better than it used to be, with surround and digital output options that are fine for all but audio buffs or avid gamers.

Bios and software

Finally, there's the system Bios. Some motherboards feature a dual Bios to protect against viruses, failure and updating mishaps, while others offer extra security features and system heat monitors.

Speed freaks can check for overclocking utilities that let you tweak settings to push your hardware to its limits for extra performance.

PCW BEST BUYS – AMD



Asus K8N-E Deluxe ★★★★★ **£92.28**

Reviewed PCW November 2004 p80

Designed for Athlon 64 processors, the Deluxe is a tidy board with plenty of room around all the major components. It has a wide range of features including 7.1 audio, and supports up to 3GB of PC3200 Ram.



ECS 915-A ★★★★★ **£61.81**

Reviewed PCW June 2005 p70

All the features you'd expect from a modern motherboard and outstanding value for money



ECS PF88 ★★★★★ **£64.63**

Reviewed PCW August 2005 p55

The PF88 is a feature-packed and compatible with both Intel and AMD processors.



Asus A8N-SLI Deluxe ★★★★★ **£98**

Reviewed PCW April 2005 p78

Another great all-round board



EpoX 8HDA3+ ★★★★★ **£79.92**

Reviewed PCW July 2004

This stands out from the crowd thanks to additions such as dual Lan and external Sata support.

ABIT's Silent OTES effectively cools your system with advanced heatpipe technology.

All-copper fins ensure supreme cooling with zero bus noise; the edge you need when silence is essential.

Deadly.



AN8 SLI

Supports AMD Socket 939 Athlon 64/ 64FX CPUs w/2GHz system bus
 NVIDIA® nForce™ 4 SLI chipset
 Supports 4 DIMM Dual-channel DDR 400
 4 x SATA 3Gbps RAID 0/1/0+1/JBOD support
 2 x Ultra DMA 100/66/33 connector
 7.1-channel audio w/ S/PDIF Out
 2 x PCI-E x16, 2 x PCI-E x1, 2 x PCI
 Gigabit LAN, USB 2.0, IEEE
 ABIT µGuru™
 ABIT AudioMAX™
 ABIT Silent OTES™
 ABIT ThermalGuard™



AN8 V2.0

Supports AMD Socket 939 Athlon 64/ 64FX CPUs w/2GHz system bus
 NVIDIA® nForce™ 4 chipset
 Supports 4 DIMM Dual-channel DDR 400
 4 x SATA 150 RAID 0/1/0+1/JBOD support
 2 x Ultra DMA 100/66/33 connector
 5.1-channel audio w/ S/PDIF Out
 1 x PCI-E x16, 2 x PCI-E x1, 3 x PCI
 Gigabit LAN, USB 2.0, IEEE
 ABIT µGuru™
 ABIT AudioMAX™
 ABIT Silent OTES™
 ABIT ThermalGuard™



AN8 Ultra

Supports AMD Socket 939 Athlon 64/ 64FX CPUs w/2GHz system bus
 NVIDIA® nForce™ 4 Ultra chipset
 Supports 4 DIMM Dual-channel DDR 400
 4 x SATA 3Gbps RAID 0/1/0+1/JBOD support
 2 x Ultra DMA 100/66/33 connector
 7.1-channel audio w/ S/PDIF Out
 1 x PCI-E x16, 2 x PCI-E x1, 3 x PCI
 Gigabit LAN, USB 2.0, IEEE
 ABIT µGuru™
 ABIT AudioMAX™
 ABIT Silent OTES™
 ABIT ThermalGuard™

Beef up the graphics

Upgrading your graphics card can make the world of difference to your PC's performance. We look at some of the key things to consider before making a purchase

A capable graphics card can breathe new life into your PC, freeing up the processor to do other work and accelerating video, games and 3D images. Here, we look at the key things you need to consider when choosing an upgrade.

Graphics processors

Most graphics cards are based on either the Nvidia Geforce or ATI Radeon family of chips. Technical differences in design give each their strengths but, in reality, both offer state-of-the-art image acceleration and comparable features – it's how software developers use them that determines the results.

Performance improves as you move up a particular range. Top chips offer more features and can usually draw more

pixels or textures in a single pass than cut-down, lower-cost options. All current graphics processors are fine for office work but hardcore gamers currently favour the Geforce 6800 series and ATI's Radeon X850 XT chips. Faster processors appear roughly every six months. Check the scores in our regular graphics cards group tests to find the best performers.

Today's leading graphics cards offer full compatibility with Microsoft's DirectX 9 graphics system and version 2 of Open GL and boast resolutions up to an astonishing 2,048 x 1,536pixels. Make sure the card you buy can display the resolutions you want to use with at least a 75Hz monitor refresh rate to avoid eye strain from flicker (if you are using a CRT monitor).



Graphics cards manufacturers often quote megahertz numbers. There are usually three clock speeds quoted – the core clock speed, the memory clock speed and the Ramdac clock speed. Core clock refers to the internal speed of the graphics processor.

Memory speed (or memory clock) refers to the speed of data transfer between the graphics card's onboard memory and the graphics processor. Ramdac speed refers to the capabilities of the digital-to-analogue converter that provides the graphics output from the card – it doesn't affect graphics performance but governs the range of supported refresh rates the card can support at a particular resolution.

Technology to smooth out the edges

Bump mapping



Believe it or not, this is supposed to be water, but its flat and motionless surface lacks realism and texture

Anti-aliasing



As you can see, the jagged edges are all too obvious in this close-up of a plane's wing

Resolution



At 1,024 x 768 this tree features more detail, however higher resolutions place more demand on the graphics card



With bump mapping enabled, the water is given a whole new lease of life with the realistic ripple effects



With anti-aliasing enabled, the jagged edges are smoothed and the wing looks a lot more accurate



With a reduced resolution of 640 x 480 the same tree is far less detailed, although the game will run faster

Memory

Graphics cards use their own dedicated video memory to store data, images and textures. In general, the more of this you have, the better the performance will be. A card with 32MB or 64MB is fine for working in, say, Microsoft Office, but we'd recommend at least 128MB or even 256MB for the latest games and video applications. You can't usually upgrade this memory later. PCs with graphics chips integrated on the motherboard often steal a portion of system Ram, reducing overall performance.

Prices

The price of graphics cards can vary from under £50 to over £400, depending on the features. However, you don't have to spend vast amounts to get a capable card. Around £40 will buy you a

Geforce FX 5200 card with 128MB of Ram, which is good for 2D action/strategy games and all but the most demanding 3D games. ATI Radeon 9200 products come in at the same price.

Those wanting to play 3D action games smoothly at higher resolutions should look at £100-£150 cards, while serious gamers who demand the fastest frame rates can take things further with high-end products such as the Geforce FX 6800 GT at £280-plus.

Interfaces

Depending on the type of motherboard in your system, you'll need an AGP, PCI or PCI Express graphics card. AGP 8x is the current standard, while PCI cards are designed for use with older systems.

PCI Express is the newest interface standard, offering up to double the bandwidth of an AGP 8x slot for even faster and more complex graphics. Both ATI and Nvidia offer PCI Express versions of most of their cards. Nvidia has also introduced its SLI (Scalable Link Interface) technology that lets you use two identical PCI Express graphics cards in SLI-enabled motherboards for ultimate performance. ATI has just launched a rival technology called Crossfire.

Features

Features to look for include support for both analogue (VGA) and digital (DVI) displays, and S-video and composite video outputs for use with TVs. Video-editing or graphic-design enthusiasts should check the multiple monitor support of the card.

Some 'all-in-one' cards have a built-in TV tuner and video-capture options, saving on separate purchases and potential compatibility problems.

In terms of on-chip features, many games won't function without hardware-based Transform and Lighting (T&L). This isn't supported by many integrated graphics chips, making a separate add-in card essential for gamers.

Full scene anti-aliasing (FSAA) can reduce jagged edges on angled lines, which is very good if you're running at 1,024 x 768 pixels or outputting lower resolutions to a TV, while hardware mpeg2 decoding will help DVDs play more smoothly.

Drivers and software

The driver software for a graphics card can make or break performance, and it's not unusual for a product to get a boost in speed simply from a driver update. Both ATI and Nvidia now offer unified drivers – a single piece of code that supports all their current chips. Whichever card you buy, visit the manufacturer's

website regularly to check for updates.

Even if you've installed the latest drivers, your graphics performance might not be fully optimised as the driver defaults are usually set conservatively. ATI and Nvidia's driver utilities let you set the balance between performance and quality. Also be aware that you'll see little benefit from the latest

graphics chips if your CPU isn't powerful enough to supply it with data – we'd recommend a 2GHz CPU minimum for any of the new breed of chips.

Other software bundled with graphics cards can include games that show off the performance, DVD-playing software and demos. These deals vary, so check out the bundle that suits you best.

PCW BEST BUYS



Powercolor X850XT Platinum Edition ★★★★★ £370.07

Reviewed PCW July 2005 p70

Based on ATI's fastest Radeon processor, this card will run the latest games with ease. It features a 540MHz core clock, a 590MHz DDR (1.18GHz effective) memory clock and 256MB of DDR3 Ram running through a 256-bit memory bus.



Gecube X850XT Uniwise ★★★★★ £376

Reviewed PCW May 2005 p71

The price tag is high, but so is performance.



HIS Radeon X850XT Platinum Edition IceQII ★★★★★ £375.94

Reviewed PCW June 2005 p72

Making use of the IceQII cooling system, it's quiet and super-fast



Gecube Radeon X800XL ★★★★★ £279.65

Reviewed PCW June 2005 p72

This card uses Gecube's own Uniwise cooling with a noise level of just 20db.



HIS Excalibur X800 XT ★★★★★ £320

Reviewed PCW October 2004 p77

The fastest graphics card we've seen in terms of real-world performance.



Aopen Aeolus Geforce 6600GT ★★★★★ £134

Reviewed PCW January 2005

A fast and well-featured graphics card that is surprisingly inexpensive.



Gigabyte GV-N68 128DH ★★★★★ £192.64

Reviewed PCW January 2005

Offers strong performance and completely silent operation.



Crucial Radeon X800 Pro ★★★★★ £240.86

Reviewed PCW October 2004 p77

Crucial's Radeon X800 Pro is a cracking 256MB card with TV-out and DVI connectors



MSI RX800XT VTD-256E ★★★★★ £407.72

Reviewed PCW January 2005

Delivers the highest performance we've seen from any graphics card.



Sapphire Radeon X800 Pro ★★★★★ £252

Reviewed PCW August 2004 p66

Outstanding performance for a reasonable price.

Note: All prices include VAT

Discovering disks

Hard disk storage is cheap these days, but there's still a lot of technology and acronyms to get your head round, from spindle speed and areal density, to ATA and Raid. We reveal all

Fitting a larger hard drive is a quick and painless way of boosting your system's performance, and there's never been a better time to buy. If you are building a high-performance gaming system, go for the fastest drive you can afford, however if you just want lots of capacity then look at the slower drives which are better value.

Another way to save money, particularly if you have all the cables, is to buy an OEM or 'brown box' drive. This is just the bare drive without the goodies that come with the boxed version.

Key features

The fastest transfer rates offered by today's Ultra ATA drives is 100Mbytes/sec or, in the case of Maxtor drives 133Mbytes/sec, while Serial ATA (Sata) drives are rated at 150Mbytes/sec.

These figures refer to the speed of the interface: the internals of the fastest drives can't consistently work that fast. Things to keep in mind are seek times, spindle speed, buffer size and the areal density of the platters (disks).

Seek time

Usually written as an average time in milliseconds, seek time is the length of time a drive's heads take to find data on the disk.

Spindle speed and buffer size

The speed at which the spindle holding the disks (platters) spins. This ranges from around 4,200rpm for a notebook drive to 15,000rpm for some SCSI drives. Generally, faster speeds give better performance. Some drives provide further performance benefits such as NCQ (Native Command Queuing). This allows the drive to internally optimise the execution order of workloads to increase efficiency.



The buffer (cache) is the amount of memory installed on the drive that holds the most recently written or stored data. The bigger the buffer, the more data it can hold, resulting in less time seeking the data on the disk.

Areal density

Often overlooked, this is the amount of data that can be stored on a given area of a drive's platter (disk). Usually written as gigabytes per platter, it can affect performance as the more data per square centimetre, the less disk movement required to bring it under the heads.

IDE (ATA)

Originally Intelligent Drive Electronics (IDE), then Enhanced IDE (E-IDE), this parallel interface is quite

common. There are nearly as many terms for this as there are drives, but the 'official' term is ATA (AT Attachment), modified with speed improvements in recent years to become Ultra ATA/xxx, where xxx is the peak bandwidth of the interface in Mbytes/sec. To differentiate Ultra ATA from Serial ATA (Sata), the term Parallel ATA is used.

Serial ATA

The latest interface to be standardised for drives is Serial ATA (Sata). They're more expensive than Parallel ATA, but prices are dropping. Unlike Parallel ATA, Sata uses just two pairs of high-frequency cables, working at low voltage which makes the data cable much thinner. Also gone is the master and slave arrangement of Parallel ATA, as Sata uses a point-to-point setup (one port per drive with no sharing of bandwidth).

SCSI

Historically, the drive of choice for many workstations, Apple and network users. SCSI (Small Computer System Serial Interface) offers many advantages over standard desktop interfaces, with one big

disadvantage: price. SCSI drives are technically no different to ATA drives, but its major strength is that it can support up to 16 devices on a single channel and you can have multiple channels in a PC.

Raid

Raid (Redundant Array of Independent Disks) was once the domain of network gurus, but now you will find Raid capability built in to most of today's motherboards. Raid is a way of hooking up multiple drives to work together, either to improve performance or provide a level of fault tolerance.

Bios issues

One problem you may come across is the inability to access the new drive's full capacity. This is usually due to problems in the Bios, as hard drive capacities reach and exceed disk size barriers. Some older Bioses only support drives up to 137GB. Some problems can be dealt with by updating the PC's Bios. Retail boxed disks often come with software that allows you to 'fool' the Bios into recognising the disk or you can buy a separate disk controller card, which fits into a PCI slot.

PCW BEST BUYS - INTERNAL



Seagate Barracuda 7200.7 160GB NCQ ★★★★★ £92

Reviewed PCW December 2004 p71

Part of Seagate's new range of its popular Barracuda range, this drive features Native Command Queuing, which allows multiple commands to be held within the drive at the same time. These can then be dynamically rescheduled or reordered for better performance.



Seagate Barracuda 7200.8 (ST3400832A) ★★★★★ £186.96

Reviewed PCW July 2005 p70

This massive 400GB drive achieves its impressive capacity and 8ms seek time



Hitachi Deskstar 7K250 (250GB Sata150) ★★★★★ £88

Reviewed PCW August 2004

Those needing a massive Sata150 drive will find this a great bargain

www.savastore.com/MOTHERBOARDS

motherboard kits

Ready² INSTALL
Receive your kit fully-assembled & soak tested

Celeron® 2.4GHz 533MHz
Celeron 2.4GHz 533MHz
+ Fan, 661FX Motherboard,
32MB Graphics On-board,
256MB PC2700 Memory

£79.95 Ex VAT
£93.94 Inc VAT

Ready to install!!
£89.94 Ex VAT
£105.68 Inc VAT

savastore.com/10277585

Sempron™ 2400
Sempron 2400
+ Fan, MSI K8M3M-V Motherboard,
32MB Graphics On-board,
256MB PC2700 Memory

£72.95 Ex VAT
£85.72 Inc VAT

Ready to install!!
£82.94 Ex VAT
£97.45 Inc VAT

savastore.com/10277597

Celeron® 2.8GHz 533MHz
Celeron 2.8GHz 533MHz
+ Fan, 661FX Motherboard,
32MB Graphics On-board,
256MB PC2700 Memory

£89.95 Ex VAT
£105.69 Inc VAT

Ready to install!!
£117.43 Ex VAT
£137.98 Inc VAT

savastore.com/10277587

Sempron™ 2600
Sempron 2600
+ Fan, MSI KT4A-V Motherboard,
256MB PC2700 Memory

£85.95 Ex VAT
£100.99 Inc VAT

Ready to install!!
£95.94 Ex VAT
£112.73 Inc VAT

savastore.com/10277599

Pentium® 4 2.8GHz Prescott
Intel P4 2.8GHz 800MHz
+ Fan, MSI PT8-Neo-V Motherboard
256MB PC2700 Memory

£140.95 Ex VAT
£165.67 Inc VAT

Ready to install!!
£150.94 Ex VAT
£177.35 Inc VAT

savastore.com/10277588

Sempron™ 2800
Sempron 2800
+ Fan, MSI KT4A-V Motherboard,
256MB PC2700 Memory

£87.95 Ex VAT
£103.34 Inc VAT

Ready to install!!
£99.94 Ex VAT
£117.43 Inc VAT

savastore.com/10277601

Pentium® 4 3.06GHz Prescott
Intel P4 3.06GHz 800MHz
+ Fan, MSI PT8-Neo-V Motherboard
256MB PC2700 Memory

£145.95 Ex VAT
£171.49 Inc VAT

Ready to install!!
£155.94 Ex VAT
£183.23 Inc VAT

savastore.com/10277591

Sempron™ 3100
Sempron 3100
+ Fan, MSI K8MM-LSR Motherboard,
64MB Graphics On-board,
256MB PC2700 Memory

£109.95 Ex VAT
£129.19 Inc VAT

Ready to install!!
£119.94 Ex VAT
£140.93 Inc VAT

savastore.com/10277604

Pentium® 4 3.2GHz Prescott
Intel P4 3.2GHz 800MHz
+ Fan, MSI PT8-Neo-V Motherboard
256MB PC2700 Memory

£165.95 Ex VAT
£194.99 Inc VAT

Ready to install!!
£175.94 Ex VAT
£206.73 Inc VAT

savastore.com/10277594

Athlon™ 64
Athlon 64 3000+ + Fan,
MSI K78 Neo-F152R Motherboard,
512MB DDR Memory

£159.95 Ex VAT
£187.94 Inc VAT

Ready to install!!
£169.94 Ex VAT
£199.68 Inc VAT

savastore.com/10275597

Item	Description	Ex VAT	Inc VAT
10275278	M7 nForce2 400FSB AGP Bx SATA 10/100 LAN	£39.99	£39.48
10275277	nForce2 400FSB AGP Bx SATA 10/100 LAN	£41.00	£51.47
10275276	ATI-GLUFI AGP Bx SATA 10/100 LAN	£46.99	£55.11
10275280	KV7 VIA VT8237 400FSB AGP Bx SATA 10/100 LAN	£32.54	£38.23
10275275	KV6-MAXX K8100 800FSB AGP Bx SATA Digital LAN	£91.00	£95.99
ABIT INTEL			
10280254	AAS DurAmix 305X 775 SATA/IDE/LAN/SOUND	£72.94	£95.70
10275268	AKI CT-6 87P 800FSB AGP Pn Bx SATA Digital LAN	£99.99	£109.49
10275270	AP-GLUFI 800FSB AGP Bx SATA 10/100 LAN	£74.47	£97.50
ASUS AMD			
10277475	A7V400-MK K1000A SKT-4 mATX AGP Bx ATA133	£29.99	£34.02
10275262	A7N8X-E Deluxe nForce2 SKT-A ATX AGP Bx SATA	£48.95	£57.52
10277473	K8N-Deluxe SK775 nForce2 SATA, RAID	£72.00	£95.65
10279629	K8V-K SK775 nForce2 AGP Bx SATA RAID	£39.00	£54.63
10279521	A7N8X-E nForce2 DDR400 Audio 10/100	£37.23	£43.77
ASUS INTEL			
10277489	P4P800 SKT478 mATX AGP/ATA133 LAN RAID	£29.41	£31.03
10272941	P4R800-VM 865P 800FSB Dual-Channel Bx LAN SATA	£42.91	£50.47
10277463	P5P800-SK775 865P 800MHz DDR400 AGP Bx	£69.99	£85.74
10277456	P5AD2-Deluxe SK775 865P 800MHz AGP Bx RAID	£99.99	£112.74
10277467	P4C600-E Deluxe nForce2 800FSB Intel LAN	£86.15	£107.68

K8N Neo4 Platinum Motherboard

- nVidia nForce 4 Ultra Chipset
- On-board NV RAID & Silicon Image SATA RAID
- Socket 939 for Athlon 64/64FX

£69.99 Ex VAT
£82.23 Inc VAT

savastore.com/10280376

A8N-SLI Deluxe Motherboard

- Nvidia nForce 4 SLI Chipset
- Two PCI-Express card slots
- Athlon 64, Athlon 64 FX compatible

£88.95 Ex VAT
£104.52 Inc VAT

savastore.com/10279625

K8N Neo4 Platinum Motherboard

www.savastore.com/msi

A8N-SLI Deluxe Motherboard

www.savastore.com/asus

www.savastore.com/PROCESSORS

intel

Pentium 4 Processor

£97.95 Ex
£115.09 Inc

savastore.com/10280288

Pentium 4 3.0GHz Processor

www.savastore.com/intel

Item	Description	Ex VAT	Inc VAT
10276283	Celeron Processor 320 2.4GHz 533MHz 256K SKT478	£36.46	£46.57
10276284	Celeron Processor 325 2.5GHz 533MHz 256K SKT478	£40.25	£51.34
10276285	Celeron Processor 330 2.6GHz 533MHz 256K SKT478	£45.06	£57.98
10276286	Celeron Processor 335 2.6GHz 533MHz 256K SKT478	£39.38	£50.34
10280287	Celeron Processor 345 3.0GHz 533MHz 256K SKT478	£67.85	£78.78
INTEL CELERON 533MHZ SKT775			
10280283	Celeron 325 2.5GHz 533MHz 256K SKT775	£44.15	£51.88
10280282	Celeron 320 2.4GHz 533MHz 256K SKT775	£44.67	£52.43
10280284	Celeron 335 2.6GHz 533MHz 256K SKT775	£38.06	£58.75
10280285	Celeron 340 3.0GHz 533MHz 256K SKT775	£91.99	£102.73
10280286	Celeron 345 3.0GHz 533MHz 256K SKT775	£39.35	£58.19
INTEL P4 800MHZ SOCKET 775			
10276292	P4 520 2.8GHz SKT775 800MHz 1MB Cache Boxed	£99.50	£116.04
10280280	P4 530 3.0GHz SKT775 800MHz 1MB Cache Boxed	£97.00	£114.07
10280289	P4 540 3.2GHz SKT775 800MHz 1MB Cache Boxed	£104.00	£124.76
10276295	P4 550 3.4GHz SKT775 800MHz 1MB Cache Boxed	£164.99	£192.07
10279910	P4 560 3.6GHz SKT775 800MHz 1MB Cache Boxed	£247.83	£291.01
10280292	P4 570 3.8GHz SKT775 800MHz 1MB Cache Boxed	£240.76	£311.00
10280290	P4 580 3.8GHz SKT775 800MHz 2MB Cache Boxed	£178.50	£214.99
10280291	P4 640 3.2GHz SKT775 800MHz 2MB Cache Boxed	£107.66	£133.89
10280292	P4 650 3.4GHz SKT775 800MHz 2MB Cache Boxed	£220.43	£269.58
10280293	P4 660 3.6GHz SKT775 800MHz 2MB Cache Boxed	£227.73	£280.99
INTEL P4 MOBILE			
10276288	P M 725 1.6GHz SKT478 FSB400 2MB Cache Boxed	£129.00	£151.58
10276289	P M 725 1.7GHz SKT478 FSB400 2MB Cache Boxed	£176.99	£214.49
10276290	P M 745 1.6GHz SKT478 FSB400 2MB Cache Boxed	£148.99	£223.13
10276291	P M 755 2.0GHz SKT478 FSB400 2MB Cache Boxed	£199.99	£283.89

AMD

Athlon™ 64 bit 3000+ CPU

£81.20 Ex
£95.41 Inc

savastore.com/10275344

Athlon™ 64 bit 3000+ CPU

- 754pin CPU
- HyperTransport
- Cool'n'Quiet
- Enhanced Virus Protection

www.savastore.com/amd

Item	Description	Ex VAT	Inc VAT
10280815	2400 1.6GHz Socket A 256KB 333MHz OEM	£30.50	£37.99
10280816	2800 1.8GHz Socket A 256KB 333MHz OEM	£38.00	£58.79
10280881	2800 2.0GHz Socket A 256KB 333MHz OEM	£41.99	£64.94
AMD SEMPRON RETAIL CPU HEATSINK/FAN			
10277147	2400 1.6GHz Socket A 256KB 333MHz Boxed	£30.00	£42.18
10277148	2500 1.7GHz Socket A 256KB 333MHz Boxed	£38.00	£49.42
10277153	2800 1.8GHz Socket A 256KB 333MHz Boxed	£44.50	£57.11
10277154	2800 2.0GHz Socket A 256KB 333MHz Boxed	£47.47	£59.36
10278859	3000 2.0GHz Socket A 256KB 333MHz Boxed	£59.00	£89.98
10280901	2800 1.8GHz Socket 754 Boxed Inc Heatsink Fan	£46.00	£48.00
10280940	2800 2.0GHz Socket 754 Boxed Inc Heatsink Fan	£55.25	£53.29
10280922	3000 2.0GHz Socket 754 Boxed Inc Heatsink Fan	£70.00	£82.28
10277155	3100 1.8GHz Socket 754 Boxed Inc Heatsink Fan	£66.50	£70.85
ATHLON 64			
10276364	Athlon 64 2800+ Socket 754 Boxed Inc Heatsink Fan	£72.96	£94.95
10276364	Athlon 64 3000+ Socket 754 Boxed Inc Heatsink Fan	£83.01	£95.21
10271823	Athlon 64 3200+ Socket 754 Boxed Inc Heatsink Fan	£100.99	£124.49
10273343	Athlon 64 3400+ Socket 754 Boxed Inc Heatsink Fan	£120.99	£150.27
10276801	Athlon 64 3700+ Socket 754 Boxed Inc Heatsink Fan	£140.00	£171.49
10276707	Athlon 64 3800+ Socket 754 Boxed Inc Heatsink Fan	£152.12	£241.02
10276914	Athlon 64 4000+ Socket 754 Boxed Inc Heatsink Fan	£204.80	£248.57
10276911	Athlon 64 3000+ Socket 899 Boxed Inc Heatsink Fan	£31.00	£35.80
10276912	Athlon 64 3200+ Socket 899 Boxed Inc Heatsink Fan	£39.00	£43.96
10280230	Athlon 64 3400+ Socket 899 Boxed Inc Heatsink Fan	CALL	CALL
10276913	Athlon 64 3500+ Socket 899 Boxed Inc Heatsink Fan	£151.65	£178.19
10276914	Athlon 64 3800+ Socket 899 Boxed Inc Heatsink Fan	£210.12	£241.02
10276914	Athlon 64 4000+ Socket 899 Boxed Inc Heatsink Fan	£294.96	£346.57
10276915	Athlon 64 ADMP55+ Socket 899 Boxed Inc Heatsink Fan	£458.80	£539.33

www.savastore.com/COOLINGFANS

Item	Description	Ex VAT	Inc VAT
10111337	Socket A Athlon Duron/S570/Sid 7 Fan & Heatsink	£3.48	£4.14
10279104	Athlon / S570 Heatsink & Fan up to 1.5ghz	£2.50	£2.90
10234415	Coolermaster Thermal Compound Kit Retail	£2.50	£2.95
10291763	Coolermaster Aeroglide II Digital Adjustable Fan Controller	£30.00	£34.62
10281765	Coolermaster Muvseller II Systems Dynamic Detector	£21.99	£25.79
10281766	Coolermaster Liquid Cooling Mini R120 Kit	£59.00	£65.74

www.savastore.com/PSU

Item	Description	Ex VAT	Inc VAT
10111766	Ares 300W PSU for ATX Motherboard	£6.50	£8.21
10244340	Ares 400W PSU for ATX Motherboard	£11.50	£13.51
10277917	Alaska. PowPower2 400W PSU 12cm Black Fan	£37.50	£44.16
10277772	Antec. PowPower2 400W PSU	£4.95	£5.74
10277768	Tegan 480W Whopper Quiet ATX Power Supply	£55.95	£70.49
10277805	Mecpower 480 Watt PSU ATX 12V 12V 0.24Pin	£72.99	£85.75

www.savastore.com/PCCASES

Antec

TX1088 AMG-UK

- Metallic Grey Tower
- Advanced Cooling System
- Full forward & backwards ATX compatible

£90.30 Ex
£106.10 Inc

savastore.com/10281928

www.savastore.com/antec

Item	Description	Ex VAT	Inc VAT
10277803	Aria Aluminium Media PC Case with 300 Watt PSU	£99.99	£120.48
10279222	Dragon Black Mid Tower 4x5.25" 6x5.5" No PSU	£38.49	£45.23
10277918	Eclipse E2 Black Ally Case 4x5.25" 6x5.5" No PSU	£78.40	£98.65
10277919	Eclipse E2 Black Ally Case 4x5.25" 6x5.5" No PSU	£78.40	£98.24
10282171	Mid Tower 300W PSU Clear Side Panel Window	£27.99	£32.05
10277053	PI90 Super Mid Tower Case 4x5.25" 6x5.5" No PSU	£68.00	£78.71
10278531	Pisssant Black Case 4x5.25" 6x5.5" No PSU	£34.99	£41.11
10268334	S-07 Mid Tower ATX PC Case & 350W PSU in USB	£19.99	£22.31
10277804	SLK265800E Black TAG Tower Case 350W	£48.11	£47.13
10277799	SLK370000E Black Tower Case with 350 Watt PSU	£52.99	£53.44
10277828	Sonata Black Tower PC Case with 380 Watt PSU	£61.91	£77.33
10278590	Stacker Full Tower 7x5.25" 4x5.5" ATX/eATX/BTX	£99.99	£109.26
10277082	Super LAMBDO Gamers Case 4x5.25" 2x3.5" No PSU	£44.99	£57.96
10262172	Cold Cathode Fluorescent Lamp	£1.90	£2.46
1026187	Case Fan - 60mm With Red LED Light	£1.99	£2.34

www.savastore.com/CARDREADERS

Aries

23-in-1 Memory Card Reader/Writer

- USB 2.0

£6.99 Ex
£8.21 Inc

Silver
savastore.com/10281430

Black
savastore.com/10281867

www.savastore.com/aries

Item	Description	Ex VAT	Inc VAT
10284100	Ares Optical Scroll + Card Reader CF/SD/MMC	£1.99	£5.86
10281407	23 in 1 card reader black	£1.99	£8.21
10275018	FM402A 3.5" FDD with Integrated 7-in-1 Card Reader	£12.25	£14.38
10275098	Mobile 8-in-1 USB2 Card Reader + 3.5" Bay Docking Bay	£18.95	£22.27

www.savastore.com/MEMORY

swissbit

512MB USB Flash Drive

- Unique twist-off design

£20 OFF

£21.65 Ex
£25.44 Inc

savastore.com/10276069

www.savastore.com/mem

Item	Description	Ex VAT	Inc VAT
10284100	Ares Optical Scroll + Card Reader CF/SD/MMC	£1.99	£5.86
10281407	23 in 1 card reader black	£1.99	£8.21
10275018	FM402A 3.5" FDD with Integrated 7-in-1 Card Reader	£12.25	£14.38
10275098	Mobile 8-in-1 USB2 Card Reader + 3.5" Bay Docking Bay	£18.95	£22.27

www.savastore.com/mem

Item	Description	Ex VAT	Inc VAT
10263982	256MB 18		

Aural experiences

A better soundcard will give you higher quality audio and good speakers will enhance your listening pleasure. Here's how to make sure your system produces great sound



With the transformation of the PC into an all-singing, all-dancing multimedia centre, sound has become an important element. Most PCs today will come with some form of built-in sound on the motherboard. However, while some support eight-channel (7.1) and six-channel (5.1) surround sound (two front, one centre, two rear speakers and a subwoofer), a dedicated soundcard is going to do a better job of bringing movies and games to life. Upgrading to a better soundcard is the best option and fierce competition means it can cost as little as £10 for a leading brand. Here are a few tips on your options, what to look out for, and what the jargon means.

Use

Before splashing out on features you will never need, decide what you want the card for. If it is for playing and making CDs and mp3s, as well as reproducing surround sound on DVDs and games, most cards will fit the bill. If you are into creating music, then you may want to start with cards offering 24bit 48KHz or 96KHz sampling quality, with internal cards starting at around £30. However, for a card boasting a decent music software bundle you can

expect to pay from £50 to £200, without entering the professional soundcard arena.

Quality

All entry-level soundcards support 16bit quality sound recorded or played back at

44.1KHz, which is CD-quality sound. The next step up is 24bit sound at higher sampling rates of 48KHz or 96KHz, which is recommended for anyone wanting to make their own music. A 24bit card is also the way to go for DVD movies sporting newer THX surround or Dolby Digital EX 6.1 or 7.1 sound formats. An increasing number of consumer cards support 24bit 192KHz playback, which is required for DVD-Audio, a relatively new music format that offers very high-quality stereo and surround-sound playback. Since this has not yet been widely adopted by the music industry, DVD-Audio functionality is not essential. Also look out for a decent signal-to-noise (SNR) ratio, measured in decibels (dB). It's a measure of the amount of sound you expect

(signal) versus that which you don't (noise) when playing something back. Decibel ratings can range from 60dB with entry-level cards, to over 100dB with high-end offerings. As a rule, the higher the dB rating, the better.

Type

Internal PCI cards are the cheapest, with some brands offering 5.1 surround sound support for as little as £10. Entry-level cards from bigger brands, such as Creative or Terratec, start at around £30 and it makes sense to spend that extra few pounds. Thanks to USB, there is a growing number of external soundcards capable of matching the quality of internal ones. Entry-level USB soundcards will cost around £35, but expect to pay £50-100 for a decent, 24bit USB card. The

PCW BEST BUYS



Creative Audigy 4 Pro ★★★★★ **£179.99**

Reviewed PCW July 2005

This updated and improved version of the class-leading Audigy 2 range sounds good, has fantastic performance, a top-notch breakout box and a good software bundle. If you're serious about audio it's a great option. It includes a copy of Cubase LE and has ASIO drivers for use in popular audio software.



M-Audio Revolution 7.1 ★★★★★ **£99**

Reviewed PCW July 2005

An excellent mid-priced soundcard offering great audio quality, but gamers might be disappointed.



Hercules Fortissimo IV ★★★★★ **£44.99**

Reviewed PCW July 2005

If you're looking to upgrade your system but have a limited budget, this is an excellent option.



Terratec Aureon 7.1 Universe ★★★★★ **£149.99**

Reviewed PCW July 2005

We wouldn't recommend this over the Audigy 4 for gamers or casual users, but musicians may be tempted.



Creative Audigy 2 NX ★★★★★ **£77.41**

Reviewed PCW January 2004

A neat external 7.1 multichannel audio upgrade for laptop or desktop users with USB2.



upside of external cards is that you don't have to go poking around inside the PC. The downside is that they may offer fewer features than internal cards and cost more, but this is changing as competition increases. PC Card soundcards can be hooked up to a notebook to boost poor onboard audio.

Gaming

Many PC games support surround sound. The main formats are A3D, Direct Sound 3D and EAX, all of which are supported on the majority of cards.

Connectivity

Most cards share many similar options, such as microphone-in, line-in/line-out (front speakers), Line-out (rear speakers), Midi/joystick port, CD-in and headphones connectors, which should all be included as standard. Newer cards also have high-speed Firewire ports to connect digital camcorders.

For audio enthusiasts, a growing number of cards have S/PDIF (Sony/Philips Digital Interface) -in and -out. This is an audio transfer format that means you can connect up speakers via a single optical or coaxial cable and get higher quality digital sound.

Speakers

PC speakers have come a long way, with most manufacturers now offering 2.1, 5.1, 6.1, 7.1, and even 8.1 packages.

Here are three things to watch for when you're looking to buy. First is the output, often

expressed in watts. Try to look beyond the manufacturer's statements, as they can be misleading. For instance, a 125w output might comprise a 100w sub-woofer and five 5w speakers. You may see speaker output quoted as PMPO (Peak Music Power), which relates to the maximum output that can be achieved under perfect conditions and is misleading. Lastly, there is RMS (Root Mean Square), which is expressed in

watts, for example total 200w RMS. This is a better reference for overall power, but not perfect.

Impedance is measured in ohms and tells you how much of an electrical load a speaker presents to the amplifier.

The higher the impedance, the less power the amplifier needs to drive it. The average on most speakers is 8ohms, which is fine.

A lower rating than this means the amplifier has to work

harder to drive them, which can result in distorted sound.

Frequency response refers to a speaker's tonal qualities and its ability to reproduce sounds at different frequencies. Speakers listed as having a response of 20Hz-20KHz (the range of a CD-quality recording) are the most common for PC speakers.

Looking to the future, you can expect the quality of on-board sound chips to improve significantly, with technology such as new Intel's High Definition Audio standard becoming more widespread. This is found on the Intel 910, 915, 925 and 955X chipsets and is a replacement for the ubiquitous AC'97 audio standard.

With the announcement of Dolby Laboratories' PC Logo program, we'll start to see PCs featuring the Dolby Digital logo, just as consumer electronics devices do now.

However, the top-of-the-range audio solutions will always be introduced first on add-in cards so, for the time being, if you want the best possible audio experience in games and movies, you should always look for a PC with good quality dedicated soundcard.

PCW BEST BUYS



Creative Gigaworks S750 ★★★★★ £266.98

Reviewed PCW April 2004

Provided your PC is kitted out with a top-notch soundcard, you won't be disappointed with these THX-certified 7.1 speakers. Although no Dolby Digital encoder is included, the sound quality and construction are superb.



Logitech X-530 ★★★★★ £59.99

Reviewed PCW July 2005

Sleek design, great sound quality and a performance that belies the bargain-basement price.



Hercules XPS5-101-Black ★★★★★ £99.99

Reviewed PCW July 2005

Excellent build quality, easy to set up, lots of power and a fantastic remote control.



Logitech Z-5500 Digital ★★★★★ £279.99

Reviewed PCW July 2005

With a built-in Dolby Digital decoder, this set also delivers impressive audio performance.



Creative Inspire T7900 ★★★★★ £99.99

Reviewed PCW July 2005

A 7.1 surround system with surprisingly good sound quality, but won't cost you a fortune.

Screen play

Whether you're looking for a CRT or TFT monitor for the office or living room, we explain the technology and reveal the meanings behind some of the buzzwords

Everyone has an opinion on what the best type of monitor is, but in reality it comes down to what you like the look of. There's no substitute for seeing a monitor in operation before you buy it, as there are large quality variations.

CRT (cathode-ray tube) monitors have gone out of fashion recently, mainly due to the rapidly dropping prices of TFT (thin-film transistor) flat-panel models. But remember CRT technology is over 100 years old and still has a lot of strengths. CRTs are bulky, heavy and power-hungry, but they are now excellent value for money.

Resolution

Resolution is the number of graphics elements displayed on a screen. Known as pixels, they are generated by your graphics card. In any TFT or LCD, each pixel is composed of three sub-pixels coloured red, green and blue.

In a CRT the pixels are spread in a grid across the screen separated by a distance called the dot pitch. The smaller the dot pitch, the sharper the image.

With TFTs, each pixel is composed of three rectangular thin-film transistors. The number of pixels equals the 'native' resolution; a 1,024 x 768 TFT will have exactly that number of pixels horizontally and vertically.

CRTs usually have a higher resolution than a TFT of the same size and work perfectly at any standard resolution up to the quoted maximum.

Running a TFT below its native resolution (the number of pixels in the TFT) can result in either a poor 'blocky' picture or one that doesn't fill the whole screen.

Thin is in – TFTs

TFTs are stylish, compact and easy to move around, plus prices are now very affordable, but there is a lot of misinformation so you need to check the



specifications of the model you choose closely.

Resolution

Check the native resolution is sufficient for your needs – for example, gamers wanting to run 1,600 x 1,200 will probably need an expensive 20in model – most 19in panels are currently limited to 1,280 x 1,024 and budget 14/15in models might only support 800 x 600.

Viewing angles

Modern TFTs can be viewed from a wide range of angles vertically and horizontally, but anything over +/- 45° doesn't make any difference in normal use.

Response time

This is the time taken for a pixel to reach maximum brightness – 12-25ms is standard and you won't notice any substantial difference within that range. Newer monitors have response times as low as 4ms, but the average user won't notice the benefit this provides.

Contrast and brightness

TFTs have high quoted contrast ratios, but this is often a maximum figure so don't take it as gospel. Evenness of lighting is more important than the overall brightness specification – but

you can only tell this from looking at the monitor.

ISO and TCO standards

The ISO 13406-2 standard specifies minimum requirements for display contrast, viewing angle, brightness, reflections, flicker, contrast and defective pixels.

You may see the standard incorporated in a TUV label with the words 'Ergonomics Approved' or 'ISO 13406-certified'.

The TCO'95 and '03 standards cover electromagnetic emissions, noise and ergonomics – ensure the monitor has at least one of these approvals.

ISO 13406-2 has stringent standards for defective pixels. Only Class I TFTs are guaranteed no defective pixels – most consumer models are Class II. ■

PCW BEST BUYS



Viewsonic VP201 (20in TFT) ★★★★★ £586

Reviewed PCW August 2004 p54

20in screens can be pricey, but at £600, the VP201 is very reasonable. It is still one of the highest quality displays we've seen. It has a native resolution of 1,600 x 1,200, a 16ms response time and has tilt, swivel and height adjustability.



LG Flatron L1980u ★★★★★ £358.36

Reviewed PCW May 2005 p69

Sharp images, solid colours and crisp text. A stylish and versatile monitor.



NEC Multisync LCD 2180UX ★★★★★ £706.37

Reviewed PCW December 2004 p63

Perfect for anyone who wants to work on A3 documents or display multiple files side by side.



Viewsonic VP191b ★★★★★ £349

Reviewed PCW July 2005 p68

It has a fast 8ms response time, easy-to-use menus and excellent picture quality.



LG Flatron L1510P ★★★★★ £218

Reviewed PCW January 2005 p62

Everything you want from a 15in TFT and more, including analogue and digital inputs



Green power

FSP's Eco-friendly Power Supply for users looking for an environmentally friendly, high efficiency and near silent solution.



Green Power Supply

Being fully aware of both protecting the environment and the forthcoming EU Directives from the WEEE and RHOS (expected to take effect in 2006), FSP introduce their environmentally friendly 400W Output PSU, which is both highly efficient and quiet.

- * Efficiency: 85% at full load
- * Standby power consumption: under 1W
- * Noise level: under 25dBA
- * Weight: 1.9kg (With 2 patent design to reduce weight from 2.5kg for less recycle tax)
- * Substance: Low on hazardous substances



Find out more about

ROHS (The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive)

WEEE (Directive on waste electrical and electronic equipment)

<http://www.environment-agency.gov.uk>

Where to buy



MicroDirect
www.microdirect.co.uk



Misco
www.misco.co.uk



Vadim Computers
www.vadim.co.uk/fsp



Gladiator Computers
www.gladiatorcomputers.com



1 PCI Express connector



2 S-ATA connector



3 ATX 20+4 pin Main power adapter

A complete 5 user network with E-mail/internet from each PC, fully installed and cabled for less than £34 per week



Package includes

- Compaq P4 Windows 2003 server
- Router with Firewall for Internet and E-mail to desk
- Cat5 cabling for 12 points + 16 port switch
- 5 workstations with Windows XP
- Automated backup system
- 2 days on-site installation and configuration

**Call us now on
01279 718693
more offers on our website
www.hardsoft.co.uk**

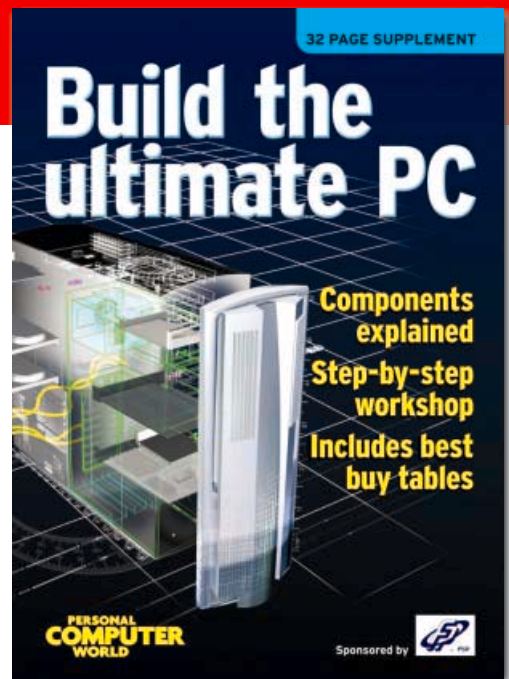
HARD SOFT

Hatfield Grange Farm, Hatfield Broad Oak
Bishop's Stortford, Herts. CM22 7JZ

**BECOME THE NEXT SPONSOR OF
PERSONAL
A COMPUTER REPORT
WORLD**

Increase your companies awareness with this amazing package including:

- Your logo on the front cover
- A page of sponsor's comment
- A generous number of adverts
- A PDF e-book of the supplement the PCW cover disk
- Up to 1000 run-ons of the report
- 1-month solus sponsorship of a dedicated section of pcw.co.uk



**PERSONAL
COMPUTER
WORLD**

For more details call Paul Harvey on 020 7316 9465 or email him at paul_harvey@vnu.co.uk



Build your own

Over the following pages we demonstrate how easy it is to build your own system, as we put together your own Intel or AMD-based dream PC

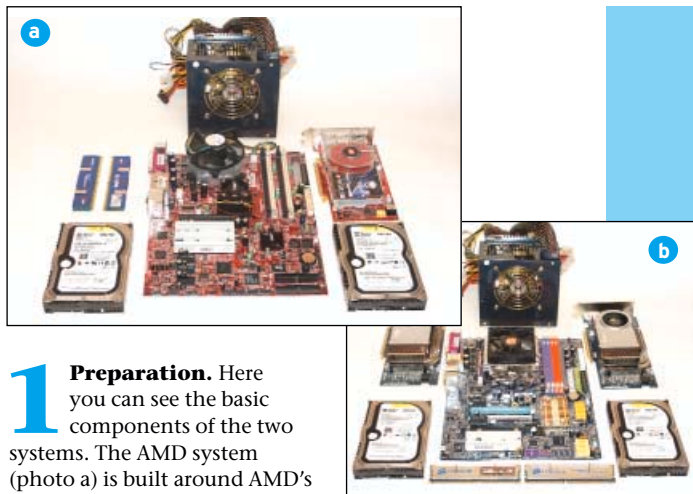
It has never been easier to build your own PC, but paradoxically it has never been harder to choose which hardware you need. The motivation for building your own system has also changed over the years. These days the building process is easier, since many modern components are sold with DIY builders in mind and so are festooned with colour coded ports and slots, clear labelling and other aids to help you put them together.

The hardest part is choosing what hardware you want to use, which will be decided by what you are going to use the PC for. It's not worth forking out £400 for the latest graphics card if all you want to do is use your PC for email, while similarly, buying a slow 20GB hard drive for a video-editing PC is a waste of time.

So why build your own PC? In the days of high prices it was a great way of saving money, but with ready-made systems now so cheap, you're unlikely to be able to build one remotely close to what you can get on the high street. However, the main attraction of self-build is the control you have over what goes in and, of course, there's the satisfaction that comes from creating your own unique system.

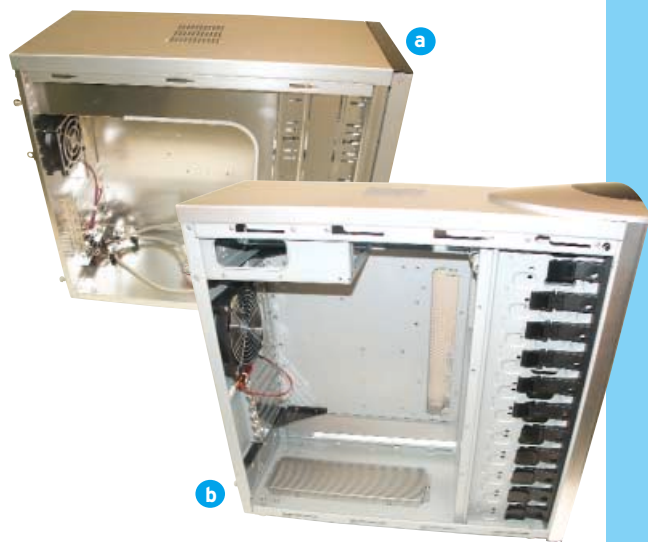
As there is a bewildering amount of hardware out there, in this guide we'll build two different performance systems using standard cooling, without any overclocking – we've chosen the latest dual core processors from Intel and AMD – the 840 and Athlon X2 4800+ respectively.

The AMD-based system features an SLI graphics setup, while the Intel uses a single, fast high end card. Both feature Raid setups, which is now more popular in desktop PCs.



1 Preparation. Here you can see the basic components of the two systems. The AMD system (photo a) is built around AMD's new Athlon X2 4800+ dual core processor. The rest of the basic components are Gigabyte GA K8N Pro SLI, two Asus N6800 Ultras, 1GB of Corsair 4400 DDR5400 memory and a pair of Western Digital 74GB Raptor hard drives. We haven't added a third-party soundcard, as we are using the integrated 8-channel audio. The case is a Coolermaster CM Stacker and the power supply an Enermax EG701AX Noisetaker 600W.

The Intel system (photo b) again features a dual core processor, this time Intel's 840. The rest of the basics are Foxconn 955X7AA motherboard, Sapphire Radeon X850XT Platinum Edition, 1GB of Kingston KHX6000 DDR2 memory and a pair of Western Digital 74GB Raptors. As with the AMD system, we have used the onboard audio. All this will be housed in a Lian-Li PC7 with an Enermax EG701AX Noisetaker 600W power supply.

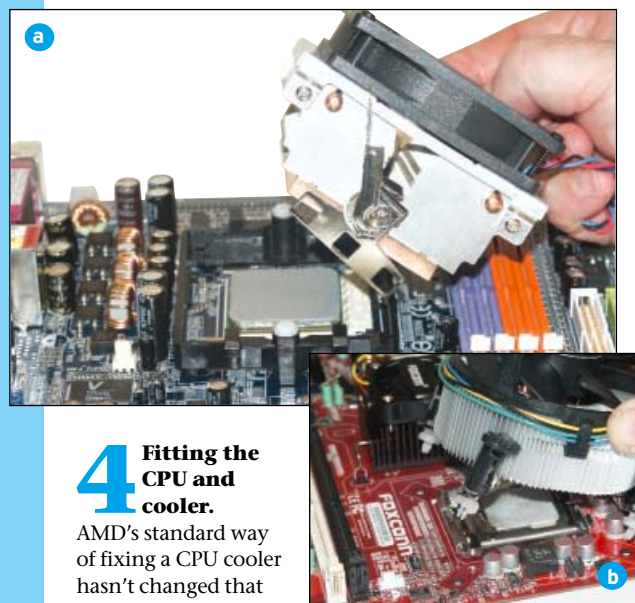


2 Cases. The choice of a case is very much a personal thing. We have used Lian-Li's aluminium PC7 (photo a) and CoolerMaster's steel CM Stacker cases (photo b). Both are well built, with a good level of quality with little in the way of gimmicks, such as lights and so on. The PC7 is a midi tower which uses thumbscrews for the case sides and the power supply mounting plate, whereas the CM Stacker is a full blown tower case which, in addition to using thumbscrews, where necessary has tool free drive bays and a removable motherboard back plate. This is probably the most useful feature you will find on a case, as it allows you to fix the motherboard, CPU, memory and ancillary cards away from the case, making life a lot



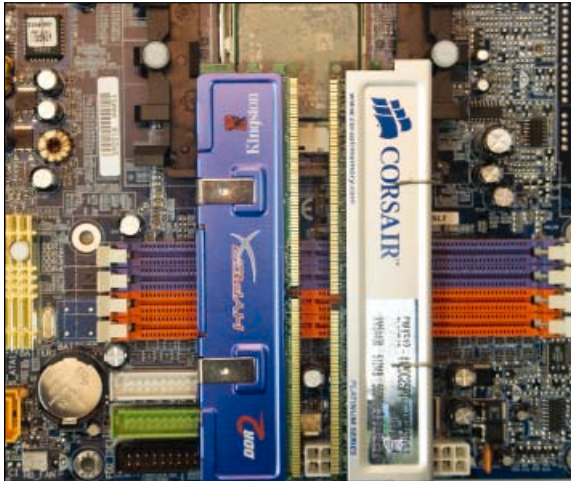
3 Fitting your PSU. In these days of power hungry CPUs and graphics cards, the output of a power supply has risen sharply. It was only a couple of years ago that 350w was the norm, but now 450w is seen as a standard and some supplies even go way past this, we are now seeing 600w supplies.

One thing you do need to look out for, particularly if you are using the latest CPUs and motherboards, is that the supply has the appropriate connectors; 24pin ATX power, PCI-E graphics (two if you are going down the SLI route) and Sata power connectors. The only problem you might find fitting a PSU is that some of the higher wattage supplies are on the large size physically, so check the space you have to fit your supply into.

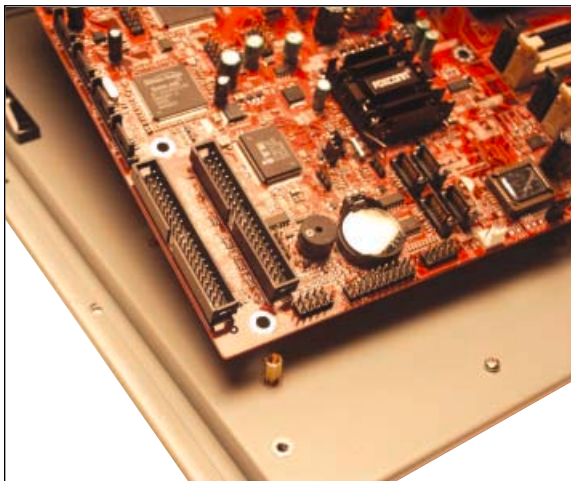


4 Fitting the CPU and cooler.

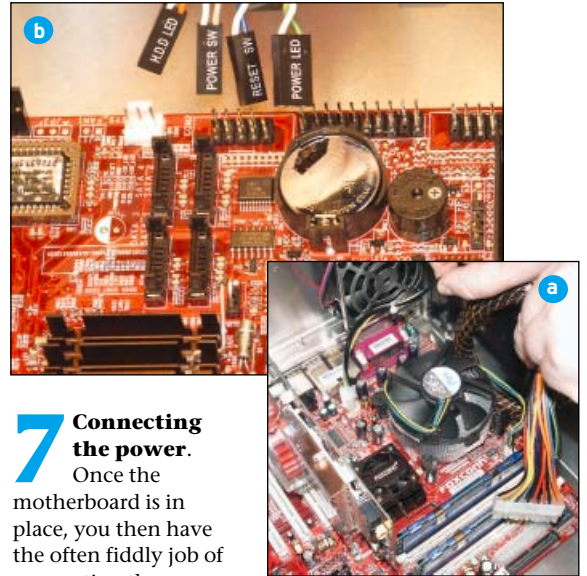
AMD's standard way of fixing a CPU cooler hasn't changed that much over the years; it's just got chunkier as the coolers have got larger (photo a). They still use a locking latch mechanism but this has moved off the socket (as in the Socket A) and now is found on the plastic cradle that surrounds it instead. Intel on the other hand has tried several different solutions. Currently the coolers for its latest processors use a locking pin mechanism (photo b) which needs quite some force to lock into place, which coincided with the move from Socket 748 to Socket 775. It's important not to forget to apply a thin layer of thermal paste on top of the CPU, which will give you a better thermal coupling with the heatsink and aid cooling. At this stage, you must also plug the power connector for the cooling fan onto the motherboard.



5 Memory. Although they look identical at first glance, there are subtle differences from DDR1 and DDR2 Dimm slots. A DDR1 module has 184pins whilst DDR2 has 240pins, so you need to make sure you buy the correct memory. If you do get it wrong you'll find the module location offset is in a different position on each type, so no matter how hard you push you won't force a DDR2 module into a DDR1 slot. You will also notice that most of today's motherboards have the Dimm slots colour coded. This is due to the appearance of dual channel memory support, so you should always check your motherboard's manual to see which slot they should fit into, otherwise you could end up with just single channel memory. Additionally, refer to the manual to find out the maximum amount of memory the motherboard can support, both overall and on a per slot basis.

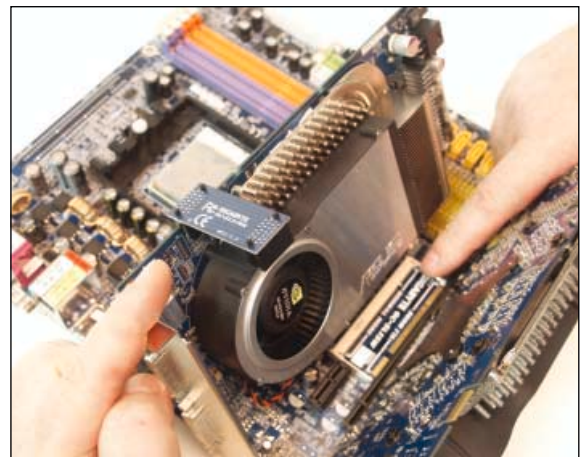


6 Installing the motherboard. Depending on your case design, you may be lucky to have a removable motherboard back plate. If you have, then the whole job of installing the motherboard is a whole lot easier. If not, prepare yourself for a bit of fiddling. Some cases have the motherboard mounting holes labelled for your motherboard format, such as ATX, Micro ATX and so on, but if like our cases they're not, then carefully match your motherboard's holes with those in the plate. Either way, be sure to use the brass standoffs that should be supplied with the case, as this will support the motherboard far better and stop it flexing. You may have a choice of fixings supplied with the case, but the brass standoffs are by far the best ones to use.



7 Connecting the power.

Once the motherboard is in place, you then have the often fiddly job of connecting the power connectors and front panel connectors to the board. Fitting the main 12V ATX power and the auxiliary 12V power connectors (photo a) pose no real problems as they can only fit one way. The really fiddly job comes, however, when you try and connect the front panel control connectors (photo b) for power, reset and hard drive activity lights, for example. The placement for these headers seem to be fine when the motherboard is out of the case but once its in, more often than not it's a real struggle to get these connected, even if you do refer to the manual.



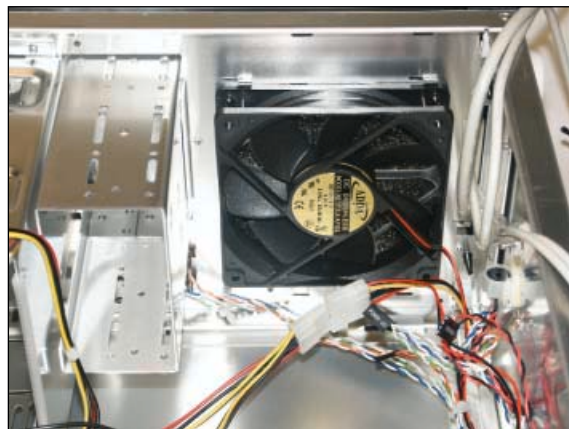
8 Graphics card. If you are using your motherboard's integrated graphics solution, then this step doesn't apply to you, but for the vast majority of people this is the time when they will add the most expensive single item of the self build, after the CPU. Both our systems use PCI-E based graphics, a single card for the Intel based system and a SLI solution for the AMD one. If you go down the SLI path there are a few things to remember. First, make sure your power supply has two PCI-E power connectors – some motherboards also have a 4pin Molex connector to provide extra power, so if this is the case make sure you supply power to it. Also, don't forget to turn the switch module to SLI mode and remember to put the SLI bridge across the two cards. The graphics card you choose depends on your needs. We're building a power PC, but if your needs are modest (occasional gaming or digital photography), consider cards for around £50-£80.





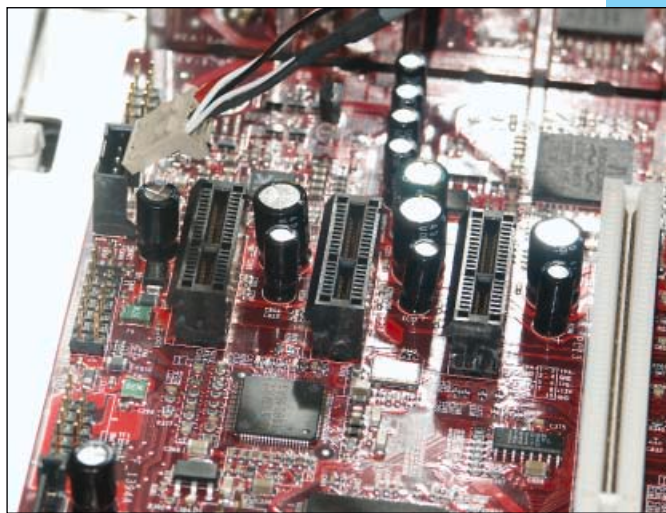
9 Hard drives.

This used to be straightforward, but if you are using a board based on Intel's latest 915/925 chipsets you may hit problems if you want to use your old drives, as the chipsets only support a single ATA port. This isn't a problem if the board has extra ports for a Raid array, as some Raid controllers can be switched into single drive mode to support optical drives, but if not, you will have to fork out for a new SATA drive. Both our cases come with removable drive bays, which are a godsend when fixing hard drives, as it's much easier to fix the drives into bays out of the case and then slide the whole thing back into place.



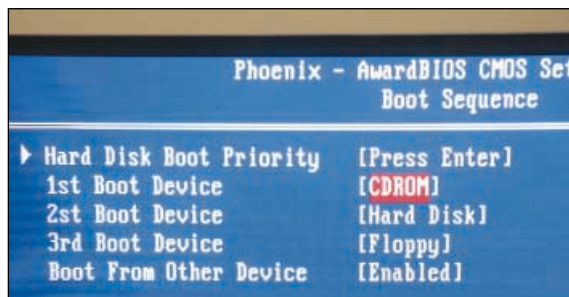
11 Case fans/peripherals.

Any good case should come with at least one fan – either 120mm, 92mm or 80mm – and better quality cases come with quiet fans and fan filters as standard. This is one area that needs careful consideration as it's a difficult balance between getting rid of heat from the CPU, graphics and hard drive, and keeping the noise level to an acceptable level. You may want to fit a fan controller in a free drive bay which should help sort things out. Plugging in any front panel features such as USB, Firewire and audio comes next and here a little care is needed when it comes to the USB connectors. Some cases provide these as plug in blocks but the majority of cases leave them as separate wires, so you need to consult the manual to prevent any damage.



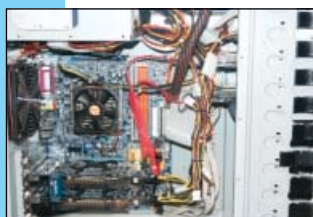
10 Optical drives/card readers.

Installing an optical drive is simplicity itself, about the only thing you have to remember is to connect the audio cable to the soundcard or, in our case, as we're not using one, the header on the motherboard. Also remember that if you are using two optical drives, one needs to be configured as the master, the other the slave. Card readers have rapidly taken over from the humble floppy drive, although if you need a floppy – and you will if you are using Raid arrays – you can buy card reader/floppy drive combos. Most, if not all, card readers are powered by USB, so it's just a matter of finding a spare USB header on the motherboard and plugging it in.



12 Booting up and the Bios.

Once everything is in place you can start the system up and enter the Bios. Although the Bios screens seem a little overwhelming, it's worth getting to know it as you can turn things off such as the floppy drive, Raid controllers and anything else you are not using – but consult your manual first. This may seem a trivial thing to do, but turning things off you're not using will speed up the boot process. Finally, go into the boot order menu and set the system to boot from the optical drive so you can begin to load the operating system from CD. Once you have loaded the operating system, remember to go back into the Bios and change the boot order so it boots first from the hard drive.



Windows XP Professional x64 Edition

The 64bit version of Windows is, in many ways, similar to the XP, so is it worth the effort? It is if you work with large data sets, because of the increase in both the physical and virtual memory it can address and 64bit native applications can deliver more data per clock cycle, making them run faster and more efficiently. Whilst it should happily run 32bit applications, it's the device drivers which may prove your undoing. This is because you'll need 64bit drivers and these can be hard to find for some types of hardware. Although new components should now have 64bit device drivers available from the manufacturers this is by no means guaranteed. Many vendors have been slow to provide support.

Windows Professional x64 will not allow you to install 32bit device drivers on your system. Driver inf files must now contain appropriately named entries in the [Manufacturer] and [Models] sections to specify operating system versions on non-x86 based systems. This is to ensure the OS functions correctly. Although in itself not a problem, the availability of 64bit drivers may prove problematic when it comes to older peripherals.

As you would expect, ATI, Nvidia and Creative, for example, all have drivers supporting their latest hardware. But before embarking on the 64bit path, it is worth doing your homework. Check to see whether you'll be left with devices unsupported by manufacturers which you couldn't do without or that would render an investment useless.

How we tested

The systems were tested using the components listed and with the latest drivers available from the respective manufacturers. The Intel-based machine with two Serial-ATA Western Digital hard drives was configured in a Raid 0 array using Intel's onboard Raid controller. The AMD system was similarly set up using its built-in Raid controller. Both Raid arrays were set up with a 128KB striping block size. The AMD system was tested with a single graphics card using 3DMark05.

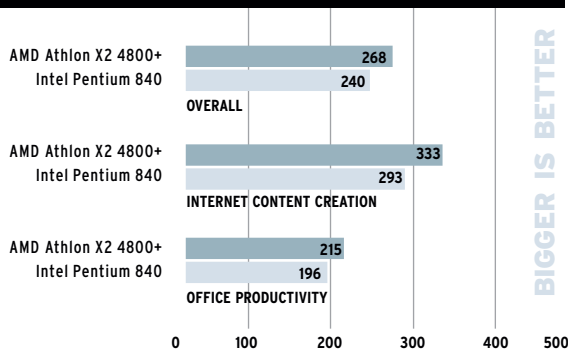
We didn't rely on the motherboard's auto configuration for the memory, but set the timings as specified by the manufacturer for each system. Before each benchmark the system was defragmented to ensure repeatability and no overclocking was performed.

The suite of bench tests included Sysmark 2004, which simulates real-life workloads for both Internet Content Creation (ICC) and Office Productivity (OP). The ICC part uses applications including Photoshop, 3ds max and Dreamweaver, while the OP tests use typical office applications such as Powerpoint, Word, and Excel.

PCMark04 consists of a series of synthetic benchmark suites, each designed to test an individual subsystem, such as memory, processor and hard drive.

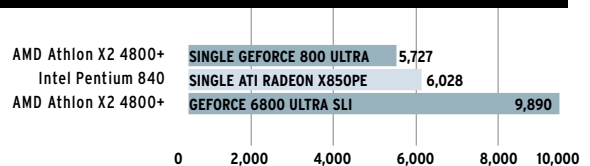
3DMark 2005 tests the Direct 3D performance of the graphics subsystem and Cinebench is a multiprocessor benchmark that measures the performance of a system when rendering 3D video scenes.

Sysmark 2004

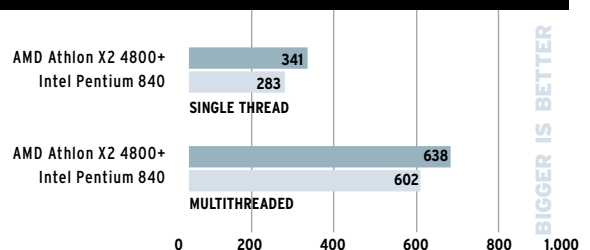


BIGGER IS BETTER

3DMark 05

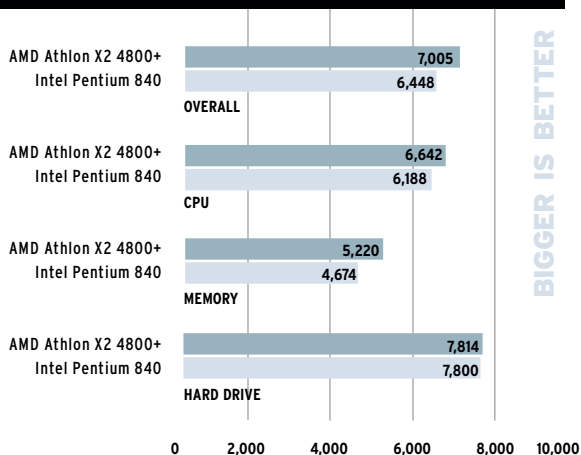


Cinebench



BIGGER IS BETTER

PCmark 2004



BIGGER IS BETTER

3Dmark05

Although the ATI Radeon X850PE just outperforms the Nvidia Geforce 6800 Ultra due to its higher core and memory clock speeds, it is left trailing when the Nvidia cards are configured in dual card (SLI) mode.

Sysmark04

Using this real world benchmark the AMD system outperforms the Intel system particularly in the content creation part of the benchmark.

Cinebench

The dual-core Intel system can process four threads due to its use

of Hyperthreading, but AMD's fast Hypertransport link enables the X2 to outperform it. On the single threaded test the AMD 2.4GHz processor still outperforms the 3.2GHz Intel CPU.

PCMark04

Hard drive scores are almost identical due to the identical Raid 0 configuration in the two systems. Memory scores show that the AMD based system with DDR memory loses out to the DDR2 in the Intel system. Overall the AMD X2 system outperforms the Intel 840 system by almost 9 per cent.



PRICING TABLES

INTEL SYSTEM	PRICE INC VAT
Intel Pentium Extreme Edition 840 CPU	£800 (approx)
1GB (2 x 512MB) Kingston KHX6000 DR2 memory	£199
Two Western WD740 74GB Digital Raptor hard drives	£250.16
Sapphire Radeon X850XT PE graphic card	£339
Foxconn 955X7AA motherboard	£161
Samsung TS-H552 DVD rewriter	£42.39
Enermax EG701AX Noisetaker (600w) PSU	£93.24
Lian Li PC7 Plus case	£62.04
TOTAL	£1,946.83

AMD SYSTEM	PRICE INC VAT
AMD Athlon X2 4800+ CPU	£800 (approx)
1GB (2 x 512MB) Corsair XMS4400PT memory	£154.04
Two Western WD740 74GB Digital Raptor hard drives	£250.16
Two Asus Geforce N6800 Ultra graphics cards	£645.52
Gigabyte GA K8N Pro SLI motherboard	£93.94
Samsung TS-H552 DVD rewriter	£42.39
Enermax EG701AX Noisetaker (600w) PSU	£93.24
Coolermaster CMStacker case	£104.73
TOTAL	£2,184.02

Build a Media Centre PC

The growth and maturity of the small form factor (SFF) PCs has made them the ideal platform for creating your own entertainment or media PC. Barebones systems from the likes of Shuttle, Aopen and Kloss make a good base to build your own Media Center, (in the case of Aopen's XC Cube AV they have done a lot of the work for you), because of the slower CPUs you can use with this type of PC. Then you have the added bonus of SFF's being smaller and generally more stylish than their desktop cousins, so you don't to have worry about hiding them away.

Whichever format you use, building a media PC offers different challenges to building any other form of PC. Performance isn't the key, it is more about getting the right balance of hardware and software.

This is quite a minefield, as you may find that not all the hardware you want to use is supported by your choice of software, although it is getting easier as more drivers become available.

If you are building a true Media Center based around Microsoft's hybrid operating system of the same name and not a media/gaming PC, you don't have to worry about a graphics card. Using a motherboard with integrated graphics should be sufficient, because hard drive and choice of TV tuner card is much more important – analogue, digital or for those still undecided, a combination of the two. For the hard drive, get the biggest one you can afford to store all the TV you might miss.

Software

The most obvious route for many when building this type of PC is to use Microsoft Media Center 2005 Edition, but you should be aware that you can't buy this as a standalone product. It can be bought by system builders, so you'll need to buy it along with other qualified components, which shouldn't be a problem if you are building your own PC – we found it on www.ebuyer.co.uk for £77.

Not all components, such as TV tuner cards, work with it, so before purchasing any components you need to check they are compatible at www.microsoft.com/windowsxp/mediacenter/partners/dfw/partnerlisting.mspx.

You'll also need to buy the Microsoft remote control, which costs about £23.

Although most people will go down the Microsoft route and install Media Center 2005, especially as the driver support is much better than previous versions, there are other options.

Cyberlink Power Cinema TV Plus: This has a similar interface to Media Center and has the added bonus

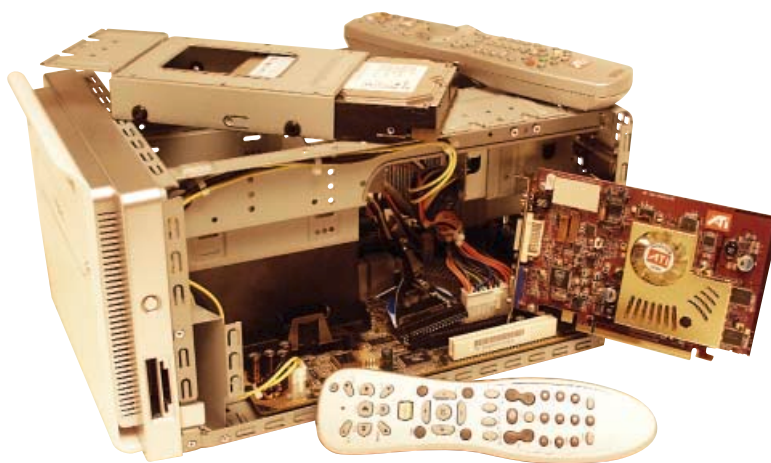
of solving which TV card you are going to use, as it comes with one.

Intervideo Home Theatre Gold Edition: It has the same range of features as Power Cinema but doesn't come with a TV card.

Showshifter: Not as easy to use as Media Center, but is full of features and cheaper.

Pinnacle MediaCenter 300i: Another to include a TV card, but this time able to receive both analogue and digital signals.

You can take control of all your video and audio duties from the comfort of your sofa as a fully featured remote control is included.



EXAMPLE MEDIA CENTRE PC	PRICE INC VAT
Intel 530 3GHz CPU	£117.34
Crucial 1GB PC5300 DDR2 memory	£129.22
Seagate Barracuda 7200.8 400GB hard drive	£191.82
ATI All in Wonder X600 Pro graphics card	£105.69
Samsung TS-H552 DVD rewriter	£42.39
Shuttle XPC SB86i case	£252.71
TOTAL	£839.17



Zen

Fanless Power

FSP's latest fanless Power Supply for users looking for a completely silent solution



**So quiet, you can hear a pin drop.
No Fans! Simple, it's quiet!**

- Products meet standard of Intel ATX 12V Version 2.0.
- Active PFC circuit.
- Full range input.
- Real No-noise Design, Full load 0dB.
- High Efficiency over 89%.
- Six smart housing Molex connectors
- Two Serial ATA connectors
- Dimensions : 140*150*86mm



20+4 Pin Main connector x 1

4Pin connector x 6

4Pin floppy Drive connector x 1

5Pin SATA connector x 2

4Pin+12V power connector x 1

Retailers

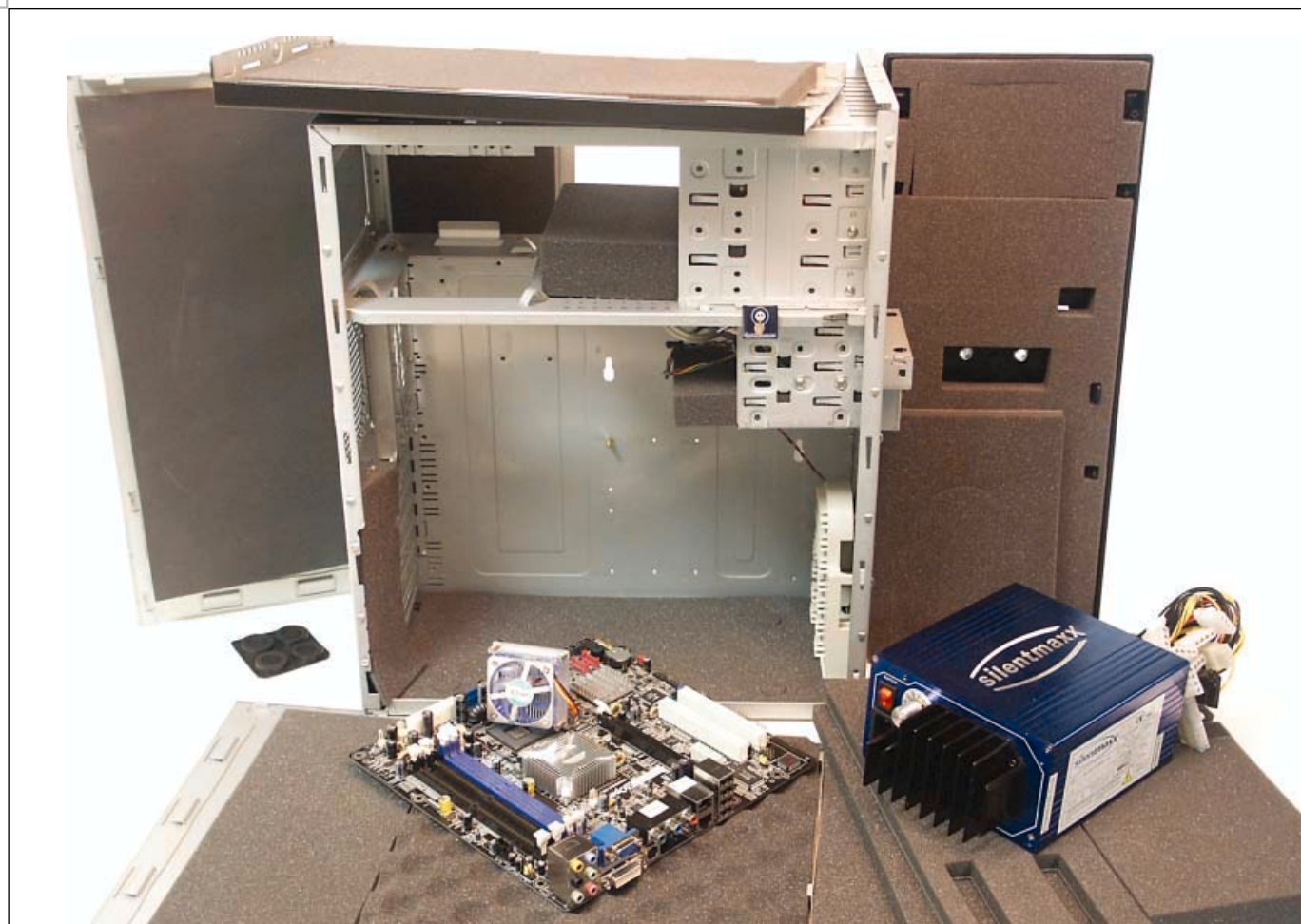


Vadim Computers
www.vadim.co.uk/fsp



Gladiator Computers
www.gladiatorcomputers.com

www.FSPgroup.co.uk



Build a quiet PC

One of the fastest growing areas of the PC market, both from system builders' point of view and the DIY builder, is the quiet PC. People will no longer put up with screaming noises coming from the graphics card, CPU, power supply or case fans and even hard drives have come in for the quiet treatment.

The one easy way to reduce fan noise is to reduce the amount of heat coming from the inside of the case; less heat equals smaller fans, which in turn means a quieter system.

In the not too distant past, building a quiet PC meant sacrificing performance for silence, as the only way to reduce the heat was use notebook components and slow graphics cards which were one step up from integrated graphics – not the ideal solution.

Now companies offer motherboards which use the latest mobile processors combined with the latest chipsets, such as Aopen's i915 GMm-HFS which combines Intel's Pentium M mobile processor and i915 desktop chipset to produce a very capable, quiet motherboard which offers integrated graphics.

If you need gaming capabilities, add a quiet graphics card such as Sapphire's X800XL Ultimate which uses a Zalman cooler.

If, on the other hand, you're not interested in games or bleeding edge performance and just want total silence, then building your PC around one of Via's Epia motherboards will give you what you are looking for, as some of them even have passive CPU coolers.

AMD and Intel have also taken notice of the growth

in this segment and the latest processors from both offer either Cool n Quiet (AMD) or Speedstep (Intel) technologies, designed to cut down the power consumption of the CPU and fan noise, when it's idling. Intel's BTX format also tackles the problem of heat and noise with some clever design ideas, but BTX motherboards and cooling solutions for the home builder are still thin on the ground.

When it comes to the rest of the case internals, specialists like Quiet PC and Nexus are the people to look out for as they are experts in the field of making a PC quiet, offering a large number of products covering every aspect of the self build, from cases and power supplies, to case fans and hard drive enclosures.

EXAMPLE QUIET PC	PRICE INC VAT
Intel Pentium M 2GHz CPU	£297.37
Crucial 1GB PC5300 DDR2 memory	£129.22
Sapphire Radeon X800XL Ultimate graphics card	£223
Aopen i915GMm-HFS motherboard	£150
Samsung TS-H552 DVD drive	£42.39
Silentmaxx Semi Fanless 450W PSU	£163.33
Quiet PC Acousticase C6606B case	£92.83
TOTAL	£1,098.14

www.savastore.com/GRAPHICS

connect3D

£39.99 Ex
£46.99 Inc
savastore.com/
10281341

Radeon 9550 256MB DDR

- TV-Out + DVI
- Dual Monitor support
- Games Bundle: Splinter Cell, Far Cry & Downtown Run

www.savastore.com/connect3d

SAPPHIRE

£184.00 Ex
£216.20 Inc
savastore.com/
10280421

Sapphire ATI Radeon X800 256MB

- PCI - Express; DDR3
- TV-Out; DVI
- 3D Image enhancement

www.savastore.com/sapphire

www.savastore.com/GRAPHICS

Item	Description	Ex VAT	Inc VAT
10280445	Aries 9800Pro 128MB TV Out DVI	£79.99	£99.52
10280471	Aries X800XT PE 256MB GDDR3 VIVO	£240.00	£282.29
10280470	Aries X850XT 256MB GDDR3 PCI Exp DVI TV Out OEM	£240.00	£293.74
10281114	Aries X800XT PE 256MB GDDR3 VISA VIVO DVI AGP	£205.00	£250.79
10281115	Aries X800XT 256MB GDDR3 VISA VIVO DVI AGP	£200.00	£237.29
10277334	Connect3D R6250 128MB DDR DVI TV-OUT	£23.00	£35.15
10277335	Connect3D R6250 256MB DDR DVI TV-OUT	£28.00	£34.06
10279303	Connect3D R6250SE 128MB DDR DVI TV-OUT	£20.00	£24.50
10279308	Connect3D R6250SE 128MB DDR DVI TV-OUT	£21.00	£25.84
10276699	Connect3D R6500 256MB DDR DVI TV-OUT	£30.00	£45.51
10267618	Connect3D R6600 128MB DDR DVI TV-OUT	£40.00	£56.20
10269570	Connect3D R6600 256MB DDR DVI TV-OUT	£40.00	£56.20
10267617	Connect3D R6600Pro 128MB DDR DVI TV-OUT	£30.00	£45.51
10266371	Connect3D R6600 Pro 128MB DDR All-in-Wonder	£140.00	£169.48
10264979	Connect3D R6600Pro 128MB DDR DVI TV-OUT	£110.00	£137.08
10279348	Connect3D R6300 128MB DDR PCI-EXP DVI TV-OUT	£30.00	£46.89
10279349	Connect3D R6300 256MB DDR PCI-EXP DVI TV-OUT	£37.00	£45.91
10279346	Connect3D R6300SE 128MB DDR PCI-EXP DVI TV-OUT	£30.00	£36.57
10279341	Connect3D R6300Pro 256MB DDR DVI TV-OUT	£30.00	£36.53
10280422	Connect3D R6300XT 256MB GDDR3 PCI-EXP DVI TV-OUT	£240.00	£285.31
10279524	Gigabyte R6800XT PE 256MB GDDR3 DVI VIVO	£200.00	£237.21
10280401	MSI R6800LE 128MB PCI-EXP DVI TV-OUT	£43.00	£51.11
10280403	MSI R6800Pro 128MB PCI-EXP DVI TV-OUT	£52.00	£62.22
10280396	MSI R6700Pro 256MB PCI-EXP DVI TV-OUT	£100.00	£143.59
10280395	MSI R6800LE 256MB PCI-EXP DVI VIVO	£170.00	£211.44
10280394	MSI R6800XT 256MB PCI-EXP VIVO	£200.00	£237.21
10280393	MSI R6800XT PE 256MB PCI-EXP VIVO	£270.00	£328.08
10278883	Sapphire R6250 256MB DDR DVI TV-OUT	£37.00	£44.29
10276697	Sapphire R6500 256MB DDR DVI TV-OUT	£47.00	£56.24
10268034	Sapphire R6600 256MB DDR DVI TV-OUT	£33.00	£40.44
10278084	Sapphire R6600 Advantage Pro 128MB DDR DVI TV-OUT	£40.00	£57.96
10278085	Sapphire R6600 Advantage Pro 256MB DDR DVI TV-OUT	£50.00	£70.37
10273897	Sapphire R6800SE 128MB DDR DVI TV-OUT	£41.00	£48.97
10279175	Sapphire R6800XT 128MB DDR DVI TV-OUT	£23.00	£36.94
10272021	Sapphire R6800XT 256MB DDR DVI TV-OUT	£33.00	£37.54
10266215	Sapphire R6800Pro 128MB DDR DVI TV-OUT	£80.00	£117.49
10271456	Sapphire R6800Pro Ultimate 128MB DDR AGP	£140.00	£165.93
10277730	Sapphire R6800 Pro 256MB DDR PCI-EXP DVI TV-OUT	£30.00	£37.49
10276662	Sapphire R6700Pro 256MB GDDR3 PCI-EXP DVI VIVO	£110.00	£132.16
10279448	Sapphire R6900 Pro 256MB GDDR3 DVI TV-OUT	£200.00	£238.09
10280421	Sapphire R6800 XL 256MB GDDR3 PCI-EXP DVI TV-OUT	£100.00	£121.19
10276875	Sapphire R6800Pro 256MB DDR VIVO AGP	£200.00	£237.24
10279204	Sapphire R6800Pro 256MB GDDR3 DVI TV-OUT	£30.00	£37.22
10277734	Sapphire R6800XT 256MB GDDR3 DVI VIVO	£30.00	£34.31
10271759	Sapphire R6800XT PE 256MB GDDR3 VIVO	£270.00	£328.99
10260033	Sapphire R6850XT 256MB GDDR3 PCI-EXP Dual-DVI VIVO	£200.00	£232.40
10277396	Galaxy 6800GT 256MB DDR DVI TV-OUT	£200.00	£269.06
10279523	Gigabyte 6800GT 256MB GDDR3 with DDMVD bundle	£200.00	£261.74
10280411	MSI 6200 128MB DDR PCI-EXP	£32.00	£41.10
10280410	MSI 6600 128MB DDR PCI-EXP	£30.00	£38.33
10280408	MSI 6600GT 128MB DDR PCI-EXP	£100.00	£123.67
10272018	MSI FX6200-TD128 128MB DDR DVI TV-OUT	£20.00	£26.19
10275686	MSI M4400 128MB TV-OUT Card OEM	£22.00	£26.44
10275719	MSI M4400 64MB TV-OUT OEM	£20.00	£23.26
10276374	MSI N6800DQ 256MB TV-OUT Dual-DVI	£300.00	£366.61
10276403	Nvidia GeForce M4400 128MB DDR TV-OUT	£20.00	£26.90

www.savastore.com/OPTICALDRIVES

SONY

£28.50 Ex
£33.49 Inc
savastore.com/
10281534

DW-Q28A Dual-Layer 16x DVD+RW

- Dual Layer recording technology
- Nero Software included
- Buffer Underrun Protection

www.savastore.com/sony

LG

£30.99 Ex
£36.41 Inc
savastore.com/
10281455

16 X SuperMulti All-Formats DVD Writer

- Supports DVD +/-R/RW/RAM
- Dual Layer Technology • Buffer Underrun Correction

www.savastore.com/10281455

www.savastore.com/OPTICALDRIVES

Item	Description	Ex VAT	Inc VAT
10214093	Lite-On 16x DVD-RW Drive + PowerDVD	£12.00	£14.44
10270717	Plextor 16x IDE internal DVD-ROM Retail	£15.00	£22.42
10299272	Samsung 16x Internal IDE DVDROM Drive Retail	£13.00	£14.84
10299976	Sony 16x DVD40x Int IDE DVD-ROM Black	£12.00	£14.34
10296363	Lite-On 5x24x52x IDE CD-RW Retail Kit	£12.00	£15.15
10272527	Plextor 5x24x52 2MB IDE CD-RW - Black w/nero PC sw	£20.00	£34.00
10272528	Plextor 5x24x52 2MB IDE CD-RW w/nero PC sw	£27.00	£32.88
10272514	Sony 5x24x52x CD-RW Drive Internal Black	£12.00	£15.26
10277854	Lite-On 5x24x52x16x IDE CD-RW/DVD Combo OEM	£20.00	£28.19
10274418	Lite-On 5x24x52x16x IDE CD-RW/DVD	£16.00	£21.96
10275168	Sony Black CD-RW/DVD Combo Drive 5x24x52x16x	£16.00	£23.44
10281515	NEC-40A Black Dual Layer Int IDE 16x DVD-RW +/- OEM	£20.00	£34.06
10281516	NEC-40A Sage Dual Layer Int IDE 16x DVD-RW +/- OEM	£19.00	£34.00
10281169	Phlips 16x40x 16x Dual Layer IDE	£30.00	£36.00
10279868	Phlips 16x40x 16x Dual Layer IDE Black	£30.00	£36.00
10279784	Plextor DWR-109 16x Dual-Layer IDE Black OEM	£25.00	£35.00
10279783	Plextor DWR-109 16x Dual-Layer IDE	£25.00	£35.11
10277380	Plextor PX-712-SA 12x DVD-R +/- IDE-R SATA	£91.00	£91.85
10279751	Plextor PX-716A 16x Dual-Layer IDE	£35.00	£74.94
10279752	Samsung Dual-Layer Int IDE 16x DVD-R	£20.00	£38.88
10277838	Sony DW-Q22A Dual-Layer Black OEM	£20.00	£34.19

www.savastore.com/EXTERNALHDD

www.savastore.com/INTERNALHDD

Item	Description	Ex VAT	Inc VAT
10268105	Samsung PL40 40Gb 7200RPM HDD OEM	£20.00	£30.54
10268107	Samsung PR0 80Gb 2mb Cache 7200RPM HDD OEM	£30.00	£37.94
10268102	Samsung PR0 160Gb 2mb Cache 7200RPM HDD OEM	£40.00	£53.59
10268406	Samsung PR0 120Gb 2mb Cache 7200RPM HDD OEM	£45.00	£53.99
10268407	Samsung PR0 160Gb 2mb Cache 7200RPM HDD OEM	£40.00	£58.70
10274122	SP1012S 80Gb 8Mb Cache SATA OEM HDD	£20.00	£42.90
10274123	SP1213C 120Gb 8Mb Cache SATA OEM HDD	£40.00	£50.46
10273144	SP1614C 160Gb 8Mb Cache SATA OEM HDD	£50.00	£64.98

www.savastore.com/INTERNALHDD

Item	Description	Ex VAT	Inc VAT
10199461	UR 20 4GB 5400RPM HDD	£20.00	£33.35
10199463	UR 40 8GB 5400RPM HDD	£25.00	£39.54
10214112	Barracuda 7200.7 40GB 2MB Cache 7200RPM OEM	£27.00	£31.84
10222267	Barracuda 7200.7 80GB 2MB Cache 7200RPM OEM	£30.00	£35.25
10277409	Barracuda 7200.7 120GB 2MB Cache 7200RPM OEM	£30.00	£46.94
10269361	Barracuda 7200.7 160GB 2MB Cache 7200RPM OEM	£40.00	£50.88
10282721	Barracuda 7200.8 120GB 8MB Cache 7200RPM OEM	£30.00	£36.88
10268213	Barracuda 7200.7 160GB 8MB Cache 7200RPM OEM	£37.00	£55.64
10275762	Barracuda 7200.7 200GB 8MB Cache 7200RPM OEM	£34.00	£53.67
10280272	Barracuda 7200.8 300GB 8MB Cache 7200RPM OEM	£55.00	£111.39

SEAGATE - SATA

Item	Description	Ex VAT	Inc VAT
10297782	ST380024S 80GB 8MB Cache 7200RPM	£31.00	£37.48
10279558	ST3120024S 120GB 8MB Cache 7200RPM	£40.00	£50.75
10268212	ST3160024S 160GB 8MB Cache 7200RPM	£50.00	£60.31
10275763	ST3200024S 200GB 8MB Cache 7200RPM	£57.00	£67.74
10280279	Barracuda 7200.7 300GB 8MB Cache 7200RPM	£50.00	£116.38
10280281	Barracuda 7200.7 400GB 8MB Cache 7200RPM	£60.00	£191.82

WESTERN DIGITAL

£38.94 Ex
£45.75 Inc
savastore.com/10234835

Caviar 120GB IDE HDD

www.savastore.com/westerndigital

Item	Description	Ex VAT	Inc VAT
10030301	Caviar 80GB 2MB Cache 7200RPM OEM	£20.00	£36.02
10234835	Caviar 120GB 8MB Cache 7200RPM OEM	£30.00	£45.75
10265528	Caviar 200GB 2MB Cache 7200RPM OEM	£44.00	£51.72
10248528	Caviar 200GB 8MB Cache 7200RPM OEM	£50.00	£59.56
10248529	Caviar 80GB 8MB Cache 7200RPM OEM	£20.00	£37.78
10234830	Caviar 120GB 8MB Cache 7200RPM OEM	£40.00	£49.94
10265311	Caviar 160GB 8MB Cache 7200RPM OEM	£44.00	£52.11
10248529	Caviar 200GB 8MB Cache 7200RPM OEM	£30.00	£52.10
10265312	Caviar 250GB 8MB Cache 7200RPM OEM	£70.00	£82.31
10273869	Caviar 120GB 8MB Cache SATA150 OEM	£44.00	£52.56
10273870	Caviar 160GB 8MB Cache SATA150 OEM	£47.00	£56.81
10273871	Caviar 200GB 8MB Cache SATA150 OEM	£57.00	£67.20
10273872	Caviar 250GB 8MB Cache SATA150 OEM	£72.00	£85.19

www.savastore.com/INTERNALHDD

HITACHI

£157.57 Ex
£185.14 Inc
savastore.com/
10277554

Deskstar 7K400 400GB IDE HDD

www.savastore.com/hitachi

Item	Description	Ex VAT	Inc VAT
10277315	Deskstar 7K400 40GB 2MB Cache 7200RPM OEM	£27.00	£31.96
10277316	Deskstar 7K400 80GB 2MB Cache 7200RPM OEM	£25.00	£29.96
10268039	Deskstar 7K200 120GB 2MB Cache 7200RPM OEM	£40.00	£47.55
10268541	Deskstar 7K250 120GB 8MB Cache 7200RPM OEM	£40.00	£50.47
10268542	Deskstar 7K250 160GB 8MB Cache 7200RPM OEM	£43.00	£51.84
10268543	Deskstar 7K250 180GB 8MB Cache 7200RPM OEM	£48.00	£54.34
10268544	Deskstar 7K250 250GB 8MB Cache 7200RPM OEM	£60.00	£62.07
10268545	Deskstar 7K250 300GB 8MB Cache SATA150 OEM	£37.00	£37.42
10268546	Deskstar 7K250 120GB 8MB Cache SATA150 OEM	£44.00	£51.76
10268547	Deskstar 7K250 160GB 8MB Cache SATA150 OEM	£37.00	£56.28
10268548	Deskstar 7K250 250GB 8MB Cache SATA150 OEM	£60.00	£62.19
10275555	Deskstar 7K250 400GB 8MB Cache SATA150 OEM	£140.00	£175.02

Maxtor

£103.10 Ex
£121.14 Inc
savastore.com/10277195

Diamondmax10 300GB SATA

www.savastore.com/maxtor

Item	Description	Ex VAT	Inc VAT
10250133	DiamondMax Plus 40GB 2MB Cache 7200RPM OEM	£23.00	£27.38
10257559	DiamondMax Plus 80GB 2MB Cache 7200RPM OEM	£20.00	£34.42
10265132	DiamondMax Plus 9 120GB 2MB Cache 7200RPM OEM	£30.00	£44.71
10260289	DiamondMax 10 80GB 8MB Cache 7200RPM OEM	£37.00	£43.85
10279780	DiamondMax 10 120GB 8MB Cache 7200RPM OEM	£42.00	£50.47
10260219	DiamondMax 9 160GB 8MB Cache 7200RPM OEM	£53.00	£51.34
10279334	DiamondMax Plus 9 200GB 8MB Cache 7		

Power matters

How do you determine what a good power supply is?

Stability

A good quality PSU, with sufficient capacity to meet your computer's needs, provides years of power stability. On the other hand, a poor quality PSU can lead to apparently unrelated PC problems.

Your PC could crash, your hard disk may develop bad sectors or software bugs may appear. But all these things are hard to trace back to the PSU

Cooling

The PSU cooling fan is the major component for cooling your PC, controlling airflow throughout the case

Energy efficiency

A higher efficiency means less energy is converted to heat (fan spins more slowly), creating less noise and waste, lowering electricity costs and prolonging the life of the PSU and other components.

Expandability

PSU capacity can affect a number of tasks, such as adding new drives or upgrading the processor or motherboard.

For example, few people are aware that a high-speed Athlon CPU and motherboard consumes far more power than a similar Pentium-based system, and the power of the PSU will need to be higher. When building your own system, ensure your PSU more than

meets your needs in order to avoid replacement when you upgrade in the future.

The pie charts in fig 1 (below) show that the cost of the PSU and cooling fan are only 2 per cent of the total PC cost, but the amount of problems a poor PSU can cause at 36 per cent.

Despite this critical role, the PSU is one of the most ignored and under-studied components in the PC. So much so that many users don't even know which PSU they are using.

The PSU takes the power input from the power supply in your home/office and turns it into a useable form (PC power current is DC, home/office power current is AC). The PSU provides several voltages at different strengths and manages additional signals from the motherboard and other components.

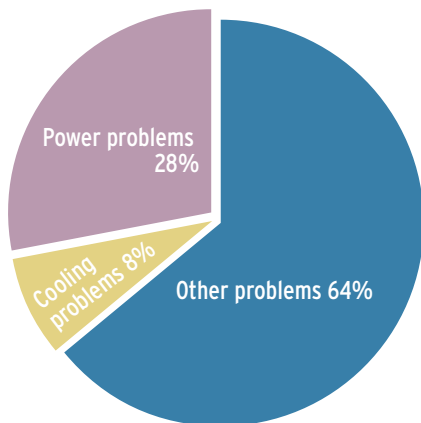
Many items in the home run off standard AC power, but use DC internally. The two indicators that a device uses DC inside are, first, it can run on batteries and second, it has an external power supply. There is a difference between this type of DC PSU and one used for a PC. External power 'bricks' are linear, cheap and simple to make.

They are wasteful – typically, 50 per cent or more of the energy supplied to the adapter is wasted – hence why they get so hot. Heat means waste, which is not acceptable for a PC power supply. PCs use switching power supplies, using a transistor switch and a closed feedback loop to produce DC output that is properly regulated, regardless of the load on it, with only the amount of AC power required to draw the DC load being taken from the utility, thus increasing efficiency.

• FSP Group, established in 1993, is a world leader in designing and manufacturing mobile power solutions and power supplies. We aim to satisfy all our customer's needs, whatever their requirements. Go to www.fspgroup.co.uk for more information.



Computer downtime



Computer expense

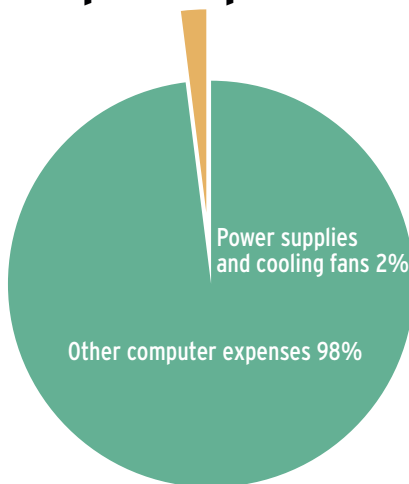


Fig 1



Complete HP Pavilion Notebook Package

SPECIALS

HOME PCS

POWER PCS

HOME LAPTOPS

POWER LAPTOPS

BASE UNITS



HP PAVILION 3000+

E-code: 01612

Tiny.com offer sensational deals from our Notebook Partner HP. The new HP 15.4" Widescreen notebooks come with powerful AMD processors, 512MB or 1024MB RAM memory, ATI Radeon graphics or Nvidia GeForce graphics, DVD burner and Wi-Fi wireless. These deals come complete with all-in-one printer, carry case, and much more from just £599!

AMD Sempron 3000+ Mobile Processor

with PowerNow! and Cool'n'Quiet Technology. (Athlon 64 3400+ on Power Model.)

512MB DDR RAM

Expandable to 2GB. (Massive 1024MB in 3400+ model.)

15.4" WXGA "Bright" Screen

High definition Bright View "Glare Type" 1280x800 TFT screen for the best possible display.

ATI Radeon IGP 128MB Graphics

Built-in ACP graphics from ATI provides ample power for general use and games. (GeForce 440 Go on 3400+ model.)

DVD-ReWriter Drive

Multi-format, Dual Layer DVD-Rw drive handles all popular formats, copies DVDs and CDs and plays DVDs.**

40GB Hard Drive

Ample storage for general use. (60GB in 3400+ model.)

Wi-Fi Wireless

Built-in Wi-Fi 802.11b/g with 125HSM SpeedBooster support for high speed wireless networking**

Full Connectivity

USB2.0 x4, VGA, 10/100 Ethernet, S-Video, 56K modem, Type I or II PC slot.

Advanced Features

90W adaptor, 8 cell Li-Ion battery, Microsoft Windows XP Home**, 3D soundblaster compatible sound, headphone socket, microphone-in, advanced keyboard with touchpad and quick launch buttons. Wt 3.6kg.

PLUS Massive Software Suites

Microsoft Works 8, Outlook Express, Adobe Reader 6, Intervideo WinDVD, Intervideo WinDVD Creator, Sonic Record Now, HP Image Zone, Apple iTunes.

PLUS All-in-One System

Lexmark X1180 all-in-one printer, photocopier and A4 flatbed scanner.

PLUS Carry Case

Notebook Carry Case.

PLUS Deskstation Pack

External USB keyboard and external USB mouse.



AMD ATHLON 64
3400+

1024MB
RAM

15.4"
'BRIGHT' SCREEN

Wi-Fi
WIRELESS

NVIDIA
GeForce
GRAPHICS

60GB
HARD DISK

DVD-Rw
DVD BURNER

LIMITED OFFER

- HP NOTEBOOKS
- £549 Laptop Deal
- £599 Laptop Deal
- £699 Laptop Deal

FREE DELIVERY
Only when you order online.
Limited Offer

Tiny.COM Brand Partner

HP is a Tiny.COM Brand partner for Notebooks and Printers. Brand partners are selected from the world's leading brands and Tiny.COM use our low overhead structure to provide these top brand products direct to customers at the lowest possible prices.

PLUS LEXMARK X1180 ALL-IN-ONE PRINTER



Printer cable not included

PLUS NOTEBOOK CARRY CASE



PLUS DESKSTATION PACK



PLUS MASSIVE SOFTWARE SUITE

OVER 10 SOFTWARE PACKS PRELOADED

£599 BUY inc vat PLUS DELIVERY† E-Code: 01612

BEST BUY

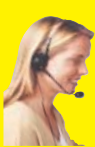
3400+ 1024MB Model (Pictured above) With AMD Athlon 64 3400+ processor, 60GB hard disk, nVidia GeForce 440 Go graphics, 1024MB DDR RAM memory and superb 15.4" ultra-bright TFT screen. Includes Package items including Printer, Carry Case, WorksSuite 2005 and Deskstation Pack. **£749** E-code: 01613

WHILE STOCKS LAST

tiny.com

FREE DELIVERY For a limited period when you order online

THE LOW COST PC COMPANY



ORDER HOTLINE
0870 830 3127
or visit www.tiny.com to see the full range
Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

TYM99BHP (PCW/08)

3 YEAR Extracare Extended Warranty
£129

19.9% APR

†Courier Delivery £39.99. Pay courier delivery by credit card. Free delivery for online orders only. Time Plan Finance Example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected models. Written details on request. These deals are not available from our partner firm The Computer Shop. **Back-up CDs available at extra cost. †Special permission is required to copy CDs/DVDs that are copyright. ‡The 60 day trial version - option to purchase extended version for special price - ask for details. •Suitable broadband router required. 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, AMD Arrow logo, AMD Athlon, AMD PowerNow!, AMD Athlon 64 and relative combination, are trademarks of Advanced Micro Devices, Inc. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 770701. Licensed credit brokers. Offer extended. E&OE.



FSP's latest ATX 12V v2.01 Power Supply
for gamers and users requiring an upgrade

Blue Storm 500W

High Efficiency over 70% up to 80%





High efficiency

Less noise

Lower power consumption



(350W & 400W also available)

- 1**  ATX 12V v2.01 supports the latest Intel and AMD processors
- 2**  With 24 pin to 20 pin connector compatible with v1.3 MB
- 3**  12cm fan provides near silent operation
- 4**  2 x S-ATA connectors
- 5**  Mesh sleeving on all output cables
- 6**  Low power consumption on standby (<1W) incorporating PFC

Where to buy



Maplin Maplin or Maplin stores
www.maplin.co.uk



MicroDirect
www.microdirect.co.uk



Misco
www.misco.co.uk

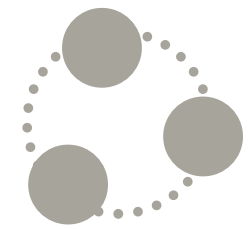


Special Reserve
specialreserve.co.uk



Vadim Computers
www.vadim.co.uk/FSP

www.FSPgroup.co.uk



Contents

Column

166 You can't do away with humans completely, says Martin Courtney

Group test

169 Networking is being made easier for small businesses and home users. Find out how, as we put 13 low-cost routers to the test

Aventail gets smart

Aventail has announced version 8.5 of its Smart SSL VPN software, designed to provide a more complete Secure Sockets Layer virtual private network system. The company said the biggest advantage is that it lets staff and customers access applications from home or hotspots as if they were in the office. It costs from £4,400, but users with a support contract can upgrade free of charge.

Links for all seasons

Lightpointe's Flightstrata 100XA features integrated fast Ethernet optical wireless for high-bandwidth outdoor wireless links. In adverse weather, the system switches to licence-free radio frequency technology in the 5.8GHz wavelength. The maximum link speed is 100Mbits/sec in the optical system and 20-30Mbits/sec in the RF system.

Vonage gets vocal

Vonage has received a \$200m (£107m approx) investment from financial backers, which it will use for a UK marketing offensive touting the benefits of VoIP. The company offers VoIP services for broadband subscribers, using a VoIP adapter that transfers the Internet signal to an analogue phone line. Its service is significantly cheaper than traditional incumbent telco operators. Vonage offers unlimited domestic calling for £9.99 per month in the UK.

www.pcw.co.uk/news/1162937

Cisco unveils box of security tricks

CEO puts up defences in protracted battle over network security

Cisco used the Interop show in Las Vegas to unveil the latest weapon in its 'self-defending network' armoury, a family of multifunction security device called the Adapted Security Appliance (ASA) 5500.

The range combines IP Security (IPSec) and Secure Sockets Layer (SSL) virtual private network capabilities with an intrusion-prevention system (IPS). The products also have packet inspection features, plus a firewall, anti-virus, anti-spam and anti-spyware tools.

In his keynote speech during the networks-focused trade show, Cisco chief executive John Chambers said that in a recent meeting of 36 corporate executives, most rated security as their biggest technical



John Chambers: Security is the biggest technical challenge

challenge. The consequences of failing to protect their customers' data was a key concern, he added.

Chief executives are aware of their role in security. Chambers

added: 'They are signing away their integrity every time they produce a report saying we believe we can get this information over [the network] accurately.' Worryingly, Chambers predicted that it would take 10 years to solve all the current security problems.

Hossein Eslambolchi, chief technology officer at AT&T, warned that security concerns could hamper the development of a global end-to-end IP network. He blamed the situation on a combination of software bugs and poor encryption and administration.

'If these bugs are not solved, we will have one virus or worm every five minutes for the next five years – it is a problem of biblical proportions,' Eslambolchi said.

Martin Courtney

Orange woos business travellers

Mobile operator Orange has improved its roaming support to attract the custom of international business travellers. It has expanded its GPRS roaming agreements to cover more than 140 networks in 73 countries and now offers a transparent pricing plan for accessing mobile data services while abroad.

Although roaming agreements make it possible for staff on business trips to access email and keep in touch by mobile phone, charges can vary greatly. A recent report by analyst company Gartner highlighted that calls made under some roaming agreements can cost 10 times more than domestic mobile calls.

'Travelling executives no longer want to rely on expensive

Transparent pricing plan is aimed to appeal to business users on the move

hotel telephones and Internet connections. They can use mobile technology, [but] they need a consistent service from their mobile network operator at a fair cost, regardless of where they are travelling,' said Shaun Orpen, marketing director for Business Solutions at Orange.

As part of its transparent pricing plan, Orange is offering consistent flat-rate data tariffs wherever it has a roaming agreement, regardless of the network or country. It is also offering per-second billing on voice calls, per-kilobyte charges for GPRS data traffic and free calls to customer services.

Orange also said it has developed a range of roaming capabilities to help business



travellers remain productive and receive a service consistent with that available in the UK. Customers abroad can get one-button access to voicemail, caller line identification and shortcode access to services, which allows users to dial numbers such as 158 to speak to customer services.

Daniel Robinson



martin_courtney@vnu.co.uk

Networked vision lacks human touch

Although networks have many benefits, Martin Courtney believes they shouldn't be the replacement for everything

'I'm not the only one alarmed at healthcare being placed at the mercy of the Internet'

In his keynote speech at the Interop show in Las Vegas, Cisco chief executive John Chambers was introduced as an entertainer who liked to get close to his fans through audience interaction.

There is no question that Chambers' delivery is supremely well choreographed or that his enthusiasm is infectious. What is not so certain is whether his vision of secure, highly available end-to-end IP networking to connect every person, location and device (fixed or mobile, wired or wireless) is achievable or desirable in either his lifetime or my own.

If this vision ever becomes reality, Cisco is likely to deserve more credit for it than most. But Chambers was keen to point out that it won't only require changes in technology; organisations will also need to change their business processes if they are to reap the true rewards.

The big question is whether these changes to business processes would be palatable to end users. Perhaps the best example of where problems might occur is the healthcare sector, cited as the fastest growing user of new networking technology.

Chambers painted a picture of a connected healthcare service using home broadband connections to remotely monitor patients and help doctors prioritise and deal with ailments, linked to systems to more accurately update patient records and improve general efficiency.

Chambers also suggested that networking technology could improve efficiency by helping hospitals keep better track of assets

such as doctors, nurses, beds and wheelchairs – something that already happens to a certain degree, using a variety of wired and wireless terminals.

I don't think I'm the only one to be alarmed at the prospect of people's health being placed at the tender mercy of the Internet. Instead of explaining one's symptoms to doctors and nurses, one might consult multiple-choice online knowledgebases. But this doesn't sound like the best route to fast, accurate diagnosis and could have fatal consequences.

It is said that the practice of medicine involves 50 per cent science and 50 per cent sympathy. These are difficult things to combine on a computer screen.

Another speaker at the show, AT&T's Hossein Eslambolchi, made much of automated call attendant applications, which use interactive voice recognition (IVR) to prevent as many callers as possible from speaking to a real person with a real desk, a real salary and other financially inconvenient accompaniments.

All well and good for the firm saving money on office space and staff headcount, but in my experience automated call attendants of any type are a consistent source of irritation and dissatisfaction to the people who are connected to them, despite the fact that they sometimes offer much faster responses to enquiries.

The drive to sell more network systems is too often dominated by a fixed focus on the bottom line. It's important to remember that not every organisation can afford to lose its human touch.

IP telephony advances go on show

Network specialist Avaya extended the reach and availability of its IP telephony offerings during Interop in Las Vegas, with new gateway and software products, while AT&T unveiled an integrated portfolio of IP services for businesses.

Avaya launched a new version of its Communication Manager software, designed to increase the reliability of IP telephony, and launched two VoIP (Voice over IP) gateways for branch office deployments.

Avaya also announced a new partnership with network equipment maker Juniper Networks to develop secure converged communications offerings. The alliance could see Avaya software installed on Juniper routers, designed for use in enterprise campus and branch office networks.

Also at the event, communications giant AT&T unveiled its new Dynamic Network Applications (DNA) services. This suite of managed

systems is designed to enable IT managers to outsource the operation and management of their IP telephony systems in distributed offices.

Voice DNA will be the first of these services. It will support a range of Cisco and Polycom handsets and softphones. It will be available under three calling plans that deliver combinations of unlimited Internet, local and long-distance calls.

Kathleen Klasnic, analyst at research firm Datamonitor, said

IP telephony is gaining ground and many firms are considering deployments as part of their upgrade cycle. 'It's not going to go off with a huge explosion, but it is starting to gain momentum,' she added.

According to Klasnic, the main benefits of IP telephony lie less in cost savings and more in the applications layer and support for new voice, customer relationship management and security applications.

Martin Courtney

GET INTO THE FLOW!



Highspeed on air!

Energy thrust for your Wireless Network – with the 108Mbps Airplus XtremeG by D-Link.

- Up to 108Mbps
- 802.11g
- WPA & 802.1X
- Extended Range



Wireless Solutions by D-Link. Wireless networking lets you work, play and access the Internet wherever you are without being restricted by wires. Your PC and laptop can be connected to share a printer, files and the Internet. You are free to stay inside, move from room to room or even go outside while remaining perfectly connected. It's simple, easy and provides high performance speeds giving you true mobility. D-Link offers an entire range of wireless networking products. Check out the NEW AirPlus XtremeG range now!

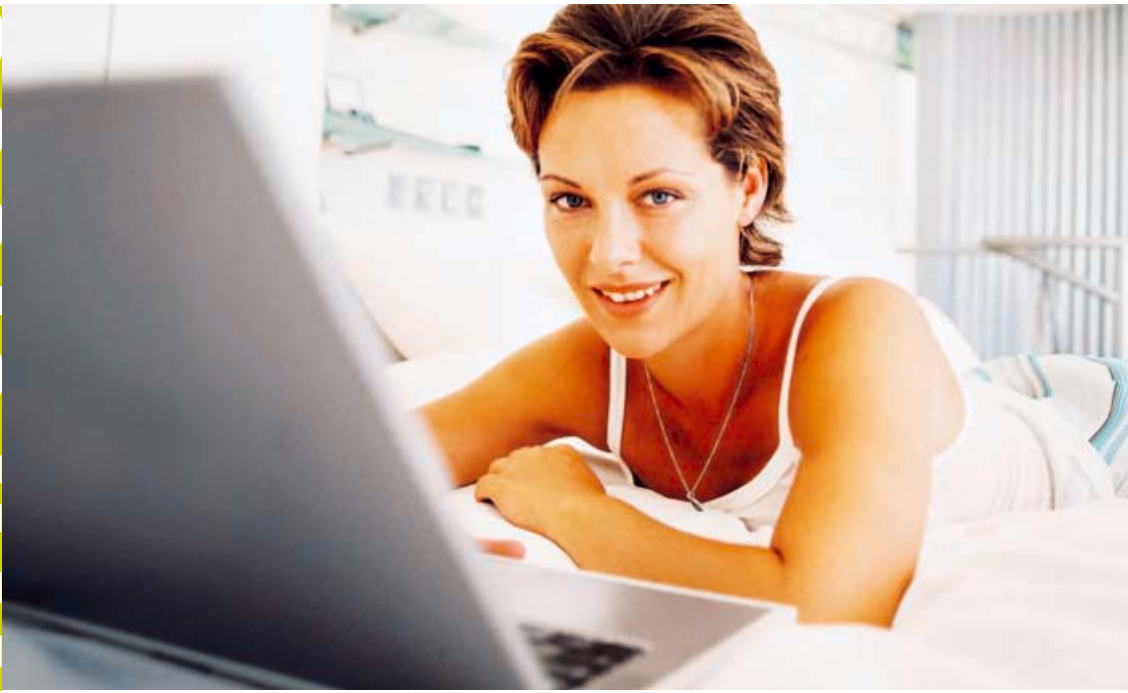
Learn more about getting into the flow: www.dlink.co.uk



Faster and Farther Than Ever Before!

Wireless-G with SRX ... Speed and Range eXpansion

Wireless



Watch streaming video or play multi-player games faster than ever before. And do it comfortably from places that were previously unreachable. Introducing the Wireless-G with SRX series, the newest, fastest, most powerful addition to the Linksys Wireless-G family.



Enjoy the Wireless-G with SRX experience:

- Up to 8 times faster than standard Wireless-G
- Increased wireless range up to 3 times farther
- Reduced dead spots in coverage area
- Compatible with public and private Wireless-G and -B networks



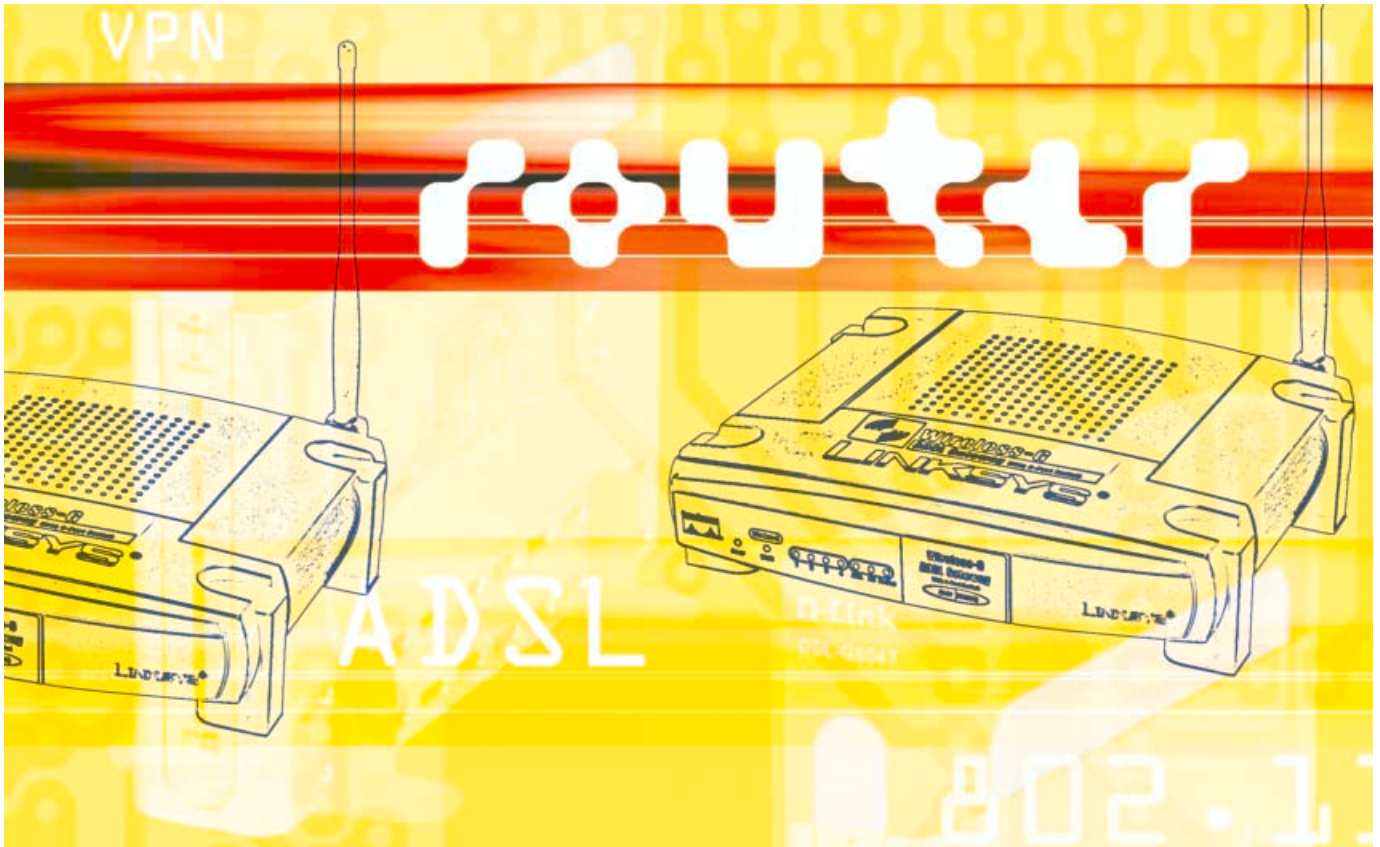
WPC54GX
Wireless-G
Notebook Adapter with SRX

WRT54GX
Wireless-G
Broadband Router with SRX

Visit www.Linksys.com today
for product details.



that was easy.™



WORDS: EDUARDO SÁNCHEZ ROJO

Soho connections

The new generation of easy-to-use routers is opening up the world of networking to small business and home users. We test 13 low-cost devices

The arrival of ADSL and its unstoppable growth has given rise to a huge market for routers, which was previously limited largely to corporate environments, especially ISDN lines.

Routers are in the spotlight as never before. Where networking used to be considered something of a black art, now small businesses and homes are setting up and running their own networks, thanks to the growing simplicity of today's routers. They are much simpler and easier to set up and run than ever before, and are being used to run small-business networks or just to give Internet access to several computers in the home.

The devices have also improved greatly over the years. They initially only served the purpose of connecting to the Internet and routing requests to machines using the Network Address Translation (Nat) system. Several

computers with different private IP addresses in a local area network (Lan) could then browse the Internet using one public IP address.

Things have changed considerably since then. Many routers now come with built-in wireless access points, increasing the connectivity options available using standards 802.11a, b and g. They typically also have advanced security features such as secure, customisable firewalls, content filtering systems, user/service bandwidth control, or even built-in anti-virus systems. These filter all the incoming and outgoing data packets and search for viral strings. They're not infallible, but they help protect against potential infections.

Many routers support virtual private network (VPN) connections, so it's possible to create data tunnels between machines or remote locations with high-security authentication and encryption.



3Com's Office Connect ADSL Wireless 11g Firewall Router has a good build quality

3Com Office Connect ADSL Wireless 11g Firewall Router

3Com's products cover a wide variety of sectors, with models ranging from the highest level to home users.

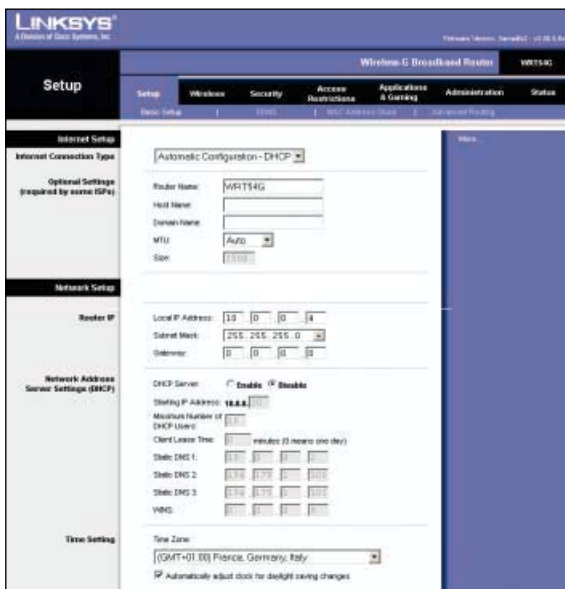
The Office Connect ADSL Wireless 11g Firewall Router is a simple option for those who want to combine a good-quality ADSL router with a high-performance, 802.11g wireless access point and basic firewall.

It is easy to set up and configure and, with its metal chassis, has a good build quality. It lacks a built-in content filter in the firewall, plus bandwidth management and Dynamic DNS support, but don't let this put you off. The quality, decent components used and easy configuration make it worthy of consideration.

Features include one RJ-11 port for ADSL and four RJ-45s for 10/100Mbps/sec Ethernet, support for 802.11b and g for channels from 1 to 13, plus two fixed omnidirectional antennas.

D-Link DSL-G604T

D-Link has a reputation for producing products with a good price and performance and the DSL-G604T is a prime example. It has an 802.11g wireless interface, an unusual, eye-catching design and is easy to



Web administration interfaces are an important aspect to consider

The DSL-G604T's eye-catching design makes it attractive to Soho users



configure. Options are lacking in the areas of Lan and ADSL configuration, as well as the wireless network and firewall.

Despite being well built, the web administration interface has a confusing structure. We were surprised that in order to redirect and manage a machine's ports, you have to register its IP in a list of authorised machines, which is tedious.

This router is well suited to Soho environments, where the user only wants an ADSL router with wireless access point functions. In this sense, its 256bit Wep encryption is worth a mention, as it's not usually found in this type of product. You can download and alter the Gnu Public Licence (GPL) source code for the firmware, allowing third parties to expand the router's capabilities.

One RJ-11 port is included for ADSL and four RJ-45s for 10/100Mbps/sec Ethernet, and there's support for 802.11b and g, plus Wep security up to 256bits and WPA/802.1x, but it lacks Radius support.

Draytek Vigor 2600G

Perhaps not as big a brand name as some of the others in this test, Draytek has a growing reputation for well-specified, reasonably priced products, including the Vigor 2600G. Although it's not the most attractive wireless ADSL router here, it is simple to get up and running – you just connect it up and choose your options. The clear interface has a simple, graphical design, yet is fast and powerful any of its settings are adjusted. On the main screen, you'll find everything you need set out logically.

So, configuring and starting it up is not complicated. However, the large number of settings and options available means you need a certain level of expertise if you don't want to lose your way at the first turn.

Good aspects include the VPN tunnels, wireless security settings and the Nat configuration. For content filtering the device lacks domain control, but offers many options for controlling network segments, ranges and IPs.

There's one RJ-11 port for ADSL and four RJ-45s for 10/100Mbps/sec Ethernet, plus a USB port for network printing, support for 802.11b and g with Wep 64/128bit encryption, and WPA and 802.1x access protocols.

Linksys WAG54G

The WAG54G series of products from Linksys, part of Cisco Systems, stand out because of their quality and features, which are good for intermediate users. This



With its clear interface,
the Vigor 2600G builds on
Draytek's growing reputation



Attention to detail sets the
Netgear WGT634U apart
from the rest



wireless ADSL router exudes quality. It has a good configuration environment, includes options such as being able to customise contents, a wide range of Nat port management options and the capacity to create up to five VPN tunnels.

Its wireless capabilities are stable and strong, and there's a built-in antenna with a power output of 18dBm (decibel milliwatts). On the down side, it is lacking some diagnostic utilities were lacking and we would have liked to have seen more detailed log reports on each of the connections.

Despite these minor gripes, the WAG54G is a great device for demanding environments requiring high-end products and some advanced features, which are nevertheless easy to configure and use.

Features include one RJ-11 port for ADSL and four RJ-45s for 10/100Mbps/sec Ethernet and support for 802.11b and g for channels from one to 13.

Netgear WGT634U

When we opened the box this router arrived in, what really stood out was Netgear's attention to detail, from the device itself through to the manuals, wizards and the accompanying CD. The router (for cable or ADSL modem) has a built-in wireless access point and its features are designed for the home environment. The attractive design means you'd be happy to put it anywhere in the home, rather than hiding it away in a back room. The router can operate wirelessly at 108Mbps/sec with the appropriate Netgear adapters.

The configuration interface is simple and comprehensive, and there's lots of online help and some

The Linksys
WAG54G will appeal
to intermediate
users



simple wizards. There's a USB port to which you can connect an external hard disk or Flash memory, which will be networked via an FTP server and you can configure users and permissions.

Other ports include one RJ-45 for a Wan connection, four RJ-45s for 10/100Mbps/sec Ethernet, and there's support for 802.11b and g, operating at up to 108Mbps/sec in wireless mode.

Ovislink WMU-9000VPN

The Ovislink WMU-9000VPN router was a bit of a surprise. It doesn't have a built-in ADSL modem, but does offer a variety of multimedia functions that make it unique.

Its build quality is nothing out of the ordinary, but the range of features is good. It has four USB2 ports to which you can connect storage devices, such as hard disks, Flash memory, mp3 players, printers or webcams (there's a dedicated PS/2 power outlet for these). You can also set up your own FTP server (although it only manages Fat16 or Fat32 partitions) or a printing or video server with support for two webcams.

Although it has a wide range of functions, it lacks two things: WPA security on the wireless front, and a content filter, which, instead of allowing full access with the exception of specific blocked web addresses indicated by the user, works vice versa using a 'whitelist'.

There's one RJ-45 port for a Wan connection, four RJ-45s for 10/100Mbps/sec Ethernet, four USB2 ports (FTP, video and printing), a PS/2 power connector, plus support for 802.11b and g and 64/128bit Wep.

SMC Barricade 7204BRA

SMC's Barricade 7204BRA router is aimed mainly at professional environments that need a device which is packed with features. The product comes with a basic firewall designed to safeguard the connection it controls, so it lacks various advanced options, such as the ability to manage the bandwidth, VPN connections and content filtering. The Barricade 7204BRA can handle connections to a considerable number of machines, so responds well to a high workload, leaving the management of any extra functions that a business may need to other elements. In fact, it offers highly advanced settings for ADSL, routing and bridging functions and Nat management.



The Ovislink WMU-9000VPN has a good range of features



Packed with options, the SMC Barricade 7204BRA is aimed at the professional market



The configuration interface has been carefully thought out, although you can reach the same point from different places, which is initially confusing.

One RJ-11 port is available for ADSL and there are four RJ-45s for 10/100Mbps/sec Ethernet. You also get a built-in firewall designed just for supervising connections and detecting different types of attacks.

SMC Barricade 7804WBRA

The second SMC device, the 7804WBRA, is a wireless ADSL router for Soho environments that need a high-quality product with features and services that are easy to configure. There's a basic content filter, a simple but functional firewall, plus dynamic DNS (Domain Name Server) for those who don't have a fixed IP address and want to access the Internet using a fixed name.

The ADSL service options are basic, but the wireless section is well covered, thanks to support for 802.11g and the option of safeguarding your connection with WPA or 802.1x. There are many options for TCP/UDP port management and control, offering you almost everything you'll need.

The technology incorporated into modern routers is increasingly advanced, including features unthinkable a few years ago

To top off the comprehensive features, there's one RJ-11 port for ADSL and four RJ-45s for 10/100Mbps/sec Ethernet, plus support for 802.11b and g, 64/128bit Wep encryption, WPA and 802.1x.

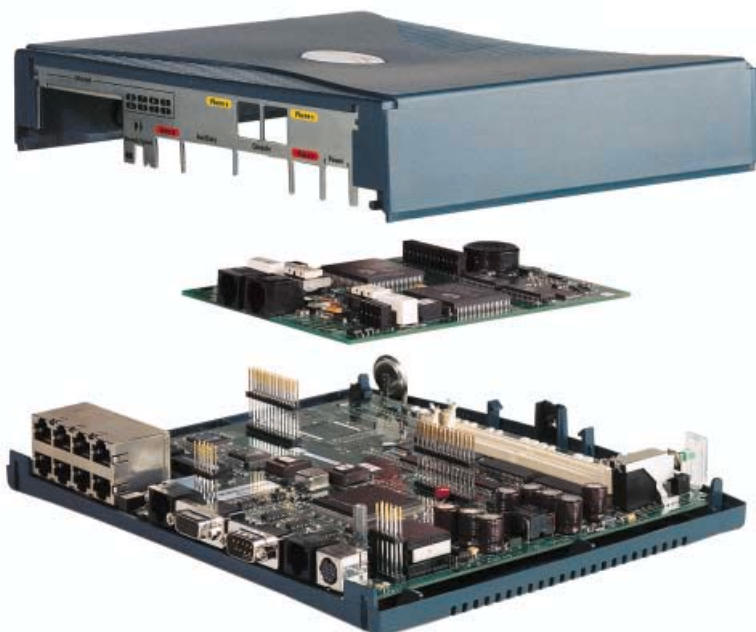
Thomson Speedtouch 510

Previously branded as Alcatel routers, the Thomson Speedtouch ADSL range is often supplied by companies such as BT to broadband customers. These are quality products with features that are well-suited to their customer base.

The first device under test, the Speedtouch 510, is clearly designed for home users who want an ADSL router for Internet browsing but don't want anything that is too technical to set up and operate.

Points in its favour include a high-quality assembly, decent software and clear manuals. The web interface has only the minimum essential options, but it is well presented with information shown clearly and concisely.

However, it does lack some of the functions found in other similarly priced products. For example, the Nat firewall isn't configurable via the GUI, making it



What's happened to 802.11n?

The newest wireless standard, 802.11n, which will see speeds of over 100Mbps/sec, should have been with us by now, but the current generation of wireless routers claiming to support the standard are still pre-ratification. In other words, the routers use the standard the manufacturers think will be signed off and, if wrong, you'll most likely require a firmware update to support the standard.

The stumbling block is largely down to the two rival camps, both of which have the backing of some industry big-hitters, being unable to agree on details. This means there isn't enough support to set a clear direction, but hopefully there'll be some decisions at the next meeting in July. On the plus side, we know 11n is backwards compatible with current standards and will support Mimo (multiple in multiple out) technology, where the antennas boost wireless bandwidth. Both will also spread data across those antennas in the same way. Until the standard is agreed, if your network needs are simple, you are better off sticking with 802.11g.

The SMC Barricade 7804WBRA has the basic features Soho users need and is easy to configure



The Thomson Speedtouch 580 comes with wireless options



unsuitable for more advanced use. The configuration of the Lan interface, ports and other aspects is complex for those not familiar with this type of device.

Elsewhere, you'll find one RJ-11 port for ADSL, four RJ-45s for 10/100Mbps/sec Ethernet and basic security measures included in any router.

Thomson Speedtouch 580

This is exactly the same as the Speedtouch 510 in terms of its features and settings, but it also comes with wireless options. This is where the device shines – it maintains the simplicity and features of the 510, but offers built-in wireless for Soho environments.

As well as supporting 802.11g, the 580 has a good security system capable of covering the needs of the home user. It doesn't support 256bit Wep, instead being restricted to 64/128bit Wep. We'd advise that you don't use 64bit Wep as it is less secure. On the positive side, though, it does support WPA and 802.1x protocols to provide maximum security for your access point and all the transmissions that go through it.

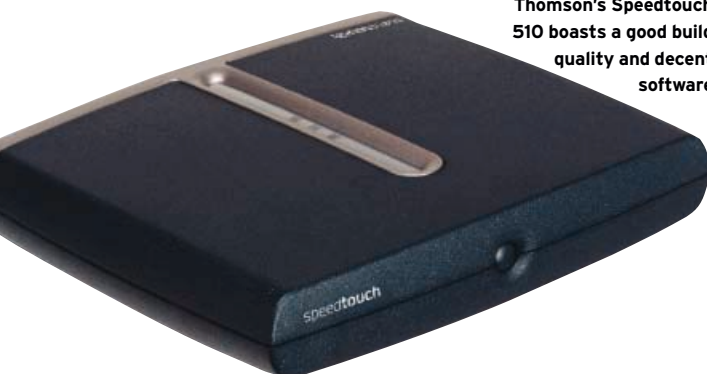
On top of this, there's a USB port, so should you not wish to go wireless, you can connect the router to a PC and use it simply as a wired ADSL modem.

One RJ-11 port is included for ADSL, as well as four RJ-45s for 10/100Mbps/sec Ethernet, support for 802.11b and g, with WPA/802.1x and Wep 64/128bit security protocols, but it doesn't support Radius servers.

US Robotics Sure Connect 9105

US Robotics has been making modems since the early days of the Internet. Now that ADSL is the most popular access technology, the company hasn't let it

Thomson's Speedtouch 510 boasts a good build quality and decent software



products fall behind, especially in the home environment and for inexperienced users. Like Thomson, its products are often part of an ADSL operator's connection kit.

The model under test here, the Sure Connect 9105, has no wireless features, but still surprised us with its ease of use and stability. So much so, that we consider it to be one of the best options for home or small-office users not looking for a wireless option.

There's a simple firewall and a comprehensive system for redirecting and controlling TCP/UDP ports. Installation was the simplest of any of the products on test, partly thanks to software, which took a matter of minutes to work through, set up and get running. Features include one RJ-11 port for ADSL, four RJ-45s for 10/100Mbps/sec Ethernet and a basic firewall, which lets you block MAC, IP or TCP/UDP port access.

Zoom ADSL 5565 X5v

Already well-known for its high-quality modems, Zoom has jumped into the VoIP router market and this is the only example of this sort of device on test here. This router is good for Soho environments where this technology still has a long way to go.

Besides being an ADSL router, the 5565 X5v has an additional RJ-11 port to which you can connect a traditional analogue telephone. You can use the router to make low-cost or free calls provided you have signed up for a VoIP service.



The Sure Connect is one of the easiest routers to set up

Unbeatable £499 19" TFT Package



HOME PCs

POWER PCs

HOME LAPTOPS

POWER LAPTOPS

SPECIALS

**Offer Ends
31st JULY**

POWER PCs
£499
19" TFT System
£628
19" TFT System
£699
19" TFT System

FREE DELIVERY
WHEN YOU
ORDER ONLINE
LIMITED OFFER



INTEL
PENTIUM 4
3.0GHz HT

512MB
DDR RAM

250GB
HARD DISK

NVIDIA
FX 5200
128MB

16x DUAL LAYER
DVD RW

16x
DVD ROM
DRIVE

MULTIFORMAT
CARD READER

USB
2.0

19"
TFT SCREEN

Tiny Power 3200+ 19" TFT

Our high performance Power 3200+ and Pentium 4 models are simply unbeatable and come complete with 19" TFT. But hurry, these offers end 31st July.

- Intel Celeron D (Prescott Core) Processor. (More power per MHz)
- 512MB Micron DDR RAM
- 200GB Western Digital 7200rpm Hard Disk
- 16x Sony Dual Layer DVD-ReWriter Drive
- 19" Stunning High-Res TFT Screen
- Microsoft Windows XP Home Edition, Microsoft Office 2003 60 day trial#, Microsoft Works package and four Cyberlink software packs
- Advanced Features include; Integrated AGP Graphics, Future-proof 7 bay ATX case, USB2.0 x5 Ports, 5.1 Audio AC97, 10/100 LAN Networking, Multimedia Keyboard and Optical Wheel Mouse

Model S2137 E-Code: 01642

PRO Model (pictured) also includes:-

- Intel Pentium 4 3.0GHz Processor with HT
- 250GB SATA High Speed Hard Disk
- Additional 16x Sony DVD-ROM Drive
- Nvidia GeForce FX 5200 128MB DDR Graphics Card with TV-Out
- Multiformat Card Reader and Writer Panel

Model S2437 E-Code: 01643

£499 BUY inc vat PLUS DELIVERY† E-Code: 01642

PRO MODEL (as pictured above) **£129 EXTRA** E-code: 01643

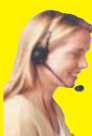
tiny.com
FREE DELIVERY For a limited period when you order online
THE LOW COST PC COMPANY

ORDER HOTLINE

0870 830 3127

or visit www.tiny.com to see the full range

Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm



TYM050125
(PCW/08)

3 YEAR Extracare Extended Warranty
£129 19.9% APR

†Courier Delivery £39.99. Time Plan finance example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £14146.96. APR 19.9% Finance is subject to status. Written details on request. Finance only available when bought with a package. ‡Backup CDs available at extra cost. †† These deals are not available from our partner firm The Computer Shop. #The 60 day trial version - option to purchase extended version for special price - ask staff for details. Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, Pentium, and Pentium III Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Tiny.com PCs are preloaded with XPS1, XPS2. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 77 07 01. Licensed credit brokers. E&OE.



Zyxel Prestige 662HW-61 has a built-in virus analyser



The ADSL 5565 X5v marks Zoom's entry into the router market



Zoom configures this device for use with the Global Village service (www.globalvillage.com), although you are not tied to this, so can use an alternative supplier.

The router offers some attractive features such as a complete DNS and high-quality reports, but does lack options in areas such as content filtering or VPN connection management, which are now commonplace in high-end products.

You get two RJ-11 ports for ADSL and an analogue telephone (VoIP function), four RJ-45s for 10/100Mbps/sec Ethernet and one USB port to enable the router to function as an ADSL modem. There's also a highly configurable firewall.

Zyxel Prestige 662HW-61

The 662HW-61 has a comprehensive range of features which are easy to configure and use and it is capable of covering the needs of fairly complex, demanding environments. Its forte, in comparison with the other models here, is its built-in packet analyser, as well as an efficient content filtering system based on words, addresses, machines or specific users.

Up to 20 VPNs can be connected to the router, and it has a comprehensive firewall and a basic management

system for bandwidth reporting, based on the services used. This last point is perhaps the least user-friendly in terms of configuring and starting it up.

Again, there's one RJ-11 port for ADSL, four RJ-45s for 10/100Mbps/sec Ethernet and an auxiliary port for serial connection or modem that you can use as a backup connection, support for 802.11b and g offering up to 100Mbps/sec in native mode and Wep 64/128/256, WPA and 802.1x support.

Editor's choice

We tested a wide variety of devices for this group test, with big differences in price, features, target market and overall quality.

Ovislink's WMU-9000/VPN is a very basic product and more expensive than other higher-quality routers on test here, such as those from SMC, Thomson and US Robotics. The good quality and reasonable price of the latter two make them ideal for home environments.

Both the Draytek and Zyxel routers are good products, including more features than the typical Wifi router targeted at the business sector. The Zyxel Prestige 662HW-61 is more difficult to set up than other products on test, so is best suited to very small offices or as a router for advanced home users.

Draytek's Vigor 2600G impressed with its extensive range of functions and options, which all come at a reasonable price. However, its interface and build quality let it down. It was a contender for the **Highly Commended** award, but we decided that the **Netgear WGT634U** pipped it to the post. This router offers better build quality, design and ease of installation, combined with some very useful home-user functions.

As already mentioned, we also liked US Robotics' router, which, although lacking any wireless features, was extremely easy to set up, reliable and stable, especially when you also take its price into consideration. So the **US Robotics Sure Connect 9105** wins our second **Highly Commended** award.

The best product and our **Editor's Choice** is the **Linksys WAG54G**. It had the good combination of being a reasonably priced, high-quality, wireless, ADSL router with advanced functions, enabling it to cope easily in demanding environments. It's also easy to set up and use, which is a major benefit.

See overleaf for the table of features for all 13 products we reviewed for this group test.



A wireless future

We're only beginning to see the new router features that will make a real difference to users. In this group test, we've tested a device with direct support for Voice over IP (VoIP). This is the technology we'll be using in the future to provide IP telephony at home or in the office, using one device connected to the Internet, protecting us and offering wireless connectivity.

Other features, whose potential is still only being taken advantage of by a few companies, include using these routers as print, FTP or even video servers.

A prime example comes from Ovislink, with a model that lets you connect external hard disks, Flash memory and mp3 players via the USB port to create an FTP server with your required access, read and write permissions.

It also supports two webcams, so it can be set up to run as a security server that can detect movement and record automatically. There's also a print server function for printing via a cable or wireless network on any USB printer.



Table of features

MANUFACTURER	3COM	D-LINK	DRAYTEK
MODEL	OFFICE CONNECT ADSL WIRELESS 11G	DSL-G604T	VIGOR 2600G
Price inc VAT (ex VAT)	£59 (£50)	£64 (£54)	£151 (£129)
URL	www.3com.com	www.dlink.com	www.draytek.com
SECURITY, CONFIGURATION & MANAGEMENT			
Interface: RJ-11/Lan RJ-45/Wan RJ-45	1/4/0	1/4/0	1/4/0
Aux port for configuration	x	x	x
Port speeds	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec
DHCP Client/Server/Static	✓/✓/✓	✓/✓/✓	✓/✓/✓
Supported ADSL protocols	PPPoA/PPPoE/IPoA/RFC1483	PPPoE/PPPoA/Static/DHCP	PPPoA/PPPoE/RFC1483
Bridge function	✓	✓	✓
Dynamic DNS/VoIP support	x/x	x/x	✓/x
DNS/DNS proxy	x/✓	x/✓	x/✓
Bandwidth management	x	x	✓
USB ports/Print server/FTP server	x/x/x	x/x/x	✓/✓/✓
VPN server/Maximum number of clients	x/x	x/x	✓/16
Encryption DES/3DES/AES/Null	x/x/x/x	x/x/x/x	✓/✓/✓/✓
Authentication MD5/SHA1/Firewall/DMZ	x/x/✓/✓	x/x/✓/✓	✓/✓/✓/✓
Built-in anti-virus	x	x	x
Content filtering/User and group policy control	x/x	x/x	✓/✓
Admin/User security levels	✓/x	✓/x	✓/x
Web admin/Telnet admin	✓/✓	✓/✓	✓/✓
SSH support/HTTPS support/UPnP support	x/x/x	x/x/✓	x/x/✓
Copy/Restore configuration/System information	✓/✓	✓/✓	✓/✓
Statistics (Ethernet/ATM/ADS)	x/x/✓	✓/✓/✓	✓/✓/✓
SNMP enabled/Remote administration via web/Telnet/FTP	✓/✓/✓/✓	x/✓/✓/✓	✓/✓/✓/✓
ADSL/Lan diagnostic tools	x	✓	✓
WIRELESS/PHYSICAL			
802.11b/802.11g/802.11a	✓/✓/✓	✓/✓/✓	✓/✓/✓
Proprietary standards/Maximum link speed	x/54Mbps/sec	x/54Mbps/sec	x/54Mbps/sec
Channels available	1-13	1-13	1-13
Number and type of antennas	2 omnidirectional	1 omnidirectional	2 omnidirectional
Wep 64/128/256bits	✓/✓/✓	✓/✓/✓	✓/✓/✓
MAC address filtering/Number of addresses	✓/32	✓/Not specified	✓/Not specified
802.1x/WPA	x/✓	✓/✓	✓/✓
Own base of users/Number	x/0	x/0	x/0
Radius support/Includes Radius server	✓/x	x/x	✓/x
Dimensions (mm) (w x d x h)	220 x 133 x 38	179 x 142 x 29	220 x 160 x 37
Weight (g)	550	368	Not specified
Power supply type/Voltage	External/12v	External/12v	External/12v
Power button/Reset button	x/✓	x/✓	✓/✓
Warranty (years)	3	2	2
PRODUCT OVERVIEW			
Pros	Quality finish and design; easy to configure and start up; clear web interface	Good finish and user manual; fairly easy to set up; comprehensive reports	Plenty of interface options; good diagnostic and information tools
Cons	Lacks a content filter and bandwidth management	Web configuration interface isn't user-friendly; lacks advanced functions	Lacks content filtering tool; configuration process needs to be clearer
Overall	A wireless ADSL router that's good for Soho environments	Suited to Sohos that want quality with just the basic requirements	Plenty of options designed for users looking for advanced settings
SCORES			
Features	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★



For the best router prices go to www.pcw.co.uk/bestprices

	LINKSYS	NETGEAR	OVISLINK	SMC NETWORKS	SMC NETWORKS	THOMSON
	WAG54G	WGT634U	WMU-9000/VPN	BARRICADE 7204BRA	BARRICADE 7804WBRA	SPEEDTOUCH 510
	£76 (€65)	£106 (€90)	£160 (€136)	£46 (€39)	£95 (€81)	£58 (€49)
	www.linksys.com	www.netgear.com	www.ovislinkcorp.com	www.smc.com	www.smc.com	www.speedtouch.com
	1/4/0	0/4/1	0/4/1	1/4/0	1/4/0	1/4/0
	x	x	x	x	x	x
	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec
	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
	PPPoA/PPPoE/RFC1483	Not specified	Not specified	PPPoA/PPPoE/RFC1483/IPoA	PPPoA/PPPoE/RFC1483	PPPoA/PPPoE/IPoA/CIP/ETHoA
	✓	x	x	✓	✓	✓
	✓/x	✓/x	✓/x	x/x	✓/x	x/x
	x/✓	x/✓	x/✓	✓/✓	x/✓	x/✓
	x	x	✓	x	x	x
	x/x/x	✓(1)/x/✓	✓(4)/✓/✓+video	x/x/x	x/x/x	x/x/x
	✓/5	x/0	✓/10	x/0	x/0	x/0
	✓/✓/✓/✓	x/x/x/x	x/x/x/x	x/x/x/x	x/x/x/x	x/x/x/x
	✓/✓/✓/✓	x/x/✓/✓	✓/✓/✓/✓	x/x/✓/✓	x/x/✓/✓	x/x/x/x
	x	x	x	x	x	x
	✓/✓	✓/✓	✓/✓	x/x	✓/✓	x/x
	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓
	x/x/✓	x/x/✓	x/x/✓	x/x/x	x/x/✓	x/x/✓
	x/✓	✓/✓	x/✓	✓/✓	✓/✓	✓/✓
	x/x/x	✓/✓/✓	✓/✓/✓	✓/✓/✓	x/✓/✓	✓/✓/✓
	✓/✓/✓/✓	x/✓/✓/✓	x/✓/✓/✓	✓/✓/✓/✓	✓/✓/✓/✓	x/✓/✓/✓
	x	x	✓	✓	x	x
	x	✓/✓/✓	✓/✓/✓	x/x/x	✓/✓/✓	x/x/x
	x/54Mbps/sec	✓/108Mbps/sec	x/54Mbps/sec	x/0	x/54Mbps/sec	x/0
	1-13	6	1-3	0	1-11	0
	1 omnidirectional	1 omnidirectional	1 omnidirectional	N/A	2 omnidirectional	N/A
	✓/✓/✓	✓/✓/✓	✓/✓/✓	x/x/x	✓/✓/✓	x/x/x
	✓/20	✓/Not specified	✓/Not specified	x/0	✓/32	x/0
	x/✓	x/✓	x/x	x/x	✓/✓	x/x
	x/0	x/0	x/0	x/0	✓/Not specified	x/0
	✓/✓	x/x	x/x	x/x	✓/✓	x/x
	188 x 186 x 48	175 x 119 x 30	240 x 154 x 30	190 x 148 x 20	220 x 132 x 30	180 x 153 x 33
	480	300	Not specified	545	550	Not specified
	External/12v	External/12v	External/5v	External/12v	External/12v	External/15v
	✓/✓	x/✓	x/✓	x/✓	x/✓	✓/✓
	3	2	Lifetime	Lifetime	Lifetime	2
	Plenty of interface options; good diagnostic and information tools	Well-designed web interface with unusual functions	A wide range of features and the ability to prioritise traffic	Features and web interface; ADSL configuration options and port traffic	Good design; simple web interface and setup wizards	Good-quality device
	Lacks detailed status and usage reports regarding Wan/Lan/Wlan interfaces	Content filtering doesn't block access to all domains except for those listed	Quality lower than others on test; no WPA and an antenna with weak coverage	Lacks additional features such as content filtering and bandwidth management	Lacks an advanced content filter	Lacks many features for security, traffic control, port management, DNS services
	Some advanced features for demanding home or professional environments	Good design, easy configuration, high quality and is reliable	Some of its shortcomings limit this router's performance	Designed for professionals seeking a high capacity and advanced options	ADSL router with a firewall and content filter that's easy to configure	A well-made, stable ADSL router with the minimum of essential functions
	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★



Table of features

MANUFACTURER	THOMSON	US ROBOTICS	ZOOM	ZYXEL
MODEL	SPEEDTOUCH 580	SURE CONNECT 9105	ADSL 5565 X5V	PRESTIGE 662HW-61
Price inc VAT (ex VAT)	£79 (£67)	£56 (£48)	£90 (£77)	£106 (£90)
URL	www.speedtouch.com	www.usrobotics.com	www.zoom.com	www.zyxel.com
SECURITY, CONFIGURATION & MANAGEMENT				
Interface: RJ-11/Lan RJ-45/Wan RJ-45	1/4/0	1/4/0	2/4/0	1/4/0
Aux port for configuration	x	x	x	✓
Port speeds	10/100Mbps/sec	10/100Mbps/sec	10/100Mbps/sec (configurable)	10/100Mbps/sec
DHCP Client/Server/Static	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
Supported ADSL protocols	PPPoA/PPPoE/IPoA/CIP/ETHoA	PPPoA/PPPoE/MER/IPoA	PPPoA/PPPoE/RFC1483/IPoA	PPoA/RFC1483/PPPoE/ENET
Bridge function	✓	✓	✓	✓
Dynamic DNS support/VoIP support	x/x	✓/x	x/✓	✓/x
DNS/DNS proxy	x/✓	x/✓	✓/✓	x/✓
Bandwidth management	x	x	x	✓
USB ports/Print server/FTP server	✓(1)/x/x	x/x/x	✓(1)/x/x	x/x/x
VPN server/Maximum number of clients	x/0	x/0	x/0	✓/20
Encryption DES/3DES/AES/Null	x/x/x/x	x/x/x/x	x/x/x/x	✓/✓/✓/✓
Authentication MD5/SHA1/Firewall/DMZ	x/x/x/x	x/x/✓/✓	x/x/✓/✓	✓/✓/✓/✓
Built-in anti-virus	x	x	x	✓
Content filtering/User and group policy control	x/x	x/x	x/x	✓/✓
Admin/User security levels	✓/x	✓/✓	✓/x	✓/x
Web admin/Telnet admin	✓/✓	✓/✓	✓/✓	✓/✓
SSH support/HTTPS support/UPnP support	x/x/✓	x/x/✓	x/x/x	x/x/✓
Copy/Restore configuration/System information	✓/✓	x/✓	x/✓	x/✓
Statistics (Ethernet/ATM/ADS)	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
SNMP enabled/Remote administration via Web/Telnet/FTP	x/✓/✓/✓	✓/✓/✓/✓	x/✓/✓/✓	✓/✓/✓/✓
ADSL/Lan diagnostic tools	x	✓	✓	✓
WIRELESS/PHYSICAL				
802.11b/802.11g/802.11a	✓/✓/✓	x/x/x	x/x/x	✓/✓/✓
Proprietary standards/Maximum link speed	x/54Mbps/sec	x/0	x/0	✓/100Mbps/sec
Channels available	1-13	0	0	1-13
Number and type of antennas	1 omnidirectional	N/A	N/A	1 omnidirectional
Wep 64/128/256bits	✓/✓/✓	x/x/x	x/x/x	✓/✓/✓
MAC address filtering/No of addresses	✓/Not specified	x/0	x/0	✓/32
802.1x/WPA	✓/✓	x/x	x/x	✓/✓
Own base of users/Number	x/0	x/0	x/0	✓/32
Radius support/Includes Radius server	x/x	x/x	x/x	✓/x
Dimensions (mm) (w x d x h)	195 x 136 x 30	234 x 140 x 41	190 x 146 x 32	180 x 128 x 36
Weight (g)	Not specified	454	Not specified	375
Power supply type/Voltage	External/15v	External/16v	External/15v	External/12v
Power button/Reset button	✓/✓	✓/✓	x/✓	✓/✓
Warranty (years)	2	2	2	2
PRODUCT OVERVIEW				
Pros	Good quality	Easy to install and use	Built-in VoIP and a user-friendly web interface	Many advanced features
Cons	Lacks many features for security, traffic control, port management, DNS services	Lack of advanced settings or a comprehensive, customised firewall	Lacks some features; VoIP server needs customisation	Web configuration interface is almost as basic as other lower-end Zyxel models
Overall	Minimal router features, but good for home environments that need quality and stability	An easy-to-install ADSL router without wireless capabilities that runs stably and is a good option for home environments	An ADSL router whose trump card is its built-in VoIP server (SIP protocol)	Some advanced features make this good for small and medium businesses that want a feature-packed product
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★

UK's Best Spec £499 19" TFT Package



HOME PCs

POWER PCs

HOME LAPTOPS

POWER LAPTOPS

SPECIALS

**Offer Ends
31st JULY**

POWER PCs
£499
19" TFT System
£599
19" TFT System
£699
19" TFT System

FREE DELIVERY
WHEN YOU ORDER ONLINE
LIMITED OFFER



19"
TFT SCREEN

AMD ATHLON 64
3000+

1024MB
DDR RAM

250GB
HARD DISK

NVIDIA
FX 5200
128MB

16x DUAL LAYER
DVD RW

16x
DVD
ROM DRIVE

MULTIFORMAT
CARD READER

USB
2.0

19"
TFT SCREEN

Tiny Power 3000+ 19" TFT

Our high performance Power 3000+ and 3000+ pro models are simply unbeatable and comes complete with 19" TFT. But hurry, these offers end 31st July.

- AMD Athlon 64 3000+ processor. Ready for the next generation of 64-bit software
- 512MB Micron DDR Ram
- 200GB Western Digital 7200 RPM Hard Disk
- 16x Sony Dual Layer DVD-ReWriter Drive
- 19" Stunning High-Res TFT Screen
- Microsoft Windows XP Home Edition, Microsoft Office 2003 60 day trial#, Microsoft Works package and four Cyberlink software packs
- Advanced Features include; Integrated AGP Graphics, Future-proof 7 bay ATX Case, USB 2.0 x 5 Ports. 5.1 Audio AC97, 10/100 LAN Networking, Multimedia Mouse and Optical Wheel Mouse

Model S2432 E-Code: 01640

PRO Model Also includes:-

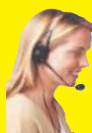
- 1Gigabyte (1024MB) DDR 400 RAM
- 250GB SATA High Speed Hard Disk
- Additional 16x Sony DVD-ROM Drive
- Nvidia GeForce FX 5200 128MB DDR Graphics Card with TV-Out
- Multiformat Card Reader and Writer Panel

Model S2432 E-Code: 01641

£499 **BUY**
inc vat
PLUS DELIVERY†
E-Code: 01640

PRO MODEL
(as pictured above) **£100 extra**
E-code: 01641

tiny.com
FREE DELIVERY For a limited period when you order online
THE LOW COST PC COMPANY



ORDER HOTLINE
0870 830 3127
or visit www.tiny.com to see the full range
Sales lines open: Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm

TINY106AMD
(PCV/08)

3 YEAR
Extracare
Extended
Warranty
£129
19.9%
APR

†Courier Delivery £39.99. *Pay courier delivery by credit card, then pay nothing until August 2005. Time Plan finance example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96 APR 19.9%. Finance is subject to status. Written details on request. Finance only available when bought with a package. †Backup CDs available at extra cost. †† Special permission required to copy CDs/DVDs that are copyright. The Computer Shop warranty prices vary. †The 60 day trial version - option to purchase extended version for special price - ask staff for details. 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, AMD Arrow logo, AMD Athlon, AMD PowerNow!, AMD Athlon 64 and relative combination, are trademarks of Advanced Micro Devices, Inc. *AMD and Microsoft strongly recommend that users continue to use third party anti-virus software as part of their security strategy. Tiny.com PCs are preloaded with XSP1. XSP2 downloads available from Microsoft. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 77 07 01. Licensed credit brokers. E&OE.



Deep Sea Tycoon 2

Take the Plunge!

...and get these TOP Games at Great Prices!



only £24.99!

only £24.99!

only £16.99!

www.gamer.uk.com

Copyright 2005 GAMER UK. All rights reserved. All copyrights and trademarks are the property of their respective owners.

Hands on



EDITED BY KELVYN TAYLOR

Contents

182 Question time

This month's questions and queries answered by our team of experts

186 Hardware

Mobile processors get put through their paces in desktops, using PCW's benchmarks

188 Overclocking

When processor manufacturers introduce new sockets, do you have to upgrade?

190 Windows

An irritating error explained, and how to make the most of your Internet cache

192 Linux/Unix

How to connect to other systems without compromising security

196 Word processing

Splitting a page into separate, equally sized sections using Word

197 Spreadsheets

How a Pivot Table can be used to analyse data in a list

198 Digital imaging & video

A guide to help you master the techniques of time-lapse photography

200 Sound

Is it worth investing in 3G mobile yet? We investigate

203 Networks

Take the pain out of updating software security patches

205 Databases

Tame annoying Access controls with our help

207 Visual programming

An insight into moving faster chips and an in-depth look at Visual Studio 2005

209 Keeping intruders out

Prevent unauthorised entry to your wireless network with our step-by-step guide



PAGE 186

Find out how the latest mobile processors fare under PCW's tough performance benchmarks



PAGE 188

Discover if buying a new processor means you also have to upgrade your motherboard



PAGE 200

Is 3G technology as good as we are meant to believe? Find out in this month's Sound

Protecting a wireless network from unauthorised access is something that should be straightforward, but in practice is most definitely not. Even if you've followed all the usual security guidelines, there are tools that can let hackers sneak onto your network. But the tools they use can also beat them at their own game, and this month on page 209 we've a special feature on using the open-source application Kismet to set up an intrusion detection system for your wireless Lan. Be warned, though – it's not a task for the fainthearted.



If you don't feel like getting to grips with the complexities of IP packet sniffing, then Networks might be the perfect alternative. This month Alan Stevens is also looking at security, but from a different angle – how to keep your network clients' software up-to-date with a free automatic patch management tool for Microsoft's server operating systems. The security theme carries on in Linux, where Barry Shilliday looks at the possibilities offered by secure shell sessions in Linux.

In Hardware, Gordon Laing continues his exploration of the possibilities offered by Intel's mobile processors when used in desktop systems – he's benchmarked his system and got some surprising results. In Overclocking, meanwhile, he's weighing up upgrading versus overclocking.

Elsewhere, in Sound, Niall Magennis takes a long hard look at how to get music onto his mobile phone and discovers it's not as simple as it should be.

Our experts thrive on odd challenges and Tim Nott's Word processing certainly got one this month – how to get Word to print four sub-pages on a single page of perforated A4 paper. Needless to say, he's got the answer.

Meanwhile, if you want to make a time-lapse movie, Ken McMahon will tell you how with a few simple tools.

With the appearance of 64bit Windows, Tim Anderson in Visual programming looks at how 64bit will affect developers, while in Databases, Mark Whitehorn finds a solution to the Access design flaws he identified last month. In Spreadsheets Stephen Wells gives you an introduction to the wonderful world of Excel pivot tables.

Plus, to round off this month's Hands on, there's our usual collection of your email queries answered by our team of experts in Question time.



Advice from our experts

Our Hands on experts answer your questions and solve your problems

Hardware

Q I recently upgraded the motherboard and CPU in my system, but kept the hard disk and Windows 98 system intact. I was advised to obtain drivers for the new motherboard's Via chipset online, but am unsure if the process is any different to installing drivers for a peripheral. In addition, when I upgrade to Windows XP, do you anticipate any problems? Finally, if I update my Bios, will it reset all its settings?

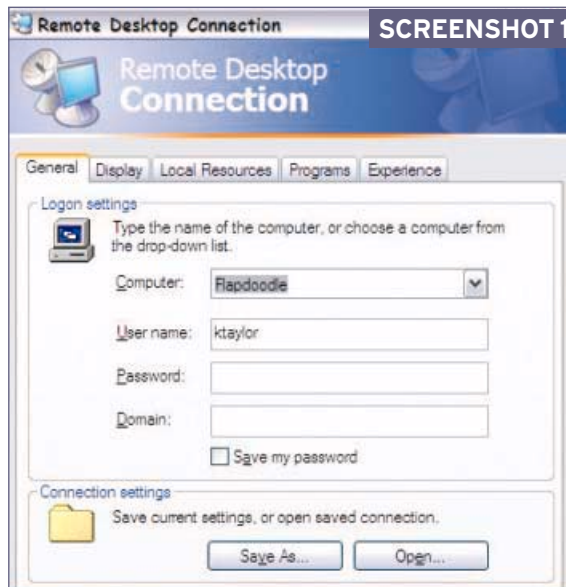
Brian Lawrence

A When you build a new system or replace a motherboard, it's crucial to install the drivers for its chipset or you'll suffer from very poor performance and some features or ports not working properly. Luckily, installing drivers for chipsets is no different from any other device. Just run the driver program and it'll do the rest. Since your motherboard uses a Via chipset, you'll need to download the drivers from the Via website at www.viaarena.com.

Via calls its chipset driver package '4-in-one' and the latest Hyperion version should be compatible with Windows 95 to XP. The Via website warns of some reported problems running this latest driver under Windows 98 though, so if your system becomes unresponsive, try downloading one of the older versions from the same web page. When you upgrade to Windows XP, we'd recommend reinstalling the latest Hyperion drivers from the Via website. You should also reinstall your graphics driver after installing the chipset driver.

Finally, when you flash your Bios to a different version, it will reset all the values to their defaults. So after flashing a Bios, you'll need to re-enter the settings for your drives, boot priority, integrated peripherals and power management etc. So if you've not been into your Bios for a while, it's worth browsing the different sections before re-flashing to remind yourself of what settings you currently use.

Q I have two PCs running Windows XP SP2, one in my office and the other in the lounge, both connected to each other using a crossover Cat5e Ethernet cable. I'd



You can control remote PCs with Remote Desktop

like to control the PC in the lounge using the one in my office. Is there any software which lets you see the desktop of the other machine and run its programs?

David Bownes

A If you're running Windows XP Professional on the machine you'd like to control, then you've already got all you need. XP Professional comes with Remote Desktop software which lets you view and control its desktop from another computer connected over a network or the Internet. While you need XP Professional on the machine you'd like to control, the client software can be run on XP Home or earlier versions of Windows if necessary – the software is on your Windows XP CD or can be downloaded from Microsoft's website.

To run Remote Desktop, open the System Control Panel on the machine you'd like to control, then tick the 'allow users to connect remotely to this computer' box under the Remote Tab. Now insert your Windows CD into the other computer and select the option to 'Setup remote desktop connection'.

Finally to control the other PC, choose Remote Desktop Connection from Communications under Accessories in your Start menu and enter the username and password for the remote system to log on (see screenshot 1). If you're not running Windows XP

Professional (and don't wish to upgrade), a great alternative for remote control is VNC, free from www.realvnc.com.

Databases

Q I have an Access database which I recently saved. Now when I open it up the screen is blank apart from a scroll bar along the bottom. When I scroll this it doesn't work and the scroll bar always returns to the right hand side of the screen. I seem to have lost my access database, even though the file is still clearly on the machine.

Andy Gloster

A Good news, your database should still be around, it is just not visible. This seems to be a bug in the Access window display which we have only seen a couple of times. The trick is to open the database, ignore the scroll bar and, from the menu, select Window and Tile Horizontally. This returns the database window into the visible area of the screen.

Digital imaging

Q I have an Advent PC with Windows ME and have bought a Benq DVD writer with bundled Intervideo WinDVD Creator 2.

I can assemble images into a slideshow with transition effects but when it comes to burning a DVD or CD I get 'wcreator has caused an error in kernel32.dll or msvcrct.dll' and my PC crashes. I purchased my PC from PC World which took it in for repair, but it still wasn't fixed.

I've spent lots of money phoning their helpline but they just don't seem interested. Is the problem due to Windows ME? PC World assured me the software should run on it. Can you suggest anything?

John Marshall

A The problem with Windows error messages is that they're not specific. The Kernel32 error messages could have any number of causes from swap file problems and damaged Registry entries to low disk space or even memory hardware problems. If it's only WinDVD creator that's giving problems, however, your hardware is unlikely to be at fault. WinDVD creator will run on Windows ME, but check your system meets with the other minimum

requirements. Remove the program and re-install it – this might help with the MSCVRT errors. Download the latest drivers for your DVD rewriter from www.benq-eu.com/serviceandsupport. Finally, it's worth checking you don't have other DVD writing software installed that's causing a conflict.

Q I am having trouble playing avi DivX files in Windows Media Player 10. The problem is unusual in that the first time after boot-up that I attempt to play a DivX file it works OK. However, any subsequent time the result is a slow stuttering playback. The first second plays OK but then it is about one frame per second.

I have noticed that when the playback is slow, CPU usage is ramped up to 100 per cent (as monitored by Task Manager). The situation can be cured by rebooting Windows, but this is very annoying.

Alan Choo-Kang

A There are a number of potential sources for the problem. The DivX codec, your video card drivers, DirectX or a conflict with another video editor or player. First make sure you're using the most recent drivers for your Geforce 5200 Go graphics card. You should also download and install DivX 5.2.1 from www.divx.com. Use Gspot (www.headbands.com/gspot) to help diagnose codec problems and conflicts (see screenshot 2).

Drop the DivX file into Gspot and click the Render button to determine the codec used for playback. Although you say you have the DivX 5.1.2 codec installed, it's possible that this is not the codec being used by Media Player.

As an alternative you might also try using the open source Xvid Mpeg-4 codec (www.xvid.org), which can play DivX files. As a final thought, you say that CPU usage is 100 per cent, but there's a possibility that another application is the culprit (not Windows Media Player). Check the Processes tab of the Task Manager to make sure this isn't the case.

Windows

Q I prefer to have multiple partitions for my XP system and have a partition for all temporary, Internet cache and swap files. Following the November 2004 article on renaming the Recycle Bin and moving shared folders (*PCW*, page 186), can I locate the Recycle Bin in that partition?

Graeme Gemmill

A No, in a word. The Recycle Bin is a virtual folder that lists the contents of the 'Recycled' (or 'Recycler' for NTFS partitions) folders which actually store the deleted files and folders under different names – one for each partition.

Q In Windows Explorer, whenever we click on a drive the Search screen comes up instead of the contents window. We now have to right-click on a drive and select Open. Once we are down to this level we can open folders just by clicking on them.

Which setting has been changed that is opening the Search window instead of the contents?

Steve Mitchell

A This is a common occurrence in Windows XP as it's very easy to inadvertently change the default action for folders.

Make a System Restore point, then run Regedit.exe. Navigate to HKEY_CLASSES_ROOT\Directory\Shell. Double-click on the 'Default' value in the right-hand pane and change its value from 'find' to 'none' (see screenshot 3).

Q When I click on XP's Start button, then the Search button, nothing happens. Having played with the ideas in *PCW*'s XP Services article in the April issue (page 185), presumably I have done something I shouldn't have done.

Clicking on restore on the predefined scripts from svc2kxp.cmd doesn't help. I do have Blink as a form of alternative search.

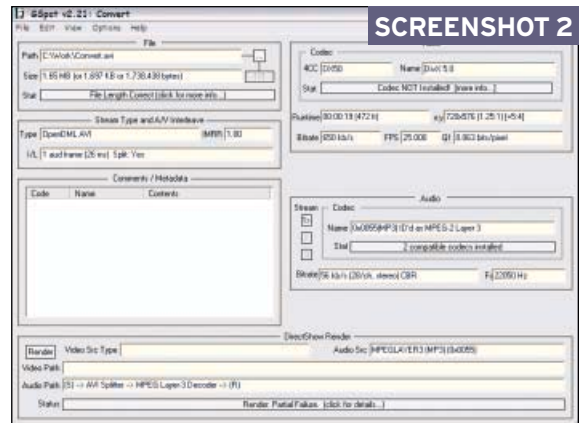
Pip Elton

A It's possible you've deleted or corrupted a Registry key – it is possible to remove the Search button from the Start menu by customising the the Start menu (right-click the Start button, choose Properties then click Customize), but in your case the icon hasn't been removed.

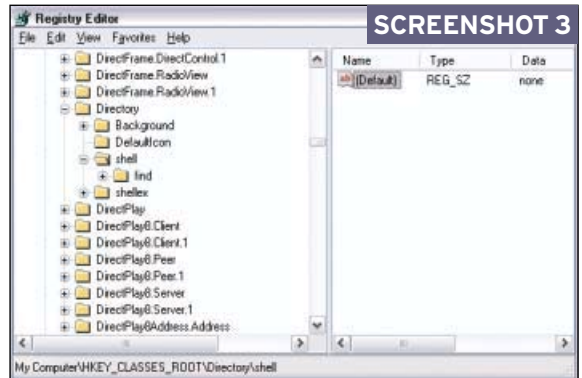
Try this Registry tweak. Open Regedit, navigate to the following key HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer and see if there's an entry in the right-hand pane called 'NoFind'.

If there isn't, create a new DWORD value (right-click in an empty part of the right-hand pane, choose New/DWORD Value. Set the value data to 0 (see screenshot 4).

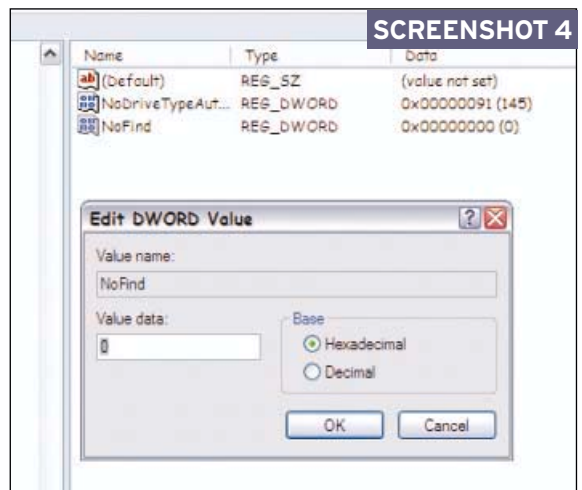
Close Regedit and logoff and logon again. Hopefully this will fix the problem.



Gspot can help troubleshoot codec problems



Problems caused by changing settings accidentally in Windows Explorer can be solved easily



A Registry tweak can return the Search button on the Start menu to full power



Word processing

Q Is there a way to customise the default Save name of a new document based on a Word template? Mine seem to revert to either Docn.doc, (where 'n' is a number) or the first few characters of any text I typed into the template or document and I would like to replace that with 'Report for month', where month is the name of the previous month.

Karen Nash

A Getting the name of a non-current month is a challenge. It can be done with some complicated field manipulation, which we last covered in February 2000's Word processing and will revisit in a future column. I have a similar requirement for saving Hands on columns with a future month name and find it less trouble to type in the month and year.

Getting the first part, eg, Report for is much easier. Open the template for editing, then go to File, Properties and turn to the Summary tab. In the Title box type the required text, OK out of the Properties dialogue, save the template and your chosen text will appear as the default save name for all new documents based on that template (see screenshot 5).

Q As a long-term Word and table user I'm accustomed to using Alt & Click to select a column and Alt & Double-click to select the entire table.

However, since upgrading to Word 2003, I find that while the latter still works, the former loads up the Research Pane. As this is something I rarely use, I'd like to restore the old table behaviour. How can I do this? I've searched Options and Customize but to no avail.

Will Gower

A We, too, have searched and the bad news is that we have come to the conclusion that the Alt & Click combination can't be changed. The good news is that there are alternatives. If you move the cursor to the top line of a table, it changes to a downwards-pointing solid arrow – one click will select the column. Alternatively, with the insertion point in any cell, Shift & right-click will select that column.

Q I've managed to set up a letter template for Word 2000 that contains my address as a letterhead and inserts the current date. However, if I subsequently open, edit, save or print one of the letters created using the template, the

date changes to the current one. This is playing havoc with my correspondence if I accidentally save a letter with the changed date. How can I stop this happening?

Spencer Locke

A It sounds as if you've put a DATE field rather than a CREATEDATE field into the template or inserted a date with the Automatic update box ticked, which amounts to the same thing.

If you open the template for editing, then press Alt & F9 you will be able to check this by viewing the field codes – delete the DATE field and replace with a CREATEDATE field – on new documents this will insert the date the document (not the template) was created and this won't change.

Networks

Q I found the article 'Unravelling QIP address mysteries' (Hands on Networks, June 2005) very informative indeed, doing for me exactly what it says in the title.

It was also very timely, as I have decided to migrate to broadband and, at the same time, include a print server in the network so that my computers can print whether or not the PCs are powered on.

On the strength of your article, I decided to migrate my simple peer-to-peer cable network from NetBEUI to TCP/IP, and to use a wireless print server. I think I would have struggled to get this phase working properly without the insights put forward in your article.

Now to the question: I have been trying to find out from my ISP whether it's essential to plug in a broadband modem to the BT master socket, or whether any extension socket will do.

The problem is that my BT master socket is pretty inaccessible, and some distance from a mains supply, hence I would ideally like to plug the modem into an extension socket close to my computers.

Ian Whiteley

A In theory there's no problem plugging your broadband modem into an extension socket, but in practice you might encounter problems if the extension cable is electrically leaky or of poor quality.

There's nothing to stop you trying it, but if you get connection problems it could be an indication of a dodgy extension line or one that's too long – as a rough guide, it shouldn't be more than about 30m away from the master socket.



Setting up a default 'save name' is simple

CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

Databases:	database@pcw.co.uk
Digital imaging & video:	digitalimaging@pcw.co.uk
Hardware:	hardware@pcw.co.uk
Linux/Unix:	linux@pcw.co.uk
Networks:	networks@pcw.co.uk
Overclocking:	overclock@pcw.co.uk
Sound:	sound@pcw.co.uk
Spreadsheets:	spreadsheets@pcw.co.uk
Visual programming:	visual@pcw.co.uk
Web development:	webdev@pcw.co.uk
Windows:	win@pcw.co.uk
Word processing:	wp@pcw.co.uk

Please do not send unsolicited file attachments.

PCI EXPRESS P4

"The Ultimate Digital Home PC For £599"



SPECIALS POWER PCs HOME LAPTOPS POWER LAPTOPS BASE UNITS

BASE UNITS

£599
17" TFT 2.1 SYSTEM

£799
17" TFT 2.1 SYSTEM

£899
19" TFT 2.1 SYSTEM

Relative Performance

This Tiny PE 630 PC with new Intel Pentium 4 630 Processor with 2MB cache and new Intel 915 chipset with 16x PCI Express Graphics is a lot faster than our Pentium 4 3.4GHz AGP System.



TFT SYSTEMS



System Deal with 17" TFT screen and 2.1 subwoofer system **£799**
Ecode 01524

19" TFT £100 Extra

NEW 400GB Power Model

630 400GB Model with 400GB Hard Disk (2x 200GB), WiFi wireless and cordless keyboard and mouse **only £100 extra**

Ecodes: Base Unit 01512; 17" 2.1 Package 01525

The Tiny Power PCI EXPRESS 630 is the most powerful and highest specification Pentium 4 PC you can buy for £599!

But hurry this price is limited for the first 800 orders!

TINY PCI EXPRESS 630

- New Intel Pentium 4 Processor 630 with HT Technology – the latest LGA 775 version with enhanced 2048K cache, 3.0GHz clock and 800MHz bus, delivering higher performance per MHz (see chart on left).
- New Intel 915P chipset motherboard with PCI Express x16 slot, Intel HD 7.1 surround sound, and Intel Matrix Storage Technology.
- 1024MB of high speed DDR 400 (PC3200) RAM.
- 200GB 7200rpm Serial ATA WD hard disk with ultra fast Serial ATA interface which can handle up to 4 drives. 400GB in Power model.
- New ATI Radeon X700 256MB PCI Express x16 Graphics Card with TV-out and DVI. Includes latest DirectX 9 gaming support and upto 3.5 times bandwidth of AGP 8x.
- New Sony Double Layer, 16 speed DVDRw multiformat (plus and minus) DVD burner drive – Double Layer is the latest technology.
- Additional SONY 16x DVD-ROM drive to run DVD movies and make one step DVD to DVD copying easy.**
- DIGITAL PC-TV system with Media Centre software and remote. Free to air – Digital Terrestrial. Capture, edit and record and burn onto DVD! Use your PC as a Video Recorder and Media Centre!
- DIGITAL Radio* – Listen to digital music and record onto your PC/CDs/MP3 Player with ease.
- Multiformat reader and writer panel allows you to use virtually any memory/flash card. Plus front audio, microphone and USB 2.0 connectors.
- CoolerMaster Musketeer PC Monitoring displays and new Tiny 7 Bay full ATX expandable case.
- Advanced Features including Gigabit Lan (1000Mb/sec, compatible with 10/100), Intel 7.1 channel High Definition surround sound, two 1394 Firewire ports, 1.44Mb floppy, 6x USB 2.0, 56K dedicated supanet optimised modem* (Wanadoo broadband upgrade available on request) and all standard I/O ports.
- Microsoft Software including Microsoft Office 2003 60 day trial#, Microsoft Works 7 and Microsoft Windows XP[®] (Model S2834). Plus Cyberlink Software Suite.

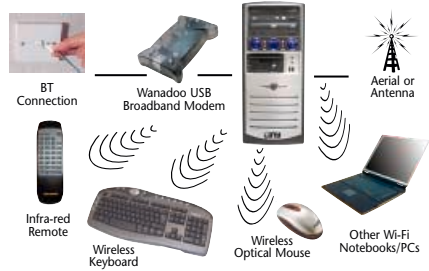
FREE DELIVERY WHEN YOU ORDER ONLINE LIMITED OFFER



POWER Model
See below for details

- INTEL PENTIUM 4 LGA 775 630
- 1024MB DDR 400 RAM
- SERIAL ATA 400GB HARD DISK
- ATI X700 256MB PCI EXPRESS GRAPHICS
- 16x SONY DOUBLE LAYER DVD-Rw
- DVD 16x SONY ROM DRIVE
- DIGITAL PC-TV
- DIGITAL RADIO
- INTEL HD SOUND 7.1
- MULTI-CARD READER
- GIGABIT LAN
- POWER MODEL WITH 400GB, WI-FI AND CORDLESS (AS PICTURED ABOVE) £100 EXTRA**
Code:01512

Digital All Wireless Wi-Fi PC



£599 **BUY**
inc vat PLUS DELIVERY†
E-Code 01511

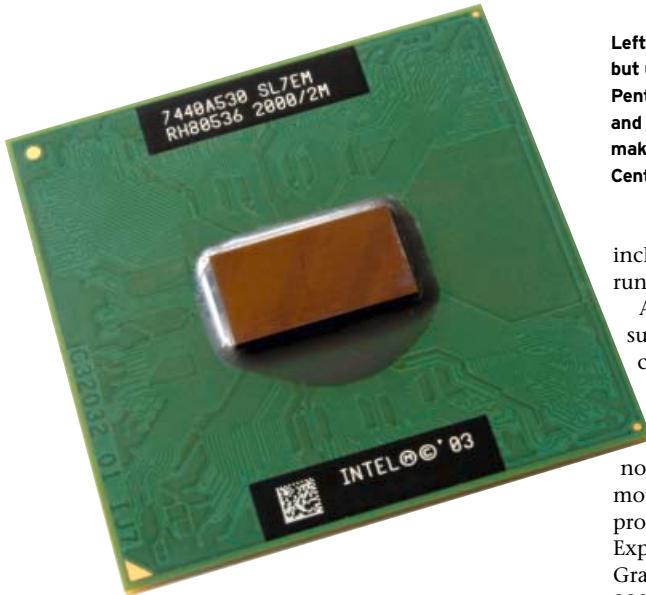
OFFER ENDS 31st JULY



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Scoring the board

We continue testing mobile processors in desktops, using PCW's latest benchmarks



Left: It may be designed for notebooks, but used in desktop systems Intel's Pentium M processor is fast, cool and economical to run, which could make it an ideal choice for Media Centers or servers

Intel's Pentium M processor may have been designed for mobile environments, but it makes a surprisingly compelling solution for desktops. The same technologies that eke every last drop out of a notebook battery can also save considerable power on a desktop, while theoretically allowing it to be silently cooled by a large heatsink alone. And by combining the best of the Pentium III and Pentium 4 architectures, it's supremely quick at modest clock speeds.

In last month's Hands on Hardware column I looked into how to build a desktop Pentium M PC using the first full-size Pentium M motherboard. The Aopen i855GEMem-LFS motherboard employs the same 855 chipset as the original Centrino notebooks, but mounts it on a micro-ATX form factor, complete with traditional I/O ports, such as PCI and AGP slots along with support for DDR memory, IDE drives and ATX power supplies.

Since it features the 855 chipset and Socket 479, it's possible to fit a Pentium M processor (pictured above) and build a conventional desktop system. Pentium M processors are available from specialist suppliers such as Ebuyer (www.ebuyer.com); you may need to click on the incorrectly named 'Pentium 4-M' link. The Aopen i855GEMem-LFS board supports 7x5 Pentium M models that run on a 400MHz FSB (front-side bus). These

include models 725 and 755, which run at 1.6 and 2GHz respectively.

Aopen has just launched the successor to the i855GEMem-LFS, called the i915GMm-HFS (pictured below). This employs the much more recent 915 chipset (as used in 'Sonoma' notebooks), allowing the motherboard to support 533MHz bus processors, DDR2 memory, PCI Express and Intel's new integrated Graphics Media Accelerator GMA 900. The motherboard itself supports either DDR2 533 or older DDR 333MHz Dimms, and sports one x1 PCI Express slot, one x16 PCI Express slot and two standard PCI slots.

Below: Aopen's i915GMm-HFS is the latest desktop motherboard to support the Pentium M processor. Featuring the same i915 chipset as the latest Sonoma notebooks, it supports 533MHz CPUs, DDR2 memory and PCI Express

Of particular interest to anyone thinking of building a powerful, quiet and economical-to-run media centre system, the new board features a wealth of HDTV (high-definition TV) connectivity, including DVI and Component Video outputs. I will be testing this board in a future issue.

For this month, it's back for a closer look at the i855GEMem-LFS motherboard. In the last issue I benchmarked a bare system using

the older Sysmark 2002 and found a 2GHz Pentium M processor scored roughly the same as a 3GHz Pentium 4 system, while consuming a third of the power. To be fair, the configuration tested had no PCI cards and used the onboard graphics. So this month I'm re-testing with a powerful AGP graphics card and updating the tests to the latest PCW benchmarks. I'm also looking into passive cooling, high-definition (HD) video playback and Media Center 2005 compatibility for the board.

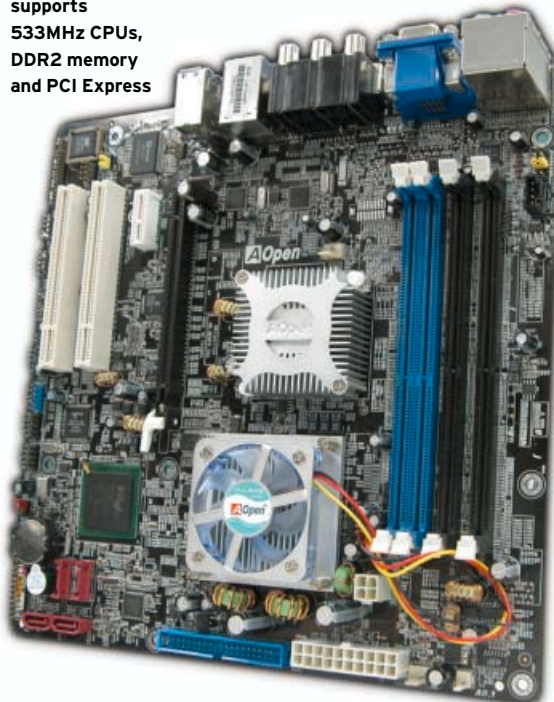
How did it perform?

The test configuration was identical to last month: the Aopen i855GEMem-LFS motherboard fitted with a Pentium M model 755 (2GHz/400MHz FSB), 1GB of Ram using a pair of Kingston Hyper-X DDR Dimms and an 80GB Seagate hard disk running Windows XP Media Center Edition 2005.

Initially I used the fan and heatsink supplied with the Aopen board and configured the Bios to only power up the fan when the CPU temperature reached 70°C; the Pentium M's maximum operating temperature is 100°C. During tests, the fan would only power on briefly and spent most of its time perfectly still. Since I was using a fanless Silentmaxx power supply (from www.quietpc.com), once the processor fan was off, the only noise came from the faint clicking of the hard disk.

Taking Sysmark 2004 first, the 2GHz configuration scored 158, placing it roughly equivalent to a 2.6GHz Pentium 4 system in general tasks. (You can check the latest benchmark scores from the Labs on our Test Bed blog at http://labs.pcw.co.uk/performance_results/index.html.)

While still a good result for the Pentium M, it should be noted that the longer pipeline of the Pentium 4 allows it to perform tasks such as video encoding more efficiently. To isolate this I took a 10-minute DVD vob file and encoded it into DivX using the Dr DivX utility and its High Quality Home Theater profile. Here the 2GHz Pentium M took 20 minutes and 19 seconds, which placed it almost neck-and-neck with a slightly more modest 2.4GHz



Pentium 4 that took 20 minutes and six seconds.

Moving on to 3D performance, the integrated graphics of the 855 chipset was sadly incapable of running 3Dmark05 or even 3Dmark03. I ran Doom 3 in High Quality with no anti-aliasing and it scored an unusable 4.6fps (frames per second). So the integrated graphics of the two-year-old Centrino 855 chipset are unsurprisingly no good for 3D gamers, but they are compatible with Windows XP Media Center Edition 2005 and had no problem decoding its mpeg2 TV recordings.

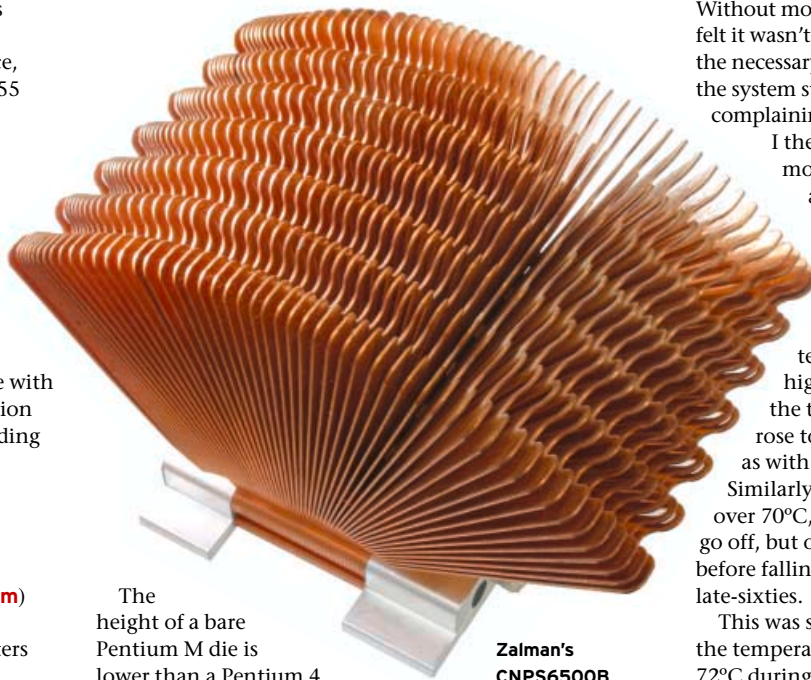
The integrated graphics are also just about capable of playing HD video. I tried the Coral Reef WMV-HD DVD (available from www.playusa.com) and the playback was smooth, other than very occasional stutters at the 720p and 1080i settings. Overclocking the processor to 2.3GHz using an FSB of 115MHz ironed these out.

Unlike notebooks, though, the benefit of a desktop Pentium M system is the ability to upgrade the graphics. The Aopen board has an AGP slot, so I popped in a Radeon X800 Pro card (pictured below) from Connect3D. Using the same quality settings in Doom 3, the system scored an impressive 65.5fps – not bad when the same card scored 57.9fps in a 3GHz Pentium 4 system. In 3Dmark05, the Pentium M/Radeon X800 combination scored 4,527, which just about matches the score of the same card in a 3GHz Pentium 4.

Interestingly, while the integrated 855 graphics were running the Doom 3 benchmark or playing HD video, the system consumed an average of 60w, as measured using a Maplin meter. With the hungry AGP card fitted, though, this power consumption increased to 72w when using the Windows desktop and leapt to between 95 and 105w when running the game benchmark. Decent 3D graphics performance is certainly very power-hungry.

Fanless cooling

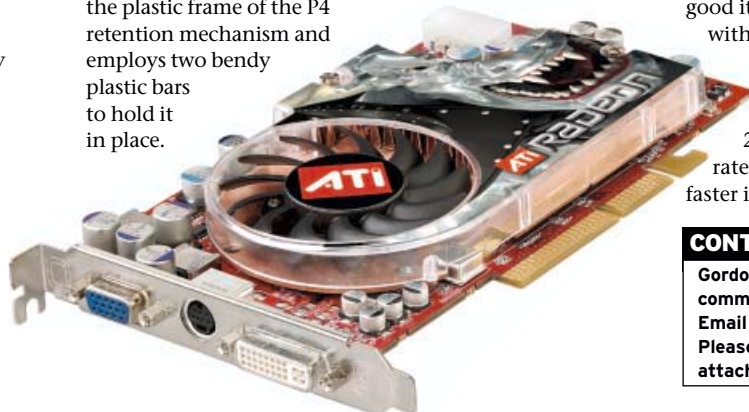
One of the main reasons for building a Pentium M desktop is the potential for cooling it without any fans. Aopen supplies the i855GMem-LFS motherboard with a low-profile heatsink and fan, which fits onto a standard Pentium 4 retention mechanism.



The height of a bare Pentium M die is lower than a Pentium 4 with its heat-spreader, so to make sufficient contact with the surface, the heatsink must also be a fraction lower. The heatsink supplied by Aopen is designed for this but, sadly, standard Pentium 4 heatsinks are not suitable... or are they?

If a Pentium 4 heatsink bypasses these clips, or can be modified to make sufficient contact with the Pentium M die, then there's no reason you shouldn't use them. Indeed, many of the ultra-efficient Pentium 4 heatsinks should be more than adequate for cooling a Pentium M without the need for a fan. Admittedly the fan supplied by Aopen is already quiet and rarely powers up during even heavy tests, but it would be nice to go completely passive.

With this in mind I sourced a Zalman CNPS6500B copper heatsink (pictured above) from www.quietpc.com. I know there are bigger and better heatsinks out there capable of cooling a Pentium 4 without a fan, but I wanted something more modest. The 6500B sits within the plastic frame of the P4 retention mechanism and employs two bendy plastic bars to hold it in place.



Zalman's CNPS6500B all-copper heatsink has the potential to keep a Pentium M cool without a fan, but requires some physical modifications to make sufficient contact with the lower die-height of the CPU

Fit a decent 3D graphics card to a Pentium M desktop system and you're looking at serious gaming potential, but the power consumption will also increase considerably

Without modification, the heatsink felt it wasn't quite exerting the necessary pressure on the CPU, but the system started up without complaining.

I then used temperature monitoring utilities to keep an eye on the processor while it ran through a number of intensive tasks such as encoding and gaming. I also set the Bios CPU temperature alarm to its highest 70°C mark. During the tests, the temperature rose to an average of 65°C, as with the Aopen heatsink. Similarly it occasionally tipped over 70°C, causing the alarm to go off, but only for a second or two, before falling back into the mid- to late-sixties.

This was slightly annoying, as the temperature never rose beyond 72°C during my tests and therefore stayed well within Intel's safety margins. I could, of course, have disabled the alarm, but would preferred to have a solution which kept it comfortably below 70°C at all times. It certainly shows promise, though, and I reckon a little careful shaving, either of the plastic retention surround, or on certain portions of the heatsink itself, should do the trick. I'll report back in a later column.

Game plan

While impressive, the Pentium M will never be a mainstream desktop proposition simply because it's just too expensive compared to similarly performing Pentium 4s. It does, however, prove a compelling alternative in a number of environments.

These latest tests have cemented my belief that the Pentium M is the ideal platform for a high-performance Media Center PC that can run quietly and more economically than a similar Pentium 4 system. Perhaps the biggest surprise, though, is how good it is at 3D gaming when coupled with a decent card. You may sacrifice the low power consumption while the game's running, but seeing a 2GHz chip match the frame rates of one clocked 50 per cent faster is undeniably impressive.

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Email him at: hardware@pcw.co.uk. Please do not send unsolicited file attachments.



Gordon Laing has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Make the most of your motherboard

When processor manufacturers introduce new sockets, do you have to upgrade?

There's nothing like a processor manufacturer changing its sockets for you to evaluate your current system. There's suddenly a real limit to how fast your current motherboard will let you go before you'll need to swap it for one that will take the new chips. And, crucially, it's normally not long before the processors that work in your current motherboard are phased or sold out.

My PC, like many, uses a Socket 478 motherboard. Currently, I have a Pentium 4C 2.4GHz processor in there, and the Bios was recently updated allowing it to use the fastest Socket 478 processor available: the 3.4GHz Pentium 4 Extreme Edition.

Now Intel's made the switch to LGA 775 processors, it looks like the end of the road for Socket 478. The latest Celerons are still made for Socket 478, but there's unlikely to be anything quicker produced for Socket 478 than the 3.4GHz Pentium 4.

So if, like me, you have a Socket 478 system and are interested in getting the most out of it before switching to another platform, the big question is whether it's worth buying a faster compatible chip while you can, or overclocking the one you have.

In previous columns I've found the 2.4GHz Pentium 4C to be an admirable overclocker when combined with fast memory – I've had it running at 3GHz perfectly stably. So will a new fast Prescott Socket 478 Pentium 4 deliver better results?

Pushing the FSB

My test system was a Shuttle SB75G2 fitted with 1GB of Crucial Ballistix PC4000 memory, ATI X800 Pro graphics from Connect3D and a Seagate 400GB Serial ATA (Sata) drive running Windows XP Professional. I first ran the tests with my old 2.4GHz Pentium 4C processor, then with a new 3GHz Pentium 4E processor; both are designed for an 800MHz internal bus and an external 200MHz FSB (front-side bus).

To overclock them, I increased the FSB setting in the Shuttle's Bios from the default of 200MHz. For example, the 2.4C processor employs a 12-times multiplier, so runs at 2.4GHz on an FSB of 200MHz; by increasing the FSB to, say, 220MHz, the processor is forced to run at 12 times 220, or 2.64GHz. When overclocking,



When processor manufacturers introduce a new socket, the clock starts ticking for owners of older systems; should they upgrade while new chips for their sockets are still available, or overclock what they have?

it's best to increase the FSB small steps at a time rather than jump straight in with, say, a 25 per cent increase.

In older systems, the FSB is linked to more than just processor speed, and increasing it also has an impact on the memory, PCI, AGP and Sata buses. This large number of variables is the reason overclocking can be unsuccessful, but luckily newer systems make the process easier. The SB75G2 Bios, for example, has an option to lock the PCI, AGP and Sata frequencies to their official 33, 66 and 100MHz speeds respectively. As a consequence, the only components affected by a change in the FSB are the processor and memory.

Since standard PC3200 memory for Pentium 4C systems is only rated for FSBs up to 200MHz, an increase in the FSB will push it further than it was designed to go. Some Bioses offer an option to lock the memory frequency, but for the best performance you should use memory that can keep up with the FSB. The Crucial Ballistix PC4000 memory I fitted is rated up to 500MHz DDR, or a system FSB of 250MHz, giving plenty of headroom.

Finally, as with all overclocking experiments, there is no guarantee it will work on your system, and there is a risk of damage that we are unable to support, so proceed at your own risk.

Speed demons

For direct comparison with the results in PCW's reviews, I tested the various configurations with Sysmark 2004 and 3Dmark05. I also ran an

additional test, timing how long it took for Dr DivX to encode a 10-minute vob file into DivX using the High Quality Home Theater profile.

With the 2.4 and 3GHz processors clocked normally, they scored 150 and 186 respectively in Sysmark 2004. Switching to 3Dmark05 saw scores of 4,384 and 4,552. Finally, the DivX encode for the two chips took 20 minutes, six seconds and 16 minutes, 12 seconds respectively.

Knowing from previous tests the 2.4C could be stably overclocked to 3GHz, I retested with an FSB of 250MHz. This time it scored 186 in Sysmark, 4,593 in 3Dmark and 15 minutes, 59 seconds for the DivX encode. While the Sysmark score was identical to the official 3GHz processor, the 3D and encoding results were slightly quicker. This wasn't surprising, since the FSB and memory were running 25 per cent faster on the overclocked system.

Of course the Prescott core can also be overclocked, so I increased the FSB to 220MHz, driving the 3GHz chip at 3.31GHz, and retested. It scored 204 in Sysmark, 4,693 in 3Dmark and took 14 minutes, 50 seconds to encode the video. The system was stable at an FSB of 240MHz with a resulting clock of 3.61GHz; here, Sysmark scored 214, with 4,700 in 3Dmark and 13 minutes, 31 seconds for the DivX encode. It even worked at an FSB of 250MHz without a voltage boost, resulting in a clock of 3.76GHz and a Sysmark score of 227, 3Dmark of 4,730 and DivX encode in 12 minutes, 58 seconds.

By overclocking, I managed to get my 2.4GHz processor running as quickly as an official 3GHz model without having to increase the core voltage. It's impossible to tell if it would reduce the processor's lifespan, but it's a good option for those who don't want to pop in a new chip.

Of course, if you do upgrade your processor, you could overclock it too, and my 3GHz P4 proved far better in this respect than I thought, operating stably on the standard core voltage at 3.76GHz – faster than any Socket 478 processor officially available.

CONTACTS

Gordon Laing welcomes your comments on the Overclocking column. Email him at: overclock@pcw.co.uk. Please do not send unsolicited file attachments.

Morgan

WAREHOUSE SURPLUS OUTLET
www.morgancomputers.co.uk

MAIL ORDER SALES LINE

0870 120 4950



BUSINESS HOURS
 Monday-Friday 9.00am-5.30pm
 Saturday 9.00am-5.00pm
 Sunday 10.00am-4.00pm
 Stock and prices subject to change, E&OE.

ALL STOCK BRAND NEW UNLESS STATED

CENTRAL LONDON

64-72 New Oxford Street
 London WC1A 1AX
 Tel 020 7255 2115
 Fax 020 7436 6285

WEST LONDON

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

TOSHIBA A60-173

WITH DVD±R/±RW DRIVE

Intel P4 3.06GHz chip
 512MB DDR RAM
 40GB hard drive
 15" TFT screen



With Intel Pentium 4 532 processor, DVD SuperMulti drive, 15" TFT screen, 56K/LAN/Firewire/USB 2 ports, 64MB ATI graphics (shared), Win XP Home. Toshiba Class 1 stock - 1 year wty.

£499⁹⁹ EX £587⁴⁹ Inc VAT

EXTERNAL DVD±RW

DUAL LAYER TECHNOLOGY

Multi-format drive
 Up to 8x burning
 Ideal for backups
 USB 2.0 interface



Freecom external 8x DVD re-writer, multi-format drive (±R/±RW), dual layer compatible - store up to 8.5GB on a dual layer DVD, hi-speed USB 2.0 interface, inc DVD burning software.

£49⁹⁹ EX £58⁷⁴ Inc VAT

ELIO PHOTO JUKEBOX

20GB STORAGE DEVICE

2.2" Colour display
 MP3/WMA playback
 SD media card slot
 Digital camera port



Compact and stylish photo jukebox, store 1000's of your favourite photos, playback your MP3 files, direct download via digital camera or SD card, inc USB 2.0 cradle. Brand new stock.

£149⁹⁹ EX £176²⁴ Inc VAT

i865 PHOTO PRINTER

WITH CD PRINT FACILITY

4800 x 1200 dpi res
 Up to 23 pages/min
 Direct-print option
 Borderless printing



High resolution colour inkjet printer, borderless prints up to A4, direct print option for compatible Canon digital cameras, prints on printable CD-Rs. Grade A refurb stock - 1 year warranty.

£79⁹⁹ EX £93⁹⁹ Inc VAT

NOW OPEN SUNDAYS FROM 10AM - 4PM

OUR GREENFORD BRANCH IS CLOSED AT WEEKENDS

VISIONEER 8700USB

FLATBED COLOUR SCANNER

1200 x 4800 dpi res
 One-touch scans
 48 bit colour depth
 USB connection to PC



Visioneer OneTouch 8700USB, high resolution flatbed scanner, fast one-touch scanning feature, includes MGI PhotoSuite LE, PaperPort 7 and Text Bridge OCR software. Brand new.

£29⁹⁹ EX £35²⁴ Inc VAT

COMPAQ 18" TFT

SPACE SAVING FLAT PANEL

1280 x 1024 dpi res
 0.28 pixel pitch
 300:1 contrast ratio
 On-screen controls



Compaq 8020 - 18" TFT monitor, true 18" visible area, 16 million colour display, ideal for graphics/GAD use, anti glare coating for a true-black display. Compaq refurb 6 month wty.

£149⁹⁹ EX £176²⁴ Inc VAT

PALMONE TREO 600

ORGANISER/PHONE

Tri-band GSM mobile
 Palm OS organiser
 Palm OS organiser
 2.7" touch screen
 Sold SIM-free



Combined Palm OS 5.2.1 powered organiser and mobile phone, full QWERTY keyboard, SD memory slot, VGA camera, email/web browsing functions, up to 6hrs talk time.

£199⁹⁹ EX £234⁹⁹ Inc VAT

ADVENT ALL-IN-ONE

MULTIMEDIA DESKTOP

Intel P4 3.2GHz
 17" TFT screen
 DVD re-writer
 XP Media Centre



Advent T1, Intel Pentium 4 3.2GHz, 512MB DDR, 250GB hd, DVD±R/RW, 7-in-1 card reader, TV tuner, 56K/LAN, USB2/Firewire, XP Media Centre. Re-work stock with 1 year warranty.

£699⁹⁹ EX £822⁴⁹ Inc VAT

AIWA MINIDISC

PC RECORDER NET MD

32x transfer rate
 MDLP function
 One-touch rec
 Weighs just 104g



MD NX-9: Net-MD player with user friendly one touch recording, transfer music from PC to MD up to 32x. USB interface, powered by a single AA battery. Brand new, 1 year Aiwa wty.

£39⁹⁹ EX £46⁹⁹ Inc VAT

DELL 22" MONITOR

IDEAL FOR GRAPHICS/DTP

1920 x 1440 dpi
 .24mm dot pitch
 Diamondtron tube
 Charcoal grey case



Dell P1230 high performance CRT monitor, ideal for graphic designers or video editors, 1600 x 1200 @ 85Hz, 20.3" visible area, dual VGA inputs. Factory refurb stock - 6 month wty.

£129⁹⁹ EX £152⁷⁴ Inc VAT

ADVENT 3.4GHz PC

FACTORY RE-WORK STOCK

Intel P4 HT chip
 DVD & DVD-RW
 256MB graphics
 250GB hard drive



T9201 with Intel P4 HT 3.4GHz chip, 512GB DDR RAM, 250GB SATA hdd, ATI 9550 256MB graphics, 7-in-1 card reader, modem/LAN/USB2 & Firewire, Win XP Home. 1 year wty.

£399⁹⁹ EX £469⁹⁹ Inc VAT

TOSHIBA A60-155

WITH DVD±R/±RW DRIVE

Celeron 2.8GHz chip
 256MB DDR RAM
 40GB hard drive
 15" TFT screen



With Intel Celeron D 335 processor, DVD SuperMulti drive, 15" TFT screen, 56K/LAN/Firewire/USB 2 ports, 64MB ATI graphics (shared), Win XP Home. Toshiba Class 1 stock - 1 year wty.

£399⁹⁹ EX £469⁹⁹ Inc VAT

BROTHER 3-IN-1

PRINT, COPY AND SCAN

Photo quality
 Up to 20 ppm
 Card reader
 USB interface



Brother DCP-110C multifunction inkjet, 1200 x 6000 dpi printing, 2400 x 600 dpi scanning with OCR, easy to use colour copier, built-in flash media card reader. Brand new with on-site wty.

£49⁹⁹ EX £58⁷⁴ Inc VAT

PURE TEMPUS-1

PORTABLE DIGITAL RADIO

Quality output
 Hiss free radio
 Backlit LCD
 Alarm feature



Fully portable DAB digital radio, cuts out all the usual hiss, crackle & fade of FM, LCD displays station name, signal strength etc, alarm clock with 'noozehandle'. Refurb stock, 1 yr wty

£59⁹⁹ EX £70⁴⁹ Inc VAT

COMPAQ NC4000

IDEAL FOR BUSINESS USE

Pentium M chip
 256MB RAM
 30GB hard drive
 Windows XP Pro



Intel Pentium M 1.5GHz processor, 256MB DDR RAM, 12.1" TFT colour screen, 56K/LAN/USB ports, SD card slot, MS Win XP Pro, weighs just 1.59kg. Brand new with 3 yr warranty.

£499⁹⁹ EX £587⁴⁹ Inc VAT

OLYMPUS C-220 ZOOM

SLIMLINE DIGITAL CAMERA

2 megapixel
 3x optical zoom
 Pop-up flash
 TFT colour screen



Compact design - take it with you wherever you go, 3x optical zoom lens, movie clip capture, automatic flash, weighs just 174g, only 35mm thick. Brand new, 1 yr Olympus wty.

£49⁹⁹ EX £58⁷⁴ Inc VAT

OLYMPUS VOICE

VN-1800 NOTECORDER

Up to 180 mins recording,
 alarm/schedule modes.
 Refurb - 1 year wty.



£16⁹⁹ EX £19⁹⁶ Inc VAT

DW-90 WITH PC BACKUP

90 min voice recorder with
 USB connection to PC.
 Refurb - 1 year wty.



£19⁹⁹ EX £23⁴⁹ Inc VAT

HP PAVILION A708.UK

FACTORY RE-WORK

Celeron D 330 chip
 DVD+R/+RW drive
 800GB hard disk
 Modem and LAN



With Intel Celeron 2.66GHz processor, 8x DVD re-writer, 256MB DDR RAM, built-in graphics (up to 64MB), 56K/LAN ports, USB 2/Firewire interface, Windows XP Home. 1 year HP wty.

£249⁹⁹ EX £293⁷⁴ Inc VAT

LEXAR DIGITAL MEDIA

USB JUMPDRIVE

No drivers req for XP
 Hi-speed USB 2.0



128MB USB flash storage, ideal for quickly transferring files between PCs. Brand new stock with 2 year warranty

£7⁹⁹ EX £9³⁹ Inc VAT

64MB SmartMedia suitable for digital cameras/MP3s...£4.99 (£5.86 inc VAT)
 128MB CompactFlash for cameras/PDAs etc£6.99 (£8.21 inc VAT)

HP TFT MONITOR

TRUE 15" VISIBLE AREA

Stylish design
 1024 x 768 dpi
 Anti glare screen
 DVI/VGA input



HP L1520 TFT flat panel display, true 15" visible area, 1024 x 768 @ 75Hz optimal res, stylish ivory/charcoal casing. HP warranty swap-out stock - as good as new with 1 year warranty.

£79⁹⁹ EX £93⁹⁹ Inc VAT

WIRELESS DESKTOP

BELKIN MOUSE/KEYBOARD

Free your desktop
 USB receiver
 Optical mouse
 Internet keyboard



Wireless freedom and optical precision all in one package, works anywhere within six feet of the receiver, easier to store/hide away, keyboard features Internet and multimedia shortcut keys.

£12⁹⁹ EX £15²⁶ Inc VAT

AIWA 3.1 SPEAKERS

USB DIGITAL AUDIO SYSTEM

81W RMS output
 Virtual surround
 Stylish design
 USB audio input



Excellent 3.1 speaker system, direct USB/analogue connection to your PC, subwoofer with twin satellite speakers, virtual surround sound mode. Brand new stock - 1 year wty.

£39⁹⁹ EX £46⁹⁹ Inc VAT

MORGAN GIANT ILLUSTRATED PRICELIST

DON'T MISS OUT!
THE MORGAN FLYER
FREE EVERY MONTH

Giant monthly price list packed full with all the latest surplus, end of line and closeout computer hardware.

CALL 0870 120 4950
FAX 0121 456 5564





Tim Nott

is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Unsuitable messages

An irritating error explained and some tips on making the most of your Internet cache

Have you ever seen this error message in Windows XP or 2000? '16bit Windows

Subsystem. The system file is not suitable for running MS-Dos and Microsoft Windows applications'.

Judging by the Hands on mailbox, it's a fairly common occurrence. In this case, the phrase 'not suitable' usually means 'missing' or possibly 'damaged'. It's also possible that config.nt or command.com have achieved 'unsuitability', in which case you will get a similar message.

Part of the message does give a clue – the 16bit reference indicates that you are trying to run a Dos-based or Windows 3.x application. The easiest way to fix the problem is to get the spare copy from C:\windows\repair. First, go to Folder Options, View, and make sure that 'Show hidden files and folders' is checked and that 'Hide protected operating system files' is not checked. Now copy the spare autoexec.nt from Windows\repair to Windows\system32. Right-click on the new copy, choose Properties, then set the read-only attribute for the new file.

If this doesn't cure the problem then you need to go to the original Windows installation CD, or the folder on your hard disk where the installation files are stored. Open a command prompt window (Start, All Programs, Accessories, Command Prompt) and type the following:

```
Expand x:\i386\autoexec.  
.nt c:\windows\system32  
\autoexec.nt
```

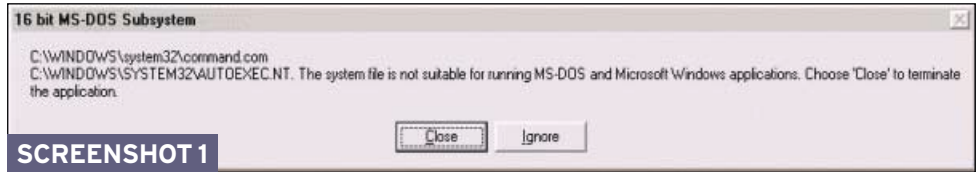
(Key: ✓code string continues)

Substitute your CD drive letter or installation folder location for X:. Then press Enter. You may need to do the same trick for config.nt and command.com. And in case you're thinking there's a fatal catch here, the native Windows XP and NT command prompt is run from cmd.exe, not command.com. If, for some reason, you can't implement either of these solutions, or the problem recurs, then there is a utility called XP_FIX at

www.visualtour.com/downloads.

This will automatically restore the relevant files.

So why does this happen? One widely held opinion is that the installation of Service Pack 2 can delete autoexec.nt. Although this



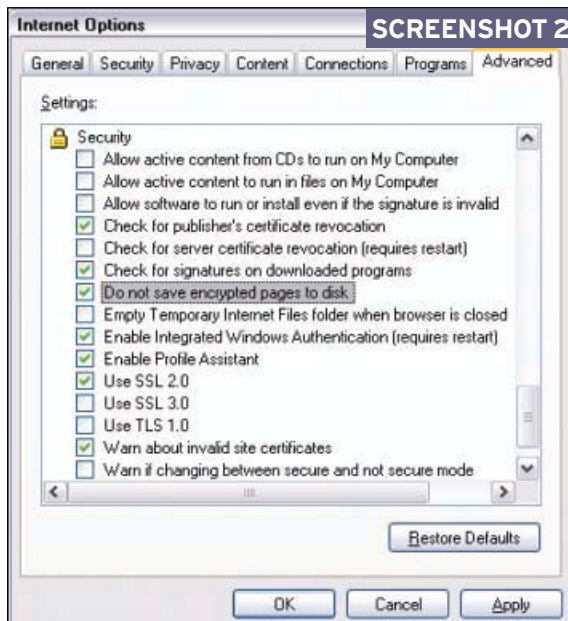
'Not suitable' usually means 'missing'

sounds possible, we haven't been able to replicate it. It also doesn't explain why some users find the problem recurs: the replacement autoexec.nt gets deleted next time Windows starts, which is why we earlier recommended making it read-only. In this sort of situation, the usual reaction is 'blame the bad guys': there is anecdotal evidence that some spyware runs at startup and deletes autoexec.nt. Two possible suspects are Admanager and Windupdate (not Winupdate). You should be able to get rid of these with a good spyware cleaner such as Lavasoft's Adaware or Spybot Search and Destroy.

Things that go bmp

A common Windows irritation is when Internet Explorer won't save pictures on a web page as anything other than bmp files, even though the actual format is, for instance, jpg. A related symptom is that the 'View, Source' command does nothing. The most common cause is that the cache – that is the store for Temporary Internet Files – is full. The remedy is to go to IE's Tools, Internet Options, and press 'Delete

This is a secure option but it may cause problems



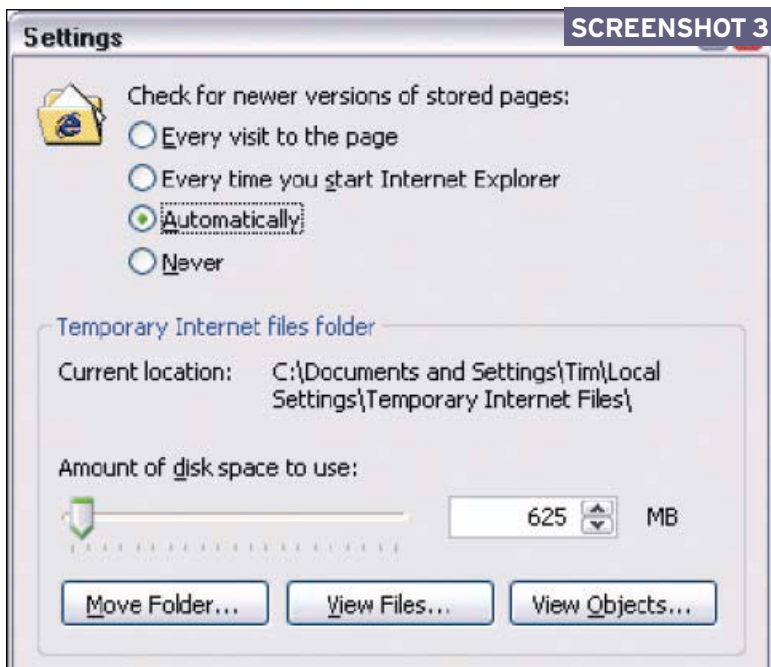
Files' in the Temporary Internet Files panel of the General tab.

If deleting the Temporary Internet files doesn't cure the problem, then there are other remedies. The same symptoms can be caused by damaged files in the Downloaded Program Files folder. In the tif panel of the Internet Options General tab, click on 'Settings', then in the next dialogue, 'View Objects'. You'll get an Explorer window open, listing the contents of Windows\Downloaded Program Files. These files are things like ActiveX controls and Java applets that have been downloaded automatically from web pages. Look in the Status column and if any items show a status of 'Unknown' or 'Damaged' right-click on them and 'Remove'.

Finally, this can be caused by having the option to not save encrypted pages enabled. The point of this is that if other people have access to your computer, you may not want to cache information such as credit card numbers or passwords given over a secure web page. Laudable though this is, it can cause the problem outlined above, and you can turn it off by going to the Advanced tab of Internet Options and unticking the 'Do not save encrypted pages to disk' option under the 'Security' heading (see screenshot 2).

Cache crop

While you are in the Temporary Internet Files (TIF) settings, there are a few things you may want to do. First, you can set the maximum size and location of the cache (see screenshot 3). To change the latter you need to create a folder in Explorer – there is no 'New Folder' button in the location dialogue. Windows allocates a fairly generous amount of space for tifs, and if you're not getting full cache problems you may feel that you could use this more profitably – which you can do with the slider or the spin box. The idea is that graphics, text and other objects are stored on your hard disk when you first visit a page, so that when you return to that page, or another page



Change the cache size and location

better way is to resurrect the old Windows 3.x style File Manager, by typing winfile.exe in the Start, Run box. This will not only give you a more accurate picture of the physical file and folder structure (see screenshot 5), but you will also be able to delete the folders as well as their content. Windows will then build a new, empty set of folders on the next reboot.

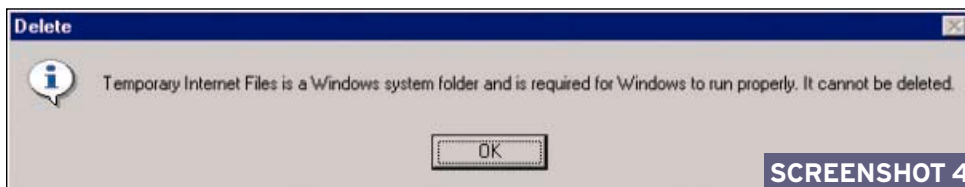
Any XP user with administrator status will find they can delete the TIF folder of another user – these are in Documents and Settings\<username>\Local Settings.

However, they won't be able to delete their own, nor will they have winfile.exe. The trick here is to restart the computer and log on as the supreme administrator. We covered this last month, and if you use the Welcome screen you'll need to press Control & Alt & Del to get the Windows 2000-style login box before you type in the name and password. With this status, you'll be able to get at, and delete, any user's TIF folder – except that of the supreme administrator.

This last is one of several reasons you keep the supreme administrator account 'clean' and only use it for – well – administration, rather than normal work and play. Having said this, we have found that an ordinary user with administrator status can delete the TIF folder of the supreme administrator account.

Single-user Windows ME systems pose special difficulties. Not only is there no MS-Dos mode, but the winfile trick does not seem to work, giving an 'access denied' message. In this case, and in similar impasse scenarios in other versions, there is a workaround, which we hinted at earlier. First, create a new folder anywhere on your system – let's call this Temporary Fix Folder. Now go to Internet Options, General and get rid of as much as possible using the normal 'Delete files' with the offline content box ticked. Click the TIF Settings button, then move the folder to your Temporary Fix Folder. When you OK this, Windows will restart. Any remaining undamaged tif content will be copied to the new location. Normally Windows will remove the old TIF folders, but if it doesn't and there is cross left behind you should then be able to delete that normally. You can then create a new TIF folder in the original location and move everything back.

Below: You can't delete the TIF folder from Explorer



SCREENSHOT 4

requests the same graphic, it does not have to be downloaded again. This is very useful if you are surfing down and back up from a home page – for instance while reading an online newspaper – but with a fast connection and normal use, a large cache doesn't offer much advantage. Also there is little point in keeping, say, a news site home page such as <http://news.bbc.com> between surfing sessions as its contents will have changed. Though there are various options for checking for new versions of cached pages, leaving the setting as automatic should satisfy most users – you can always do a manual check by pressing the IE refresh button.

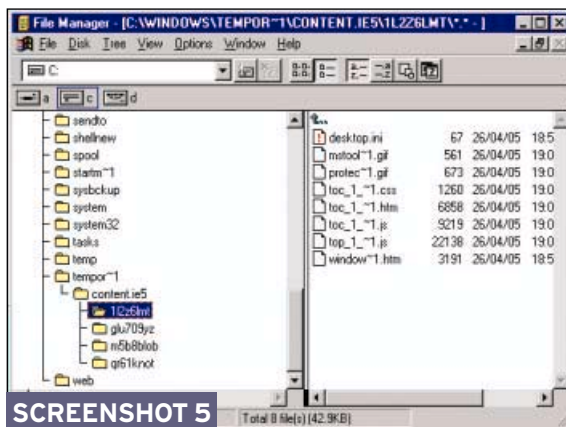
One other option that helps minimise disk usage, as well as maximise privacy, is to be found in the security items on the Internet Options/Advanced tab. If you check the option to 'Empty Temporary Internet Files when browser is closed' then it will do just this. Sometimes, files can get stuck in the TIF folder – this is usually because of damage, and they may not be visible. One simple thing to try in this instance is to tick the 'Delete offline content' box in the delete confirmation dialogue. If this doesn't work, there are more drastic measures. The most ruthless is to delete the Temporary Internet Files

folder completely. Unfortunately, this can be something of a battle, and we simply don't have the space to give instructions for every possible scenario, but here are the basics.

Starting with Windows 98 and a single user, you'll find the Temporary Internet Files folder in the Windows folder. Though you can delete individual items in Explorer, you can't delete the whole folder (see screenshot 4). Windows will rather teasingly ask you if you are sure, and when you confirm, will tell you that you can't, anyway.

One way round this is to restart in MS-Dos mode and delete the contents of the various folders, but this is tedious and can be error-prone. A

The old File Manager reaches parts that Explorer can't



SCREENSHOT 5

CONTACTS

Tim Nott welcomes your comments on the Windows column. Email him at: win@pcw.co.uk. Please do not send unsolicited file attachments.



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

Ssh, someone's listening

Connect to other systems without compromising your security passwords

Two separate computer systems have been able to talk to each other over a network since the early days of Unix.

The TCP/IP protocol developed for Unix (now used universally to form the basis of the Internet) provides reliable connections between systems. It doesn't, however, guarantee any security; just as telephoning a friend is a reliable way to talk, it's possible that someone could be listening in on your conversation. For the ultra-paranoid, it's conceivable that the number you've called could be directed somewhere entirely unexpected without your knowledge.

The Unix telnet program establishes such a connection between systems. You supply a TCP port number and the telnet client attempts to make a connection. The usual purpose for this is to connect to a telnet daemon (also known as telnetd), whose function is to listen for connections on the standard telnet port. When a connection is established, a login program authenticates the person at the other end and, if successful, an interactive shell session starts.

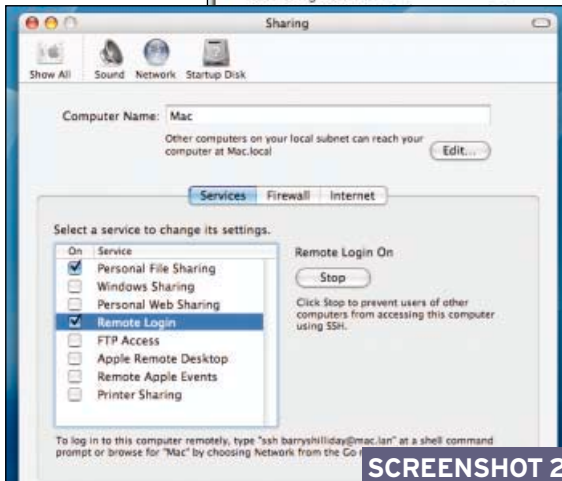
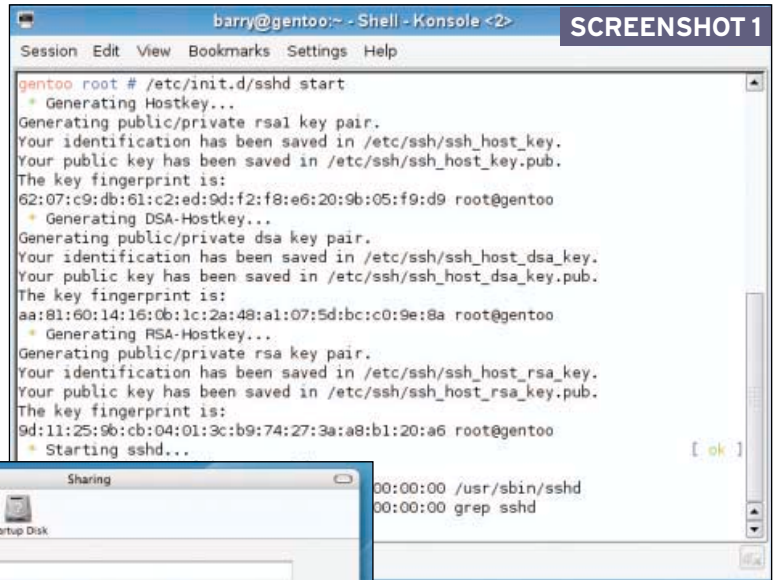
This system worked fine for decades and is still in use today. Its drawback is lack of security. Everything that goes over the telnet connection is open for anybody to see, so long as they have access to the local network. While that might not sound like a problem if you're just running basic shell commands, one vital exception exists – your user name and password are just as easily read.

Another security concern is that there is no way of knowing that the system you have connected to is what you think it is – it's very easy to fake an IP address on a TCP/IP network. You could connect to a system masquerading as another and enter your login details, thus rendering them compromised.

To get around this on the web we have https, the secure equivalent to http. The information sent between the browser and the server is encrypted, and there's no way for a malicious server to 'pretend' to be your credit card company's web server without it bringing up warnings about security certificates being invalid in your browser. For straightforward connections between systems, the equivalent exists in OpenSSH.

Right: Start up the OpenSSH server under Linux. Check the server is running with the ps command

Below: Enable the OpenSSH server in Mac OS X by enabling 'Remote Login' in the System Preferences



program (sshd). For any of the client programs to work, the sshd server must be running on the remote machine. To start the server on most Linux distributions, run:

```
# /etc/init.d/sshd start
```

Many distributions start sshd automatically at boot time, or can be set to do so easily through the system configuration tools. You can check the server is running at any time by running 'ps -ef | grep sshd'. The first time the server is run it will generate the encryption keys that are necessary for it to work (see screenshot 1). In the case of OSX you can enable the server by starting the 'Sharing' system tool and enabling 'Remote Login' (see screenshot 2). OSX runs the server on demand via another daemon (xinitd), so you cannot check the server with the ps command as with Linux.

Simple connection

To test the basic connectivity, we will use two computers; one OSX Mac and one Linux PC. Having checked that OpenSSH is enabled for both machines, a connection should be possible without any further configuration. In this example, the Linux machine has the hostname Gentoo and IP address 10.0.0.1, and the Mac is named hostname Mac and IP address 10.0.0.2.

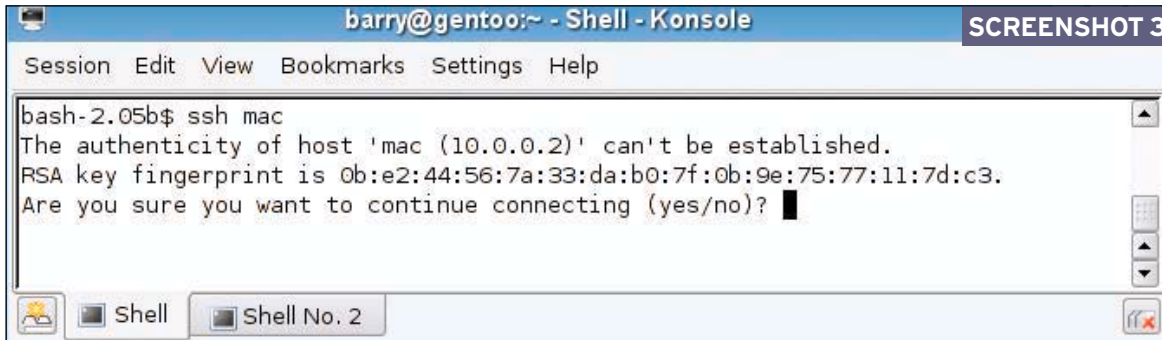
Open up a shell on the Linux machine, and run either of the following:

```
$ ssh mac
$ ssh 10.0.0.2
```

OpenSSH (www.openssh.org) is a free open-source suite of network tools based on the SSH protocol. It includes several utilities, such as ssh for establishing secure shell sessions, scp for securely copying files between systems, and sftp for a secure version of FTP. OpenSSH was developed for OpenBSD, one of the three versions of free BSD-based Unix operating systems, but has been ported to Linux, OSX and commercial forms of Unix. We're going to look at setting up OpenSSH on a Linux and Mac OSX system, and configure it in order to obtain password-less secure connections between them.

The source code is available for download at the project's website. OpenSSH comes included with Mac OSX, and any Linux distribution worth its salt has it supplied as well, so we're not going to look at how to compile or install it.

Just like telnet and telnetd, OpenSSH requires client programs (ssh, scp and so on) and a server



The first time you connect to a new system you are asked to accept the system's host key for authenticating that system

Since this is the first time we are connecting to this computer, OpenSSH has no way of knowing whether this is the machine we expect it to be, so you will see a message that says the authenticity of the host cannot be established. A fingerprint is given with this message, which uniquely identifies the host (see screenshot 3). One way to establish that this is the machine we expect, is to run `ssh` locally from the system we want to connect to. So, from the Mac, run:

```
$ ssh localhost
```

An identical message should appear (see screenshot 4), with the same fingerprint identification. To perform this check, you must be connected and logged on to the second machine to obtain this information. For now, accept the authenticity at the prompt. The fingerprint information is stored in local files, so OpenSSH can guarantee that whenever you connect to this machine again it will be what it says it is.

By default, `ssh` will try to log in using the same user ID with which you're currently logged in, so as the user on the Linux system is 'barry', `ssh` will attempt to log in as barry on the Mac, too. The passwords of the two users can be anything – they don't have to match (see screenshot 5). The host-key information was stored by the previous step, so this time OpenSSH doesn't complain about the authenticity – it has checked this and confirmed it's valid. The password is entered correctly, and we're now logged into the Mac and running a shell.

OpenSSH would be a bit limited if it could only connect to another system using the same user ID. To log in with a different one there are two methods: use the `-l` option and specify the ID, or put the ID before the hostname in the `user@host` format. For example:

```
$ ssh -l john gentoo
$ ssh john
```

This method should let you connect reliably to any system running OpenSSH as any user whose password you know. The user and password information, along with all

the data sent over the connection, is fully encrypted, giving a secure login capability and no fears of intrusion.

When the first connection was made, the OpenSSH server and client exchanged keys to ensure the authenticity of the host. These are the keys that are generated the first time the OpenSSH server is run. The exchange is secure, with no passwords, and is completely transparent. Wouldn't it be useful if the same sort of exchange could be used for the login itself? OpenSSH provides this method of authentication, which is what we'll look at now.

Abandoning passwords

OpenSSH offers the normal password-based authentication method, but also permits authentication through public and private keys. In this case, two keys are involved: a public one, which is roughly equivalent to a lock, and a private one, which protects the security of the public key and is similar to a real key. An analogy would be that the public key is your thumbprint, which can be used anywhere to prove your identity, and your thumb being the private key, which hopefully remains with you at all times and is unique to you.

To use authentication keys in OpenSSH, you generate the key-pair first. The public key is then sent out to any system you want access to. When connecting to the system, the private key is validated (usually by entering a passphrase or password), and the two keys are compared to grant access. The private key is needed to 'unlock' the public key. You must, therefore, secure your private key with a passphrase,

It's possible to check the host key by running `ssh` locally. The same key fingerprint is given for a remote connection

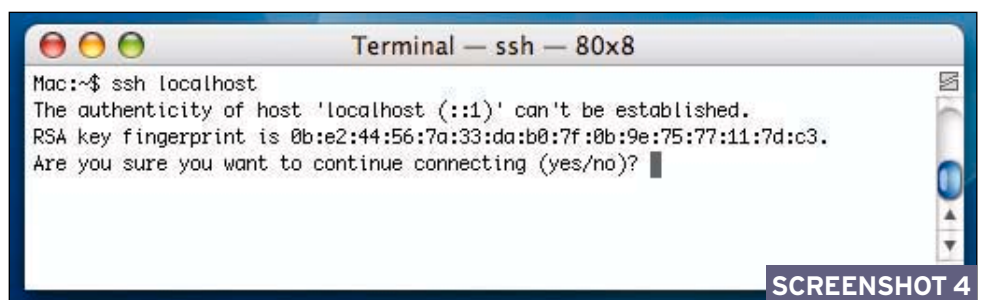
otherwise it would be the equivalent of removing your analogous thumb and giving it to others to use.

If you have to enter a password for your private key, you might wonder how it's beneficial over a normal password login. The difference is that only your private key needs to be secure. You can then copy the public key to any systems running OpenSSH and gain access to them with that one private key. The passphrase on your private key can be anything you like – it has no connection to the users' passwords. Imagine a network with 1,000 different systems. Each could use the same password, which is highly insecure, or you could use a single private key with a single passphrase. The remaining alternative is remembering 1,000 different passwords.

So back to our example system. We want to connect from Gentoo to Mac without the use of passwords. To set this up, you will need access to both systems to begin with. The first step is to generate a key-pair on Gentoo, since this is the system we're connecting from:

```
$ ssh-keygen -t dsa
```

The `-t` option specifies the type of key to create and must be provided. Possible values are DSA or RSA, though it shouldn't matter which you use. The private key is created as the file 'id_dsa' (or id_rsa) and the public key as 'id_dsa.pub' (or id_rsa.pub). As standard, both are saved in the `.ssh` subdirectory in your home directory (see screenshot 6). Here the DSA keys are generated and saved. The passphrase entered is used to encrypt the private key, so only you have access to it.



SCREENSHOT 4



```

barry@gentoo:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

bash-2.05b$ ssh mac
barry@mac's password:
Last login: Sun Apr 24 12:07:49 2005 from 10.0.0.1
Welcome to Darwin!
Mac:~ barry$ █
    
```

Left: A simple login to a remote system using OpenSSH. Enter the remote user's password and that's all you need to do

Now we have our keys, it's necessary to send the public key to the Mac system and put it in the right place. When attempting to log in a user, the OpenSSH server expects the public keys to be listed in the file 'authorized_keys' inside the user's .ssh directory. This file contains a list of every public key that is allowed to log in as this user. To copy this information across we could use FTP or Samba, but why not use scp, OpenSSH's secure copy:

```
$ scp .ssh/id_dsa.pub mac:
```

This command securely copies the public key from the Linux machine to the Mac (hostname mac). Just like ssh, it uses the same user ID, and copies to the home directory of that user. Alternatively, we could copy directly to the .ssh directory:

```
$ scp .ssh/id_dsa.pub mac:.ssh/gentookey
```

(Key: ✓ code string continues)

We need to specify a new name here for the copied file, or we could overwrite an existing public key for the user on the Mac system, as it would also be under the .ssh directory and have the same name.

The next step is to add the public key from Gentoo to the 'authorized_keys' file on the Mac, or create the file if necessary. The spelling is important: authorised_keys will not work. So, on the Mac:

```
$ cd .ssh
$ cat gentookey ✓
>>authorized_keys
```

The '>>' notation means that the contents of 'gentookey' will be added to the end of the authorized_keys file if it already exists, or will create it with the contents if it doesn't. Do not use the more-common '<' notation, as this will overwrite any existing file.

You can log in to another system using your public key alone

```

barry@gentoo:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

bash-2.05b$ ssh-keygen -t dsa
Generating public/private dsa key pair.
Enter file in which to save the key (/home/barry/.ssh/id_dsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/barry/.ssh/id_dsa.
Your public key has been saved in /home/barry/.ssh/id_dsa.pub.
The key fingerprint is:
e1:e8:0e:87:87:fe:f6:7d:24:66:3c:e3:7c:39:4a:5d barry@gentoo
bash-2.05b$ █
    
```

SCREENSHOT 6

It should now be possible to connect from Gentoo to Mac without needing the password for the Mac user (see screenshot 7). Instead of being asked for the password of barry@mac, ssh now wants a password only for the private key. Once entered correctly, the login is completed using keys alone. Now the authenticity of the host and the user is validated through secure keys – probably the most secure way to connect to another system.

Avoiding passphrases

When generating the key-pair you enter a passphrase. This can be changed at a later date with the -p option of ssh-keygen. Either at creation, or with this option, you can set an empty passphrase. Without a passphrase your private key is unencrypted and unprotected. The benefit of such a situation is that you can access any systems authorised with your public key without the need to enter a passphrase at all. The obvious drawback is the security risk. If anybody gets hold of your private key they too can access the same systems without entering a passphrase. This might be useful for very specific purposes, where access isn't as important as secure connections, but generally it's a very bad idea.

A way to get around this is to use the ssh-agent. This is a program that stores validated private keys for

authentication. It starts up as part of your login session. You can then add private keys to the agent, which means you no longer have to use your passphrase every time you use an OpenSSH program. Linux desktops and OSX automatically run ssh-agent for you when you log in. Start by adding your private key to the agent:

```
$ ssh-add
```

You are prompted for the passphrase of the private key. It's essential to enter the passphrase once, or the agent won't be able to use the key. When you now try to connect to an OpenSSH server, the public key on the remote system is checked against the already validated private key you've added to the ssh-agent, removing the need to enter the passphrase.

Probably impossible

In April's Hands On, on the topic of MD5 checksums, I said that it would be impossible for two different files to have the same checksum value. This is not exactly true. MD5 checksums are of a limited size (128bit), and hence the number of different possible checksums is also limited. So, in theory, it is possible for two files to have the same checksum. However, the probability of this occurring is exceptionally remote (there are 2 to the power of 128 possible checksums), so it may be more accurate to say it is exceptionally unlikely for two files to have the same checksum, and for the purpose of engineering a security risk, effectively impossible. Thanks to Sam Edge for bringing this to my attention.

```

barry@gentoo:~ - Shell - Konsole
Session Edit View Bookmarks Settings Help

bash-2.05b$ ssh mac
Enter passphrase for key '/home/barry/.ssh/id_dsa':
Last login: Sun Apr 24 15:00:15 2005 from 10.0.0.1
Welcome to Darwin!
Mac:~ barry$ █
    
```

SCREENSHOT 7

CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: linux@pcw.co.uk. Please do not send unsolicited file attachments.

Subscription Offer

3 TRIAL ISSUES

Subscribe to Personal Computer World and claim your **3 FREE TRIAL ISSUES** and also **SAVE** up to **37%** on the shop price.

Your risk-free subscription

Your 3 trial issues are **risk-free** and come with a full **money-back guarantee**. If you find that Personal Computer World is not for you, you can cancel before receipt of your 3rd issue and receive a full refund – no questions asked.



Order Now! quoting P130 (CD Edition) V130 (DVD Edition)



www.subscription.co.uk/pcw



01858 438870

**PERSONAL
COMPUTER
WORLD**

I would like to subscribe to Personal Computer World DVD Edition starting with 3 trial issues, and then continue at £29.99 for 10 issues (quote V130)

I would like to subscribe to Personal Computer World CD Edition starting with 3 trial issues, and then continue at £19.99 for 10 issues (quote P130)

Please charge £29.99/£19.99 (delete as appropriate) to my credit card

Visa Mastercard Amex Delta Switch/Maestro (Issue no. ____)

Card No. Valid from / Expiry date /

Signature _____ Date _____

I enclose a cheque for £29.99/£19.99 made payable to VNU Business Publications

Your details

Title	Initials	Surname

Email		

Address		

		Postcode

Telephone		

We will use one or more of the various contact details supplied to contact you about Personal Computer World including your subscription, reader research and related products or events. Please indicate below your privacy wishes for other contact from VNU and 3rd party organisations:
Email Tick box to receive information about other products or services from the VNU group of companies by email
 Tick box to receive information about products or services from selected companies by email
Mobile/SMS Tick box to receive information about other products and services from the VNU group of companies by SMS Tick box to receive information about products and services from selected companies by SMS
Postal/telephone Tick box if you do NOT want to receive information about other products and services from the VNU group of companies by post/telephone Tick box if you do NOT want to receive information about products and services from selected companies by post/telephone.
Offer available in the UK only, for overseas subscriptions call +44 (0)1858 438870. Offer ends 31st August 2005.

Post this order form to:
PCW Subscriptions, FREEPOST LON14776, Market Harborough, Leics, LE87 4NZ

**P130
V130**



Tim Nott

is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Divide and rule

How to split a page into separate, equally sized sections using Word

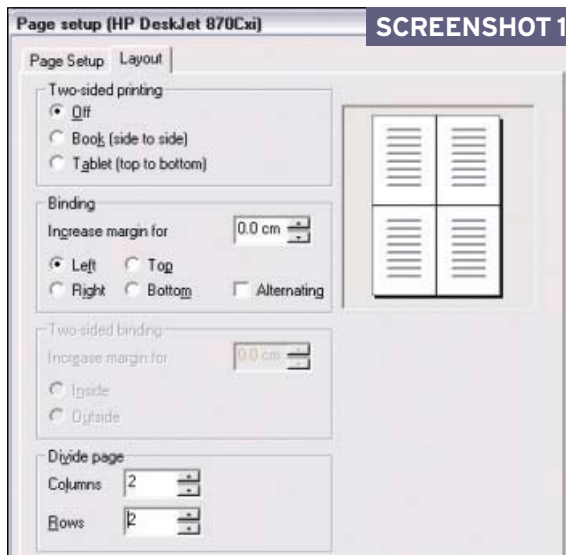
A reader who received a new stock of A4 paper, micro-perforated so that each sheet could be separated into four A6 pieces, set me a challenge: to get Word to see the four sub-pages as separate entities, each with the same margins. The simple solution is to ditch Word and use Wordperfect, which has an option to divide the page into any number of equal sections. You'll find this in File, Page Setup, Layout, and the process takes seconds (see screenshot 1).

However, if you are determined or constrained to stick with Word then, although recent versions of Word have the facility to divide a page into two in Page Setup, four sub-pages takes some fiddling – a phrase that will be familiar to Word users.

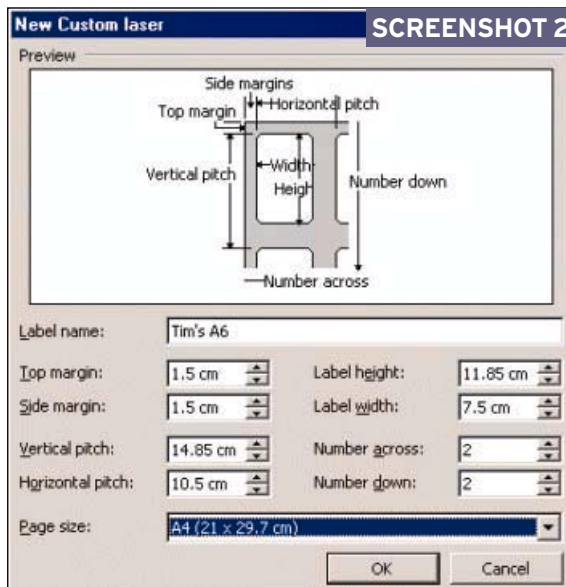
In this exercise we'll look at the three approaches: labels, tables and text boxes. Let us assume you want to split an A4 page into four A6 sub-pages, each with equal 1.5cm margins. Taking labels first, you can spend a lot of time going through the available formats, but it's better to create your own from scratch. Go to Tools, Envelopes and Labels (2003 users need to go to Tools, Letters and Mailings, Envelopes and Labels) and turn to the Labels tab. Click the Options button and you'll get the Label Options dialog. Ignoring the lists of Label Products and Product Numbers, click the New Label button to summon the New Custom label design dialog.

First, give your label a name – this will be added to the list in the previous dialogue so you can re-use it. Next, set both the top and side margins to 1.5cm. The vertical and horizontal pitch – that is, the distance between the tops and corresponding edges of each label – should be set to the A6 size, namely 14.85cm and 10.5cm respectively. The label height and width should be set to the pitch minus both margins of your sub-page, namely 11.85cm and 7.5cm, the numbers across and down as two, and the page size as A4 (see screenshot 2).

OK out of the custom label designer and your new label name will appear selected in the Label Options dialogue. OK out of this dialogue, and you'll see your custom label in the bottom right of the Labels tab. Click the 'New Document' button and you'll get a new document with the page divided



SCREENSHOT 1



SCREENSHOT 2

Top: The easy way to divide a page, using Wordperfect

Bottom: The laborious way, using Word

up as specified. It's a good idea at this stage to switch to Print Layout view and check that everything is as it should be, with the margins in the correct positions – it's easy to make mistakes in the label designer.

What you have now is a table, so you can fine tune it by right-clicking in a cell, selecting table properties and adjusting the height and width if necessary. You'll probably want to change the vertical alignment from centre to top in the Cell tab. Having done this you could save the document as a template.

So far, so good if you want to create discrete sub-pages either all the same, such as a menu or invitation, or

different, such as name cards or address labels. If you want continuous text that flows from sub-page to sub-page, such as a booklet, you'll need to use text boxes. Although you could do this from scratch, working out absolute page positions, it's easier to use the table as a guide. Go to Insert, Text Box and drag out a text box to the approximate size of one of your sub-page cells. In later versions of Word a 'Drawing Canvas' will appear: delete this and you will be able to place the text boxes directly onto the page.

As soon as you've created one text box, you need to do a couple of things to avoid frustration. First go to the Draw menu on the Drawing Toolbar, select Grid and turn off 'Snap to grid'. Next, right-click on your new text box, select 'Format text box' and, on the Colours and Lines tab, set the fill and line colours to 'No fill' and 'No line'. On the Size tab, change the size to the sub-page within-margin size – the same as your new label size. On the Layout tab choose 'In front of text', and on the Text Box tab set all the margins to zero. You'll then find it easier to line up the text box with the corresponding table cell – once the first one is right, copy and paste it three times and drag the box to the other cells. Remember to deselect each box before pasting the next, otherwise you'll replace the original. Alternatively, hold down Control as you drag to create a copy.

With the four text boxes in position, the final step is to link them. With the first box selected, click the chain button on the Text Box toolbar. The cursor will turn into a jug: move this over the second box and the jug will tip, and click to 'pour' the contents into the second box. You may find this easier if you put some dummy overflowing text in the first box with the =rand(10,10) followed by Enter trick, which will create 10 paragraphs of 10 sentences of 'The quick brown fox...' (you need to have Auto Correct's 'Replace text as you type' option turned on for this to work). When all is set up correctly you can delete the contents of the text boxes.

CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: wp@pcw.co.uk. Please do not send unsolicited file attachments.



Turn information into answers

Some useful advice on how a Pivot Table can be used to analyse data in a list

Although many people use Excel for making lists, it is surprising how many have never used a Pivot Table to analyse the data they have gathered. An Excel list is a simple database and follows database rules. The types of information gathered are called fields and the worksheet columns are headed with the field names. The rows hold the individual records. The list could be of anything: club subscriptions, personal expenses or investments.

The example here records a year's sales and profit for a wholesale nursery that sells to 10 retailers, each of which has outlets in several counties. The seven field names are County, Type, Date, Retailer, Qty, Sales and Net. The 500 rows record individual sales. So the first row after the headings might record that on (Date) there was a sale to a nursery (Retailer) in Essex (County), for 10 (Qty) trees (Type), with the amount charged to the retailer (Sales), and the wholesaler's profit (Net).

Looking at those seven columns and 500 rows reveals that a bewildering amount of data has been gathered. But who were the best customers? How did all sales break down between trees, shrubs and plants? Where were the profits made – by retailer and by quarter?

There are formulas you could use to convert this data into useful information but a Pivot Table can give you the answers far more quickly. Pivot Tables have been available since Excel 97. Each version of Excel since has added small features but they all work the same way. This example is using Excel 2002.

Click any cell within your list and then choose Pivot Table and Pivot Chart Report on the Data menu. This starts the Pivot Table Wizard. Click Next and Next again. In Excel 97 you would continue to Step 6 of the Wizard, but in Excel 2000 and later you can click the Layout button in Step 3. This offers you a diagram with rectangles labelled Page, Column, Row and Data. On the right-hand side are listed your field names. Click on Sales and drag into the Data square. It's now labelled 'Sum of Sales'. Drag Retailer into the Row space and Type into the Column space.

SCREENSHOT 1

County	Type	Grand Total
Essex	Sum of Sales	£237,660

SCREENSHOT 2

Retailer	Date	Type	Grand Total
Arboretums	Qtr1	Trees	£5,313
Aunt's Plants	Qtr1	Trees	£1,019
Aunt's Plants	Qtr2	Trees	£1,243
Aunt's Plants	Qtr3	Trees	£1,411
Aunt's Plants	Qtr4	Trees	£1,494
Aunt's Plants Total		Trees	£5,167
Bark and Bushes	Qtr1	Trees	£510
Bark and Bushes	Qtr2	Trees	£717
Bark and Bushes	Qtr3	Trees	£771
Bark and Bushes	Qtr4	Trees	£621
Bark and Bushes Total		Trees	£2,619
Down To Earth	Qtr1	Trees	£1,143
Down To Earth	Qtr2	Trees	£1,008
Down To Earth	Qtr3	Trees	£1,056
Down To Earth	Qtr4	Trees	£1,487
Down To Earth Total		Trees	£4,694
Landscapers	Qtr1	Trees	£1,105

Finally drag County into the Page space. Click OK and then Finish.

You'll now see on a new worksheet the Pivot Table you have created plus a Pivot Table Field List box and the Pivot Table toolbar. You can click on the headings of the box and toolbar and drag them to any convenient position.

Select cells B5:E14 – that's all the Sales amounts without the totals – and format for Currency with no decimals and no symbol. Highlight the totals, B15:E15, and format similarly but with the pound symbol. Highlight B4:E4 and click the centring tool. Add any font or colour formatting you wish (see screenshot 1).

To change the order to trees, shrubs, plants, just right-click on the Trees heading and choose Order, Move to Beginning. This view tells you a lot about all the sales made to these retailers for their Essex outlets, both in total and by type: trees, shrubs and plants. To see the Sales

for all the counties, click the down arrow in cell B1 and choose All.

But it gets better. Choose a cell with a value in it, such as sales of trees to Aunt's Plants in their outlets in all counties. Double-click on it. Instantly a new worksheet is created with all the information about those sales: the dates of the sales, the quantities, the value and the profit.

As this workbook grows it's a good idea to double-click on the worksheet tabs and rename them – for example, List, Pivot Table, and Aunt's Plants – instead of having to remember what is on Sheet 1, 2 and so on.

How about a breakdown of profit by customer by month? Go back to the Pivot Table. Click on Sum of Sales and drag this title off the table. All the values disappear and are replaced by the label Drop Data Item Here. From the Pivot Table Field List box drag Net into the largest rectangle. Instantly you have profit instead of revenue figures. You could substitute the Date field for the Retailer field, but let's show both. Drag the Date field label over the line between the list of retailers and the main data table. The Type information now moves to the right and the dates of sales becomes column B.

At the moment, the dates of all sales are displayed. Here's the way to show it by month. Right-click on the Date heading and choose Group and Show Detail and then Group. In the Grouping box choose Months. You now have a Pivot Table that shows profit from sales first by retailer and then by each month of the year.

Alternatively you could show profit totals by quarter and year. If you re-Group the Date field you can produce a result like that shown in screenshot 2.

If you ever change a data entry in the original Excel list, don't forget to refresh the Pivot Table by clicking on the exclamation mark (!) on the Pivot Table toolbar. Next month I'll introduce you to another very useful feature for visualising the Pivot Table data – Pivot Charts.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.



Ken McMahon is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

The waiting game

Time-lapse photography has a unique appeal – and here's how to master the techniques



SCREENSHOT 1

The Sony DCR-HC39E in smooth interval recording mode

and camcorders have interval timers built in. Still cameras with this feature include some Canon Powershots, the Fujifilm S1 Pro, Minolta Dimage 7 and the Olympus E10 and E20.

Some older Sony camcorders are equipped for time-lapse shooting, and the

frame here and there, or mis-time exposures by a second or so, no-one is going to notice.

If being tethered to a notebook PC isn't an option, then hardware timers provide a solution. There are several reasonably priced hardware timers on the market. US company Harbortronics sells its Digitsnap 2000 for \$129 (about £70). You hook it up using the serial cable supplied with your camera, though for some models you will have to buy one from Harbortronics for an additional \$22. Find out if your camera is compatible on the Harbortronics website: www.harbortronics.com.

At \$295 (approx £155), the Mumford Time Machine (pictured below) (www.bmumford.com) is a more expensive alternative that can be triggered by sound, light or motion and used for high-speed flash photography (freezing water droplets, popping balloons and so on) as well as time lapse.

Software solutions

In some ways the best option, and certainly the cheapest, is to control the camera using software. An ideal solution would be a Pocket PC application and I've looked hard, but such a thing doesn't seem to exist. Tethered control from a desktop or notebook PC is obviously no problem for studio-based time lapse, and even for outdoor shooting it is fine in most circumstances – let's face it, you're not likely to use your expensive digital camera in an environment that's not suitable for a notebook PC. Risky environmental conditions (including risk of the theft of unattended equipment, as well as inhospitable weather) are going to need more robust hardware.

There are two ways to use software to control your camera. One is using software designed for stop-motion animation such as Stop Motion Pro (www.stopmotionpro.com) or Animator DV. These applications are primarily designed for animators using models who need to shoot a frame at a time, but they include time-lapse controls. They use video drivers to capture images in the same way as video-editing applications, so are easy to set up with a camcorder or webcam.

Another, more flexible, approach is to use software that controls your digital still camera. This will allow

In this month's Hands on I have something that will appeal both to the photographer and the cinematographer in you. Time-lapse photography is a term that's broadly used to describe the technique of shooting slow-moving events at very low frame rates, then playing back at normal frame rates to massively speed up the action.

Any subject that changes over time (with the possible exception of drying paint) makes a good subject for time-lapse photography. Events that occur within a timeframe of a few hours, such as opening flowers, falling snow and even car journeys make good time-lapse subjects. Slower moving events, such as building construction, plant growth, crystal formation and organic decay (for example, rotting fruit) may take a while longer, but the results can be fascinating.

Frame rates for time-lapse vary depending on the subject, and are usually in the range of one frame per second to one frame every few minutes. Very slow-moving events might involve frame rates measured in days rather than seconds, and involve setting up the camera in the same position for each shot. But there are also subjects that can be shot in a few minutes. Sunsets, cloud formations, traffic flows and street scenes, for example, are the work of just a few minutes.

Though you can shoot time-lapse manually, some kind of timer that allows you to make exposures at defined intervals is going to be very useful. Some digital still cameras



new widescreen DCR-HC39E provides two time-lapse modes. The first mode, 'Interval photo recording' (see screenshot 1) shoots and records still images to the Memory Stick at preset intervals of one, five, or 10 minutes – not terribly flexible, but useful for shooting over a long period.

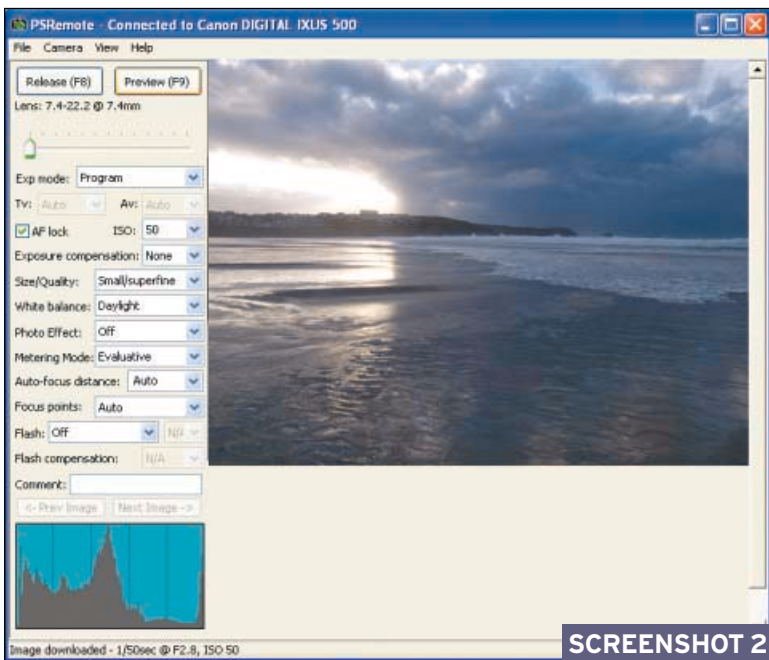
Better still, the second mode, 'Smooth interval recording', allows you to set an interval between one second and two minutes. Frames are stored in memory, then written to tape as DV video in batches of five. This is by far the most convenient way to shoot time lapse because, instead of combining still images into a video clip (a process I'll explain later), smooth interval recording gives you a finished time-lapse clip. You can play it back immediately in the camcorder or capture and edit it along with the rest of your footage.

If you don't have the luxury of built-in interval timing, there are three alternatives: you can buy a hardware timer; connect the camera to a PC and control it using software; or shoot manually.

The last of these options isn't as tedious as it sounds. For short events of up to 10 minutes or so, you can easily shoot at intervals of a few seconds using nothing more complicated than your watch. Time-lapse timing isn't critical and, if you miss a



The Mumford Time Machine can be motion-triggered for high-speed photography as well as conventional time-lapse recording



SCREENSHOT 2

Software such as PS Remote can help your camera capture time-lapse sequences

you to shoot better quality, high-resolution images which, even when downsampled to Pal video resolution, will look superb. You may find, depending on your camera and software, that you have control over more than the shutter; for example, you may be able to control exposure settings, focus and zoom remotely.

Remote control

Some digital SLRs provide software for remote camera control, but this is unlikely to include interval timing control. I've used Breeze Systems PS Remote (www.breezesys.com) successfully to capture time-lapse sequences using my Canon Digital Ixus 500. PS Remote works with all Canon Powershot cameras, including the Ixus range (see screenshot 2). Another Breeze product, DSLR Remote Pro, works with Canon EOS 1DS, 1D, 10D, D30, D60 and 300D cameras.

To use PS Remote you connect the camera via the USB cable and switch it on in playback mode. When you launch PS

Remote it switches the camera to record mode and loads the current camera settings, which are displayed in a series of pull-down menus on the left of the preview screen. You can change any of these, including exposure mode, size/quality, white balance, metering mode and flash mode, simply by selecting different options from the menus. You can also change the zoom setting by means of a slider.

You can capture an image which is displayed in a large preview window, but a better option is to use the live preview, which provides a video feed to a separate window. The preview function also displays a histogram, which is quite handy for checking and adjusting exposure settings.

The time-lapse dialogue is where you set the interval and other parameters. You can set it up to start



recording immediately, or to record at a future date and time, and to record for a specified length of time by setting start and end points, or for a given number of frames. The minimum interval is one second. I can't tell you the maximum, but I can say that, although I didn't wait for it to complete, PS Remote happily accepted a value of 31,536,000 seconds, took the first shot and started counting down to the next one a year hence.

Having shot your time-lapse sequence, the next step is assembling it. You can use most video-editing applications, although some are better than others. I mentioned earlier that the interval is largely dependent on the subject and this is true, but it also determines the length and relative speed of the final clip. Assuming each frame you shoot will comprise a single frame of 25fps (frames per second) Pal video (you can't always assume this, but more about that in a second), with an interval of one second and an event lasting an hour, you'll get 3,600 frames, which at 25fps will give you 144 seconds of video running at 25-times normal speed.

Leave the images as sequentially named by the camera and they will import in correct chronological order to your video-editing software. Most applications set a default duration of around six seconds, or 150 frames, the assumption being that still image import will be for slideshow purposes. In Adobe Premiere Pro and Premiere Elements, you can reduce this to a single frame by setting the value in the still image preference dialogue to 1 (see screenshot 3). When you drag the images from the Media window to the timeline they will be arranged in sequence, each occupying a single frame. Render the timeline to view the time-lapse sequence.

To edit the sequence, or include it in another project, export it as a DV avi file and trim it, add effects, and treat it just like any other DV clip.

You may find that your video editor doesn't allow you to specify a single frame duration for imported images. The minimum in Microsoft Movie Maker 2 is an eighth of a second. In Ulead Videostudio 8 it's a second; you can manually trim images on the timeline to a single frame, but given that you'll have hundreds, or possibly thousands of clips to adjust, it's not what you'd call a satisfactory solution.



SCREENSHOT 3

For best results use a video-editing program that can import stills with a single frame duration, such as Adobe Premiere Elements

CONTACTS

Ken McMahon welcomes your comments on the Digital imaging & video column. Email him at: digitalimaging@pcw.co.uk. Please do not send unsolicited file attachments.



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

Hanging on the telephone

The next music medium is the 3G mobile, but is the technology worth investing in yet?

If you thought music downloads were only about Apple's iTunes and the re-launched Napster, you need to think again, because the next wave of music download services is starting to appear not for the PC or Mac, but for mobile phones.

It's pretty logical that mobiles should be the next big medium for music. After all, there tend to be three things most of us carry around with us all the time: money, keys and our mobile phone. In fact, around 53 million people in the UK own a mobile, so the potential for selling digital music is massive. Of course, at the moment, music on mobiles is much more about potential than reality. It will take a lot to shift the attention away from Apple's iTunes music store as the majority of digital music is still being purchased through iTunes, with sales dwarfing those of other online music stores such as Napster.

Nevertheless, this month we take a closer look at a couple of the latest 3G mobile music services and see how they compare to downloading tracks to your PC. We were interested to see whether there was any way to get the tracks out of the mobile phone and onto your PC for playback.

It used to be that if you wanted music on your mobile you had to download a ringtone approximation of your favourite tune. Early ringtones were about as pleasant as a bout of influenza, but things improved slightly with the introduction of mobiles that could play polyphonic tunes. After this came Realtones, short samples of real music that you could use as a ringtone. Now, however, mobile operators are starting to flex some serious music muscle by allowing you to download entire tracks to your phone.

Orange finds its groove

Orange's music service, for example, relies on technology from a company called Groove Mobile, formerly known as Chaoticom. To use the service you need to be on a monthly contract and download the Music Player application for your phone from Orange's Wap service.

We tried it on a Nokia 6630 handset, which is compatible with Orange's 3G network. Once you start



the application you're presented with a list of options to view various music charts, the latest releases or a full A-Z list of songs. There's also a link called 'My Music' that takes you to the folder where your downloaded tunes are stored.

If you choose to check out the charts you'll be shown a list of songs from which you can select a tune to download. Buying a track costs a whopping £1.50, which compares pretty unfavourably with the likes of iTunes or Napster, but we guess that's the price of convenience. At least the downloads happen in a matter of seconds rather than minutes and the songs stream as they are being downloaded. Also, if you buy the Nokia 6630 handset from Orange, you get three free music tracks a month for three months.

The big question, of course, is what is the sound quality like? The answer, unfortunately, is that it's pretty dire. In fact the tracks we downloaded sounded much closer to the quality you'd expect to hear on medium wave radio than on a CD. Obviously the music is being heavily compressed.

Groove Mobile originally designed its technology for delivering music over GPRS networks rather than faster 3G networks, so the file sizes are very small. For example, the version of *Little Sister* by Queens of the Stone Age we downloaded

Unfortunately the quality of the tracks you can download from the Orange Music service is more comparable to medium wave radio than audio CDs

weighed in at just 790KB. The files are saved to the phone's memory card in the '.kzi' format used by the Groove Mobile Microkozom player on the phone. You can transfer these files to your PC for backup purposes, but Orange provides no way of playing them back on your PC and there is no compatible PC application provided by Groove Mobile. This, of course, means that once you buy the tracks they are tied to your phone – a bit disappointing considering the cost of each track.

Vodafone quality

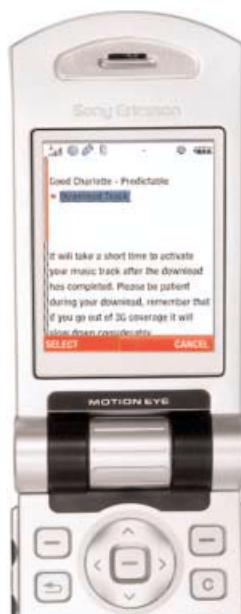
Vodafone has also started offering music downloads over the air directly to mobile phones. Its service works in a similar way to Orange's offering, except you don't have to download the music player to get started. Instead you use the player built into the phone. We tried it with a Sony Ericsson V800 3G handset.

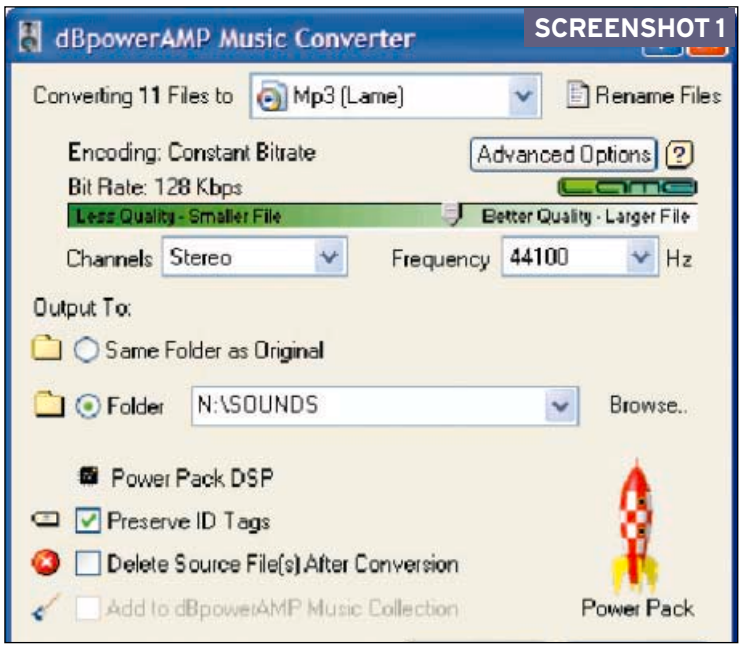
Songs downloaded to the phone are stored as '.dcf' files. They use mpeg4 AAC compression with the result that the file sizes are relatively small. For example, we downloaded the track *Club Foot* by the band Kasabian, and the downloaded file was just 1.3MB. The quality was vastly superior to the tracks we tried on the Orange service, even though they cost the same price; in fact, they sounded about as good as a normal mp3 file encoded at 128Kbits/sec.

However, the '.dcf' file format is protected by digital rights management (DRM) technology – the '.dcf' extension stands for DRM Content Format. This is a standard file format for music and video on mobiles as defined by the Open Mobile Alliance (OMA), a consortium of mobile manufacturers and operators. For music, the format is comparable to the AAC tracks you buy from iTunes, except that instead of being encrypted with Apple's Fair Play system they are encrypted using the DRM technology defined by the OMA.

Unfortunately, although you can transfer the songs from the phone's memory card to your PC for storage there's no way to play the files. It's disappointing because the quality of the downloadable files is pretty good – they could

Vodafone's music service uses mpeg4 technology to compress the audio tracks so the sound quality is very good even though the file sizes are very small





certainly sit alongside mp3 tracks you already have on your computer without standing out due to poor audio quality. The problem, of course, is down to the DRM used in the files. To be able to play the file on your PC, there would have to be some way of transferring the rights for the file across to your PC from your phone. To do this you'd need software on your PC that was able to recognise the file and use the DRM part of it appropriately. Currently no such software exists.

However, things may be starting to change. Nokia and Microsoft have recently signed a deal that will see Microsoft supporting the OMA's DRM technology and the AAC family of codecs in Windows Media Player 10 via a plug-in. In return, Nokia will be making sure that music stored in wma files on PCs can be transferred to and played on handsets that run its Series 60 operating system software.

Because the OMA digital rights management technology is supported by more handset manufacturers than just Nokia, this could be a significant development. For example, the V800 from Sony Ericsson that we were using to download tracks from Vodafone stored its audio in the OMA format, so in the future tracks downloaded by this phone could be played back using Windows Media Player 10.

But even if this doesn't happen, one of the advantages of the move towards over-the-air downloads is that mobiles are starting to feature built-in mp3 players. This, of course, means you can download tracks from your own mp3 music library

You can use DBPoweramp to convert mp3 files to a lower bit rate to make them compatible with fussy handset music players

Some phones can play back files compressed using AAC codecs. The advantage is that music stored in this format takes up very little space

the USB performance of these handsets can also be very slow for large file transfers. In fact we've found that by far the best way to get mp3 files into a handset is to use a PC memory card reader to transfer the tracks to the phone's memory card. You can now get a multi-format card reader for as little as £10, so even if your computer doesn't already have a reader, it's not expensive to add one.

However, you have to be careful to make sure that you put the music tracks in the correct folder, as many of the phones don't feature a file browser and the mp3 player applications will only read tracks from a specific place on the memory card. For example, on the V800 the mp3 tracks have to be stored in the MSSEMC\Media files\audio folder, otherwise the music player application won't be able to find them. The Nokia 6630, on the other

to the phone. But what's the best way of doing this?

Most of the latest phones have Bluetooth technology built in, and sometimes you can use this to transfer files from your laptop or PC to the handset. But while transferring ringtones and the odd picture file over Bluetooth is fine, the technology is too slow to use for sending larger mp3s. Many of the phones also come with USB leads you can use to connect them to a PC. Unfortunately

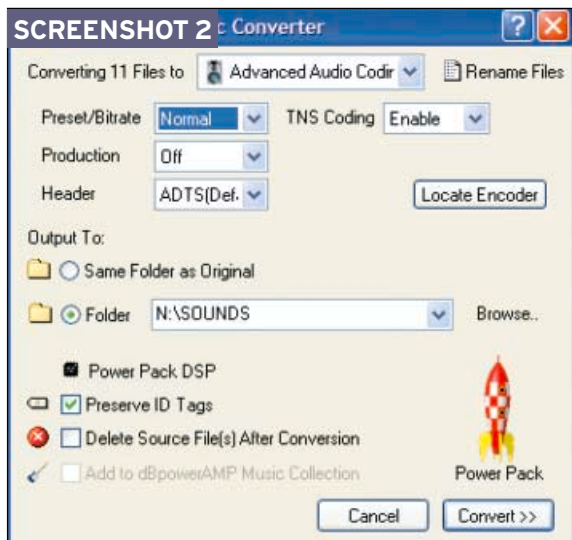
hand, will automatically find any compatible files loaded on your phone, so it doesn't matter where you place the files. However, it's best to keep them in the \Sounds\Digital\ folder, because that's the default area where the Series 60 operating system stores digital audio files.

Converting music files

Another issue is that handsets tend to be fussy about the files they will read. Many will simply refuse to play variable bit rate files and some handsets, such as the Sharp GX-30, will only play mp3 files encoded at rates of 128Kbits/sec or less. The easiest way we've found around this is to use a program to convert the bit rate of your files before sending them to the memory card. A neat application for taking care of this job is the music converter you can download from www.dbpoweramp.com.

Once you've installed the application on your computer, you need to place the phone's memory card in your PC's card reader and then run the application. You'll be asked to select the tracks you want to convert. DBpoweramp can batch convert files so you can select a whole folder of songs in one go if you like. On the next screen select 'Mp3 (Lame)' as the format you want to convert to and use the slider to set the bit rate to 128Kbit/sec (see screenshot 1). Then on the 'Output to' line, select the folder on your memory card where you want to copy the files to. Finally click on the convert button and your files will be converted to the correct bit rate and stored in the correct folder on your memory card. The conversion process shouldn't take all that long on a reasonably specified machine. Also, as long as you make sure the Delete Source Files box is not ticked, your original mp3s will remain unaffected.

Some phones can also play back music compressed using mpeg4 AAC technology. The advantage of AAC files is that they are much smaller than mp3s, yet offer roughly the same audio quality. If you want to try out using AAC you'll need to download the AAC codec from the Codec Central part of the DBpoweramp website because it's not included as standard in the main application (see screenshot 2).



CONTACTS
Hands on Sound will return in the October issue. Niall Magennis welcomes your comments on the Sound column. Email him at: sound@pcw.co.uk. Please do not send unsolicited file attachments.

PLASMA & LCD TVs

▶ PLASMA PACKAGES

£1799

£1999

£2399

Tiny Optima 42" Plasma Package

Tiny.com cut out the middlemen to deliver our amazing 42" Plasma package at a sensational price. This Plasma TV comes complete with £399 PT40 Plasma Table, £349 FS400 5.1 Floor Standing Speaker System, 5.1 DVD system and many other extras for just £1999!

The complete set-up with everything for just £1999!

42" Tiny Optima 431 Plasma TV with Samsung Panel, Integral advanced TV tuner system with Teletext and TV remote. Full connectivity with component video, 2 SCARTs and many other inputs. Handles XGA (1024 x 768) PC inputs.

- Plus Desktop Stand
- Plus Stereo Detachable Speaker System
- Plus £349 FS400 5.1 Speaker System
- Plus £129 DP3 DVD System with 5.1 sound system

Plus £399 PT40 Plasma Table

~~£1999~~
£999

inc vat
PLUS Delivery†

E-code Tab: 10068
E-code Wmt: 10069

HALF PRICE

FREE DELIVERY
WHEN YOU ORDER ONLINE
LIMITED OFFER



WALLMOUNT OPTIONS
(INSTEAD OF TABLE)
-NO EXTRA COST

BEST BUY Focus 4291 Package

with superb 3000:1 contrast and metal chassis. Includes FREE upgrade to £299 DR50 DVD Recorder ~~£2399~~ **HALF PRICE £1199** E-code 10066

HALF PRICE

Complete LCD and Plasma TV Packages



FREE DELIVERY
WHEN YOU ORDER ONLINE
LIMITED OFFER

Tiny.com 27" LCD Package

High spec Tiny.com 27" HD Ready LCD TV complete with £399 PT40 Plasma Table and many other extras for just £1399 - Half Price at £699 for first 100 orders.

The complete set-up with everything for just £1399!

27" Tiny LCD TV with superb XGA (1280x 1024) TFT screen (HD TV Ready), Integral advanced TV tuner system with Teletext and TV remote. Full connectivity with component video, DVI, SCARTs and many other inputs.

- Plus Desktop Stand
- Plus £99 Internet Box
- Plus £399 PT40 Plasma Table
- Plus £349 FS400 5.1 speaker system
- Plus £129 DP3 DVD system with 5.1 sound system

~~£1399~~
£699

inc vat
PLUS Delivery†

E-code Tab: 10066
E-code Wmt: 10070

HALF PRICE

32" LCD Package

As above but with 32" LCD TV and Free Upgrade to DR50 £299 DVD Recorder System. **£299 extra** E-code 10065

▶ PLASMA PACKAGES

£1399

£1599

£1799

the computer shop

&

tiny.com
HOME CINEMA - FACTORY DIRECT

STORES NATIONWIDE
For nearest store call
0870 830 3119

ORDER HOTLINE Mon-Fri 9am-7pm Sat 9am-5pm Sun 10am-4pm
0870 830 3184
or visit www.tiny.com to see the full range

††LCD TV Courier delivery £39.99 27"; £99.99 32". *Pay courier delivery by credit card. Time Plan finance example: Cash price £1000. Pay 48 monthly payments of £29.52. Total price £1416.96. APR 19.9%. Finance is subject to status and only available on selected Models. Written details on request. Prices, specifications and offers subject to change, availability and our conditions of sale - copies available from Tiny.com, DCS Ltd, Granville House, Burnley, BB12 7TG. Fax: 01282 77 07 01. Offer extended. Licensed credit brokers. E&OE

19.9%
APR
3 YEAR
Extended
Warranty
£399

HCM20
(PCW/08)

Alan Stevens has been implementing and supporting networks for over 25 years, working for IT vendors, systems integrators and customers. He now mostly researches and writes about networking matters



Get your network security SUSsed

Find out how to take the pain out of updating software security patches

Security is a term which covers a multitude of sins, with an equally daunting array of tools to go with it – some easy to deploy, others not so easy.

Firewalls, for example, tend to come ready-configured, often as just another option inside an Internet router. Likewise, anti-virus protection is easy to set up, with most products more than capable of keeping themselves up to date – just as long as you continue to pay the subscription.

Making sure the software on your PCs and servers is similarly updated, however, is far from easy and it's this issue of software patching that we'll concentrate on this month.

Automatic updates

The practice itself may not be simple, but the rationale behind patching is easy enough to understand. Vulnerabilities in both operating systems and application software make it easy for would-be hackers, virus writers and the like to go about their nefarious business, with the popular Windows platform a favourite in this respect. Patching the software to eliminate vulnerabilities as and when they're discovered is, therefore, an essential first line of defence against such threats.

It's taken a while, but in the past few years Microsoft has started to wake up to this need and is at last doing something about it. Moreover, the most obvious manifestation of this new-found emphasis on security is the very useful Windows Automatic Update service, included in every implementation of Windows from Windows 2000 onwards.

Automatic Updates relies on something called the Background Intelligent Transfer Service (BITS) to transparently download and install security updates, hotfixes and other Windows patches as and when they're released. Spare bandwidth and processing power are used to achieve this with minimal impact on performance, the background update services quietly getting on with the job while the users of those systems go about their normal activities.

Unfortunately, as much as this is a good idea on individual PCs, on a network, individual automatic updates aren't necessarily welcomed.



First, most network administrators like to check for compatibility and potential problems before allowing any new updates to be installed. That way they can avoid a sudden rush of support calls when a new patch clashes with a particular application or custom setup. Added to which the more PCs on the Lan, the less likely you are to want to leave them to download the same large files from the Internet at the same time. All the more so, given the Microsoft release schedule, which sees most of its updates released on the second Tuesday of every month. A date when network bandwidth and availability can be shot to pieces if you don't manage the automatic update service yourself.

In small companies, where you only have to worry about a handful of systems, you could always get away with manual management. But as numbers rise this becomes increasingly impractical, so it's worth investigating the Software Update Service (SUS), a free tool, which can be downloaded from the Microsoft website and run on a server to better manage the download and distribution of Windows updates.

Some security measures such as firewalls are easy to deploy, even on small networks. Others, such as PC and server patches, are a lot more hands-on

How SUS works

Microsoft's Software Update Service is a very straightforward application, which can be set to automatically download the same updates and patches as used by the Windows Automatic Update service. However, instead of applying these to host systems individually, the patches are stored and only made available to client PCs and servers once marked as 'approved' for release.

The same client software as used by the Automatic Update service is employed to apply the patches once approved, but they're downloaded from the local SUS server rather than Microsoft's Windows Update site. Extra controls are also available to specify when updates are downloaded, and when and how they're made available, with management via Group Policy another benefit of the SUS approach.

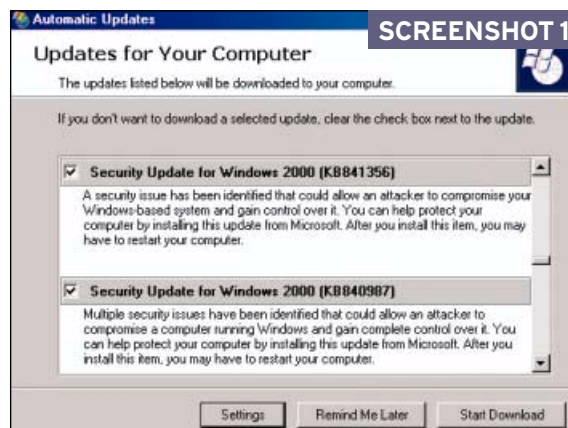
The current version of SUS (SUS 1.0 with SP1) can be downloaded from the Microsoft website (www.microsoft.com/downloads). There is a later version, now referred to as WSUS (Windows Server Update Services), able to handle other updates for applications beyond the core Windows OS. However, at the time of writing, this new application was only available in beta format (see box on the next page for details) so, for the purposes of this article, I'll be sticking purely with SUS.

SUS deployment

Any implementation of Windows Server from 2000 onwards can be used to host the SUS software, including Small Business editions. However, the SUS server can make big demands on the processor, particularly when synchronising updates with the Windows Update website, so don't put it on an already heavily used system. There can also be clashes with other IIS applications and Microsoft recommends using a dedicated server if at all possible.

You'll also need at least 6GB of disk space to hold the patches, on top of space required for the software itself (50MB). However, there are no licensing issues to worry about and no charges, either for the SUS software itself, or for using it.

In order for SUS to work, the host server needs to be IIS configured, and



Great for individual PCs, Windows Automatic Updates can be a problem to manage on a network

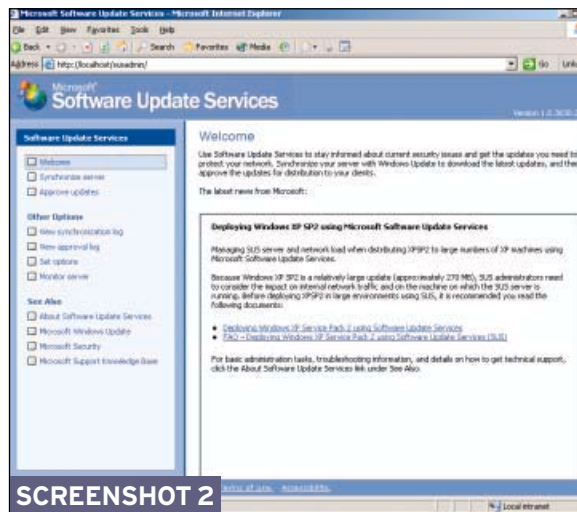
if installing on a Windows 2000 Server or Microsoft Small Business Server 2000 with SP1, the setup utility will automatically install the IIS Lockdown 2.0 and URL Scanner 2.5 add-ons for you. That aside, there aren't any other prerequisites and installation is straightforward – just a matter of running the self-extracting executable and answering a few questions asked by the setup wizard. A browser GUI is provided (see screenshot 2) to manage the SUS server, so you don't have to log on to the local console every time.

Once the SUS server is up and running you can choose between manual and automatic synchronisation of updates, against the Windows Update server, with the option of scheduling the process to run out of hours if required. Either way, the first synchronisation is likely to take several hours (even with a fast Wan connection) and is best done overnight to minimise the impact on the host server and your Internet bandwidth.

On the plus side, you can minimise the time taken by only downloading updates for the languages you need to support. It's also possible to just download the catalogue listing the contents of the updates, while the .cab files themselves (the actual updates) are left on the host server. This really does speed up the synchronisation process, although you will have to download the updates at some point to enable local distribution, otherwise clients will still have to pick up the approved patches from the public Windows Update server.

The approvals process

Having synchronised the SUS server with the Windows Update website you'll then be able to view the list of downloaded updates and patches via



SUS becomes WSUS

Although worth having, SUS is limited to patching the main Windows OS and can't be used to manage updates for Office, SQL Server, Exchange or any other Microsoft applications. That will soon be possible with the next release, which was initially named WUS (Windows Update Services) but was re-named Windows Server Update Services (WSUS).

At the time of writing the WSUS release candidate had just been made available for open evaluation – just for Windows updates. The final version should be more generally available by the time you read this and, like SUS, can be deployed on Windows 2000 or Windows Server 2003 systems.

As well as being able to handle updates to Office, Exchange, SQL Server and, eventually other Microsoft applications, WSUS adds new facilities to target update policies. This can be done using either manually defined machine groups or organisational units in an Active Directory domain. The ability to build tiered networks of Update Server will also make it easier to handle large networks, and extra reporting facilities have been added to help troubleshoot and manage patch distribution.

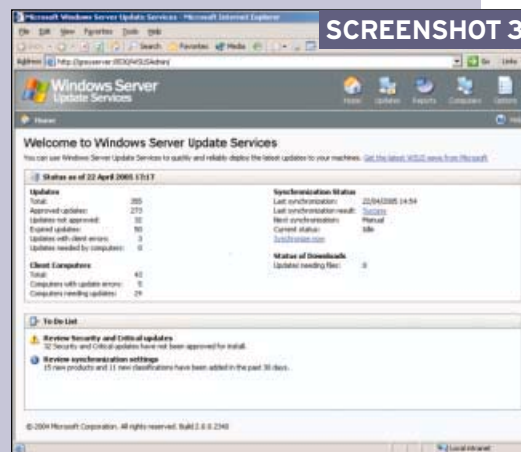
Better integration with Microsoft Systems Management Server (SMS) and the Baseline Security Analyser (MSBA) tool is another benefit of WSUS. At present, different analysis engines are used by these applications to check for vulnerabilities and, similarly, they use different back-end databases for storage. With the introduction of WSUS (and MSBA 2, due later this year) this will no longer be the case.

SUS is installed on a Windows server running IIS and is managed remotely via a browser

the management GUI. Individual updates can then be approved, thereby making them available to automatic update clients. Alternatively, it's possible to save the associated .cab files to a local directory for testing before deciding whether or not to approve.

You can also opt to synchronise against other SUS servers. This provides a degree of control over the bandwidth required, allowing you to locate servers where they can be accessed locally, rather than over slow Wan links. It also enables updates to be tested in a secure test lab environment before being distributed to local update servers on the main company network. You can even deploy a SUS server on a network without a direct Internet connection this way.

At the client end you also need to tell the automatic update software to pull updates down from your SUS server instead of going over the Internet to the public Windows Update site. The preferred way of doing this is through Group Policy, although for networks where Active Directory isn't used the client



Now called Windows Server Update Services (WSUS), the next generation of SUS will be able to manage patches for Office, SQL Server and Exchange as well as Windows

One result of this change is that WSUS will require SQL server to hold updates. However, a copy of MSDE (Microsoft SQL Server Desktop Engine) will be provided for companies without an existing SQL Server host and is also included in the evaluation download. The only other requirement is for version 2 of the Background Intelligent Transfer Service (BITS), used to download updates with minimal impact on network bandwidth and host processing time. This isn't included with the software and should be obtained and installed separately, prior to trying to deploy the WSUS application.

Registry can be modified directly. Just how you distribute the Registry changes will then depend on your environment. But full details of the keys required can be found in the SUS deployment guide also available from the Microsoft download site. Details of what's required to manage the process using Group Policy are also in this document.

Similarly, if you have an early implementation of the automatic updates client, which doesn't support SUS, an updated version is available to download. However, if you've kept up to date with service packs, that shouldn't be necessary. With Windows XP, for example, an updated client was included in SP1 and in SP3 for Windows 2000. These can be used with an SUS server without any modification and once you've configured SUS the clients should update themselves automatically.

CONTACTS

Alan Stevens welcomes your comments on the Networks column. Email him at: networks@pcw.co.uk. Please do not send unsolicited file attachments.



Get control over option groups

Some Access controls have annoying habits, so we show you how to tame them

Access provides a set of UI (user interface) controls, one of which is the option group. This is great for users, but it does have some odd behaviour that is less than optimal for developers. It allows the user to choose from a set of acceptable text options (such as 'King', 'Emperor', 'Adelie' or 'Rockhopper'), but it always writes a numerical value (1, 2, 3, 4) into the field. This makes querying the database somewhat counter-intuitive. In fact, explaining this bizarre phenomenon was the basis of a large part of last month's column. This month, instead of whining about it, I thought I'd offer a solution that allows an option group to insert text, rather than numbers, into the underlying table. The solution I'll use (there are others) helps illustrate the difference between bound and unbound controls. It also involves writing two VB event procedures that use the functions Switch and Choose; so, even if option groups don't appeal, you may still find the solution useful.

The basis of this approach is to 'unbind' the option group, which simply means it is no longer automatically bound to a field in the table. This stops it from writing those perfidious numbers into the field. We then use some VB code that tells the option group to interact with the required field, but in a specific way that we control.

The sample database (you'll find DBCAug05.mdb on the DVD edition of PCW) contains a table called Penguin. Within Penguin there is a text field called Topen (Type of Penguin) that already holds some text entries – some of which are correct, others that are inappropriate (see screenshot 1). Create an autoform based on the table Penguin. Swap into design mode and turn the Tool wizards off. Then place an option group on the form and give it a Name, such as PickPenguin. In the sample database, I have saved a form at this point called Penguin1.

Now place four option buttons into the group (the background of the option group turns dark grey as you do this), one for each of the four permissible choices. Name the option buttons as you wish – I've chosen to use the prefix Option and then the text value, as in OptionKing,

ID	Name	TOPen
1	Louis	RockHopper
2	Cuthbert	RockHudson
3	Tim	RockHopper
4	Claudius	DennisHopper
5	Kitty	Adelie
6	Cecil	King
7	Flim	King
8	Kit	Emperor
9	Dougal	Adelie
10	Constantine	RockHopper
11	Herbert	King
13	Julius	Rock Hudson
14	Keith	King
15	Snail	1
16	Pim	King
17	Linda	RockHopper
18	Ahl	Emperor
19	Ptolomy	King

SCREENSHOT 1

OptionEmperor and so on. In order to work, the option group needs a number allocated to each option (as we know from bitter experience) so set the Option Value property for the OptionKing button to 1, for OptionEmperor to 2 and so on. Change the Caption of the labels to help the user. This is saved as a form called Penguin2 (see screenshot 2). Now we have everything we need on the form, what's our plan?

First, we want the option group control to be able to convert the text entries in the underlying table into numbers so the control can display the correct selection for the existing records. If, for instance, it finds 'Emperor' in a record, it should highlight its second button, the one that has the value 2 as its Option Value property.

Second, whenever a new record is added or an existing one updated, we want the option group to convert the numbers it uses into text. It should then pop that text into the underlying table.

Let's tackle the first part of the plan. The form has an On Current property: an event procedure attached here will be activated every time a move is made between records. The controls fetch and display the current record and this is where we need our text-to-number conversion code. Click in the form's

top left corner to see its properties, find the On Current property (under the 'Event' tab), right-click and select Build, choose Code Builder, and Visual Basic should spring into life and allow you to insert the code.

This is the code to do what we want:

```
Private Sub Form_Current()
Me!PickPenguin = ✓
Switch( _
Me![TOPen] = "King", 1, _
Me![TOPen] = "Emperor", ✓
2, _
Me![TOPen] = "Adelie", ✓
3, _
Me![TOPen] = ✓
"Rockhopper", 4)
End Sub
```

(Key: ✓ code string continues)

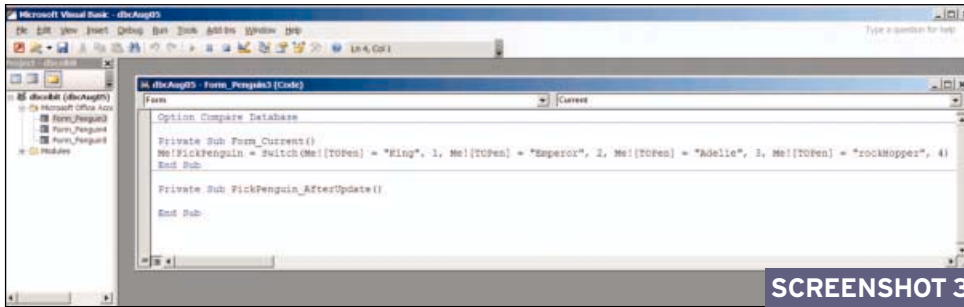
The underscores indicate line breaks put in for readability: the code can be written as one long line, and Me always indicates the current object (see screenshot 3).

How is it working? The Switch function is the important part here. It takes a list of up to seven pairs of expressions and values: our code uses four pairs. Here Switch looks at what's in Me![TOPen]; in other words, it looks in the field called TOPen and returns the value for the current record. Let's assume it returns 'King': now it looks along its list, identifies the 'King' expression as a true match and returns the value '1'. Switch feeds this value to the PickPenguin option group and the first button is shown as selected. When the form displays another record, the On Current code is fired again and the option group again displays the correct selection. The form called Penguin3 shows this working.

The field Topen contains a mixture of accurate and non-accurate data

The form begins to take shape; this is Penguin2

SCREENSHOT 2



SCREENSHOT 3

Now for the second part of the plan. We need code that will allow the option group to cope with new and updated records. Find the option group's After Update property and attach this code:

```
Private Sub PickPenguin_AfterUpdate()
    Me!TOpen = Choose( _
        Me!PickPenguin, ✓
        "King", "Emperor", ✓
        "Adelie", "Rockhopper")
End Sub
```

Here the key function is Choose. You give it a value to match and Choose looks at its list of expressions (it can take up to 13) and returns the one that matches the value. Here we've given it Me!PickPenguin; this is the number presently held by the option group. If it was 4, then Choose would return Rockhopper and it's fed into Me!TOpen, the text box bound to the underlying table.

Save the form, flip into Form view and inspect the records. This has been saved for you as form Penguin4.

One last tweak would be to delete the Topen text box from the form so that only the option group is showing the value in the Topen field (saved as form Penguin5). For each record with a text entry, the option group displays the correct choice (see screenshot 4). You'll notice that the option group cannot translate records that already contain an entry that is not on the list – even 'Dennis Hopper' and 'Rock Hudson' are unacceptable substitutes for 'Rock Hopper'. However, the good news is that, as long as this form is used to enter records, only correct data can be entered into the table.

There are many ways to accomplish the functionality shown here. An alternative is to bind the option group to a hidden text box on the form, and bind that to the underlying table. This is more complex, but it makes the code more portable. The bottom line is that, by modifying the default behaviour of the option group, you can make it more useful.

ASP.Net and ADO.Net

Database engines are pieces of software that hold and manipulate

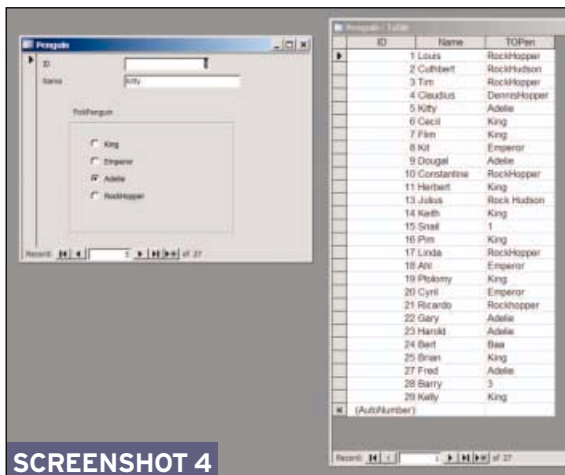
Here Visual Basic is being used to write the code attached to the form's On Current event

data. Strictly speaking, they have nothing to do with presenting data to the users. Most companies that supply database engines are, of course, happy to sell you add-ons for functions such as form and report building. Indeed, Access has these built in; but it is still true that database engines are not concerned with data presentation. On the other hand, a database is useless if users can't reach the data it contains, and more and more users are expecting to reach data across the Internet. So we've decided to look at the technology that aims to help get data to users; namely ADO.Net and ASP.Net.

The following is somewhat simplified; indeed, it would take an entire book to tell you everything you need to know about these technologies. With that in mind, I've been looking at some books on these topics and next month I'll include some brief reviews.

Starting with the common suffix, .Net is Microsoft's development platform comprising several technologies with the collective name of the .Net Framework: these technologies facilitate the rapid development of web- and Windows-based applications. Associated with, but not part of, the Framework is Visual Studio .Net (VS.Net), which is a development environment in which you can work with ASP.Net.

The completed form has an option group that looks perfectly normal but now has a more useful behaviour than the default



SCREENSHOT 4

ASP.Net is also a Microsoft technology for building web-based applications: as you'd guess from its name, it makes extensive use of the .Net platform. It is a development of ASP (Active Server Pages), but is a different ball game, so much so that migrating an application from ASP to ASP.Net is likely to require significant exertion. ASP is now often referred to as 'classic' ASP.

With ASP.Net you can create Web Forms and web services. Working within the VS.Net environment, Web Forms can be constructed rapidly by dragging and dropping controls onto a form and then writing the code to perform the necessary response. Web services can also be built from within VS.Net: these are applications without a user interface that are used to provide services to websites or other applications (an example is a 'stock ticker', which fetches the current value of the chosen stock from a database that can be anywhere on the Internet).

ADO.Net is again a much souped-up version of its predecessor ADO (ActiveX Data Objects). ADO.Net also makes use of the .Net Framework. and ADO.Net's role is to provide consistent access to data sources. It offers a set of optimised data providers for accessing a range of data sources such as OLE DB, ODBC, SQL Server native and so on.

The fundamental difference between the two technologies is that ASP.Net is used to create web pages, while ADO.Net retrieves information from various data sources.

Too much Access?

In rapid succession I received two emails berating me for devoting too much of the column to Access. The reason for the Access bias is that by far the majority of the emails I get relate directly to Access. In my defence, I try, whenever possible, to look at issues that are more generic and to offer solutions in SQL, which is broadly transferable. However, the readership is always the boss. If you feel you want more of the column devoted to another database engine, simply email me with a subject line reading 'Column – name' where 'name' is the name of your chosen engine. You don't even have to put anything in the email. You can, of course, also elect to maintain the status quo by voting for Access.

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: database@pcw.co.uk. Please do not send unsolicited file attachments.



Champing at the 64bit

An insight into moving to faster chips, and an in-depth look at Visual Studio 2005

At the Windows Hardware Engineering Conference (Winhec) in April, Microsoft released the first 64bit version of Windows XP, bringing 64bit computing into the mainstream of personal computing for the first time.

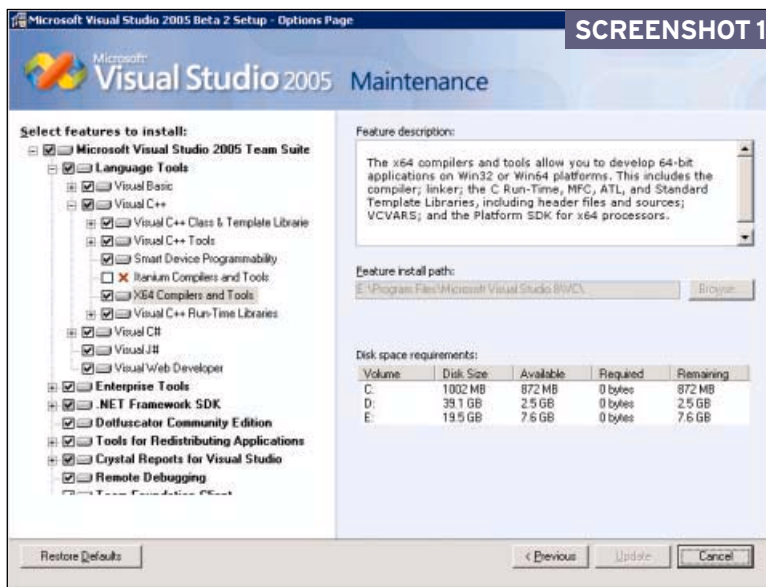
This is one area where the hardware is ahead of the software. AMD, Intel and IBM have been selling 64bit processors for some time, but operating systems have moved more slowly. There are two main reasons. The first is compatibility – most software today is 32bit, and nobody wants an operating system that will not run the software they use. To succeed in the mainstream, a 64bit operating system needs excellent support for 32bit applications.

The second factor is the lack of much benefit to typical users. In fact, 32bit processing does not impose any obvious limitations on most day-to-day work, so whereas users saw an immediate advantage moving from 16bit to 32bit in the 1990s, the move to 64bit now is less compelling.

Here is a quick look at the advantages of 64bit. In a 64bit processor, the general registers are 64bits wide, which means they store numbers between 0 and 2^{64} , or 18,446,744,073,709,551,616. This typically becomes the fundamental integer type of the system. The most obvious consequence is that the system can theoretically address 16 Exabytes of memory, up from 4GB in 32bit systems. An Exabyte is more than a thousand million gigabytes, so the difference is so big that it is hard to grasp.

There are also advantages for maths calculations, since the processor can work efficiently with 64bit integers, enabling faster high-precision calculations. The downside is that data typically occupies more space in memory. Pointers are represented by 64bit integers, occupying twice the space of a 32bit pointer.

Since few PCs today, other than servers, have as much as 4GB of Ram, the ability to address a squillion times as much is not yet exciting for most users. On the other hand, there is a big advantage for server applications, which can cache more data in Ram for very fast search and retrieval. There are some other factors



to consider. The 64bit processors have additional registers, and the operating system can exploit these for extra performance. Microsoft has added an extra twist, by releasing a 64bit version of Windows XP that is more than just a port. The x64 Edition of XP is built from the Windows Server 2003 code, so it includes numerous improvements that have nothing to do with 64bit as such. People will want to use 64bit Windows XP simply for the sake of its extra reliability and security.

The downside is that even if you have a 64bit processor, there might not be any compatible drivers for your cards and peripherals (see our feature on 64bit computing in *PCW* July, page 103, for our experiences with the pre-release software). There is no way to use 32bit drivers in 64bit Windows. That will put a brake on widespread adoption until drivers are available, but even so there will be some adoption. You may happen to have an application that will benefit from 64bit memory access or calculations, but even if you do not, you still need to plan ahead as it's likely that your work will end up running on a 64bit system eventually.

Programming issues

Nobody would run Windows XP x64 if it lacked support for 32bit applications. In fact, these run very well, but do so in a compatibility layer called WOW64 ('Windows on Windows'). If you want to create

Visual Studio 2005 comes with compilers for x64 and Itanium, which you can install even on 32bit systems

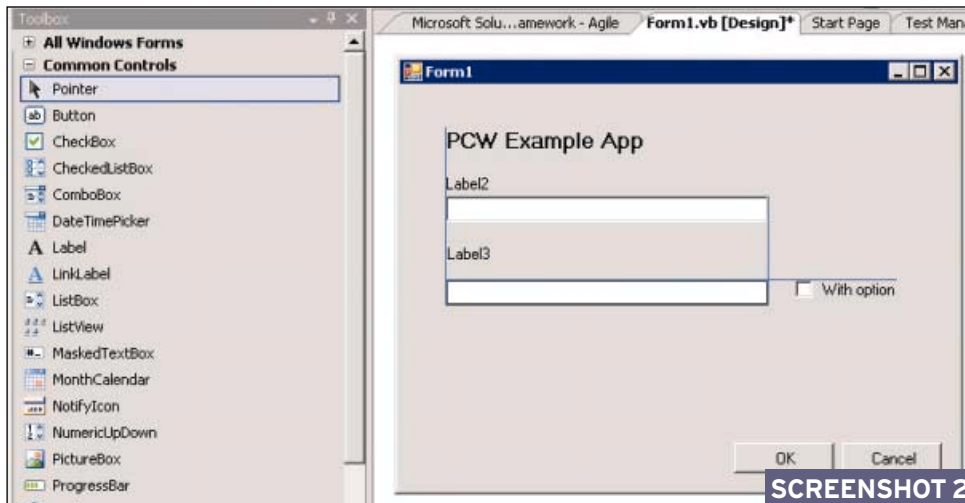
straightforward. Most data types are the same length in both 32bit and 64bit Windows. However, there are a few things to be aware of:

- All pointers are now 64bit. This causes problems if you have existing code that casts pointers to 32bit data types.
- Most other data types are the same length in Win32 and Win64. For example, an int is still 32bit. There are new 64bit data types.
- 16bit applications will not run at all in Win64.
- 64bit code cannot call 32bit code directly. There is no 64bit equivalent to thinking, used to call 16bit DLLs from 32bit code. Instead, use inter-process communications.

It is useful to be aware of these issues even if you work in Visual

64bit programming on Mac OS X

The G5 processor used by Apple in most of its desktop systems is a 64bit processor, but able to run 32bit applications at native speed. It is similar in that respect to the x64 processors from Intel and AMD, but Apple's approach is different from Microsoft's. OS X remains essentially 32bit, and the Apple sees little advantage in 64bit for client computers. However, OS 10.4 does include 64bit libraries conforming to the Unix LP64 standard, and you can compile and run fully 64bit applications. The main limitation is that the Mac GUI API remains 32bit, so you have to use inter-process communication if your 64bit application has a GUI component. The bottom line is that Mac users have an easier ride in terms of compatibility, but Windows has a more complete 64bit implementation.



Basic, since it impacts Windows API calls. As for native-code VB, it seems unlikely that Visual Basic for Applications will ever be ported to 64bit. Microsoft is promoting the .Net Visual Studio Tools for Office as the next-generation macro programming language.

Visual Basic .Net is a different story. The .Net concept is designed to make platform transitions seamless. There is a 64bit version of the .Net Framework 2, and its just-in-time compiler will take your VB.Net application and compile to native 64bit code. The same is true for C#. The catch is that this will only work if your .Net code does not use PInvoke (Platform Invoke) to call native code libraries. The .Net runtime will try to detect this case, and if it finds PInvoke code, the entire application will run under the 32bit version of .Net. Unfortunately, a large proportion of real-world .Net applications do use some PInvoke, so it is likely that your application will end up running on WOW unless you do some porting work.

Visual Studio 2005

Visual Studio 2005 is very late. It was originally intended as a 2004 release, but is now set for late this year. Longhorn, the next major version of Windows, will likely signal a further release of Visual Studio. If Longhorn makes its promised 2006 date, that could mean a short life for the new Visual Studio. All that is open to speculation. In the meantime, Microsoft has released a second beta of Visual Studio 2005 complete with the new Team System. The beta is on offer to anyone who cares to sign up for it, and you are even allowed to do limited deployment of your applications using a 'Go live' licence. This is mainly intended for web applications, since you are still not

The blue lines shown here appear automatically when you move or resize controls. Since most form layouts require aligned controls, this is more useful than simply snapping to a grid

Each Team System project automatically generates a team site, based on Windows 2003 Sharepoint Services, where you can host documents and discussions, view dynamically generated reports, and track bugs and other work items

allowed to distribute code built with the beta version.

This is a huge release, and does a lot of things right. Many small details add up to a big improvement on the old version. For example, the new auto-align feature snaps a control into line with other controls on a form, making the tedious business of form layout faster and easier (see screenshot 2). Another benefit is that new data-aware controls in Visual Basic bring back some of the ease of use that was in VB 6, and which got lost in the transition to the .Net database API. The ability to run .Net stored procedures in SQL Server is great news for VB developers, and the Express versions of the various Visual Studio products are ideal for hobbyists and those on limited budgets.

At the other end, Team System has a fantastic feature set, with integrated testing and bug-tracking and an automatically generated team website for sharing documents, hosting discussions and tracking progress (see screenshot 3). Everything is accessible from within the Visual Studio IDE, so you can simply right-click to perform tasks

such as checking out code, viewing code history, adding bug reports or other work items, or running queries to monitor progress. The team website can be viewed within Visual Studio, or in a separate Internet Explorer window.

Although there is a lot to like, the Visual Studio 2005 beta also has some worrying aspects. The first question mark is over performance. Many developers are hoping for substantially better performance in .Net 2, especially for Windows Forms applications. It would be silly to make a final judgement on this based on a beta, but it is disappointing that there is little evidence of improvement. The IDE itself is rather slow. Second, the installation process for Team System is painful. It builds on a bunch of Microsoft technologies, including SQL Server 2005 with Reporting Services, Sharepoint Services, Microsoft Office, and the .Net Framework 2.

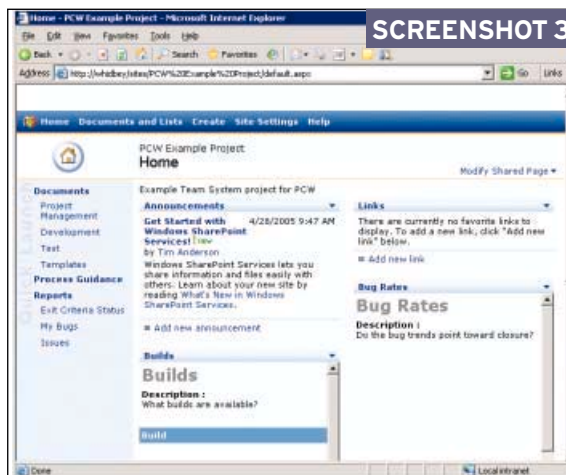
It is also a multi-tier system, although it is theoretically possible to install all the tiers on a single box. Windows Server 2003 is required, and you should use a test system because a clean uninstall cannot be guaranteed. If you do have the resources and patience to install Team System, it's important to read the release notes carefully, do things in the right order, and watch out for the permission issues that have afflicted many early adopters.

It is only a beta, but it looks as if Team System will always be large and complex. At the same time, features such as integrated testing, bug-tracking and document libraries are valuable even for solo developers, so it will be a shame if Team System proves unsuitable for small-scale setups. The other concern is that all these interdependencies may make Team System fragile. There is still something to be said for more ad-hoc systems, using something like Subversion for source control, and standard web-based discussion boards and mailing lists for team interaction. These systems may be less satisfying from an integration perspective, but they are less likely to break and easier to fix when they do, because each part runs independently.

For more information on Visual Studio 2005, go to <http://msdn.microsoft.com/vstudio>.

CONTACTS

Tim Anderson welcomes your comments on the Visual programming column. Email him at: visual@pcw.co.uk. Please do not send unsolicited file attachments.



Keeping the attackers at bay

How do you know if your wireless network has been hacked? Follow our step-by-step guide to find out what to look out for and get some tips on how to prevent unauthorised entry

In this Hands on workshop, we're going to give you several tips on how to detect 'pests' in wireless networks. Even if you're aware of the protection mechanisms used to defend against various types of attack on a wireless network, if something goes wrong without you realising, how do you know if someone has managed to get in?

Having configured the encryption of your network, established a good password rotation system, filtered authorised devices via MAC addresses and installed a good firewall on your network, security should not be a problem. But are you really sure? How can you know whether a wireless network is only being used by those permitted to do so?

This is a difficult situation if you don't have a firewall between the your cabled and wireless networks and, unfortunately, it is very

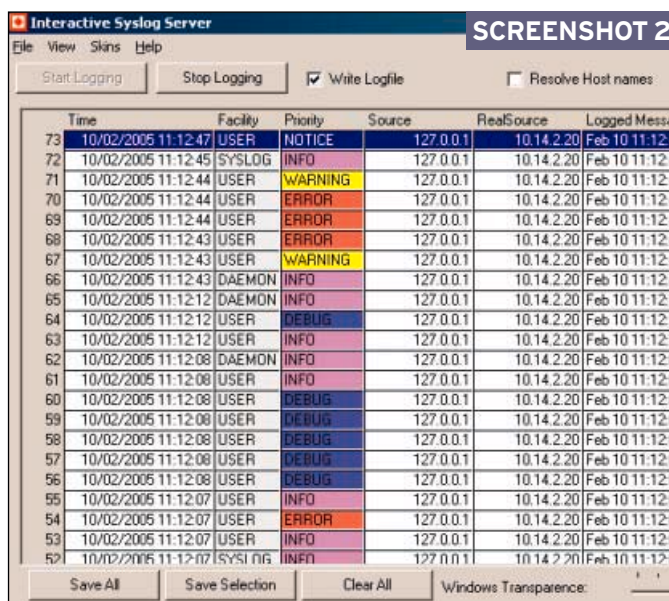
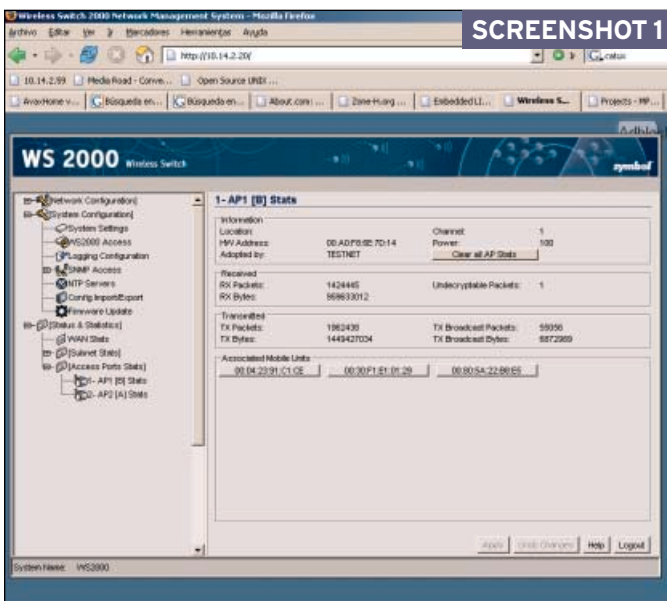
common not to have a firewall. There are several ways of directly detecting the presence of unauthorised devices, although these depend on the capabilities of your access point (AP).

In general, the more modern and the higher-end the device, the more it can detect and protect, with the best devices being the ones designed for industrial-strength installations.

Manufacturers of simpler, low-cost APs intended for consumer use often offer only basic options. We'll now look at some of the most effective ways of checking who is infesting your wireless network.

This article assumes familiarity with networking terminology and compiling applications under Linux and, as such, is intended for intermediate to advanced users.

José Plana Mario



Step 1 – The access point itself

Most devices, even routers with the most basic wireless functions, let you use the management software or web interface to see the client devices that are currently connected. This doesn't mean it's the most effective way of detecting intruders, but at least you'll know who is connected at any given time.

Implementations vary, but it will normally show you at least the MAC addresses of all devices currently using the AP. The downside of using this method is it relies on you keeping track manually of the coming and going of clients – hardly a productive use of your time.

You also have to manually identify the owners of each of the MAC addresses. Also, in many cases there's no activity log recorded for clients and there's no information about possible security breaches. In short, it's a step in the right direction, but by no means the last.

Step 2 – Syslog (centralised logging tool)

Another way of controlling what's happening at the access point is to use special logging tools. The most commonly used tools use the standard Syslog protocol. Chiefly used in Unix environments, this enables a device's events to be logged onto another machine, often one designed specifically for this task. Once configured properly, the end result is a single log file containing all the events generated by all the devices and nodes in the network.

This is also a particularly useful application when configuring and setting up many types of network devices. For Windows, you'll need some kind of tool that 'listens to' these messages and saves them or displays them on screen.

A couple of suitable options include Winsyslog (www.winsyslog.com) and Snare Micro Server (www.intersectalliance.com/projects/SnareMicroServer/index.html), a freeware application. You can download Winsyslog for free, but some of its functions will stop working after a few days. Snare is easy to install and needs minimal reconfiguration.



SCREENSHOT 3

Step 3 – Sending messages

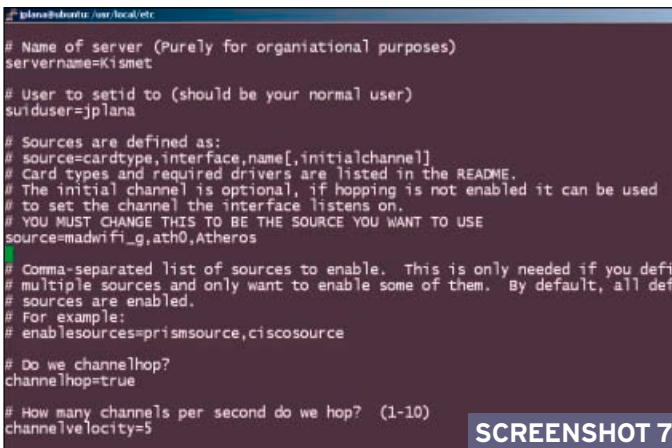
You'll have to configure your access point so it can send alert messages to the machine running Snare. If the access point has an alert function, all you have to do is specify the Snare server's IP address and the correct port (the Syslog default port is UDP port 514). If there is a firewall between the access point and the machine with the Snare Micro Server program, you should open it up to traffic to this machine. Another way of making sure your access point lets you know what's happening is to use SNMP (Simple Network Management Protocol) traps, if your AP supports these. Traps are a simple way for a network device to send an event-triggered message to a network management application – you'll need to check your AP's documentation to see if it supports traps and how to enable this feature. There are some free applications for Windows that let you receive these alerts. A good example is Trap Receiver for Windows NT/2000 (www.ncomtech.com/download.htm), which is capable of receiving traps and generating alerts.



SCREENSHOT 4

Step 4 – The alternative

The methods described in the previous steps are quite basic when it comes to providing detailed information on what's happening on your network. A more robust option is to implement an intrusion detection system (IDS). This examines all the packets in your network, looking for suspicious behaviour ranging from denial-of-service (DoS) attacks to the most sneaky hacking attempts. The best-known solution in the open-source world is Snort (www.snort.org), a Layer 3 (network level) IP packet sniffer which can be run on Windows and can detect many of the dangers encountered in IP networks. Another good tool, and the one we're going to investigate here, is Kismet (www.kismetwireless.net). This is an application for detecting intruders in wireless networks, which works at the Layer 2 (data link) level to identify suspicious activity. The only point to be aware of is that it's a Linux-only application.



SCREENSHOT 7

Step 7 – The configuration file

After installing Kismet, you need to configure some settings in a file called Kismet.conf. We found this in the /usr/local/etc directory. First, specify a user so Kismet can work. To do this, on the line:

```
suiduser=
```

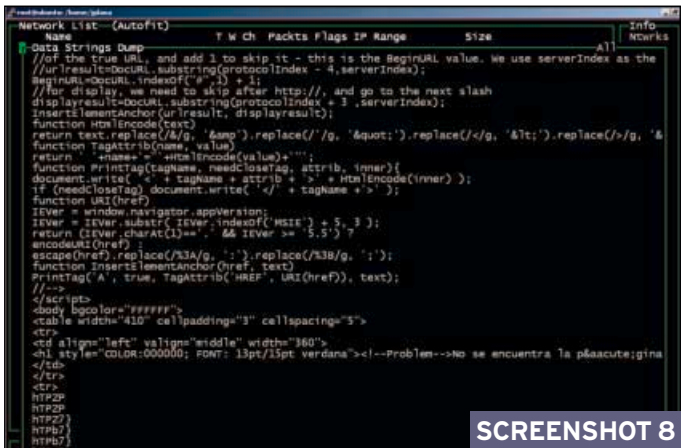
add the user name you normally use. You also need to establish the source from which the tool will take the network packets. In our config file, for example, this was:

```
source=madwifi_g,ath0,Atheros
```

The first parameter is the card driver, the second is the card's device identifier (iwconfig command will show you the available ones) and, finally, the card's system-assigned name. If you want the application to only watch over your network, you'll need to add a line such as:

```
sourcechannels=Atheros:1
```

where the first parameter is the system-assigned name for your card and the second is your wireless network channel number. If you don't specify the last line mentioned, Kismet will channel-hop.



SCREENSHOT 8

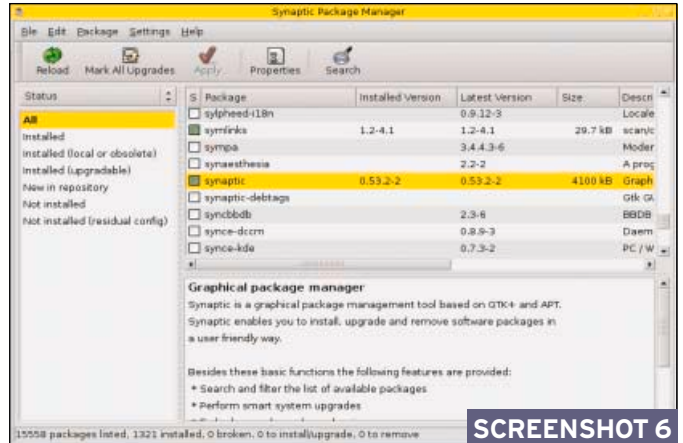
Step 8 – The first time

To start up Kismet, go to the user home directory you specified in the configuration file and run it from there. Otherwise, the application might not be able to write its log files and may not start up. Once the program has started up, you'll be able to see a small list of networks which it detects passively. Obviously, since you've configured it not to jump from channel to channel, you'll only see the networks found on that channel. If your network is encrypted, you can tell Kismet what Wep key to use. Going back to the configuration file, add the line: `wepkey=00:AA:AA:BB:CC:DD,[hexadecimal WEP key]` where the first parameter separated by a colon specifies the access point's MAC address and the second parameter defines the Wep key in hexadecimal (to find out how to convert between Ascii and hexadecimal, go to www.kingsley-hughes.com/tech/security/wep.htm).

Another configuration file (kismet-ui.conf) also controls many of the display options for the panel interface. From this panel you can interact with Kismet, as the screenshot shows.



SCREENSHOT 5



SCREENSHOT 6

Step 5 – Hardware setup

In order to set up your own IDS, you'll need a PC capable of directly connecting to the wireless network. This computer must also have Linux installed and the network card must be supported by Kismet within range.

We used an old Pentium II with 128MB of Ram, with a D-Link (DWL-G520) 802.11g wireless PCI card. The card, which contains an Atheros chipset, is almost fully compatible with Linux and, above all, supports the raw monitoring (rfmon) mode – this is where the card is not associated with any particular network, but listens to all wireless packets within range. Our Linux distribution was Ubuntu (www.ubuntulinux.org), but there's nothing to stop you using an old laptop with a wireless PC Card and a different Linux distribution. Two final pieces of advice – you must be able to connect the device to your wireless network, and don't place it too far from the AP you want to monitor.

Step 6 – Fine tuning

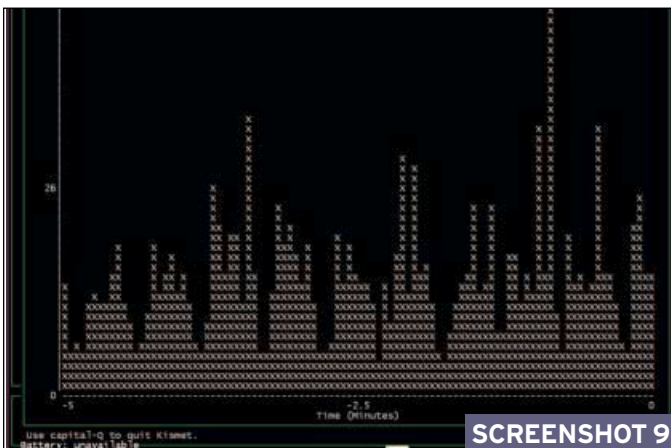
Installing Kismet involves first compiling the application. This is perhaps the most complex step because those who have never done it before will usually come across some kind of problem, such as not having a compiler installed on your machine.

If this is the case, you'll have to use the commands (from a root console)

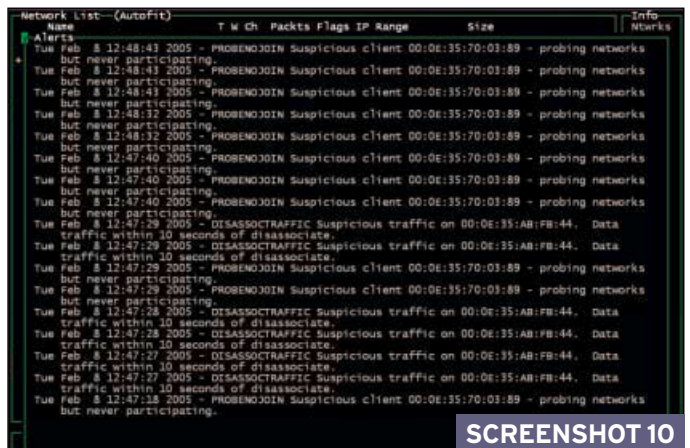
```
apt-get install gcc
and
```

```
apt-get install g++
```

to install the compiler. Then you can follow the steps laid down in the Kismet documentation for preparing the installation (www.kismetwireless.net/documentation.shtml). Another way of loading the necessary packages is to use Ubuntu's Synaptic Packet Manager which you'll find under the system's Device/Configuration menu.



SCREENSHOT 9



SCREENSHOT 10

Step 9 – Searching for suspects

There are several ways of using this excellent tool. We've already seen that it's not difficult to use it as a sniffer and that the packets are saved in a file for subsequent analysis with other utilities.

However, you can also examine what types of packet are being sent, and even the signal level and data transfer rates. The latter option is particularly interesting because since there is a log, it's easy to see if anyone has suspiciously entered your network at 4am.

Step 10 – Alerts

However, the real job of an IDS is far more interesting than this. For example, it can see if anyone with a network stumbler (an application that scans for active APs) is near your access point or if someone is forcibly trying to enter your network. Kismet has built-in signatures for threats and it will display alerts when it detects activity that matches one. Two examples are shown in this screenshot – PROBENOJOIN and DISASSOCTRAFFIC. The first alert is displayed when a client is found to be probing for networks but never joins any that respond. The second is a sign of a possible DoS attack, with data coming from a client within 10 seconds of it disassociating from the network.

It's even possible to integrate Kismet with Snort, by sending the stream of packets captured to a Snort installation so the two applications complement each other. And you can configure it to create voice alerts using its support for the Festival open-source speech synthesis application. We've only scratched the surface of Kismet's functionality, but it should give you a flavour for what it's capable of.



power computing ltd

opening hours
mon - fri 9 - 6pm
sat 10 - 4pm
sun closed

All prices include VAT. **t 01234 851500**

Sale Sale Sale!

2 YEARS RTB PARTS & LABOUR WARRANTY FREE COLLECT & RETURN ON ALL SYSTEMS

Power Cracker 2600+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- AMD Sempron 2600+
- 256MB DDR 3200
- 5.1 On-Board Sound Card
- 40GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- 52x CD Rom Drive
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty
Free Collect & Return

Change CDROM to CDRW for only
£10.00 Extra!
Or CDROM to DVDRW16x +/- for
only £40.00 Extra!

Power Evo 3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- AMD Sempron 3000+
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty
Free Collect & Return

Change CDRW/DVD Combo Drive
to DVDRW16x +/- for only £20.00
Extra!

Power Predator 64bit 3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- FOXCONN K8S760 M/Board
- 1xAGPx8 3xPCI 1x Parallel
- 2x Front USB 2.0 4x Rear USB 2.0
- 1x FireWire Port 2x SATA RAID 0,1
- AMD 64Bit 3000+ Skt. 754
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- 2 Years Parts & Labour Warranty
Free Collect & Return

Power AMD64 3000+ DDR PC

NEW SPEC!

- ATX Midi Tower Case 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 3xPCI,
2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel
2x SATA RAID 0,1
- AMD 64Bit 3000+ Skt. 939
- 512MB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache
Graphics Card Supports 256MB
- Integrated GB Ethernet Card
- 2 Years Parts & Labour Warranty
Free Collect & Return

WAS £219.95
NOW **£189.95**
Save £30!

WAS £279.95
NOW **£249.95**
Save £30!
Inc VAT

WAS £359.95
NOW **£319.95**
Save £40!
Inc VAT

WAS £449.95
NOW **£399.95**
Save £50!
Inc VAT

Power Stopper 2600+ DDR PC

- ATX Midi Tower Case 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 4x Rear USB 2.0 1x Parallel
- 2x Front USB 2.0
- AMD Sempron 2600+
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 80GB 7200RPM Hard Drive
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- ASUS 52x32x52 CDRW 16x DVD
- Nero 6 & Power DVD
- Integrated SIS 3D Graphics Card
- Integrated 10/100 Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty
Free Collect & Return

Add a 15" TFT
for £119.95

Change CDRW/DVD Combo Drive to
DVDRW16x +/- for only £20.00
Extra!

WAS £349.95
NOW **£299.95**
Save £50!
Inc VAT

Power Xtra Black 3000+ DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- FOXCONN Socket A M/Board 400FSB
- 1xAGPx8 3xPCI 4x 1x Parallel
- 2x Front USB 2.0 Rear USB 2.0
- AMD Sempron 3000+
- 512MB DDR 3200
- 5.1 On-Board Sound Card
- 120GB 7200RPM Hard Drive
- 17" TFT 16m/s Silver & Black Flat
Panel Monitor Inc. Speakers
- Logitech Internet Pro Keyboard
- Logitech Optical Wheel Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS V9520-X Nvidia FX5200 3D Graphics
- Integrated 10/100 Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works 8
- Anti Virus Software
- 2 Years Parts & Labour Warranty
Free Collect & Return

Complete
System

WAS £609.95
NOW **£559.95**
Save £50!
Inc VAT

Millennium Black 64bit 3000+ DDR PC

- ATX Midi Tower Case Black 400Watt PSU
- ASUS A8V-E DELUXE M/Board
- 1xPCI Express x16, 2x PCI Express x1, 3xPCI
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 2x SATA RAID 0,1
- AMD 64Bit 3000+ Skt 939
- 1GB DDR 3200
- 8 Channel On-Board Sound Card
- 120GB 7200RPM Hard Drive
- 19" TFT 16m/s Silver & Black Flat
Panel Monitor Inc. Speakers
- Logitech Internet Pro Wireless Keyboard & Mouse
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- ASUS 6200 NvidiaTurbo Cache Graphics Card
Supports 256MB
- Integrated GB Ethernet Card
- 56.6k Internal Dial Up Modem
- Windows XP Home Inc. CD & Licence
- Microsoft Works Suite 2005 Inc. Word,
Works,Encarta,Photo Standard, AutoRoute
- Anti Virus Software
- 2 Years Parts & Labour Warranty
Free Collect & Return

Complete
System

WAS £899.95
NOW **£799.95**
Save £100!
Inc VAT

Power Extreme SLI 3500+ DDR PC

- ATX Midi Tower Case Black
- Hiper Type-R 480Watt PSU
- ASUS A8N-SLI Deluxe M/Board M/Board
- 2xPCI Express x16, 3xPCI,
2x PCI Express x1
- 2x Front USB 2.0 6x Rear USB 2.0
- 1x FireWire Port 1x Parallel 4x SATA
RAID 0,1,5
- AMD 64Bit 3500+ Skt 939
- 2GB DDR 3200
- 8 Channel On-Board Sound Card
- 200GB SATA 7200RPM Hard Drive
- 1.44MB Floppy Disk Drive
- NEC 16x DUAL LAYER DVD RW & CDRW
- Nero 6 & Power DVD
- 2x ASUS Extreme 6600GT
Graphics Card In SLI Mode
- 2xIntegrated GB Ethernet Card
- Windows XP Home Inc. CD & Licence
- Anti Virus Software
- 2 Years Parts & Labour Warranty
Free Collect & Return

WAS £1050.95
NOW **£999.95**
Save £50!
Inc VAT

We Custom Build PC's to your specification - please call

Index >>>>

Batteries and Adapters

216 Computerbattery.co.uk

Business Services

226 Digital Data

Consumables & Disc Media

- 218 Advent Data
- 220 Britink
- 221 Cartridge Express (Cartex)
- 222 Inkjet Direct
- 226 Inky Pinky
- 216 Manx
- 225 Offtek
- 225 Tonezone Consumables

Data Recovery

- 214 Computer Recovery
- 214 Dataquest

Hardware

- 218 Advent Data
- 223 Computer Bargains
- 226 Cyberia Systems
- 214 PC Connection
- 224 Sterling XS

Internet Services

- 216 1&1 Internet
- 216 123 Reg
- 226 Abel Internet
- 215 Web Fusion

Laptop Repair Services

- 226 Accent

Memory

- 226 Flash Drive Direct
- 225 Offtek

Notebooks

- 226 Laptop Spares

PDA's & Mobile Communication

- 221 i2 Mobile Solutions

Peripherals & Accessories

- 223 Computer Bargains
- 224 Sterling

Software

- 216 Saver Software

PCW Marketplace

- 226 Marketplace

Data Recovery

LOST CRITICAL DATA ?!

Damaged.. Corrupted.. Deleted.

Don't Panic!

No Data No Charge
Guaranteed*



Computer Recovery Labs

Data recovery specialist

The solution is in our hands

Tel: 020 8230 1904

Web

ComputerRecoveryLabs.com

Email

Recovery@ComputerRecoveryLabs.com



DATA RECOVERY
SPECIALISTS

- FREE DIAGNOSIS
- NO FIX NO FEE POLICY
- 24hr COMPREHENSIVE SERVICE
- IN-LAB RECOVERY OPTIONS
- CLEAN ROOM FACILITIES

Tel: 0845 2009241

Fax: 023 9263 9664

E-mail: sales@dq-int.co.uk

Website: www.dq-int.co.uk

Hardware

Look across the pond!

For more than 20 years,
PC Connection and MacConnection have offered
the very best values on a HUGE selection of PC and
Mac hardware and software to a world of customers.

■ COUNT ON US FOR:

Competitive U.S. prices • More than 100,000 products
Over 1,400 manufacturers • Knowledgeable customer service
Expert technical support • Rapid, dependable delivery

So surf our Web sites and catch some
of the best IT deals anywhere.

PC Connection

www.pcconnection.com
001-603-446-0095

MacConnection

www.macconnection.com
001-603-446-0092

730 Milford Road, Merrimack, NH 03054-4631 • FAX: 001-603-683-5775
Source: V4089. Please reference when ordering.

Internet Services

Professional hosting is now within your reach.

Whatever you want to achieve online, WebFusion can help make it happen. From registering your domain, through to hosting on a shared or dedicated platform, we have a great range of cost-effective products to enhance and grow your business online. Since the mid-1990's WebFusion has led the field, making professional grade internet solutions available to all.



You need a seriously easy hosting package that can grow with your needs, from a company with proven reliability.

Our solution...



Linux Hosting

The WebFusion Linux range delivers the benefits of an open source environment in packages tiered to match the needs of all sizes of business. Access flexible webspace supporting applications such as PHP cost-effectively and simply.

- Entry level package **£7.95** a month
- Business-grade package **£19.95** a month
- 2 months FREE when you pay annually

You need windows shared hosting delivering .NET technology that's secure and scalable.

Our solution...



Windows Hosting

Created in collaboration with Microsoft®, secure .NET hosting from WebFusion brings the latest Windows hosting technology and .NET development tools within your reach - first.

Build a stylish, dynamic site with ease using DotNetNuke - FREE with all Windows accounts

- .Net Home package **£5.95** a month
- .Net Business-grade pack **£19.95** a month
- 2 months FREE when you pay annually

You need a powerful dedicated server within a failsafe environment for your e-commerce site.

Our solution...



Dedicated Servers

Support your business with hosting and security systems giving the ultimate in power, control and reliability for all budgets.

Secure your system with a **Free Cisco Firewall**

When you order any dedicated server!

Limited period offer, while stocks last. Allow up to 5 days for Firewall provision after order.

New Low Price Reseller Packages
£26.99 a month

Add value to your business and offer your customers a broader portfolio with our Reseller package. Becoming a WebFusion Reseller gives you the power to develop your own web hosting business, and because we're part of leading Tier 1 ISP PIPEX you can also offer your clients a broadband service.

All major credit cards welcome. Prices exclude VAT @ 17.5%. WebFusion is part of the PIPEX Group.

WebFusion

www.webfusion.co.uk 0800 0317 800

Internet Services

1&1 DOMAINS

REGISTER AND GO

1&1 offers simple and efficient domain name registration at great prices – plus loads of FREE features.



You can also test drive
1&1 web hosting
free for 6 months

FREE with all 1&1 Domains:

- DNS management
- Transfer existing domains at no additional cost
- 50 free e-mail addresses (aliases)
- Catch-all e-mail, autoresponders, unlimited e-mail forwarding
- Domain parking for future use
- Masked website forwarding

.co.uk

**BEST PRICE
IN THE UK**

£1.99
PER YEAR

**.com, .net, .org, .info,
.name, .us, .biz**

£8.89
PER YEAR

All-inclusive per year prices, including all registration fees + VAT

Check your name now at www.1and1.co.uk
or call 08708 503305

1&1

www.1and1.co.uk



Software

SaverSoftware.co.uk

BRANDED SOFTWARE - UNBEATABLE PRICES

Ulead VideoStudio™ 9

Powerful Video Editing Made Easy

Ulead® VideoStudio® 9 is easy-to-use software that turns great video moments into fun-to-watch movies. In minutes add titles, audio & stunning special effects, and then share your videos on DVD.

Key features:

- New DV-to-DVD two-step wizard
- 16:9 widescreen and Dolby® Digital audio
- Includes free book on shooting video
- Unmatched stability; real-time performance
- Chroma Key editing to create the 'weatherman' effect



£44.99

inc VAT

Was £49.99 (Save £5)

Includes Free Book

VideoStudio 9 includes a 102-page book* written by musician & video guru, Douglas Spotted Eagle. Entitled, Digital Video Basics - A Guide to Shooting Great Digital Video, this helpful guide is full of production tips on lighting, camera angle, capturing audio and more...

email: ulead@saversoftware.co.uk

Order online or our through our dedicated order line

Freephone: 0800 458 8071

Prices are correct at the time of going to press

Consumables & Disc Media

www.printconsumables.com

**PRINTER CARTRIDGES DIRECT
FROM Manx Print Care**

**PREMIUM OR BUDGET
COMPATIBLES - YOUR CHOICE**

OUR 12TH 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
REMANUFACTURED 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!!

JETTMANX THE SUPERB REFILL INKS & KITS
SPECIFICALLY FORMULATED FOR YOUR PRINTER

(TRIED "UNIVERSAL" INKS? NO GOOD? TRY JETTMANX!!)
FULL RANGE COVERING HP/CANON/EPSON/APPLE/LEXMARK/OLIVETTI
INDIVIDUAL FORMULA FOR EACH MODEL

Over 40 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
HP No. 56/57/27/28/14 cartridges & Canon BC13/BC16/BC124
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

Batteries & Adapters

www.computerbattery.co.uk

POWER/UP!

Acer, Apple, Compaq, Dell, IBM,
Sony, Toshiba and many others

Use the Quick Selector on our web site to find the power
products available for your Laptop. We have a massive
range of Batteries and AC Aapters always held in stock.

or call us on 0870 872 6730

★ Laptop Batteries

★ Power Adapters

★ Car & Airplane
Adapters

★ PDA Batteries

★ Digital Camera
Batteries



**FAST, FREE
Delivery to Europe**

Usually next day delivery to mainland UK

2-power
distributor



all trademarks acknowledged

It's as simple as...



It's never been easier or cheaper to have your own domain name! 123-reg delivers a totally automated service with the best value on the Internet. You will not find a more cost-effective or convenient way of buying and managing your domain names.

Price per year inclusive of all fees

.co.uk £2.59
.org.uk/.me.uk

.com/.net/.org £8.99
.info/.biz/.name

.tv/.cc £30.95

Some domains are payable bi-annually, visit 123-reg.co.uk for more info.

Bulk Discounts:
Generous discounts available when you register multiple domains.

Quickly create a great looking web site online with 123-reg Site Builder - it's easy!

The new 123-reg Site Builder is a revolutionary product in the UK that leaves you with no excuse not to have your own high quality web presence, hosted by Europe's leading web hosting company.

£4.20 per month*

There's no better place to host your site!

Our 123-reg hosting packages are fantastic value for money. They are all feature rich and include at least 100MB of webspace, masses of mail boxes and free webmail.

Professional web hosting has never been so affordable.

from £1.59 per month*

A one-off set-up fee applies.

* Monthly equivalent, paid annually.

We welcome all major credit cards. Prices exclude VAT @ 17.5%.

123-reg.co.uk is part of PIPEX Communications Hosting Ltd, the specialist web hosting arm of Tier 1 ISP, PIPEX.

123-reg.co.uk

For all your domain and web hosting solutions visit: 123-reg.co.uk

Hardware & Consumables

Oh why why why don't you try
OYYY.co.uk



**FREE COMPUTER
TOOL KIT FOR EVERY
ORDER OVER £100**

WHEN YOU ENTER THE FOLLOWING
OFFER CODE OYFCW7 WITHIN
PROMPTED IN THE CHECKOUT PAGES

All prices including VAT



£44.47

**HP Deskjet 3745
Colour Inkjet Printer**

The compact HP Deskjet 3745 is quick to set up and easy to use. Print vibrant colour up to 4800-optimized dpi colour and laser-quality black text. Create beautiful 4 x 6 borderless photos, up to 3.5 x 11 inch with white borders. Print with speeds up to 14 ppm base-quality black, up to 1.0 ppm colour.



**Screen
filters
from** **£5.86**



£99.99

Brother MFC410CN

The MFC410CN is a compact, easy to use, network ready all-in-one machine that can print, fax, copy and scan. It also has the ability to print digital images from a memory card without the need of a PC.



£43.49

Verbatim 5 in 1 Store 'n' Go

This exciting USB device from Verbatim offers 5 practical functions in 1, including:

- 128MB of data storage,
- video recorder
- voice recorder
- digital camera and webcam



£81.55

**Imation Disk Stakka Carousel
holds 100 CDs/DVDs**

Never waste valuable time searching for discs or files again. Disc Stakka is an automated carousel that stores, protects and retrieves your 12 cm optical discs including data CDs, DVDs, music and game discs.



£376.00

**Toshiba TLP-ET1 Home
Cinema LCD Projector W/VGA**

The ET1 is the ideal entry-level home cinema projector offering not only a stunning design in itself, but also a wealth of integrated features to achieve a great home cinema experience.



**Imation USB Flash Drive
Mini 128 Mb**

The Imation USB Flash Drive Mini is a compact, affordable solution for everyday file sharing.

£12.50



**Digital Cameras
from** **£46.00**



£4.48

**Canon
GP4014XGB060F
Glossy Photo Paper 4X6 50
Sheets Buy One Get One FREE**

Superb value pack of brilliant white glossy paper for every photo printing need.



£17.81

**DAC Security Cable &
Combination Lock for Laptop
& Notebook Computers**

Protect your laptop with this high quality 2 meter steel cable with combination lock. 2,000 computers a day stolen throughout the UK, can you afford not to protect your laptop and more importantly your data with this excellent value product.



£90.99

Brother HL2040 Mono Printer

With the thoughtful and space saving design, the HL-2040 should be at home in any modern office environment. High speed printing facilitates peace of mind when deadlines have to be met.



£136.99

**Creative DAP
- Jukebox ZEN Micro in Green**

8GB USB 2.0, MP3 Player, FM Radio & Voice Recorder, with headphones & AC adapter. Address book, Calendar & To-Do List synchronisation with Microsoft Outlook.



£254.72

**Acer N35
GPS PDA**

NBS GPS PDA
Samsung 200MHz,
64MB SDRAM,
32MB Flash ROM,
3.5" 240x240 TFT
Screen, 3.5mm Sdk, Built Microphone &
Speaker, 3.5mm stereo jack, IrDA/Wireless,
105 g, MS Mobile 2003 with Destination
Software for SdkNav



£6.64

**Epson A4
Photo Paper 2
for the price
of 1! (2 x 20
Sheets) (C133041140BG)**

This heavyweight photo paper offers the perfect surface for truly photographic quality printing. Capable of a resolution up to 1440dpi, Photo Paper is ideal for photographers and home users who can create fun photos and enlargements from the convenience of their home or studio.



Laptops from
£433.00



£389.61

Belinea 20" monitor

Belinea's high end range of TFT displays feature the most modern panel technology, wide viewing angle and dual input - these high end TFT displays exceed the expectations of even the most demanding user.

GREAT BRANDS, GREAT PRICES, GREAT SERVICE. OYYY GO ANYWHERE ELSE?

Hardware & Consumables

Oh why why why don't you try
OY.YY.co.uk

VISIT WWW.OY.YY.CO.UK NOW!!

FLASH MEMORY



VERBATIM FLASH MEMORY

TYPE	CAPACITY	PART. NO.	£££
Verbatim CompactFlash Card	128 MB	47004	9.05
Verbatim CompactFlash Card	256 MB	47008	15.13
Verbatim CompactFlash Card	512MB	47009	29.03
Verbatim CompactFlash Card	1GB	47010	48.99
Verbatim CompactFlash Card	2GB	47011	96.06

Smart Media

Verbatim SmartMedia Card	64 MB	47103	9.05
Verbatim SmartMedia Card	128 MB	47104	20.36
Verbatim MultiMedia Card	128 MB	47113	9.19
Verbatim MultiMedia Card	256 MB	47114	14.05
Verbatim MultiMedia Card	512 MB	47165	28.87
Verbatim MultiMedia Card	1 GB	47166	55.91

RS-Multi Media Card

Verbatim RS MultiMedia Card	128 MB	47230	9.96
Verbatim RS MultiMedia Card	256 MB	47231	16.89
Verbatim RS MultiMedia Card	512 MB	47232	30.51

Secure Digital

Verbatim Secure Digital Card	64 MB	47117	8.82
Verbatim Secure Digital Card	128 MB	47118	9.61
Verbatim Secure Digital Card	256 MB	47119	15.61
Verbatim Secure Digital Card	512 MB	47170	26.85
Verbatim Secure Digital Card	1GB	47171	49.61

miniSD + Adaptor

Verbatim Mini Secure Digital Card + Adaptor	128 MB	47220	11.78
Verbatim Mini Secure Digital Card + Adaptor	256 MB	47221	18.10
Verbatim Mini Secure Digital Card + Adaptor	512 MB	47222	31.69

Memory Stick

Verbatim Memory Stick	64 MB	47200	17.63
Verbatim Memory Stick	128 MB	47201	19.21

xD Picture Card

Verbatim xD Picture Card	64 MB	47210	10.28
Verbatim xD Picture Card	128 MB	47211	12.34
Verbatim xD Picture Card	256 MB	47212	23.21
Verbatim xD Picture Card	512 MB	47213	45.83

Verbatim xD Picture Card

Verbatim xD Picture Card	128 MB	47214	10.28
--------------------------	--------	-------	-------

11 in 1 Card Reader

Verbatim '11 in 1' USB 2.0 Memory Card Reader			47195	10.53
---	--	--	-------	-------

Store 'n' Go Hi Speed USB 2.0

Verbatim, PROFESSIONAL, 256MB Portable USB Drive	256MB	47152	21.45
Verbatim, PROFESSIONAL, 512MB Portable USB Drive	512MB	47153	34.61
Verbatim, PROFESSIONAL, 1GB Portable USB Drive	1GB	47154	58.56
Verbatim, PROFESSIONAL, 2GB Portable USB Drive	2GB	47155	113.18
"Verbatim, 128MB Portable USB Drive"	128MB	47180	11.58
"Verbatim, 256MB Portable USB Drive"	256MB	47181	15.53
"Verbatim, 512MB Portable USB Drive"	512MB	47182	28.16
"Verbatim, 1GB Portable USB Drive"	1GB	47183	52.88
"Verbatim, 2GB Portable USB Drive"	2GB	47184	104.52



PRINTER SUPPLIES

HP INKS	CODE	£££
HP Black Inkjet Cartridge No. 45 for Deskjet 820 880 870 890 1100 42ml	C4515A	15.69
HP No 56 Ink Cartridge Black Inkjet Print Cartridge	C6556AE	10.73
HP Colour Ink Cartridge No. 78 for Deskjet 920 940 PSC750 19ml	C6578D	17.48
HP Ink Cartridge Colour for Photosmart 100	C6657AE	17.89
HP Black Ink Cartridge No. 15 for Deskjet 920 940 PSC750	C6615DE	15.22
HP Black Ink Cartridge No. 27 for Deskjet 3320 3420 3745 4215 4255	C8727AE	9.91
HP Black Inkjet Cartridge No. 10 for Designjet 500 800 69ml	C4844A	17.56
HP Black Ink Cartridge No. 14 for CP1160 Officejet 7110 7130 23ml	C5011DE	11.58
HP Colour Ink Cartridge for Deskjet 3320 3420 3745 4215 4255	C8728AE	11.39
HP Colour Ink Cartridge No. 23 for Officejet T45 T65 R45 R65 30ml	C1823D	17.14
HP Colour Ink Cartridge No. 78 for Deskjet 920 940 PSC750 38ml	C6578A	32.79
HP Magenta Ink Cartridge No. 11 for Business Inkjet 2200 2250 28ml	C4837A	17.69
HP Cyan Ink Cartridge No. 11 for Business Inkjet 1000 2200 2250 2600 2800 9110/20/30 28ml	C4836AE	17.02
HP Colour Ink Cartridge No. 17 for Deskjet 816C 825C 840C 843C 15ml	C6825AE	16.27
HP Black Ink Cartridge No. 339 for Deskjet 5740 6520 6540 6620 6840 7210 7310 7410 8750	C8767EE	15.86
HP Inkjet 9800 Photosmart 2610 2710 8150 8450 21ml	C4938AE	17.00
HP Yellow Ink Cartridge No. 11 for Business Inkjet 1000 CP1700 2200 2250 2600 2800 9110/20/30 28ml	C9363EE	16.83
HP Colour Ink Cartridge No. 344 14ml	C5010DE	15.70
HP Colour Ink Cartridge No. 14 for CP1160 D145 23ml	C5010DE	15.70
HP Colour Ink Cartridge No. 49 for Deskjet 600 660C 670C Officejet 500 590	C51649AE	16.87

HP TONERS

HP Mono Toner Cartridge No. 96A for Laserjet 2100 5k	C4096A	49.54
HP Mono Toner Cartridge No. 15A for Laserjet 1200 1220 2.5k	C4127X	64.94
HP Mono Toner Cartridge No. 27X for Laserjet 4000 4050 10k	C8061X	65.14
HP Mono Toner Cartridge No. 61X for Laserjet 4100 10k	C2612A	36.52
HP Mono Toner Cartridge for Laserjet 1010	C0138A	78.6
HP Mono Toner Cartridge No. 38A for Laserjet 4200 12k	Q2613A	36.82
HP Mono Toner Cartridge No. 13A for Laserjet 1300	Q2610A	60.99
HP Mono Toner Cartridge for Laserjet 1160 1320 2.5k	Q5949A	37.46
HP Mono Toner Cartridge No. 92A for Laserjet 1100 2.5k	C4092A	29.42
HP Black Toner Cartridge for Laserjet 4600 4650	C9720A	79.41
HP Mono Toner Cartridge No. 15X for Laserjet 1200 1220 3.5k	C7115X	39.92
HP Mono Toner Cartridge No. 13X for Laserjet 1300	Q2613X	46.44
HP Cyan Toner Cartridge for Laserjet 4600 4650 8k	C9721A	107.13
HP Magenta Toner Cartridge for Laserjet 4600 4650 8k	C9723A	107.51



BROTHER INKS

Brother LC800M Magenta Ink Cartridge for MFC3220 MFC3320	LC800BK	10.63
Brother LC800C Cyan Ink Cartridge for MFC3220 MFC3320	LC800C	5.86
Brother LC800M Magenta Ink Cartridge for MFC3220 MFC3320	LC800M	5.86
Brother LC800Y Yellow Ink Cartridge for MFC3220 MFC3320	LC800Y	5.86
Brother LC900BK Black Ink Cartridge for MFC410 DCP310	LC900BK	10.63
Brother LC900C Cyan Ink Cartridge for MFC410 DCP310	LC900C	5.87
Brother LC900M Magenta Ink Cartridge for MFC410 DCP310	LC900M	5.86
Brother LC900Y Yellow Ink Cartridge for MFC410 DCP310	LC900Y	5.86
Brother TN8000 Toner Cartridge for 8070P MFC93070 2.2k	TN8000	16.76
Brother TN6500 10547 Toner Cart for HL 1030 HL1240 HL1440 6k	TN6500	45.35
Brother TN3000 10546 Toner Cart for HL 1030 HL1240 HL1440 3k	TN3000	22.34
Brother TN3060 HL5100 series Toner Cartridge 6.7k	TN3060	46.50
Brother TN3030 HL5100 series Toner Cartridge 3.5k	TN3030	36.32
Brother TN200 9002 Toner for 8000P 8060 8250P MFC9000 2.2k	TN200	15.39
Brother Drum Unit DR6000 for HL1030 HL1230 HL1440 20k	DR6000	83.59
Brother TN7600 Toner Cart for HL1650 HL1670 5030 5040 6.5k	TN7600	42.94

PRINTING SUPPLIES ALSO AVAILABLE XEROX



EPSON INKS

EPSON INKS	CODE	£££
Epson Black Pigment Ink Cartridge (Standard Capacity) T044140 for C64 C66 C84 C86 CX3600 CX6600	C13T044140	10.36
Epson 3 Colour Ink Cartridge T052040 for C400 1160 1520	C13T052040	17.20
Epson Cyan Ink Cartridge (High Capacity) T044240 for C64 C66 C84 C86 CX3600 CX6600	C13T044240	8.16
Epson Yellow Ink Cartridge (Standard Capacity) T045440 for C64 C66 C84 C86 CX3600 CX6600	C13T045440	6.27
Epson Magenta Ink Cartridge (High Capacity) T044340 for C64 C66 C84 C86 CX3600 CX6600	C13T044340	8.16
Epson Black Ink Cartridge T048140 for R200 R300 RX500 RX620	C13T048140	8.82
Epson Black Pigment Ink Cartridge (High Capacity) T043140 for C84 C86 C66 CX6600	C13T043140	18.01
Epson Cyan Ink Cartridge (Standard Capacity) T045240 for C64 C66 C84 C86 CX3600 CX6600	C13T045240	6.27
Epson Yellow Ink Cartridge (High Capacity) T044440 for C64 C66 C84 C86 CX3600 CX6600	C13T044440	8.16
Epson Magenta Ink Cartridge (Standard Capacity) T045340 for C64 C66 C84 C86 CX3600 CX6600	C13T045340	6.27
Epson Black Ribbon S015019 for FX-80 LX-300	C13S015019	2.65
Epson Yellow Ink Cartridge T042440 for C82 CX5400	C13T042440	8.96
Epson Magenta Ink Cartridge T042340 for C82 CX5400	C13T042340	9.05
Epson Black Ink Cartridge T036140 for Stylus C42 C44 C46	C13T036140	10.16
Epson Black Ink Cartridge T007401 for Stylus Photo 870 1270 1290S	C13T007401	13.72
Epson Black Pigment Ink Cartridge T032140 for C70 C80 C82	C13T032140	21.20
Epson Black Ink Cartridge T040140 for C62 CX3200	C13T040140	22.01
Epson 5 Colour Ink Cartridge T009401 for Stylus Photo 1270 1290S	C13T009401	16.58
Epson Black Ink Cartridge T051140 for C740 1520 1160	C13T051140	17.20
Epson A4 Photo Quality Ink Jet Paper	C13S041061	8.30
EPSON TWIN PACKS/ MULTIPACKS		
Epson Black Ink Cartridge Twin Pack T003012 for Stylus Colour 900 980	C13T003012	32.88
Epson Colour Twin Pack T008403 for Stylus Photo 870	C13T008403	20.52
Epson Black Ink Cartridge Twin Pack T013402 for C20 C40 Stylus Colour 480	C13T013402	18.08
Epson Black Ink Cartridge Twin Pack T017402 for Stylus Colour 680	C13T017402	34.78
Epson Black Ink Cartridge Twin Pack T019402 for Stylus Colour 880	C13T019402	34.10
Epson Black Twin Pack T026402 for Stylus Photo 810	C13T026402	30.51
Epson Colour Twin Pack T027403 for Stylus Photo 810	C13T027403	25.51
Epson Yellow/Magenta/Yellow Triple Pack T032540 for C70 C80	C13T032540	28.15
Epson Twin Pack 1 X Bk Cart & 1 X Col Cart T036140BA for C42 C44 C46	C13T036140BA	13.72
Epson DURABrite Quad Pack (Cyan, Magenta, Yellow, Black) T044140BA for C64 C66 C86 CX3600 CX6600	C13T044140BA	24.20
Epson Six Pack Bk,C,M,Y,L,C,M) T048140BA for R200 R300 X500 X600 RX620"	C13T048140BA	32.09
Epson Triple Pack (Cyan, Magenta, Yellow) T048B40 for R200 R300 RX500 RX600 RX620	C13T048B40	21.39
Epson Triple Pack (Cyan, Magenta, Yellow) T048B40 for R200 R300 RX500 RX600 RX620	C13T048B40	21.39
Epson Triple Pack (Cyan, Magenta, Black) T048C40 for R300 X500 RX620"	C13T048C40	21.51
Epson Black Ink Cartridge Twin Pack T051142 C740 1160 1520	C13T051142	29.72

EPSON PHOTO PACKS

Epson PictureMate PicturePack T557040	C13T557040	20.51
Epson RX420/425 PhotoPack (4 Ink Cartridges and Paper) T055640 for RX420 RX425	C13T055640	20.51

EPSON PHOTO PAPER VALUE PACKS

Epson 2X Promo Photo Paper A4 20 Sheets	C13S0411408G	6.64
Epson Bogol Glossy Photo A4 20 Sheets	C13S041287BG	9.85
Epson A4 photo paper 20 sheets + free pack of 4 x 6 photo paper	C13S0411408K	6.64



CANON INKS	CODE	£££
Canon Black Ink Tank Refill for 3300	BC248K	4.60
Canon Yellow Ink Tank BJC8200	BC19Y	5.76
Canon Black Ink Tank Refill BJC6000	BC19BK	7.83
Canon Magenta Ink Tank BJC8200	BC19M	6.06
Canon Black Ink Tank BJC8200	BC19BK	6.06
Canon Cyan Ink Tank BJC8200	BC19C	6.06
Canon Colour Ink Tank Refill for 3300	BC124C	9.69
Canon Photo Magenta Ink Tank BJC8200	BC19PM	6.06
Canon Black Ink Tank Twin Pack I70	BC115BK	11.60
Canon Photo Cyan Ink Tank BJC8200	BC19PC	6.06

CANON PAPER PACKS

Canon GP401A80B0GF Glossy Photo Paper A4 20 Sheets Buy one Get one FREE	9157A038	4.48
Canon Ink Cartridge BCI-24 1xBlack & 1xColour with FREE Gp401 4x6 Glossy Paper	BC124PROMO	14.63
Canon GP4014X8B0GF Glossy Photo Paper 4X6 50 Sheets Buy one Get one FREE	9157A039	4.48
Canon MP101A48B0GF Photo Paper A4 50 Sheets Buy one Get one FREE	7991A017	6.81

OKI TONERS

OKI TONERS	CODE	£££
OKI Black Toner Cartridge for 8P 8im 6W OF4500 office84 00079801 Type 6 1.5k	00079801	15.16
OKI Black Toner Cartridge for C5100 C5200 C5300 C5400 42127408 5k	42127408	32.20
OKI Black Toner Cartridge for 400E 600E OF1000 09002395 Type 2 2.5k	09002395	20.92
OKI Black High Capacity Toner Cartridge for B4300 01101202 6k	01101202	44.07
OKI Black Toner Cart B4100 Type 9 2.5k	01103402	21.15
OKI Magenta Toner Cartridge for C5100 C5200 C5300 C5400 42127406 5k	42127406	84.62
OKI Cyan EP Image Drum for C5100 C5200 C5300 C5400 42126607 Type C6 17k	42126607	63.96
OKI Black Toner Cartridge High Capacity for 20 & 24 series 41022502 Type 7	41022502	32.67
OKI Rainbow Toner Pack (Rainbow Kit) for C5100 C5300 42403002 CMYK Type C2 5k	42403002	249.20
OKI Black Toner Cartridge for 10e 10i 10ex 12i 12m 40433203 Type 5 2.5k	40433203	26.21

LEXMARK INKS

LEXMARK INKS	CODE	£££
Lexmark Black Ink Cartridge 213 No.16 410Pages	10N0016	16.24
Lexmark Black Ink Cartridge 3200 No.70 600Pages	12A1970	17.37
Lexmark Colour Ink Cartridge 213 No.26 275Pages	10N0026	17.30
Lexmark Colour Standard Capacity Ink No.20 450Pages	15M0120	19.66
Lexmark Black High.Res.Low Capacity Ink 205Pages	10N0027	10.64
Lexmark Black Waterproof Ink 600Pages	13400HC	19.71
Lex		

Consumables & Disc Media

Finest Quality
EPSON
Compatible Ink Cartridges

• As Epson specialists, we only stock **brand new** cartridges - not recycled or refilled cartridges •
All our ink cartridges are manufactured to **ISO9001** standards, are **guaranteed** to perform to the same standard as original cartridges, and will not invalidate your printer warranty. In addition, all come with a full **100% money back** guarantee.

Epson Stylus:
C20, C40, 400, 440, 460, 480
580, 600, 640, 660, 670, 700
740, 750, 760, 880, 980, 1160

Black Ink Cartridges
£1.99 each
3 pack: **£4.99**

Colour Ink Cartridges
£2.99 each
3 pack: **£7.99**

Epson Stylus:
C42, C44, C46, C60, C62
CX3200, 680, 790 810, 830
870, 890, 900, 915, 925, 1290

Black Ink Cartridges
£2.99 each
3 pack: **£7.99**

Colour Ink Cartridges
£3.99 each
3 pack: **£9.99**

Epson Stylus:
C64, C66, C70, C80, C82, C84
C86, CX3600, CX6600, RX420

Black Ink Cartridges
£3.99 each
3 pack: **£9.99**

Colour Ink Cartridges
£2.99 each
any 3 colours: **£7.99**

Full sets of 4 cartridges:
(Black/Cyan/ Magenta/Yellow)
£11.99 per full set
3 full sets: **£32.99**

Epson Stylus:
Photo R200, R300, R300M
RX500, RX600, RX620

Black Ink Cartridges
£2.99 each
3 pack: **£7.99**

Colour Ink Cartridges
£2.99 each
any 3 colours: **£7.99**

Full sets of 6 cartridges:
(Black/Cyan/Mag/Yell/P.Cyan/P.Mag)
£15.99 per full set
3 full sets: **£45.99**

"Premier Ink Supplies stock the compatible cartridges that achieved top ratings under independent testing, and provide all the guarantees of quality, reliability and service that should assure any customer"
- **Independent on Sunday, September 2004.**



In a comprehensive test of Epson compatible ink cartridges, conducted by Digital Photo Magazine in 2004, cartridges from 8 manufacturers were tested.
Our cartridges were the ONLY Epson compatible ink cartridges awarded a full 5 star rating!

"Lower quality inks can cause blockages and poor results, but these haven't been an issue. These cartridges are new, and not refills, which makes a big difference to our confidence in using them. Recommended."
- **Micromart, March 2005.**

Canon Compatible Cartridges

100% Brand New, fully guaranteed Canon compatible ink cartridges.

BCI24 Black Ink Cartridges:	£1.99 each or 3 pack £4.99
BCI24 Colour Ink Cartridges:	£2.99 each or 3 pack £7.99
BCI3e Black Ink Cartridges:	£2.99 each or 3 pack £7.99
BCI3e Cyan / Magenta / Yellow Ink Cartridges:	£2.99 each or 3 pack £7.99
BCI6 Cyan / Magenta / Yellow Ink Cartridges:	£2.99 each or 3 pack £7.99
BCI6 Black / P.Cyan / P.Magenta Ink Cartridges:	£2.99 each or 3 pack £7.99

Genuine Lexmark Cartridges

Brand new, Original Lexmark cartridges, direct from the Lexmark factory.
Below is just a small selection - full range on our website

No.17 (10N0217) Original Lexmark Black Ink Cartridge:	£12.99
No.27 (10N0227) Original Lexmark Colour Ink Cartridge:	£14.99
No.19 (15M2619) Original Lexmark Colour Ink Cartridge:	£15.99
No.48 (17G0648) Original Lexmark Black Ink Cartridge:	£12.99



Genuine HP Cartridges

Brand new, Original Hewlett Packard cartridges, direct from the HP factory.
Below is just a small selection - full range on our website.

No.27 (c8727a) Original HP Black Ink Cartridge (10ml):	£12.99
No.28 (c8728a) Original HP Colour Ink Cartridge (8ml):	£14.99
No.56 (c6656a) Original HP Black Ink Cartridge (19ml):	£14.99
No.57 (c6657a) Original HP Colour Ink Cartridge (17ml):	£19.99
No.58 (c6658a) Original HP Photo Ink Cartridge (17ml):	£17.99
No.339 (c8767ee) Original HP Black Ink Cartridge (21ml):	£19.99
No.344 (c9363ee) Original HP Colour Ink Cartridge (14ml):	£22.99



Papers : CDRs : DVD+/-Rs

CD-Rs: 52 speed, 25 pack, in protective tub	£4.99
CD-Rs: 52 speed, 25 pack, in protective tub, inkjet printable surface	£6.99
DVD-Rs: 4 speed, 25 pack, in protective tub	£6.99
DVD-Rs: 8 speed, 25 pack, in protective tub, inkjet printable surface	£8.99
DVD+Rs: 4 speed, 25 pack, in protective tub	£7.99
DVD+Rs: 8 speed, 25 pack, in protective tub, inkjet printable surface	£9.99
100gsm Matt Coated Paper, High Quality, Quick Drying, A4, 100 sheets	£4.99
120gsm Matt Coated Paper, High Quality, Quick Drying, A4, 100 sheets	£5.99
140gsm Matt Coated Paper, High Quality, Quick Drying, A4, 100 sheets	£6.99
260gsm Gloss Photo Paper, High Quality, Instant Dry, A4, 20 sheets	£7.99
260gsm Satin Photo Paper, High Quality, Instant Dry, A4, 20 sheets	£7.99

- Royal Mail 1st Class Delivery • P&P 99p Per Order •
- Freephone Number • Secure Online Ordering •
- All Prices Include VAT • No Minimum Order •

Premier
INK SUPPLIES

0800 1075 270
www.PremierInk.co.uk

Orders also accepted by cheque / postal order:
Premier Ink Supplies
Unit 8, Rigby Close
Heathcote Industrial Estate
Warwick CV34 6TH

Consumables & Disc Media

Don't Buy Printer Cartridges until you've visited www.cartex.co.uk



UK's Lowest Prices - Guaranteed*

Buy Direct From The Manufacturer Of Compatible Cartridges

Order Online For **FREE Delivery!**

No Minimum Order



Brother Compatibles Each**	Canon Comps Each**	Epson Comps Each**	Epson Comps Each**	Dell Compatibles Each** Pt Ex	HP Compatibles Each** Pt Ex	Lexmark Comps Each** Pt Ex
LC01102 BkCMoY £1.75	BCI-6 QP £4.10	TO17 Bk £1.75	TO332\3\4\5or6 £2.93	720\A920 Bk £14.09 £11.73	C6625 Col £10.56 £7.04	10N0217 Bk £9.39 £7.04
LC21 BkCMoY £1.75	BCI-6 Photo's £1.16	TO18 Col £2.34	TO331-6 SP £15.85	720\A920 Col £15.26 £11.73	C6628 Bk £9.39 £7.04	10N0227 Col £10.56 £7.04
LC25 BkCMoY £1.75	BC-02 Bk £5.86	TO17\18 TP £3.51	TO341 Bk £2.93	720\A920 TP £28.18 £22.31	C6656 Bk £9.38 £7.04	12A1970 Bk £10.56 £8.21
LC31 BkCMoY £1.75	BC-05 Col £9.39	TO19 Bk £1.16	TO342\3\4\5or6 £2.93	A920\A960 Bk £14.09 £11.73	C6657 Col £11.74 £8.21	12A1975 HCBk £11.74 £9.39
LC41 BkCMoY £2.34	BC-02\05 TP £14.09	TO20 Col £1.75	TO347or348 £3.51	A920\A960 Col £15.26 £11.73	C6658 Photo £10.56 £7.04	12A1980 Col £11.74 £8.21
LC50 Bk CMoY £2.34	Epson Comps Each**	TO19\20 TP £2.34	TO341-48 Pack £21.14	A920\A960 TP £28.18 £22.31	C8727 HCBk £9.39 £7.04	12A1985 HCCol £12.91 £9.39
Canon Compatibles Each**	SO20093 Bk £1.16	TO26 Bk £1.75	TO38 Bk £1.75	HP Compatibles Each** Pt Ex	C8728 Col £11.74 £8.21	12A1990 Photo £14.09 £10.56
BCI-15 Bk £2.34	SO20089 Col £1.75	TO27 Col £2.34	TO39 Col £2.34	51625 Col £9.39 £5.86	51626\51625 TP £15.26 £9.39	15M0120 Col £11.74 £8.21
BCI-15 Col £2.93	SO93\89 TP £2.34	TO26\27 TP £3.51	TO38\39 TP £3.51	51626 Bk £7.04 £4.69	51629\51649 TP £16.44 £10.56	15M0125 HCCol £12.91 £9.39
BCI-15 TP £4.69	SO20108 £1.16	TO28 Bk £1.75	TO422\3or4 £2.93	51629 Bk £7.04 £4.69	51645\51641 TP £15.26 £9.39	17G0050 Bk £10.56 £8.21
BCI-21 Bk £1.16	SO20187 Bk £1.16	TO29 Col £2.34	TO431 HCBk £2.93	51633 Bk £7.04 £4.69	51645\51823 TP £15.26 £9.39	17G0060 Col £11.74 £8.21
BCI-21 Col £1.75	SO20191 Col £1.75	TO28\29 TP £3.51	TO441 Bk £2.34	51641 Col £10.56 £7.04	51645\51678 TP £15.26 £9.39	18L0032 Bk £12.91 £10.56
BCI-21 TP £2.34	SO187\191 TP £2.34	TO36 Bk £1.75	TO442\3or4 £2.34	51645 Bk £5.86 £3.51	5011\5010 TP £14.09 £10.56	18L0042 Col £14.09 £10.56
BCI-24 Bk £1.16	SO20193 £2.34	TO37 Col £2.34	TO441-4 QP £8.80	51649 Col £10.56 £7.04	C6614\51649 TP £16.44 £10.56	10N0016\26 TP £25.83 £19.96
BCI-24 Col £1.75	TO07 Bk £1.75	TO36\37 TP £3.51	TO431\442-4QP £9.39	C1823 Col £10.56 £7.04	C6615\1823 TP £16.44 £10.56	12A1970\80 TP £21.14 £15.26
BCI-24 TP £2.34	TO08 Col £2.93	TO40 Bk £1.75	TO481 Bk £2.34	C4841\2or3 £7.04 £4.69	C6615\16578 TP £16.44 £10.56	12A1975\85 TP £23.49 £17.61
BCI-3 Bk £1.46	TO07\08 TP £4.10	TO41 Col £2.34	TO482\3or4 £2.34	C4844 Bk £8.21 £5.86	C6615\6625 TP £16.44 £10.56	17G0050\60 TP £21.14 £15.26
BCI-3 CMoY £1.16	TO09 TP £2.93	TO40\41 TP £3.51	TO485or6 £2.34	C5010 Col £8.21 £4.69	C6656\6657 TP £19.96 £14.09	250ml Bulk Ink £25.84 £19.96
BCI-3 QP £4.69	TO07\09 TP £4.10	TO321 Bk £2.93	TO481-6 SP £12.33	C5011 Bk £7.04 £4.69	C8727\8728 TP £19.96 £14.09	Refill Kits/Links Black Col £3.51 £4.69
BCI-3 Photo's £1.16	TO13 Bk £1.16	TO322\3or4 £2.34	TO51 Bk £2.93	C6578 Col £10.56 £7.04	Lexmark Comps Each** Pt Ex	60ml Bulk Ink £2.34 £2.95
BCI-6 Bk £1.16	TO14 Col £1.75	TO321-4 QP £9.98	TO552\3or4 £2.93	C6614 Bk £7.04 £4.69	10N0016 Bk £12.91 £10.56	250ml Bulk Ink £7.04 £9.39
BCI-6 CMoY £1.16	TO13\14 TP £2.34	TO331 Bk £2.93	TO551-4 QP £10.56	C6615 Bk £7.04 £4.69	10N0026 Col £14.09 £10.56	

100% Guaranteed

All Prices Listed INCLUDE VAT

Established 1993

We stock Original and Compatible Inkjet, Laser, Fax and Copier Cartridges for all Printer Makes & Models from Apple to Xerox

Key:-
TP = Twin Pack (1 black and 1 colour)
QP = Quad Pack (1 black, 1 cyan, 1 magenta and 1 yellow)
SP = Six Pack (1 black, 1 cyan, 1 light cyan, 1 magenta, 1 light magenta + 1 yellow)
Pt Ex = Part Exchange - empty exchange cartridge required
Comps = Compatible inkjet cartridge



Call now on: 0870 243 5610

20 sales/enquiry lines open Monday - Friday 8:30am - 5:30pm

Fax: 0870 243 5611 email: info@cartex.co.uk

*Find the same product cheaper & we will beat it by up to 10%. Delivery charges included in price comparison. Verification required. **When purchased in multiple quantities. Prices may fluctuate, please check website.

PDA's & Mobile Comm

CREATE YOUR OWN APPLICATIONS FOR POCKET PC / WIN CE DEVICES

New version 3.0 supports 2nd Edition!

Pendulum software enables non-programmers to create sophisticated mobile applications quickly and easily for Pocket PC-powered devices, from PDAs to rugged industrial units. Use Pendulum to develop affordable solutions wherever you need to mobilise key processes and increase productivity and profits. Use our own developers to create your Pendulum application — and you still own the code! Call to discuss options.

Use Pendulum for:

- ◆ time/expense recording
- ◆ fleet management
- ◆ market research
- ◆ field engineers
- ◆ asset tracking
- ◆ stock control
- ◆ van sales

- NEW** supports Windows Mobile 2003 SE
- NEW** multi-column database list control
- NEW** over 100 new @special functions
- NEW** extra sample apps and much more!



Consumables

Cartridgeshop.co.uk

Epson Compatibles
400/440/460/480/580/
600/640/660/670/700/
740/750/760/800/850/
880/900/980/C20/C40

Black and Colour
From £1.99 a Pair

Epson Compatibles
680/790/810/830/870/
890/895/900/915/925
C42/C44/C46/C60/C62
CX3200

Black And Colour
From £2.99 a Pair

Epson Compatibles
C70/C80/C82/
C64/C66/C84
CX5400/CX5200/
CX3600/CX3650/
RX420/RX425

Set of 4
From £5.99

Epson Compatibles
R200/R300/
RX500/RX600/
RX620

Set of 6
From £6.99

Just a selection of our range. All prices includes VAT & Delivery

Tel-0845 890 1589 E&OE

Consumables & Disc Media

Inkjets delivered direct from the warehouse



Visit www.phoenixdirectuk.co.uk
for special offers and bulk purchase deals

The UK's best prices on
100% guaranteed inkjets

MASSIVE Savings!

SIPIX CAMERAS
Web 3 Dual Mode
now only **£9.99**



epson compatible

stylus colour (standard cartridges)
200, 400, 440, 460, 480, 500, 580, 600, 640, 660, 670 photo 700, 740, 750, 760, 800, 850, 860, 880, 900, 980, 1160, 1200, 1520, EX, C20, C40 scan 2000, 2500
*black from **£1.12**
*colour from **£1.85**
when bought in packs of 8
*pairs from **£2.38**
when buying 8 pairs

stylus colour (chipped)
680, 777, photo 790, 810, 820, 830, 870, 890, 895, 900, 915, 925, C42, C44, C46, C50, C60, C62, CX3200, photo 1270, 1290
*black from **£2.10**
*colour from **£2.60**
when bought in packs of 10
*pairs from **£3.89**
when buying 10 pairs

stylus colour (chipped)
photo 950, 2100,
C64/C66/C84/C86
black from **£2.50**
colour from **£2.50(e)**
when bought in packs of 3

black from **£2.66**
colour from **£2.66(e)**
when bought in packs of 3
full set **£11.49**

black from **£2.66**
colour from **£2.66(e)**
when bought in packs of 3
full set **£11.49**

black from **£2.50**
colour from **£2.50(e)**
full set from **£14.00**
when buying 10 + sets

black from **£2.62**
colour from **£2.62(e)**
when bought in packs of 5
full set from **£9.99**
when buying 5 sets

Picture Mate Deals

1 x Phoenix ink cartridge **£ 9.95**

1 x Phoenix ink cartridge & 100 sheets of 260gsm Super Gloss Paper **£18.99**

1 x Phoenix ink cartridge & 100 sheets of 180gsm Matt paper **£14.95**

PHOENIX other items

t-shirt transfers (x10) **£5.98**
A4/A5 greeting card (x10) **£2.99**
standard CD labels (x50) **£3.95**
standard CD labels (x100) **£6.90**
photo matt CD labels (x20) **£2.98**
photo matt CD labels (x50) **£5.99**
photo gloss CD labels (x20) **£3.99**
photo gloss CD labels (x50) **£7.99**

canon compatible

BCI 10 black
BJ30, BJC50, 70, 80, 55 85, BN700, starwriter jet 300, 500, 4000 **£1.50** each

BCI 11 black / colour
BJC50, 70, 80, 85 BN7000, starwriter jet 350c, 550c
black **£1.00**
colour **£2.00**

BCI 21 black / colour
BJC2000, 4000, 5000 Multipass C20, C30, C50
black **£1.50**
colour **£2.00**
1 pair **£3.00**
3 pairs **£8.50**

BCI 3 / 3 photo
BJC3000,6000 series, S400, S450, 4500, S6300, S6500, i550, i850
£2.00 black/colour
£5.99 for 4

BCI 6 / 6 photo
BJC8000, S8000, i950, S9000, i9100
£2.00 black/colour
£5.99 for 4

canon remanufactured

BC 02 black **£ 8.25** **£5.99**
BC 05 colour **£11.75** **£7.99**
BJ150, 210, 240, 250 1000 series
BC 20 black **£10.49** **£5.99**
BJC2000, 2100, 2110, 4000, 4100, 4200, 4300, 4400, 4550, 4650, 5500, MPC-20,

PHOENIX CDR's

80 min. 52x CDR (x 25) **£ 5.99**
80 min. 52x CDR (x 50) **£ 8.99**
80 min. 52x CDR (x 100) **£16.99**
52x Printable CDR (x100) **£19.99**

PHOENIX DVDR's

DVD A grade 4x -R(x25) **£ 7.99**
DVD Printable 4x -R(x25) **£ 9.99**
DVD A grade 4x +R(x25) **£10.99**
DVD Printable 4x +R(x25) **£12.99**
8x also available please see website

hp remanufactured

HP C6656A black **£11.98**
PSC 2210, 2115, 2110, 1210, 1205, 1110, 1200, 1300, 5552, 5550, 7600

HP C6657A colour **£14.99**
PSC 2210, 2115, 2110, 1210, 1205, 1110, 1200, 1300, 5552, 5550, 7600

HP 51626A black **£ 8.95** **£5.99**
desk jet 400, 500

HP 51625A colour **£11.75** **£7.99**
desk jet 400, 500

HP 51629A black **£ 9.15** **£5.99**
desk jet 600, 660c, 690c 693c, 694c, 695c, 697c

HP C6614A black (HP20) 40ml **£ 9.39** **£5.99**
desk jet 610, 615, 640 925xi fax

HP 51649A colour **£13.49** **£7.99**
desk jet 600, 600c, 625c 660c, 670c, 690c, 691c 693c

HP 51645A black **£8.50** **£5.99**
desk jet 710, 715, 720 722, 815, 820, 850, 870 880, 890, 895, 950, 970 1100, 1120, 1600

HP C6615D black (42ml) **£10.28** **£5.99**
desk jet 810c, 840c 843c, PSC 500

HP C1823D colour (38ml) **£13.89** **£7.99**
desk jet 710c, 715c 720c, 722c, 810c, 815 880c, 890c, 895, 1120 PSC 500

HP C6625A colour (38ml) **£13.99** **£7.99**
desk jet 840c, 843c

HP C6578A (38ml) **£13.99** **£7.99**
desk jet 930, 950 970CXI, 1220, G55 G85, G95

Lexmark remanufactured

12A1970 black
Z53, Z52, Z51, Z45, Z43, X85, X83, X73, X125, 7200, 7000, 5700, 3200 **£14.99**

12A1980 colour
Z31, Z11, Opra 45, 40, 7200V, 7000, 5770, 6000, 3200, 3000 **£15.99**

1380619 / 13619HC colour
Medley 4x, Medley 4c, Winwriter 150c, 100, Exejet IIc, 2055 **£15.99**

17G0050 black
P706, P700, Z12, Z22, Z32, Z700, Z703, 3100 **£14.99**

17G0060 colour
Compaq IJ600, Z32, Z22, Z12 **£15.99**

xerox compatible

C / M / Y / B
XJ4C, XJ6C, 450CP **£2.00** each
DWC450C, C6, C8 **£7.50** full set

C / M / Y / B (High capacity)
M750, M760, M940 **£12.00** full set

PHOENIX A4 matt paper

coated matt 100gsm (x100) **£4.99**
coated matt 120gsm (x100) **£5.49**
coated matt 140gsm (x100) **£7.29**
coated matt 160gsm (x100) **£8.50**
coated matt 180gsm (x100) **£9.75**
d/s matt card 110gsm (x100) **£7.46**
d/s matt card 210gsm (x100) **£9.99**

PHOENIX A4 gloss paper

instant dry gloss 150gsm (x20) **£ 3.99**
instant dry gloss 150gsm (x50) **£ 7.99**
instant dry gloss 180gsm (x20) **£ 4.99**
instant dry gloss 180gsm (x50) **£11.49**
instant dry gloss 210gsm (x20) **£ 6.99**
instant dry gloss 210gsm (x50) **£14.99**
photo gloss 260gsm (x20) **£ 8.99**
photo gloss 260gsm (x50) **£18.75**
photo satin 260gsm (x20) **£ 8.99**
photo satin 260gsm (x50) **£18.75**

*trade in your old carts!

your old carts could be worth up to **£2** each! call now to find out...

- ✓ **FREE DELIVERY**
- ✓ **SAME DAY DESPATCH**
- ✓ **NO MINIMUM ORDER**
- ✓ **ALL PRICES INCLUDE VAT**
- ✓ **NO CREDIT CARD CHARGES**

Phoenix Direct, Unit 5, Western Avenue, Matrix Park, Buckshaw Village, Chorley, PR7 7NB



freephone mon - fri 8.30am - 8pm sat 8.30am - 5pm

0800 19 77 488



Peripherals & Accessories

www.computerbargains.co.uk

WARRANTY. TRADE PRICES 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 DIRECT TO THE PUBLIC. CREDIT CARD SURCHARGE. FREE TECHNICAL SUPPORT.



HP COMPAQ
CD-RW + DVD 15" TFT
WIRELESS NOTEBOOK
£445 ~~£522.88~~
+VAT inc VAT

- Compaq Presario 2209 with Intel Celeron M330 CPU
- 512MB Ram, 60GB HDD, Modem, Lan & Wireless
- CD-RW + DVD Combo Drive, 15" TFT Colour Display
- Microsoft Windows XP Home & Works Software
- HP Compaq factory refurbished stock, factory sealed in brand new condition with 1 year warranty
- Notebook Carry Case add £20+VAT (£2)

**BUY NOW
PAY NOTHING
FOR
6 MONTHS**



HP PAVILION
A622N P4 2.8GHz
512MB/160GB DVD-RW
£349 ~~£410.08~~
+VAT inc VAT

- HP Pavilion A622N PC. Intel Pentium 4 2.8GHz CPU
- 512MB DDR SD RAM, 160GB Hard Drive, 3.5" FDD
- DVD-Rewriter Drive, 9 in 1 Card Reader, Modem & Lan
- MS Windows XP Home, Works & Anti Virus software
- Factory clearance refurb stock with 1 year warranty
- CRT Monitor add £75+VAT, 15" TFT add £109+VAT
- TFT Monitor add 139+VAT (£163.33inc VAT)



iFRIEND
1.2GHz 256MB/30GB
CDRW+DVD NOTEBOOK
£349 ~~£410.08~~
+VAT inc VAT

- iFriend NC123x4 Notebook, 1.2GHz VIA CPU
- 256MB Ram, 30GB Hard Drive
- 14.1" 1024 x 768 Res Colour TFT Screen
- Built in CD-RW + DVD Combo Drive
- 4x USB Ports, Modem, Lan & VGA Ports
- Supplied with Microsoft Windows XP Home
- 1 year manufacturers collect & return warranty

**1 YEAR
COLLECT &
RETURN
WARRANTY**



HP PAVILION
A624X P4 2.8GHz
512MB CD-RW + DVD PC
£289 ~~£339.58~~
+VAT inc VAT

- HP Pavilion A624X PC. Intel Pentium 4 2.8GHz CPU
- 512MB DDR SD RAM, 80GB Hard Drive
- CD-RW & DVD Combo Drive, Built in Modem & Lan
- MS Windows XP Home, Works & Anti Virus software
- HP factory clearance refurb stock with 1 year warranty
- 17" CRT Monitor add £75+VAT, 15" TFT add £109+VAT
- 17" TFT Monitor add 139+VAT (£163.33inc VAT)



DELL
LATITUDE C610
1GHz CD-RW NOTEBOOK
£299 ~~£351.33~~
+VAT inc VAT

- Dell Latitude C610 Notebook, Intel Pentium III 1GHz
- 256MB Ram, 20GB Hard Drive, CD-RW Drive
- 14.1" TFT Colour Screen with 1024 x 768 res
- 3.5" Floppy Drive, Modem and Network
- Serial, Parallel, VGA, PS2, PCMCIA and
- Microsoft Windows 98 plus Recovery CD
- Dell refurb stock with 6 months warranty.

**DELL FACTORY
REFURBISHED**



COMPAQ
PIII-866MHz PC with
256MB RAM 20GB HDD
£79 ~~£92.83~~
+VAT inc VAT

- Compaq Deskpro PC, Intel Pentium III-866MHz CPU
- 256MB Ram, 20GB Hard Drive, 3.5" Floppy Drive
- Built in CD ROM Drive, Modem and Network Card
- Supplied with Keyboard, Mouse & Speakers
- Compaq refurbished to grade A condition, 3 months warranty. Software and Monitor available at extra cost



HP COMPAQ
P4-3.0GHz 512MB
DVD-RW + TV TUNER PC
£425 ~~£499.38~~
+VAT inc VAT

- Compaq Presario SR1350 PC. Intel P4 3.06GHz CPU
- 512MB RAM, 200GB HDD, Dual layer DVD Rewriter
- Serial, Parallel, USB, Firewire, 56K Modem & Network
- Memory card reader, Built in FM TV Tuner plus remote
- Microsoft Windows XP Home & MS Works Software
- HP Compaq factory refurbished stock, 1 year warranty
- 17" CRT Monitor £75+VAT, 17" TFT Monitor £



HP COMPAQ
P4 2.66GHz WIDESCREEN
WIFI NOTEBOOK
£565 ~~£663.88~~
+VAT inc VAT

- HP Pavilion ZV5230, Intel Pentium 4 2.66GHz
- 256MB Ram, 40GB HDD, CDRW+DVD Combo Drive
- 15.4" Widescreen display with ATI Radeon graphics
- USB ports, Modem, Lan & 54g 802.11b Wireless Lan
- Microsoft Windows XP Home & Works Software
- Compaq factory refurbished stock, factory sealed in brand new condition with 1 year warranty.

**DELL FACTORY
REFURBISHED**



MEGAVIEW
PORTABLE MEDIA PLAYER
MP3 & VIDEO RECORDER
£199 ~~£233.83~~
+VAT inc VAT

- Megaview 566 portable media player with 20GB hard drive and SD MMC Slot. Store your favourite MP3, DivX MPEG4 and files, record straight off your TV, DVD player and watch back through the built in TFT LCD. Also view and store your favourite photos through built in card reader. Includes batteries, AC adapter, case, headphones, remote control, cables and software.

**NEW HOT
PRODUCT**



HP COMPAQ
ATHLON XP 3000+
15.4" WIFI NOTEBOOK
£529 ~~£621.58~~
+VAT inc VAT

- Compaq Presario 3120, AMD Athlon 3000+ CPU
- 512MB Ram, 60GB Hard Drive, CD-RW + DVD Drive
- 15.4" Widescreen with NVIDIA GeForce graphics
- Built in Modem & Lan plus 54g 802.11b Wireless Lan
- Microsoft Windows XP Home & Works Software
- Compaq factory refurbished stock, factory sealed in brand new condition with 1 year warranty.



HP COMPAQ
PRESARIO SR1200NX
AMD 2800+ CDRW PC
£225 ~~£264.38~~
+VAT inc VAT

- Compaq Presario SR1200NX, AMD Sempron 2800+
- 256MB Ram upgradeable, 40GB Hard Drive
- CD-RW Drive, Modem, Lan, USB & Firewire Ports
- MS Windows XP Home, Works & Anti Virus Software
- HP factory clearance refurb stock with 1 year warranty
- DVD & DVD-RW Versions also available call for details
- 17" TFT Monitor add 139+VAT (£163.33inc VAT)



HP MEDIA CENTRE
M1070 PHOTOSMART PC
DVD-RW TV & FM TUNER
£595 ~~£699.13~~
+VAT inc VAT

- HP Media Centre M1070, Intel P4 3.0GHz HT CPU
- 512MB DDR RAM, 160GB Hard Drive
- DVD + DVD Rewriter Drive, nVidia 256MB Graphics
- Modem & Lan, 9 in 1 Memory Card Reader, Built in TV & FM Tuner plus Remote Control & Speaker set
- Wireless Keyboard and Mouse, Microsoft Windows XP Media Centre plus Works Suite and other software
- HP factory clearance refurb stock, 1 year warranty.



ACER N35
POCKET PDA WITH
BUILT IN SAT NAV
£225 ~~£264.38~~
+VAT inc VAT

- Acer N35 PDA with satellite navigation solution
- Includes PDA with built in GPS and local country maps bundled onto a 256MB Card. Easy to use & navigate
- Package includes Acer N35 PDA with 266MHz CPU
- Windows Pocket PC 2003 Software, plus Destination Voice guidance Sat Nav Software, cables & car kit etc.
- Brand New with full manufacturers warranty.



HP COMPAQ
ATHLON 64 DVD+RW
15.4" WIFI NOTEBOOK
£649 ~~£762.58~~
+VAT inc VAT

- Compaq Presario 3240, AMD Athlon 64 3200+ CPU
- 512MB Ram, 60GB Hard Drive, DVD Rewriter Drive
- 15.4" Widescreen with NVIDIA GeForce graphics
- Built in Modem & Lan plus 54g 802.11b Wireless Lan
- Microsoft Windows XP Home & Works Software
- Compaq factory refurbished stock, factory sealed in brand new condition with 1 year warranty.



DELL
1.2GHz CD-RW+DVD
512MB/30GB NOTEBOOK
£375 ~~£440.63~~
+VAT inc VAT

- Dell Latitude C610, Intel Pentium III-1.2GHz CPU
- 512MB Ram, 30GB Hard Drive, 14.1" TFT Screen
- CD-RW+DVD Combo, 3.5" FDD, Battery & Charger
- Built in 56K Modem and 10/100 Network card
- 2x PCMCIA, Serial, Parallel, IrDA, VGA & USB
- Supplied with Microsoft Windows XP Home Software
- Compaq factory refurbished stock with 6 month warranty
- Notebook carry case add £20+VAT (£23.50inc VAT)

GREAT SPEC



USB PEN DRIVES
128MB TO 4GB
CALL FOR
PRICES!!

- USB pen drives are now the most convenient way to backup and transfer your data from your laptop, pc etc
- Available in 128MB, 256MB, 512MB, 1GB, 2GB & 4GB
- Supports Windows 98, Me, 2000, XP, Linux and Mac
- USB 2.0 standard and compatible with USB 1.1
- Brand new retail packaged with one year warranty.



FAMOUS BRAND
2.6GHz 256MB/80GB
DVD REWRITER PC
£265 ~~£311.38~~
+VAT inc VAT

- Famous Brand PC with Intel Celeron D330 2.66GHz CPU
- 256MB DDR Ram upgradeable, 80GB Hard Drive
- Dual Layer DVD Rewriter Drive, Keyboard & Mouse
- Built in Modem, Lan, USB Ports & Audio In/Out
- Supplied with Microsoft Windows XP Home Software
- Factory clearance refurb stock with 1 year warranty
- 17" CRT Monitor add £75+VAT, 17" TFT add £139+VAT



IBM
THINKPAD T20
700MHZ DVD NOTEBOOK
£249 ~~£292.58~~
+VAT inc VAT

- IBM Thinkpad T20, Intel Pentium III-700MHz CPU
- 256MB Ram, 12GB Hard Drive, 14.1" TFT Display
- Includes DVD ROM, Floppy Drive, Battery & Charger
- Built in Modem, Serial, Parallel, USB & Ports
- IBM factory refurbished stock with 6 months warranty.
- Notebook carry case add £20+VAT (£23.50inc VAT)
- Software excluded available at extra cost.

COMPUTER BARGAINS

1 STAND LANE, RADCLIFFE, MANCHESTER, M26 1NW.

Mail Order Sales Call: **0870 757 2216** General Enquiries Call: **0161 723 2222**
Fax No: **0870 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

Hardsoft

THE BEST DEALS ON NEW, EXCESS AND REFURBISHED LAPTOPS & PCs. ESTABLISHED 1991

ORDER ON-LINE

www.sterlingxs.co.uk

See website for full list of products

NEW LAPTOP BARGAIN

IFRIEND NC202i4 LAPTOP
Intel Celeron 2GHz processor
256mb ram, 20gb hard drive
14.1" TFT screen (1024x768)
Integral CD rom
UK keyboard & trackpad pointing device
56k modem, 10/100 network interface
2x USB ports, Parallel port
IEEE 1394 firewire port, VGA,
PS2 & TV out ports
Li-ion battery & AC adaptor/charger
Windows XP Home.
New & boxed with manual,
recovery cds & carry case
One year on-site collect & return iFriend warranty

£319.99 ex-vat
£375.99 inc-vat



NEW LAPTOP SPECIAL CLEARANCE

Brand new iFriend NA243rx5 laptop,
with powerful Athlon processor
AMD Athlon XP2400+ processor
256MB RAM, 30gb hard drive
15.1" TFT display (1024x768)
Integral DVD/CDRW combo drive
Soundblaster pro compatible sound system,
with AC97 direct sound 3D support
Graphics up to 64mb shared
UK keyboard & trackpad pointing device
56k modem, 10/100 network interface
4x USB 2.0 ports & IEEE 1394 firewire port
VGA & 1x pcmcia (type II) ports
Li-ion battery and AC adaptor/charger
New and boxed with driver cds.
No operating system included.
One year on-site collect & return iFriend warranty

£349.99 ex-vat
£411.24 inc-vat



PANASONIC TOUGHBOOK CF-71

Tough magnesium shock proof alloy case,
with built in carry handle.
Designed for engineers, industrial & outdoor applications.
Intel Pentium II 300mhz processor
64mb RAM (sdrum pc100mhz)
6.4 gb hd - shock mounted
13.3" TFT screen - 1024x768 resolution
Internal CD rom drive
Spill resistant UK keyboard & trackpoint pointing device
Soundblaster compatible sound
2x type II pcmcia (cardbus) slots
USB serial, parallel, ps/2, infra red, vga ports
Li-ion battery & charger
Refurbished with 90 days RTB warranty

£249.99 ex-vat
£293.74 inc-vat



COMPAQ ARMADA SPECIAL

COMPAQ ARMADA 7400
Intel Pentium II, 300mhz processor
256mb Sdrum memory
6gb hard drive
13.3" TFT screen (1024x768)
Integral cd rom drive
Sound system, with built in speakers
4mb AGP graphics
UK keyboard, with pointing device
USB , parallel, infrared & serial ports
VGA and PS2 ports
2x Type II PCMCIA slots
Li-ion battery & AC adaptor/charger
2nd user with 90 days RTB warranty

£149.99 ex-vat
£176.24 inc-vat



PANASONIC TOUGHBOOK CF-27

Toughbook features a magnesium alloy case - 20 times stronger than plastic. Shock resistant & water resistant - ideal for industrial/outdoor applications
Intel Pentium 266mhz MMX processor
64mb ram 4gb hard disk
12.1" TFT display (800x600)
Internal DVD rom
UK keyboard & Touchpad
Sound, USB, serial, parallel, ps2, vga ports
Li-ion battery & charger
Refurbished with 90 day RTB Warranty
Also available preloaded with Windows 98, with COA & backup CD at £234.99 inc vat

£169.99 ex-vat
£199.99 inc-vat



IBM THINKPAD T23 SPECIAL

IBM THINKPAD T23 with DVD
Corporate quality factory refurbished slimline notebook (weights just 2.1kg & 3.3cm thin)
Intel Pentium III mobile 1GHZ processor
256mb & 20gb hard drive
14.1" TFT screen (1024x768)
Integral DVD drive, Swappable 3.5" 1.44mb floppy drive
S3 savage video, Crystal soundfusion WM audio
UK keyboard & trackpoint pointing device
56k modem & 10/100 network, Parallel serial, S-video
VGA and PS2 ports, 2x Type II PCMCIA slots & 2x USB ports
Li-ion battery & AC adaptor/charger
Factory refurbished (keyboards replaced & cases virtually free from markings), with 90 days RTB warranty
Windows 2000 professional pre-installed with COA (backup cd included)

£340.42 ex-vat
£399.99 inc-vat



ADVENT AMD 64 HIGH SPEC TOWER

Advent Mini Tower T8002
AMD Athlon 64 3200 processor
1024mb DDR RAM, 250gb hard disk
DVD Rewriter dual layer 8x & separate DVD drive
7 in one card reader, 3.5" 1.44mb floppy drive
56k modem & 10/100 network
OnBoard AC'97 Sound Card & speakers
ATI Radeon 9550 256mb DDR graphics, with VGA & DVI & S-video
6 USB ports, 2 IEEE 1394 Firewire ports
serial, parallel ports.
UK keyboard & wheel mouse
Windows XP Home & Works 7,
Power DVD & Nero Burner with restore cds
As new and boxed (factory refurb)
One year return to base warranty

£399.99 ex-vat
£469.99 inc-vat



COMPAQ ARMADA DVD LAPTOP

Corporate quality notebook, with Intel Pentium III 750mhz processor
Intel Pentium mobile III 750mhz processor
256mb memory, 12gig hard drive
14.1" TFT screen (1024x768)
Integral DVD drive
Swappable 3.5" 1.44mb floppy drive
Sound system, with built in speakers
8mb ATI rage mobility graphics
US keyboard with trackpoint pointing device
Integral 10/100 network & 56k modem
USB port, 2x ps2 ports
Parallel, infrared, VGA & serial ports
Built in 10/100 network & 56k modem
2x Type II PCMCIA slots
Li-ion battery & AC adaptor/charger
Refurbished product with 90 days RTB warranty

£239.99 ex-vat
£281.99 inc-vat



Updated daily, don't forget to check out our website for full list of currently available products

SAME DAY DISPATCH



Sterling Management
Systems Ltd
13-15 Barrack Road,
Guildford, Surrey, GU2 9ZW

Tel: 01483 301331
Fax: 01483 533079
e-mail: sales@sterlingxs.co.uk

PLACE YOUR ORDER ON-LINE OR BY PHONE, FAX OR POST

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 - please telephone before travelling to confirm availability. Photos for illustration only. E&OE.

Consumables & Disc Media

Order online at www.offtek.co.uk
and take Advantage of FREE UK Delivery!



Notebook Memory

Prices from	64MB	128MB	256MB	512MB
	£19	£19	£21	£42

Desktop Memory

Prices from	32MB	64MB	128MB	256MB	512MB
72 Pin Simms	£20	£57	£129		
168 Pin Dimms	£14	£15	£24	£41	£63
184 Pin DDR Dimms			£16	£20	£35
Rambus Rimms			£31	£59	£166

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	£15	£16	£16	£19
Smartmedia	£13	£15	£19	
Multimedia	£13	£14	£17	£23
Secure Digital Card	£14	£15	£17	£22
Memory Sticks		£18	£23	£31

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



Print-Rite
Quality Earlier Non-Chipped Epson Compatibles
Black **£1.29** Colour **£1.95**

R-200, R-300, RX-500, R X-600
C64, C66, C70, C80, C82, C84
C86, RX-425, CX-3600, CX-3650
CX-5200, CX-5400, CX-6400, CX-6600
Offer@ **£1.75**Each

Canon Compatibles
BCI-24 black **£1.69** BCI-24 colour **£1.95**
BCI-3 & 6 compatible **£2.49** per cartridge
BCI-24 black compatible £1.69
BCI-24 colour compatible £1.95

Print-Rite
Quality Chipped Epson Compatibles
Black **£2.49** Colour **£2.95**

Quality Low Priced
Chipped Epson Compatibles
Black **£1.75** Colour **£1.95**

HP Compatibles
51645 42ml black **£8.95**
C6578 39ml colour **£11.95**
C1823 39ml colour **£11.95**
C6625 39ml colour **£11.95**
Lexmark, HP, Brother, Phillips @ Low Prices
+ Ink Film for faxes

Photo Paper

- 6 x 4 Photo Matt 190gsm 50 sheets **£3.95**
- 6 x 4 Photo Gloss 210gsm 50 sheets **£5.49**
- 7 x 5 Photo Matt 190gsm 50 sheets **£4.49**
- 7 x 5 Photo Gloss 210gsm 50 sheets **£6.79**
- 100mm x 10m Roll Photo Gloss 259gsm **£14.95**
- 100mm x 10m Roll Photo Silk 259gsm **£14.95**
- A4 Photo Gloss 210gsm 20 sheets **£5.69**
- A4 Photo Gloss 260gsm 20 sheets **£5.95**
- A4 Photo Matt 120gsm 100 sheets **£5.95**

Enigeris / FameartD digital camera 2 Ap ower adaptor.
With a set of 16p lugs
Only **£12.95**

Also available, switch mode power supplies with a set of 16 plugs. Voltage output 3v, 4.5, 5v, 6v, 9v & 12v
800ma output **£11.95**.
1000ma output **£12.95**

10hrBa terych argerwi th
4x 2300mah NiMH
AAbat teries **£9.95**
(With 4 x2000mah) **£7.95**
Just the charger **£5.95**

64 minute charger with 4 x 2300mah AA batteries **£21.95**
NiMH Batteries
2300mah AA **£5.95**
2500mah AA **£7.95**
800mah AAA **£5.95**
Lithium CR-2016, CR-2025, CR-2032 59p
CR-123 **£1.69** CR-2 **£1.95** CR-5 & CRP2P **£2.95**

Digital Memory Cards

Please note, these prices are subject to change frequently without notice. Please see our website for latest prices

Compact Flash(20x speed) 128MB **£12.50** 56MB **£15.95** 512MB **£27.50** 1GB **£44.95**
SDc ards(20x speed) 128MB **£11.49** 256MB **£17.95** 512MB **£26.95** 1GB **£15.50**
Mini SDC ards 1 28MB **£14.95** 2 56MB **£20.50** 512MB **£34.95**
XDC ards 6 4MB **£12.95** 128MB **£17.50** 256MB **£25.50** 512MB **£34.95**
MemoryS tick(standard) 64MB **£14.95** 128MB **£19.95** 256MB **£24.95**
MemoryS tickD uo 128MB **£33.95**
MemoryS tickP roD uo 128MB **£23.95** 256MB **£31.95**
USB-2 High Speed Flash Drives 128MB **£11.95 256MB **£17.95** 512MB **£27.95****

All Company, product and brand names listed are the property of their respective holders and are used only for descriptive purposes

Prices include VAT
Free UK delivery on orders £10 and over
(For orders under £10, its just £1 p&p)

www.tonezoneuk.com
Tel. 0870 800 1 800
Fax. 0870 800 2 800

ToneZone Consumables
Callers Welcome
8 - 10 Littlehampton Road
"Thomas-a-Becket", Worthing
West Sussex, BN13 1QE

Get more from PCW

www.pcw.co.uk

The Test Bed

PCW's labs blog, giving you the latest performance results, news and gossip on the products we test, plus the chance for you to comment or ask questions.

The current issue

Details what's in the latest issue, plus with a single click, you'll get an outline of the following month's issue, which we update during the month.

Reviews

More reviews on our home page, with an improved search facility and direct links to our Best Buys recommended lists and our Pricerunner-driven Best Prices cost comparisons for a massive range of products.

Group tests

Recently introduced to PCW online, we have made our popular comparative tests easier to find and more extensive than ever.

Hands on

If you don't buy every issue, then search our archive of Hands on articles from the past few years, available to buy for 99p.

News

Updated regularly throughout the day, the essential news on the industry and product releases. Click the News tab and you'll find even more news, plus special reports. Plus you can access an RSS feed to get the latest news on your desktop.

Best Prices

Here you can compare product prices from a large group of online retailers for a huge range of products, checking out the cheapest price before making a purchase with a couple of clicks.

The screenshot shows the PCW website homepage as of May 5, 2005. The site has a blue header with the logo 'PERSONAL COMPUTER WORLD' and navigation tabs for HOME, NEWS, REVIEWS, DOWNLOADS, FORUMS, HANDS ON, and JOBS. A search bar and utility links (RSS, PDA, Site map) are present. The main content area features a large banner for 'The test bed BLOG' with a 'Click for FREE trial' button. Below this, there are sections for 'THE CURRENT ISSUE' (highlighting 'BULLET PROOF!' and 'CENTRINO LAPTOPS'), 'REVIEWS' (featuring 'Buffalo 125 High Speed Mode Wireless Router'), and 'GROUP TESTS' (listing 'Web browsers' and 'Network Attached Storage'). A 'Hands on' section is also visible. The right sidebar contains 'MORE REVIEWS' (Logitech Harmony H655, Belkin Wireless Pre-N Router), 'The test bed' (512MB graphics cards), and 'MARKETPLACE'. The bottom section includes 'DIGITAL EDITION' (Zinio), 'DOWNLOADS' (Diskeeper 9.0 Home Edition, Application Compatibility Toolkit, DOSBox, RobotProg, HandyFind), and 'ADVERTISING' (Napster Free Trial). Red arrows from the text on the left point to these specific features on the website.

Leisure

Contents

Games

- 228** Close Combat:
First to Fight
229 Freedom Force vs
The 3rd Reich

Competitions

- 230** Two Jai Phoebe PCs
231 A Shuttle computer

Retro

- 232** Intel's 4004 remembered

LOADING...



Console city in LA

Next-generation games consoles from Microsoft, Sony and Nintendo were unveiled at the Electronics Entertainment Expo in Los Angeles. Attendees at the world's biggest gaming trade show, E3, were given previews of Microsoft's Xbox 360, Sony's Playstation 3, and Nintendo's Revolution.

While little was shown of the latter, the Xbox 360 and Playstation 3 were shown in their full glory, and offer significant performance gains over their predecessors. Xbox 360 uses a triple-core IBM PowerPC processor clocked at 3.2GHz and 512MB of unified memory shared with an unnamed ATI graphics card. Unusually for a console, it uses a liquid cooling system.

The Playstation 3 is even more powerful – using a custom Cell processor capable of two trillion floating point operations per second. Whether all this computing power means we'll get better games remains to be seen.

For the full scoop on all three next-generation consoles and some great games in development, see news section, page 40.

Close Combat: First to Fight

Test your leadership skills as a Marine lance corporal



The latest in a rash of games developed in conjunction with America's fighting forces is Close Combat: First to Fight. It was created with the help of dozens of active-duty US Marine Corps recruits, and revolves around the civil unrest in the Lebanese city of Beirut.

Terrorist insurgents and military forces from neighbouring Arab nations have run amok and your role is a Marine lance corporal in charge of a four-man squad. As part of an expeditionary unit under the control of a United Nations peacekeeping corps, your team is sent into the thick of the action.

Most missions involve a lot of shooting, but you'll need your troops to work as a team to get the best results. Running into a room full of insurgents all guns blazing will probably get you killed, but issuing commands to your team requesting the use of flash grenades and covering fire will yield more success.

Unlike some games of this type, you can usually rely on your squad to form an effective defensive and offensive team. The unit follows the Marine Corps doctrine known as

The right orders will elicit the best results most of the time

our orders were ignored – not the most ideal situation when you're surrounded by bloodthirsty killers. The behaviour of enemy soldiers can be equally unreliable.

The main game should take the average player a while to complete, but you'll probably have the most fun in the multiplayer mode, which can be played across a network, or via the Internet. There are standard team deathmatch modes, as well as a co-operative mode that lets you play in tandem with other players across the entire single-player campaign.

This probably isn't the best example of the genre, but is an enjoyable squad-based shooter with some great moments.

Rory Reid

DETAILS

PRICE £29.99 inc VAT

CONTACT 2K Games

www.2kgames.com

SYSTEM REQUIREMENTS

Windows ME, XP or above • 256MB of Ram • 32MB DirectX 9 video card with T&L • 1.3GHz CPU • 8x CD-Rom drive • 16bit DirectX9-compatible soundcard • 2.8GB of hard drive space

VERDICT

Good, clean squad-based shooting fun, with a great multiplayer mode

OVERALL





Competitions 230 Win a Jal Pheobe PC or a Shuttle XPC System G5 8300M

Don't miss out on your chance to win one of these prizes



Freedom Force vs 3rd Reich

Become a superhero freedom fighter



The fantasy of having men in tight-fitting clothes defend

civilisation from evil is worryingly popular.

Freedom Force vs The 3rd Reich (FFVST3R) takes full advantage of this disturbing fondness. The action continues where the original Freedom Force finished. After saving the world, the game's cast must travel back in time to 1942 in a bid to defeat the Nazis.

We won't spoil the plot, but suffice to say the game is vaguely reminiscent of the Double Dragon games. Players must lead a small troupe of heroes, destroying anyone foolish enough to get in their way and levelling any building unfortunate enough to have been constructed nearby.

The control scheme is similar to that of a massively multiplayer game, as you'll need to pause the game at regular intervals to issue commands to your squad. You'll often need to split the team, taking on different enemies in different locations, or using characters with long-range attacks to bring foes within your range of mêlée fighters.

Everything around you can be destroyed using super powers, but you'll have just as much fun using trees, lamp

posts and other inanimate objects as makeshift weapons.

A superhero game would be nothing without an assortment of outrageous villains and FFVST3R has them in abundance. These include Blitzkrieg – an evil Nazi genius with the power to make men do his bidding, and Fortissimo – an eccentric flying baritone who can crush buildings with his voice alone. The game's standard goons are also very well done. Brains in jars, ape men and all manner of bizarre creatures do their best to destroy you.

If you have even a passing interest in comic books or simply want to play something a little different, Freedom Force vs The 3rd Reich comes thoroughly recommended.

Rory Reid

DETAILS

PRICE £29.99 inc VAT

CONTACT

Digital Jesters
www.digitaljesters.com

SYSTEM REQUIREMENTS

Windows ME/XP or above • 128 MB of Ram • 32MB DirectX 9 video card with T&L • 733GHz CPU

VERDICT

A refreshing and humorous comic-book style romp that doesn't take itself too seriously

OVERALL ★★★★★

Trackmania: Sunrise

Good-looking, high-speed fun



There are two types of gamers in this world; those who enjoy realism and those who prefer wild arcade action. Trackmania: Sunrise, the follow-up to the original Trackmania, is designed specifically for the latter group.

The game uses the same formula as its predecessor, but stands out mostly due to its improved graphics. The original game wasn't bad looking, but the sequel incorporates a level of graphical detail that puts most games, regardless of genre, to shame.

In contrast to the amazingly complex graphics, the game itself is sheer simplicity. Essentially, there are three different kinds of race, each using a specific type of vehicle. The first and most common employs the use of a fast sports car. This is all about accelerating as quickly as possible and building up speed. The second race type uses a four-wheel drive vehicle, which is adept at performing death-defying stunts. The third and final race type uses a coupe designed with intricate manoeuvres in mind.

All three race types are present across the four gameplay modes. The standard race modes (inherited from the

original Trackmania) include a basic time trial and a puzzle mode that involves having to lay down a limited supply of track pieces as fast as you can in order to complete a circuit.

These standard modes are joined by two new ones; platform and crazy. In platform you must make it over as many platforms from one side of a course to the other without falling off. Crazy requires you to race against 16 computer-controlled opponents. The slowest car on each lap is eliminated, which forces you to achieve faster lap times.

Trackmania: Sunrise won't win any awards for realism, but if you want fun, high-speed racing it is worth considering.

Rory Reid

DETAILS

PRICE £29.99 inc VAT

CONTACT

Digital Jesters
www.digitaljesters.com

SYSTEM REQUIREMENTS

Windows ME/XP or above • 128 MB of Ram • 32MB DirectX 9 video card with T&L • 450MHz CPU • 4x CD-Rom drive

VERDICT

Trackmania: Sunrise is fast, fun and exquisitely good-looking

OVERALL ★★★★★



Two Jal Phoebe PCs

Jal is giving two *PCW* readers the chance to have one of its award-winning computers. The Jal Phoebe received a *PCW* Highly Commended award in the May 2005 issue thanks to its high performance, generous features and value for money.

The Phoebe is equipped with an Athlon 64 2800+ CPU and 512MB of fast PC3200 Ram, installed on an Asrock K8 Combo Z motherboard. Unlike most budget computers, it does not use an integrated graphics adapter. Instead, Jal has supplied an ATI Radeon 9550 card (a cut-

down version of the Radeon 9600), with 128MB of Ram – an inclusion which gamers and video-editing enthusiasts will be more than pleased with.

Jal hasn't skimped on the rest of the computer either. A decent 120GB hard drive is supplied, which should be more than adequate for most home users. A DVD reader/CD-rewriter is also included. This features a built-in multiformat card reader, so you can quickly transfer images from your digital camera to the PC. To round off this excellent package, Jal has included a wireless keyboard and mouse,

a copy of PowerDVD, a PC-Cillin security package and Nero Burning Rom.

For more information on Jal's range of award-winning PCs, visit www.jal.co.uk or for your chance to win one of two Jal Phoebe computers, answer the question below and follow the instructions on how to enter.

What graphics card does the Jal Phoebe use?

- a) ATI Radeon X300
- b) Nvidia Geforce 5900
- c) ATI Radeon 9550

PCW AUGUST 2005 JAL COMPETITION ENTRY FORM

What graphics card does the Jal Phoebe use?

.....

Name:

Address:

Email address:

Daytime telephone number:

Mobile telephone number:

We may use the contact details supplied to communicate with you regarding PCW.

Email Tick box to receive information about other products and services from the VNU Group by email

Tick box to receive information about products and services from selected companies by email

Mobile/SMS Tick box to receive information about other products and services from the VNU Group by SMS;

Tick box to receive information about products and services from selected companies by SMS

Postal/telephone (landline) Tick box if you DO NOT want to receive information about other products and services from the VNU Group by post/telephone;

Tick box if you DO NOT want to receive information about products and services from selected companies by

post/telephone



Rules of entry

This competition is open to readers of *PCW*, except for employees (and their families) of VNU Business Publications, Jal and Shuttle. *PCW* is the sole judge of the competition and the Editor's choice is final. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. VNU will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. Prizes will be dispatched direct by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. VNU will use all reasonable efforts to ensure that the prizes are as described on this page. However, VNU cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

June winners

The winners of the three Brother multifunction devices are M Suffield from Wakefield, R Sharp from Dundee and Bryan Suitters from Harpenden.

The winners of the six Seagate Barracuda hard drives are David Webb, John Bell, A Sutton, Judith Robinson, R Sunley and AH Harker.



A Shuttle XPC System G5 8300M

The Shuttle XPC System G5 8300M is an ultra-small PC, which was reviewed in the May issue of *PCW* and received an overall score of four out of five thanks to its excellent blend of features and performance. One *PCW* reader is in with a chance of winning one of these PCs.

The system is based on the XPC SB83G5 barebones chassis, but it comes fully kitted out with a 3GHz Pentium 4 CPU and 512MB of DDR400 memory giving it a strong technical foundation. As you would expect, it also has excellent multimedia capabilities. The Shuttle XPC G5 8300M

uses Windows XP Media Center Edition, so you can watch your favourite movies and television programmes easily. You can even rewind, pause and record live broadcasts thanks to a large 200GB hard drive.

As an added bonus, Shuttle will also include an XP17 Temp AR monitor. This screen is designed to deliver crystal-clear images and has a super-fast 8ms response time – ideal for watching DVD movies and playing games. The screen is clear, bright, has good viewing angles and features an anti-reflective coating to

stop images losing some focus under certain light conditions.

For more information on Shuttle's products, visit www.shuttle.com or for a chance to win an XPC G5 300M, simply answer the question below and follow the instructions on how to enter.

What is the response time of the Shuttle XP17 Temp AR monitor?

- a) 8 seconds
- b) 8 milliseconds
- c) 8 nanoseconds

How to enter

Fill in the coupon and send to the following address by 22 July 2005:
 PCW/Jal competition or PCW Shuttle competition, PO Box 122258, Sutton Coldfield, B73 9AB
 Or enter online at www.pcw.co.uk/Competition.

We may use the contact details supplied to communicate with you regarding PCW. Please indicate in your email if you are also happy for use to contact you via email or mobile about other products or services available from PCW and the VNU 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 or TELEPHONE 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 or TELEPHONE about their products or services.

Competition open to UK residents only.

PCW AUGUST 2005 SHUTTLE COMPETITION ENTRY FORM

What is the response time of the Shuttle XP17 Temp AR monitor?

.....

Name:

Address:

Email address:

Daytime telephone number:

Mobile telephone number:

We may use the contact details supplied to communicate with you regarding PCW.

Email Tick box to receive information about other products and services from the VNU Group by email

Tick box to receive information about products and services from selected companies by email

Mobile/SMS Tick box to receive information about other products and services from the VNU Group by SMS;

Tick box to receive information about products and services from selected companies by SMS

Postal/telephone (landline) Tick box if you DO NOT want to receive information about other products

and services from the VNU Group by post/telephone; Tick box if you DO NOT

want to receive information about products and services from selected companies

by post/telephone



Intel 4004

How a groundbreaking microprocessor helped one company to achieve world domination

It's easy to take microprocessors for granted, as virtually every electrical appliance today uses them.

Yet before microprocessors and the transistor were invented, computers were constructed from fragile and power-hungry vacuum tubes and filled entire rooms.

The pinnacle of vacuum tube computing was the Eniac I (Electrical Numerical Integrator And Calculator), commissioned by the US Military in 1943 and completed three years later at a cost of half a million tax dollars.

The Eniac I contained 17,468 tubes, measured 1,800 square feet, weighed 30 tons, consumed 160 kilowatts of electrical power and caused brownouts in Philadelphia when it was switched on.

It was an impressive piece of kit, but vacuum tubes were proving intolerable to work with; indeed JR Pierce, the Bell Labs engineer who coined the term transistor, commented 'nature abhors the vacuum tube'.

Bell Labs perhaps more than any other company wanted a practical replacement for tubes and mechanical relays. Its telephone network employed hundreds of thousands of them to connect or amplify the circuits needed to make calls, and the existing technology was slow and demanded regular maintenance.

So in the summer of 1945, Bell Labs director of research, Mervin Kelly, established a group to look into alternatives using semiconductors.

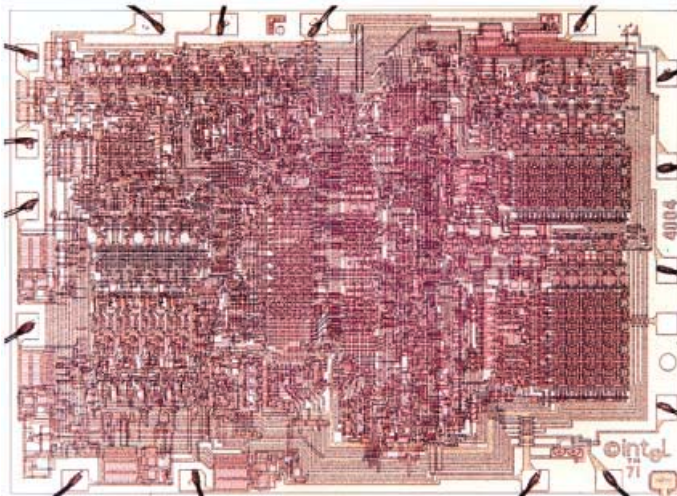
The group consisted of John Bardeen, Walter Brattain, Bob Gibney, Bert Moore and Gerald Pearson, with Stanley Morgan and William Shockley as leaders.

Rather than pursue the complex materials used unsuccessfully in earlier tests,

though, the team focused their efforts on silicon and germanium crystals. It was to prove a fortuitous decision: on 16 December 1947, Bardeen and Brattain observed amplification when two strips of gold were pressed onto a germanium surface.

They had discovered the transistor effect, which one month later Shockley developed into a junction transistor.

In 1955, Shockley left Bell Labs to form his own company and one year later, won the Nobel Prize for Physics with former colleagues Brattain and Bardeen, for their work



in discovering the transistor effect. Buoyed by this recognition, Shockley focused on a new silicon diode project, but members of his team became restless and in 1957 eight of them left.

These eight young scientists, Gordon Moore, C Sheldon Roberts, Eugene Kleiner, Robert Noyce, Victor Grinich, Julius Blank, Jean Hoerni and Jay Last, started with \$3,500 of their own money to develop a means to mass produce silicon transistors on a single wafer.

They were soon backed by \$1.5m from Fairchild Camera and Instrument Corporation.

The goal of Fairchild Semiconductor was to find a way of integrating the separate components of a complete circuit onto a single chip made from semiconducting material. Noyce devoted himself to finding a solution but was unaware that Jack Kilby of Texas Instruments was working on the same problem.

In 1959 they both applied for patents, with Kilby choosing germanium as a semiconductor, and Noyce choosing silicon. After several years of litigation, the two companies decided to cross-license their respective technologies and recognise

both Noyce and Kilby as the inventors.

The steady increase of transistors in integrated circuits prompted Fairchild's Gordon Moore to plot a graph to accompany an article he'd written for *Electronics* magazine in 1965. It originally showed the number of transistors in integrated circuits were doubling every year, a number he later refined to every 18 months.

Amazingly, Moore's Law, as it became known, has accurately predicted (or perhaps cynically driven) transistor density to this very day.

Back in 1968, Noyce and Moore left Fairchild

Semiconductor, along with Andy Grove to form their own company. Venture capitalist Art Rock, who'd previously helped fund Fairchild Semiconductor, came up with \$2.5m and NM Electronics was formed.

Noyce and Moore weren't keen on the name though so changed it to Integrated Electronics, or Intel for short. A motel chain owned the name, but was happy to sell it on.

In the early 1970s, a Japanese company called Busicom approached Intel to design 12 custom chips for a new calculator. One of Intel's engineers, Ted Hoff, believed a single chip could do the job of all 12. The plan was to design a general-purpose logic chip which could be programmed by software.

Federico Faggin and Stan Mazor of Intel, along with Busicom's Masatoshi Shima worked on Hoff's plan and nine months later on 15 November 1971, the first microprocessor was born.

Intel's 4004 microprocessor consisted of 2,300 transistors, ran at 100Hz and, despite being smaller than a fingernail, matched the processing power of the room-filling Eniac I. It was a revolution, but one owned by Busicom. Intel later bought the 4004's design and marketing rights for \$60,000, but it wasn't a foregone conclusion anyone would want a microprocessor.

Intel needn't have worried. In 1974, its new 8080 processor was selected as the brains behind the MITS Altair and six years later the 8088 was chosen by IBM for its Personal Computer. The rest, as they say, is history. Intel now employs 85,000 people and last year earned a revenue of \$34.2b. And following Moore's prediction 40 years ago, today's microprocessors have grown to feature tens or even hundreds of millions of transistors.

Gordon Laing

Index of Advertisers

Advertiser	Contact	Page	Advertiser	Contact	Page
AJP Computers	020 8208 9755	126-127	Jal	see advert	120
Abit**	see advert	10 & 11	Konica Minolta	see advert	61, 64, 65, 67
Antec	see advert	41	La Cie	see advert	125
AOL	see advert	93	Linksys	see advert	168
Buffalo	see advert	IBC	Maxtor	see advert	69
Canon	see advert	83	Mesh Computers	0870 046 4747	23, 24, 25, 26, 27, 28, 29, 30, 31
Crucial**	see advert	8	Morgan Industries UK	see advert	189
Dell Computer Corporation	01344 724 872	IFC, 5, 70-71	MSI	see advert	78
D-Link	see advert	167	Pipex	see advert	113
Draytek	see advert	21	Power Computing	see advert	212-213
Elite Group	see advert	107	Reader Offer	see advert	66
Epson	see advert	11	Subscriptions	see advert	195
Evesham Technologies	0800 496 0800	44-45	Tiny.com	0870 830 3127	57, 84, 94, 102, 108, 117, 118, 119, 174, 179, 185, 202, 31**
F-Secure	see advert	74-75	Tiscali	see advert	101, 132
FSP**	see advert	2, 19, 27, 32	Vodafone	see advert	8
Gamer	see advert	180	Watford	see advert	32-33, 15 & 29**
Gigabyte	see advert	14	Westlakes	see advert	236
GSEC	see advert	18-19	Zoom	see advert	35
Hardsoft**	see advert	20	Zyxel	see advert	39
Hi-Grade	see advert	OBC			
Viewsonic	see advert	8			
Infocus	see advert	53, 55			

* Insertions/inserted cards, catalogues, pre-printed adverts and sections ** Build the ultimate PC supplement



PCW Direct

FUJIFILM FINEPIX F455

Specifications

- 3.4x optical zoom
- 2in LCD viewing screen
- 16MB memory card

The Finepix F455 Zoom is the latest addition to the small, stylish digital compact camera range from Fujifilm. It is easy to use and feels comfortable to hold, due to its ergonomic design. With the same dimensions as a pack of standard playing cards, the F455 Zoom is small enough to take anywhere.

The Finepix F455 Zoom also features a 5.2megapixel CCD, essential for enlarging your images without losing quality, and a new image processor to ensure each picture has true-to-life colours and accurate exposures, meaning you get brilliant results every time. You can rely on the F455 to make the complicated picture-taking decisions when you press the shutter.

And all this technology is powered by a rechargeable battery, ensuring the camera lasts as long as possible. The Finepix F455 Zoom comes complete with a Picturecradle, making recharging and downloading both easy and convenient, while Pictbridge compatibility also allows printing at home without the need for a PC or Mac.



Please quote order code Z162

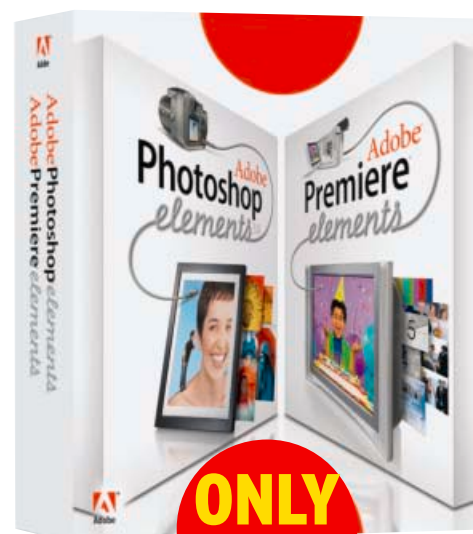
RRP

£259.99

READER PRICE

£229.99

ADOBE PHOTOSHOP & ADOBE PREMIERE



HOW TO ORDER

>> ONLINE

via our secure website

www.direct-pcw.co.uk

>> PHONE

on 01858 438 883

>> FAX

on 01858 468 969

>> **POST** using the form opposite, post your order to:

PCW Offers Direct, Tower Publishing Services Ltd, Tower House, Sovereign Park, Market Harborough, LEICS, LE16 9EF

PCW ON CD-ROM 5

The latest *Personal Computer World* back-issue CD-Rom is now available.

CD-Rom 5 features the entire editorial content from Volume 27 of *Personal Computer World* so you can enjoy all of 2004's issues, in a searchable, browsable and printable format.

With new enhanced search tools you can also search keywords, phrases, products or authors, as well as reading through each issue in your own time.



Please quote order code Z179

READER PRICE

£14.95

SUBSCRIBER PRICE

£13.45

>> www.direct-pcw.co.uk

ELEMENTS 3 ELEMENTS

Two powerful products are combined into one affordable package, so you can do more with your digital photos and video.

Photoshop elements offers top photo-editing facilities, while Premiere Elements gives you top-of-the-range video-editing facilities to create impressive home videos.

You can automatically transfer all footage from your DV camcorder to Premiere Elements' timeline in one easy step, and then edit it simply and efficiently with the help of text-sensitive how-to guides.

Please quote order code Z177

RRP £109.99
READER PRICE £89.99

MCAFEE INTERNET SECURITY SUITE



Get the full power of McAfee's award winning security and privacy software in one box. The package includes full versions of Virus Scan Home, Firewall, Spamkiller and Privacy Service to keep your family safe online.

Safeguard personal data, prevent viruses, stop unauthorised computer access, filter spam from your inbox and block pop-up ads – all with one powerful, fully integrated package.

Best of all, automatic updates ensure you always have the latest protection.

Please quote order code Z117

RRP £49.99
READER PRICE £39.99

TITLE	INITIALS	SURNAME
ADDRESS		
POSTCODE		EMAIL
DAYTIME PHONE NUMBER		MOBILE
FAX		SUBSCRIBER NUMBER (IF KNOWN)

We will use the contact details supplied to communicate with you regarding your order. If you are also happy for us to contact you about products and 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.

Order code	Item name	Reader price	Subscriber price	Quantity	Total price
		£	£		£
		£	£		£
		£	£		£
		£	£		£
		£	£		£

Add £6 for postage and packing outside the UK

POSTAGE & PACKING	£
TOTAL	£

- Please charge £ _____ to my Credit/Debit card: (tick as appropriate)
- I enclose a cheque for £ _____ payable to VNU Business Publications Ltd

Visa
 Mastercard
 Amex
 Switch
 Delta

Card number

Expiry date / Valid from / Issue No (Switch only)

Signature _____ Date _____

If you do NOT wish us to contact you BY POST about products or services available from PCW and the VNU Business 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

August Cover Disc

Six pages of workshops, special offers and more >>

On the CD

Readiris Pro 7

ACDSee 7 PE

Serif PhotoPlus 7

Dan Elwell's Broadband Speed Test



On the DVD

Readiris Pro 7

Backup4all 1.5

ACDSee 7 PE

Serif PhotoPlus 7

Dan Elwell's Broadband Speed Test



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 5.5 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 open the terms.htm file 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 August 2005 cover disc

ABT, 306 St Mary's Lane

Upminster, Essex RM14 3HL

quoting reference 'PCW Vol 28 No 8'.

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 go to www.vnusupport.co.uk.

Or email us at pcw@vnusupport.co.uk.

SOFTWARE LISTING

CD

Full versions

Readiris Pro 7
ACDSee 7 PE
Serif PhotoPlus 7
Dan Elwell's Broadband Speedtest

Trial versions

acdsee PowerPack 7
Adobe GoLive CS2
Backup4All 2
Cyberpatrol 7
Readiris Pro 10

From the magazine

dBpowerAMP Music Converter
GSpot 2.21

Kismet
Snare Micro Server
StopMotionPro 4
Trap Receiver
VNC Free Edition
WinSyslog
XP Fix
XviD 1.0.3

Freeware including

BadBlue PE 2.64
DVD Identifier 3.6.3.1
Fresh Diagnose 7.0
Kolorgenerator 1.1.0.3
RealAccount 1.2 build 190

Resources including

Alcohol 120% 1.9.5.28
CD Burner XP 3.0.116

Directory Opus 8.1.06
Encrypted FTP 3.3.0.139
Google Desktop Search
MSN Messenger 7
Startup Inspector 2.2
WinPatrol 9.1
WinRAR 3.42
ZipGenius 6.0.2.1030
ZoneAlarm 5.5.062

DVD

Everything on the CD PLUS...

Full versions
Backup4all 1.5

Trial versions
Adobe Photoshop CS2

Resources

Adobe Reader 7
OpenOffice v2 beta

Linux and open source

Austrumi 0.9.5a
Knoppix 3.8.2
Slax 5.05
Ubuntu 5.04

Game demos including

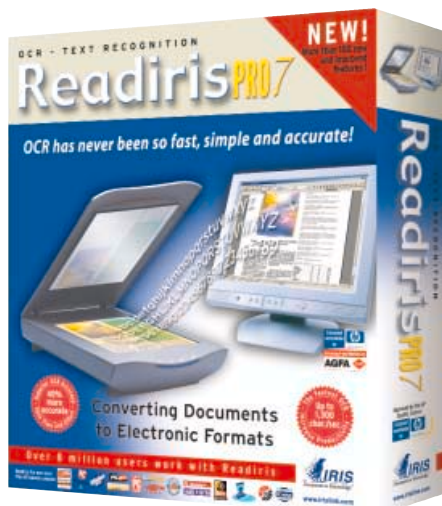
American Civil War – Gettysburg
Battle Mages Sign of Darkness
Cloven Crania Meadow
London Taxi
Salvo!
The Bard's Tale



Readiris Pro 7

This handy OCR tool will create an editable copy of just about any printed page within seconds

**FULL
VERSION**



Need to know

System requirements

64MB of Ram, Windows 98 or later, 70MB of free disk space, Twain-compliant scanner/digital camera to produce document image

Information

www.irislink.com

Registration

Use the serial code 532804200500101, then click Register > Registration Wizard within the application

Limitations

None

It's no secret that the best way to share documents is via email. Unfortunately some people haven't realised this and still prefer to send out printed copies, which is particularly annoying if you then have to retype them into your own PC.

However, converting paper documents into an electronic, editable format doesn't have to be a difficult process. Readiris Pro 7 comes with its own OCR wizard, for instance, which walks you through every step. Once you've told the program what it's examining (a scanned document or an image file) and picked the document language, it will create a copy within seconds.

But is it an accurate copy? Under normal circumstances, it should be. Readiris Pro 7 can handle all American or European character sets (including Baltic, Central European, Greek and Cyrillic), copes with just about any quality level from typeset to draft dot matrix, and is comfortable with anything from 6point to 72point text. It can also automatically detect document orientation and cope with skewed pages if they're not properly aligned in your scanner.

The program can't work miracles, and if you're trying to scan a low-quality fax, say, or an old document that's very faded, then it may not be able to convert every character automatically. But Readiris Pro can provide access to Twain scanner controls, so you can increase resolution, adjust brightness, or try other ways to get a clearer picture.

And that's only one option; the really clever idea comes next. If Readiris Pro isn't sure about a character, it will display its best

guess and allow you to choose an alternative. What's more, if you click the 'Learn' button, it will remember your choice and be more likely to correctly detect that character in future. Even with the default settings you'll normally see a high level of accuracy, but this training process means it will improve over time, even if you're using unusual fonts or symbols that the program might not normally recognise.

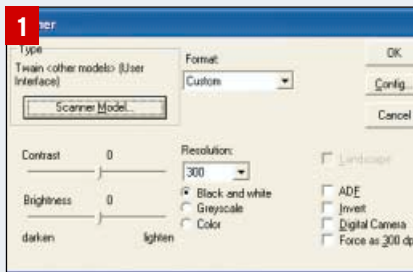
These features are enough to recognise simple documents, such as a letter, but others may need more advanced analysis. What if you're trying to extract only the text from a newspaper, for instance? Readiris must then pick out the columns and sort them into order, to make sure your text flows correctly. If you're running the OCR Wizard, all this happens automatically without any input from you, and it usually delivers excellent results. But if you've come across a more complicated document, then it's also possible to tell Readiris Pro manually what it should do. It's nothing difficult: just draw boxes around the text, graphic or table areas of your page and Readiris Pro will handle the rest.

All finished? Then it's time to export the completed document, and you have plenty of options here. Choose 'Send to', for instance, and you can have it open in Word, Excel or Wordpad, or sent to the clipboard. Alternatively, select 'External file' and direct Readiris to save your document in one of 23 different formats, from .txt and .csv to Word .doc, .rtf and HTML.

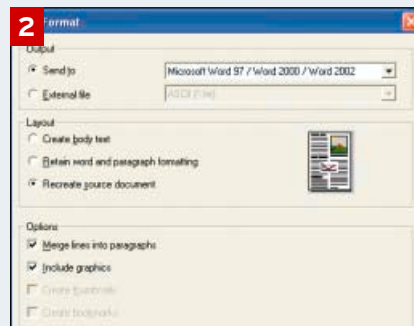
Key features

- Connect to any Twain-compliant scanner, digital camera or analyse image files
- Works with automatic document feeder to scan multiple images
- Automatic compensation for page orientation and deskewing
- OCR wizard
- Can duplicate the document layout
- Recognises over 90 languages
- American and European character sets
- Retains formatting eg tables or text columns
- Export to MS Word, Excel or the clipboard
- Save your document in .rtf, .doc, html or many other formats

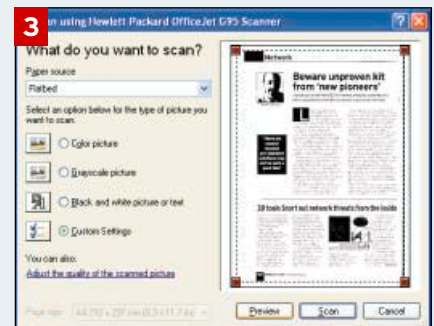
Quickly create an editable copy of just about any document



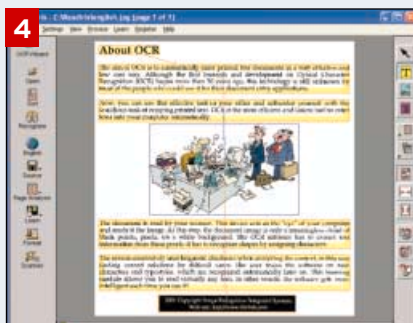
1 Readiris Pro has the OCR wizard for speedy document analysis, but it's really just as easy to run the program manually. You've more control, too. Start by clicking **Scanner > Scanner Model**, then choose the scanner type you have installed. If it is not listed, 'Twain <other models? (User Interface)'' should work with anything Twain-compliant.



2 Now click **Format** and choose how you'd like the scanned document to be saved (you can send directly to Word or Excel, save as an HTML file, or whatever suits your needs). You can also decide how much of the document Readiris should extract: the body text only, with word and paragraph formatting, or everything in the source document, graphics too.



3 Click **Scan** to launch your scanner driver (click **Source** if you don't see the **Scan** toolbar button). The basic settings (document type and resolution) should match whatever you chose in Step 1, but everything else (brightness, contrast and so on) can be freely tweaked, so play around until you have the clearest text image.



4 Readiris now analyses the scanned page, drawing yellow borders around areas of text and blue borders around graphics. (Click 'Analyse page' on the right-hand toolbar if you don't see this). Right-click on a window and select **Window > Type** if the program's wrong, or manually draw in new windows of your own.



5 If you are happy with the layout, click **Recognize** and Readiris will scan through your text. If the program isn't sure about a character then it will be displayed, in context, with the best guess Readiris has to offer. Correct it if necessary, then click **Learn** if this is a typical document, and it shouldn't make the same mistake next time.



6 If you're in a hurry or don't mind if one or two characters are incorrect, then ignore the **Learn** option and click on **Finish** instead. Readiris will take the scanned document and open it in Word or Excel, send it to the clipboard, or whatever other option you chose earlier.

Upgrade offer >> Readiris Pro 10

New features

- >> Pdf support
- >> Exporting pdf files as text
- >> Converting scanned documents to pdf
- >> Handles hand-printed text in capitals
- >> Recognition speeds of up to 1,600 characters per second
- >> Accuracy of over 99 per cent

The latest Readiris includes pdf support, reading in pdf files to export them as text, or converting regular scanned documents into pdf. It now handles hand-printed text in capital letters, while recognition speeds are up to 1,600 characters a second. Accuracy has



improved to over 99 per cent on even average quality documents.

As we write, the web price for Readiris Pro 10 is £105, around £32 below list. Click **Register > Upgrade** to place your order.

SAVE £32 OFF RRP

ACDSee 7 PE



Organise the digital images on your hard drive

The graphics world is full of image organisers, yet ACDSee still manages to stand out from the crowd. Why? Because it's packed with convenient features that you won't find elsewhere.

You might be browsing through your images and want to change the default thumbnail size. While others programs force you to poke around deep inside a configuration dialogue, ACDSee provides a slider on the thumbnail window. Use this to choose previews of anything from 25 x 18 to 240 x 180pixels, so you can get exactly the right view for each individual folder.

There are plenty of ways to organise and view your images, too. You can browse the folders on your PC, create customised albums or add keywords to images for speedy location later. There's also a useful Calendar

view, quickly grouping images according to the month in which they were taken.

ACDSee offers lots of format conversion and editing features, often with more options than you'll find elsewhere. Among those, you'll find welcome bonus extras such as Image Audio, which lets you record voice notes for jpeg or tiff graphics, then stores them within the image file itself.

The program really excels when it comes to sharing your pictures. Slideshows may be created in standalone exe, Windows screensaver scr, Flash swf and Adobe pdf formats, for example, all with your choice of fancy transition and optional soundtrack. There are also options to write images to CD, build HTML albums or print contact sheets, each capable of delivering high-quality, professional results.

Need to know

System requirements

128MB of Ram, Windows 98SE/ME/2000/XP, 100MB free hard drive space

Information

www.acdsystems.com

Registration

Follow prompts within the application

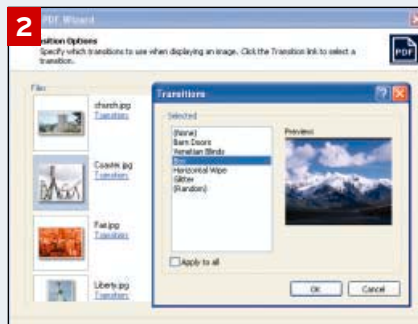
Limitations

None

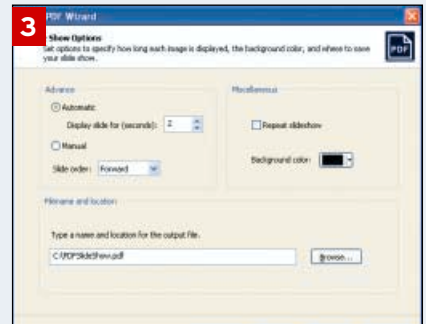
Share your images with a pdf slideshow



1 Building a slideshow is the easiest way to share your favourite pictures and using the pdf format means just about anyone can view it. Click Create > Create PDF > Create a PDF Slideshow > Next to begin, then click Add and choose your images. Click OK when you're done.



2 You've selected some images, but if they're not in the right order for your slideshow then click one and use the <<or>> buttons to move it around. Now click Next and choose the type of transition you'd like to apply between each image (or check 'Apply to all' if you'd prefer to use just one).



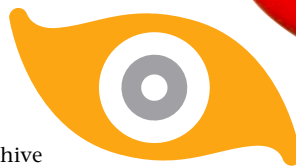
3 Finally you get to choose details, such as how long each slide remains on the screen, and whether you'd like the slideshow to loop back to the beginning once you've viewed the last image. Click Next and ACDSee will write the file for you ready to email or be placed on the web.

Upgrade offer >> Retail edition

New features

- >> Extra view modes
- >> Works with just about any file format
- >> Tools to find duplicate pictures or take screen captures

So you need even more graphics power? The retail edition of ACDSee 7 includes extra view modes (Explorer-like icons, filmstrip, details), works with just about any archive file format (zip, rar, tar, cab and more), and has tools to find duplicate pictures or take screen captures.



**SAVE £13.50
OFF RRP**

The list price for ACDSee 7 is €49.99, but as a registered Partner Edition owner you can upgrade for only €29.99, or around £21. Click Help > Upgrade Now to order.

FULL
VERSION

Serif Photoplus 7



This graphics tool has something for everyone

With a name like Photoplus, you'd expect this package to include an array of functions for correcting your digital photos, and it doesn't disappoint. There are the usual adjustments for colour, brightness and contrast, a supremely easy-to-use red-eye remover and plenty of special effects to give your images a little extra impact.

So far, so normal, but Serif pushes the boundaries a little further with some useful selection options. This version includes a Magnetic Selection tool, for instance, clinging to an edge as you trace around it. And for more complicated work, look no further than the new Extract command. Draw a rough border around the object's edge, choose a couple of colours, and Photoplus will isolate it for you.

Effects such as the new Elastic Warp tool can be painted on to an image, giving very precise results. And as every change can now be stored on an Editable Adjustment Layer, fine-tuning is easier than ever: just click the layer and change the adjustment settings to anything you like.

If you're feeling inspired, then why not create a new image from scratch? There's a full set of paint and drawing tools, along with options such as Smart Shapes, letting you quickly draw and edit clipart shapes such as hearts, arrows, stars and teardrops.

The package is rounded off with a good set of web graphics options. Whether you're looking to optimise file size, produce image slices or hotspots, or even create animations (with animated gif or avi output), there's something for you here.

Need to know

System requirements

Windows 98 or later, 55MB free disk space,

Information

www.serif.com

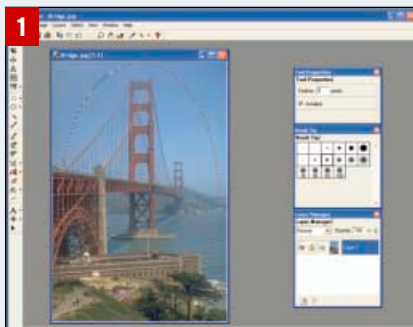
Registration

Follow prompts within the application

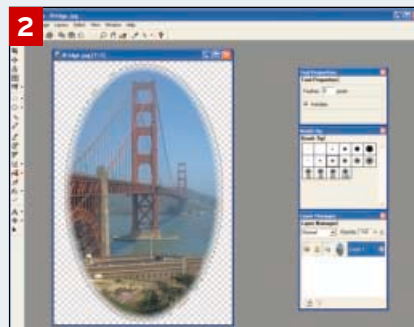
Limitations

None

Get creative with your favourite photos



1 Launch Photoplus, then choose 'Open Saved Work' in the Startup wizard and pick Bridge.jpg. Right-click 'Background' in the Layer Manager, select Promote to Layer, then pick the Ellipse selection tool and drag it around the picture (the bridge should be exactly in the middle).



2 Our selection will look more better if we feather it, fading in from the edges. Choose Select > Modify > Contract, and decrease the selection by 20pixels, then click Select > Modify > Feather and enter 20pixels again. Click Layers > Add Mask > Reveal Selection to see what we've done.



3 Click Layers > Merge Mask to make our mask part of the image, then click Layers > New Layer > OK and drag Layer 2 to the bottom of the Layer Manager list. Click Layer 2 and press Ctrl+D to erase the selection, then use the Flood Fill tool to add the background colour of your choice.

Upgrade offer >> Serif Photoplus 9

New features

- >> Dodge, burn and sponge retouch tools
- >> Scratch remover for photo repairs
- >> Automated image correction
- >> New special effects

The latest Photoplus adds features such as dodge, burn and sponge retouch tools, a scratch remover for photo repairs, automated image correction and many new special effects. ICC Colour Profile support ensures accurate printing or you can export images to Photoshop psd or Adobe pdf formats.



List price for the CD version is £79.99, but order before 23 July 2005 and you'll pay only £59.99. Just call 0800 376 7070 (+44 (0)115 914 5454 from outside the UK), quoting code RO/PCW/PH7/0605.



Backup4all 1.5.0



Need to know

System requirements

Windows 98 or later, 4MB of disk space

Information

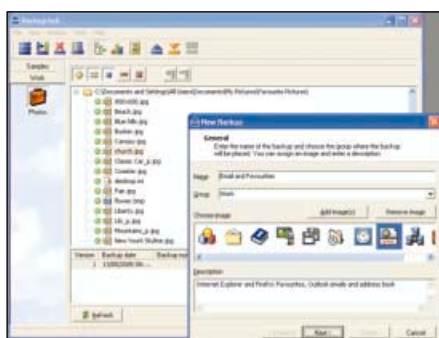
www.backup4all.com

Registration

Click Help > Register > Get registration details for instructions

Limitations

None



Every new backup job can be categorised into your choice of group and gets its own icon for speedy recognition

Backing up your most valuable data is a hassle, whatever software you use, but at least Backup4all ensures the process is quick and straightforward. This starts with a simple Group scheme for categorising backup jobs. Click File > New Group and enter 'Desktop', for instance, and you could create jobs to save 'My Documents', 'My Pictures' or just your desktop files. And that's the key, if you're lazy about backups: keep the jobs short, over in a minute or two, and you're much more likely to run them frequently.

Building a particular backup job is easy, as you're guided through every step by a

wizard. You give the job a name, choose the folders or files to back up and specify a destination. And that's when it gets

more interesting.

There are powerful include and export filters, for instance, to define more clearly what you do (and don't) want to back up. You can define these by file name, size, attributes, access or modified or creation date.

You can also choose to run full or incremental backups that only save new or modified files. There's a scheduler for running unattended backups and even options to run specific programs, before the backup starts and once it's been completed.



Upgrade offer >> Professional Edition

The latest Backup4all includes differential backups, disk spanning and integrated CD/DVD burning (no third-party drivers or applications required). Zip files may now be any size, files can be previewed before you restore them and command line support



allows common tasks to be automated in scripts.

Backup4all Professional Edition 2 normally retails at \$45, but registered users of 1.5.0 need only pay \$36 (around £20). Click Help > Upgrade to Backup4all Pro 2 to order.

Dan Elwell's Broadband Speed Test

Need to know

System requirements

Windows 98/ ME/ NT4/ 2000/ XP, 7MB disk space, broadband connection (at least 128Mbps/sec)

Information

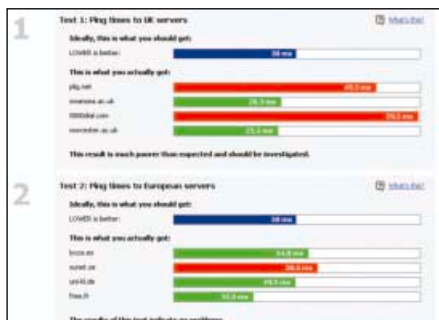
www.broadbandspeedtest.net

Registration

Not required for basic testing

Limitations

None



Your full speed test report is available in numeric, text or graphical formats

If you want to measure your broadband connection speed, there are lots of websites around that promise to do just that. Typically, they'll download a large file to your PC, measure the time it takes and produce an average speed. This is certainly simple, but it probably isn't accurate.

The problem is that there are many, many factors involved in assessing connection performance. If the speed test site is busy when you use it, for instance, or it's located on the other side of the world, the results are likely to be far from accurate.

Dan Elwell's Broadband Speed Test is very different. It starts by tailoring the

tests to suit your location, ISP and account speed, for instance, allowing it to choose servers that will deliver the most reliable evaluations.

It then carries out many different types of test, measuring factors such as ping times and packet loss as well as download speeds. These are repeated with servers around the world, so you can compare ping times with Europe, America or Australia, say.

When finished, all the results are available in detailed reports. Print them out and you'll be able to compare performance over time – especially handy if you're trying to optimise your connection and want to measure the results.

Upgrade offer >> Registered version

If you choose to upgrade to the complete Speed Test, you'll gain extra features such as Scheduled Testing, which is ideal if you want to compare performance over time. Upload speeds are tested, as well as downloads. In addition to this,

reports can be saved in text, rtf, csv or HTML formats, or saved in a portfolio for easy recall later.

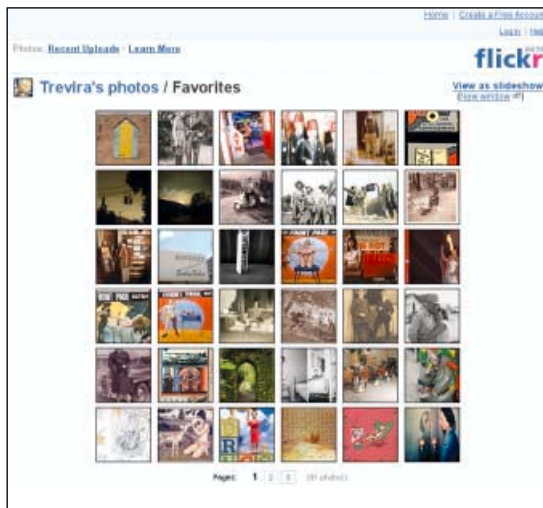
The cost of upgrading is only £10, and you can even pay by cheque or postal order. Simply Click File > Register this software to order.

Next Month

on sale 21 July 2005



Find out which
TFT monitors
come out on top



Log on to some of the best photo-sharing websites



Make the most
of wireless
hotspots

Don't miss September's PCW...

19in TFT monitors

CRT monitors have practically been consigned to the history books, and if you want to upgrade to a TFT, there's a vast choice. Priced around £250-£300, 19in TFT displays are one of this year's favourite upgrades, and we have 12 of them fighting for the crown.

£799 PCs

We're always happy to see a bargain, and £799 for a fully featured PC system definitely sounds like a great one. But which of the seven models in our group test comes up to our demanding standards?

Online photo sharing

Digital photography makes it much easier to share your images, but with the explosion in photo-sharing websites, which offers the best solution? We investigate the main players, and look at the other services they offer such as online print ordering.

Freedom to roam

Wifi is here to stay, yet many are unsure how to take advantage of the freedom it offers. We show you how to make the most of wireless hotspots and how to set up a neighbourhood wireless network.

For regular updates of what's in September's issue, go to

www.pcw.co.uk/magazine/nextissue

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**



AUGUST 1985

Commodore's brand new Amiga was splashed on the front cover back in August 1985. Guy Kewney's first impressions were good – almost too good, he feared. After playing around with it for a while, he simply couldn't fault it. Coming complete with a colour monitor, a mouse and plenty of memory, the Amiga looked like a sure-fire winner. What's more, it was able to multi-task and, back then, was relatively cheap at just \$1,200 in the US. After giving it a thorough examination, Kewney gave it the thumbs up and brought a new price level to business computing.

With 32bit processors about



to be released, columnist Martin Banks asked whether the world really needed to upgrade to 32bit computing. Although he could see the benefit 32bit machines could have for number-crunching and graphic-intensive tasks, Banks argued that the majority of users could quite happily get by with an 8bit machine. With Windows XP nowadays fully supporting 64bit processors, it remains to be seen whether the average home user will make use of all those bits.

AUGUST 1990

August 1990 brought with it the 'first affordable multimedia system' – Commodore's CDTV – an interactive graphics player that was set to herald a new era of home multimedia. Our own Chris Cain was part of the team that helped to decide whether it was truly a revolutionary device or just a dressed-up Amiga. In the end, we concluded that the CDTV was an amalgam of Amiga, CD player, software and a large dose of marketing hype.

Elsewhere in that issue, we looked at Acorn's R260 – a £4,999 workstation that boasted an ARM 3 processor running at just under 30MHz with 4k of internal cache memory. If you couldn't afford this, you may have been interested in a *PCW* feature that described

In 1985, Commodore's Amiga impressed Guy Kewney who struggled to find fault with it

how most computers, regardless of price and promotional methods, are basically the same. Gone were the days when bespectacled boffins and sandal-shod hackers in Santa Clara fought to bring us new technology. Instead, we saw production lines churning out 14,000 PCs a day from Texas to Taiwan.

That month in our news section we had a glimpse of the future of overclocking. At Comdex in Atlanta, Landmark was demonstrating the Velox Icecap – a Peltier device (essentially a refrigerator) that could cool a 25MHz processor to run at a whopping 38MHz.

AUGUST 1995

Our colour inkjet printer group test took up most of the cover in 1995, although confusingly we gave the best print quality accolade to a dye sublimation model (thermal dye diffusion, if you want to be picky), the Kodak XLS 8600PS. Costing £6,999 for the Postscript version, it really brings home the fact that the quality you get from today's sub-£50 printers is nothing short of incredible. We rated its colour and mono output as 'astonishing'. Even our 'value' choice, the Lexmark Winwriter 150c, cost an eye-watering £299 – for a product with a resolution of 600 x 300dpi and an 'impressive' 3ppm colour printing speed. And not a USB interface in sight, we might add.

CD-Rom spin speeds were reaching the giddy heights of quad-speed, but for some reason we weren't too sure about which one to choose as a winner in our group test – an indication that, even then, the drives were becoming a commodity item, with brand preferences playing a larger role in the buying decision than performance.

Our PC group test pitted five Pentium 133MHz models head-to-head and we were impressed by the performance advantage these showed over the older 120MHz models.

The new architecture of the Pentium Pro (P6) was just a couple of months away and in our news section we reported on Intel's challenge to Professor Nicely (the chap who discovered the infamous Pentium Fdiv bug) to find any faults in the new P6 chip. He didn't find any and the P6 became the basis of the Pentium II that was launched a couple of years later.

AUGUST 2000

It's easy to forget how new broadband is – in our August 2000 issue, Hands on columnist Gordon Laing was one of the intrepid beta trialists of the BT Istream S2000 service, which eventually became the basis of the first consumer ADSL services in the UK. Gordon wasn't a happy chap as, due to glitches in the installation, he'd ended up losing his headline for nearly a week. When it was all up and working, though, he 'adored' the service and 'could not return to a conventional dial-up account'. A common feeling at the time, although with the benefit of five years of ADSL experience we now realise that it's wise to have a backup dial-up account for those times when your broadband connection just won't play ball.

The dot.com bust was still hiding around the corner in those heady days, so it's no surprise to see that we featured a group test of 'web development PCs' – a concept that strikes us now as rather bizarre – what would you do on one of these that you couldn't do on a normal PC? In the end we chose the Systemax Athlon 750 R Pro as our winner, chiefly because it came with Dreamweaver, Fireworks 3 and MS Office Pro.

The dot.com mania was also evident from the 'e' word being slipped in at every opportunity – even the flash on the cover for Hands on slipped in the words 'including ecommerce'. It's easy to look back with 20/20 hindsight and mock but, at the time, it was a mentality that was hard to escape – as they say, if you weren't there, it's very hard to imagine.

The PCW team

Store, Share & Expand

Storage Solutions for the consumer and small business technology



LinkStation – Network Storage Centre

Store and share music, videos, images and other files with this easy and affordable network attached storage.

- 120, 160, 250 and 300 GB of Network Attached Storage
- 300 and 400 GB with Gigabit Ethernet
- Offers Built-in Print and FTP Servers
- Two USB 2.0 Ports to expand drive capacity or as Backup with Buffalo DriveStation

DriveStation – USB 2.0 External Hard Drive

Instantly add up to 250GB of storage capacity to your personal computer. Keep backups of data files, presentations, audio and digital photos.

- 120, 160 and 250 GB Capacities
- Auto Power On, Auto Setup and Auto Backup
- Preformatted Hard Drive for Out of the Box Operation
- Heat Sink Chassis Keeps Internal Parts Cool



Work faster and smarter with Buffalo networking, storage and memory products.



Further information and dealer contacts are available on our website.

MISCO
complete business IT solutions

Insight

dabs
com