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Best iPhone, Android
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IDG ISSUE 200 MAR 2012

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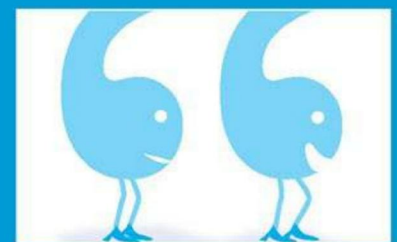
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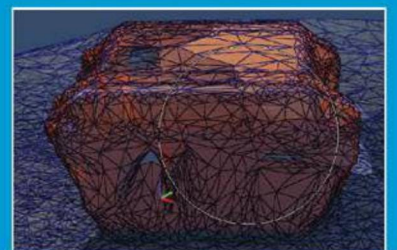
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




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What do you think of this issue of PC Advisor?
We welcome feedback - email Rosemary Hattersley at rosemary_hattersley@pcadvisor.co.uk and include the issue number in the subject heading



Why future tech doesn't matter

We've seen a lot of tech come and go over our 200 issues - now the question is what to do with it all

It's our 200th anniversary, so we've taken a long hard look at *PC Advisor's* history and where the technology we write about has journeyed in the same period. Accordingly, there are opportunities to poke fun at our technology predictions of more than a decade ago, including our interest in all things WAP (page 143), a technology so far from being missed that its very existence had slipped our minds.

Don't worry, there's as much - and more - of the usual reviews, news and advice as every other issue. We've also put together our biggest ever tips guide. Turn to page 84 to get your fix of computing tips and troubleshooting advice.

We've also been giving thought to how best to present the reviews and advice we bring you each issue. Eagle-eyed readers may have noticed in our February edition that rather than hiding them away in the Top 5 charts at the rear of the magazine, we gave more prominence to our desktop PC group tests. These are now geared towards function rather than simply price, reflecting the fact that the strengths of an office PC differ from those of one geared up for gaming and entertainment.

“PC Advisor is now an in-depth buying guide and user manual for your computer”

You could say we're taking our own advice. The buying guides in our group tests - including the smartphones on page 56 - suggest first identifying what a product will be used for; price and features second.

This amply demonstrates how our relationship with technology has changed over the years. In 1995 when *PC Advisor*

launched, it was as the offshoot of a computer catalogue and capitalised on the growing home and business user market kickstarted by the advent of Windows 95 PCs. Home PC bundles were distinguished from each other by the tower of software and the particular inkjet printer that accompanied them. These days, we want as little 'bloatware' with our PCs as possible, but demand huge storage capacity. We're too busy creating our own digital content to want to clog up our terabyte-plus hard drives with preinstalled multi-megabyte programs.

As well as web access and at least two processing cores, we take for granted many technologies that would have cost a king's ransom back in the 1990s (see page 108 for a then-and-now comparison).

My first issue of *PC Advisor* led with a group test of sound cards, a fantastically complex PC component that was necessary if you were to trick out your home-built computer with the means to play more than mere system sounds, or even as a media centre to play CDs. Recordable DVDs, streaming audio and iPods had yet to exist.

These days, the ability to play music isn't just a given; it's just one element of the audio-processing capabilities of even the lowliest PC or laptop. HD video? That 30-nanometre Intel chip includes a dedicated HD decoder, along with a TV tuner, digital signal processor and support for 3D rendering.

These days, the internet is one enormous online catalogue and pcadvisor.co.uk an in-depth buying guide and user manual to help you choose a computer and make the most of its almost infinite capabilities. Think of us as your techno guides and curators of possibilities, highlighting usability differences and championing apps to control and customise your gadgetry. The technology works; now it's up to you to choose what to do with it. ☒

Reader letters



PC Advisor's Inbox pages reflect the growing number of ways in which you communicate with us. For your chance to appear here, keep in touch via email, our forums, comments on our news stories, and our social-networking accounts

pcadvisor.co.uk/news

BBC iPlayer app for iOS

Previously available only for iPad, the BBC is opening up its iPlayer app to the iPhone and iPod touch (tinyurl.com/cvzscqh). *Old Bert* can't see the point. "I can't understand why anyone would want to watch anything on a phone. I do hope the BBC hasn't been spending the licence fund on this," he wrote.

Adobe Flash for mobile devices

As we pointed out that HTC's Titan smartphone doesn't support Adobe Flash, *Chris Georgeson* replied that the company was dropping Flash support for mobile devices in any case (tinyurl.com/d6akwzd). "I'm not going to get on my Commodore 64 and judge it for not running Windows," he commented.

Buy coffee with your mobile

Starbucks has topped 26 million mobile transactions (tinyurl.com/d7ugdxy), but *James Stein* isn't sure that linking a phone with a retailer-specific prepaid card is the way technology should be heading. "What would happen if every retailer took the same approach?" he asked.

Litigation stifling innovation

Samsung has won the right to sell its Galaxy Tab 10.1 tablet in Australia (see tinyurl.com/6nbw7an). "A ray of sanity at last," wrote *Maccyroy*. "I wish all parties would get on with developing and improving their products instead of wasting money on litigation. All tablets are rectangular with big screens. All multitouch screens respond to gestures. It's important to defend your intellectual property, but I don't believe Samsung was the sole inventor of Wi-Fi any more than I believe Apple was responsible for inventing the capacitive touchscreen."

Population control

The results of a simple proximity test conducted by Argentinean researchers revealed that Wi-Fi signals from laptops could be damaging to male fertility (see tinyurl.com/6vzn7yq). Far from fearing this apparent threat, *owen* thought it a good solution for population control. "It doesn't matter if one million sperm are damaged - we've got plenty more. And this should be good news, because our population is going up," he wrote.

XP the biggest threat in 2012?

Cybercriminals will focus their attention on computers running Windows XP in 2012, according to security software vendor F-Secure (tinyurl.com/btm322b). *Anonymous* disagreed. "XP can easily be secured with some common sense. A lack of User Account Control doesn't mean the OS is suddenly unusable and every XP PC in the world is going to get infected."



iFlame 4

It's hard to imagine the iPhone getting any hotter, but reports from Brazil suggest an iPhone 4 has short-circuited and burst into flames (tinyurl.com/6oxLpem). *Derekdouglass* barely raised an eyelid. "Who needs an iPhone? Pen and paper still work," he wrote.

Flagged: Star letter

Girl power

Is there a way you can exercise some clout over male contributors so that they may finally stop writing tosh like: 'How much trouble can the kids get into with your old laptop, or nan with her new mobile phone?' (page 82, Feb issue). I stopped my subscription to another magazine because it was frequently using this sort of rhetoric. There is no room for such over-used and grossly outdated language. I'm not sure that any of *PC Advisor's* female editorial staff are old enough to be nans (with or without new mobiles), but I'm sure you'll understand what I'm getting at. *Dr Margaret Clark*

Rosemary Hattersley, associate editor, replies: You're quite right to pull us up on this, Margaret. It was rather a hackneyed angle to take in introducing a feature about how tech-savvy readers might guide new PC owners through setting up and securing their kit. We are often amazed at the proficiency of our readers young, old, male and female. I hope you found the content of the feature of interest.

Margaret wins an Honestech Film Scan&Save, worth £79, for her thoughts. Next issue, our Star letter writer will win a £100 voucher to spend on gadgets.



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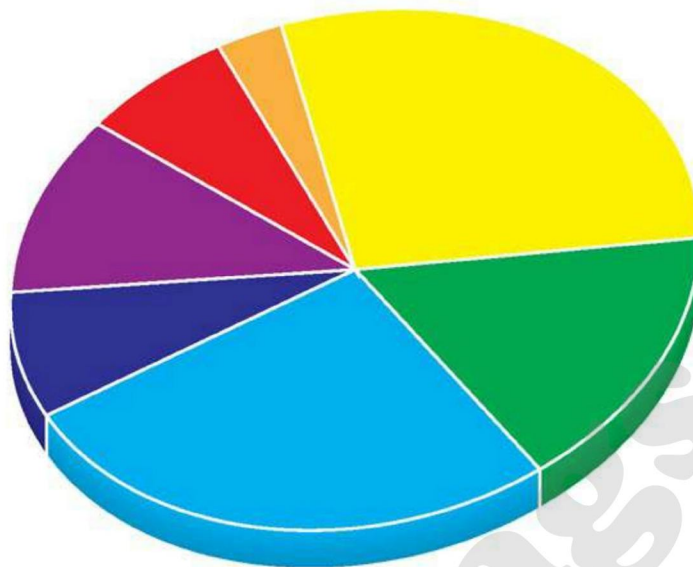
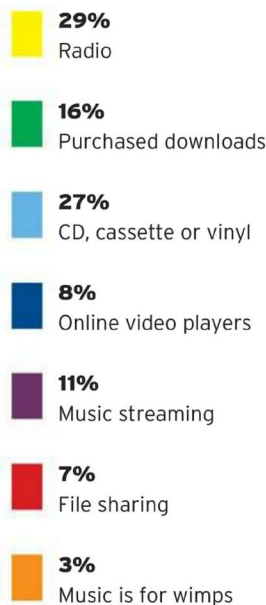
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tinyurl.com/c7r4cwz

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Firefox in trouble?

Johndrew alerted forum members to an article that suggested Mozilla Firefox has a bleak future. We were intrigued by their reaction (tinyurl.com/bttbw9n).

morddwyd remains a faithful Firefox fan – at least where PCAdvisor.co.uk is concerned. "I use Firefox for this website for its accessibility options, but I use Google Chrome for everything else," he admitted.

"I think all the web browsers are having trouble keeping up with the relentless development of Google Chrome – it's been around for only three years and we're already on to version 15.0.874.121," said **alan14**. "Chrome's interface is largely clear of clutter, there's a good selection of extensions, and it's really fast."

"I must admit that I've practically abandoned Firefox in favour of Google Chrome, but I'd still be disappointed to see it disappear," wrote **canarieslover**. "It seems to have lost that speed edge it once had, but competition is always a good thing in any market."

buteman agreed that Firefox's continued development was important to the browser market. "We need browsers like Firefox to break the monopoly of Google and Microsoft," he wrote.

But **Forum Editor**'s loyalties lie elsewhere: "I use Chrome as my primary browser because, frankly, it's the best there is. Companies such as Google and Microsoft are big and powerful because they provide the market with quality products that people like to use," he wrote.



letters@pcadvisor.co.uk

Ergonomic laptops

Recently I received an email from a company that sells devices to make laptops more ergonomic. They advised using a keyboard and mouse, which is obviously practical only in an office environment. They also suggested raising the screen height to improve back and neck posture. I'm surprised that manufacturers aren't considering these points, and I should like to see you campaigning for more ergonomic, user-friendly laptops. *Sylvia Lymbery*

Matt Egan, editor, replies: In the rush to portability the ergonomics of a workstation are not often considered. Although it's tempting to hunch down in order to type and look at a laptop screen, and if you're using a laptop for lengthy periods you should try to avoid this. However, it should be possible to set up and use a laptop, or even a tablet, in a healthy manner.

A separate keyboard or display helps, but you don't need them. The important thing is to make sure you're sitting comfortably, your back is straight, and that you're not looking up or down at the screen, which is often a question of the relative height of screen and

chair. And as with even the best computing setups, you should take regular breaks.

Easy target

Millions of mobile phone users are potential victims of hacking; what more can a blackmailer or a thief want, than a victim with voicemail? I suggest that either the voicemail system is about as secure as a paper bag, and hence the equipment isn't fit for purpose; that the security instructions supplied aren't clear, and do not prominently spell out the risks of not resetting the default codes; or that most mobile phone users are simply careless. *Harry Leeming*

Solid-state DRIVE

I often spot solid-state drives being referred to as solid-state disks, which irks me. Although the two are used interchangeably these days, the correct term is 'drive' since it has no spinning disk. *Tarmo Kappa*

Out of touch

It gave up on the TouchPad, and now HP has decided to remain in the consumer market with a... Windows 7 tablet? Has it gone completely mad? *Brian Chamberlain* ✉

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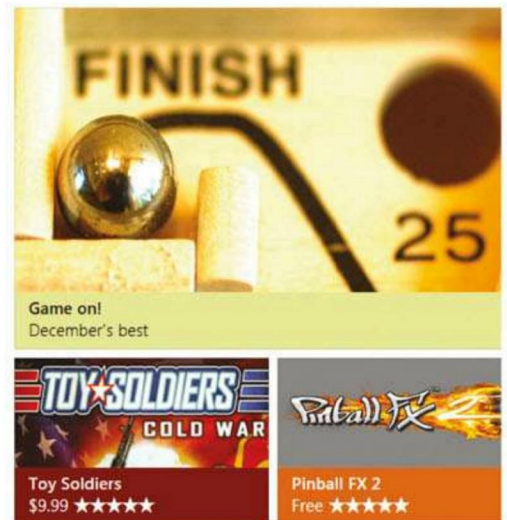
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Store

Spotlight



Games



WINDOWS APP STORE CONFIRMED

Windows 8 beta to become available in February • Software store to appear in Windows 8 beta

PC users will get their first look at the app store integrated into Windows 8 in February when Microsoft makes the beta version of the operating system available.

The Windows Store will offer apps for both the traditional desktop operating system and its Metro-style interface, which has been influenced by Microsoft's Windows Phone 7 interface and lets users access installed apps through a series of tiles. These are updated with live data.

This is the first time Windows has had an integrated app store. Even when Microsoft unveiled the Developer Preview of the forthcoming OS in September, the store remained a closely guarded secret.

Microsoft hasn't revealed many details about which programs will be available, saying only a select number of developers have been invited to offer apps in the Windows 8 beta period. During a demo of the Windows Store, Microsoft showed Metro-style apps such as Evernote, eBay, Cut The Rope (a popular mobile game), and digital books from Disney. It's a good bet that at least some of these will be part of the Windows Store during the Windows 8 beta. You'll be able to browse apps by category and ranked lists, as well as search for the program you require. Microsoft said app lists will include the latest, most popular apps, and fast-rising ones. You will also see recommendations based on your download history.

The Windows Store will be similar to the Mac App Store, on the desktop at least. Apple allows users to download Mac apps from outside sources, as well as the store.

Microsoft said it will initially cost \$49 (£31) to register an app for sale in the store. The tech giant will take 30 percent of all sales, leaving the developer with the remaining 70 percent. However, Microsoft said that when an app achieves \$25,000 (£16,000) revenue from the Windows Store, it will reduce its cut to 20 percent. The store will also offer local currency

“We wanted to do the best job of connecting people to as many apps as possible”

payments. All the apps available through the Windows Store during the beta preview will be free of charge. However, Microsoft said once the store goes live in the final version, paid-for apps will be available, with prices starting from \$1.49 (95p).

The store isn't based on the web and can be accessed only from a device running Windows 8. However, there will be an online catalogue listing, and those running Windows 8 and viewing the catalogue will see a button prompting them to open the Windows Store app. Microsoft said

developers would also be able to add a 'Get the App' button to their site, which inside Internet Explorer 10.0 will link directly to the Windows Store. It's not clear whether other browsers will be able to display these links.

There'll also be the option to download software trials from the Windows Store, which can then be upgraded to the full version or added to via in-app purchasing.

"We've just passed the 500 million licences sold mark for Windows 7, which represents half a billion PCs that could be upgraded to Windows 8 on the day it ships. That represents the single biggest platform opportunity available to developers," Antoine Leblond, vice-president of Windows Web Services, said. "When we set out to build the Windows Store, we wanted to do the best job of connecting people to as many great apps as possible."

Microsoft hasn't revealed the feature set you can expect to see in the beta, or the exact date it will be made available. However, the company did reveal that more than three million copies of the Windows 8 Developer Preview have been downloaded since it was made available.

Windows 8 has been described by Microsoft as the "reimagining of Windows from the chipset to the experience", and as well as offering a dual interface and integrated app store, the operating system will be available as a download (see page 16 for more information.)

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GOV'T PLANS 'SUPER-CONNECTED' CITIES

London and Cardiff among those to have net connection of between 80 and 100Mbps

The government plans to invest £100m to create a number of 'super-connected' cities in the UK, where residents and businesses can enjoy speeds of between 80 and 100 megabits per second (Mbps).

As part of the Urban Broadband Fund, London, Belfast, Edinburgh and Cardiff will be joined by six other cities, in receiving a share of the £100m over the next three years. The funding will be concentrated on locations where private companies are unlikely to install high-speed internet connections as it's not economically viable without a subsidy. The remaining six cities will be announced in this year's budget. The chancellor George Osborne hopes the funding will create "new super-fast digital networks for companies across our country".

"These do not exist today. See what countries like China or Brazil are building,



and you'll also see why we risk falling behind the rest of the world," he explained.

"Our great cities are at the heart of our regional economies. And we will help bring world-leading, super-fast broadband and

Wi-Fi connections to 10 of them - including the capitals of all four nations."

Furthermore, the government said it will open up the £20m Rural Community Broadband fund "to ensure more rural homes and businesses receive super-fast broadband". If the scheme proves successful it may be extended. The funding is in addition to the £830m the government has pledged to bring super-fast broadband of 25Mbps and above to 90 percent of the UK by 2015. Nearly two thirds of this money will come from a portion of the BBC licence fee that was originally allocated to fund the digital switchover. The government is aiming for the UK to have the "best super-fast broadband network in Europe".

A BT spokesman said the Urban Broadband fund "is a positive initiative that will help ensure our major cities have the best available super-fast broadband".

EU Commission to investigate Apple over e-book price fixing

EU concerned anti-competitive behaviour has taken place "with the help of Apple"



Apple is to be investigated by the European Commission over anti-competitive behaviour regarding e-book pricing.

The investigation is focusing on the 'agency model' adopted by five publishers: Hachette Livre, Penguin, HarperCollins, Simon & Schuster and Georg von Holzbrinck Publishing Group. Under this method of sale, the publishers set the price for e-books sold through Apple's own iBooks store and then split the revenue between themselves and Apple. The EU believes the firms may have engaged in anti-competitive practices, "possibly with the help of Apple", which breaks EU antitrust regulations.

Apple first launched iBooks in April 2010 when it made the first iPad available. The app was then made available to iPhone and iPod touch users in June of the same year.

"The Commission will in particular investigate whether these publishing groups and Apple have engaged in illegal agreements

or practices that would have the object or the effect of restricting competition in the EU or in the EEA," the EU explained.

"The Commission is also examining the character and terms of the agency agreements entered into by the above named five publishers and retailers for the sale of e-books."

The Office of Fair Trading (OFT) has already undertaken a similar investigation, which began in February, although it was closed "on grounds of administrative priority". The EU said the OFT "has made a substantial contribution to the e-books investigation and will continue to co-operate closely with the Commission going forward."

A timeframe for the investigation has not been detailed, but the Commission plans to treat the case "as a matter of priority."

In the US, the Department of Justice has also started a similar investigation, although it has not named the parties involved.

Firms offer Wi-Fi details to clients

Nearly one in five (18 percent) small businesses have given out their personal Wi-Fi details to customers so they can access the web from their premises, said The Cloud. Research by the public Wi-Fi network provider revealed that 59 percent of small firms don't offer Wi-Fi to their customers, while 44 percent said they have no plans to do so, despite 61 percent being asked by customers 'often or very often' to do so.

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Nine in 10 silver surfers go online every day

Web users over the age of 60 are keen surfers, with nine in 10 going online every day. According to TalkTalk and F-Secure, 68 percent of these surf the web several times a day, compared to 77 percent of 26- to 35-year-olds.

Furthermore, a third of silver surfers now access TV online.

MORE: tinyurl.com/7wu925r

10 billion Android apps downloaded

Google has revealed more than 10 billion apps have been downloaded from the Android Market, the official app store for devices running Google Android. The store, which launched in July 2008, took 22 months to hit the one billion downloads mark, but steady growth ensured it hit the 10 billion milestone just 16 months later. Furthermore, downloads increased by one billion between November and December 2011, said Google.

MORE: tinyurl.com/couggh

ULTRABOOKS PRICE CUT COMING SOON

Ultra-thin category of laptops set to have its price slashed next year

The price of ultrabooks, Intel's category of thin-and-light laptops, could drop to below \$500 (£320) in 2013. According to Acer president Jim Wong, prices are likely to decrease by between 5 and 10 percent in the first quarter of 2012. However, by 2013 they could drop to \$499.

Ultrabooks, which are laptops under 20mm thick, marry the performance and capabilities of today's laptops with tablet-like features, and are designed to offer a happy medium between laptops and tablets. The laptops run on Intel Core CPUs, with advanced designs and features such as touchscreens, all-day batteries and instant-boot capabilities. They are expected to prove popular over the next few years.

Acer's first ultrabook is the Aspire S3, reviewed on page 32, which went onsale in the UK in September. Powered by either

an Intel Core i5 or i7 processor, the Aspire S3 runs Windows 7. The Core i5 model, with 4GB of RAM and a 320GB hard drive is currently priced at £699.

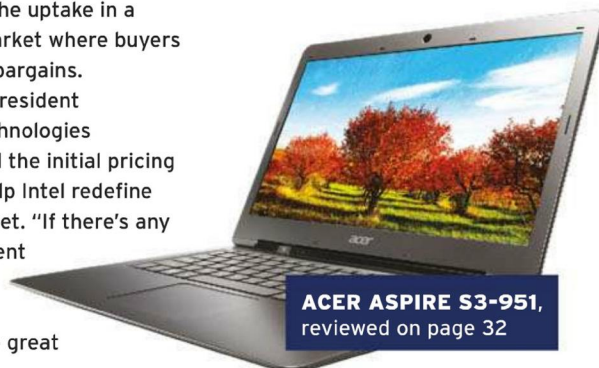
Ultrabooks are not meant to replace netbooks or other low-cost laptops, but Intel hopes that they will make up 40 percent of consumer laptop sales by the end of this year.

However, with an initial price tag of \$1,000 (£650) some analysts believe the cost has hampered the uptake in a slumping PC market where buyers are looking for bargains.

Roger Kay, president of Endpoint Technologies Associates, said the initial pricing is unlikely to help Intel redefine the laptop market. "If there's any fly in the ointment it's the price. Even though they are great

packages, you're talking about \$1,000," he said. The predicted price cut may help to increase the popularity of the laptop category.

Ultrabooks may also benefit from HD screens in the near future, after it was rumoured that Acer and Asus are working on 1080p displays for their next generation of designs. This will offer more screen space and improved viewing pleasure for entertainment and games, without sacrificing portability.



ACER ASPIRE S3-951, reviewed on page 32

Tablets to get Qualcomm Snapdragon quad-core chips

Windows 8 tablets with quad-core processors will be available later this year

Tablets featuring a quad-core version of Qualcomm's Snapdragon chip look set to hit the market later this year. Designed to run the next iteration of Microsoft's Windows OS, the processor is part of the S4 product line and is based on the ARM architecture.

The chip will go head-to-head with nVidia, which has already shipped a quad-core ARM processor for tablet PCs. However, the S4 includes an integrated 3G and 4G modem, which gives it a competitive edge.

Catherine Rice, spokesperson for Qualcomm, confirmed that tablet PCs with the S4 chip will be able to run Windows 8. The chip's Adreno graphics core will also support DirectX 9.3, which Windows 8 will use to bring realistic graphics to devices.

The integration of a modem and graphics processor helps reduce the size and power consumption of the Snapdragon S4, said Dean McCarron, principal analyst at Mercury Research. The quad-core chip will be made using the 28-nanometer process, which will improve performance while reducing power consumption. As a result, tablets with S4 chips could be thinner and more power efficient.

However, Rice did not comment on the release date for S4 tablets with Windows 8. Microsoft has yet to reveal when the final version of the operating system will be available, however, it has confirmed the beta version will be released in February (see page 12).

Snapdragon chips are already being used in HTC's Jetstream and Lenovo's IdeaPad U1 tablets. Qualcomm is working on 30 tablet designs with top device makers, Rice said. ☒



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Download Windows 8

Starting the Windows 8 upgrade online could prove faster and easier than using a disc. Ian Paul and Gregg Keizer find out why

PC users will be able to upgrade to Windows 8, the next version of Microsoft's OS, using a download in favour of a disc purchased from a retailer.

Microsoft said it wants to make upgrading to Windows 8 from older versions of its desktop OS easier and faster.

"Our aim in improving setup is to reduce the time from start to finish," said Microsoft's Windows president, Steven Sinofsky.

The software firm is following in the footsteps of Apple, which offered a similar option with the release of OS X 10.7 Lion.

Microsoft is still giving PC users the option to purchase a Windows 8 DVD, but the firm hopes more people will opt for the download option. Microsoft did not reveal whether there would be a pricing difference between online downloads and physical DVD purchases of Windows 8.

Those who opt for online delivery will still be able to create a bootable thumb drive or DVD to install the new version of Windows.

This might be advisable for those who plan to back up their files to a second hard drive and do a clean install of Windows 8.

Microsoft claims that starting the upgrade wizard online and then completing the move to Windows 8 on the desktop will be "one continuous integrated experience from beginning to end."

“Upgrading the OS online will be one continuous integrated experience from beginning to end”

Furthermore, Microsoft said this easy install option doesn't involve entering a 25-digit product key to activate the software. Instead, the product key will be embedded into the disk image you download during the setup process.

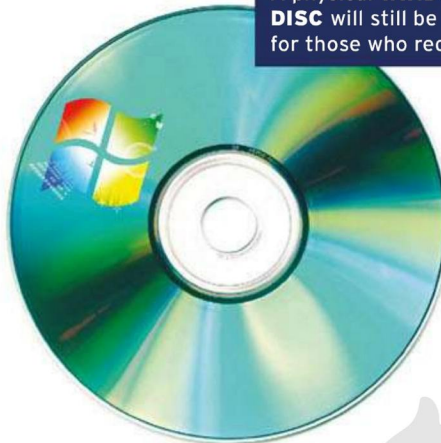
Upgrading to Windows 8 online

Microsoft starts the process by scanning a PC to determine its compatibility with Windows 8. You can then read a simplified or detailed report on whether there are any upgrade problems with your installed software and peripheral devices. The compatibility scan also allows Microsoft to automatically determine in which language it should deliver the new OS and whether your PC can support a 32- or 64bit version.

Once this is complete, Windows 8 starts downloading to the PC. Windows 7 users can choose to retain their complete Windows profile, including their account settings, personal files and programs, only their personal files or nothing at all, with the latter option providing a clean slate. Vista users can keep their settings, user accounts and files, while XP users are able to retain only their user accounts and files.

The process is said to have 82 percent fewer screen clicks than a Windows 7 upgrade.

A physical **WINDOWS DISC** will still be available for those who require one



A Windows 7 upgrade requires four different installation wizards, including the Windows 7 Upgrade Advisor and Windows Easy Transfer, and up to 60 screen clicks to complete. However, Microsoft has dramatically reduced the maximum number of screen clicks during a Windows 8 upgrade to just 11. But does cutting back here result in a faster and streamlined upgrade process?

According Christa St Pierre, a member of Microsoft's Setup and Deployment team, it certainly does. She said a clean install - where all files and data are wiped from the drive prior to installing Windows 8 - should wrap up in 21 minutes, which is 35 percent less time than the 32 mins Microsoft said it takes Windows 7 to do the same.

For what Microsoft called a "medium upgrade" - on a system with 213,000 files and 77 applications installed - Windows 8 is three times faster. An upgrade on such a PC is completed in just 42 mins, versus Windows 7's 2 hours and 11 mins.

The real time savings are revealed by machines sporting between 430,000 and 1.4 million files, and 90 to 120 applications. Here, Microsoft claims that Windows 8 was between four and 10 times faster in its initial time trials.

Microsoft hopes that improving its upgrade process will help convince the users of more than 450 million Windows 7 PCs worldwide to make the switch. It also has designs on the large number of computer users still running Vista and Windows XP, who may finally be ready to upgrade.

"We have integrated what was once many separate steps for people to perform when preparing and starting their setup into a streamlined user experience, with a fast and reliable setup engine under the hood," said St Pierre.

“It's a reimagining of Windows from the chipset to the experience”

"Customers who choose to install Windows from an online source will have a greatly improved experience over what we've delivered in the past, with smaller and faster downloads, as well as increased resiliency and control. We hope you will find these improvements a great way to start your experience using Windows 8."

Although the final version of Windows 8 is yet to be released - and has no official launch date other than "some time in 2012" - the Developer Preview is available for download. You can grab your copy from our website (head to tinyurl.com/3zqh77t for the 32bit version; tinyurl.com/6xe4Lo2 for 64bit), but note that the Windows 8 Developer Preview is in development code and should be installed only by experienced users. *PC Advisor* accepts no responsibility for any problems incurred.

What to expect

Steven Sinofsky has described the OS as a "reimagining of Windows from the chipset to the experience". For the first time, a Microsoft desktop OS will feature a dual interface. A Classic desktop is designed for traditional keyboard-and-mouse input, while a touch interface known as Metro is ideal for use with tablets and other touchscreen devices. You simply press what used to be the Start button to switch between the two.

Metro borrows heavily from Windows Phone 7, featuring a series of live tiles that contain real-time data or link to applications.

In another first for Windows, the OS will include an integrated app store, known as the Windows Store, where you can purchase apps for Metro, and traditional desktop software. Metro-based apps will work on devices that feature ARM processors, although traditional desktop programs will not - such software is unable to take advantage of ARM's advanced features, such as the ability to adjust power states when not in use. Sinofsky said that it would make little sense to provide a way to run such applications on ARM processors.

How Windows Store will collect payment for downloaded apps and whether the service will be available when Windows 8 launches remains to be seen.

Microsoft claims a PC running Windows 8 will take less than 10 seconds go from powered down to the Start screen. This speedy bootup is thanks to a new hybrid system that mixes processes used in cold boots and hibernation mode.

"We took everything great about Windows 7 and we made it even better," said Sinofsky. ☑



Three rising cybercrime threats

Just when you think you've safeguarded yourself from electronic security risks, along comes a new exploit to keep you up at night. John Brandon explains three up and coming threats, and how to beat them



TEXT-MESSAGE MALWARE

While smartphone viruses are still relatively rare, text-message attacks are becoming more common, according to Rodney Joffe, senior vice-president and senior technologist at mobile messaging company Neustar and director of the Conficker Working Group, a coalition of security researchers that came together to fight the malware known as Conficker. PCs tend to be well protected today, he said, so some black-hat hackers are now targeting mobile devices. Their incentive is mostly financial:

text messaging provides a way to break into devices and make money.

Khoi Nguyen, group product manager for mobile security at Symantec, confirmed that text-message attacks aimed at smartphone OSes are commonplace now that people are increasingly reliant on mobile devices. It's not just consumers who are at risk, he added. Any employee who falls for an SMS ruse using a company smartphone can jeopardise the business's network and data.



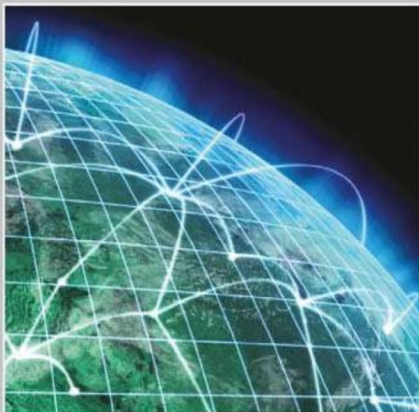
SOCIAL NETWORK SPOOFING

Users of Facebook, LinkedIn and other social networks are vulnerable to attacks that rely on account spoofing. A scammer poses as someone you know or a friend of a friend in order to fool you into revealing personal information. He then uses that information to gain access to your other accounts and eventually steal your identity.

In a typical exploit, someone contacts you on a social network pretending to be a friend of a friend or a co-worker of someone you trust. This new 'friend'

then contacts you through text message or email. The correspondence seems legitimate because you believe he has a connection with someone you trust.

In another scenario, a scammer might impersonate someone you already know - claiming to be an old school friend, for example. Spoofers can find out your connections by following your public feeds or looking up the names of co-workers on sites such as LinkedIn, where you've posted your work information.



GPS JAMMING

An emerging criminal tactic, which sees hackers interfering with GPS signals, has security experts divided on just how harmful it could become.

Jamming a GPS signal at the source is next to impossible, said Phil Lieberman, founder of enterprise security vendor Lieberman Software. Blocking the radio signals that are broadcast from orbiting GPS satellites would require a massive countertransmission. And because the satellites are operated by the US military,

jamming them would be considered an act of war and a federal crime.

However, it's easy to jam GPS receivers' using low-cost jamming devices such as one sold by Brando. This jams a receiver by overloading it with a signal that's similar to the real GPS signal. The receiver then becomes confused because it can't find a steady satellite transmission.

Lieberman doesn't give much credence to fears about jammers disrupting aeroplanes or air-traffic-control systems,

...and how to beat them

"This is a similar type of attack as is used on a computer - an SMS or MMS message includes an attachment, disguised as a funny or sexy picture, and asks the user to open it," Nguyen explained. "Once they download the picture, it will install malware on the device. When this malware has loaded it will acquire access privileges, and it then spreads through contacts on the phone, who each get a message with the malicious attachment from that user."

In this way, said Joffe, hackers create botnets for sending text-message spam with links to a product the hacker is selling, usually charging you per message. In some cases, the malware even starts buying ringtones that are charged to your phone bill, lining the pockets of the hacker selling the ringtones.

Mobile operators try their best to stave off the attacks. For instance, US network Verizon's spokeswoman Brenda Raney said the company scans for known malware

attacks, isolates them on the mobile network, and even works with federal crime units to block them.

To keep such malware off phones, Joffe recommends that businesses institute strict policies limiting whom employees can text using company networks and phones, and what kind of work can be done via text messaging. Another option is a policy that prohibits text messaging entirely, at least until the industry figures out how to deal with the threats.

Once the scammer has established a connection with you, he uses devious means to steal personal data, such as chatting online to find out the names of your family members, favourite bands, hobbies and other seemingly innocuous information. Then he uses that information to try to guess your passwords.

Justin Morehouse, a principal consultant at Stratum Security, describes another type of attack that targets companies. The spoofer might set up

a Facebook page that claims to be a company's official fan page, suggesting members should use it to contact the firm.

The page might offer fake coupons to entice people to join, and it soon goes viral as people share it with their friends. Once hundreds of users have joined the page, the owner tricks them into giving out personal information, perhaps by signing up for additional coupons or special offers.

Consumers are harmed because their personal data is compromised, and the

company is harmed because its customers now associate the fake Facebook page with the real company - and decide not to buy from that company again.

There's no way to prevent a criminal from setting up a fake Facebook page, but companies can use monitoring tools such as SocialMention.com to see how their name is being used online. If an unauthorised Facebook page is turned up, the company can ask the social network to remove the fake listing.

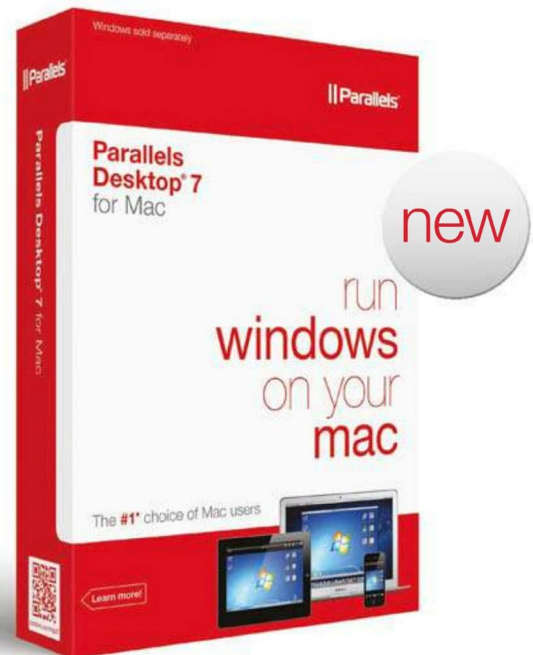
because those networks use a different GPS signal from the one we use in cars and handheld devices. Jamming could, however, be a potentially dangerous issue when it comes to financial records because GPS devices are used in the banking industry to add timestamps to financial transactions. Although completely blocking transactions would be difficult, he said, an industrious hacker could theoretically disrupt transactions and cause headaches for banks.

Security expert Roger Johnston, a systems engineer at the Argonne National Laboratory in Chicago, said spoofing GPS signals is the greater danger. GPS receivers are low-power devices that latch on to any strong signal, he explained. Spoofing could be used for serious crimes - tricking a delivery truck driver into turning down a dark alley, changing the timestamps on financial transactions, delaying emergency vehicles from finding their routes, and so on. There have been no

reported cases of GPS spoofing to commit a criminal act, but Johnston warned that the government and businesses must work to deter such attacks.

Taking some extra precautions - using strong encryption technology, engaging only with trusted friends on social networks, and using penetration testing software on corporate networks - can alleviate some fears and help you sleep at night, even if the bad guys keep coming up with new exploits. ☒

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2012: the year of the mobile threat

Smartphones will become more dominant in 2012 and beyond, leaving PC shipments in the dust. That will bring big benefits, but also big risks. Taylor Armerding explains

Its benefits for user convenience and productivity are obvious and irresistible – a smartphone can handle everything from email to collaboration to video chat. It can serve as your GPS. It can scan product barcodes. It can find and store your favourite songs, help you take high-resolution photos and HD video and expand both your social and professional network.

But it isn't very secure, which puts users and the enterprises that employ them at risk.

A combination of relative defencelessness and ubiquity means mobile devices are an increasingly tempting target for attacks ranging from spyware to rogue applications.

Security experts say the industry is aware of the risks. IBM's IT security research team, X-Force, predicts 33 software exploits targeting mobile devices in 2012. That may sound small, but it's double the number released in the previous 12 months.

Many of the attacks will come through the browser, which Anup Ghosh, co-founder and CEO of Invencea, described as "a terrific attack vector for any malware writer". While each new wave of browsers has better security built-in, there's no slowdown in the number of vulnerabilities. Indeed, there are up to 75,000 variations of malware per day.

"The whole model of detecting attacks and then responding to them is fundamentally broken," said Ghosh.

The methods of attack are varied. They can come with attachments to emails, with third-party apps that promise to perform a useful service but end up harvesting your personal information, or simply through opportunistic infections as you surf the web.

Current estimates are that one in 60 Facebook posts and one in 100 Tweets contain malicious attachments.

Who's in charge here?

Gary McGraw, CTO of Digital and a co-founder of BSIMM (the Building Security In Maturity Model), an organisation that helps software developers build security into their products, believes that the growing awareness of the threats means more effort will be made to improve security for mobile devices. But, he noted, "This is a very complicated space. A lot of different people are responsible for different parts."

Those involved in the making and using of mobile devices range from network operators and device makers to chip manufacturers and those who make mobile OSes.

"They're all thinking very seriously about this problem," McGraw said. "But the business model for mobile commerce hasn't been laid out. It's hard to make risk-management decisions when you're trying to get ahead of your competitors." >>

McGraw agrees that users are vulnerable, particularly to threats such as non-vetted third-party apps. "You can wave your phone around and pay for your petrol - or maybe pay for everyone's," he said.

Zach Lanier, principle consultant at Intrepidus Group, agrees that security is sometimes left aside in the rush to gain a competitive advantage. Developers are making the same mistakes they made with desktop PCs a decade ago, he said.

"We're forgetting the lessons we already learned," added Lanier.

Mobile security isn't an issue of browsers, per se. Lanier believes that mobile devices are vulnerable, but not inherently more so than desktops and laptops.

It is a matter of scale, he said. "Let's say there is a bug, and the most current version of Android is fixed. But everyone runs different versions of Android. So in sheer numbers, they are more vulnerable."

Ultimately, staying safe online comes down to people - the end users. If they can be tricked into opening a malicious PDF file, technology can't block that.

McGraw and Lanier both believe companies will become more active in mobile-device management in response.

Still, a "lack of savvy is not going to go away," Lanier said. To which McGraw added: "You can't protect people from themselves." ☒

IS MALWARE A THREAT TO ANDROID USERS?

Security vendors are playing on your fears to try to sell you protection software for Android, RIM and iOS, according to Chris DiBona, Google's open-source programs manager.

"They are charlatans and scammers. If you work for a company selling virus protection for Android, RIM or iOS you should be ashamed," said DiBona.

According to DiBona, none of the major smartphone OSes has a virus problem similar to what the Windows and Mac ecosystems experience. He dismissed the Android threats reported by the security industry as little things that didn't get very far because of the platform's sandbox model and other architectural features.

Security experts disagree with this assessment and point out that the levels of Android malware have registered a huge increase this year.

"Malware for Android devices is one of the biggest issues in the mobile malware area today," said Denis Maslennikov, a senior malware analyst at Kaspersky Lab. "The growth in malware for Android over the past 5 months is significant. In June we discovered 112 modifications of Android malware; in July, 212; August, 161; 559 in September; and 808 in October."

A similar trend was observed by other antivirus vendors, with Trend Micro reporting a 1,410 percent increase in the number of Android threats from January to July 2011. "The more important figure is not the total number of malware, but the rate of increase. That demonstrates current, active and sustained criminal

interest in the mobile platform," said Rik Ferguson, the company's director of security research and communication.

The majority of Android malware threats consist of Trojans, not traditional self-replicating viruses or worms. However, these can be just as damaging, if not more so, the security experts said.

"It depends on your definition of damaging. Is it recording and uploading voice conversations to a remote server, stealing email and text message histories, or running up huge bills through premium-rate text and voice scams? It all depends on the point of view of the victim and the fallout of the infection," Ferguson said.

However, Android's security issues aren't limited to malware alone. Like any users who access email and websites, smartphone owners are vulnerable to platform-independent threats such as phishing and advance-fee scams.

"What DiBona is missing is that mobile security tools do much more than just antivirus. Antitheft, remote lock, backup, parental control, web filter - these features are the main reason why people buy mobile security products. They get antivirus as a bonus," said Mikko Hypponen, the chief research officer at antivirus firm F-Secure.

DiBona acknowledged that there are some cases where security software is beneficial, such as for enforcing certain corporate policies on business devices. However, he strongly believes that these should be sold independently. "Marketers that sell such things sometimes tack on

virus protection. That part is a lie," he said.

"Well I guess that's one way to make a platform appear malware-free," replied Trend Micro's

Ferguson in a blog post. "Am I ashamed of myself? Not at all. I'd prefer to offer protection against a growing threat to personal and business security than to bury my head in the sand and defend my stance with wild accusation."

Most malware researchers agree that the openness of the Android platform, which allows installing non-vetted apps, and - more importantly - the openness of the Android market, which lacks a strict application-review process, contribute to its malware problem.

"The most important step that Google may take in order to make Android more secure is tighten application-review policies to prevent malware appearing in the Android Market," said Maslennikov. He pointed out that Trojans were found in the Android Market on multiple occasions, and sometimes stayed there for weeks or months before detection.

"We've learned that relying on the users to follow best practices doesn't really work," said Ondrej Vlcek, the CTO at Avast Software. "For computer experts, the threat may not be too high at the moment, but for the majority of people, the threat is real," he added.

Lucian Constantin



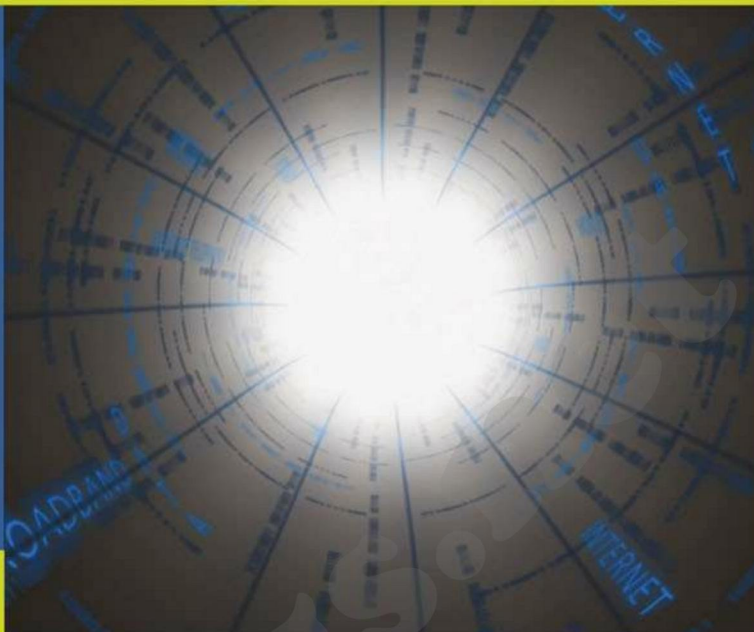
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Web running out of addresses



Some sites and services are moving to IPv6, but the majority remain wedded to IPv4, after the last of the unclaimed IPv4 addresses were handed over to regional registry bodies. Stephen Lawson explains

Support for IPv6 has grown by almost 20 times in the past year, but most websites still can't be reached without IPv4, the current Internet Protocol, which is running out of unclaimed addresses.

The number of subdomains under .com, .net and .org that support IPv6 increased by about 1,900 percent in the year leading up to October 2011, according to an automated sampling of subdomains by Measurement Factory. The study, which was sponsored by IPv6 software specialist InfoBlox, used a script to automatically sample 1 percent of the subdomains under the three well-known top-level domains.

IPv4 allows for only about 4 billion addresses, whereas IPv6 has a near-unlimited supply. The Internet Corporation for Assigned Names and Numbers (ICANN) assigned the last of the unclaimed IPv4 addresses to regional registry bodies earlier this year. Some enterprises and service providers are making a gradual transition to IPv6 using dual software stacks, but experts expect users eventually to come to the internet without IPv4 addresses. They will need pure IPv6 communication, which most operators of websites can't offer today.

Last month, 25.4 percent of subdomains under .com, .net and .org supported IPv6, up from just 1.27 percent a year earlier. However,

the long-awaited IPv6 future may not be as close as it sounds from that statistic.

All the figure means is that a domain name system (DNS) server can point to those subdomains using IPv6. If a user with an IPv6-only device tries to go to a website, for example, the site's registrar can match up its URL with an IPv6 address and kick back an answer to the web surfer, said Cricket Liu, vice-president of architecture at InfoBlox.

GoDaddy leads the way

Most of the dramatic boost in the past year came when GoDaddy, one of the world's largest domain registrars, made its DNS work with IPv6. GoDaddy claims its DNS service has more than 30 million customers. Had it not been for GoDaddy, the number of subdomains supported would have grown by a bit more than double, to about 3 percent, according to Measurement Factory.

But for now, most of those DNS requests wouldn't take an IPv6-only user to an actual web page, because less than 1 percent of all subdomains surveyed had IPv6-enabled web servers. Likewise, there were very few IPv6 email servers. Just over 2 percent of zones were served by IPv6-compatible mail servers.

The good news is that many more operators of websites can serve IPv6 visitors once they have an IPv6-compliant

web server, Liu said. Along with GoDaddy, Measurement Factory cited three other major registrars - Gandi and OVH in France, and Active24 in the Czech Republic - that adopted IPv6 during the period.

GoDaddy has said it plans to extend its IPv6 strategy soon by supporting the new protocol on its website-hosting service. Companies that rely on GoDaddy instead of operating their own web servers will then be able to run an IPv6 site.

The Measurement Factory found France leading in IPv6 adoption, with 57 percent of subdomains in France reachable by IPv6, followed by the US with 42 percent and the Czech Republic with 36 percent. But its scope was limited by examining only .com, .net and .org. For one thing, this left out subdomains that are under country-level domains in Asia, where a more severe shortage of IPv4 addresses has led to strong government efforts to push IPv6 in some countries.

The sample also overlooked other top-level domains where IPv6 has been more widely adopted, such as the .gov domain of the government and the .edu domain used by universities, said Nav Chander, an Internet infrastructure analyst at IDC. However, the move to pure IPv6 networking remains slow. "There's still very little IPv6 usage," he said. ☐

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It's not that easy to create a whole new gadget niche. Many of the devices Rosemary Hattersley and Carrie-Ann Skinner have unearthed manage exactly that feat

Archos G9 101 >>

Android tablet

This upgraded version of Archos' G9 101 tablet runs Android 4.0 'Ice Cream Sandwich', which offers video hardware acceleration. It's a relatively cheap 10in-screen device with a Texas Instruments Omap4 processor and 8GB of storage (expandable via MicroSD). A 250GB hard-disk version is also available. The G9 101 was designed with audio and video entertainment in mind, and thus boasts a 1280x440-pixel screen, an HDMI port, a microphone and a large speaker. The Archos also has a spindly, but not unwelcome, kickstand. A recessed slot on its underside houses a 3G dongle, but adds £50 to the price.

From £269 inc VAT
archos.com



>> BergCloud Little Printer

Printer

If you're a fan of lists, you'll understand the appeal of the Little Printer. It's a dot-matrix printer that's controlled via a smartphone app and takes feeds from your social networks and social diary. Items are added via a Wi-Fi feed. A shop till-style printed roll call of appointments and events is produced so that rather than the vague knowledge you've a few things on today, you can be super-organised and see it all listed in black and white.

Price TBC

bergcloud.com/littleprinter



>> Lytro cameras

Digital cameras

Lytro's light-field cameras let you compose a shot and adjust the focus at the editing rather than composition stage. Designed to take advantage of 3D photography techniques, the Lytro approach involves capturing information from 11 million light rays. Once an image has been saved to the 8GB internal memory, it can be copied via MicroUSB to a Mac running OS X 10.6 or later (Windows is not yet supported). The camera has an 8x optical zoom and a fixed aperture of f2.

\$400 (£258)

lytro.com



>> 3M Ergonomic Wireless Optical Mouse

Wireless mouse

If you've resolved to make better use of technology in 2012, putting less strain on your digits and joints in the pursuit of text and email messaging is worth consideration. For the Ergonomic Wireless Optical Mouse from 3M, keeping RSI at bay and providing more naturalistic ways of gripping and controlling navigation is the raison d'être. Using it promises less shoulder stiffness and muscle fatigue.

£150 inc VAT

3Mselect.co.uk



TC-Helicon Voice Live >>

Audio accessory

'The X Factor' and other shows that promise instant fame have a lot to answer for - the warbling and caterwauling from across the street when audition time comes round, for one. If you want to find your voice, a device that gives you constructive feedback is the best accompaniment to practice, practice, practice. The Voice Live Touch's array of buttons helps wannabe singers improve their signing technique by indicating proper pitch. It does the same for guitar riffs and solos. The best samples can be looped and overlaid, making it easier and faster to create tracks worth listening to.

£415 inc VAT

tc-helicon.com



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>> Leica Lux L3 Digital camera

The L3 is Leica's first mega-zoom compact camera, and it's reasonably priced, too. The 12.1Mp camera has a 24x zoom at its command, which equates to 25-600mm in 35mm terms. Designed for sharp-shooting action and wildlife photography, the L3 can take continuous 12.1Mp stills at 12fps, or 3.5Mp shots at an exceptional 60fps. The camera also has a full-HD video mode that captures AVCHD files at 60fps; an Mpeg4 option is available for easier sharing. Scenes are composed on the Leica's 3in (460k dot-resolution) tiltable LCD.

£690 inc VAT
leica-camera.co.uk



3M CP45

Camcorder/projector hybrid

This dual-function camcorder and projector aims to do for the pico projector market what the Flip camcorder did for flash-storage video capture. The 190g CP45 can take 5Mp photos and snag 720p video footage, both of which can be previewed and reviewed on its 2.4in QVGA LCD. A LCoS light sensor makes the most of the available light, while the digital light processing (DLP) projector displays images at 800x600 pixels in a 4:3 aspect ratio. £299 inc VAT
amazon.co.uk



Acer Liquid Express >> Smartphone

Acer's latest smartphone, the Liquid Express, runs Google Android 2.3 'Gingerbread' and supports near-field communications (NFC). The handset has a 3.5in half-VGA screen and offers 3D emulation. Available on Orange and T-Mobile networks, the Liquid Express offers contactless mobile micro payments and can add supplementary information to product listings. The phone has a 5Mp camera with an LED flash, runs off an 800MHz Qualcomm 7227 processor and costs as little as £15 a month, depending on your mobile contract.

From £15 a month
acer.co.uk



Recon Instruments Mod Live

Ski mask

What's the point in risking life and limb as you hurt yourself down a mountain at breakneck speed if no-one's watching? Sticking a camera on your head spoils your aerodynamics; a video camera embedded in your ski mask is a better option. Complete with a speedometer, contact list, call monitor and playlist, the Recon Mod Live pumps tunes straight to your brain as you power down the slopes. The clever bits are powered by Android, so you get to be geeky and cool all at once. €360 (£301)
reconinstruments.com



Pure Contour 100Di

DAB/FM radio and iPod dock

Any self-respecting audio device has its own app. So it is with the Pure Contour 100Di - a revision of the original semi-spherical iPod dock launched a year ago. This model is smaller and a little less pricey, and it doesn't include internet radio on the device itself; instead, you tune in via an iOS app and use the Contour as a speaker. The 100Di offers DAB and FM radio, plus access to The Lounge podcast portal. It pumps out 20W of audio. Pure Music subscriptions are supported, too.

A recessed dock tucks out of sight when not required.

£100 inc VAT
pure.com



Canon Pixma Pro-1 >>

A3+ photo printer

Unlike most consumer and small-office photo printers, which use four or six inks to create realistic colours, the Pixma Pro-1 uses 12. This significantly expands the colour gamut. Two black inks (Photo and Matt), three greys, six colours (Cyan, Photo Cyan, Magenta, Photo Magenta, Yellow and Red) and a 'Chroma Optimiser' combine to increase black density and make glossiness uniform. Source images of up to a maximum of 1200dpi can be printed at up to 4800x2400dpi.

£799 inc VAT

canon.co.uk



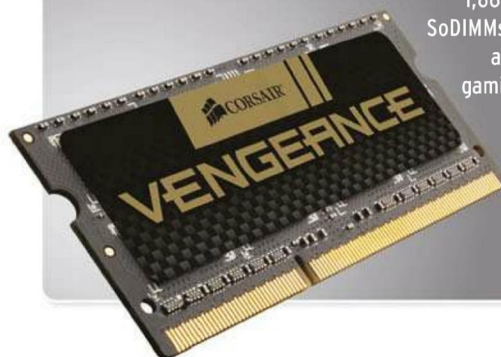
Corsair Vengeance

Laptop memory kit

The quickest way to improve PC performance is to increase the RAM allocation, and the same is true of laptops. Corsair's Vengeance high-performance DDR3 modules can boost your laptop's memory to 4GB and 8GB, and are designed to take advantage of the number-crunching potential of

second-generation Intel Core i5 and i7 processors. The 1,866MHz and 1.6GHz SoDIMMs are particularly aimed at boosting gaming performance.

Price TBC
corsair.com



Verbatim Wireless Bluetooth Mobile Keyboard >

Bluetooth keyboard

Smartphones have impressively large screens and vast swathes of memory for storing music and photos, but they aren't as accomplished as devices on which to compose lengthy emails or type with accuracy. A Bluetooth keyboard can make a marked difference. Verbatim's second-generation folding keyboard is compatible with most Android smartphones and tablets, as well as iPhones and iPods. It can store pairing details with six Bluetooth-enabled devices and is powered by a single AAA battery.

\$79 (£51)

verbatim.com



H2O Shower Powered Radio

Radio

If you enjoy listening to music in the shower, H2O's Shower Powered Radio is an interesting device. This 75x131x4.3mm FM radio connects to your shower hose and uses a patented micro-turbine concept that converts water pressure into energy to power the radio. As well as being 'green', this method means your batteries will never run dry while you're covered in soap. The white-and-blue radio scans and locks on to stations and can remember the last one you tuned into.

£34 inc VAT

waterpowerradio.com



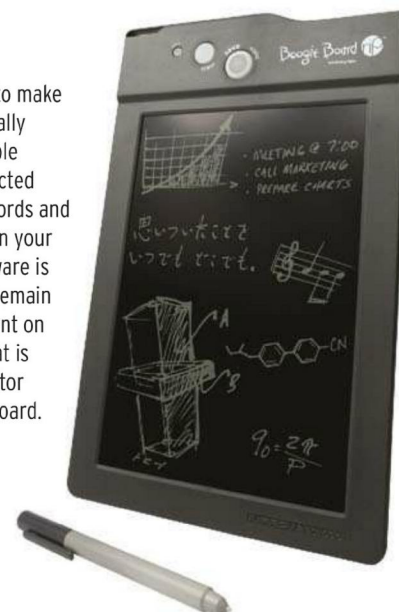
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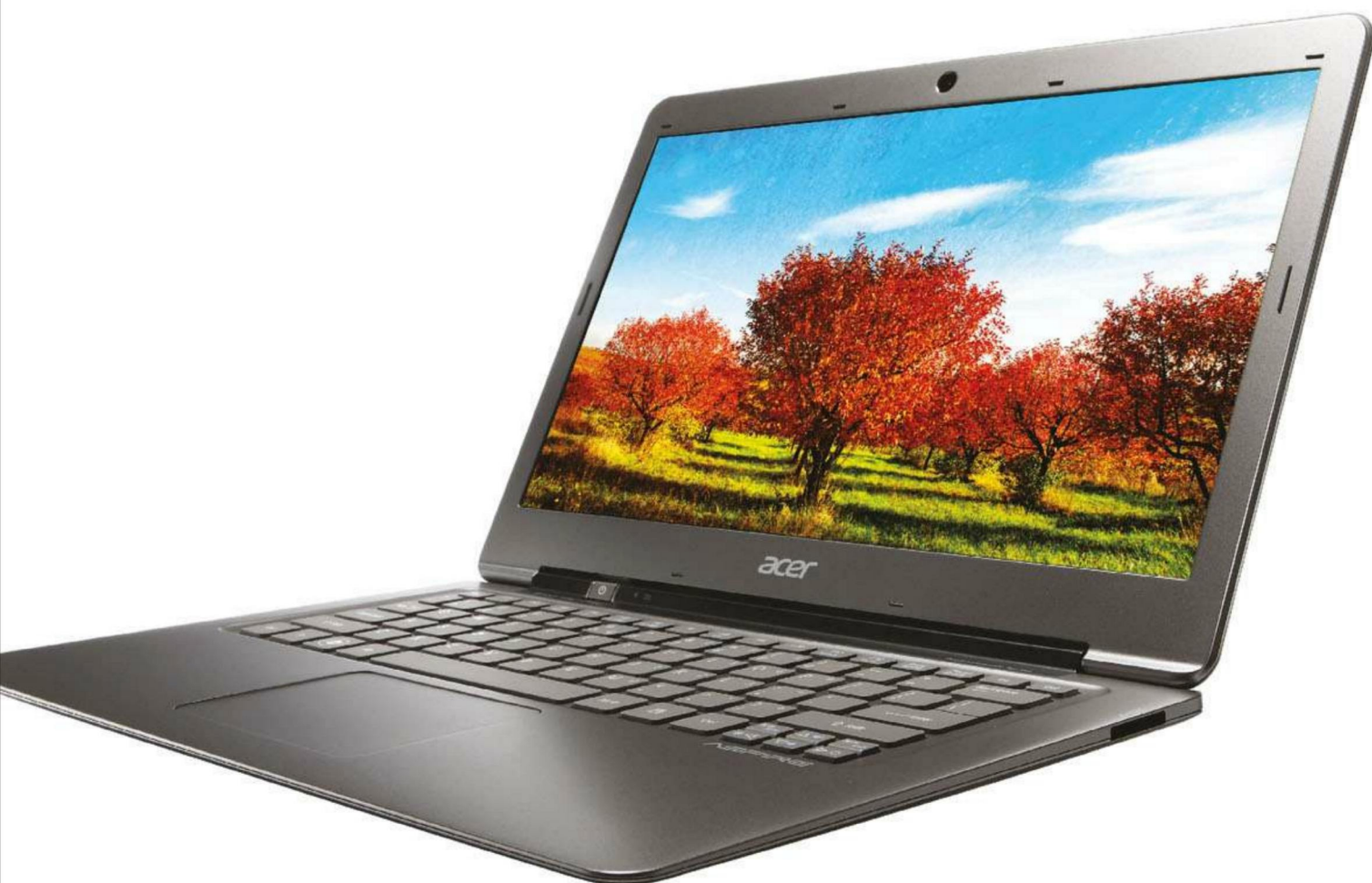
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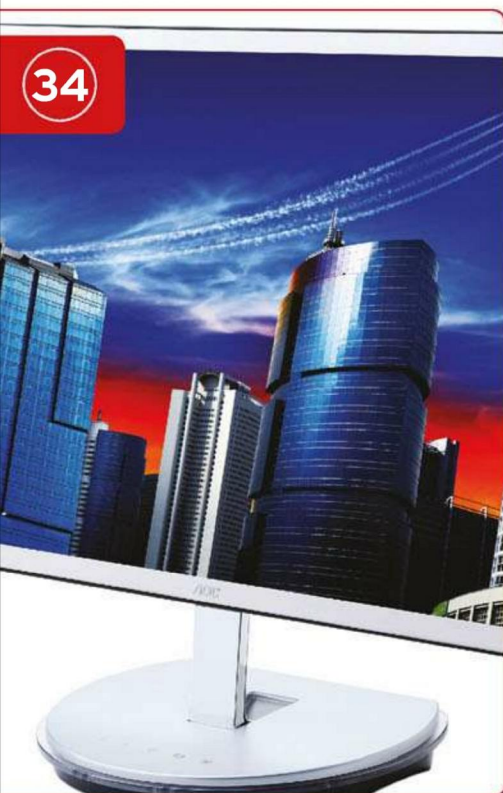


DrayTek
www.draytek.co.uk



Acer Aspire S3-951-2634-G24iss

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Eyeing up the future

Our special 200th issue of *PC Advisor* includes a look back at the ground we've covered over the past 16 years. But let's briefly look forward to the immediate future of computer technologies we can expect to see over the coming year.

Intel has already started the ball rolling with thinner, lighter laptops, which it's calling 'Ultrabooks'. Very much inspired by Apple's achievement with its MacBook Air, these ultraportables are becoming more affordable - although, from what we've seen so far, the best value ultrabook remains the original Air, and its overall user experience is still very much second to none. One of the first ultrabooks, the Acer S3-951-2634-G24iss, is reviewed overleaf.

In a few months' time we should see the next generation of ultrabook, fitted with Intel's latest 22-nanometre 3-D Tri-Gate processor. This CPU's transistors are stacked vertically to enable even smaller die sizes, and thereby faster performance with the same power consumption - or the same performance, but even longer battery life. It'll be interesting to see how closely Intel can approach upstart rival ARM in power-efficient computing.

So Intel's 'Ivy Bridge' family of processors, successor to the 'Sandy Bridge' chips seen in many of our desktop PC and laptop reviews, is now on the horizon. These CPUs also promise integrated graphics that can drive very-high-resolution displays. Since 1440x900 pixels is enough for an ultraportable's 13in screen, you'd be forgiven for wondering why we need to pack more pixels into a small screen.

The answer is a new concept in ultra-high-resolution graphics: HiDPI. This will give the same kind of photographic realism we've seen in the iPhone's Retina display. We've been experimenting with HiDPI in OS X Lion, letting a 2560x1600 screen render its interface with 1280x800 readability, but with incredible grain-free graphics.

The same type of 'dotless' displays should also be appearing in tablets in just a few months, and the ongoing battle between Apple and Samsung in the tablet market will be fought on this graphical battleground. Watch this high-resolution space to see how invisible pixels will transform our vision of 21st-century computing. ☒

“
Invisible pixels
will transform
our vision of
21st-century
computing
”

ANDREW
HARRISON



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Specification

1.7GHz Intel Core i7-2637M (as tested); 1.6GHz Core i5 as sold; Windows 7 Home Premium 64bit; 4GB DDR3 RAM; 240GB A-Data SSD; 13.3in (1366x768) glossy LCD; 802.11b/g/n; Bluetooth; 2x USB 2.0; HDMI; headphone jack; webcam; stereo speakers; non-removable battery; 86x69mm trackpad; 323x218x14-18mm; 1.34kg

WorldBench 6 score: 134

Battery life: 370 mins

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



ULTRABOOK

Acer Aspire S3-951-2634G24iss

The Acer Aspire S3-951 is the first of a new wave of MacBook Air clones. This new product category has been dubbed and trademarked 'Ultrabook' by Intel, which is keen to keep its processor order books filled as consumers abandon the netbook.

The tech giant is keen to push its hardware customers into Apple's ultraportable territory, and while Intel has denied reports of a \$100 bounty per laptop, the company does have a \$300m slush fund to encourage laptop makers. It has also handed out a blueprint design to the likes of Acer, Asus and Toshiba to follow.

Acer was quick to market with its Aspire S3-951, a rival to the 13.3in version of the MacBook Air. But in order to compete with the original, Acer needs to innovate with useful technology not found in Apple's lightweight laptop; or match the quality and sell it for a much lower price. Let's see where it's succeeded.

Design

Our first impression of the S3-951 with its lid closed was positive. But what appears to be an all-metal construction is soon revealed to be a plastic laptop, with a thin skin of brushed metal just covering the lid. The rest of the device is assembled from plastic that's been painted a silver-grey colour to mimic the Air's high-quality metal construction.

Like the Air, the closed S3-951 tapers from the back to the front, only it's fatter at both edges. At its maximum at the rear, the S3-951 is 18mm against the Air's 17mm.

In weight, Acer has patently been paring down the grams in order to beat Apple, settling for 3g lighter at 1.338kg on the sample we reviewed.

The keyboard is like Apple's now-familiar Scrabble-tile layout. Unfortunately, there's a little more sponginess and less precision on the Acer's grey keys. Also troubling was the way the normally double-height Return key was a single-height one. We found ourselves tapping the 'V' key above, which has been shaped to look like part of the Return key.

The trackpad follows Apple's idea of keyless operation. Unlike the Air though, multitouch support is hit and miss. You can try two-finger vertical scrolling, and pinch-to-zoom



sometimes works in certain apps, but sideways scrolling, three-finger gestures and four-finger-and-a-thumb gestures are absent.

All the ports, including two USB 2.0, one HDMI, a power inlet and a cooling vent, are under the screen hinge. There's an SD slot on the right, and an audio jack left.

The screen has the same 13.3in headline size as the Air, but it's smaller in area due to its wide 16:9 aspect ratio. The MacBook has a 16:10 screen that's arguably better suited to PCs than one designed primarily for watching widescreen video.

More important is the screen quality, which is lacking on the Acer. It's too shiny for comfortable viewing, has a low resolution of 1366x768 pixels, and there are serious visibility issues when viewed off-axis. Budget screens such as this may be familiar on £400 laptops, but they embarrass a £1,099 model.

One area where Windows PCs have traditionally stumbled may finally have been resolved - standby mode. 'Instant-on' worked well in our tests. In fact, this is the first Windows laptop we've encountered that could be consistently put to sleep by closing the lid, and which would wake again and be ready for business when opened.

The S3-951 includes a pair of small speakers that vent through the base and the keyboard. Don't be fooled by the 'Professionally Tuned' legend on the bodywork, though, as these speakers sound terribly tinny, despite the marketing efforts of Dolby and its Home Theater 4.0 software.

Performance

The unit we tested had an Intel Core i7 CPU running at 1.7GHz, along with a 240GB A-Data SSD and 4GB of memory. This made the S3-951

very fast. It recorded 134 points in WorldBench 6, whereas the 13in MacBook Air scored 122.

As is typical for an ultraportable, the Aspire relies on integrated graphics. These aren't cut out for 'proper' gameplay, but we saw it play Fear (Maximum detail) at an average of 12fps. After dropping the detail to High, it averaged 38fps, proving that Intel's latest generation of Core chips can get you by if you keep the quality down. Apple's 13in Air managed a smoother 17 and 52fps in the same two tests.


The longevity of the built-in battery is very good. We recorded 6 hours 10 minutes in the MobileMark 2007 Productivity challenge.

Price

Acer UK doesn't have the resources to provide relevant review samples of its products, but instead found us an Acer S3-951-2634G24iss model that's not sold here.

The nearest UK version we could find to match this 1.7GHz Core i7 laptop has a 1.6GHz Core i5 processor. With the same 240GB SSD storage capacity and 4GB of memory, this slower model sells for £1,099 - the entry-level price of the 13.3in Apple MacBook Air.

Verdict

Against Windows ultraportables of recent times, the Acer S3-951 would stand out as a smartly finished and extremely speedy example of a lightweight laptop. Against the laptop it's based on, it's faster in application performance thanks to the Core i7 processor. But it falls far behind in build quality, has shorter battery life and lacks decent multitouch control. In short, it fails to deliver on price or in innovation, leaving the MacBook Air as the wiser choice.  **Andrew Harrison**

£1,199 inc VAT

Contact

■ dell.co.uk

Read more

■ tinyurl.com/5wtg6wp

Specification

2.7GHz Intel Core i7-2620M dual-core processor; 4MB level 3 cache; Windows 7 Home Premium 64bit; 8GB DDR3-1333MHz RAM; 750GB 2.5in SATA 7,200rpm hard disk; 15.6in (1920x1080) glossy LED-backlit display; nVidia GeForce GT 525M graphics card with 2GB VRAM; 802.11b/g/n; gigabit ethernet; Bluetooth 3.0; 2x USB 3.0; 1x eSATA/USB 2.0; HDMI; DisplayPort; SD/MS Pro/xD card reader; slot-loading 8x DVD \pm RW DL drive; stereo speakers; webcam; mic input; headphone jack; 64Wh 8-cell built-in lithium-ion battery; 385x260x25mm; 2.55kg

WorldBench 6 score: 135

Battery life: 409 mins



LAPTOP

Dell XPS 15z

Dell pays visual tribute to the Apple MacBook Pro with its XPS 15z. At a glance, you'd be forgiven for mixing up the two – especially with the lid closed. Take a closer look, though, and the many differences become a great deal more obvious.

Lift the lid and you'll find a rather strange-looking keyboard, squashed in between two large speaker grills. The unusual font used on the labelling of the keys is presumably intended to look modern, but the futuristic-70s effect is rather more square and angular.

Features

Typing on the keyboard is easy enough, and the Spacebar, Backspace and Return keys are pleasingly large. The Dell seems to be a few keys short of the full set, however, and the Arrow keys are somewhat small. But the keyboard follows Apple's lead with backlit buttons, which aid usability in darkened rooms.

Below the keyboard sits a large 100x54mm touchpad, which performs reasonably well. This unit from Cypress is delightfully responsive for basic cursor steering, but leaves something to be desired for more ambitious pinch-to-zoom functions, for instance, which are slow and laggy.

The screen comes complete with a finish so glossy that it'll dazzle you should you unwittingly catch the reflection of a light source. This panel offers impressively bright colours and sharp definition, though, and does a great job of displaying HD video footage.

You won't even need to downscale full-HD content, as this screen is rather unusual in its native 1920x1080-pixel resolution. For best results in Windows, we set the



screen magnification to 125 percent, resulting in clear, legible fonts and suitably sized interface elements.

Dell has included Stage, a quick-launch overlay in Windows 7 Home Premium. This appears as large tiles floating on the wallpaper at the bottom of the screen. It could help inexperienced users find their way around Windows' often confusing directory layout, allowing them to quickly access pictures, music and games, for example.

Sound quality isn't bad: a little lispy and metallic, and lacking in any bass, but better than many Windows laptops. And as an entertainment-focused laptop, the Dell is no slouch.

Performance

The processor specification of the XPS 15z is admirable. Our sample had a 2.7GHz dual-core Intel Core i7-2620M. It may have been around for nearly a year but, matched with a generous 8GB of RAM, the CPU helped power the Dell to a score of 135 points in WorldBench 6.

Since Dell built this sample, it's upgraded the processor options to include a 2.8GHz Core i7-2640M. This chip could increase the 15z's performance score by a point or two.

The nVidia GeForce 525M graphics card with 2GB of video memory is also a beaut, and propelled the 15z to an average framerate of 51fps in our Fear test (Maximum detail settings). This isn't the best score we've seen from a laptop of this type, but the Dell's graphics horsepower shouldn't entirely disappoint a keen gamer.

Three USB ports, including one that doubles as an eSATA connection, are found on the laptop's left side – just like on the MacBook Pro. If, like this reviewer, you're a left-handed mouse user

and need to plug a wireless receiver dongle into one of the USB ports, you're likely to find yourself knocking into those peripherals on a frequent basis.

Neither is your author a fan of built-in batteries, although the eight-cell, 64Wh lithium-ion power pack inside the 15z does a very good job. In the MobileMark 2007 benchmark it lasted just short of 7 hours.

The slot-loading DVD rewriter is also reminiscent of the MacBook Pro, even if its eject button has counter-intuitively been placed three keys in from the top-right of the keyboard, rather than the more obvious position in the top-right corner. And, as optical drives go, it's also rather noisy.

Connectivity options are decent – aside from the aforementioned USB ports and USB/eSATA combo, you'll find an HDMI port and a Mini DisplayPort – an Apple favourite, and something we're increasingly seeing on Windows laptops.

Single-band Wi-Fi and Bluetooth are present, as is a multi-format card reader that'll deal with just about any card you care to slip into it.

Verdict

The Dell XPS 15z is equally comfortable to use as a desktop-replacement laptop or a travelling companion, but at 2.55kg you might not want to carry it around for too long. The £1,199 price tag is high but, despite our reservations about the keyboard, the overly reflective glossy display and the positioning of the USB ports, this Dell laptop is a good all-rounder – and particularly strong for entertainment-focused tasks. Nevertheless, in overall build quality, security and fine attention to detail, an Apple MacBook Pro it ain't. **Ben Camm-Jones**



£150 inc VAT

Contact

■ aoc-europe.com

Read more

■ tinyurl.com/7twLb2a

Specification

23in LED-backlit 3D monitor; 1920x1080; IPS panel; 16.7M colours; '50,000,000:1' dynamic contrast ratio; 250cd/m²; 178/178-degree viewing angle; D-Sub; 2x HDMI; -4/14-degree tilt; Vesa 100 mount; 5ms response time; stereo speakers with 2x 2W amp; 550x388x187.7mm; 5.6kg

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



23in MONITOR

AOC i2353Fh



This is a very impressive monitor. Almost impossibly thin, tastefully styled and finished in brushed aluminium, the i2353Fh from AOC is one of the best-looking displays we've tested. Not only that, but it's fitted with a high-quality panel that delivers excellent colour and wide viewing angles.

At just 10mm thick, the i2353Fh makes a pleasant change from the hunks of black plastic that usually form a PC monitor. To achieve this slim frame, AOC has employed a space- and energy-saving LED backlight, while moving most of the inner workings and user controls into the monitor's stand. The power supply lives in an external module.

The base of the stand is a circular disc with a flattened rear, where the connection ports can be found. It's topped with the same brushed-aluminium finish that surrounds the display panel and houses five touch-sensitive control buttons. A clear plastic rim circumnavigates the base, through which a large dual-colour LED shines to denote power status.

The control buttons are easy to operate by hand, and bring up a large, clear onscreen menu at the bottom of the display that's simple to navigate. You also get AOC's Windows-only software package, which includes a utility to adjust the monitor's settings.

Inputs include a VGA connector, a pair of HDMI sockets and an analogue audio input for driving the stereo speakers.

Another interesting feature is the Vesa 100-compatible mount on the underside of the base. Unlocking the stand mechanism and rotating the base through 90 degrees allows you to mount the display to a wall with the base parallel to the screen.

The i2353Fh delivers exceptional image quality, thanks to its in-plane switching (IPS) panel technology. This allows for wider viewing angles than the popular and less-expensive twisted-nematic (TN) variant, which means that colours and brightness levels don't appear to shift as you move your head.

Lab results

The i2353Fh produced a very good-looking image in our tests. Our results show that its colour reproduction wasn't as spot-on as that of some other IPS-based monitors, but it's nothing that a bit of calibration can't fix.

The viewing angles are quoted as a wide 178 degrees and we saw no perceivable colour shifts left-to-right or top-to-bottom. This makes the display very restful on the eyes, despite its punchy contrast and



saturated colours. We noticed a small amount of backlight bleed during a video's dark scenes, but were impressed with the overall image.

We measured a maximum brightness level of 225cd/m², with a black point luminance at 0.75cd/m². The AOC recorded a healthy 666:1 contrast ratio. With reference to NTSC, the colour gamut was 75.9 percent and 107.1 percent sRGB. Power consumption at maximum brightness was 32W, falling to just 21W at 120cd/m².

Verdict

It's not perfect but, at this price, the AOC i2353Fh exceeds expectations at every turn. It outperforms any TN-based display and its expensive looks belie its budget price. The wide viewing angles of its IPS panel technology make it a great choice for anyone editing photos or video on a budget. **Paul Monckton**

27in 3D TV & MONITOR

Samsung LT27A750

£650 inc VAT

Contact

■ samsung.com/uk

Read more

■ tinyurl.com/7trps7L

Specification

27in LED-backlit 3D monitor; 1920x1080; TN panel; 300cd/m²; 170/160-degree viewing angles; HDMI; TV tuner; 631x454x191mm; 7kg

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



When living arrangements dictate that a single room is used for both work and play, you'll probably find room for only one big screen in your life. Featuring a built-in Freeview HD tuner and 3D support, Samsung's LT27A750 TV/monitor fulfils both roles admirably – and a lot more.

The super-slim 27in LED-backlit panel is large enough for big-screen entertainment, yet small enough to serve as a PC monitor. Featuring a screen resolution of 1920x1080 pixels, it's capable of full-HD 1080p playback and comes with a host of premium features.

A thin, black bezel is enhanced with a transparent surround. This sits atop a small circular base unit

with a decorative silver trim, which also houses eight softly illuminated touch-sensitive controls for use when sitting at your desk.

There's no VGA socket, so you'll need to connect your PC via one of the two provided HDMI ports. Other inputs include component and composite video, Scart and an RF input for your antenna.

Digital terrestrial broadcasts can be viewed, including Freeview HD, via the built-in tuner. HD TV's picture quality is very sharp. An ethernet port is also provided, which we hooked up to our network, enabling us to browse and play back media from our Synology NAS drive with no need for any user setup.

A dedicated button on the remote control brings up Samsung's Smart Hub, which provides a content-rich media centre-like environment, gathering media from broadcast TV, your LAN and the internet.

Favourites such as BBC iPlayer are pre-configured, and you can even download and install apps directly on to the TV. It's simple to use and the software updates itself periodically enabling new features.

In addition to supporting 3D Blu-ray, you can also display content from your PC in 3D using either the supplied software or a third-party solution such as nVidia's 3DTV Play. The LT27A750 uses active shutter-based 3D glasses. Our 3D copy of

£59 inc VAT**Contact**■ pinnaclesys.com**Read more**■ tinyurl.com/ccmjjsw**System requirements**

1.8GHz processor;
Windows XP/Vista/7;
3.2GB hard-disk space;
DVD drive

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



VIDEO-EDITING SOFTWARE AND HARDWARE BUNDLE

Avid Dazzle Video Creator HD

Camcorders have been resolutely digital for over a decade now, which has made getting your footage on to your computer for editing much easier. If, however, you were an early camcorder adopter, you could have hours of precious memories in analogue form, and transferring these to the digital realm might be a challenge. This is where the Dazzle Video Creator HD comes in.

The hardware is a small curvy USB 2.0 breakout box called the DVC100. It has analogue composite and S-Video video inputs, while stereo audio is accommodated by twin RCA sockets. Don't be fooled by the 'HD' in the product's name, though. This device captures video at a standard-definition resolution of 720x576 pixels.

Digitising hardware wouldn't be much use without the software to handle the footage after capture though, and the Video Creator HD comes with Pinnacle's Studio HD 14.0. This isn't the latest iteration, but it's still a capable video-editing program, and you can upgrade at a reduced price if you want to keep things current.

Grabbing your footage starts with the Import tab in the Studio HD software. You can choose whether to use the composite or S-Video input, and the settings dialog lets you adjust brightness, contrast,

sharpness, hue and saturation during capture. You can also select 4:3 or 16:9 aspect, depending on whether your clips were shot in widescreen or not, and indicate whether the footage is from a PAL, NTSC or Secam source.

Aside from AVI and Mpeg presets, there's also a custom option. This allows you to record your footage as DV, Mpeg or M-Jpeg. Data rates for Mpeg range from 1 to 10 Megabits per second (Mbps), but M-Jpeg has only a quality setting and no DV options other than whether or not you want to record audio as well as video.

Once the video is digitised and on your system, all the software's editing abilities will be at your disposal. It's an easy application to use, and you can apply a variety of effects and enhancements to your footage. However, it's worth noting that some of the more adventurous effects require activation, and you'll need to pay for them.

All the Studio Ultimate RTFx filters, for example, cost extra, although you do get the Studio HD RTFx pack, and RTFX Volume 1, with the latter including quite a few fun filters such as the old-film effect.

At the output stage, there's the usual array of burning to DVD,



exporting to a file, recording back to tape or uploading to the web. It's here, however, that Studio HD 14.0 shows its age, as you can burn to HD DVD, but Blu-ray isn't supported; and web options include YouTube and Yahoo Video, but not Facebook or Twitvid. However, you can use the DVC100 with other video editing apps - we used CyberLink PowerDirector successfully - and buy this bundle for the capture hardware alone.

Verdict

The HD title is misleading, as you can't grab it with the analogue capture hardware. Overall, the Dazzle Video Creator HD provides everything you need to take your analogue video collection into the pre-HD digital age. If you've got a pile of analogue videos you want to digitise, the Dazzle Video Creator HD does a capable job. **James Morris**



Alice in Wonderland was rendered with a very convincing 3D effect, although the right-eye image bled very slightly into the left eye. This

was noticeable only while reading the movie's main menu, though.

Lab results

Our Spyder 3 calibration tests measured some bright, highly saturated colours, although a little calibration was needed to bring them fully into alignment. This is normal for a TN panel and the LT27A750 performed far better than many displays based on this technology. The colour spread stretched to 82.6 percent of the NTSC gamut and 116.6 percent of the sRGB range.

The maximum measured brightness was relatively high at 255cd/m², with black point luminance at just 0.46cd/m². The

contrast ratio was 682:1. As you might expect of a TV with extra electronics, the power consumption was a little higher than a regular monitor - 52W at full brightness and 37W at 120cd/m².

Its built-in stereo speakers were capable of delivering clear audio without distortion from the 7W amp even at high volume levels, but there's little bass response.

Verdict

A very pricey display, the LT27A750 nonetheless sports premium features in an eye-catching design. Multimedia picture quality is very good and the 3D support works well. **Paul Monckton**

SCREEN CALIBRATOR

X-Rite ColorMunki Display

The ColorMunki serves two purposes. First, it can set colour and brightness levels during a five-minute calibration process on Windows and Mac computers. Thereafter it acts as a room brightness gauge, optionally tweaking the monitor's brightness level to better track changes in ambient lighting throughout the day.

The device is a well-made, lightweight plastic device that's 65mm tall, with a long USB cable stretching from its side. In order to serve its dual-role as calibrator and

ambient light monitor, it has a neat swivel action with a light diffuser on top. With the internal light sensor facing downwards, it's ready to be levelled against a screen for measurement. Swivelled 180 degrees, the sensor faces upwards through a white plastic diffuser and monitors in-room light levels.

After installing X-Rite's software, you connect the device to a USB port on the computer. The software installs easily, with no need for serial codes, although it does demand admin privileges.

There are two modes to choose from: Easy or Advanced. In the former, you first measure the room's ambient level. You're then prompted to reverse the diffusing lens to calibrate the screen. The software then cycles through a number of single-colour images as ColorMunki measures the display's output. Once it's finished, you just name your calibration profile.

If, instead, you opt for the Advanced setup, you get a few

more options to play with such as Ambient Light Smart Control, which adjusts screen brightness throughout the day.

At the end of either setup process, you can view a selection of useful colour and black-and-white images, with Before and After buttons to spot the differences. Once you've finished, a green icon sits in the menu bar to show that all is well with your screen setup.

The device can also take on projector calibration. The results we saw when calibrating screens were excellent. Skintones would typically soften and appear more tanned on LED-backlit screens. Some test images with bouquets of flowers let us see the individual colouring of the bunch, whereas only certain blooms had previously been discernible.

Verdict

The ColorMunki Display is easy to use and can bring outstanding results to computer monitors.

✉ Andrew Harrison

£139 inc VAT

Contact

■ xritephoto.com

Read more

■ tinyurl.com/cjeoq3e

Specification

Display calibration colorimeter; ambient light sensing mode through diffusing lens; ColorMunki Display software; requires Mac OS X 10.5/Windows XP or later; 1024x768-pixel display; USB 2.0; 1.8m cable; 66x64x38mm

Build: ★★★★★

Features: ★★★★★

Value: ★★★★★



£240 inc VAT

Contact

■ uk.msi.com

Read more

■ tinyurl.com/cm2mk8q

Specification

nVidia GeForce GTX 560 Ti 448; 1280MB GDDR5 RAM; 750MHz core clock; 975MHz memory clock (3.9GHz DDR effective); 400MHz Ramdac; 320bit memory interface; 448 stream processors; 56 texture units; 40 ROP units; PCI Express; 2x 6-pin power connectors; DirectX 11.0; 2x DVI; 1x Mini-HDMI; 3-year warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



GRAPHICS CARD

MSI N560GTX-448 Twin Frozr III Power Edition/OC

The GTX 560 Ti 448 is built around the GF110 core, as used in the top-of-the-range GTX 580 chip that has 512 stream processors. The cut-down GTX 570 has 480 stream processors. Now we have the nVidia GTX 560 Ti 448 - once again built around the GF110 core, but taking just 448 stream processors (hence the name GTX 560 Ti 448).

Besides the 448 processors, the 560 Ti 448 comes with an ample 40 raster operation pipelines (ROPs), in line with the 570 and 580. Its 56 texture units are also reasonably capable, although the 580 and 570 come with 64 and 60 of these respectively.

The default core-clock speed of the 560 Ti 448 is 732MHz, although MSI bolsters that to 750MHz. The default memory clock of 900MHz (3.6GHz DDR effective) is pushed up further to an impressive 975MHz (3.9GHz DDR effective). Add the 1280MB of GDDR5 memory and the MSI has extremely well-endowed memory specifications.

The card needs two six-pin power connectors from the PSU, and provides output over a pair of DVI ports and a mini-HDMI - the latter can be upgraded to a full port with an adaptor.

It has slightly lower power consumption, with a Thermal Design Power (TDP) of 210W against the 219W of the 570. However, it's worth remembering that a standard 560 Ti is rated at 170W, making this card relatively hungry. In use it's also loud, particularly under load.

In terms of performance, we found the GTX 560 Ti 448 to be just a step or two behind the GTX 570. In BattleForge, for example, it achieved framerates of 56.3 and 50.9fps at resolutions of 1680x1050 and 1920x1200 respectively. The 570 offered 60.1 and 53.9fps here.

In Heaven, it was marginally behind, producing figures of 38 and



29.8fps against the 40.9 and 31.3fps of the GTX 570.

In Crysis, the GTX 560 Ti 448's numbers of 34.3 and 28.2fps were again slightly down on the 570's 37.8 and 30.7fps.

These figures are pretty good, particularly given the acknowledged strength of the 570: the 560 Ti 448 is significantly faster than other sub-£200 cards.

Verdict

The 560 Ti 448 is a decent product for the money. It offers a significant £30 saving on the GTX 570, and the drop in performance is reasonably slight. ✉ Robin Morris

Dell recommends Windows® 7.



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£320 inc VAT

Contact

■ corsair.com

Read more

■ tinyurl.com/braynsc

Specification

256GB SSD (also available in 128GB capacity); 2.5in form factor; SATA 6Gbps interface; 34nm NAND flash; 2x 256MB DDR3-1333 cache; Marvell 88S9174 controller; 65g



SOLID-STATE DISK

Corsair Performance Pro 256GB

PC ADVISOR
GOLD



Corsair's latest high-performance SSD range is the Performance Pro series. These drives advertise incredible speeds - over half a terabyte per second in sequential reads. Thanks to their Marvell controller, we can be confident that this performance is available with any kind of data we need to move.

For some Windows PCs there is Trim, an OS-level command that pre-erases deleted blocks in a bid to keep write speeds consistent throughout the life of the SSD. But even if your operating system doesn't use Trim, a drive with the Marvell controller should stay in shape even after the drive has had heavy use.

In the ATTO test, the Corsair hit a maximum read speed of 508MB per second (MBps), and write speed of 441MBps. More revealing results are to be found in the CrystalDiskMark (CDM) test. Using compressible 0x00 data, for example, the disk recorded speeds of 466 and 407MBps for read and write respectively.

With random data, write figures barely changed, showing 452 and 406MBps. Compare that to the SandForce-powered Kingston HyperX, for example, which posted results here of 492MBps, but only 308MBps for sequential writes. Using stacked data, the Corsair could read and write small files very fast. The 4k QD32 test showed scores of 285 and 276MBps.

In the AS SSD test, the Corsair really stretched its legs. An overall nominal score of 867 points is the highest we've ever seen.

Looking more closely, it must have been helped by very impressive input/output operations per second (IOPS) figures, here nudging 69k for read and 63k in writes.

Our previous SSD Best Buy, the Crucial M4 256GB, had a faster write IOPS of 84k but slower reads at 40k. And its best sequential speeds (CDM, random data) seem almost

pedestrian now, at 412 and 256MBps for read and write.

Verdict

It may not boast the very highest read/write speeds but, make no mistake, the Corsair Performance Pro is the fastest SSD in real terms we've ever tested. With transfers of around half-a-terabyte per second in either direction, this is a startlingly quick storage device. Add in OS-agnostic housekeeping, and the competitive price, and this SSD becomes easy to recommend as the finest all-round internal drive available today. **Andrew Harrison**

£174 inc VAT

Contact

■ hp.com/uk

Read more

■ tinyurl.com/cqLsg63

Specification

Colour laser printer; 600x600dpi print resolution; quoted print speed: B=12ppm, C=8ppm; actual print speed: B=9.6ppm, C=5.6ppm; USB 2.0; ethernet; 150-sheet input tray; 1-sheet priority feed slot; 128MB memory (expandable to 384MB); toner cost: B=£75, C=£55 x 3; print yield (pages): B=2,000, C=1,300 x 3; 399x453x254mm; 18.1kg



PRINTER

HP LaserJet CP1525n

At around £174, the LaserJet CP1525n is an inexpensive colour laser printer. Value lasers are typically a touch flimsy, but not this HP model.

The design is functional, and toner cartridges can be accessed from a front panel. The oversized casing also means that HP can build an expansive tray into the top. You can't expand its paper feed capabilities (an additional one-sheet slot at the front is the only other option), although you can upgrade its 128MB of memory to 384MB.

The control panel feels basic - it shows two lines of text to run through various options. These aren't particularly easy to read, and the buttons are rather small.

There are few extra features, and no slots for USB drives or memory cards. Neither is there an auto-duplex option. This printer has only ethernet connectivity, but the CP1525nw adds Wi-Fi for £17 more.

On mono text, HP lists a figure of 12 pages per minute (ppm). In reality,

the HP churned through our text tests at 9.6ppm. The £135 Oki C110 (page 192) comfortably betters the HP with a rate of 15.8ppm. However, when it comes to colour printing, the Oki's figure of 2.5ppm is far behind this HP's 5.6ppm. Nonetheless, the CP1525n is slow; if speed is key, it will prove a poor choice.

Its colours are dark but rich and realistic, and the HP experiences very few problems with banding and dithering. Skintones are smoothly handled, and it did well in text quality, too, producing characters that are light yet well formed.

The HP may initially be relatively cheap, but it isn't cost-effective to run. Toner costs work out at 3.8p for a page of text. That 3.8p is in line with the Oki C110, although it's still around twice as much as you'd pay with a decent mono model.

The real eye-waterer is the cost of colour, which works out at 12.7p



per page. When even the Oki offers colour pages for 5p, consumables are clearly a concern here.

The HP is attractively styled. The cream livery combined with extreme curvature of the front panel makes for a printer that's easy on the eye.

Verdict

The HP LaserJet Pro CP1525n is a well-built model that produces good-looking images. However, it's somewhat slow and the cost of toner could prove prohibitive. Whether you're focused on text printing or graphics, there are much better options out there. **Robin Morris**

WIRELESS ROUTER

Sitecom Wireless Media Router 300N WL-350

Plenty of low-priced routers are available that offer a basic home network setup, but the manufacturer often cuts a few corners to keep down costs. This is certainly not the case here, however.

The 300N itself is robust, with a tough plastic chassis and no external antennae. It's very small, with bright blue activity LEDs on the front. The router has four LAN ports, here specified for gigabit ethernet speeds. The WAN port is also gigabit, which will be essential when broadband exceeds 100 Megabits per second (Mbps). A single USB 2.0 port is used for connecting hard disks, and a WPS button lets you set up a secure wireless network.



The device supports up to four wireless networks at 2.4GHz and another four at the less congested 5GHz frequency. At each frequency, you can create both a standard and a guest wireless network. When the router is first switched on, both its default networks are protected with WPA2 security.

We didn't have any trouble navigating the web interface to adjust the settings. The Home page gives an overview of every aspect of the device, while under the Basic header are all the network settings. The firewall gets its own menu, while everything else is located under the Advanced Settings header. You can also share specific folders on external USB hard disks, and adjust their access permissions.

There are different Quality of Service (QoS) settings for various types of data. The 300N uses a technology Sitecom calls Stream Engine, which it says uses a dedicated chip

built into the router to analyse the network traffic. This prioritises HD video streaming to one computer, while another is playing online games, without the video pausing or the game performance dropping.

Wireless Intelligent Stream Handling (Wish) is also supported. This lets you choose whether to prioritise video streamed over http (YouTube, for example) or to other computers on your network.

In our tests, the 300N WL-350 approached the best performing routers we've reviewed at 2.4GHz, at least at short range. We measured an average throughput of 86Mbps at a distance of 1m, with higher peaks during the transfer. At long range, through two solid walls, it still managed 23Mbps.

Verdict

Despite the good performance and long list of extras that Sitecom has squeezed into the 300N, it still costs only £60, which makes this a great investment. **✉ Orestis Bastounis**

£60 inc VAT**Contact**■ sitecom.com**Read more**■ tinyurl.com/c6zfmr**Specification**

Dual-band wireless router; 802.11b/g/n wireless; 2.4GHz and 5GHz concurrent wireless frequencies; 4x gigabit LAN ports; 1x gigabit WAN port; SPI firewall; Virtual Server; Stream Engine; Wireless Intelligent Stream Handling; WEP/WPA/WPA2 wireless security; UPnP; Dynamic DNS; 1.3g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



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■ sony.co.uk

Read more

■ tinyurl.com/68y8ufb

Specification

1GHz nVidia Tegra 2 processor; dual-screen 2x 5.5in (1024x480); Google Android 3.2 Honeycomb; 1GB of RAM; 4GB flash storage; 802.11b/g/n; MicroUSB; 3G modem; Bluetooth 2.1; DLNA; GPS; digital compass; three-axis gyroscope; 5Mp rear camera; 0.3Mp (VGA) webcam; headphone jack; internal speaker; microphone; 158x180x14mm; 372g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



GOOGLE ANDROID TABLET

Sony Tablet P

Sony came to the tablet party late. Fashionably so as it turned out, and in two distinct guises: Tablets S and P. This Android 3.2 (Honeycomb) tablet is the game-focused model.

The Sony Reader Store has yet to launch, but there's plenty of other digital content to get your teeth into. There's the Video Unlimited and Music Unlimited streaming and download services, plus the PlayStation Network gaming around which this tablet's design is based.

The pair of 1024x480-pixel screens on which you play don't quite match, but offer plenty of depth. Sony ought to round off the edges of the tablet, though: grasping the lower portion to use the virtual gamepad isn't comfortable.

Build quality is very good. The tablet isn't light, but it's sturdy and we like the way the screen folds in on itself. The other important feature is 3G - not something found on many Android tablets.

Charging is via a stubby circular connector similar to that for a

laptop. A MicroSD card slot adds to the puny 4GB of installed flash storage, plus there's a 5Mp camera, a webcam, Wi-Fi and Bluetooth 2.1.

You'll want to use the Tablet P on home turf a lot of the time, though. The battery won't last the claimed 7 hours if you use its entertainment options.

Email composition and management is superbly handled. A grid at the bottom of the inbox offers options to Compose, Discard or Search messages, add or view other accounts and manage your settings. We also like the way you can scroll up and down the entire contents of your inbox.

The screen accuracy is excellent: the responsive display and 1GHz nVidia Tegra 2 processor are a solid combination. We didn't encounter a single lockup, just a few lags when playing free games downloaded via the PlayStation Network portal.



The Android Market displays only in the upper screen of the Tablet P. We also had no luck getting to view samples of Google Books suggested in the scrolling screen at the top of the Android Market list.

Verdict

The Tablet P is a mixed bag. The screen is beautiful, the build robust, the inclusion of 3G welcome and performance above par. But we can't ignore the poor integration of the Sony Entertainment Network elements for which people may buy this tablet. **✉ Rosemary Hattersley**

£195 inc VAT

Contact

■ y-cam.com

Read more

■ tinyurl.com/8yaek4n

Specification

0.3Mp IP camera; 1/4in CMOS; 2.5mm focal length, F2.0; Mpeg4 and M-Jpeg video codecs; 640x480-pixel maximum resolution at 30fps AMR and G.276 audio codecs; built-in condenser mic; 10/100 ethernet; PoE; 802.11b/g; WEP/WPA-PSK/WPA2-PSK encryption; MicroSD card slot; 2.5W power consumption; 90x90x90mm

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



IP CAMERA

Y-cam EyeBall

The Y-cam EyeBall is a fixed security camera that's hidden in the domed body of a PTZ-style housing. You press in the spherical end to loosen it, swivel it by hand into position and release to lock it in place again.

Designed to be mounted on a ceiling or wall, the EyeBall includes a white box that's attached by a 20cm cable - this connects to an external power plug. The device is also designed to be powered through the 10/100 port using Power over Ethernet (PoE) technology. Another jack allows audio output, for two-way communications with a built-in microphone on the dome.

For network connectivity you can use either ethernet or Wi-Fi wireless, but it supports only 802.11g.

Y-cam MultiLive software for Windows and Mac is included for viewing and recording camera streams, and Y-cam also offers an iPhone/iPad app, so you can keep an eye on things from your iOS device.

The EyeBall is relatively easy to set up. This is achieved through

a web browser, and three video streams are available. It also supports UPnP, which means it will open the correct port on most home routers. This is essential if you wish to stream video beyond the bounds of your home or office network.

The picture quality is usable. The fixed-focus, wide-angle lens provides an excellent field of view, albeit with some visual distortion. Low-light performance is reasonable, although there's no supplemental infrared coverage.

The best image recording is obtained in Windows, or using a compatible NAS drive such as those from Synology with its DiskStation Manager 3.2 server operating system.

The Mac software is, however, disappointing. It recompresses the video stream to Mpeg-1, resulting in conspicuous macro blocking and mosquito noise. Despite setting the stream to 25fps, we noticed that the recordings were conspicuously jerky - we'd estimate a framerate more like 5fps. Mac users may be



better served by the full-featured SecuritySpy from Ben Software.

Both the Windows and Mac software allow recording directly to a computer, either continuous or initiated by the motion detection trigger. You can also record to local storage, using the MicroSD card slot.

Getting a working image on an iPhone using the free Y-cam app for iOS was simple. The ease with which you can set up this feature recommends itself very well to less technical users.

Verdict

The Y-cam EyeBall is an easy-to-use security camera solution, with a wide field of view and some useful added features. **✉ Andrew Harrison**

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£150 inc VAT

Contact

■ netgear.co.uk
Read more
■ tinyurl.com/bmsdr74

Specification

2-bay NAS drive; accepts 3.5in SATA HDDs; 1.6GHz Marvell ARM processor (single-core); 256MB of RAM; gigabit ethernet; 1x USB 2.0; 2x USB 3.0; Raid 0/1 and JBOD; DLNA-compliant; 60W external power adaptor; 142x101x220mm

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



NAS DRIVE

Netgear ReadyNAS Duo v2

PC ADVISOR
RECOMMENDED

The Netgear ReadyNAS Duo v2 straddles the small-business and home-media usage categories. It's a compact two-bay unit, with a sober but purposeful metal dress that's almost military-looking in its gunmetal finish.

The front fascia, a ventilated metal mesh, hinges away from a magnetic clasp to reveal two drive caddies behind - hot-swappable trays that carry 3.5in SATA disks. Netgear hasn't drilled out these trays to allow the easy fitting of quieter 2.5in laptop drives.

A single USB 2.0 port faces forward, ably augmented by a pair of USB 3.0 connections on the back. Also on the rear is a large fan, which proves more effective than faster-revving small-diameter fans at pulling air over the disks and electronics inside.

The fan was rarely audible in our tests, and almost entirely drowned out by the intrinsic noise of even a single 3.5in hard disk.

The Netgear's build quality is superb. This is a solid-feeling all-metal brick, although some slight warp in the chassis meant it could wobble on its four feet.

It's available as a diskless unit for around £150, or pre-stuffed with one or two hard disks.

Interface and setup

An essential part of the NAS is its software and interface. The Netgear is Linux-based, with an unusual Dashboard-style interface. This graphically rich environment gives a good overview of what's happening on the NAS and how it's been configured, down to an animated blade icon that indicates fan speed.

The ReadyNAS Duo v2 sets itself up with Netgear's X-Raid2 system by default, which gives automatic expansion as you add more disks. In the case of the ReadyNAS Duo v2, though, with just two bays, adding a second disk creates a mirror of the first: in other words, Raid 1.

The ReadyNAS is also capable of JBOD and Raid 0, with the latter useful for extra speed and capacity.

To set up this unit in any array other than X-Raid2, you must reset the drive to its factory settings using Netgear's RAIDar program for Windows or Mac, requiring Java. You



then have a 10-minute window in which to use RAIDar, and select what Netgear calls Flexi-Raid.

Like most modern consumer NAS drives, Netgear makes it easy to access your files remotely. This is a handy asset, and more so for home users than businesses. As with most such solutions, you'll need to open ports or take advantage of UPnP facilities on your router.

ReadyNAS Remote is an app that allows access to any file through the FTP protocol, while ReadyNAS Photos II is designed to both browse and upload photos to the NAS.

Performance

Driving the ReadyNAS Duo v2 is a new single-core ARM processor, clocked at 1.6GHz, replacing the Sparc-platform Risc processor of the original ReadyNAS Duo.

This processor suggests low power consumption - an important consideration for a device that will typically remain switched on 24/7. And compared to Intel-processor solutions, it will also run cooler, and therefore more quietly.

With the system loaded with two disks and active but idle, we measured a 15W power draw. This rose to 22W under load, and fell to just 8W when the NAS was dormant.

The flip side of low-power processors is typically slower file-transfer performance, especially when writing files to the NAS. We initially tested transfer performance with a single Hitachi 1TB 7,200rpm disk that was supplied with the unit.

In large file tests (greater than 3MB), read speeds peaked at around 102MB per second (MBps) over AFP. For files down at the 32kB level, sequential reads were still relatively strong at 35MBps, although random 32kB reads dropped to just 0.7MBps.

Write performance was lower, as expected: just 17MBps for 3MB samples, rising to a maximum of 42MBps for 40-100MB data.

With a second disk fitted in a striped Raid 0 configuration, the Netgear's overall performance improved in most tests. For 32kB files, for example, sequential reads increased slightly to 44 Megabits per second (Mbps), but sequential writes shot up to 12MBps; and random writes similarly expanded, from 0.7 to 13MBps.

Curiously, the maximum sequential read speeds in Raid 0 were lower, peaking at 99Mbps, while writes hit a high of 47MBps.

Netgear claims the v2 is twice as fast as the previous generation. The speeds we saw are very respectable, especially in Raid 0 mode. Without striping data, performance was still healthy at the large file-size level. And considering the £150 price tag, the v2 is a very capable NAS.

Verdict

We were very impressed with the design and performance of this versatile two-bay NAS drive. It has an approachable interface, and topping the package is a competitive price for the diskless unit. **Andrew Harrison**

£550 inc VAT**Contact**

■ viewsoniceurope.com

Read more

■ tinyurl.com/7wp963u

Specification

DLP projector; 0.45in DMD chip; 1280x800 resolution; fixed manual optical zoom; manual optical focus; auto keystone correction; 100in max/30in min display size; 0.9-3m throw distance; 1.4:1 throw ratio; 20,000 hours lamp life; 500 Ansi Lumens; 6,000:1 contrast ratio; 1.07B colours (RGB 10bit); HDMI 1.3, VGA; Composite Video; S-Video; Component Video (via VGA connector); RS-232 control; 2x 3.5mm mini jack audio in/out; USB; SDHC reader; speaker; 2W amp; 36dB/32dB normal/eco modes; 3-year limited warranty; 214x42x164mm; 1.18kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



PROJECTOR

ViewSonic PLED-W500

The PLED-W500 is an ultraportable LED projector that's ideal for office presentations. It's also capable of HD film playback in 3D.

The projector is finished in an expensive-looking glossy black, with a posh silver trim that helps project a smart, executive image even before you turn it on. It's tremendously portable – a little smaller and lighter than a paperback copy of *Harry Potter and the Deathly Hallows*. It's bundled with a rather fetching soft case with ample room for its associated cabling, too.

Not only does the PLED-W500 look good, it's also packed with useful features. What's not apparent from its external appearance is that it contains enough built-in intelligence to function without the aid of a PC or laptop.

Its 1GB of internal storage can be used to display a variety of media, including photos, music, video and office documents. You can also access such content directly from a USB flash drive or hard drive. We successfully projected a selection of Microsoft Office documents, including Word, Excel and PowerPoint files.

Video support also works well with various formats, and we found HD Windows Media files played back flawlessly, even downscaling from 1080p without a hitch.

Inputs include HDMI, VGA, composite and S-Video. A rather tinny mono speaker is also built-in.

The ViewSonic is able to project an image of your desktop to serve as a PC display via USB. If you're forced to use a wall rather than a screen, the projector can compensate for



the colour of your wall by allowing you to select an appropriate colour in the onscreen menu.

The small size of the projector necessitates a small, high-speed internal cooling fan. This results in a moderately noisy projector. It's rated at 32dB in its quieter Eco mode, but this setup reduces the brightness.

When you've finished, there's no need to leave it sitting on the table with the fan whirring as it cools down. Pressing the off switch results in a full power-down within seconds.

Powerful projection

Although this isn't designed to be an entertainment projector, the PLED-W500 provides support for stereoscopic 3D using DLP 3D or nVidia's 3D Vision kit, enabling an immersive big-screen 3D experience.

With a native resolution of 1280x800 pixels, the PLED-W500 displays images in a 16:10 aspect ratio. Importantly, for a multi-purpose projector, this allows you to use both 1024x768 and 1280x720 (720p) without forcing the digital interpolation of pixels. In this way both business and entertainment applications are served equally well, without any reduction in quality.

There's no zoom control, so the sizing of the projected image depends on the placement of the projector. This is rarely a problem for a portable device that's intended for temporary use in a boardroom, but it limits the placement options for a longer-term installation.

A small but chunky remote control is included, with a built-in laser pointer and a sculpted rear surface to facilitate comfortable use. It's an improvement over the credit-card-sized controllers we often see with similar products, although it has no illuminated buttons for use

in darkened rooms. With a relatively meagre 500 Ansi lumens available, you may have to dim the lights when projecting for a larger audience to a big screen size.

Performance

We tested the projected image using a Datacolor Spyder 3 calibrator and found the quality to vary considerably depending on selected display mode. The default PC mode, for example, does a good job of getting a bright, readable image on to the screen, but with a severely limited palette of colours.

It's no match for a dedicated home-cinema device, but switching to the ViewSonic's Movie mode caused the screen to dim a little, while bringing about a dramatic improvement in colour saturation and accuracy, as well as a reduction in audible noise. Skintones were also rendered with a much more natural appearance, making video content rather pleasurable to watch.

We measured just 52.5 percent of the NTSC gamut in PC mode, or 74.2 percent of sRGB. In Movie mode, this expanded to 80.1 percent NTSC and 113.1 percent sRGB.

The ViewSonic consumed 60W in normal mode, and 46W in Eco. This dropped to 53W (normal) and 34W (Eco) in Movie Mode.

Verdict

Portable, good-looking and feature-rich, the ViewSonic is an ideal accessory for the mobile executive who wants to make a good impression with their presentations. It'll also provide a weekend's entertainment in Movie mode, although the lack of a zoom function and its low brightness rating limits its usefulness in this regard.

✉ **Paul Monckton**



£203 inc VAT

Contact

■ samsung.com/uk
Read more
■ tinyurl.com/75rb5nz

Specification

Mono laser printer; 1200x1200dpi print resolution; 600MHz processor; 128MB memory (max 384MB); quoted print speed: B=35ppm; actual print speed: B=28.6ppm; USB 2.0; 10/100 ethernet; 250 + 50 sheet input tray; auto-duplex; toner costs: B=£86/£135; print yield (pages): B=5,000/10,000; 366x368x253mm; 10kg



PRINTER

Samsung ML-3710ND

The Samsung ML-3710ND isn't the most attractive mono laser we've seen, and its control panel and text display aren't especially fancy. But this affordable model offers good output at reasonable speeds, and it has some decent upgrade options.

Connectivity options include ethernet, allowing the Samsung to slot into most office networks. Its 128MB of RAM can be boosted to 384MB, although both this and the standard 250-sheet input tray should accommodate most needs. The substantial output tray built into the top can hold up to 150 sheets.

A 520-sheet additional tray is also available; combine this with the 50-sheet multipurpose feed and the Samsung offers great potential, able to handle up to 820 sheets.

Samsung claims the ML-3710ND can turn out 35 pages per minute (ppm). It gets close to this in its fastest mode, falling marginally short with 28.6ppm. In best mode, the printer's performance drops only slightly to 27.3ppm.

The ML-3710ND's text output is a little thin, and it won't please those who like their lettering to be dark and thick. The fine characters are well-defined, though, and the neat text is easy to read. The Samsung had no problem in handling a variety of font sizes.

Pictures are never going to look their best in greyscale, but there are a sufficient number of shades available to afford them strong definition and diminish banding.

The Samsung supports auto-duplexing, although the speed in best mode drops to 16.2ppm with this in gear. This 40 percent performance loss doesn't look great on paper, but the print output does: you'll still get good-quality text.

Samsung's drivers include a range of eco tools to help you save in terms of paper, power and carbon dioxide. The printer is also reasonable in its running costs.

Using high-yield cartridges we calculated costs of 1.4p per page,



which is in line with competing models. Using standard inks, which are cheaper but offer less coverage, the Samsung costs 1.7p a page. The cheapest option is a £56 2,000-page cartridge, but with this the cost per page is rather steep at 2.8p.

Verdict

The ML-3710ND may be a rather unattractive printer, but it's very effective at its job. The expansion options are varied, and the speed is very capable. Throw in the informative eco tools and you have a printer that projects genuine beauty from within. **✉ Robin Morris**

£80 inc VAT

Contact

■ tp-link.com
Read more
■ tinyurl.com/7sqdkf3

Specification

24-port unmanaged network switch; 24x gigabit ethernet ports; full-duplex gigabit; auto-MDI/MDIX; 8,000 MAC address auto-learning; 10kB jumbo frame capability; high-speed cooling fan; built-in power supply; 294x180x44mm



ETHERNET SWITCH

TP-Link TL-SG1024D

PC ADVISOR
RECOMMENDED

The network switch serves the invaluable role of uniting ethernet devices beyond the router. In a networked business, switches fill tall racks with their lines of ports and snaking cables, often with 48 ports to a single switch.

But there's still a place for a simple switch such as this TP-Link. And by simple, of course we mean the unmanaged switch, a plug-and-play device that requires no administration or configuration while usefully expanding the number of devices that can talk to each other.

The TP-Link isn't rack-mounted out of the box. A pair of L-shaped mounting brackets (supplied) let you bolt it to a standard rack.

Up to 24 ports are available, stacked in three sets of eight across the front. Also available are eight- and 16-port versions. Each port is signposted by one green LED, with the usual Link (solid) and Act (blinking) designation, while a second LED lights up when the port is synched at gigabit speed.



Setup is as easy as connecting to a router or another switch through any of its 24 ports, leaving 23 free to unite wired PCs, NAS drives and other ethernet devices.

This sturdy metal switch has a high-quality construction. And an internal power supply means no faffing with external wall-warts.

As a pro-level unit, the TP-Link is specified for maximum throughput of full-duplex gigabit (2x 1Gbps) on each port, with the device promising up to 48Gbps switching capacity.

Like much server-room kit, it safeguards against overheating by rather over-zealous fan cooling. A small diameter fan runs at high speed at one end, with ventilation holes at the other. The net effect is a noisy unit.

With the fan silenced in our tests, the TL-SG1024D barely got warm. An intelligent multi-speed fan that kicks in only when essential might be a better solution for this device.

The TL-SG1024D can auto-sense connected equipment for gigabit operation, as well as straight-through and crossover cables. Each port is also said to sense its input and cable length, and adjust the power levels accordingly.

We found no issues in use, such as the slow zeroconf mDNS/DNS-SD (Bonjour) services that have affected some switches we've tested.

Verdict

A smart and well-made gigabit switch that performs well and comes at a good price. **✉ Andrew Harrison**

£425 inc VAT**Contact**■ canon.co.uk**Read more**■ tinyurl.com/cx7on3b**Specification**

Desktop sheet-fed scanner; 600dpi maximum resolution; 24bit colour; duplex; 30-sheet feeder capacity; J-Path/Straight Through feeders; 3m long document mode; USB 2.0; 1,500-sheet daily duty scan; Twain/Isis-compliant; 300x235x336mm (fully open); 300x156x217mm (closed); 2.6kg



DOCUMENT SCANNER

Canon DR-C125

A sheet-fed scanner that's designed to let you take bundles of documents and turn them into electronic forms, the Canon DR-C125 in fact looks more like a paper shredder.

It's a compact device, measuring just 156x217mm with all its trays and feeds tucked away. But you pay for this convenience with a flimsy page holder that doesn't extend very far.

The front folds down, so any paper jams are easily corrected, and a Long Document Mode lets you work with sheets up to 3m long.

The simple control panel has just two buttons: power and 'automatic scanning'. It's not fully automatic, though, since the default Capture OnTouch interface still insists that you select your options before initiating the scanning.

There are three output options. We experienced a number of paper jams using the Straight Through option, whereby the scanned documents drop out the bottom at the front of the scanner. A better

choice is J-Path, in which the feed path resembles the letter J, with the finished sheets curling up and popping out the low-slung feeder on the front.

Twain and Isis drivers, plus a very good software bundle are included. This comprises OmniPage 4.0 SE, PaperPort 11.0 and BizCard 6.0.

The Capture OnTouch software also lets you compress document scans, and convert them to various file types, including PDF, Tiff, Jpeg, BMP and PowerPoint.

The C125 has plenty of speed and, at a 200dpi resolution, it turned our 20-sheet test into a searchable PDF in 49 seconds (24.5ppm).

You can exceed this performance by opting to convert documents into picture files (28.9ppm), or turning down the resolution. We wouldn't recommend the latter, although at 200dpi the quality is decent enough.

Characters are a touch light and the Canon doesn't render fleshtones in photos perfectly. Nonetheless, for letters and documents the



low-quality mode is fine. Speed falls to 9.8ppm at 300dpi, and to less than half that at 600dpi.

At 300dpi, the Canon's OCR software is able to recognise all but the most complex of documents.

Verdict

The Canon DR-C125 isn't the cheapest of sheet-fed scanners - although it's around half the price of the DR-M160 reviewed below - but it offers good quality and a useful turn of speed. Add the decent software bundle, and this is a good document scanner that'll prove a welcome tool for any office. **Robin Morris**

DOCUMENT SCANNER

Canon DR-M160

Given this £940 scanner's high price tag, the inability to load it up with a huge pile of documents and leave it working away is something of a problem. Although it supports up to 7,000 sheets, Canon recommends you limit yourself to 60.

The output tray itself is good. It extends in three sections, and some significant curvature allows it to collect the scanner source material. A Long Document mode lets you feed in source material up to 3m.

The control panel is relatively simple, with buttons for selecting which job number to process, as well as for starting and stopping scans. Paper jams are a regular feature of high-speed document scanners, but a quick press of the Double Feed Release button adjusts the feeder.

CapturePerfect 3.1, Kofax VRS and Nuance eCopy PDF Pro Office software is bundled, but the main interface is the same Capture OnTouch used by the DR-C125 above. This lets you adjust the resolution and create a variety of file types.

The Canon links seamlessly with SharePoint, allowing it to integrate well within offices using Microsoft software. Canon doesn't list support for Apple hardware.

We expected the DR-M160 to be much faster than Canon's cheaper DR-C125. The difference wasn't as great as we expected in our tests, however. While this Canon can scan documents faster, much of the conversion process revolves around the computer rather than the scanner.

At a resolution of 200dpi, the DR-M160 converted our 20-page test into a searchable PDF in 34 seconds - 15 secs faster than the C125, but at a rate of just 35.3ppm.

Turning documents into image files rather than PDFs is faster, with such jobs completed at 52.2ppm.

Scan quality is improved over the DR-C125. The DR-M160 offers darker, sharper text, while fleshtones appear smoother and more natural. The colour is better, too. And even at 300dpi the speed remains a



very usable 19.4ppm; 600dpi mode produces documents at 10ppm.

Verdict

The Canon DR-M160 has a relatively high price tag. We're not convinced that it offers enough of an improvement over the cheaper DR-C125 to warrant this extra expense. The paper-feed capacity isn't especially high, but the feed itself is fast. And the lack of Mac support is mystifying. We can't dispute the quality of this high-end document scanner, however. **Robin Morris**

£940 inc VAT**Contact**■ canon.co.uk**Read more**■ tinyurl.com/c9e83zg**Specification**

Desktop sheet-fed scanner; 600dpi maximum resolution; 24bit colour; duplex; 60-sheet feeder capacity; 3m long document mode; USB 2.0 interface; 7,000 sheet daily duty scan; Twain/Isis-compliant; 280x640x346mm (fully open); 280x172x178mm (closed); 3.2kg



INTERNET SECURITY SUITE

BullGuard Internet Security 12.0

£51 inc VAT (3 PCs)

Contact

■ bullguard.com

Read more

■ tinyurl.com/d7j4c6j

System requirements

Windows XP/Vista/7;
512MB RAM; 200MB
hard-disk space

BullGuard has been producing antivirus and internet security software for the past nine years. Its latest offering adds a firewall, parental controls, PC Tune Up, online backup and a Vulnerability Scanner.

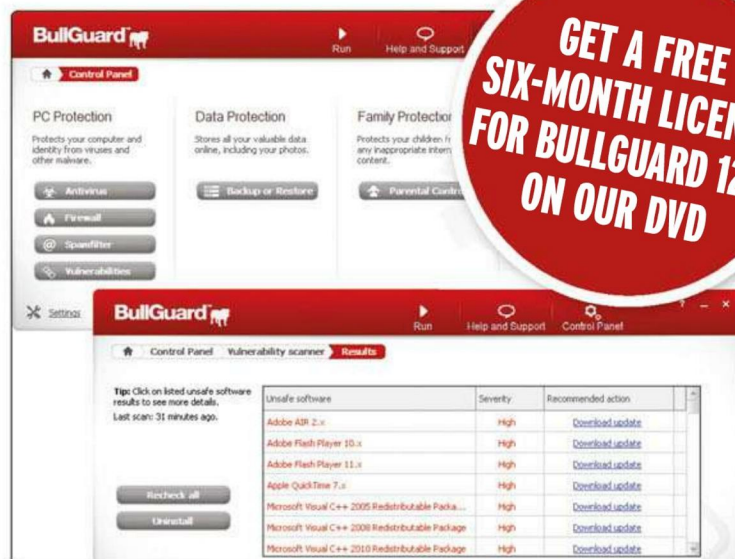
Internet Security 12.0's main control screen is well organised and, although things get more complex as you work your way down through the menus, it's comparatively simple to use.

Its full virus scan, which can be scheduled to run when a PC isn't in use, took over three hours on our test machine, and even a quick scan took five minutes.

Most internet security suites automatically choose which files need to be scanned, but here you can either scan them all or just the program files. You can also manually add in specific file types.

Independent testing lab AV-Test doesn't yet have any results for BullGuard 12.0, but it certified version 10.0 with 12/18 in Windows 7 and 13/18 in XP. It scored particularly well for protection, with 5.5/6 and 5/6, respectively. There was no BullGuard 11.0 and there's no reason to believe its latest release will score any worse than version 10.0 did.

The backup facility handles files in categories such as documents,



**GET A FREE
SIX-MONTH LICENCE
FOR BULLGUARD 12.0
ON OUR DVD**

BULLGUARD 12.0 lets you view in detail any files it suspects are unsafe

video and music, and can back up to another hard drive - internal or external - a CD or DVD, or online. BullGuard also provides 5GB of online storage for the one-year period of the software licence.

A new addition is parental control. This works by category, with the broadest being age group. Within this, access to, for example, violent content can be prohibited.

A unique feature, called the Vulnerability Scanner, is designed to look at your system and check that your software is up to date. Older application versions won't contain

the most recent fixes, so this is a reasonable approach.

PC Tune Up identifies unneeded Windows and internet temporary files, removes broken Registry entries and defragments the Registry, if necessary. There's no appreciable increase in performance, but this tidying up is likely to increase system stability.

Verdict

This suite has most of the trimmings you might want. If it's as competent as its predecessor, it will be a good choice. **Simon Williams**

Usability: ★★★★★
Features: ★★★★★
Value: ★★★★★
★★★★★

INTERNET SECURITY SUITE

Symantec Norton Internet Security 2012

£27 inc VAT (3 PCs)

Contact

■ uk.norton.com

Read more

■ tinyurl.com/cvvdwur

System requirements

1GHz processor; Windows
XP/Vista/7; 256MB RAM;
300MB hard-disk space

Norton Antivirus was, if not the very first, certainly one of the earliest anti-malware products, and as a core part of Symantec's software portfolio, Norton Internet Security is still one of the leading applications in the field.

The 2012 incarnation offers antivirus protection, parental controls and system rescue and ensures that your ID is kept secure. There's also a two-way firewall, and spam and phishing prevention.

Installation is reasonably painless, although it wouldn't proceed until we'd uninstalled Iolo's System Mechanic - if you value that maintenance software (other utilities we weren't running might also prove incompatible), you'll need to look elsewhere for your internet security.

**PC ADVISOR
RECOMMENDED**

This clash appears to be down to the program's Sonar 4 behavioural protection. This searches for suspicious behaviour by evaluating the processes on your PC and, if it's unsure of a particular process, prevents it from taking place. Unfortunately, other legitimate software that works behind the scenes can be confused with malicious programs, so is best not run alongside the Sonar engine.

Norton Internet Security's main interface has been overhauled but continues to be straightforward to use. The most popular options - Scan, LiveUpdate and Advanced settings - have been given more prominence and setting screens are mainly devoted to slide switches, which are simple to work with.

There's a useful performance display that shows CPU and memory usage by Norton and other processes, and a timeline of threat detections and resolutions. This is the kind of feedback that few other internet security products offer.

The Norton window can't be viewed in a full-screen mode, which means that this information, along with the global malware activity map, is little more than window dressing - the map is too small to identify specific places.

Another irritation is that scans aren't represented with a progress bar, so it's hard to tell how long they're likely to take. However, our tests show that it's fast. A 50GB scan of 175,621 files took 27 minutes 8 seconds, resulting in an average

Usability: ★★★★★
Features: ★★★★★
Value: ★★★★★
★★★★★

INTERNET SECURITY SUITE

Vipre Internet Security 2012

£30 inc VAT (1 PC)**Contact**■ vipreantivirus.com**Read more**■ tinyurl.com/bt4y2p8**System requirements**

1GHz processor; Windows XP/Vista/7; 512MB RAM; 300MB hard-disk space

It still surprises us just how vibrant the antivirus software market is. Long-standing suppliers such as Symantec and McAfee are far from having things all their own way and there are new arrivals offering basic security popping up each year.

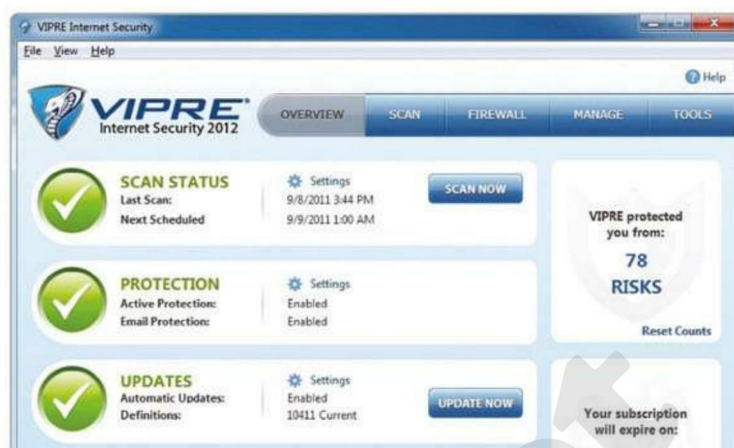
One of these is GFI's Vipre Internet Security 2012. Its interface has a 'classic' look, which provides easy access to all the main features. The five control tabs lead down to a comprehensive set of controls. When scanning, there's a neat little animation that shows various bits and pieces, including what look like 1980s IC chips and Rubik's cubes being examined under a lens.

There's a web monitor, which can report potentially dangerous sites before you visit them. This is tied to web filtering and includes a useful ad blocker.

There's no parental-control function though, so if this is one of your reasons for buying, you'll have to add it from another source.

As well as antivirus protection, Vipre IS 2012 offers spam prevention and a two-way firewall, which didn't automatically trust the workgroup our test machine was connected to.

There are also three extras: Secure File Eraser, History Cleaner and PC Explorer. The latter can



VIPRE 2012 provides a comprehensive set of controls to protect your PC

display lists of current ActiveX controls, startup applications and running processes, among other categories. Useful, if a bit techie.

AV-Test tested version 4.0 of the Vipre engine and gave it an overall score of 13/18, which is very close to average across its most recently tested antivirus products.

One of the main claims GFI makes for Vipre is that it doesn't slow down a PC and our file-transfer test supported this, taking just 40 secs to copy a 1GB file. This compares well with our recent tests of McAfee and BullGuard, which each took around 25 percent longer.

A full scan of our 50GB test partition took over 26 minutes, with Vipre looking at 18,586 files. It

inspected over 3,000 more than any of its rivals we've tested recently.

GFI has an innovative pricing scheme too, where you can buy licences for one, two or up to 10 PCs; and for one, two, three years or the PC's lifetime. Prices range from £30 for one user/one PC, to £120 for the latter 10/lifetime option.

Verdict

Vipre Internet Security 2012 is a good, general-purpose security suite, combining the most popular functions - except parental controls - into a well-designed, easy-to-use product. It's quick and has a generally light impact on a Windows PC's speed, except when scanning.

☒ **Simon Williams**



SYMANTEC NORTON's main interface is simple to navigate

scan rate of 108 files per second. This is the fastest we've recorded for any internet security suite but, by default, the program tested 10 times as many files as its rivals, which may be over-exhaustive.

Symantec claims that Norton Internet Security 2012 has a smaller footprint than its predecessors, and this was certainly born out by our copy tests. With the program running in the background, the 1GB copy took 50 secs, which is close to the other suites we've looked at recently. With a scan running, it took 1 min 15 secs, which is pretty much in the middle of the times taken by its competitors.

AV-Test evaluated the latest engine and gave it a score of 14.5/18; a very good result. Breaking that down, Norton scored 5.5/6 for protection, missing only 2 percent of all the malware thrown at it in two months, while it also scored well above the industry average at repairing infected systems, gaining

5/6. It dropped to 4/6 in usability, mainly due to a few false positives.

In comparison with Norton 360, there are no backup and restore options, nor PC tune up, so you should consider whether you need those functions before saving around £10 by going for Norton Internet Security.

Verdict

This is probably the best known of all internet security products and Symantec has stood the test of time by constantly improving its product with useful extras, both in its core engine and in the way it reports what it's been up to. The latest version is light on resources and does what it sets out to quickly and efficiently. ☒ **Simon Williams**

VIRTUALISATION SOFTWARE

Parallels Desktop 7.0 for Mac

£65 inc VAT

Contact

■ parallels.com

Read more

■ tinyurl.com/d4e9sft

System requirements

Mac with Intel Core 2 Duo/Core i3/i5/i7/Xeon processor; Mac OS X 10.5.8 or later; 4GB of RAM; 500MB hard-disk space (plus 15GB for each virtual machine)

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★

★★★★★

Virtualisation software such as Parallels is one of several ways to run Windows, Linux and other x86 operating systems on a Mac. This package remains the fastest and most fully featured solution.

Version 7.0 includes running improvements to performance and the interface, plus compelling new features - notably Lion in Lion.

Windows on the Mac

The advantage of running a virtual machine (VM) is you can simultaneously run one OS inside another, with no need to reboot the PC to switch between the two.

For security reasons, being able to run Windows inside the more isolated and controlled environment of a Mac is an obvious advantage. Should a malware infection strike, you can delete the VM and revert to a backup in minutes.

Parallels claims version 7.0 is faster than its predecessor. The company has also invested in the graphics, and it's even better for playing Windows games inside a VM.

New features

Your PC's webcam is now accessible to any OS running inside a VM, and Parallels has also increased the amount of video memory assigned to the secondary OS from 512MB to 1GB. DirectX 9 and Shader Model 3 are supported, too.

The once free Parallels Mobile iOS app now costs £2.99, but makes it possible to launch, view and control a VM. This works easily enough, even over 3G. Fingertip

control isn't best suited to a desktop OS, but we found scaling down its resolution to 960x600 made Windows more finger-friendly. Impressively, it can give the iPad some approximation to Adobe Flash playback, too, by viewing Flash video from inside a guest Windows VM.

Other improvements include support for 192kHz digital audio, 7.1-channel surround sound, and better integration with new



PARALLELS DESKTOP 7 lets you run an OS X Lion VM inside OS X Lion

user interface features in Lion. And rather than using hot corners to enable a page-curl graphic, revealing the host OS below, Parallels now requires you only to move your mouse to the screen top.

It's still possible to run Windows programs in an Aero-free environment. This Coherence feature allows good integration with Lion's Mission Control interface.

Linux on the Mac

Parallels provides the best solution for running Linux distributions as VMs. Unlike VMware's Fusion 4.0, it has support for OpenGL hardware acceleration that lets you fully appreciate the glorious 3D interface of a modern desktop Linux.

The interface works well in the last two versions of Ubuntu with Unity interface (11.04 and 11.10), and Linux Mint 12.0 with Gnome 3.0.

But while copy and paste functions work with Linux guests, drag-and-drop between host and guest OSes isn't possible.

Mac on the Mac

Perhaps the most notable new feature is the ability to run OS X Lion within an OS X host. This opens up the doors of virtualisation to software developers and security researchers, by creating a safe environment to experiment on a disposable OS within the boot OS.

Hardware acceleration of video seems to be possible only with Windows and Linux. Consequently, the virtualised OS X that Parallels creates feels conspicuously less fluid - even with 1GB of video memory assigned. Embedded video in web pages using Adobe Flash was often

too slow to play; or in the case of YouTube content, wouldn't play at all.

Using Geekbench to test the virtual processor and memory performance, we saw just a 9 percent drop in speed between a host machine and its OS X Lion guest.

Integration between the host and guests is lacking in many areas, most notably with the omission of copy and paste functionality. Neither can you drag-and-drop files between the host and guest OSes.

Also missing are most of Apple's multitouch gestures - although they are available to Windows guests.

Performance

Parallels is so fast that we can no longer discern any difference between running Windows natively or through Boot Camp. It's a great choice for gamers, too, offering framerates that bizarrely exceed those of a native install in our tests. For example, a MacBook Pro running Windows 7 with Intel graphics can play Fear (Max) at 22fps, while the same laptop offers 57fps inside a VM.

Sometimes speed comes at the expense of stability, though. Of the many programs we run on the Mac platform, Parallels Desktop is the only one that sporadically gives us a Unix kernel panic. Other times, when a program seizes up within Windows, the Mac requires a forced reboot.

Verdict

Parallels 7.0 for Mac is a good upgrade to the established virtualisation program for OS X. It also enables running the OS inside Lion, although more work is required here to make the facility truly useful. **Andrew Harrison**

PARALLELS MOBILE makes it possible to launch, view and control a VM from an iPhone or iPad



BROWSER UTILITY

Cookie 2.1

PC ADVISOR
RECOMMENDED

£10.49 inc VAT

Contact

■ sweetpproductions.com

Read more

■ tinyurl.com/cx5gxjs

System requirements

Mac OS X 10.6.6 or later

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★



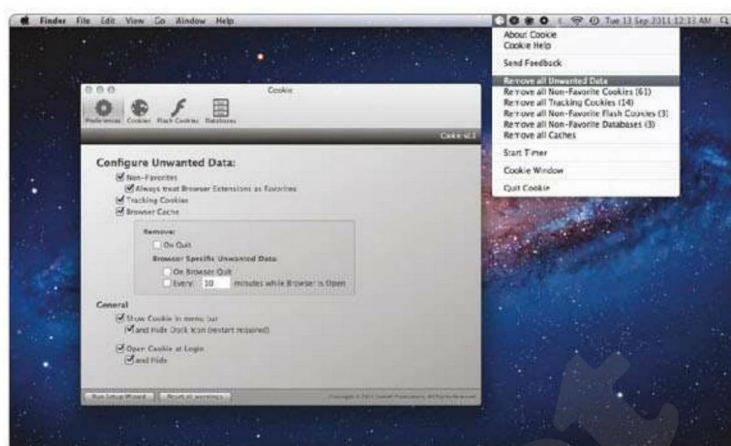
For many of us, cookies are unwanted intrusions into our surfing habits. That's not to say they're all amoral as they can store user site preferences and sessions IDs, letting you stay logged into webmail or online shopping sites.

Cookie 2.1 is a Mac OS X program that helps you control these, and works with Safari, Firefox, Chrome, Chromium and Camino.

On first setup, a wizard asks which browsers you'd like protected. Next, you're given the option to accept tracking cookies. You can also choose which ones, if any, you would like to keep as Favorites.

You're then asked if you'd like the program to clear the browser cache, in order to remove Evercookies. These are designed to automatically respawn themselves from various secret caches, so that even when you try manually deleting cookies from each browser, you'll often see them reinstalled later.

Next, select your preferences for the removal of unwanted data.



COOKIE 2.1 will help keep your surfing habits a secret from prying eyes

Options here include when Cookie closes and when you quit a browser.

Finally, the wizard asks about Cookie's display options such as whether you'd like to see it running, and if you want it to start when you log into your computer.

Sometimes the deletion of cookies isn't as instantaneous as you might expect, so the program will parse and remove all unwanted Safari cookies twice each time the browser quits.

As well as regular cookies, the software will also manage Flash cookies and databases. You can click on the menu bar item any time to see at a glance how many cookies you've accrued in recent surfing, as well as delete them.

Verdict

Cookie is an invaluable program for Mac users who value their online privacy. It's simple to operate and does the job. **Andrew Harrison**

WIN

a Monitor Audio i-deck 200, worth £399! Two to be won!

Monitor Audio's i-deck 200 is the ultimate solution for listening to the music stored on your iPod or iPhone. The company's 40 years of award-winning audio expertise is behind the i-deck 200's dynamic design and exceptional audio performance.

The i-deck 200 will transform your digital music, delivering startling levels of detail and volume. Carefully selected materials and an efficient design help this luxury device to deliver the best sound quality. Monitor Audio has applied its specialised know-how to achieve the best possible audio experience, and the i-deck 200 features an array of class-leading functions.

The i-deck 200 extracts the digital data from an iPod or iPhone and converts it through a high-speed 28-/56bit dual-precision digital-to-analogue converter (DAC). To ensure pure, dynamic sound from the DAC, the i-deck 200's four high-quality drivers are individually powered by a custom-trimmed amplifier.

The i-deck 200 is also equipped with an innovative room-equalisation facility - Automatic Position Correction - to prevent poor acoustics destroying the sound. Each time the i-deck is plugged in, an internal microphone samples and corrects for the room response.



MONITOR AUDIO
design for sound

Answer the simple question at pcadvisor.co.uk/competitions for your chance to win one of two Monitor Audio i-deck 200s.

Closing date: 5 March 2012

iOS GAME

Infinity Blade II

PC ADVISOR
GOLD

£4.99 inc VAT

Contact

■ infinitybladegame.com

Read more

■ tinyurl.com/cebpcgn

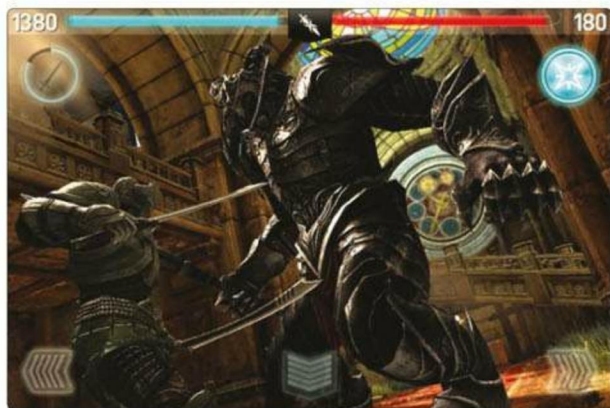
System requirements

iPhone 3GS/4/4S/iPod touch 3rd/4th-gen/iPad; iOS 3.2 or later

OVERALL



To defeat the game's giant monsters, you'll need to learn their attack patterns



Not many games get the honour of stage time in the middle of an iPhone launch. But when Tim Cook's team wanted to show off the 4S' gaming pedigree, they made a call to Chair and asked how the sequel to Infinity Blade was coming along.

A one-game riposte to console snobs who don't take mobile gaming seriously, Infinity Blade brought craft and ambition to the iOS platform. It has stunning graphics, slick gameplay and surprisingly deep RPG elements, leavened by a dip-in piecemeal style that perfectly suits gaming on the go.

And now, two months after wowing the 4S launch audience in demo form, Infinity Blade's sequel has burst on to the iTunes Store. But can it improve on the beloved original? And in pushing the limits of Apple's A5 processor in the iPhone 4S and iPad 2, has Chair made a game that less fortunate iOS users won't be able to enjoy?

A5 haves and have-nots

Let's tackle the second question first. Infinity Blade II is magnificent, with graphics that surpass even the original game, with fast, responsive gameplay. But the iTunes Store's specifications state that as well as A5-equipped devices, the iPad, iPhone 4 and 3GS and two generations of iPod touch can run the game too. (A spokesperson for parent company Epic Games told us it would have preferred – but wasn't permitted – to specify 16GB-plus models of the third-gen iPod touch, however.)

In practice, A5 devices will be at an obvious advantage. We found the game ran like a dream on an iPad 2, but we experienced a few crashes



INFINITY BLADE II is bigger and better-looking than its predecessor

on our iPhone 4; while some early users have complained of more frequent problems on the iPad 1. An update has been issued to address these reports, and the spokesperson assured us that more are on the way.

Infinity – and beyond

The structure of the game is largely the same as before: it's a series of heavily scripted one-on-one battles with giant monsters, with a small amount of choice in the routes you take between them. Each time you must learn your enemy's attack patterns and respond with the correct combination of parries, blocks, counterattacks and magic spells, activated via touchscreen gestures: swipe across the enemy to attack, to the side of the screen to dodge, and so on.

Once you've fought enough minions, you get to a boss. The first time you play he will probably give you a beating, but the beauty of the game, as in the original, is that you immediately get to play through again, with all your equipment and skills intact, and try to do better. That's the 'Infinity' bit.

There's more depth than the first game, with around four times the length of play; different routes will take you to various 'Deathless' bosses. And the fights themselves require more varied techniques; overuse the dodge, for instance, and your character will get exhausted. And each battle offers an XP reward for mastering a particular technique.

There are multiple fighting methods: as well as the classic sword/shield, you can dual-wield or fight with a heavy, two-handed

weapon. Ability-enhancing gems help you to upgrade weapons.

Less than Infinity

There are a few changes we're less keen on, though. The premise lacks the neatness of the original, in which getting killed caused you to come back two decades later as your own avenging son. There's more going on plot-wise, however.

It also seems to take longer to get going, thanks partly to a so-so opening section where you're strolling around with super-powerful gear pinched from the God King.

Veteran gamers will know at once that those items are going to be taken away, but you hold on to them for long enough to level up a few times. And when you do lose the Infinity Blade, the sense of accumulation, of working your way up from rusty second-hand rubbish to godlike armour and weapons – the essence of all RPGs – is diminished.

Finally, for some odd reason Chair seems to have decided that everyone loved spotting and grabbing those occasional bags of gold in the background of the first game; now there are dozens of them. Instead of sitting back between fights and taking in the astonishing views, you end up obsessively playing 'Where's Wallet?'

Verdict

Infinity Blade II is the perfect sequel. The graphics are better, you're forced to approach the fights more imaginatively, and there's more of everything. If anything can force the world to take iOS gaming seriously, this is it. David Price

GAME

Minecraft

PC ADVISOR
RECOMMENDED

£16 inc VAT

Contact

■ minecraft.net

Read more

■ tinyurl.com/cxahg4L

System requirements

1.5GHz processor;
512MB RAM; graphics
card with 64MB memory;
internet connection

Minecraft is, at heart, Lego, letting you build anything you can think of from cubes of assorted colours, weight and physical properties.

The game isn't as simple as selecting the blocks you want and getting on with it, though. If you want a rare substance such as a diamond, first you'll have to hunt for it – generally by digging. You won't be able to mine it until you've built the right tools, though, using a simple but unexplained crafting recipe system.

Unfortunately, Minecraft expects you to find out these recipes from outside the game. It's not difficult tracking down the information, but annoying nonetheless.

However, you will create your own storyline, for the game's other great achievement is its survival mode. At night-time, the pristine cube-world is invaded by monsters such as zombies and skeletons. You need to hide, or you must fight.

If you fight before you've built the right weapons and armour, you



MINECRAFT is a highly addictive game that lets you develop your own story


will die. So it's best to build a hole in the ground, wall it up and spend the night until you're strong enough to hunt down your hunters.

It's tense and unforgiving, but it means that the first hole in the ground you dig will almost immediately feel like home. Over time, you will improve it, adding lights and supplies, for example.

It's also why it's been so successful – it doesn't impose the restraints that most games

do. Its success and development are almost an accident, the result of a developer working with and responding to his community to create a game that's for the people. It's a game that needed to happen.

Verdict

Simple yet fiendish, crude yet charming, infinitely varied yet instantly accessible – Minecraft is a video game that celebrates what video games are.  **Alec Meer**

OVERALL



WIN

a Nikon COOLPIX S9100 digital camera

Packing a huge 18x-zoom lens into an incredibly slim body, the COOLPIX S9100 lets you close in on your subject in style wherever you go. The versatile Nikkor lens offers wide-angle to super-telephoto coverage, while the compact dimensions make it ideal for carrying around.

No matter what light you shoot under, the highly sensitive back-illuminated CMOS image sensor captures scenes just as you see them. Sensor-Shift Vibration Reduction ensures sharp photos and movies,

even when shooting at the telephoto end of the zoom. Plus, with full-HD movie recording with stereo sound at the touch of a button, you can easily switch between stills and filming. Optical zoom and autofocus are available during recording, and you can even capture a photo while filming, providing a wealth of creative options.

For more product information about the stunning S9100 (RRP £279.99), visit nikon.co.uk



3 cameras up for grabs!



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Closing date: 1 February 2012

Creative software

Griffin Crayola ColorStudio HD

Free

Contact

■ griffintechology.com

Read more

■ tinyurl.com/7p8qevy

System requirements

iOS 3.2 or later; 73.4MB available memory

Griffin's Crayola ColorStudio HD iPad app allows your children to create and add colour to endless pictures. The app itself is free, but for £24.99 you can purchase an iMarker, a digital stylus that can be used instead of your finger. This is comfortable to use, but offers little more precision than your fingertip.

The app has three modes: Make a coloring page, Coloring pages and Free draw. It also offers six categories of colouring pages, as well as five pen types: brush, pencil, marker pen, wax crayon and felt-tip. Each pen creates much the same stroke texture, but the choice of colours available varies.

To make a colouring page you drag in backgrounds, as well as clip art, text bubbles, visual effects and songs. The clip art is resizable and can be rotated or flipped, brought to the front of the image or deleted. Once a page is finished, it can be saved and then drawn on in the Coloring pages option.



Free draw mode is in essence a blank piece of paper. You can use whichever pens and colours you like. Once finished, young kids will love the fact that some of the picture elements become animated.

Settings let you choose between a tap-to-fill function for speedy effects, a no-overwrite option where colours don't exceed the delineated area, and freehand colouring in which colours are

laid down just as your pen dictates. Colour mixing isn't possible, but the app includes a large number of pens, several stroke weights and a range of textures.

Verdict

This is a great app that will keep youngsters busy for hours on end. However, we found the stylus unnecessary and its cost too high.

✉ Joe Harrington



Autodesk Sketchbook Pro

£3.21 inc VAT

Contact

■ autodesk.co.uk

Read more

■ tinyurl.com/7szsnc

System requirements

iOS 4.0/Android 3.0 or later; 14MB available memory

If you ever wanted to ditch the old pen and paper, and use your tablet to draw, sketch or create complex multi-layered collages, Sketchbook Pro is the app to use. The interface is very slick, but hidden behind its clean white canvas is an abundance of features to satisfy even the most demanding artist.

At first, you're presented with a tiny doughnut-shaped button to access menu items, but this can easily be changed in the Settings menu. There's also a clever shortcut panel to allow quick access to your drawing tools. Pens, brushes, fill and erase tools are displayed in the middle of the screen around a circle. To adjust the brush size and opacity, hold down the middle of the panel and drag up/down or side to side.

What sets this app apart from the competition is its support for multiple layers, each of which is transparent. This means you're able to move them in front or behind the previous layer, without obscuring the



layer below. We were also impressed with its ability to shuffle them in any order, and to adjust opacity and apply blending modes to each individual layer.

Importing and resizing images is a breeze, but accurate transformations are less easy to achieve. Another poor element is text handling: fonts are immediately rasterised and no longer editable. However, other visual elements are

preserved as editable layers and PNG support lets you save them as such. Saving as a Jpeg image flattens an image once and for all.

Verdict

While we found the actual drawing process cumbersome in Sketchbook Pro, it's still great for on-the-go drawing and far superior to many equivalent apps we've tried.

✉ Dominik Tomaszewski



Drawing Pad

£1.23 inc VAT

Contact

■ drawingpadapp.com

Read more

■ tinyurl.com/7ox82jk

System requirements

iOS 3.2/Android 2.2 or later; 22MB available memory

Drawing Pad falls somewhere between the sophistication of Sketchbook Pro and the simplicity of the Griffin Crayola app. It's about freehand drawing rather than colouring in, but has a number of scalable 'sticker' designs and a selection of virtual paper backgrounds that you can use.

The stickers make good use of the pinch to zoom - it's easy to pull, stretch and rotate them. Dozens are included, so you can build up a picture. You can also select various decorative elements such as stars and bubbles, and create streams of them. We were pleased with some of the results, given the unpromising interface with which we were presented when launching this app.

As with Crayola's ColorStudio app, you get a selection of pens, highlighters and pencils with which to draw freehand. There are around 50 shades on offer when using a pencil, felt-tip pen or crayon; more if you use a paintbrush since, unlike



the other implements, you also get to choose one of four brush sizes. Manipulation by weight and pressure of touch isn't supported, but there are three eraser size options.

Once you've finished, iPad users can save their creation to iPhoto, Android owners can export it to their Android Gallery, and both can save it to the Album within Drawing Pad itself. It's also possible to share your artwork on Picasa or over Bluetooth,

Gmail or another email client, as well as to save it to SD Card. Press the USB thumb drive icon to save and bring up the Share menu. Choosing an option brings up your contacts list and instantly shares or sends it.

Verdict

Text support and layer preservation are both missing, but there's plenty of scope for getting creative with this app. ☒ Rosemary Hattersley



Adobe Photoshop Touch

£6.99 inc VAT

Contact

■ adobe.com/uk

Read more

■ tinyurl.com/74ty2ar

System requirements

Android 3.1 or later; 38MB available memory

Photoshop Touch brings many of the editing program's most popular features to Android tablets, and offers many popular Photoshop tools, filters and effects for a touchscreen format. The app also connects to Adobe's Creative Cloud, so you can move your work back and forth between a tablet and a PC.

The interface is located around both the edges and top of the screen, and includes selection tools, adjustments, effects and other miscellaneous items. The icons and menus are large and finger-friendly, and double-tapping a layer will take you into a 3D view of all the layers in the current project.

The selection tools are limited by the accuracy of the tip of your finger, unless you happen to have the Lenovo ThinkPad, which has an active digitiser. Working with selection tools takes some getting used to, but we were able to replace a colleague's head with a cow's in just a few minutes.



Drawing or painting backgrounds with your fingertip isn't always ideal: a stylus would be useful. Manipulating images using two fingers to pinch and zoom, or pan around is more effective, with just a hint of lag.

The app uses a new file type called PSDX, which can be imported into Adobe CS5 with a plug-in. PSDX files are limited to 1600x1600 pixels and 16 layers. Text is rasterised

once you finish adding it, so it can be deleted - but not edited - afterwards. Effects don't remain live and, while they can be undone, they can't be changed.

Verdict

Overall, we were impressed with Adobe Photoshop Touch. It provides a wide array of useful and easy-to-use tools for manipulating images on the go. ☒ Michelle Mastin





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Smartphones

If you're looking for a new smartphone but are intimidated by the sheer number of models and platforms, don't despair. Sandra Vogel looks at how to find the perfect handset and compares eight of the latest models

It's not easy choosing a smartphone, and the dazzling array of options can seem blindingly difficult to navigate. Even if your selection is limited by what's available within your network contract, it's not always easy to narrow down the choices. There are, however, some strategies you can employ to find a handset that's right for you.

First, consider how you will be using your smartphone. If, for example, you plan to use third-party apps, you may want multiple home screens on which to put quick-access shortcuts. Are you going to send many emails? If so you'll need a text-entry system that suits you. This may be a BlackBerry-style physical keyboard or a touchscreen

one. We recommend you try before you buy. If you're going to be spending a lot of time surfing the web, a large screen will be almost as important as a generous data allowance.

It's also worth considering how much music and video you'll want to play. Capacity isn't an issue if you choose a handset with a MicroSD Card slot or if you're likely to stream albums, but it's still worth considering. Your handset will, however, need a well-positioned headphone socket, so that the device sits easily in your pocket with headphones attached. You'll also need an easy way of getting media on and off the phone. MicroSD Card slots that are obscured by batteries are a pain to use.

Data security is another very important issue, particularly if you've any intention of buying anything or viewing emails relating to online purchases via your phone. At the very least you should PIN-protect access to your handset. On Android smartphones, a swipe pattern to unlock the device is common. It's really the apps you install and the social networks you visit that pose the most problems, though. Apps such as Lookout can help check the integrity of items you attempt to download, but location-tracking apps and those that hook into the kernel of your handset are problematic in their own way.

While Apple iPhone and BlackBerry handsets are more secure than the open-



Photography by Dominik Tomaszewski

source Google Android platform, you still need to practice caution.

Should you mislay your phone, you'll praise remote tracking. Some apps also have remote wipe features, so that if the worst happens you can delete their contents. Once the domain of corporate systems, it's slowly extending to consumer handsets.

If your smartphone is to offer the full range of multimedia content available, you'll probably want support for Flash, which is used to play video embedded in web pages. However, mobile handsets don't support this well. Android phones with processors clocked at 1GHz or more should be fine, but check before you buy.

Flash is no longer being developed for the mobile web, and its replacement HTML5 is ably supported on the iPhone and BlackBerry Torch.

Check also for compatibility with video formats, and on the availability of native and third-party players, as well as how easy it is to transfer content.

Data synchronisation and sharing may also be an issue for you. If you need to transfer your calendar or contacts from your desktop or the cloud to your smartphone, then you'll want automatic systems for doing this. Windows Phone, for example, has no facility for desktop contacts and calendar synchronising,

instead requiring this to be done via the cloud. Its desktop synchronisation only extends, via Zune, to media.

If you shortlist smartphones using these kinds of factors, you will probably find more than one that meets your criteria, and they may have different operating systems. You might then decide to make your final decision on the basis of aesthetics, price, screen size, processor power, internal storage and the operating system.

In the end, choosing a smartphone relies on a mix of your head and your heart. To make the best choice, the head needs to come into play first, your heart second.



**PC ADVISOR
RECOMMENDED**

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

APPLE iPhone 4S

£499 inc VAT • vodafone.co.uk • tinyurl.com/62teb9g

Even though it's not the redesigned iPhone 5 that many were hoping for, the 4S is still an impressive handset, and there are plenty of new improvements under the bonnet to keep people happy.

For starters the device has two antennae, which addresses the much-publicised signal problems of its predecessor. Other features include an 8Mp camera that's capable of taking detailed photos and 1080p video capture. There are, however, fewer photography settings and features than on Android handsets. Your work can then be viewed on the wonderfully sharp 3.5in 640x960-pixel display. A dual-core processor ensures the handset is speedy.

Arguably the iPhone 4S's most talked about new feature is Siri. Offering voice control, Apple claims that it offers a more sophisticated service than its rivals. Indeed, during our tests we found that it worked well, however, you should note that it won't work without a data connection.

Apple's new handset also comes with iOS 5, the latest version of the company's mobile operating system. This offers a whole raft of new features, including iCloud. Offering cloud-based backup, it aims to make sure that you're always up to date with your data including contacts and your calendar, as well as all your iTunes purchases. Owners of multiple Apple devices can synchronise these with iCloud.

Then there's iMessage, Apple's free instant-messaging service, which allows free communication between devices running iOS 5. Other new features include a drop-down notifications panel that provides information on incoming messages and upcoming calendar appointments. You can add widgets to this that deliver information such as the local weather report. Social media fans will also appreciate the Twitter integration that lets you Tweet from within apps, for example, tweeting a photo as you view it.

VERDICT: Since iOS 5 is available for free, there's not a huge reason for existing iPhone users to upgrade to the 4S. If, however you're not sold on Android, then there are enough features here, including Siri, its sharp display and superb camera, for you to choose the iPhone.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

HTC TITAN

£478 inc VAT • htc.com/uk • tinyurl.com/d6akwzd

The HTC Titan runs the latest version of Microsoft's smartphone platform, Windows Phone 7.5 (Mango). This update features over 500 tweaks and improvements, and while many of these are under the bonnet, the addition of support for Office 365, the ability to group contacts, and the introduction of LinkedIn and Twitter support to Facebook may appeal to many.

Mango also has the same look and feel as its predecessor, which is shown off to some benefit on the HTC Titan's enormous 4.7in screen. While you won't find many smartphones with larger displays, this is its greatest advantage and biggest annoyance. On the down side it's impossible to reach across it for one-handed use, but it also displays complex content very well. Web pages look superb, and email is easy to read. We'd have preferred a higher resolution than this handset's 480x800 pixels, but that's a Microsoft requirement and not HTC's fault. The onscreen keyboards are large in both tall and wide mode, so entering text is easy.

Elsewhere the HTC Titan suffers from a lack of support for MicroSD cards, leaving you reliant on the 512MB of built-in storage. It's also hampered by a lack of support for Flash. Again, both of these are down to Microsoft and not HTC.

This is a large handset, although the HTC is very thin measuring 131.5x70.7x9.9mm, and you'll need sizable pockets for it, but it feels robust and there's no flex in the chassis.

Professionals should like the SharePoint synchronisation, while those without corporate facilities can use their Windows Live account and 25GB of SkyDrive space for Word, Excel, PowerPoint and OneNote synchronisation, as well as contact and calendar sync and photo backup. There's also an 8Mp camera, which unusually for a Windows Phone supports burst and panorama modes.

VERDICT: The HTC Titan puts Windows Phone 7.5 into an enormous chassis, and the big screen has its advantages. However, there's no Flash or external memory support, and the operating system lacks some key features found on other handsets here.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

LG OPTIMUS 3D

£358 inc VAT • lg.com/uk • tinyurl.com/5svp2dv

As its name suggests, the headline feature of the LG Optimus 3D is that it can shoot stills and video in 3D thanks to twin cameras on its rear. It can also run some 3D applications. Its only rival in this area, the HTC Evo 3D, is limited to just shooting video and stills in 3D, with no applications support.

The LG Optimus 3D has some other positive features. The 4.3in screen will be too large for some people to reach across for one-handed use, but its size and 480x800-pixel resolution means it renders multimedia and text well. It isn't too big for the pocket at 128x68x11.9mm, although its twin cameras affect its 168g weight.

The dual-core 1GHz processor marks this handset out as top-end, and the onboard 512MB of RAM has been divided so that each processor core can access its own chunk. This, claims LG, speeds things up, although we found the Optimus was a little slow at times, particularly when responding to requests to run apps. A mediocre 8GB of internal storage can be boosted with a MicroSD card.

The Optimus 3D runs in 2D mode most of the time. To launch 3D mode there's a button on the right of the chassis and a tappable icon. Choose either and a carousel appears offering 3D Gallery, 3D Camera, 3D Games & Apps, YouTube 3D, and a simple user guide. We were highly impressed with the 3D effect, though you'll need to position the screen precisely to get the full effect and only one person at a time can get the optimum viewing angle.

While the main cameras shoot at 5Mp, when you opt for 3D shooting the LG Optimus' maximum resolution falls to 3Mp. Shooting in 3D works well only in landscape mode due to the orientation of the two lenses. The Optimus can then send your images to a 3D TV via HDMI. This is an attractive plus point, but unfortunately LG doesn't provide a cable.

VERDICT: We aren't convinced that 3D has a place in the smartphone world, although we do appreciate the way LG offers more than just 3D photo and video capture. Aside from this, the LG Optimus 3D is a capable handset, albeit an expensive one.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

MOTOROLA DEFY+

£246 inc VAT • motorola.co.uk • tinyurl.com/77uLwsj

Motorola's Defy+ brings an interesting twist to the smartphone in that it's a rugged handset that's certified as IP67-compliant. This is one of a number of internationally designated ratings, and any device that has this rating is dustproof and able to withstand immersion in up to 1m of water for 30 minutes.

The shell of the Defy+ is the same as its predecessor, with rubber covers for the two ports (microUSB on the left edge and headphones connector along the top) the most obvious feature. The backplate is held in place by a sliding lock, and the MicroSD card slot, which can be used to boost the 1GB of internal storage, is under the battery.

The Gorilla Glass screen is scratch-resistant. Motorola has built all this without having to bulk out the chassis much. The Defy+ measures a fairly standard 107x59x13.4mm and weighs 118g.

The single-core 1GHz Ti OMAP3620 processor is perfectly adequate. Motorola's Android 2.3 (Gingerbread) operating system provides seven home screens and adds a range of applications and widgets. Among the additions are some social media tools for Twitter and Facebook, and support for DLNA media sharing. Car Dock, an alternative user interface for use when driving, offers just six large onscreen icons at any one time. It connects to your contacts, and provides navigation, music and calling facilities, although it offers very few customisation options.

The most impressive of the Motorola-specific apps is undoubtedly the music app. The built-in FM radio and stored music and video options are joined by features such as YouTube searches, lyric finding from within the music playback window, and song identification courtesy of SoundHound – a popular inclusion and one we remember fondly from previous Motorola handsets. Nonetheless, it's an enticing extra for music fans.

VERDICT: Overall, the Motorola Defy+ impresses. The rugged features don't bring it to industrial standards, but might provide some extra solidity in everyday work or leisure use. There are also some nice software extras, and the handset is a good size for one-handed use.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

NOKIA 700

£300 inc VAT • nokia.co.uk • tinyurl.com/c8dqvn

The Nokia 700 is a neat little smartphone with a solid and tidy physical design. Gorilla Glass ensures the screen is protected against scratches, while the backplate is made from rigid metal.

Weighing just 96g and measuring 110x50x9.7mm, it will appeal to anyone who wants to fit their handset into a small pocket and likes the idea of being able to reach right across the screen with just one hand. The trade-off is a small 3.2in display that can feel a little cramped at times. If you need to read a lot of emails on your smartphone, enjoy viewing video or even playing games, you'll find the size restrictive. And the slightly narrow format afforded by the 360x640-pixel ratio might not work for you, either. We certainly found that it made web browsing a bit of a fiddle.

There are tiny buttons for locking the screen, adjusting the volume and accessing the 5Mp camera with LED flash sit along the right edge. Their small size means they are not easy to hit accurately, and if you have chunky fingers you might have trouble.

While its flagship operating system is now Windows Phone, Nokia has not completely abandoned Symbian, and the 700 runs the company's latest incarnation, Symbian 10.1 (Belle). A nod and a wink to Android come in the shape of between three and six home screens (you decide how many you need) plus widgets, and third-party apps are available through Nokia's Ovi Store - although far fewer than you'll find in the Android Market or iTunes Store.

A solid 1GHz processor and 2GB of internal memory, GPS with Nokia Maps in support, and the usual smartphone accoutrements of Wi-Fi and HSDPA are all included along with relative newcomer near-field communication (NFC). There's not a lot you can do with this at present, but the potential for data exchange between devices within proximity of each other may appeal to some.

VERDICT: The fact that the smartphone basics are catered for mean the Nokia 700 has decent functionality. However, it may be that bit too small to pass muster as a usable handset, and Symbian 10.1 feels distinctly hampered by a lack of third-party app support.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

RIM BLACKBERRY TORCH 9860

£378 inc VAT • uk.blackberry.com • tinyurl.com/7pztr5y

BlackBerry handsets are known for marrying a screen with a small but usable keyboard. They are the darlings of the business world, which makes copious use of the BlackBerry Messenger service. RIM's forays into screen-only smartphones have not been such a success, so the Torch 9860 also comes with a slide-out keyboard.

A capacitive 3.7in, 480x800-pixel touchscreen dominates the device, while the familiar BlackBerry Call, End, Home and Menu buttons sit beneath it, with an optical touchpad in the centre.

The design is unmistakable, with its slightly curved short edges and silver and black colour scheme dominating. Unfortunately, the headphone socket is located along the righthand side - an awkward spot for anyone who wants to listen to music when the 9860 is in their pocket. The chassis design also features RIM's 'convenience key', which can be set to launch your favourite application.

The 9860 runs BlackBerry 7, the company's latest operating system. Having suffered from criticisms concerning poor specifications in the past, this device has a 1.2GHz processor and offers 4GB of storage with a MicroSD card slot. A 5Mp camera rounds off the key specifications.

Without a physical keyboard users are reliant on the onscreen keyboard. When working in portrait mode you can switch from full qwerty to a two-characters-per-button keyboard, which helps make the most of reduced screen space. A downward sweep on the screen closes off the keyboard, and tapping in any text field opens it up.

The 9860 retains all the usual BlackBerry strong points, and many will like the touchscreen element. Fans of the BlackBerry OS who have hankered for a larger screen for web browsing may be pleasantly surprised here, but only until they try to run embedded video. It doesn't support Flash.

VERDICT: Overall, RIM may have done too little with the Torch. It offers the same core features as other BlackBerry 7 smartphones, but the single home screen looks bare when compared to the multiple-screen, widget-supporting offerings of competitors.



**PC ADVISOR
BEST BUY**

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

SAMSUNG GALAXY S II

£406 inc VAT • vodafone.co.uk • tinyurl.com/76wnp2h

The Samsung Galaxy S II first went on sale in May 2011 and quickly became a firm favourite with gadget fans. Nine months later, it's still the standard bearer for Android smartphones - which, in this fast-moving world, is some achievement.

There are several reasons for this. The superb design and build qualities, and high-end specifications continue to impress, and it benefits from the popularity of the original Galaxy S. A key attraction of this smartphone is the impressive 4.3in Super AMOLED Plus screen. With a resolution of 480x800 pixels it's sharper than many other smartphones, and the AMOLED technology means that the screen delivers vivid colours.

The presence of a 1.2GHz dual-core ARM Cortex A9 processor is also a draw, and its inclusion means that the Galaxy S II zips along nicely. Of the advertised 16GB of built-in storage only 12GB is accessible, but a MicroSD card can accommodate more if you find that the device is running out of space. If you need to swap storage cards, note that Samsung places the bay for this out of easy reach under the backplate.

The S II also includes Samsung's Kies Air app. This allows you to access the device over Wi-Fi through a web browser for file copying. It doesn't look particularly attractive, but it works well.

HDMI is supported, although there's no dedicated expansion slot. Instead it's delivered via the MicroUSB slot, and you'll need to invest in a cable. The presence of HSDPA goes without saying in any modern smartphone. In use, the 3G modem here is slower than the iPhone 4S.

With attractive Android 2.3 (Gingerbread) skinning and a good array of widgets, many of which are resizable, the Galaxy S II lends itself perfectly to plenty of user customisation.

VERDICT: Nine months might be an eternity in smartphone development, but the Galaxy S II still holds its own very well against more recently released devices. While its price has fallen since its launch, Samsung's handset is still an expensive option.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

SONY ERICSSON XPERIA ARC S

£349 inc VAT • vodafone.co.uk • tinyurl.com/czya7Lb

Sony is famous for producing great-looking kit, and the Xperia Arc S continues this tradition. It has a slight outward curve to its long edges, which is accentuated by the inward curving silver side panel.

We weren't, however, so enamoured with its build quality, and the Arc S feels less robust than other smartphones here. In particular, the backplate is large, thin and very flexible. On the other hand, it's very light, weighing just 117g. The location of the headphone socket was also a bone of contention for us, situated as it is along the upper-left side of the device. This means that the Arc S requires more pocket space than it should, and our headset connector snagged risking damage to the phone and our clothing.

The 4.29in screen is generous, and it's bright, sharp and clear. The resolution of 480x854 pixels is adequate for delivery of even the smallest text, though we'd have liked the screen to be a little brighter. Oddly there's no automatic screen brightness setting. Instead you have to use the sliding scale in the Settings area. This seems particularly strange as Sony Ericsson has talked up its Mobile Bravia Engine screen technology, which it claims delivers improved stills and video quality. We didn't notice a great improvement on other smartphones with good-quality screens, though.

The Sony Ericsson Xperia Arc S comes with a very fast 1.4GHz single-core processor, which didn't falter under our fingers. The internal memory at 1GB is paltry, and only 320MB of that is accessible for use. An 8GB MicroSD card is, however, provided and this gives adequate storage space.

The Android 2.3 (Gingerbread) skin includes Sony Ericsson's Timescape social media system, which captures messages from Facebook and Twitter and presents them in a flick-through carousel. It's an acquired taste that won't appeal to all, but it's easily ignored.

VERDICT: Sony Ericsson hasn't always made the best of its smartphones, and some models can be described as, frankly, disappointing. But the Xperia Arc S is a thin, light and powerful Android smartphone, although it's let down by some build issues.

Conclusion

Each smartphone platform has its good and bad points, while we all have different requirements. Frequent mobile email users may prefer BlackBerry devices because small physical keyboards are easier and faster to use – as well as more responsive – than most screen-based keyboards.

There are plenty of reasons to choose Apple's iPhone, too. While we could snipe about its lack of Flash support, we can't argue with the superb user interface and strong visual appeal of iOS. The huge array of third-party apps is also a big draw.

Microsoft's Windows Phone, with its native support for Microsoft platforms such as SharePoint and Office 365, has clear corporate appeal. Its latest update

to version 7.5 shows promise, and a range of third-party partners are producing some solid hardware.

Android certainly isn't better than the competition at every task, but it's seemingly infinitely malleable by handset manufacturers, who skin it to change its look and add their own, as well as third-party, widgets to customise it. Importantly, Android works well at a range of price points, from sub-£100 handsets up to flagship devices.

With that in mind, our top smartphone in this group test is the Samsung Galaxy S II. At nine months old it's not the newest handset here, but it's a competent all-rounder with great appeal.

How we test

The general standard of smartphones is impressively high, with most including such features as Wi-Fi, email support, a media player and a large screen. We also looked for 3G connectivity, generous internal memory, the availability of apps with which to customise the device, and build and design credentials.

Increasingly, we are aware of the need to be able to protect the handset's contents, both from casual theft and malware attacks, often in the form of rogue apps. Solid content filtering and email and message encryption are all important here. A curated app store such as Apple's properly patrolled iTunes



	APPLE £499 inc VAT ★★★★★ PC ADVISOR RECOMMENDED	HTC £478 inc VAT ★★★★★	LG £358 inc VAT ★★★★★	MOTOROLA £246 inc VAT ★★★★★	
Model name	iPhone 4S	Titan	Optimus 3D	Defy+	
Operating system	iOS 5	Windows Phone 7.5	Android 2.2 (upgradable to 2.3)	Android 2.3	
GSM coverage	850/900/1,800/1,900MHz	850/900/1,800/1,900MHz	850/900/1,800/1,900MHz	850/900/1,800/1,900MHz	
Screen	3.5in (640x960 pixels)	4.7in (480x800 pixels)	4.3in (480x800 pixels)	3.7in (480x854 pixels)	
Design features	capacitive touchscreen, Retina display	capacitive touchscreen, proximity sensor, gyro sensor, ambient light sensor	capacitive touchscreen with glasses-free 3D	capacitive touchscreen, proximity sensor, accelerometer, ambient light sensor	
Processor	1GHz (Apple A5) ARM Cortex A9 dual-core	1.5GHz	1GHz ARM Cortex A9 dual-core	1GHz single-core	
Camera	8Mp stills with autofocus, tap to focus, face detection, LED flash; 1080p video recording; VGA front-facing camera	8Mp stills with BSI sensor, dual-LED flash; 720p video recording; 1.3Mp front-facing camera	5Mp stills, stereoscopic 3D images at 3 megapixels; 1080p video recording (720p in 3D)	5Mp stills with autofocus, LED flash	
Internal memory	16/32/64GB	512MB	512MB/8GB	512MB/1GB	
Memory card	not supported	not supported	up to 32GB	up to 32GB	
Connectivity	3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP	3G, HSDPA, GPRS, 802.11b/g/n, GPS	3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP, DLNA	3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP	
Included apps	Siri, FaceTime, Safari, Maps, Newsstand, YouTube, Stocks	Twitter, Facebook, Windows Live, SkyDrive	Google Maps, 3D Space, Facebook, Latitude, Finance, Twitter, YouTube, Voice Search	Google Maps, Connected media player	
Email & contacts/document handling	POP, Imap	Gmail, POP, Imap, Exchange ActiveSync, SharePoint, Microsoft Office 365	Gmail, POP, Imap, Exchange ActiveSync	Gmail, POP, Imap, Exchange ActiveSync	
Battery	lithium-ion	1,600mAh lithium-ion	1,500mAh lithium-ion	1,700mAh lithium-ion	
Battery life (GSM)	14 hrs (talk) 200 hrs (standby)	710 mins (talk) 360 hrs (standby)	not specified	6.8 hrs (talk) 9.9 days (standby)	
Dimensions	115.2x58.6x9.3mm	131.5x70.7x9.9mm	128x68x11.9mm	107x59x13.4mm	
Weight	140g	160g	168g	118g	

PC ADVISOR TEST CENTRE

Store, or the less well-populated but secure BlackBerry App World Store and Nokia Ovi Store get our thumbs-up. We're less keen on the Android Market, which is far too open.

We also looked at the user interface. Its layout, how easy it is to interact with and the responsiveness of the touchscreen icons and onscreen keyboard are all important factors. If the screen doesn't refresh properly when you zoom in to read a story, or locks up when you have more than one app open, the handset is likely to end up forgotten in a drawer somewhere and written off as an expensive mistake.

Most mobile contracts tie customers in for 18 months, so you need to be sure

you're not signing up for a brick. A good-looking smartphone that falls down on functionality won't earn a Best Buy award.

Content handling is a must, too. Flash support is becoming less important as HTML5 comes into its own on the web, but it's still a valid criticism of the iPhone and BlackBerry. However, both handle photos, video and music with aplomb, and offer intelligent media searches, too. On the other hand, 3D is still rather a gimmick.

Our comparative tests of the LG Optimus 3D, alongside Samsung's and Sony Ericsson's offerings, showed it offered better overall system performance, but its graphics capabilities were far worse.

BENCHMARKS WITH RIGHTWARE BASEMARK

	SYSTEM	GRAPHICS
Sony Ericsson Xperia Arc S	135	248
LG Optimus 3D	180	202
Samsung Galaxy S II	163	222

Web browsing aside, there's no uniform benchmark for all platforms measuring each of the factors we've highlighted above. Nonetheless, we'll be adding pertinent performance scores to our smartphone reviews and charts from now on. ☒


NOKIA
£300 inc VAT

★★★★★

700

Symbian OS 10.1
850/900/1,800/1,900MHz
3.2in (360x640 pixels)
capacitive touchscreen, AMOLED screen, ClearBlack, Gorilla Glass
1GHz ARM 11 single-core
5Mp stills with fixed focus, face detection, geotagging, red-eye reduction, LED flash
512MB/2GB
up to 32GB
3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP, NFC

Nokia Maps, Nokia Store, Facebook, Twitter, iPlayer, YouTube, Nokia Social, Shazam, Vlingo, SMS voice synthesiser
POP, Imap, Microsoft Exchange, Nokia Messaging

1,080mAh lithium-ion
12 hrs (talk)
465 hrs (standby)
110x50x9.7mm
96g

RIM
£378 inc VAT

★★★★★

BlackBerry Torch 9860

BlackBerry 7
850/900/1,800/1,900MHz
3.7in (480x800 pixels)
capacitive touchscreen, proximity sensor, accelerometer
1.2GHz single-core
5Mp stills with continuous autofocus, face detection, geotagging; image stabilisation; 720p video recording
768MB/4GB
up to 32GB
3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP

Twitter, Facebook, BlackBerry GPS, Mobile TV, browser
POP, Imap, BlackBerry internet and enterprise support, BlackBerry Messenger

1,230mAh lithium-ion
6.2 hrs (talk)
13.9 days (standby)
120x62x11.5mm
135g

SAMSUNG
£406 inc VAT

★★★★★

Galaxy S II

Android 2.3
850/900/1,800/1,900MHz
4.3in (480x800 pixels)
capacitive touchscreen, SuperAMOLED Plus display
1.2GHz ARM Cortex A9 dual-core
8Mp stills with autofocus, LED flash; 720p video capture
16GB
up to 32GB
3G, HSDPA, GPRS, 802.11b/g/n, Bluetooth A2DP

Google Maps, Social Hub, Music Hub, FM radio
Gmail, POP, Imap, Outlook, Exchange ActiveSync

1,650mAh lithium-ion
1,100 mins (talk)
710 hrs (standby)
125.3x66.1x8.49mm
116g

PC ADVISOR
BEST BUY
SONY ERICSSON
£349 inc VAT

★★★★★

Xperia Arc S

Android 2.3
850/900/1,800/1,900MHz
4.2in (480x854 pixels)
capacitive touchscreen
1.4GHz Qualcomm Snapdragon single-core
8.1Mp stills with face detection, smile detection, red-eye reduction, image stabilisation; 720p video recording; 3D sweep panorama
512MB/1GB
up to 32GB
3G, HSDPA, GPRS, 802.11b/g/n, , GPS, Bluetooth A2DP, DLNA

Timescape, Facebook inside Xperia, FM radio
Gmail, POP, Imap, Exchange ActiveSync

1,500mAh lithium-ion
7.3 hrs (talk)
460 hrs (standby)
125x63x8.7mm
117g

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yet 3 in 10 owners store personal data on their phones such as Pin numbers, passwords and home addresses.

Macs are not immune

As of last year there were 5000 Malware versions targeting Macs, a growth of 10% month on month.

Yet 82% of Mac users believe they are not at risk from virus infections.

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Protects your personal data if stolen or lost, and allows you to surf the web in safety.



Instantly detects and blocks viruses and protects you from malicious websites, and much more!

* Based on current market prices of individual softwares sold for PC, Mac, Smart Phone and Laptop devices

"...we're confident in declaring McAfee® All Access the Editors' Choice in its class." PC Mag, Dec 13 2011

"None of these subscriptions [Kaspersky, Trend Micro, Bitdefender, Symantec] can come close... and we're confident in declaring McAfee® All Access the Editors' Choice in its class." PC Mag, Dec 13 2011

EDITOR RATING
●●●●●
very good



	Windows PC (Desktop/laptop/netbook)	Mac (Desktop/MacBook)	Smartphone ¹ (iPhone ² /Android/BlackBerry/ Symbian)	Tablet ¹ (Android)
Anti-Virus	✓	✓	✓	✓
Anti-Spyware	✓	✓	✓	✓
Anti-Phishing	✓	✓	✓	✓
Firewall	✓	✓	✗	✗
Website Safety Ratings	✓	✓	✓	✓
Anti-Spam	✓	✓	✗	✗
Content Filtering ¹	✓	✓	✓	✓
Data Encryption	✓	✗	✗	✗
Home Network Defense	✓	✗	✗	✗
Online Backup	✓	✗	✗	✗
File Shredder	✓	✗	✗	✗
Mobile Device Lock	✗	✗	✓	✓
Remotely Wipe Data from Mobile Device	✗	✗	✓	✓
Back up and Restore Mobile Data	✗	✗	✓	✓
Locate and Track Mobile Devices	✗	✗	✓	✓
Uninstall Protection	✗	✗	✓	✓
Monitor Online Activities ¹	✓	✓	✗	✗
Instant Message Monitoring ¹	✓	✗	✗	✗
Program Blocking ¹	✓	✗	✗	✗

¹Features and functions are not available on all operating systems and may vary depending on operating system. ²McAfee® Mobile Security for iPhone is sold separately at the Apple App Store.

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USB 3.0 hard drives

Costs are fluctuating at the moment, but that's no excuse not to back up your important documents. Cliff Joseph looks at how well the latest external hard drives perform

If you've got a collection of photos, music, video clips and personal documents on your computer, you need to back them up. Whether these include pictures of a family wedding or birthday, or a report that you've just written for work, making sure there's a copy of them somewhere is a must.

The best backups take just moments to perform - often in the background. The hard work goes into deciding what sort of drive to use and how to fit the process conveniently into your daily routine. If you're mainly office-based and generate a lot of files that take up a fair few gigabytes, a 3.5in drive will offer the best combination of backup speed and value. For mobile workers or anyone who flits from place to place, a pocketable 2.5in drive that runs off USB power will probably suit you better. We review both types here.

One point to note before we start is that hard-disk prices are fluctuating at the

moment, with the floods that hit Thailand in the autumn to blame. Most of the main hard-disk manufacturers have factories in Thailand and one company taking part in this group test told us that its entire production line "is under water". Indeed, hard-disk production was down by more than 50 percent in October.

Scarcity of supply inevitably means that prices will rise. Those we quote here were current as we went to press, but we'd advise you to shop around. Still, acts of nature aside, people are always going to need external drives to back up their important files and delaying a purchase now could cost you dearly if your computer encounters a natural disaster of its own while you're waiting for prices to come back down.

We've therefore decided to take a look at some of the latest USB 3.0 hard drives to see how they compare, both in terms of

performance and additional features such as encryption and backup software. If your PC has only USB 2.0 ports, then you can save money by sticking with an older USB 2.0 drive. However, buying a USB 3.0 drive means that you're future-proofed for when you upgrade to a newer computer.

The next choice is deciding whether to opt for a portable drive or a larger desktop model. The former is an obvious choice for laptop users, but they can come in handy if you use a desktop PC too, as you can easily carry the drive back and forth between home and your office. Some people also prefer the plug-and-play convenience of a portable drive that's powered off the USB port and doesn't need a separate power supply and cable.

However, portable drives do have to make compromises. They're generally available in only 500GB or 1TB capacities, and all



Photography by Dominik Tomaszewski

the portable drives we review here have a 5,400rpm drive mechanism. They're still three or four times faster than ordinary USB 2.0 drives, but they don't take full advantage of the USB 3.0 interface - in fact, we found that the 7,200rpm mechanisms used by some of the desktop drives were another 30 to 40 percent faster than their 5,400rpm counterparts. Of course, desktop drives offer much greater storage capacity, with 1TB generally being the entry-level point, and 2TB and 3TB models also available.

We tested the drives using the Crystal DiskMark 3 utility. This provides an overall performance rating for sequential read/write performance, as well as allowing us to test the drives with smaller 512kB file sizes - an area where many drives come unstuck. We were a little surprised to see that only two of the desktop drives

submitted for review - from Hitachi and Seagate - actually ran at 7,200rpm and, as you'd expect, those two drives were far and away the best performers.

The results from the 5,400rpm drives were much more mixed, so it's well worth checking out our test results to see which ones provide the best performance. But don't forget that other features can be just as important, too.

All these drives come with their own backup software, for example. Password-protection and encryption will also be important if it's a drive that you'll be using to store work files. A few gigabytes of cloud storage can come in handy, too, as this provides an extra level of backup protection for your most important files. The cheaper models tend not to provide features such as these, so take a look at our reviews to see which drives provide the

all-round combination of price, performance and features that best suits your needs.

Conclusion

If portability is your priority, then Freecom's Mobile Drive Sq is a good pocket-sized solution. However, the rugged design of the Buffalo MiniStation Extreme makes more sense for a drive that's going to be on the move a lot of the time. It also proved to be the top performer among the portable drives and provides 256bit encryption, making it the best all-round choice in this category.

The choice in the desktop group seems easy - a high-capacity desktop drive with a USB 3.0 interface ought to have a 7,200rpm drive mechanism, which narrows the choice to the Hitachi Touro Desk Pro and Seagate's FreeAgent GoFlex Desk. The Hitachi is slightly cheaper at the moment, but Seagate pulls ahead with its encryption features.

3.5in DESKTOP DRIVES



HITACHI TOURO DESK PRO 3TB

£180 inc VAT

• hitachi.co.uk • tinyurl.com/cLqLhc3

The Hitachi Touro Desk Pro 3TB is a little chunky – its 60mm waistline is almost twice that of the slimline Iomega Prestige drive – but as one of only two 7,200rpm drives here it's also one of the best performers.

Its overall sequential speed of 150.9MB per second (MBps) when reading files was the fastest in this group, although only by a small margin. It took a narrow second place to the Seagate for writing performance, but its speed of 116.6MBps was still more than respectable. Performance with smaller files was similar. The Touro was neck and neck at the head of the pack with Seagate at 54MBps for read speed, and earned a strong second place when writing at 69.1MBps.

Hitachi's Backup program is a little basic as it provides only two scheduling options – a single daily backup or regular automatic backups – but it's very simple to use. It also allows you to simultaneously back up your files both to the Touro Desk Pro itself and to the 3GB of free online archive provided by Hitachi. You can also upgrade the online storage to 250GB for \$49 (£32) per year, which is cheaper than other cloud services such as Dropbox.

VERDICT: Hitachi's one big omission is encryption and password protection. However, it provides good performance and backup features at a reasonable price.



IOMEGA PRESTIGE 1TB

£113 inc VAT

• iomega.com • tinyurl.com/d4kaLcw

The Iomega Prestige isn't the fastest drive here, but it's well designed, affordable and includes a useful set of software.

It's easily the slimmest and most compact of the desktop drives reviewed here, being just 31.4mm thick. You can lay it flat or use the small stand included in the box to prop it upright, in which case it'll take up hardly any desk space at all.

Performance isn't the Prestige's strong point, though. Its 5,400rpm drive mechanism results in modest overall sequential speeds – 119.3MBps when reading files and write speeds of 107.3MBps. However, performance when copying smaller files is more respectable at 45.2MBps and 56.7MBps for reading and writing.

Iomega makes up for this in other areas, though. The drive supports 256bit encryption for protecting your files, and its Protection Suite provides a range of extra features, including a year's subscription to Trend Micro Internet Security. You also get Iomega's v.Clone software, which can create a virtual image of your main PC that can be used by any other computer connected to the Prestige drive.

VERDICT: There's definitely room for improvement in the Prestige's performance. However, its slimline design, encryption and extra software features will appeal to many.



LACIE PORSCHE P'9230 1TB

£115 inc VAT

• lacie.com/uk • tinyurl.com/d7adbh9

The chunky aluminium casing of LaCie's Porsche P'9230 may not be to everyone's taste, but at least it ensures that the drive is well-protected against the occasional mishap in the office.

We were surprised to discover our test drive wasn't formatted when we first plugged it in, but there is a good reason for this: LaCie's setup utility gives you a number of different options. You can format the entire drive as one large NTFS partition, or create an additional FAT32 partition for exchanging data with Mac and Linux machines. There's also an option for creating a password-protected partition to keep important files away from prying eyes.

LaCie also throws in both a backup program and a one-year subscription that gives you 10GB of online storage with the Wuala service.

Unfortunately, the Porsche doesn't live up to its namesake. The 5,400rpm drive offers relatively modest overall sequential performance at just 109.8MBps, although write speed is closer to average at 111.1MBps. It's also one of the slower desktop drives when copying smaller files.

VERDICT: The design and software features of the P'9230 are attractive but, at £115 for 1TB of storage, it ought to offer Porsche performance as well as style.

3

Months Free

+ free connection

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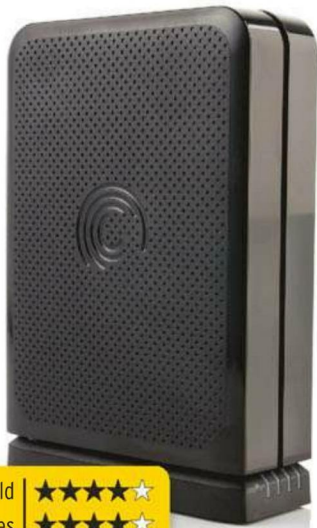
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MISCO.co.uk

2.5in LAPTOP DRIVES



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

PC ADVISOR
BEST BUY

SEAGATE FREEAGENT GOFLEX DESK 3TB

£190 inc VAT

• seagate.com • tinyurl.com/bn2z92f

Seagate's GoFlex has an unusual two-part design that consists of the main drive unit and a separate 'desk adaptor' that houses its USB 3.0 interface and also acts as a stand for the drive. The thinking behind this is that you can purchase a different adaptor if you need to – perhaps one with a FireWire adaptor for a Mac. You can also buy the drives on their own at a slightly lower price, then simply connect each drive to the adaptor as required.

It's an interesting idea, although it doesn't give the GoFlex any great advantage over its more conventional rivals. However, the drive works well and emerged as one of the top performers in our tests. The Seagate's overall sequential speed of 150.5MBps put it neck and neck with the Hitachi Touro Pro for read performance, and it nudged ahead of the competition with a speed of 119.3MBps for writing performance. That pattern was repeated when copying smaller files: the GoFlex and Touro Pro read files at 54MBps, while the Seagate pulled even further ahead when writing small files to achieve a speed of 85.6MBps.

VERDICT: The GoFlex certainly provides good performance. Throw in 192bit encryption and the bundled Memo Backup software, and you've got a good all-round combination of speed and data-protection features.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

PC ADVISOR
BEST BUY

BUFFALO MINISTATION EXTREME 1TB

£113 inc VAT

• buffalo-technology.com • tinyurl.com/ce4z9ym

It's hard to find fault with the MiniStation Extreme, as it provides good performance and features at a competitive price.

Our 1TB drive came in black, but there are a variety of colours to choose from as well as a 500GB model. The Extreme is a little chunkier than most of its portable rivals, but that's because of the military-standard shock-proof casing that's designed to withstand drops of up to 2.3m.

There's extra protection for your data too, in the form of 256bit encryption, so the Extreme is a good choice for keeping all your important data safe. We also like the tidy, built-in USB cable that slots into the body of the drive when not in use.

Performance is good too, with overall sequential read and write speeds of 116.9MBps and 109.7MBps respectively, which give it an edge over all its portable rivals. Performance with small files is more modest, but still among the best in this group. Buffalo also provides a good set of software features, including backup software and a RAMdisk utility in addition to its encryption and password features.

VERDICT: Buffalo gets all the basics right with the MiniStation Extreme. Its rugged design, good performance and attractive price make it an excellent choice for anyone who needs a reliable portable disk.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

FREECOM MOBILE DRIVE SQ 500GB

£85 inc VAT

• freecom.com • tinyurl.com/bmvzw3r

The new Mobile Drive Sq is so slim we had to double-check with Freecom that it is actually a conventional hard disk and not one of those newfangled SSD drives. The square drive unit is just 10.5mm thick, making it far slimmer than any of its portable rivals, and it weighs in at less than 200g too, so it's certainly easy to slip into your pocket or a carry case when you're on the move. There's also a 1TB model that measures a mere 13mm thick.

The drive's performance is respectable but not outstanding, achieving sequential read and write speeds of 105.4MBps and 104.7MBps. Performance with smaller files was slower, as expected, but not out of line with its rivals at 35.7MBps for read speed and 36.4MBps for writing.

Freecom includes a copy of Nero's BackItUp & Burn software for making backups of your files, as well as a formatting utility and a 'green button' feature that allows you to 'suspend' the drive after a specific amount of time in order to save power. However, there's no encryption or password-protection.

VERDICT: The slimline design of the Sq drive is attractive and the Freecom is reasonably priced. However, it's not the fastest performer and lacks the additional security features found in some of its rivals.

2.5in LAPTOP DRIVES

VERBATIM STORE 'N' GO 500GB

£80 inc VAT • verbatim-europe.co.uk • tinyurl.com/d57tybe

Verbatim and Freecom are part of the same group of companies, but Verbatim generally seems to focus on the more affordable end of the market. Consequently, its 500GB Store 'n' Go drive lacks the eye-catching slimline design of the Freecom Mobile Drive Sq and opts for a more conventional rectangular design that comes in at a very reasonable £80 for the 500GB model we tested.

Even so, it's still rather slim and neatly designed, and its 150g weight makes it the lightest drive in this group. It's also available in a wide range of colours to suit your personal taste. We weren't surprised to see that it also has the same set of bundled software, with Nero's BackItUp & Burn software, the energy-saving 'green button', and a formatting utility.

The drive's performance proved to be a little erratic, though. The overall sequential speed was good, at 110.5MBps for reading files and 109.4MBps for writing. However its performance with smaller files varied dramatically - we got a relatively strong 39.2MBps when

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



reading small files, but a mere 14.8MBps for write speeds. That could be a problem if you're regularly backing up lots of small files.

VERDICT: The Store 'n' Go's performance leaves room for improvement, and it lacks the password and security features found in some of its rivals. However, it's light, portable and offers good value.



3.5in USB 3.0 DESKTOP HARD DRIVES

	HITACHI £180 inc VAT (3TB) ★★★★★ <small>PC ADVISOR RECOMMENDED</small>	IOMEGA £113 inc VAT (1TB) ★★★★★	LACIE £115 inc VAT (1TB) ★★★★★	SEAGATE £190 inc VAT (3TB) ★★★★★ <small>PC ADVISOR BEST BUY</small>	
Model name	Touro Desktop Pro	Prestige	Porsche P'9230	FreeAgent GoFlex Desk	
Capacities available	1/2/3TB	1/2TB	1/2TB	1/2/3TB	
Drive format	3.5in SATA	3.5in SATA	3.5in SATA	3.5in SATA	
Spin speed	7,200rpm	5,400rpm	5,400rpm	7,200rpm	
USB	powered USB 3.0/USB 2.0	powered USB 3.0/USB 2.0	powered USB 3.0/USB 2.0	powered USB 3.0/USB 2.0	
FireWire/other	none	none	none	optional adaptor	
Encryption	none	256bit	none	192bit	
Bundled software	Hitachi BackUp, 3GB online storage	Iomega Protection Suite, 2GB online storage, v.Clone	Backup Assistant, password protection, 10GB online storage	Memo Backup	
Dimensions	183x60x129mm	124x31.4x188mm	38x120x190mm	158x44x124mm	
Weight	970g	1kg	1kg	1kg	
Warranty	2 years	3 years	2 years	2 years	
Performance					
Sequential read (MBps)	150.9	119.3	109.8	150.5	
Sequential write (MBps)	116.6	107.3	111.1	119.3	
Small files read (MBps)	54	45.2	39.4	54	
Small files write (MBps)	69.1	56.7	57.4	85.6	

WESTERN DIGITAL MY PASSPORT ESSENTIAL 500GB

£89 inc VAT • wdc.com/en • tinyurl.com/435zgfw

It's not the fastest drive in this group, but Western Digital's My Passport Essential is neatly designed and includes some useful software features. The slim, glossy drive is very light and easy to carry, and also comes in a variety of colours. The Essential is available only in 500GB capacity – although WD does make other portable drives in 750GB and 1TB capacities, too.

Western Digital always pays close attention to detail with its products, and that shows in the bundled SmartWare software. As well as providing password and encryption features to protect your data, it performs continuous incremental backups of all your files. This includes a 'history' option that can save multiple versions of files.

Its performance was a little disappointing, though. The drive's sequential read and write speeds of 78.4MBps and 77.4MBps make it the slowest overall performer in this group. Oddly, though, it perks up a bit when writing small files and reaches 48.5MBps, which could be handy if you're using the continuous backup option. Performance

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



when reading smaller files isn't as good – we recorded 33MBps – but it's still acceptable.

VERDICT: The My Passport Essential could be a bit faster, but its slimline design is attractive and portable, and WD's SmartWare provides good backup and security features to protect your data.



2.5in USB 3.0 LAPTOP HARD DRIVES

BUFFALO £113 inc VAT (1TB) ★★★★★ PC ADVISOR BEST BUY	FREECOM £85 inc VAT (500GB) ★★★★★	VERBATIM £80 inc VAT (500GB) ★★★★★	WESTERN DIGITAL £89 inc VAT (500GB) ★★★★★
MiniStation Extreme	Mobile Drive Sq	Store 'n' Go	My Passport Essential
500GB/1TB	500GB/1TB	500GB/1TB	500GB
2.5in SATA	2.5in SATA	2.5in SATA	2.5in SATA
5,400rpm	5,400rpm	5,400rpm	5,400rpm
USB 3.0	USB 3.0	USB 3.0	USB 3.0
none	none	none	none
256bit	none	none	256bit
Backup, RAMdisk	Nero BackItUp & Burn, Green Button, formatting utility	Nero BackItUp & Burn, Green Button, formatting utility	WD SmartWare
18x89x128mm	10.5x120x120mm	15x80x121mm	15x83x110mm
230g	195g	150g	150g
2 years	2 years	2 years	2 years
116.9	105.4	110.5	78.4
109.7	104.7	109.4	77.4
36.9	35.7	39.2	33
38.8	36.4	14.8	48.5

BUSINESS desktop PCs

You don't need to spend a fortune on a business PC, with many companies offering more affordable options. Paul Monckton looks at six office machines to see what you can get for your money

General-purpose business PCs aren't about ultimate performance, multimedia or graphics power. Designed for productivity, their main requirement is to run office applications such as your word processor, spreadsheet and email client, along with some web browsing. We expect conservative styling and competitive pricing, usually below £500.

In a typical networked business environment there will be storage available on the LAN, so you're unlikely to need a large hard drive - especially at their currently inflated prices. A 500GB drive should be ample unless your business involves storing a lot of video or other large media.

Provided you have sufficient RAM, any modern CPU will provide enough power for low-level administrative tasks. Intel's dual-core Core i3 chips should provide ample performance for general use and come with integrated graphics, saving you the cost of buying an additional card.

AMD's Llano series of processors, such as the A8-3850, offer value for money, but with performance shifted towards graphics processing rather than general-purpose computing. Our business performance benchmark scores are therefore considerably lower for AMD-based PCs than Intel-based ones at any given price.

A 4GB memory setup should be fine - even 2GB should be okay. We would normally expect a standard processor cooler to be installed, but third-party cooling fans can help to keep down noise levels.

The motherboard won't need the latest and greatest features, although some spare memory slots may prove useful so that extra RAM can be added later. Power-management and fan-speed control can also help to save you money and create a more peaceful working environment.

Integrated GPU solutions provide enough graphics power for business applications, so you're unlikely to need to add a graphics card to your specification. However, you may want to consider an entry-level one if you're running a multi-screen setup.

If you're using an Intel processor, the low-cost H61 Express chipset should provide all you need for a basic office PC, while keeping the price as low as possible.

Wireless keyboards and mice can cause issues in the workplace due to interference between adjacent workstations. A decent wired kit is ideal, while quiet-typing keyboards can be less distracting to others.

For small businesses with just one or two PCs, you may find it saves money to opt for Windows 7 Home Premium. Windows 7 Professional is, however, a better option

for most offices, especially if you need compatibility with older software designed for XP. The Windows XP Mode available in the Professional option places additional demands on the processor and memory, so it's a good idea to invest in both if you want to make frequent use of this feature. You may find it preferable in this case to go for a quad-core CPU and 8GB of RAM. Furthermore, the network backup and restore option is missing from the Home Premium Edition. Windows 7 Professional will add £50 to the price of your system.

Always pay close attention to the warranty offered with your PC. Obviously, a longer period is preferable, but also look at the terms and conditions. When you're relying on your PC for the running of your business, an onsite arrangement can save you considerable time and money. Also check to see whether the vendor will collect faulty systems for repair or whether they must be returned to the vendor at your own cost.





Photography by Dominik Tomaszewski

ARBICO VALUE 210 MX

£399 inc VAT • arbico.co.uk • tinyurl.com/ccckogg

Arbico takes a sensible, measured approach to the 210 MX, producing a smart, reasonably balanced office PC. Gigabyte's compact, sleek and yet business-like GZ-M1 system case houses a PC based on Intel's 3.1GHz dual-core Core i3-2100 processor. It delivers solid performance, exceeding that of any AMD-based system here.

Inside, there seems to be considerably more cabling than is strictly necessary, although Arbico has carefully fixed this to the bottom of the case with adhesive clips and cable ties. There are no tool-free drive bays, but accessibility remains relatively easy.

The basic Intel processor cooler has been replaced with a more powerful Xigmatek Apache model. It's relatively quiet, but hasn't resulted in a machine that's quieter overall than either the Braebo or Eclipse – the latter using the standard Intel cooler. It is, however, quieter in operation than the noisy Dino PC and CyberPower systems.

Only two memory slots are included and both are filled with the supplied 4GB of memory; if you envisage an upgrade, be prepared to replace the existing modules. The supplied Sumvision keyboard and mouse combo feel decidedly cheap, and are best avoided. If your business involves the use of digital cameras, you'll appreciate the inclusion of a multi-format card reader, which also adds an extra front-facing USB port, bringing the total up to three.

To maximise customer choice, no monitor is provided. Arbico's own offerings would add around £65 for an 18.5in screen or £90 for the inescapable AOC F22+ found on two other PCs in this round-up.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

Even taking this additional cost into consideration, the 210 MX costs less to buy than all but Braebo's AMD-based Athena. Aside from Windows 7 Home Premium, no other software is included.

VERDICT: Arbico's Value 210 MX is a sensible, no-nonsense PC in an subtly styled case. It offers a modest, yet entirely competent level of performance. Provided without a monitor, the choice of display is left up to you, so remember to include this in your budget.

BRAEBO ATHENA

£383 inc VAT • braebo.com • tinyurl.com/buosf5v

The modest performance of Braebo's Athena is offset by its excellent price. Costing less as a complete system than Arbico's monitor-less Value 210 MX, it will appeal to those with a minimal budget who nevertheless need a PC that can complete everyday tasks.

AMD's Athlon X4 640 powers the system. It's a quad-core chip running at 3GHz and, although it's noticeably slower than any other CPU used in this group test, it still delivers what we would consider adequate performance. However, those running heavier workloads may be advised to go for something with a bit more poke.

This CPU doesn't have an integrated graphics processor. Instead, the graphics capabilities are provided by the ASRock N68C-S UCC motherboard, which comes with rather slow nVidia GeForce 7025 graphics built in. Being based on an AM2 chipset, the ASRock motherboard also restricts the performance of the Athlon X4 640, which is an AM3-based chip. This is part of the reason for the slower performance of this system.

Braebo's business-like case provides ample room to manoeuvre around the internals, although the lack of cable management leaves connecting wires dangling messily inside. Most of them have been bundled together with cable ties, but not fixed to the side of the case. Plenty of free expansion bays are available and two empty RAM sockets allow you to upgrade the supplied 4GB. A 500GB hard drive is included, which is a sensible capacity given the currently inflated prices of these components.



Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

Also included is an 18.5in AOC 931Swl display. This has only a VGA port and we initially had to fiddle with the controls to align the image properly. With a meagre 1366x768 resolution, it's far from ideal if you want to work on multiple documents, but it does keep the cost down.

VERDICT: The Athena acquits itself well as the least expensive PC of the group, but its outdated motherboard holds back performance and the small analogue-only monitor leaves a lot to be desired.

CHILLBLAST FUSION PALOMINO

£499 inc VAT • chillblast.com • tinyurl.com/bm9q39x

One of three systems coming in at £499, Chillblast's Fusion Palomino delivers the fastest performance of any PC in this month's group test - its 3.3GHz Intel Core i5-2500K processor and 8GB of RAM powered it to an impressive 164 points in WorldBench 6. It's 64 percent faster than the Braebo Athena and only 30 percent more expensive, so it offers good value for money if you need the extra turn of speed.

The 'K' version of the i5-2500 processor isn't selected for its overclocking capabilities, but for its enhanced HD 3000 graphics, which are faster than those on the standard edition of the chip.

The Inwin Z637 Micro ATX case augments its otherwise unremarkable looks with an attractive red piping effect around the drive bays, where you'll also find a pair of front-facing USB ports and audio in/out jacks. Unfortunately, our sample machine arrived with the front ports disconnected.

There are no troublesome or breakable flaps to be found. Inside, we find tool-free drive bays and slot-retention clips. The case is also opened by means of tool-free latches, although you can add a couple of screws to make theft of the internals less tempting. Chillblast has done a good job of tidying up the internal cabling too.

The Asus P8H61-M LE/USB3 motherboard is the same model selected by Arbico. It has just two memory slots, but with 8GB installed as standard you're unlikely to need to upgrade any time soon. The system includes a 21.5in AOC F22+ display which, while far from perfect, is a big step up from the 18.5in model supplied

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



by Braebo, and comes with a DVI connector. Chillblast's two-year collect-and-return warranty policy saves you the cost of couriers when returning a faulty system for repair.

VERDICT: Fast and reasonably priced, the Palomino is well-constructed and offers a good balance of performance and features. No other system here can touch it in terms of application performance, and its two-year collect and return warranty is the best available.

CYBERPOWER ULTRA TRITON SE

£499 inc VAT • cyberpowersystem.co.uk • tinyurl.com/cf2cgz5

In its ATX-sized case, complete with transparent side-panel, you would be forgiven for mistaking the Ultra Triton SE for another gaming PC. Despite its inappropriate dress sense, this Cooler Master Elite 430 housing offers better build quality than most of the competition.

Like Braebo's ultra-low-cost PC, the Triton SE uses an AMD processor, and CyberPower has opted for the FM1 A8-3850 running at 2.9GHz. Despite its slower clock speed, it outperforms Braebo's offering by nearly 20 percent. The quad-core chip is based on the newer Llano architecture and features integrated Radeon HD 6550D graphics. Graphics processing on this machine is pretty impressive, outpacing all other integrated graphics solutions.

Overall application performance is, however, still much lower than any of the Intel-based PCs; and there's no price advantage to offset this. Chillblast's Fusion Palomino, for example, offers a similar specification for the same price, but with a much higher WorldBench score of 164 points to the CyberPower's 119.

The Gigabyte GA-A75-D2H motherboard doesn't restrict the bandwidth available to the AMD processor, allowing much greater performance. The A8-3850 is also fitted with a large Cooler Master processor cooler, but any noise advantage gained from this is offset by the loud system power supply, which makes the CyberPower Ultra Triton SE the loudest PC of the group.

A full 8GB of RAM is included, along with a 500GB hard disk. The provided display is the competent, but unimpressive 21.5in AOC F22+,

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



while Logitech's MK120 keyboard and mouse combo is one of the better offerings. Microsoft Office Starter is preinstalled, but unsuited to office work with its flashing adverts and stripped of Outlook.

VERDICT: Although it's solidly built and offers good value for money, the Ultra Triton SE looks like a gaming rig masquerading as a business PC. Its performance is also skewed in favour of graphics, which is an unnecessary luxury on an office PC.

DINO PC PLUTOSAUR 2400

£499 inc VAT • dinopc.com • tinyurl.com/ccdrsf5

With a 3.1GHz Intel Core i5-2400 processor, the Dino PC Plutosaur is one of the faster PCs here. It comes with 4GB of RAM, a 500GB hard disk, and is constructed inside an EZCool N750D case that's finished in black with metal-like plastic trim. A hinged flap conceals a pair of front-facing USB ports and audio in/out jacks.

Inside, a Gigabyte GA-H61M-S2P motherboard uses Intel's low-cost H61 chipset – an appropriate choice for this sort of system. It includes only two memory slots, so if you want to upgrade later you'll have to discard your installed chips in favour of larger-capacity modules. There's plenty of room to work inside the case, but Dino PC's attempt to tie up the internal cables in our test unit has resulted in a bundle of wires that partially block the air flow to the processor cooler. The power supply is also noisy, making this computer considerably louder than either the Braebo or Eclipse.

Just like Chillblast and CyberPower, Dino PC has plumped for the Logitech MK120 keyboard and mouse combo, which we like, despite its obvious low-cost construction. It's much better than some of the ultra-cheap models we often see thrown in with PCs at this price.

The two aforementioned systems share this PC's £499 price tag, but both also offer double the memory and faster graphics.

In its favour, the Dino PC Plutosaur 2400 comes with a much better display. The Asus VE228T is a 22in screen with an LED backlight and superior image quality to the AOC F22+ favoured



by Chillblast and CyberPower. Overall it's a pretty good deal, but it does mean sacrificing a little in terms of core specification in order to get the better monitor.

VERDICT: The Plutosaur 2400 is a serious PC with sensible middle-of-the-road components and good performance. Its Asus VE228T monitor is also among the best here.

	ARBICO £399 inc VAT ★★★★★	BRAEBO £383 inc VAT ★★★★★	CHILLBLAST £499 inc VAT ★★★★★	
Model name	Value 210 MX	Athena	Fusion Palomino	
Processor	3.1GHz Intel Core i3-2100	3GHz AMD Athlon X4 640	3.3GHz Intel Core i5-2500K	
Monitor	none	18.5in AOC 931Swl (1366x768)	21.5in AOC F22+ (1920x1080)	
RAM	4GB DDR3	4GB DDR3	8GB DDR3	
Storage	500GB Seagate SATA 6Gbps	500GB SATA 3Gbps	500GB SATA 3Gbps	
Power supply	500W Ace	500W	500W EZCool	
Motherboard	Asus P8H61-M LE/USB3	ASRock N68C-S UCC	Asus P8H61-M LE/USB3	
CPU cooler	Xigmatek Apache	standard AMD	standard Intel	
USB	4x USB 2.0, 2x USB 3.0	4x USB 2.0	6x USB 2.0, 2x USB 3.0	
Graphics card	Intel HD Graphics 2000	nVidia GeForce 7025 with 256MB VRAM	Intel HD Graphics 3000	
Sound	onboard	onboard	onboard	
Speakers	none	none	add £4	
Optical drive	22x DVD±RW DL with LightScribe	24x DVD±RW	24x DVD±RW	
Operating system	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	
Bundled software	none	free utilities	free utilities	
Case	Gigabyte GZ-M1	Braebo Fides Case	Inwin Z637 Micro ATX	
Keyboard	Sumvision (wired)	Braebo Black USB Keyboard	Logitech MK120	
Extra features	card reader	500GB online storage	none	
WorldBench 6 score	135	100	164	
Idle power consumption	43W	49W	32W	
Warranty	2-year RTB	1-year RTB	2-year collect-and-return	

ECLIPSE FUSION i3212R677**£979 inc VAT** • eclipse-computers.com • tinyurl.com/c2qsg2q

This PC is too expensive. We expected vendors to supply business PCs costing around £500, so a system priced £979 was absolutely not what we were expecting. Not only that, but its dual-core Intel Core i3-2120K processor is only slightly faster than the version used in Arbico's Value 210 MX, which costs many hundreds of pounds less.

The Eclipse Fusion i3212r677 is also the only PC of the group to incorporate a discrete graphics card, and the AMD Radeon HD 6770 delivered by far the best graphics performance of the PCs on test. Most business users simply won't need this, but it may come in handy if you're thinking of setting up a dual- or triple-monitor system or are a power user who needs to display a large amount of information at once. However, in which case you might also appreciate a faster CPU.

The system comes with a 23.6in HKC 2412 display, which is larger than any other in the group, and presents text at a more comfortable-to-read size than a 22in display. It also incorporates internal speakers, so we were surprised to find a set of Logitech LS21 external stereo speakers thrown in. These improve the sound, but aren't necessary for a general-purpose business PC.

Perhaps most surprising of all is the use of an Asus P8Z68V LE motherboard. Based on the Z68 chipset, this is a vastly superior motherboard than the budget H61 version seen elsewhere. However, most of its extra features are likely to be unused in this PC's intended environment, making the added expense unnecessary.



We like the compact Cooler Master Elite RC-360 system case which, despite its compact dimensions, makes the Eclipse Fusion i3212r677 one of the quietest PCs of the group.

VERDICT: This is a well-built PC with some unique features. It's the only PC with a powerful graphic subsystem, too. However, at this price we're used to seeing a much faster PC with far better components.

CYBERPOWER £499 inc VAT ★★★★★	DINO PC £499 inc VAT ★★★★★	ECLIPSE £979 inc VAT ★★★★★
Ultra Triton SE	Plutosaur 2400	Fusion i3212r677
2.9GHz AMD FM1 A8-3850	3.1GHz Intel Core i5-2400	3.3GHz Intel Core i3-2120K
21.5in AOC F22+ (1920x1080)	22in Asus VE228T (1920x1080)	23.6in HKC 2412 (1920x1080)
8GB DDR3	4GB DDR3	8GB DDR3
500GB SATA 3Gbps	500GB SATA 3Gbps	1TB SATA 6Gbps
450W WinPower	not specified	650W EZCool
Gigabyte GA-A75-D2H	Gigabyte GA-H61M-S2P	Asus P8Z68V LE
Cooler Master	standard Intel	standard Intel
4x USB 2.0, 2x USB 3.0	6x USB 2.0	6x USB 2.0, 2x USB 3.0
AMD Radeon HD 6550D with 1GB VRAM	Intel HD Graphics 2000	AMD Radeon HD 6770 with 1GB VRAM
onboard	onboard	onboard
none	none	2x Logitech LS21 and subwoofer
24x DVD±RW	22x Samsung SH-S222AB DVD±RW	22x Samsung SH-S222AB DVD±RW
Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Microsoft Office Starter 2010	free utilities	none
Cooler Master Elite 430	EZCool N750D	Cooler Master Elite RC-360
Logitech MK120	Logitech MK120	Octigen (wired)
none	none	none
119	150	147
44W	30W	58W
3-year RTB (1 year parts, 3 years labour)	3-year RTB	1-year RTB

>> How we test and our conclusion



Conclusion

A good business PC isn't simply a home computer with the graphics card removed. Unfortunately, that's exactly the sort of PC we're seeing offered by the UK systems builders here. Windows 7 Home Premium may be Microsoft's cheaper offering, but it's useless for any business relying on Microsoft Active Directory to network its computers.


We feel Chillblast's Fusion Palomino is the closest thing to a balanced office PC. It offers fast application performance and an overkill 8GB of RAM, but the budget hasn't been squandered on unnecessary components elsewhere. Chillblast also offers

the best warranty terms. The software package comprises free or open-source programs, such as LibreOffice and AVG Free, and you can add Microsoft Office Home and Student for £71, although this still omits Outlook and will not suit many businesses.

Arbico's 210 MX may offer good value for money, although the level of performance is lower and you'll have to provide your own monitor. It's also somewhat noisy, and the £5 keyboard is a letdown.

It's possible to spend even less and still obtain a useful desktop PC. Braebo's Athena offers such an example, although its

motherboard doesn't make the best use of the installed processor. It lacks a DVI video output and the case is very basic.

We'd like to see more better-quality peripherals bundled with these PCs. For maximum productivity, the keyboard should be comfortable to type on and a monitor, where supplied, crisp and clear. The Logitech MK120 keyboard supplied with three of these PCs seems to be the best of the bunch. We'd recommend a digital monitor connection where possible, as it's less susceptible to interference and doesn't require alignment to achieve the best picture. 

How we test

The *PC Advisor* Test Centre evaluates each PC in a number of ways.

Application performance

Core system performance is measured using the WorldBench 6 real-world benchmark. This customised test suite runs actual Windows applications with a real-world workload, mimicking how a PC is used in day-to-day life.

The workload includes tasks such as editing Microsoft Word documents and Photoshop images, compressing files, browsing web pages and encoding video. Select tasks are then run simultaneously to form an additional test of the PC's multitasking capabilities.

In total, eight applications are used: Adobe Photoshop CS2, Autodesk 3ds Max 8.0, Firefox 2.0, Microsoft Office 2003, Windows Media Encoder 9.0, Nero 7.0 Ultra Edition, Roxio ViewWave Movie Creator 1.5 and WinZip Computing WinZip 10.0.

Results are then combined to produce a numerical score relative to a baseline PC.

The baseline configuration is a computer running a 2.4GHz Intel Core 2 Duo E6600 processor, 2GB of DDR2 RAM, an nVidia GeForce 7900 GS graphics card, two Western Digital Caviar WD3200KS 320GB drives in a striped Raid 0 array. The operating system is Windows Vista Home Premium (32bit). This baseline PC scores 100 points in WorldBench 6.

In round-ups of office PCs, we don't publish any gaming test results.

Overclocking

Currently, we allow overclocking of the processor only in dedicated gaming computers. All other components are run at their stock speeds, with the exception of factory-overclocked graphics cards, which are designed and sold at boosted speeds.

Power consumption

We measure the power consumption of each PC while it's idling at the desktop and has settled down after booting up.

Subjective assessment

Of course, it's not all about performance. We also pay close attention to the physical characteristics of the PC, its noise output and its build quality, delving inside the system case and taking note of important features such as the quality of components used, cable management and air flow.

Good-quality peripherals are also important, and where these are supplied we pay particular attention to details such as the ergonomics of the keyboard and mouse as well as the quality of the display.

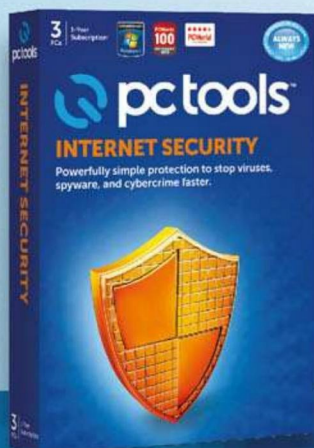
For reasons of image quality and convenience, digital display connections are preferred over analogue ones.

Support

Differences in warranty terms can affect our verdict. Obviously, longer warranties are better, but we also look at the terms and conditions - specifically whether faulty systems must be returned to the vendor at your own cost, and whether both parts and labour are included.



ALWAYS CHOOSE SIMPLE.



Rely on powerfully simple PC protection with the all new PC Tools™ Internet Security. The new look PC Tools is built on award-winning technology, yet made straightforward for everyday use. It's real protection for real people. PC Tools exposes the latest cybercrime scams like "get rich quick" offers. Plus, it's been meticulously engineered for a refreshingly intuitive, faster experience. When it comes to powerful PC protection the choice is simple. Power up at pctools.com/simple.

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powerfully simple.



PROTECTION



PERFORMANCE

IN JAPAN, WE'VE ALWAYS BELIEVED SMALL IS BEAUTIFUL



THE EPSON SMALL-IN-ONE RANGE

Like the Bonsai tree, less is definitely more. Each model does everything you'd expect of an Epson all-in-one, but takes up 39%*¹ less room. With automatic Wi-Fi set-up, individual inks and easy wireless printing from smartphones and tablet PCs*², it not only saves you space, it saves you time and money as well.

To find out more visit www.epson.co.uk

*¹ Based on total volume of the printer, with trays closed, compared to previous models. For more information, please visit www.epson-europe.com *² Selected models only. Model shown Epson Stylus SX445W.

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PC ADVISOR IS 200!



A lot has changed in the 16 or so years that *PC Advisor* has been around. To mark the occasion of issue 200 we've prepared a bumper edition, full of tips and tricks, analysis of the best technology of the past 200 issues, and predictions for the future

“ Let me take this opportunity to thank all *PC Advisor* readers past and present (especially present) ”

200 is a lot of anything. Can you imagine the space 200 pairs of shoes would take up (some of our female readers may not need to engage their imagination)? Or the 200 odd socks you've mislaid? In fact, I'm not sure I own 200 of anything, although I can lay my hands on the 100 copies of *PC Advisor* to which I have made a small contribution. And I can tell you from personal experience that it takes a lot of talented people a great deal of time to put together one issue of a magazine like *PC Advisor*, so the combined skill and effort of all of our editors and contributors over the years deserves recognition.

More important even than that: you can't keep making a magazine if people don't read it. So let me take this opportunity to thank all *PC Advisor* readers past and present (especially present) for their continued support. There have never been more ways of reading *PC Advisor*, from this magazine in both print and digital formats, to the PCAdvisor.co.uk website, our mobile website (mobile.pcadvisor.co.uk), our many smartphone and tablet apps, as well as Facebook (facebook.com/pcadvisor) and Twitter (twitter.com/pcadvisor). And there have never been more *PC Advisor* readers - around 1.6 million at the last count. But

there's no better way of enjoying *PC Advisor* than in our curated monthly round-up the very best news, reviews, features, tips and buying advice. The magazine as you're reading it now.

In honour of the bi-centennial issue of *PC Advisor*, we've put together no fewer than 200 pages of expert advice: much of it based around the theme of, well,

200. So in this section you'll find 200 great tips - our biggest ever guide to making the most of your

PC, laptop, printer and camera (overleaf). We also find out what our team of intrepid writers would shell out for if they were given £200 to spend only on technology (page 102), before juxtaposing those putative purchases with the technology of 200 issues ago when we take a look at what the money you spend on PC components and software back then would get you now (page 108). Sample fact: if houses depreciated in value at the same rate as hard drives since 1995, an average two-bedroom semi-detached house in a coastal Devon town would now cost £155.

We've also been looking back, misty-eyed, over the 200 months or so that have passed since *PC Advisor* was born. Arguably, there has never been a more fast-paced period of growth in information technology. We've picked out 10 significant changes we've seen in personal computing, and the ways in which we interact with it (page 110). We've also identified 10 major breakthroughs that allowed us to reach the point we are at today (page 120), and even tried to select the 10 best products we've seen from the thousands we've reviewed (page 128). And while we're looking back, we hope you'll indulge us as we spend a page or two picking out some of our favourite *PC Advisor* covers, showing as they do the way that what matters in tech has evolved over the years (page 143).

We've also thrown forward, leaving ourselves hostage to fortune by making 10 bold predictions about how technology will change over the next 200 issues (page 136). And the only way you'll know how wrong we are is to keep reading *PC Advisor* for all that time! (No pressure.)

All the people who work so hard to put together *PC Advisor* appreciate what a privilege it is to do so. And we know full well that we couldn't do it without you, our readers. It's been great fun sharing *PC Advisor* with you for the first 200 issues, and we look forward to many, many more.

Matt Egan
 Editor, *PC Advisor*



Biggest **ever** **tips** **guide**

Rosemary Hattersley presents our biggest ever collection of tips and tricks for getting more from your PC, laptop, tablet, phone, printer, camera and more

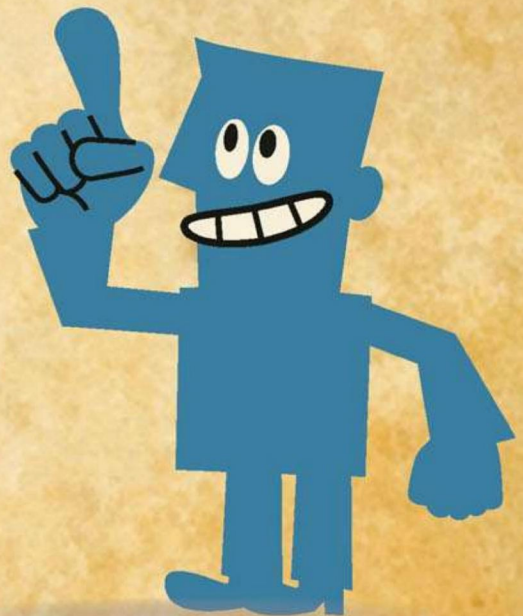
We use our PCs and laptops for so many different tasks these days, it's a wonder there's a point in the day when we aren't using technology in one form or another. Whether we're getting all we can from this technology is, however, a very different matter.

Over the years, *PC Advisor* has offered productivity advice on a vast range of loosely PC-related topics. We're not sure that many readers need to know about powering their laptop from the deck of a canal boat, but web access from the garden shed and installing wireless broadband for use in a caravan are queries that have come up more than once.

Over the following pages, we present some of our favourite tips for getting your PC out of a fix, repairing a wonky installation, recovering from malware and avoiding social-networking pitfalls. Drunken tweets? Check!

There are a lot of tips here: some are satisfyingly techie; others are more about enhancing your PC and tablet-based entertainment. Our aim was to provide something for everyone – a bit like all 200 issues of *PC Advisor*.

Featuring advice from Rick Broida, Chris Byers, Marco Chiappetta, Eric Geier, Andrew Harrison, Dave Johnson, Paul Monckton and Carrie-Ann Skinner.



PHOTOS, MUSIC, VIDEO; PC SETUP

Organise and edit photos for free

Picasa is a great free photo editor and manager. Get it from picasa.google.com and let it manage your images and display them in groups automatically organised by date. It supports tagging and face recognition, and offers some simple non-destructive edits.

Create a custom screensaver with Google Picasa

Google Photos Screensaver (get it free from tinyurl.com/2vrwuz) is another freebie based on Picasa. Launch Picasa, click the Tools, Configure Screensaver option and select a source from those listed in the Settings menu. RSS feeds, Flickr photostreams and your own photo library are all options. Pan, zoom and panorama are all supported.

Use Windows' photo-printing tools

Windows may offer little more than Paint in terms of photo-editing tools, but its Fax and Photo print driver is rather clever. It can auto-arrange photos on a page, stretch or resize them, and help you choose the most appropriate paper type and resolution.

Create a musical slideshow in Windows Media Center

Windows Media Center usually offers up some exploding fractal graphics to accompany your choice of music. Head to the Tasks, Settings menu and add some photos to your Favourites menu - tagging any you wish with star ratings. Click Save, then go to the Music Library, select an album and press Play. Choose Play pictures from the far left to start the slideshow.

Sound advice

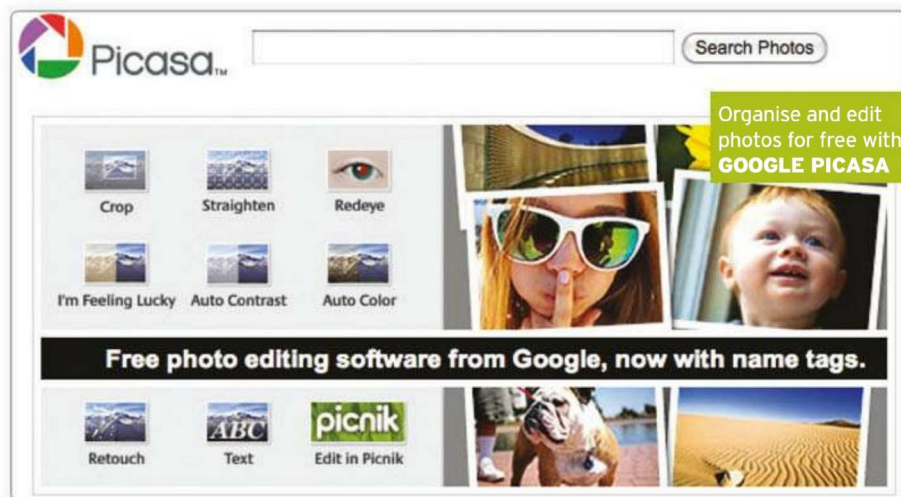
Windows audio can sometimes cause music playback to stop. If this happens go to Control Panel, Sound. Select the Playback tab and check your preferred sound output is selected as the default device. If it isn't, highlight the preferred option and click Set Default.

Volume issues

Updating the drivers for the internal sound card or for any external speakers often clears a playback issue. Check the Sound, Properties, Advanced tab, and try adjusting the playback quality settings and clicking on Test to see if something else is interfering.

Play more video formats than just Mpeg4

QuickTime and Mpeg4 movies are actually a collection of video codecs, but they are fairly widely supported. If your tablet, PC or laptop



won't play a clip that you want to watch, try either VLC Media Player (videolan.org), which can handle most video files without additional software, or download the Combined Community Codec Pack for Windows Media Player (cccp-project.net).

Safari's iTunes safe browser

Whenever we plug an iPhone into a Windows laptop, iTunes seems to spend ages thinking about synchronising our music, and so on. We've noticed it's checking with Safari about safe browsing. There's no real need, so just click cancel to go straight to your iTunes library.

Add album art

Missing album artwork in Windows can be tracked down by right-clicking on the album cover and choosing 'Update Album Art'. In iTunes you need to choose 'Enable Automatic Downloading' for your cover art. To track down any that iTunes has missed, try the collection maintained by Amazon, which is also available as a widget from Apple's downloads site at tinyurl.com/6etn85.



PC makeover

You can instantly change the look of your Windows PC by changing the desktop background to something other than the images that came with Windows. Right-click anywhere on the desktop, choose Personalize and then select a new wallpaper.

Warm to your Windows Theme

A theme is a combination of pictures, colours and sounds that give Windows PCs a particular look and feel. You can change the default one by right-clicking the desktop and choosing Theme, then selecting from those on offer. Alternatively, download one from tinyurl.com/273hutd.

High-resolution hell

Just because your display is capable of supporting HD resolutions, it doesn't mean you should set it to do so all the time. Cramming more pixels into a smaller space results in a smaller onscreen image - so you're more likely to squint. Right-click on the desktop, choose Screen resolution and select a slightly lower setting.

Beware screen fatigue

Of course, we all love our PCs, laptops, tablets and smartphones, but you can have too much of a good thing. Give your eyes a break from that backlit screen. If you're forgetful, use a pop-up reminder app. The likes of AntiRSI can also be useful to stop you ending up with aching limbs.

Get a second screen

If you mainly use your laptop at the same desk or table, consider using an external LCD. You'll enjoy a larger screen and will be sitting further back from the screen itself, making for a more comfortable viewing experience.

PRODUCTIVITY; WEBMAIL; CONNECTING ONLINE

Keyboard conflicts

Your Windows keyboard will almost certainly be set up for UK English, but third-party apps sometimes change this. When we installed Apple's iCloud software to synchronise the contents of an iPhone, for example, some keys started displaying anomalous behaviour. To change the keyboard back, click on the Keyboard icon in your laptop's System Tray and change the option to UK Extended.

Symbolic gestures

Add frequently used symbols to your custom keyboard with the shortcut key assignment tools in Word. Go to the Insert menu and click on those you need most often.

Fool the format tool

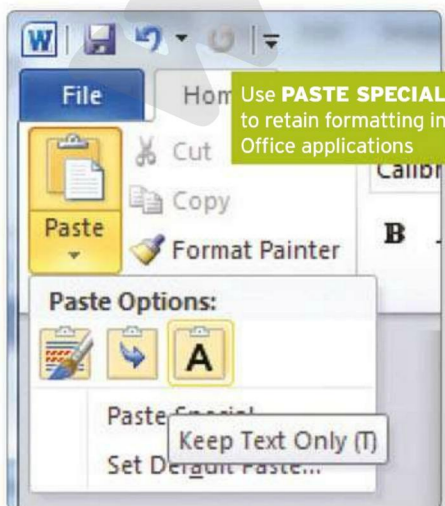
Formatting in Microsoft Word and other Office applications is often too clever by half. To paste an item into a text document without changing the formatting, use the Paste Special command at the top left. If you are pasting in items from multiple sources, you can ensure consistency under Paste Options by clicking on the Default button.

Image-embedding options

Image files also have their own paste options: choose Device Independent Bitmap if you need to precisely reproduce an image.

Instant replacement

Ctrl, H to find and replace is ideal for all sorts of things: you can make universal changes to the format or spellings, and can also override imported character symbols you don't like. A common bugbear is that text pasted from the web uses clunky 'straight quotes' rather than more sophisticated 'curly' ones. Enter the before and after choice in the upper and lower fields to amend the lot.



SkyDrive

View the photos and Office documents you have stored on SkyDrive from your Smartphone. Just go to skydrive.live.com on your mobile phone and sign in with your Windows Live ID.

With Windows Phone, pictures you take can be automatically uploaded to your SkyDrive account.

SKYDRIVE offers 25GB of online storage space for free



Shortcut key drill

Keyboard shortcuts require less effort than using a mouse. Ctrl, N for a new document, Ctrl, X to cut, Ctrl, S to save, Ctrl, H to find and replace, and Ctrl, Z to undo are useful.

Fast undo and redo

Among the most useful shortcuts are Ctrl, Z (or Apple, Z on a Mac) to undo any errors you may have made, and Ctrl, Y to redo something you've accidentally deleted. Depending on the program you can use both commands multiple times to go back and forth through your document history or edits.

Down tools faster

Finished work for the day? In Windows 7 or Vista there's no need to close all your open applications individually. Shut them all in one fell swoop with a click of the 'Close All Windows' icon.

Get more screen space

Move the Windows Taskbar and get more vertical onscreen space to view documents and web pages. Right-click an empty area of the Taskbar and clear the option next to Lock the Taskbar. Now drag it somewhere unobtrusive, such as one side of the screen.

Taskbar tweak

7 Taskbar Tweaker (rammichael.com) is a free application that gives you more control over items such as Windows Jump Lists. Our favourite tweak allows the middle mouse button to narrow what's onscreen, rather than obliterating it with a new blank window.



Locked-file fix

Files that you should be able to open but can't, and those that are falsely reported as being 'open by another user', can be prised open by a couple of helpful utilities. Unlocker 1.8.9 is a respected option, while iObit now offers Unlocker 1.0. Grab it from our Downloads site at tinyurl.com/dybdnf4.

Templates work

Don't spend hours tinkering with logo placement and font choices when creating stationery and other standard documents. Microsoft Word has masses of templates built in, while extras can be downloaded from the internet. If you really want a distinctive look, Moo.com offers custom business cards. Similarly, WordPress and other preformatted website templates will serve you very well until you can afford a bespoke design. Devote your energy to the business plan and marketing your products instead.

Protected view and editing and printing docs

When you try to open a Word document that's sent by email, it displays in Protected View. It takes several extra clicks in order to make it editable or for you to even be able to print it. Go to the File, Options menu to tell Windows this isn't necessary.

Preview Gmail messages

There's no split-pane preview option in Gmail. If, however, you click the gear icon at the top right of your account, choose Mail settings, Labs and then scroll down to 'Message Sneak Peek' and click Enable, you'll be able to see an approximation.

View only unread Gmails

Gmail's almost limitless inbox is great for archiving lots of messages. But if you want to filter out those you've already seen, and head straight for only unread messages, enter **is:unread** in the Search Mail field at the top of your inbox.

Continues >>

Don't depend on Gmail

Having a seemingly limitless email archive to draw upon is great news; having a multi-gigabyte archive go missing isn't. Having experienced just such an outage in early 2011, we quickly looked into ways to prevent it from happening again. Google Backup can save and store your mail box, and download it if required. See tinyurl.com/cfmywo6 for in-depth details.

Get a Hotmail address

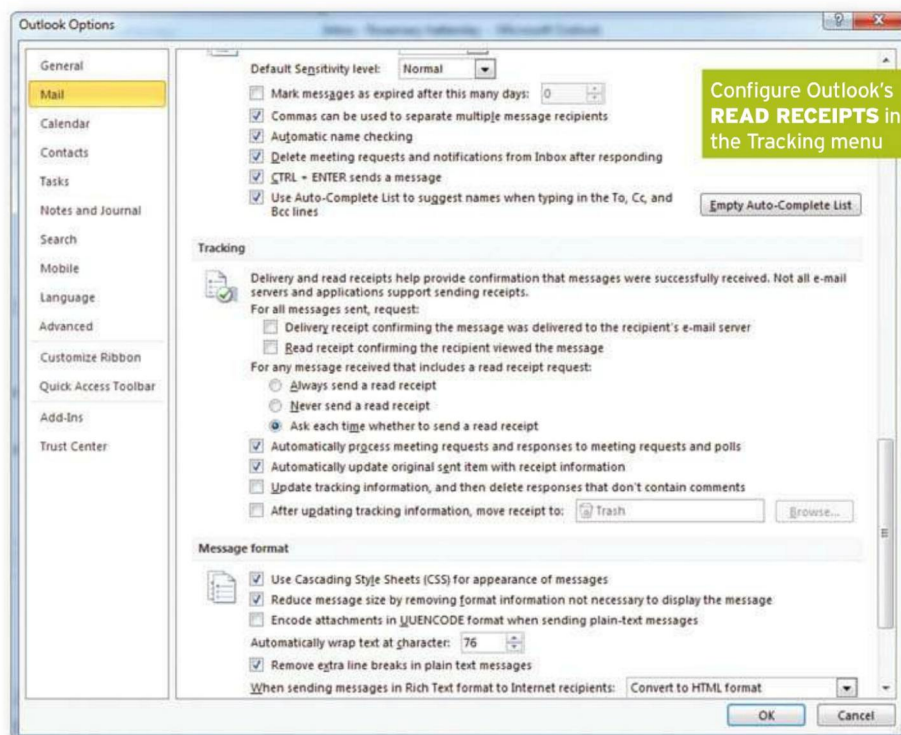
Hotmail may sound like a throwback email client, but we can't argue with the free 25GB of online storage that Microsoft offers in return for creating a Microsoft ID and using its SkyDrive (skydrive.live.com).

The SkyDrive's the limit

Better yet, you can use an existing email address to log in at windowslive.co.uk/skydrive and still claim that 25GB of free storage space.

Zimbra Desktop email management

If you favour Hotmail or Yahoo Mail over Gmail, you can back up emails for free using Zimbra Desktop (zimbra.com).



Read-receipt wrangle

If you need to use Outlook email, but are forever being bugged for unnecessary receipt acknowledgements, head to Options, Mail, Tracking menu and choose either 'Always send a read receipt' or 'Never send a read receipt', rather than continuing to be prompted each time.

Outlook file fail-safe

We often get asked how to export or back up .pst files for Microsoft Outlook. Since these sometimes get corrupted, preventing the program from running, it's useful to know.

Note that you may first need to 'unhide' the file. The Outlook/.pst file is a hidden file within a hidden folder. Go to Folder Options and select 'Show hidden files and folders'. To export the file, go to the File, Import and Export menu in Outlook 2003 or File, Data File Management in Outlook 2007. Save it to an external device for safekeeping.

Email massive missives

It's considered bad form to email huge attachments of your children and grandchildren to blameless relatives. If your 'outlaws' haven't yet heard of it, introduce them to YouSendIt - a free email delivery service that lets the recipient pull down the photos to their hard drive at their leisure.

iPod touch talk

There's much to admire about Apple's iPod touch, but one of its best features is that even though it's not tied to a phone contract it can still be used for web chat. As an iOS device with full access to the App Store's gems, the likes of Truphone, Vonage and Skype can all be used for Wi-Fi calls.

Find My iPhone

Siri may be all chat, but you'll surely have plenty to say if your iPhone ever goes walkabout. Enable 'Find My Phone' in its Settings menu and you'll be able to track its latest whereabouts (clue: under the cushion on the sofa).



SECURITY

Don't double up on antivirus

A two-way firewall, good anti-spyware and an antivirus that's kept up to date will help protect your PC. Two antivirus products installed on the same PC will, however, wrestle each other for supremacy, rather than look out for rogue software. Removing one to let the other do its job usually involves lots of coaxing and restarting the PC in Safe mode.

Ignore bank notifications

You cheerfully ignore phishing messages that arrive in your inbox from financial institutions other than your own on the basis that there's no reason for them to be contacting you. Do the same with any messages that purport to be from your bank. Hovering your mouse over the originating email address may uncover the deception, but this can also be spoofed. If you're not sure whether an email is legitimate, call the number on the back of your credit card and ask if they've been trying to get in touch. Banks never email.

Odd messages from your mates

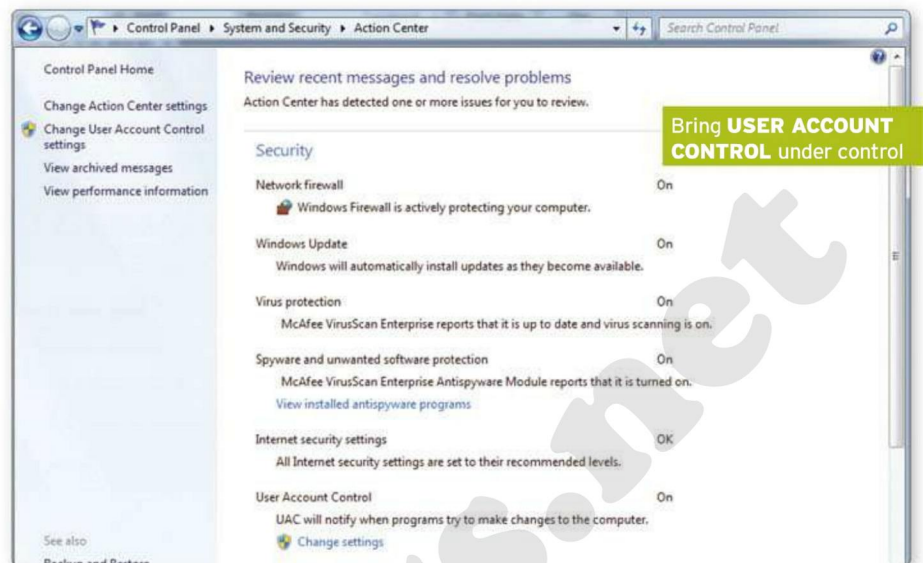
Facebook, Twitter and your email inbox are increasingly being used to dupe you, and it's the messages that appear to be from your friends that are the delivery mechanism. If a message or an action isn't the sort of language your friend would use, assume it's spam or their account has been compromised, and let them know.

Just can the spam

Don't reply to spam, or even open it if possible - it confirms that your email address is in use and encourages more spam.

Don't click that link

Don't click on links in emails - cut and paste them into a site checker such as mywot.com and have their integrity checked.



Short web address danger

Shortened web links take up less space on a Twitter message, but don't always take you where you expect. Create 'safe' short links using mcaf.ee, which verifies the page it goes to and flags up any changes between the link's creation and the user clicking on it.

Practice online prudence

Safe browsing isn't just to stop kids seeing things they shouldn't; raising the security settings in your web browser can also prevent you from viewing images and other elements you wish you hadn't, as well as potentially endangering your PC's security. A browser's Tools options let you blacklist and whitelist specific sites, and give any with dodgy images, for example, a wide berth.

Don't leave details

Clear your browsing history and remember to log out of any email or social network accounts after using someone else's PC.

Be autocomplete-aware

Autocomplete is useful, but convenience has its down side, especially with keylogger programs able to harvest the data. Go to the Settings menu in your browser and switch off autocomplete.

User Account Control

For convenience and security, set UAC to tell you of actions that access the Registry, but not those you've initiated. Go to Control Panel, System and Security and, under Action Center, click Change User Account Settings and adjust the slider.

Back up and surrender

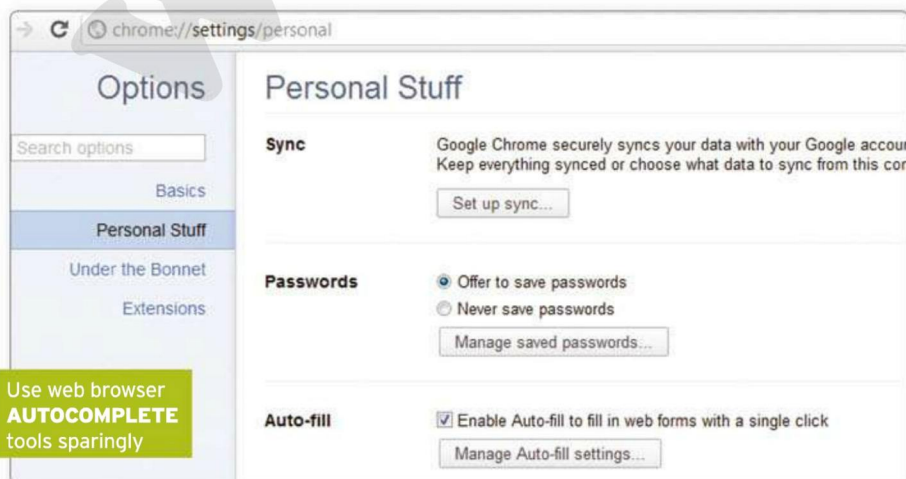
We know we bang on about backups, but we also know how annoying and time-consuming things become when you lose important files. Choose an external hard drive (see our group test on page 66) that autosyncs, can be encrypted and is small enough to fit in a pocket. Or why not try a web-only service such as iCloud or SkyDrive?

Secure that USB key

Backing up to a USB thumb drive that you lose within days is no way to look after your work or personal files. Email yourself a copy of important documents if you really can't be bothered to back up properly. Just ensure that you use a service such as PKZIP or PGP to encrypt sensitive files.

Make better passwords

Most of us are guilty of using the same few passwords for everything. Use the brilliantly named Awesome Password Generator (tinyurl.com/bmd9tdf) and you'll have neither need nor excuse.



BROADBAND; WIRELESS SECURITY

Situating your router

Where you site your broadband router can have a significant effect on the Wi-Fi signal that's carried around your home and the connection you experience. Thick walls, interference from other electrical items, and being placed low down rather than at waist height or higher all make a difference.

Don't let it snow

The weather can affect your web connection. Extreme cold, wind and wet can all hinder the service. "If you hear noise on your phone line it's a fair indication of damage to the wiring itself. If you hear any hissing, crackling or popping you should report it to your telephone provider. When the noise is gone your broadband should return to normal," advises broadband provider Plusnet.

Clean those filters

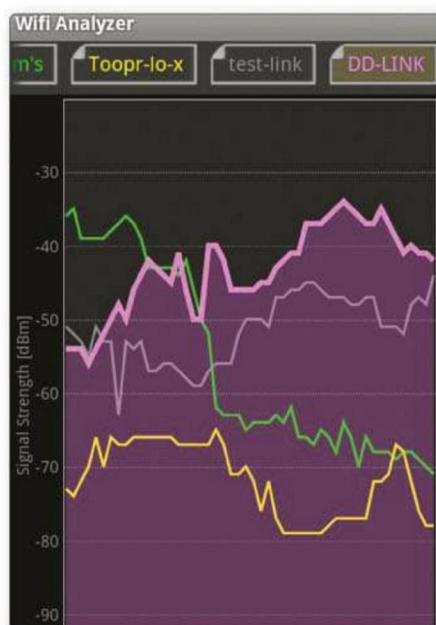
A fresh ADSL filter costs less than £5 and can improve your broadband connection. The BT Shop and some hardware stores sell them. Ensure the broadband connection is plugged in directly. A BT I-Plate may further boost the contact point, although it is debatable.

Wi-Fi check

With so many of us using wireless networks to get online, there's bound to be some jostling for priority. Android users can check for channel congestion and make an informed choice of which one to switch to using Wi-Fi Analyzer (tinyurl.com/7woLkvp).



Consider using a BT I-PLATE to boost your broadband connection



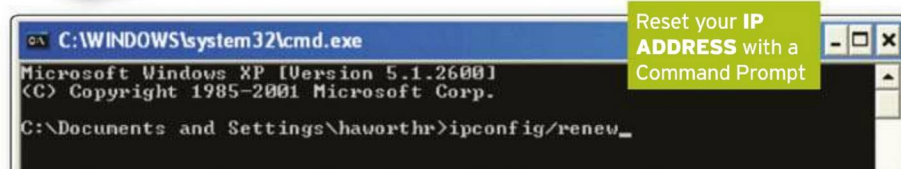
Reset your IP address

If your system's connection to a network is unreliable, or you're getting IP address conflict error messages, try renewing your IP address. First, click on the Start button, navigate to the Command Prompt (Start Menu, Applications, Accessories, Command Prompt), right-click it, and select 'Run as Administrator' from the menu. Then type **ipconfig /renew** and press Enter.

Flush your DNS cache

When you type an address into a browser, your PC asks the DNS server to translate that URL into an IP address, and caches that information. That data cache can occasionally become outdated or corrupt, which can cause internet connection problems. To clear your DNS cache, run a Command Prompt as the administrator, type **ipconfig /flushdns** and press Enter.

Restarting a Windows 7 system will also flush its DNS cache, but if any applications (malware, for example) are altering the cache, flushing manually could also help.



Raise the antennae

One of the limiting factors for Wi-Fi routers is that they tend to come as compact boxes, with little or no antenna protrusion. However, the interplay between their multiple antennae magnifies their effectiveness. We recommend that you screw on a larger, more powerful antenna for a noticeable Wi-Fi boost.

Bluetooth lament

Bluetooth is a very useful, localised communication and file-transfer technology. Gadgets with this feature switched on announce themselves by broadcasting their presence and seeking devices with which to pair. When not using the Bluetooth keyboard, headphones or headset for your laptop or smartphone, disable Bluetooth. Rogue files can be transmitted by passers-by.

Avoid torrents

There's been a lot of press coverage about the 'three strikes' rule relating to customers downloading pirated music. We don't condone file sharing of copyrighted content, but nor do we think much of the strong-arm tactics used by ACS:Law seeking to intimidate customers suspected of doing so. More pertinently, using torrent and peer-to-peer sites leaves your computer vulnerable to infection. Steer clear of such online temptations. It may well be cheaper in the long run.

Lenovo® recommends Windows® 7.

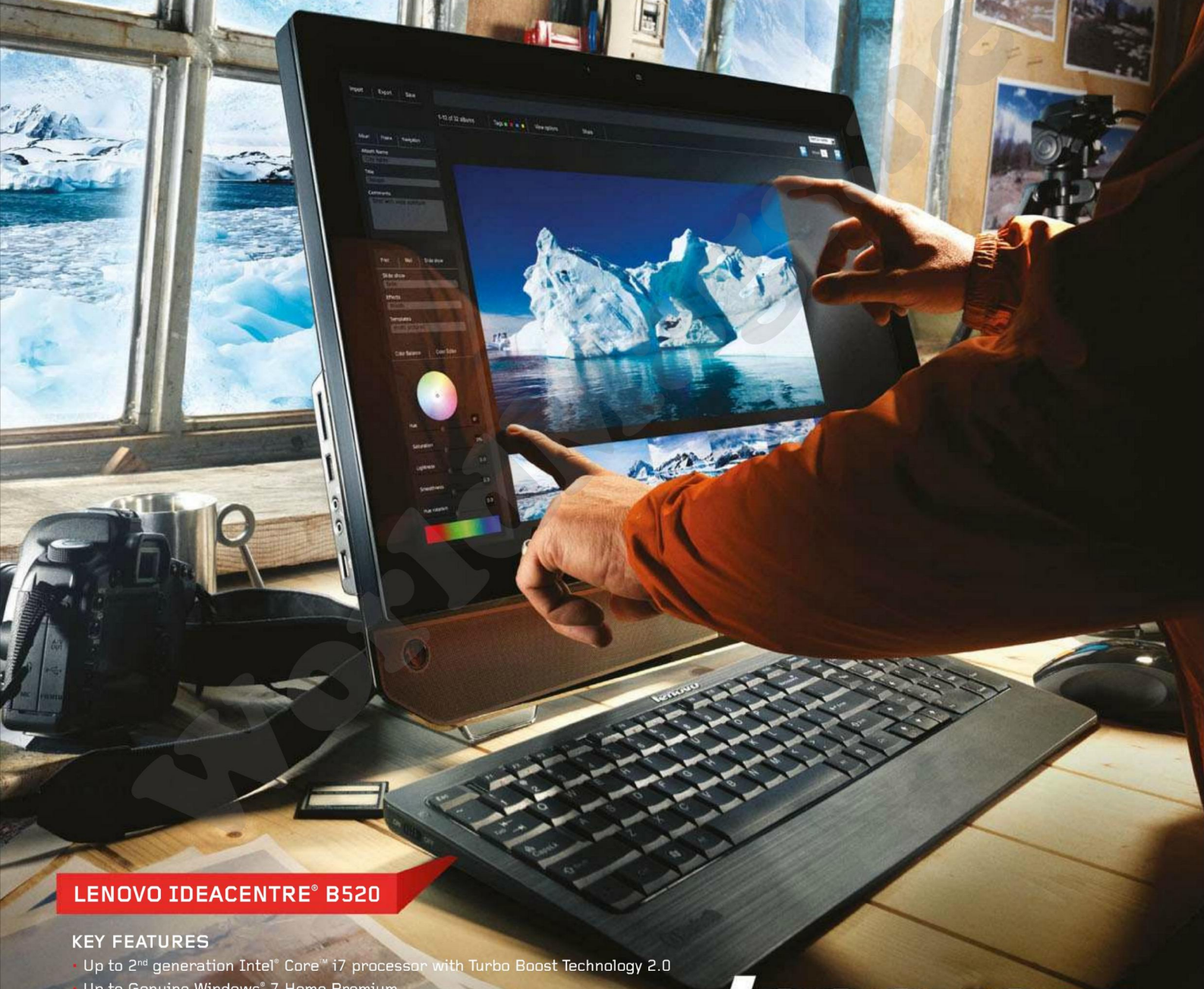
intel inside™

CORE™ i7

Visibly
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MIDDLE OF NOWHERE | UPCOMING PHOTO EXHIBITION | ONE TOUCH AWAY FROM AN AWARD

PLACE YOUR IDEAS
WHERE THEY BELONG.
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- Up to Genuine Windows® 7 Home Premium
- Cinematic 23" full HD frameless multitouch display
- Integrated digital TV tuner
- Integrated 5.0 speakers brings entertainment to life
- 3-in-1 mouse for gaming and remote control functions

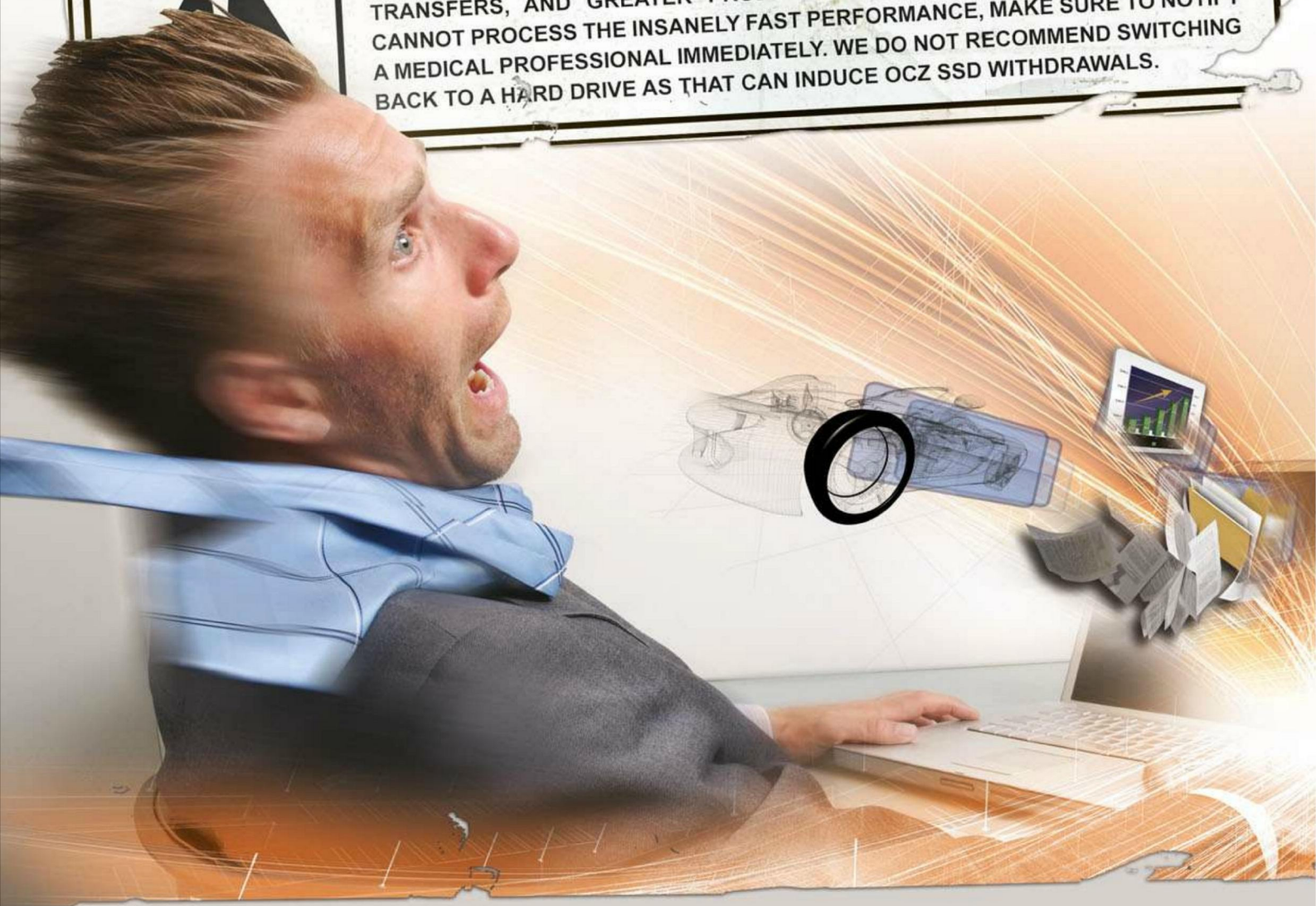
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WARNING!

OCZ SOLID STATE DRIVES ARE KNOWN TO SERIOUSLY INCREASE YOUR SYSTEM PERFORMANCE TO LEVELS 100 TIMES OVER HARD DRIVES. BE FULLY PREPARED FOR SNAPPIER DATA ACCESS, QUICKER BOOT UPS, FASTER FILE TRANSFERS, AND GREATER PRODUCTIVITY. IN THE EVENT YOUR BRAIN CANNOT PROCESS THE INSANELY FAST PERFORMANCE, MAKE SURE TO NOTIFY A MEDICAL PROFESSIONAL IMMEDIATELY. WE DO NOT RECOMMEND SWITCHING BACK TO A HARD DRIVE AS THAT CAN INDUCE OCZ SSD WITHDRAWALS.



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- SATA 3.0 6Gb/s and SATA 2.0 3Gb/s
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INTERNET

Defeat Facebook tagging

Do you hate it when your friends tag you in photos? Facebook has recently added an option to report or block whoever is tagging you. Click the Report/Remove Tag option below the offending image, decide whether to simply tell Facebook to remove the tag, or go further and state how it offends, harasses or infringes your rights, click Continue, then request its removal. Better yet, have a quiet word with your friend.

Report Facebook spam

Facebook messages posted in your name are bad news, and tagged images can be an unpleasant surprise. If your Facebook account – or a friend's – is compromised, immediately report it and change your password. This may be inconvenient, but it's better than your friends being phished. Facebook's Report/Remove Tag beneath photos makes reporting it easy, too.

Remove unfortunate tweets

If you said something in haste on Twitter, you can easily fix it. Go to your own feed and press Delete to remove the offending missive. With luck, no-one else will have seen it; if you think it necessary, immediately tweet

FIREFOX is a good alternative browser to Internet Explorer

Different by Design

Proudly non-profit | Innovating for you | Fast, flexible, secure

Firefox
Free Download
8.0.1 for Windows
English (British)

Systems & Languages | Release Notes | Privacy

an apology (but don't repeat what you said). If you tend to tweet ill-advisedly late of an evening, use a tweet checker or tweet delayer to save future red faces.

Can the Twitter spam

Twitter spam is easy to block – simply click on the follower, then press Block Sender. Be particularly wary of people sending you @messages. These are often spam and are designed mainly to appear in your feed to trip up unsuspecting followers.

Internet Explorer has its uses

Not all browsers are the same. Google Chrome and Firefox are often regarded as better than Internet Explorer, but there are plenty of tasks that are optimised for Internet Explorer, which may not work properly in other browsers – FTP sites being one.

Keep your browser options open

It's worth keeping your options open and having several browsers installed, so you can fire up an alternative if your usual one freezes. If you use only one browser and then have to install a new one if it goes down, you'll lose precious time installing it. You can use one browser for work, one for email, and so on.

Get a custom home page

Why give MSN or Google your clicks? Either go to the Tools menu in your browser and choose the site you visit most often, for convenience, or give a charity site such as Everyclick (everyclick.com) a boost by launching to its home page by default.

Give as you shop

Whether you like books (Flashlight Worthy), bees (BBCT), animals or many other charities, clicking the links from its site as you go to Amazon or other large e-tailers can be used to earn them micro-payments.

Lose the browser hangers-on

Browser extensions can cause issues. If your browser throws a wobbly, switching off all the extensions and then selectively reinstating them can quickly identify the culprit and banish them, while losing only a minimal number of convenience keys.

Share photo albums over Wi-Fi

Facebook and Flickr don't have all the best tricks: you can show off a photo gallery stored anywhere you wish without the iniquity of sarcastic 'friend' comments using a SkyDrive and your smartphone or laptop.

What would you like to do?

James Walker uploaded this photo and tagged you in it. If you dislike this photo you can:

- ☒ **Remove the tag James Walker created**
This removes the tag and takes the photo down. The photo will still be visible in other places unless James asks to take it down.
- ☐ **Ask James Walker to take the photo down**
Send a message to James to ask to take the photo down. This is the best way to remove the photo from Facebook and help James post better photos in the future.
- ☐ **Block James Walker**
You and James will not be able to contact each other on Facebook, and James's photos will stop showing up on your Profile. You might still see the photo and the tag on other friends' profiles. You can manage your blocked list on the Privacy settings page.

Continue Cancel

everyclick Raise money for charity

Welcome | Sign In
Giving to All Supported Charities

Search the web and raise funds for free

Web Search

Where is this?

£2,248,513.38
raised for charity

Join the **168,471** fundraisers who are raising money for charity right now

Get Involved!

PC PROBLEMS

Get a web diagnosis

There are very few computing problems that the web is unaware of. Typing in error codes and brief descriptions of symptoms can be one of the most effective ways of identifying and troubleshooting a problem. If you can't find an immediately obvious error message, look in Control Panel, Problem Reports and Solutions (Vista). For Windows 7, open Control Panel, Action Center, Maintenance, View reliability history, and click on View all problem reports at the bottom of the window.

A better process manager

Sysinternals Process Explorer is a strong alternative to Windows' Task Manager. Click on one its four graphs - CPU usage, commit history, I/O bytes history and physical memory history - to bring up a full-sized window view that's akin to the Performance tab in Task Manager, but with far more detail.

Analyse the Blue Screen of Death

Thankfully, the Blue Screen of Death is an uncommon Windows sight these days. Should you experience one, we recommend BlueScreenView (tinyurl.com/Ly4dmg), which can help identify the driver that caused it.

Find out what's hogging disk space

WinDirStat (windirstat.info) generates easy-to-understand graphical reports about disk usage, so you can see at a glance which individual files or folders hidden deep within a directory tree are gobbling up your memory.

Start up faster with Delayer

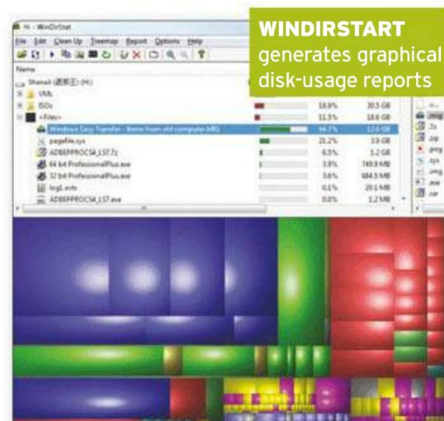
Windows 7 is faster than its predecessors, but if you've been using it a while and have clogged it up with programs and files, it'll be feeling the strain. Use Startup Delayer (tinyurl.com/7c48fgz) to prioritise which programs load when you first fire up Windows and which can be held back.

Restore-point revival

Windows automatically recreates a restore point when you install a program, make a certain type of change to your system, or simply because it's scheduled to. If your PC throws a wobbly, type **System Restore** in the search box to bring up a calendar showing the last such point. Roll back your PC to before things went awry, then restart.

Don't restore malware

An exception to the above restore point advice is if you're trying to clear an infection. It's possible the System Restore archive is itself infected. See page 156 for more.



Create a system repair disc

Before things go wrong is the best time to make a backup of Windows. To do so, insert a blank disc, click the Windows Start button, type repair, and choose 'Create a System Repair Disc'. Follow the instructions from there, remembering to label the disc when you've finished.

More RAM

Windows used to be limited to only 2GB or 3GB of RAM. The days of 32bit computing are numbered; if you were canny enough to choose a 64bit Windows machine, you'll be able to enjoy 3GB or more.

Instant RAM upgrade

Installing more RAM in your laptop is tricky, so for an instant boost you can use a USB flash drive. In the AutoPlay options, choose the option to use the drive's available memory to boost performance.

Avoid electrical interference

Cable clutter is unsightly. It can also cause electrical items to short-circuit and data transfers to take longer than they ought. A cable tidy, or simply unfurling curled up

cables, can help. Cable ties that tame excess lengths are also useful.

Disk-integrity check

It's a pain having to wait for Windows to check your USB drive or CD isn't corrupt, but it can make the difference between peace of mind and a botnet infection. Allow your security software to proceed.

Revive a dead laptop battery

If your laptop is a few years old, the battery won't hold a charge as long as it used to before needing to be plugged in. Before replacing the battery itself, try replacing the laptop fuse (if the charging light on the battery doesn't come on, it's the charger at fault). Compatible chargers can be bought if the manufacturer can't supply one, just makes sure the voltage is the same.

Cleaner, faster computing

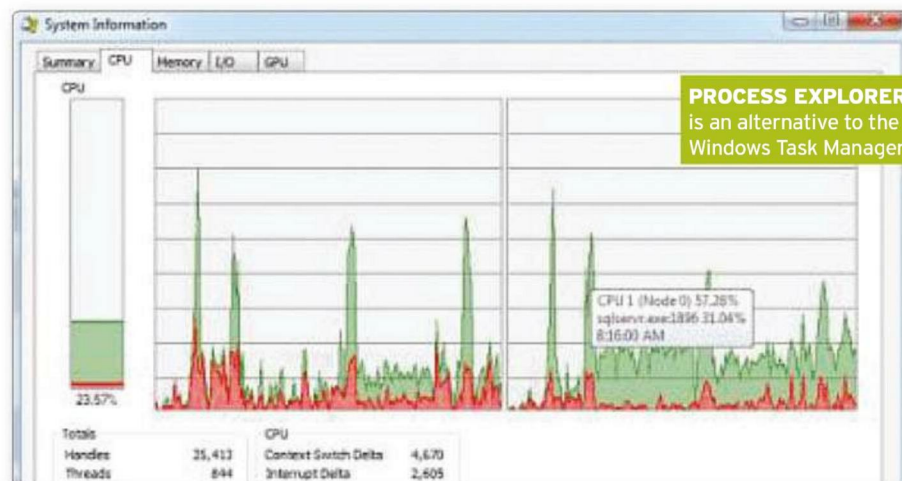
See all that grot that's accumulated on your computer keyboard? The fan grille and the interior of your case also get dusty and grubby. Wipe a damp lint-free cloth over the exterior of a switched-off machine. A low-power mini vacuum to clean the innards occasionally will also help a PC's efficiency.

Back up your system drives

Semper Software Drive (sempersoftware.nl) saves and restores all system drivers. This is invaluable since system manufacturers rarely supply drivers on disc any more, so if you ever need to wipe your hard drive and reinstall Windows, you might find yourself without a critical driver.

Carry your apps with you

Like the way your PC is set up? Carry your media manager, web browser, office software and preferences with you, and you can



PC PROBLEMS; EMAIL; BROWSING

hotdesk with aplomb. A SanDisk U3 drive will let you log in at any Windows PC and get to work as if you were sitting at your usual PC desktop. Apps are available from PortableApps.com.

One PC; many users

Security and parental controls are two good reasons to have different login accounts for family members. Preferred desktop layouts, browsers, email clients, backgrounds and screen settings are another. Head to the Control Panel and click User Accounts to get a personalised desktop for everyone.

One careful user

If no-one else uses your PC, you can speed up logins by having a single user account with full admin rights and no password protection. This isn't recommended if it's a laptop that ever leaves the house, though.

Limited users are liberated users

You need one Windows user account for the administrator. Getting into the habit of instead logging into a separate 'limited' user account makes sense from a security point of view. Malware needs admin rights in order to get to the Registry and to make other substantive changes to your computer's setup. It can't do this if you're using the PC in non-admin mode.

Switch your operating system

If you want to play it even safer, running Mac OS X or a Linux OS rather than Windows is a good alternative. If you're comfortable partitioning a hard drive, you can dual-boot your PC and keep your OS options open. Parallels software is another good option and supports multiple OS environments.

Copyright your work

You've probably noticed watermarks on images on the web; you can add the equivalent to your own work by choosing the



Tools, Protect document option in Microsoft Word. Click the Read Only button and select a password before allowing that report you composed to be published.

Protect it with a PDF

PDF creation used to be the preserve of the publishing industry, but there are now free tools such as Nitro Pro (tinyurl.com/dyy6cgv) that can create them at a much lower cost than Adobe's Acrobat. More recent versions of Word and Excel also have a File, Save As, PDF option in their drop-down menus. By saving this way, you prevent someone easily editing your words or spreadsheet contents.

Micro-manage your email

Filters and rules are often used by office workers to keep on top of the vast amount of email flooding into their inboxes. Webmail software such as Hotmail and Gmail also support filtering. Go to the Filters tab and click Edit in the Gmail inbox view to create and apply rules for bypassing or filing items.

Visual email overview

Click on the Labels tab at the top of your Gmail inbox to start colour-coding contacts to earmark personal and work mail.

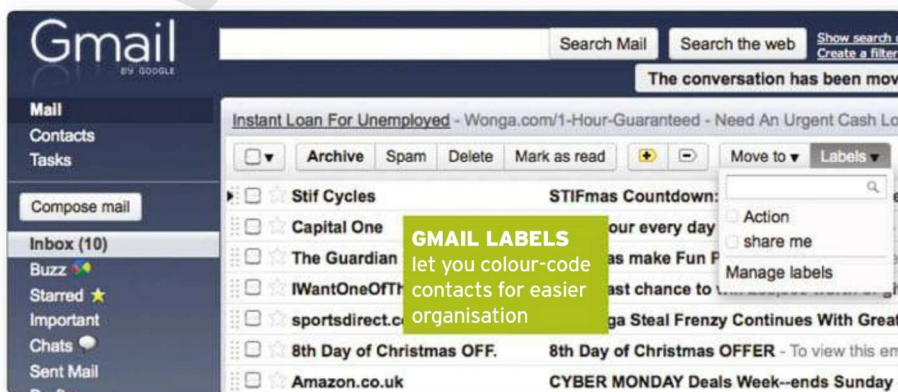


Trace an email's origins

If you want to know the source of a suspicious email or URL, check its IP address. To trace the IP address of a web domain, such as pcadvisor.co.uk, go to Start, Run and type **cmd**. In the command prompt that pops up, type **tracert**, followed by the domain name. Tracert will track all stages of connection between you and the website, then provide a final line that includes its IP address. Use this to check the location of the server by using visualroute.visualware.com or ip-adress.com.

Perform a ping test

The simplest of all internet tools is the humble ping command, which lets you use the command prompt to contact a website and see whether it's alive and responding. It also resolves host names to IP addresses, so if you issue the command ping www.pcadvisor.co.uk, it will tell you the site's associated IP address. And it also



Continues >>

PITY THE SOUND'S AS THIN AS THE TV.



There's one problem with flatscreen TVs. The sound quality's a bit flat too.

That's why Orbitsound have developed the revolutionary new T12 Spatial Stereo TV soundbar and iPod dock.

With its integrated 100-watt amplifier and standalone bass subwoofer, the T12 brings

cinema-quality sound to your living room, without the need for multiple speakers and yards of cabling.

And thanks to our unique spatial stereo technology, you hear true stereo sound wherever you're sitting in the room.

We call it the infinite sweetspot, and it's

infinitely better than conventional systems.

But don't take our word for it. Come and listen to the T12 for yourself.

Ears don't lie.



Available at John Lewis or buy online at orbitsound.com

orbitsound
BELIEVE YOUR EARS

BROWSING; MUSIC & VIDEO

tells you the speed of the connection and response - handy if you want to check on your own connection.

Manage browser add-ons

Use Microsoft's Mats Run utility to check for browser toolbars and add-ons. To disable unwanted toolbars, right-click the Internet Explorer toolbar and deselect any you don't use. You may need to look in Manage add-ons or Add/Remove Programs to disable them.

Update your browser to fix performance issues

If a once favoured browser no longer works flawlessly, upgrade to the latest version. Not only will that stop its makers bugging you about the upgrade's availability, but it will improve stability and content handling, too.

Test your web connection

Another web speed test, speedtest.net, also uses a ping test to check the bandwidth between you and the web server your ISP has provided. Remember that connection speeds vary across the day, with peaks of usage in the early evening.

Download domains

For downloads, using a local mirror server somewhere in Europe rather than the US will generally result in faster access to the program you crave.

P2P file-sharing danger

Peer-to-peer file-sharing and torrent sites are among the most dangerous places you can visit on the web. They are fronts for the nastiest forms of malware, and are especially effective as they require you to open ports on



your PC to let other users access your files.

Stream music and video for free

Rather than amassing a digital music library by buying through iTunes or Amazon MP3, you could use the web to stream music instead. There are thousands of online radio stations, but also free versions of music-streaming and subscription services. Napster and We7.com are two good examples; both allow you to enjoy music playlists and to save tracks you like for later offline listening.

Rent your tunes

As long as you're happy to pay £5 per month, Spotify and Napster are content

to share their seven million-strong music libraries with you - including live sets and unreleased studio sessions. Depending on the subscription model you choose, you can log into the account on your PC, laptop, tablet and smartphone, and bring up your chosen playlists whenever you like. Your favourite albums can even be enjoyed offline, so you can tune in without a web connection.

Google, Amazon and Tesco offer free video streaming

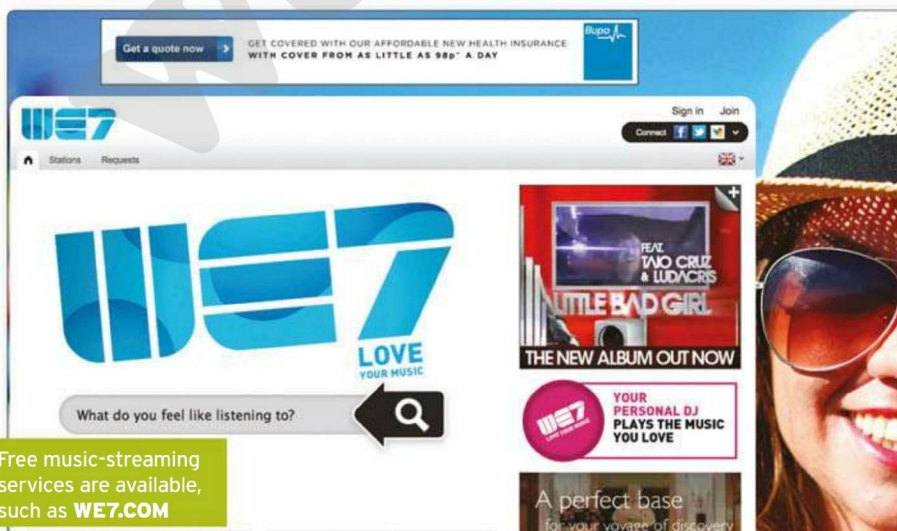
All of the above companies have recently launched video-on-demand services that let you rent or buy outright Hollywood blockbusters, British indie flicks and renowned TV series. Tesco's is called Blinkbox and is preinstalled on some Smart TVs. A limited number of free films and programmes are also on offer, and you don't even need to log in.

BBC iPlayer is now even better

The BBC iPlayer app is so popular that UK ISPs groaned about the extra bandwidth we started using. It's now available on the Xbox 360, PlayStation 3 and Nintendo Wii consoles, but also on iPad and Android tablets, so you can enjoy it in comfort rather than simply through a PC screen.

Add a parental lock to iPlayer

A potential caveat of the iPlayer is that it will play anything it's asked to, at any time. Click on a post-watershed programme title, click



Free music-streaming services are available, such as **WE7.COM**

Continues >>

WINDOWS; HARDWARE



the padlock icon next to the Guidance button, and enter a password and your email address on the Parental Guidance page that pops up.

Act your age

DVDs have age ratings on the box; as do computer and console games. Prevent your children ignoring them by implementing Parental Controls in Windows. You'll find it in the User Account settings.

Remote access tools rule

If you can't fix your PC, someone else surely can. Use the Remote Assistance tools in Windows to get context-based help or allow a technical support staffer to peer at what's happening and apply a few tweaks.

Manage exclusions to Windows Firewall

Windows 7's firewall constantly asks you to allow or deny an application's access to your network. To unblock or block a program, you'll have to manually change some settings in the Windows Firewall control panel.

Click on your Start button, type **Allowed Applications** into the search field, and press Enter. In the resulting window, all the programs installed on the system that were flagged by Windows Firewall will be listed. If there is an application communicating through the Firewall that you now want to block, click the Change Settings button at the top of the screen, then scroll through the list of programs until you find the offending software, and disable it from accessing the internet over Home/Work or Public networks. Conversely, if you'd like to allow a program that was previously blocked, find it on the list, and select the appropriate boxes next to the entry.

Revive a non-functioning PC

We can't perform miracles, but we can suggest some common fixes. A non-starting

PC may have power supply issues, but a poorly seated processor, RAM module or graphics card could also be at fault.

Crashing soon after startup

Uninstall anything you recently downloaded, then check your startup apps and background processes to see if something is going wrong. View the processes in the Task Manager by pressing Ctrl, Shift, Esc and clicking the Processes tab. Use ProcessLibrary.com as a reference to identify the obscure ones.

For startup items, enter **msconfig** in the Start menu Search bar, then launch the application and click on the Startup tab to see what's going on. If something you recently installed shows up in there, it might be the culprit.

Unexplained PC crashes

If your crashes aren't easy to reproduce, get your security software to scan for viruses and malware. If you've recently installed a new security suite and have started seeing problems, try uninstalling it and then use a different one. Security applications typically get deeper into the guts of your system

than other apps, meaning they're more prone to incompatibilities.

Windows won't load

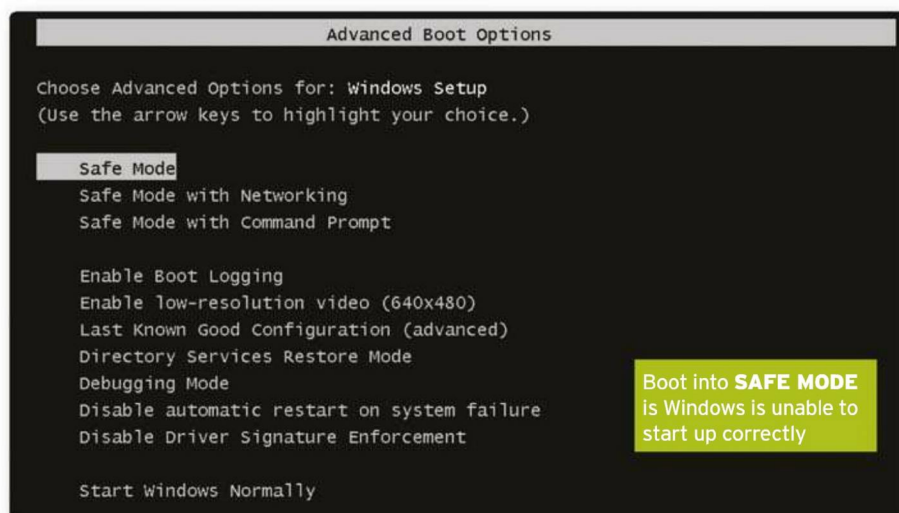
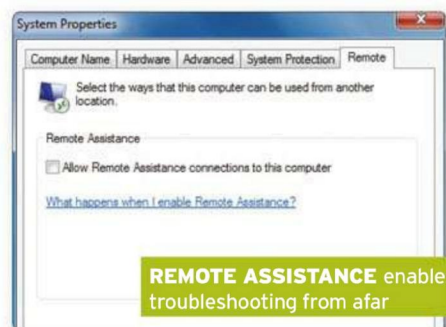
This is best addressed by booting into Safe mode - you'll probably be offered this option if Windows fails to start. Uninstall whatever you installed most recently, update any drivers such as the Bios software, then head to the System Restore menu and select a recent date. Restart the PC.

Hard-drive errors

A failing hard drive won't be fixed using the Safe mode and System Restore tools, but going through the process may help alert you to it. Get your recovery disc, boot up from it, and save whatever data you haven't backed up. Run your disk diagnostic app or Check Disk, which is built into Windows. Right-click your hard-drive icon, select Properties, Tools, then select Check now... under the Error Checking tab. There's no cure for bad sectors - you'll have to replace the drive.

Imminent motherboard failure

The motherboard issues a series of beeps to alert you to its plight. Back up the drive and save what you can before calling on tech help or looking for a replacement component.



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SOFTWARE

Change the operating system

We've already noted how Linux can bring security benefits. Using Ubuntu 11.10 'Oneiric Ocelot' (the latest consumer version of Ubuntu) rather than Windows will also let you get more oomph from an elderly laptop. Another Linux choice: Puppy Linux (puppylinux.org) is lightweight and secure, as well as free, and can be run off a USB drive if you prefer.

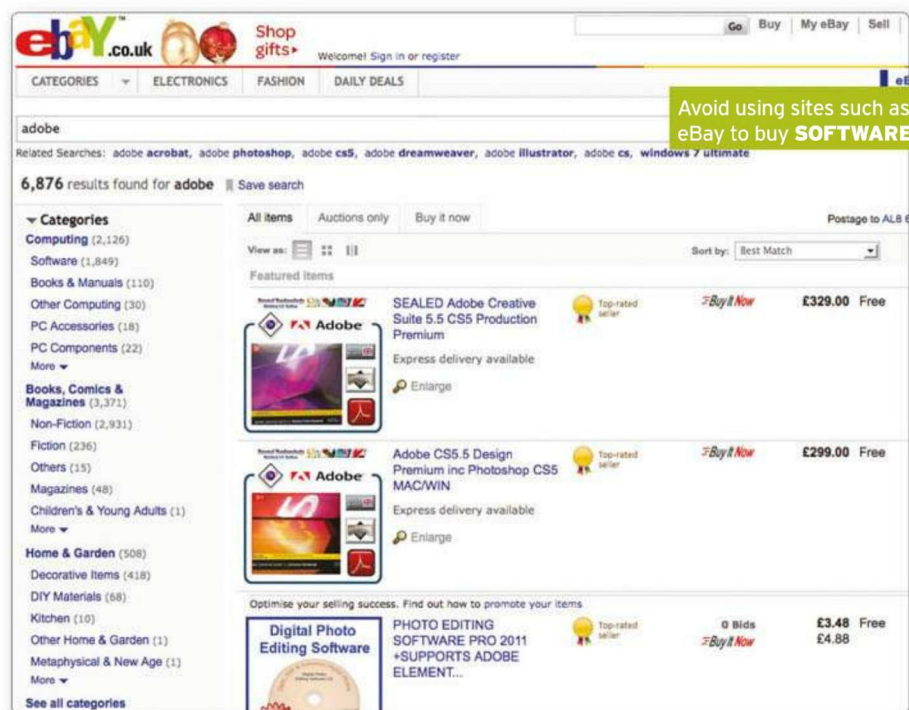
A new Windows for old

Windows is getting less bloated and laggy. Hooray! You could dump Vista or XP for Windows 7 Home Premium and enjoy a slicker Windows experience. Alternatively, you could try out the unfinished Developer Preview version of Windows 8.

You can download it from the *PC Advisor* website at tinyurl.com/3zqh77t (32bit) or tinyurl.com/bwhhaL4 (64bit). The worry-free way to test drive Windows 8 - or if you simply don't have a spare PC on which to run it - is to use virtualisation software. We like VirtualBox (tinyurl.com/cvs9qx6).

Enjoy easier Windows upgrades

You need to back up everything on your PC before doing so, but once you've completed the preparation, there's still lots of hard graft ahead. You'll need to reinstall your applications and transfer your programs files, email and browser bookmarks. Microsoft helps ease this task by offering its Windows Easy Transfer utility, which is available as a free download (tinyurl.com/y2o5wkr). It scans



the software, saves everything to an external hard drive and assembles all the items you'll need when you load up your new version of Windows. It also transfers your files to the correct locations on your new PC.

Wireless keyboard keeps playing up

It's not uncommon for wireless peripherals such as keyboards and mice to present problems. They need to maintain a connection with their RF receiver base

station - the small module that plugs into the PC via USB - in order to communicate to Windows what you're typing. Unfortunately, other electronic items in the vicinity often interfere. If you work with your mobile phone by your side, it's likely to be the culprit.

Is my software kosher?

When you install Windows for the first time, you'll be prompted to activate it. You can run the operating system for the first 28 days without needing to do so but, after that, Microsoft will start reminding you that "this copy of Windows is not genuine", hoping you will activate (or register) your copy. The licence key will be written on the embellished sticker on the disc's paper jacket, or on the box. If you don't have a licence key, you'll need to buy one or face sudden shutdowns and screen blackouts.

I think I've bought pirate software

Software piracy is rife. Buying software through an auction site such as eBay is ill-advised; you transfer money into a stranger's PayPal account, they cash it and provide a string of numbers to unlock the software you downloaded. Expect a nasty malware infection as well as there's a high likelihood that the software is 'cracked' and therefore unusable (or not legally). Our advice is don't bother. If you can't afford to buy expensive software, there are many free alternatives for almost every computing and creative task imaginable.



MOBILE

Keep files in sync

Always have the latest version of a given file to hand: use Dropbox (dropbox.com) or SugarSync (sugarsync.com) and they'll do the sorting for you. Install the free software on your home and work PCs – and your iPhone, BlackBerry or Android device if you need to – and the most recent version of a file will arrive in the Dropbox folder that appears next to your Documents and Downloads one.

Share a mobile web connection

Got a 3G connection on your smartphone and need to get online to send an email from your laptop? If Wi-Fi isn't an option, try tethering your laptop and phone. Pair them using Bluetooth and then head to the Settings menu on your phone to share the connection as a mobile hotspot.



Password protection

A PIN will stop someone picking up your iPhone and idling scrolling through your Facebook messages; another for your SIM will stop someone downloading your contacts list; a code for your voicemail could stop phone hacking.

Spare battery pack

An extended battery pack offers more oomph, but also adds to the bulk. Nonetheless, a fully charged spare is a more efficient alternative to waiting for your dead brick to charge from the mains. If you must travel light, the likes of Philips and Belkin offer external battery packs that you charge in advance and then



transfer power to whatever they're hooked up to. If mains power isn't in reach but you still need to work, these could prove a lifesaver.

Improve laptop battery life

Switching off Wi-Fi when you're not using the web, not having lots of items running in the background, and setting the battery to balanced mode can all extend your phone's life.

Add ports and possibilities

A sleek laptop that's light enough to take with you is highly desirable; such a machine probably skimps on ports to keep weight to the bare minimum though. A docking station that stays at home, but adds supplementary ports, could prove a worthwhile investment. Think ethernet, multiple USB and FireWire connections and an HDMI-out.

MALWARE

Should you be duped into downloading a 'virus scanner' that ensures your PC is compromised by the time your antivirus software has kicked into action, the clean-up can be messy. Tell-tale signs include strange pop-ups and your web browser being hijacked with add-ons that won't uninstall. If you suspect the worst, take your PC offline.

We used to get calls from worried readers who were concerned that even if the PC was no longer connected to the internet, viruses could still be ruining their computer's innards. They can't, but a Trojan or botnet virus could be lying dormant, waiting for the call to action from their master. Botnets are zombie PCs that have been taken over and are used to launch a denial of service (DoS) attack on a server somewhere. So it's vital you

thoroughly investigate before you allow the PC anywhere near a web connection again.

Start up your computer in Safe mode. Usually, you need to press the F8 button to boot into this before the Windows loading page appears. In the 'Advanced Boot Options' menu, select 'Safe mode with Networking' and press Enter. Run a Disk Cleanup (listed under Programs, Accessories, System Tools) to get rid of any strays, then run a scanner such as Malwarebytes (malwarebytes.org).

Since your existing antivirus software may have missed or been disabled by malware, don't rely on this. If needs be, connect to the internet just to grab a suitable malware scanner, then come offline. Better yet, use another PC to download the file, copy it to a USB drive and install it from that.



With luck, the scan will complete successfully and you can follow its advice about deleting quarantined files. Restart the PC and run another scan to check all infections are gone. If the scanner fails, a deep-seated infection may be at play. ☒



If I had **£200** to spend...

Because they've been very, very good for the past 200 issues, we've given each *PC Advisor* editor £200 to (pretend to) spend. Here's what some of them would buy



Contrary to popular opinion, the editors of *PC Advisor* can't lay their hands on the latest tech goodies simply by batting an eyelid toward any number of sycophantic manufacturers. Often, we have to - whisper it - purchase the PCs, laptops and smartphones we desire from the meagre stipend afforded us by the world's greatest technology magazine.

But what if our benevolent masters, in their wisdom, granted each of us

£200 to spend only on technology? What would those paid to know about these things consider a good purchase?

With this in mind, and by way of a year-end bonus, we granted each team member 200 virtual pounds, to spend as they see fit. Here, we print a selection of the tech toys and gadgets our writers would buy if objectivity and benchmarked testing was cast firmly to one side, and the only criteria was simply: I want one of those.



MATT EGAN, EDITOR:
Kodak Hero 9.1 printer
£199 inc VAT

Far be it from me to add to the perception of the editor as the boring one, but a printer is, for me, an indulgence. Especially a top-of-the-range wireless multifunctional model such as the Kodak Hero 9.1, which has all the bells and whistles you could wish for, and is inexpensive to run.

You see I have a printer at home, and I think it even works. But the only things I have printed over the past couple of years have been boarding passes for business flights, and these days I can use either my iPhone or Android tablet to do that. I just don't have the inclination to boot up the PC, wrestle with a paper jam, and shell out for consumables in order to produce a piece of paper featuring a barely legible image that, in the case of the boarding pass, is 99 percent guaranteed to see me earmarked for the queue marked 'potential terrorist'.

But the Hero is different. It even looks like the kind of home-entertainment device you'd want within sight of guests. More importantly, it produces staggeringly good-quality results on text, graphics and photos. And notice the lack of the caveat 'for an inkjet' in the preceding sentence.

Of course, having a good-quality printer is one thing. What would make the Hero an indulgent purchase for me is the way that I could casually use it to print photos, instead of my life's memories living on a hard drive and in the ether on Facebook. It's cheap to run, so even my Yorkshire upbringing wouldn't stop me banging out the occasional frivolous print. More importantly, with a free app installed in each, I could print in a single touch from my Android tablet and iOS smartphone. From anywhere in the world where I have connectivity - and that includes the pub. Google Cloud Print extends even those options.

There are other high-end printers with these functions from the likes of HP and Epson, but I've spent a bit of time testing the Hero 9.1 and, if I had an extra £200 to hand, it's what I would buy.



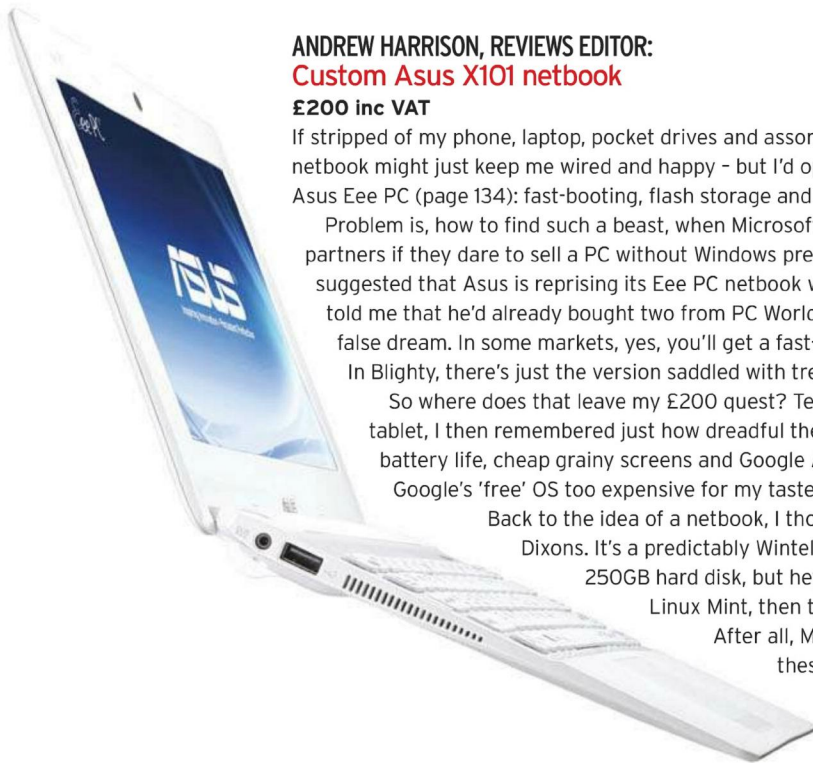
ROSEMARY HATTERSLEY, ASSOCIATE EDITOR:
Apple iPod touch MP3 player
£169 inc VAT (8GB)

I wasn't convinced by the first iPods. I didn't like the clickwheel navigation, and iTunes on XP (and later Windows 7) drove me to distraction. But I can't but help admire - and desire - the iPod touch. It has a beautifully sleek profile, and a large, gorgeous screen with a 960x640-pixel resolution that's sharp enough to comfortably watch TV programmes and music videos.

It's also ideal for gaming. In landscape mode, the widescreen display tilting between your thumbs lets you flick, leap and spin in response to the gyroscope inside. The music player and App Store need no introduction, while bonus items such as podcasts, iTunes U, the digital Newsstand and iCloud - with its auto-synching cleverness lauded on the iPhone - are all present, too.

I'd hope for 16GB rather than the 8GB my £169 buys me, as the 101g iPod touch would double as my portable hard drive, ensuring I was never without a file or photo, but these are mere quibbles. The touch is exceptionally good-looking, well connected and comes without the hassle and expense of a monthly contract. This gadget is the jewel in Apple's crown.





ANDREW HARRISON, REVIEWS EDITOR:
Custom Asus X101 netbook

£200 inc VAT

If stripped of my phone, laptop, pocket drives and assorted USB gadgets, a £200 netbook might just keep me wired and happy – but I'd opt for one closer to the original Asus Eee PC (page 134): fast-booting, flash storage and a Linux OS.

Problem is, how to find such a beast, when Microsoft is punishing its hardware partners if they dare to sell a PC without Windows preloaded? A colleague tip-off suggested that Asus is reprising its Eee PC netbook with MeeGo Linux, and in fact he told me that he'd already bought two from PC World for his kids. It turned out to be a false dream. In some markets, yes, you'll get a fast-booting secure netbook with a speedy SSD.

In Blighty, there's just the version saddled with treacly malware-magnet Windows.

So where does that leave my £200 quest? Tempted for a microsecond by the idea of a sub-£200 tablet, I then remembered just how dreadful these devices are. The hardware is crippled by short battery life, cheap grainy screens and Google Android. Ironically for this budgeted project, I find Google's 'free' OS too expensive for my taste – expensive in the cost to my personal privacy.

Back to the idea of a netbook, I thought about this virtual investment in an Asus X101 from Dixons. It's a predictably Wintel netbook spec – just 1GB memory, an audible and fragile 250GB hard disk, but hey, at least it's got a matt screen. I could install Ubuntu or Linux Mint, then try to get a refund on the unwanted software onboard.

After all, Microsoft's EULA states 'By using the software, you accept these terms. If you do not accept them, do not use the software. Instead, contact the manufacturer or installer to determine its return policy.'

But I found an easier solution. Amazon.de sells the very Linux netbook I'm looking for, an Asus X101 replete with 8GB SSD, for just €169.90. That's £145 or thereabouts, so I could even get a spare battery (£45) to supplement its undersized three-cell job, and swap out the 1GB memory for 2GB for another tenner. Thank you very much.



MARIE BREWIS, PRODUCTION EDITOR:
HTC Wildfire smartphone

£169 inc VAT

The one gadget that's always by my side is my smartphone. Back in 1995, when *PC Advisor* first hit shop shelves, such a concept was unheard of – forget broadband and apps, I didn't even send my first SMS until 1996, when a schoolmate was making good business charging an extortionate amount of money per text on her Ericsson GA 628. Thankfully, I was her best friend: I got a discount. Shame I had very few people I could contact via SMS.

But that hideous brick was nothing like today's large-screen mobile phones – and it did none of the things for which I now use my smartphone. It rang people and it sent texts; fast-forward to 2011, and calls and texts now take a back seat. I might communicate in this way if I have to, but you're more likely to get hold of me on Facebook or by email.

I go online, I email, I play games, I watch web video and catch-up TV, I take (and edit) photos and video, and I download all manner of useful apps – mostly for free, thanks to Google Android's open-source platform. I can't edit *PC Advisor* from my mobile, but I can do pretty much anything else for which I would normally use my computer.

So if the kindly folk at *PC Advisor* Towers were to slip an extra £200 into my wages, there's no other gadget I'd consider spending it on. I'd need a little more to get one of the better phones on the market, of course, but some entry-level models are worthy of consideration.

HTC's Wildfire is a good example, selling on Amazon for £169 SIM-free at press time. This Android handset has a 3.2in touchscreen and a 5Mp camera, and accepts MicroSD memory cards up to 32GB in capacity for all those apps and media content.

We also like the Samsung Galaxy mini. This costs just £109 and has a faster 600MHz processor (the Wildfire has a 528MHz CPU), although its 3.14in screen and 3Mp camera are inferior.





CARRIE-ANN SKINNER, DEPUTY NEWS EDITOR:
Humax Foxsat HDR500 set-top box
£199 inc VAT

Having bought my first home last year, money is tighter than ever. One of the first luxuries to go was cable TV. Once upon a time I could have made do with the four or five terrestrial channels, but that's no longer an option - the final switchover to digital-only TV is expected to materialise in London in April.

And it's not just the wealth of channels paid-for TV services offer that I miss, it's also the convenience of being able to record programmes to a set-top box for later viewing and functions such as series record, which ensures all episodes of a show are recorded to disk no matter when they're broadcast.

With this in mind, if I had £200, I'd purchase the Humax Foxsat HDR500. This set-top box with integral hard drive can be picked up

for around £199. It connects to an existing satellite dish and picks up the free-of-charge Freesat TV service, in standard definition and HD where applicable. The box not only offers the ability to record two channels at the same time, or watch one while recording another, it's also got 500GB of storage. That leaves me plenty of space to store all those episodes of *Come Dine With Me*.

Freesat also offers access to online catch-up TV services, BBC iPlayer and ITV Player, through a dedicated channel and a net connection (an ethernet port is situated on the back of the device). At the time of writing, the Humax Foxsat HDR500 is one of just a handful of compatible devices that can access both catch-up TV services - most offer only BBC iPlayer. This is much less fiddly than hooking up my ancient laptop to my TV via VGA (my PC doesn't have an HDMI connection).



DAVID COURT, ONLINE EDITOR:
Sennheiser HD 25-1-11
by Adidas Originals headphones
£199 inc VAT

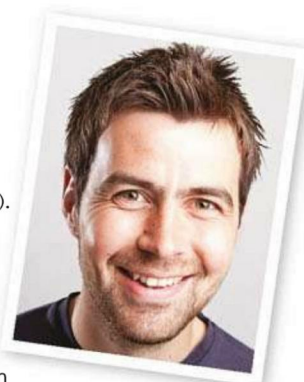
If I had £200 I'd buy the Sennheiser HD 25-1-11 by Adidas Originals headphones (try saying that in one go). The reason? Although £200 is a considerable amount of money in the real world, it doesn't stretch too far in the tech space - you certainly couldn't buy a laptop or a tablet that's worth having for that sort of money. Headphones are one of the only categories where £200 will buy you a toy that's top of the range... and I'm shallow enough to need something that's top of the range.

Now, even though I'd look a complete berk on a train or a plane wearing a pair of these DJ headphones, I was mightily impressed by the sound that they produced when I reviewed these cans last year - and I don't know the first thing about DJing (nor do I pretend to like the music that baseball cap-wearing 'artists' produce).

Nevertheless, the dulcet tones of Paul Simon and Art Garfunkel sounded as complementary to my ears as they ever have.

The only down side to these cans is that they're not the comfiest. In fact, if you're a wimp like me you'll need to give your ears a break after about 40 minutes. But the tightness of the headphones is there only to improve the audio experience and keep them on your head, so I shouldn't complain about that.

If you love music and happen to have £200 burning a hole in your pocket, the Sennheiser HD 25-1-11 by Adidas Originals will bring you a lot more pleasure than a budget smartphone, laptop or tablet. ☒



AOC



ULTRA-THIN BEAUTY

The stylish 58.4 cm/23" Full HD flatscreen i2353Fh with its super-slim 9.6 mm profile fascinates business and home users alike. But it is more than just a design-statement: The innovative IPS panel and a high dynamic contrast ratio (50,000,000:1) ensure a realistic colour reproduction and crisp images with finest details. Two HDMI ports offer a multitude of options for connecting high-definition sources. Enjoy this pretty package full of great inner values!



Ultra-slim profile



Discreet touch controls



Inputs in the stand avoid cables hanging from the display





1995-2012: Price crash

Now that *PC Advisor* is 200 issues old, David Court dusts off the cover of our first ever magazine to see how much the cost of technology has dropped since October 1995

Two monumental events in history can be attributed to the month of October 1995: OJ Simpson was found not guilty of two murders; and the launch issue of *PC Advisor* hit shop shelves.

In our early days, we were committed to giving sound advice such as *World Wide Web: How to cruise the internet* and *How to set up and use email*. Sixteen years later, our commitment to providing expert advice is as strong as ever. But one thing that has clearly changed is what you can get for your money.

Here, we look at tech pricing in 1995 and compare it to today's market. Of course, most of the components and peripherals of your beloved 1995 PC have since evolved beyond recognition - and fair comparison.

Your monitor would have been of the bulky CRT rather than flat-panel LCD type

that now adorns almost every computer user's desktop. And your dust-collecting trackerball mouse has likely been replaced with an optical rodent that resembles something out of *Terminator 2*. As for a keyboard, well, you may not even use one.

There are just two components that are directly comparable to the parts found inside a 1995 PC: the hard drive and the RAM. Memory and storage are now both faster and boast a larger capacity than their 1995 counterparts, but we can draw some comparisons. Prepare to be amazed.

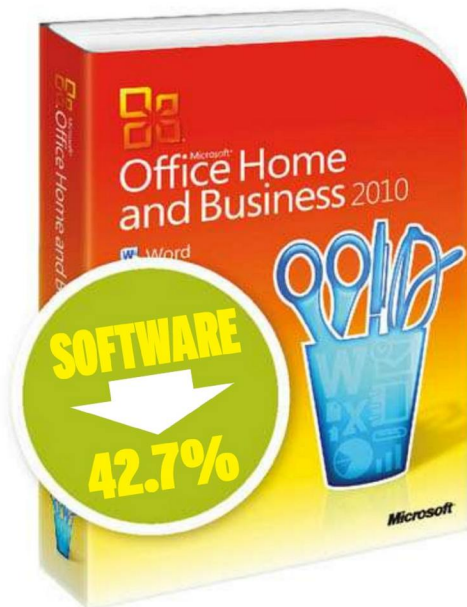
Memory

One of the advertisers in our launch issue hoped to tempt readers into purchasing a whopping 16MB of memory for an enormous £320. That's £20 for just 1MB!

A quick search on eBay - which, like all great things, also launched in 1995 - turned up 4GB of new RAM for £20. This works out at £5 per 1GB or roughly £0.005p per 1MB. The price of memory has thus decreased by a staggering 99.75 percent in 16 years, and is now 1/4,000 of its 1995 price. Ridiculous.

Storage

The largest internal hard disk sold by an advertiser in our launch issue was comparatively tiny to today's terabyte drives at 1GB. And it broke the bank at £169. You can't buy a hard drive with such a low capacity in today's market, although 1TB models are available in their droves around the £35 mark. We calculate the price per 1GB at 3.5p, meaning prices here have fallen even further than in memory - by 99.98 percent.



To put this into perspective, if houses depreciated in value at the same rate as hard drives since 1995, an average two-bedroom semi-detached house in a coastal south Devon town would now be worth just £155. We'll have 10, please.

Software

Interestingly, software hasn't experienced anything like this devaluation. Take Windows Office as an example. In essence the package you got in 1995 is the same as you get today, albeit that some features have changed and the whole thing is a lot snazzier and snappier.

When our first issue came out, Microsoft was offering an Office Standard package consisting of Word, Excel, PowerPoint and Schedule for £330. Today, Microsoft charges £189 for Office Home and Business 2010,

which includes Word, Excel, PowerPoint, OneNote and Outlook. In essence, this suite offers the same capabilities as the 1995 package: you get a word processor, spreadsheets and presentation programs, plus an email client. Although the price has dropped by a not-to-be-grumbled-at 42.7 percent, this reduction isn't particularly impressive when compared to storage and RAM, which have both seen great technological advances in the past 16 years.

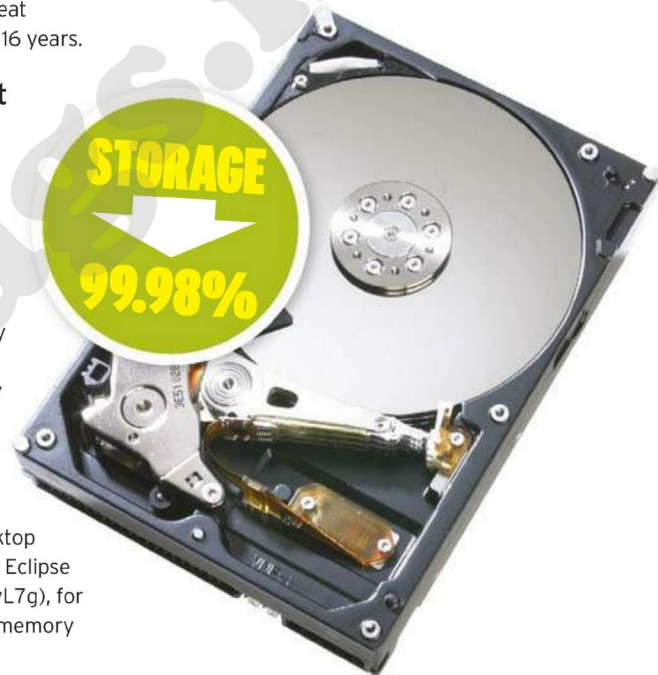
Moore's Law put to the test

What's interesting is how these technological advances compare with Moore's Law. For those of you who are unfamiliar with this particular edict, Intel co-founder Gordon E Moore espoused that the number of transistors that can be placed on to a circuit doubles every 18 to 24 months. To put this to the test, let's take the 16MB of memory in 1995 as a starting point and double that every 18 months until 2012. According to Moore's Law, we should now have 16.384GB of memory fitted in our high-end desktop PCs. Amazingly, we do. Look to the Eclipse Matrix i726R697 (tinyurl.com/659vL7g), for instance, which has 16GB of DDR3 memory as standard. Well done, Gordon.

Future

As you can see, technology has continued to snowball since *PC Advisor* launched in October 1995. Whereas 16 years ago our PCs might have had 16MB of memory and 1GB hard drives, today they have 16GB of RAM and terabytes of storage. Both have come down in price by more than 99 percent. So in what position can we expect the market to be in 2028, another 16 years down the line?

This is where things get complicated. It's widely agreed that the aforementioned and scarily accurate Moore's Law will expire in 2020, due to the fact it will not be possible to fit any more transistors per square-inch. If, however, Moore's theory remains broadly accurate up until then, we can expect memory sizes of up to 8TB in 2020 and hard drives with the storage capacity of 512TB.



Just for fun, let's pretend that Moore's Law wasn't set to expire in 2020. If that were the case, by the time *PC Advisor* publishes its 400th issue, you can expect to find PCs for sale with 17TB of RAM and just over 4PB (4,096TB) of storage.

Given that 1GB of RAM costs around £5 today, 17TB would set you back £87,040. And with 1GB of storage costing around 0.035p at present, a 1PB hard drive would be priced at £146,800 today.

Such is the nature of this feature, that we could go on forever and a day. But in an attempt to include at least one succinct point, we'll leave you with the bombshell that memory size and storage capacity technology appears to be expanding at a rate of 1.28 percent per week. ☒



GLOSSARY: 1,024kb = 1 megabyte (MB) • 1,024MB = 1 gigabyte (GB) • 1,048,576MB = 1 terabyte (TB) • 1,073,741,824MB = 1 petabyte (PB)

Note: Storage prices may have increased since the time of writing due to flooding in Thailand.

The changes we've seen

A lot has changed in the world of technology during the 200 months that *PC Advisor* has been in existence. Matt Egan takes a look at some of the more significant developments, and what they mean

The world in 1995 was a very different place, in ways both significant and banal. Most people didn't have a robust internet connection, and no-one had heard of Mark Zuckerberg or Facebook (not so surprising, given that he was 11 at the time *PC Advisor* made its bow). Google, eBay, YouTube and Twitter were all well in the future, Microsoft was on a roll and Apple looked to be on its way down the plug hole. How things have changed.

The connected world of digital music, movies and photos that we enjoy now would

have been inconceivable. Mobile computing was so far in the future that even laptops were the exception.

All these developments have changed not only our technological horizons, but also the way we live our lives and view the world at large. Some make our existences better but, in other areas, such progress has come at a cost.

We've selected what we think are 10 of the most significant changes we've seen, and analysed their impact. You may disagree, so feel free to let us know at tinyurl.com/c8uvoqd.





Look around the majority of households in 1995 and you'd find that the TV was the undisputed king of the home-entertainment world. A big fat CRT that dominated the front room. And in 1995, in most cases that meant only analogue TV - in those days a four-channel affair, as the world was as yet mercifully unaware of the hilarious ironic in-joke that would grow up to be Channel 5.

The birth of the Premier League in 1992 massively ramped up the number of subscribers that Sky had, but it wasn't until 1998 and the launch of the Astra satellite that modern digital TV became available. Cable TV, initially from NTL and Telewest and later from the unified Virgin Media, was a localised niche product until 1996, and free-to-air digital TV was a pipe dream (or a non-pipe dream, depending on your method of receiving it). As for streaming TV from the web - what web?

In those houses that had a PC, the old beige box was unlikely to be found anywhere more prominent than the spare bedroom.

A word processing, printing and occasional gaming device, functional, hidden and unloved by all but geeks.

Fast-forward to today and Sky TV alone has 10 million subscribers, each of whom is able to watch literally hundreds of channels 24 hours a day. They can view programmes on demand, remotely record to a hard-disk-based recorder, and pause live programmes, returning to watch the remainder later. And this, reader, is the more traditional end of home entertainment.

Because now, in an increasing number of homes, the PC is at the centre of entertainment. And even if the device you're using to consume media isn't recognisably a Windows PC, I bet that beneath its branded, set-top box clothing, it's nothing but a computer, processor, RAM and all.

In my own front room I can see an old Mac hooked up to a speaker set used principally to play music. I watch Blu-ray Disc, DVDs and TV on-demand from BBC iPlayer and others via a PlayStation 3. Also a PC. The PlayStation

is somewhat neglected as a gaming device since I got a Wii. Finally, the Sky+ box sits under the telly, which is now little more than a flat-screen display, as the Sky-branded PVR - itself nothing more than a locked-down PC - streams all the TV I want to watch, when I want to watch it.

If I want to listen to radio I stream it from my laptop, a device that nominally lives in the office upstairs, but rarely makes it back there unless it needs to be charged.

And that's before we address the way that devices more traditionally recognised as PCs now take up space in the lounge. Rare is the TV programme so gripping that I can't be found pootling about on the web using a laptop or tablet. And if all else fails I'll be fiddling with my smartphone (much to Mrs Matt's annoyance). Indeed, there are plenty of households that no longer have a dedicated TV, choosing instead to watch programmes on-demand from a laptop or PC.

The TV had a good run. But the PC is now the king of the home.





Then: Letters, phonecalls

When was the last time you wrote a letter? Not a piece of formal communication, an annual round robin or a birthday card, but an honest to goodness, common-or-garden 'how are you doing' letter? For me it's been at least 10 years. In fact, I can directly trace the demise of my letters correspondence to the birth of what I laughingly call my 'career', and my introduction to ubiquitous email.

During my student days, which commenced after the birth of *PC Advisor*, the only way to keep up with former schoolmates was the occasionally scrawled note. Infrequent, but personal and direct to the correspondent, friendships might lose their immediacy, but longer-lasting intimacy was faithfully preserved. At the same time I was honour-bound to phone my parents at least once a week, which required a freezing trip to the phonebox (it was always cold), and a brief chat down the line, usually curtailed by the pips before my shoulder gave into the effects of trying to hold up a phone the weight of a dumbbell. I am a man, reader, and

a man of Yorkshire at that. Talking on the phone does not come naturally to me.

Interestingly, my sister attended the same university five years after me, by which time three significant things had changed. Most importantly, the scuzzy old university bar had become a 'fun pub'. More pertinently to this feature, SMS via mobile phones and email had both become popular. This meant that, even before social media, IM and mobile email came on the scene, my younger sibling had a different social experience of higher education.

While I only vaguely kept in touch with friends from my younger days, Egan minor was able to communicate daily, if not hourly, with her childhood pals. As a consequence, the not-massive distance between our childhood home in Leeds and alma mater in Hull felt a lot bigger to me than it did her.

Fast-forward a few *PC Advisor* issues to today, and the world is a very different place. It's possible to keep up a constant conversation with friends and family

regardless of geographical distance, using email, texts and instant messages. This gives the impression of a greater level of intimacy, but does it work like that? It's a lot easier to keep up the semblance of a correspondence when it's a simple question of typing and hitting send. It's also less private: whether or not you make it clear to your recipients, it's simple to send digital mail from one to many.

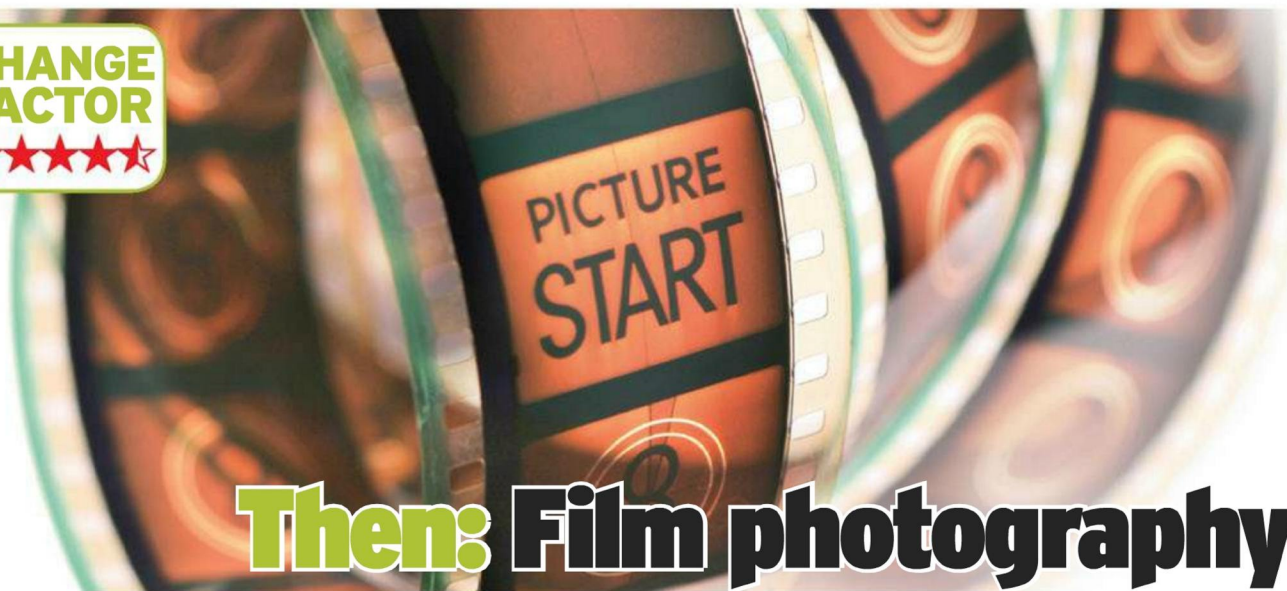
It's also the case that before everyone habitually texted each other you had to make a firm time and place to meet up, rather than heading to the same area and relying on technology to hook you up. Thus even face-to-face meetings become more casual affairs.

On the other hand, I know I'm able to maintain relationships with people I care about that I wouldn't be able to in a world without email, SMS and IM. And I'm more likely to send someone a text asking if they want to meet up than I ever would phone them.

The shift from more formal, paper and phone-based communications to digital messaging has changed the way we live.

Now: Email, SMS, IM





Then: Film photography

Film photography still has a healthy existence, with some expert photographers refusing to use anything else. And those throwaway cardboard analogue cameras are still around, proving an especially resilient hit on the wedding circuit. Plus, of course, there are plenty of film makers who would never use anything other than 35mm film camera, believing it simply looks better.

But the move from analogue to digital in the world of still and video photography has been quick and almost total. And when you consider that the first modern digital camera widely available was the Casio QV-10 in 1995, and the first camera to use CompactFlash was the Kodak DC-25 in 1996, the speed of change becomes apparent. The concept of Jpeg didn't even exist until the late 1980s.

For the vast majority of people at the time *PC Advisor* first appeared, photography was strictly an analogue pursuit, and movie making the preserve of the one friend or relative who had everything. Going to the chemist to pick up your holiday snaps was as

much a part of the trip as wondering what would arrive home first: you or the postcard.

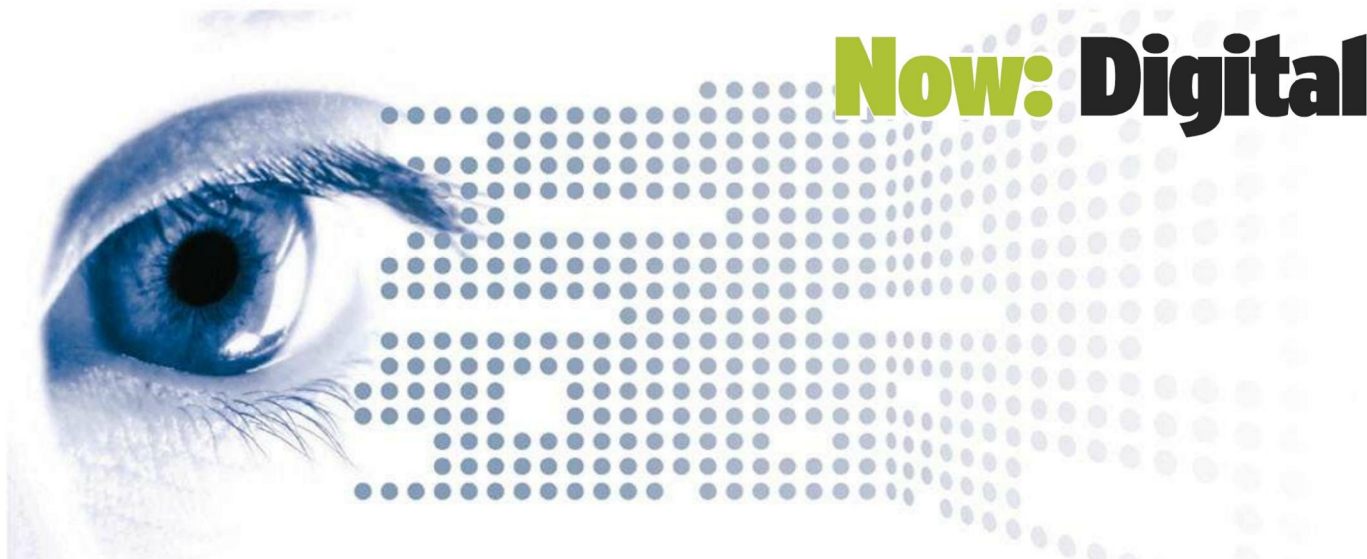
You had no preview, so the chances that all 24 or 32 snaps would be good or even usable were very low. (Unlike the chance that the assistant in your local Boots was likely to take his or her own copy of your most embarrassing snap for under the counter posterity.) Changing the film on many cameras was strictly mum- or dad's preserve, as clumsy hands could easily expose a whole roll of film to natural light and ruin a week or two's hard photographic work. And even though film limited the amount of photos you could take, shooting a few shots of the wardrobe in order to finish the roll was an honourable tradition.

I remember being stupendously impressed by one of my uncles when he showed up to a family gathering with a handheld VHS camcorder. It was about as big as a small family car, took awful footage and had next to no battery life. But still. Me, on the telly. It was like magic.

Today this seems impossibly quaint. To take photos and video you don't even need a standalone camera, as every Tom, Dick and Harryhausen carries a veritable digital studio everywhere they go in the shape of their phone. As is often the case with digital media, the sanctity of the individual shot has disappeared as it's possible to take and retake an infinite number of photos until you have that perfect shot of everyone gurning around a pint pot.

Home movies are posted online in seconds, for all the world to see (often before their subjects know the footage has been captured). And editing both photo and video is within the grasp of everyone who has access to a PC and some basic software.

There's still no substitute for photographic skill. There never will be. But the world of digital puts the ability to take decent photos in the hands of everyone, all the time. And that has to be a good thing. Try to remember that the next time an embarrassing picture of you appears on Facebook.



Now: Digital



Then: Desktop computing

Take a look at the cover of our launch issue (it's on page 144) and you'll see: PCs have changed. A lot. Back in 1995, the term 'PC' referred almost exclusively to a beige Windows box, hooked up to a CRT monitor and a keyboard. You might have a connected printer - probably a dot-matrix type - and super-early adopters may even have a dialup modem, perfect for spending hours tying up the home phoneline in order to attempt to hack the Kremlin.

Up until the early 2000s, desktop PCs were more powerful, much easier to upgrade and, partly in consequence, much cheaper than laptops. But over the past decade or so that's changed. Laptops are close to becoming as powerful as desktop PCs, they start as cheap as the same spec in a desktop, and most peripherals are available in laptop-compatible USB versions, which minimise the need for internal add-on cards.

Given a straight choice, what benefits do desktops offer, apart from a marginally easier upgrade process? And if I can change

the hard drive in a laptop (and I can) it can't be that difficult. Laptops on the other hand - even hulking great desktop-replacements - are more convenient. Even if you don't want to take one on the train, the biggest laptop is still simple to shift from one room to another. And if it's that keyboard-and-screen desktop experience for which you hanker? You can have it using your laptop and peripherals, and still have the benefit of portability.

All of which means that it was no surprise when, in the second half of 2008, laptops outsold desktops for the first time. The desktop isn't going to disappear any time soon, but the trend toward portability is headed in only one direction. Not least because it suits manufacturers: laptops are easier to ship, they can be built and stored in vast numbers, and they are sold as a consumer commodity rather than a confusing amalgamation of parts.

But that's not the end of the story. Far from it - we've done nearly 40 issues since laptops overtook desktop computers.

And in that time the trend has been for an ever increasing array of personal computers in ever decreasing sizes. Consider the things for which you use your home computer: email, word processing, web surfing, gaming, photo and video editing, social networking. Each of those tasks can be accomplished on a smartphone or tablet, with a greater or lesser degree of comfort.

As computing platforms and form-factors continue to evolve and diverge, the choice of personal-computing device increasingly becomes a case of horses for courses: smartphone, laptop, netbook or tablet - and which is best for the task in hand, in your current circumstances.

There are still plenty of occasions where a desktop system best fulfils that criteria, but they tend to be workstation-based, editing large media files, crunching numbers and the like, often in an office situation. The days of a household having only one computing device, and it being a desktop PC, are numbered if not gone.



Now: Mobile computing



One result of all the extra digital photos and videos we are now capturing is that we all need more storage space. Music, movies, books, files... all were once analogue 'things' for which we had to find shelf space – a self-limiting process. We've investigated the changing price of storage on page 108, but it's fair to say that the exponential rate of increase in the amount of digital media we all generate, own and share means we are increasingly unable to store everything on physical storage media in our homes.

Enter the cloud.

Let's get one thing straight. True cloud computing is the delivery of computing functionality as a service rather than a physical product. It is a means of sharing resources, software and information between multiple devices, as a utility, over a network, which almost always means the internet. So if you use an online word processor or video editor from a web-based interface, you are cloud computing. But, these days, 'the cloud' tends to refer to any service

that utilises web connectivity to share and stream information and media. It's a term appended to products and services good, bad, complex and simple in an attempt to add an element of mystique to what is a very simple process: if you have neither the storage space or the computational power to do something from your desktop, you can throw it up into the cloud.

It's an idea that was unheard of in 1995, but something we are all doing today – to a greater or lesser extent. Even if you don't know it as cloud computing.

Use webmail? That's storage in the cloud. Share your images over Facebook, Picasa or Flickr? Cloud. Perhaps in your working life you share and edit documents using a service such as Google Docs or Huddle? That, my friend, is cloud computing. And all of that information is being stored remotely, whereas once you'd have had a physical copy.

More prosaically, increasing numbers of businesses choose to back up their data to offsite cloud storage services. It's a sensible

idea. Even if you slavishly back up every file and folder you have in your business, if the tape drive is in the same building as the office and it burns down then you've lost the originals and backup in one fell swoop.

The same principle applies to individuals in the home. All reputable online storage services use servers across multiple sites, mirroring content so you're covered in the case of natural disaster. One of the weirder hangovers from the rapid switch from analogue to digital is that we all consider hard copies of photos, music and so on to be more robust than ephemeral digital files. It's a completely wrong-headed principal: digital files are simply a set of digits. Saved across multiple servers they will last unharmed as long as those servers remain live. An optical disc or paper copy will eventually degrade, no matter how carefully it is stored.

Sixteen years ago if you owned a record or a photo, you had to store a physical device. Now we all have multiple copies stored on servers all over the world.





Meeting people in the flesh is so hard. All that eye contact, hugging and shaking hands. Do you bump cheeks, actually kiss or maintain an awkward distance? Who starts up the conversation? When do you leave? Much better to sit in a darkened room and communicate with the outside world via a social-media website...

Or not. In *10 technology breakthroughs* (page 120) we've talked about the fantastic speed of growth that social media has enjoyed, but not so much about the way it's changed how we communicate. It's easy to sneer at the banality of much of the content shared on social sites such as Twitter and Facebook, but consider the benefits.

Back in 1995, the only way you could talk with others about a shared interest was to join a group that allowed you to subscribe to a newsletter, or - if you were really lucky - attend events set up by like-minded people. To communicate with a group you had to be geographically close. It almost certainly cost money. Today, that's very far from the case.

An interesting case study is *PC Advisor's* own social media network: the PCA Forum (head to pcadvisor.co.uk/forums). Where else could you get together with 315,000 people interested in technology, in order to shoot the breeze about the latest hardware and software, solve problems and support PC projects? The answer is nowhere. And nowhere else could you ask a technical support question, and have your PC problems solved within hours, for free, by another user somewhere else in the country.

This kind of thing simply didn't happen in 1995, and it's all over the internet now. On Facebook alone there are special interest groups representing subjects as diverse as knitting and support for sports teams, there are virtual book groups and fan clubs, and discussions on everything from the Leveson inquiry to Justin Bieber.

When world events happen, eye witnesses can share news and opinion, in real time, with the rest of the globe. If you want to find out what's happening on the ground of a country

with no external international media, just search Twitter. Of course, this isn't without problems. Personal opinion is often reported as fact, flame wars can quickly descend to unpleasantness, and hate mobs can brew up frighteningly quickly. Famous people are regularly incorrectly reported as dead, too.

Perhaps more importantly, social-media websites can produce a genuine sense of community. There has been at least one marriage born from 'meeting' on our Forum, and many more occasions where people who have felt desperate and lonely have been able to reach out and receive support from virtual friends. And that's without even considering the very successful results of dating websites: most people under a certain age know someone who met a significant partner via such a means.

Despite my facetious comments at the beginning of this chapter, it's clear that there's no substitute for human contact. But social-media websites offer us a lot now that we didn't have then.





Then: Dialup Now: Broadband



Originally 'broadband' had an actual, proper technical meaning. But it has long been used as a marketing term for any high-speed, always-on internet access. Let's define it for these purposes as an always-on connection that can at least nominally reach download speeds of 2 megabits per second (Mbps). You almost certainly have it now - but if you were lucky enough to have an internet connection in 1995, it was dialup.

Ah, dialup. It really is impossible to get misty eyed about dialup internet. In retrospect, and at the time, it was a dog. For most households with a single phoneline, dialup meant precious time wasted hooking up a modem and waiting for it to 'dial' the relevant number several times before it finally caught on. Then you had to wait for even the most simple sites to load, knowing all the time that (a) your phoneline was tied up (and this at a time when most people didn't have a mobile) and (b) every second you were online you were pouring money into your ISP's pocket. And that's before we talk about the vast volume of Tiscali and AOL CDs that clogged up shop counters.

Dialup internet was slow and expensive, and decidedly unreliable. Not surprisingly this

affected how we used the internet, which in turn shaped the kind of content posted up on to the web. There wouldn't have been much point in BBC iPlayer existing in 1995, because no-one would have been able to see it. In fact web video felt ludicrously futuristic. There were no MMORPGs or photo-sharing sites. Web 1.0 consisted almost entirely of static text content. And it was aimed at a much more tech-savvy audience than is today's more equalitarian net.

People rationed the amount of time they spent online. Sending an email was more like writing a letter, infrequent and long form, as you wrote things offline and popped online to hit send.

Nowadays it's unusual to find a household without at least a nominal 2Mbps connection. This means that people can habitually browse the web, communicating, enjoying music and video, messaging friends. It also means that people rely on the web as a medium of entertainment and business much more than they did.

Dialup and broadband are related but, in terms of user experience, they are different beasts; life would be far less enjoyable if we were still using dialup internet.

Then: Cheques, cash Now: Cards, credit



It used to be that the only person who didn't carry cash was Her Majesty Queen Elizabeth II. But now in the UK debit- and credit cards are accepted everywhere for any amount. Cheques, not so much. Pull out a wad of cash in certain upmarket stores and you're certain to get odd glances. PayPal and other payment services hold cash for you to make purchases online. Passengers on public transport systems pay for their journeys via a smart card, and mobile users and gamers habitually make purchases using micro-payment services for which they need only a password and username.

Don't think this describes you? Then we can only assume that you've never purchased an app on the iPhone or an Android device. Or your kids don't buy games via Xbox Live.

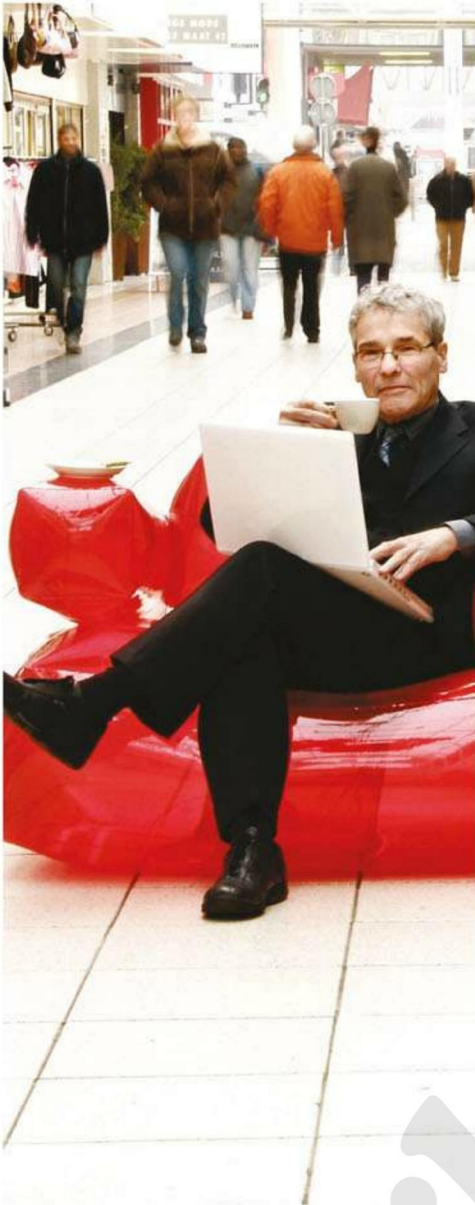
These are all fantastically simple, time-saving and straightforward ways of making purchases. But the very convenience creates an enormous risk. If you get someone's details, you are able to convert them quickly to cash. But in the past 16 years we've collectively chosen convenience over security, in much the same way that credit won out over prudence.

Which is not to say that the banks and credit-card companies accept the risk. We always advise making large purchases using a credit card, as the bank is buying the product on your behalf - if the purchase goes wrong, they have to recover the cash. That's not the case with smart cards and payment services.

Banks in the UK have now converted all debit cards in circulation to chip and PIN to increase transaction security; but PINs aren't required for internet transactions, and they exist principally to pass on the transactional risk to customers. If a shop fails to spot a spoofed signature you can't be blamed. If you give away your PIN code, you can. It's the logic behind the PIN-generating machines most banks hand out to online banking customers, too. Your account is more secure, but you are responsible for that security.

The move toward a digital payment economy isn't going to slip into reverse any time soon. Contactless payments are starting to spring up, phone apps are replacing paper tickets for travel, and smartphone payment systems are only a matter of time away. The price we pay is additional exposure to risk, albeit managed risk.





Then: High street Now: The web



Staying with the theme of splashing your cash, take a close look at your local high street. Ask yourself how you did your Christmas shopping this year, and how you did it in 1995. I'm pretty certain I did mine in a single branch of Halfords back then, but I'm a bad son with a lazy streak. The point is that in the mid-90s, we none of us went shopping on the web. That's very far from the case now.

A recent *PC Advisor* poll makes for interesting reading. When asked where they'd do their Christmas shopping, 23 percent said they would do all their shopping online, and only 3 percent said they'd shop on the high street only, as online shopping 'isn't yet reliable enough'. A more understandable 31 percent said they'll probably do a bit of both, while 25 percent said they'd shop wherever they could find the best deals. So only a fraction of those people who are doing Christmas shopping wouldn't be doing at least a part of it online. (Incidentally, the outstanding 18 percent have somewhat damaged our previous point about the *PC Advisor* Forum making people warm and fuzzy inside, saying 'Christmas? Bah, humbug. I don't do presents'.)

That categorically wouldn't have been the case in 1995, when online shopping barely existed. Amazon, Play, Dabs, eBay, More Computers, CCL... we could fill up this chapter with a list only of online stores,

without even talking about auction sites such as eBay, itself a marketplace bigger than any city in the world.

Meanwhile, our high streets are looking ever more moribund. Dixons, PC World, Comet, Maplin and their independent brethren battle manfully to keep the bricks-and-mortar technology store alive in a world where almost anyone can set up an online tech store, without holding stock. Simply by backing into the networks set up by distributors, and cutting the profits earned to a bare minimum, anyone with a web connection can undercut the high-street stores.

Voucher schemes from services such as Groupon further erode the ability to compete on price of stores with hefty rent to pay. And innovative social selling schemes such as MoreFrom.me allow the customer to set the price and make a little cash as they sell.

But there is hope, despite the rapid rise and fall of Best Buy's UK operation. The phenomenal success of Apple's high-street stores shows that there's a market for shops that offer expertise and advice (and know how to take your cash before you have time to think twice). And supermarkets are increasingly turning a healthy profit from technology as the personal computer becomes a commodity and people want to do all of their shopping in one place for convenience.

Then: Private, secure Now: Public, insecure

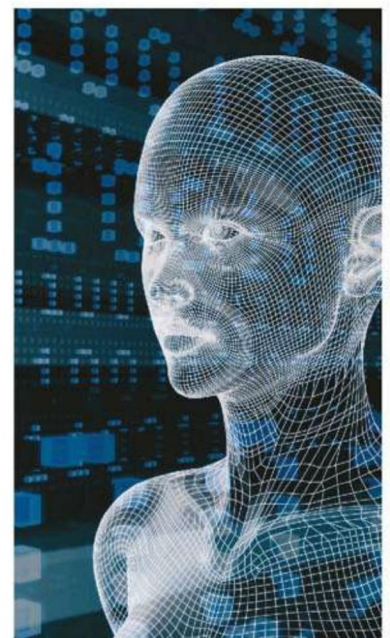


Almost all the changes we've outlined above represent a move from a world where our security and privacy was established by physical locks and barriers, to a more fluid, infinitely more convenient, but lots more dangerous world.

The way our personal-computing devices have increased in power and scope, the increased connectivity, the casual way with which we communicate with a wider world... all these things made life easier and more interesting, but leave us more open to loss of data and privacy. The very portability of laptops, smartphones and tablets makes them easier to steal, and the data they access gives up our identities. Shopping and banking online requires

trust. Our always-on web connections offer great connectivity in, but a portal for thieves to take data out. The social networks we so love to use are fertile data-mining territory for criminal gangs. Without digital messaging there'd be no phishing, placing our data in the cloud allows third-party access to our information, and even the humble digital photo contains information about where we go and what we do.

Is it worth it? In my view it most certainly is. We live infinitely richer and more varied lives than we did just 16 short years ago, able to communicate with a greater number of like-minded people, and stay closer to loved ones despite greater geographical distance. ☒



10 BIGGEST TECH BREAKTHROUGHS OF THE PAST 200 ISSUES

Reaching back through the *PC Advisor* archives, Matt Egan picks out the 10 technological leaps forward that have most affected our computing lives

To a time traveller from 1995, the pace of change in technology over the past 200 issues is such that the current world is bewilderingly futuristic. When *PC Advisor* launched, the idea of handheld devices offering instant access to an exponentially bigger world of entertainment would have been the stuff of science fiction.

Gizmos the size of books now contain detailed maps of the world, your entire record collection and hundreds of, well, books. We can access everything, everywhere, all the time. And we expect to be able to contact all the people in our lives, whenever, wherever.

Each day for the past 16 years and more, *PC Advisor* has reported on new technologies and products. Some stay with us and some disappear. Most are mediocre updates of existing technologies. But some, like the 10 listed here, changed our computing world for ever. This list includes fantastically clever technologies, user-led trends and simple upgrades. But in each case they paved the way for further changes that made our world unrecognisable from the way things were when *PC Advisor* started out.

But don't take out word for it, let us know what you think at tinyurl.com/bv3yh3e.



3G BROADBAND

TECH BREAKTHROUGH RATING:



It had a painful birth in the UK, and no-one who's had to rely on it for work or play will be entirely enamoured of its flaky ways, but 3G represents a breakthrough. If you don't believe us, simply cast your mind back to WAP.

Before 3G came along, the mobile web was, frankly, nothing of the sort. It was a strange, Ceefax-like hybrid with which you could just about glean stock prices and football scores, but only with patient coaxing and an underdeveloped sense of the ridiculous. I remember attending conferences where people talked about the commercial opportunities offered by mobile web use, and thinking 'yeah, right. Pull the other one'. No longer.

The first pre-commercial 3G network was launched by NTT DoCoMo in Japan in 2001. Although global rollout took longer than expected, by June 2007 more than 200 million 3G subscribers had been connected around the world. Some used smartphones, others mobile web dongles. Indeed, it's worth remembering that this figure was achieved without the first-generation iPhone - launched in early 2007 and a touchstone product for so many emerging technologies, but a 2G phone and no more.

In the UK, telcos who had written off billions of pounds on 3G licences they bought in a feverish auction found that mobile dongles represented a lucrative new business. Over time, the smartphone and tablet markets have grown to such an extent that UK consumers are now getting grumpy about how long it's taking us to get 4G connectivity outside of a few trial networks.

It's imperfect, expensive and growing increasingly tired. But because it freed us from home and business broadband connections, 3G led the way to much faster developments in mobile computing. And it lets me watch Sky Sports under the table at boring meetings.



DIGITAL DOWNLOADS

TECH BREAKTHROUGH RATING:



To understand how much the digital world has changed the way we consume music, movies and games, talk to someone under the age of 20. Unless you happen to be under the age of 20. Then talk to me.

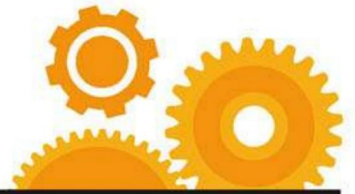
When I were a lad, we bought records on vinyl, and we watched films on the TV. And we were lucky to get either. Then, for some unfathomable reason, we migrated to tape cassettes for audio and games, and VHS video cassettes for movies. Well, I did. Those with taste and foresight stayed true to vinyl.

When audio CDs and, later, movie DVDs came along, it felt like a staggering step forward. The ability to leap direct to the song or movie chapter of your choice? Wow. Whole albums without turning over? Kerching.

Yet now it all seems archaic. Tonight, if you're sitting on the bus and you want to hear a particular song, for a small fee you can immediately buy and listen to it on your smartphone. With an app such as Shazam, you don't even need to know what it's called. You can hold your entire music collection in a device a little bigger than a cigarette packet, watch movies on your phone until you get home (and then catch the rest on the big screen), and download and play the latest game without even having to stretch your legs with a stroll down to the shop.

We'll gloss over the way in which media downloads were initially driven by criminal sharing, and put that down to media owners being slow on the uptake. The technology is the thing and, for better or worse, it's totally changed the world of entertainment. It's even changed the way it's produced: no-one now buys albums, so singles, ringtones and live performances are key to musicians making a crust.

It's not just music, though. Podcasting has allowed comedians and radio presenters to create their own markets, while TV series debut simultaneously around the globe and are immediately available to download.



BLU-RAY DISC

TECH BREAKTHROUGH RATING:



It's more of an upgrade than a radical new technology, but Blu-ray Disc is worthy of inclusion because it succeeded when the odds were heavily stacked against it.

Blue-laser technology emerged in 2000. A putative successor to the DVD format backed by industry heavyweights including Sony, Blu-ray uses a blue laser to read information off the disc at a greater density. This allows more information to be stored than is possible with the longer-wavelength red laser used for DVDs. (Note to DVD-player makers: call them 'Red-ray Disc', and watch sales fly.)

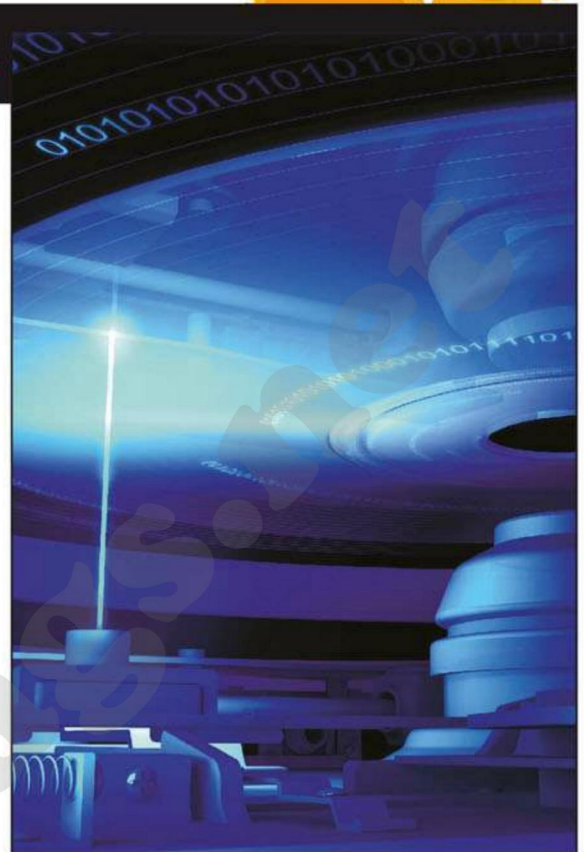
After a series of false starts and stumbles, Blu-ray finally came to commercial players in June 2006 - with plenty of doubts over its long-term success.

A single-layer Blu-ray Disc can store up to 25GB of data; two-layer discs that offer up to 50GB of space are also available. In principle you can add third and fourth layers, each adding a further 25GB, but commercially 50GB is your lot. It's enough, though. Enough to allow for HD and 3D movies and games to be sold to fans, enough to keep people upgrading their home-entertainment equipment, and more than enough to keep the makers of optical drives in business.

Which is all very well, but why would a mere storage-capacity upgrade make it into our list? Well, because unlike its principle rival, Blu-ray is still with us.

In August 2002 Toshiba and NEC decided to challenge the in-development Blu-ray with their own large-storage blue-laser optical-disc format, which eventually came into being as HD DVD. This technology made it on to shop shelves before Blu-ray, and initially had greater success, but then Sony launched the PlayStation 3 with a Blu-ray drive and the rest is history.

Simply for winning this battle, as much as for its part in the drive toward HD and 3D entertainment, Blu-ray Disc deserves its place as a technology breakthrough. It's a born survivor.



MOBILE EMAIL

TECH BREAKTHROUGH RATING:



I remember sending my first email. I was a student and my alma mater had gifted me use of an email account. The address was an impossible-to-remember string of digits, and to access it I had to book a timeslot at the university's computer centre. On balance, I decided that even a task so suited to email as keeping up with friends at other universities was much simpler when scrawling on a scrap of paper and heading down to the post office. And the post office sold sweets.

Of course, even then email was more portable than I'd realised. But it remained only a slightly easier way of sending letters, using a static PC or laptop, until push email for mobile devices became prevalent. Although push email was standard on Japanese smartphones from around the turn of the last century, it wasn't until RIM started flogging its BlackBerry phones that it became a big deal in the UK.

The first full-featured BlackBerry phone launched as recently as 2003. Its impact in that short time has been nothing short of staggering. Now almost all white-collar workers carry at least one push-email-enabled portable device and, in plenty of cases, more than one. The age of being out of contact when out of the office is well-and-truly over, as executives email from the beach, and weekend warriors check their email in nanosecond moments of down time.

Being able to email from a mobile has - along with SMS - in turn spawned other, more immediate forms of mobile communication, from instant messaging, through Twitter and Facebook to video-calling. But mobile email remains the daddy of them all, meaning that working 9 to 5 is a distant memory, while enabling flexible working practices.

Whether this makes us more efficient and flexible, or simply more stressed, is a moot point. The way we communicate has changed to a staggering extent, and this in no small part down to mobile email.

MULTITOUCH

TECH BREAKTHROUGH RATING:



At any point in the first 10 years of *PC Advisor*, you'd have been within your rights to offer only a casual shrug at the idea of multitouch technology representing a major breakthrough. The use of touchscreens to control devices has been around since the dawn of computing, but for a long time it remained unpopular. Indeed, like many of our technology breakthroughs, touch input was something that Microsoft correctly recognised as important, without immediately cashing in.

Microsoft's table-top touch platform - Microsoft Surface - was dreamed up in 2001, but a final spec was announced with typically poor timing barely a month before the iPhone. Surface interacts with both the users' touch and objects placed on the display, and the technology forms a huge part of Microsoft's plans for a future wherein every surface is an input device, and every device can interact.

But it was Apple that made multitouch popular with the iPhone, launched in 2007. The iPhone's screen tech was ultimately the product of a company called Fingerworks. Fingerworks spent the early years of this century developing various multitouch technologies. It produced several products, including a touchscreen keyboard that Apple liked so much it bought the company.

Of course, no-one is claiming that Apple invented multitouch - except Apple itself - but the iPhone was the first mobile device with a multitouch screen.

From being a niche feature, touch is now intrinsic to all manner of devices. Not all touchscreens are made equal, and by no means are all multitouch, but the success of the iPhone and the products that followed it have firmly entrenched a 'touch first, ask questions later' policy into the minds of most computer users. It may not be the ideal input mode for every type of product, but it's not going away: place a child in front any tech device, and they will instinctively attempt to control it by touch. That, my friends, is intuitive.



SOCIAL NETWORKING

TECH BREAKTHROUGH RATING:



For almost as long as there's been a *PC Advisor*, there's been a *PC Advisor* forum - our own social network, and the largest of its kind in Europe. But it took the rest of the world a while to catch up.

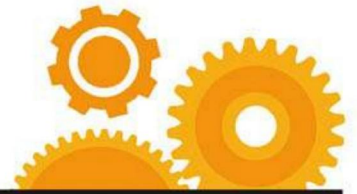
According to Wikipedia, the first social-networking websites went live around the same time as *PC Advisor* thrust itself on to an unsuspecting world. But the key dates in social networking happen much later.

Consider this, as you browse the web: the term 'weblog' didn't exist before 1997 and, although people published online diaries, the first dedicated blogging sites appeared even later than that. Friendster, MySpace, FriendsReunited... they've all risen and fallen since 2002. And even then, success and failure are relative terms, given the thousands of people who still use networks considered moribund by the watching world. Facebook debuted in 2004, Twitter in July 2006, and yet the amount of web traffic that now goes to such sites is staggering.

Facebook, the biggest of all, tells us it has more than 800 million active users - more than half of whom visit the site at least once a day and a staggering 350 million of whom access the site through mobile phones. More than 250 million photos are uploaded each day, the site is available in more than 70 languages, and there are more than 900 million pages, group events and community pages.

Facebook, Twitter and the rest have changed the way we communicate, while other sites and services have altered the way we access and consume media. There's more content on YouTube today than has ever been broadcast on all the TV stations in the world. Want to share an event with a loved one far away? If photos on Flickr and live Twitter updates aren't enough, just Skype it.

Love it or loathe it, social media has changed the lives of millions of people to the extent that it's not the 'social web'; for lots of people, it's just 'the web'.



SATELLITE NAVIGATION

TECH BREAKTHROUGH RATING:



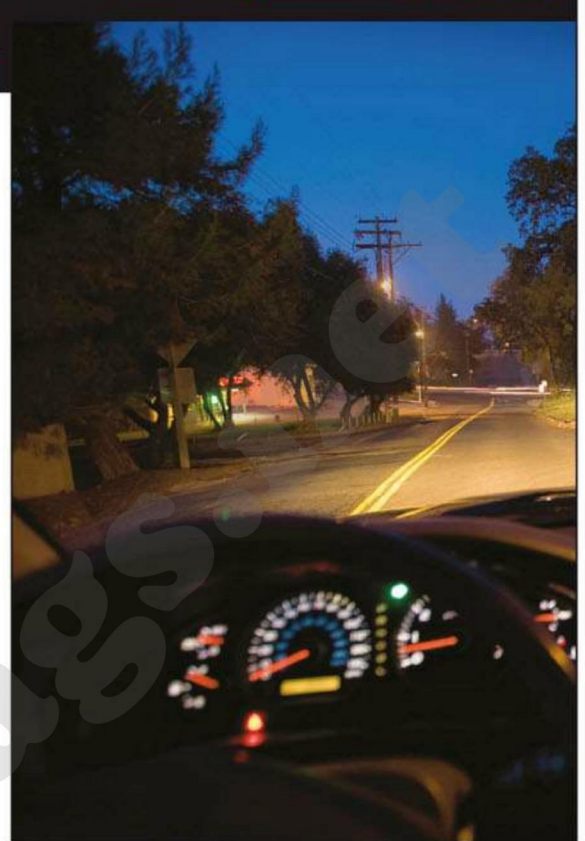
Who remembers maps, hey? These clumsy paper contraptions were the 'route' of 37 percent of all divorces between 1973 and 1988. Okay, we made up that stat, but I can't be the only child of the 70s for whom the advent of turn-by-turn navigation banished forever nightmares based around French road systems and the M25.

Navigation by satellite has been available in some form since the 1960s, but for most of that time it was principally a military tool. It became a realistic civilian product only when the then US president Bill Clinton opened up the military's Global Positioning System in the late 1990s. That's right, we have the good old US of A to thank for satnavs. Before long, a device that literally told you where to go became a crucial part of every serious driver's armoury.

Of course, despite the way we rely on them, satnavs are no panacea. Like all digital devices, when they are good, they are very, very good, and when they are bad they send you down a single-track country lane in a double-decker bus. As maps get older and road systems change, your satnav can be every bit as geographically challenged as a harassed spouse with an A-Z. There's a patch of the A1 which throws my own device into paroxysms of rage as it screams at me to stop driving through a field.

But the modern satnav is often internet-enabled, allowing it to update on the fly. And such is the power of modern smartphones, and the utility of satnav software, that many people now use their mobile devices as constantly updating GPS navigators. Indeed, Android users may never need to look beyond the Google Navigation app for getting from A to B.

Something that seems almost banal now would have seemed like science fiction back in 1995, and for that reason satellite navigation on smartphones and dedicated devices is a serious technology breakthrough.



USB

TECH BREAKTHROUGH RATING:



PC Advisor is older than Universal Serial Bus (USB), version one of which was released in January 1996. Offering specified data rates of 1.5 megabits per second (Mbps) and 12 Mbps for low- and full-bandwidth respectively, the first version of USB couldn't support extension cables or pass-through monitors. Had we not seen the birth of USB 1.1 in 1998, the technology would be little more than a footnote in the history of computing.

That iteration of the connectivity technology achieved popularity, while USB 2.0 was launched in 2000 and blasted its way to ubiquity. Promising a higher maximum bandwidth of 480Mbps, USB 2.0 was also known as 'Hi-Speed'. It also offered the flexibility of MiniUSB, but it's the technology's plug-and-play simplicity that makes it such a winner.

Look around your home or work computing setup, and count the number of USB connections. You may or may not run your mouse and keyboard by USB, but we bet you have external storage devices and USB thumb drives to extend your PC's storage and move files around. And while smartphone and MP3-player makers may infuriate all but themselves by making the device end of their charge and synch cables proprietary, the bit you plug in to the PC? That's USB.

Desktop printers and scanners, laptop stands with cooling fans, lights, cup holders, hubs for more USB connectivity... all are powered by the one hardware port to rule them all. 'What about wireless connectivity?' I hear you say. A fair point. But don't forget that USB is used in dongles that connect everything from Bluetooth peripherals to wireless networks.

USB has a battle on its hands to stay ahead of such rivals as Thunderbolt. But with USB 3.0 already on stream, who's to say that it won't remain the king of all connectors for the foreseeable future?



WEB SEARCH

TECH BREAKTHROUGH RATING:



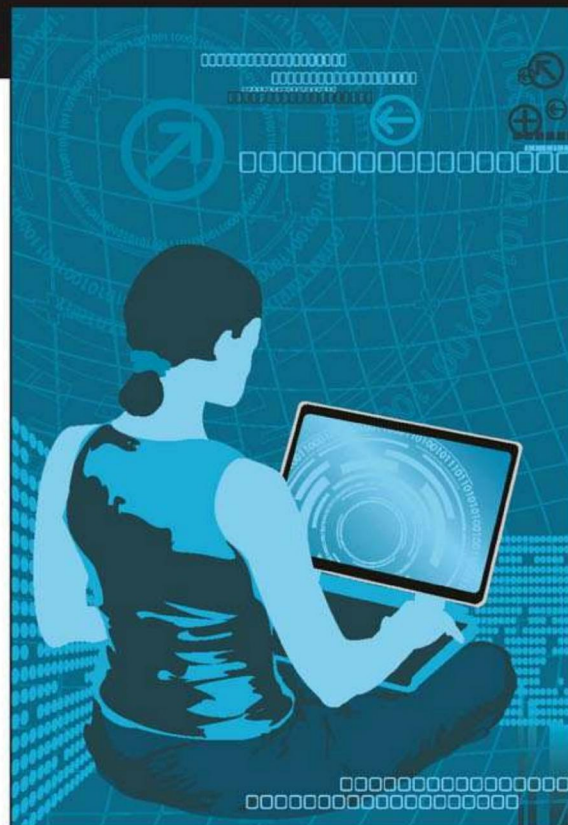
Search has been around since the early days of the web, but finding useful content was for a long time a complex and unsatisfying business. Domain names and URLs were hugely important, and you never really knew what you were getting until you landed on a page, with often negative results.

Although Google's ground-breaking PageRank algorithm was the internet's great leap forward, search really kicked into gear in 1996. Netscape held a competition to find a search engine for its then market-dominant web browser. The competition was so stiff it ended up choosing five search partners, each paying \$5m for the pleasure of appearing one fifth of the times that Netscape's search page was called up. Yet the successes of Yahoo, Magellan, Lycos, Infoseek and Excite fell with the dotcom boom and the inexorable rise of Google.

Google Search rose to dominance around the turn of the century, with its use of inbound links to ascertain popularity and uncluttered user interface blowing away the competition. In time, Microsoft's Bing and Yahoo have come together to provide a viable alternative to Google, and other search engines provide more specialist services, meaning that most web-browsing sessions start with a search.

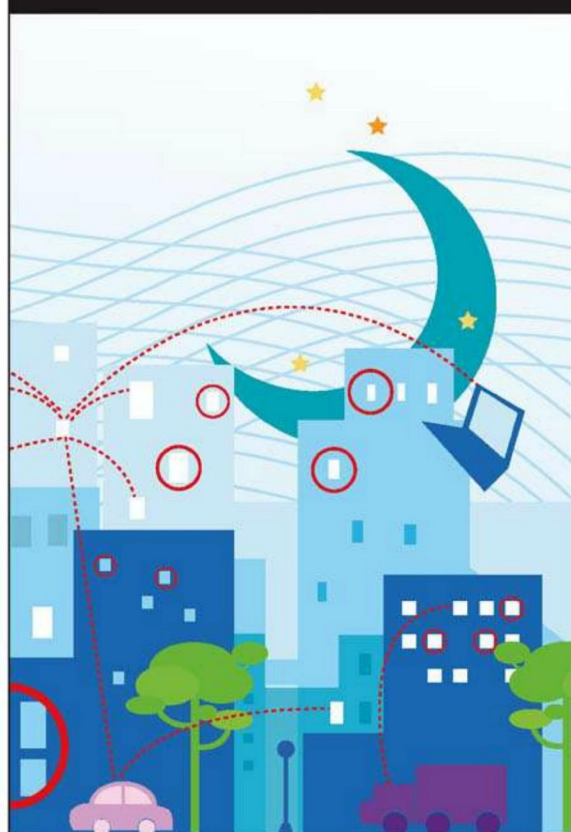
Search engines are the most important newsstands for website owners. They dominate the web-advertising industry, and in some ways rival the sites and services they promote. Optimising sites so that they rank higher in search-engine results has become a full-time profession. At the same time, search engines have become much savvier at understanding what web users actually rate on the internet, and grown increasingly sophisticated at picking out the best of the net.

Count on search to play a crucial part in the way the web develops, as the distinction between on- and offline continues to blur. Good, bad or indifferent, the internet as we know it exists the way it is now only because of search.



WIRELESS INTERNET

TECH BREAKTHROUGH RATING:



Although the origins of Wi-Fi are much older than *PC Advisor*, a quick glance through our launch issue confirms that wireless connectivity was nothing more than a pipe dream in 1995. The first commercial products to be marketed under the term 'Wi-Fi' appeared in 1999, and we were still banging on about the advantages of wireless well into the noughties, as takeup proved stubbornly slow.

There are plenty of reasons for this. A robust broadband infrastructure helps to make wireless in the home useful and desirable, and there are plenty of places in the UK where that remains out of reach to this day. And until Microsoft and the mainstream ISPs worked out that consumers need serious hand-holding, configuring a wireless network in Windows was fiendishly difficult.

But once setting up a network became a relatively simple task, Wi-Fi became ubiquitous. The PC is liberated from the study, and sofa surfing with a laptop is possible. Smartphones, tablets, printers, games consoles, set-top boxes and audio systems... all can access your home network, pulling down media and pushing out information. And each is more useful for its wireless connection to the web.

Step out on to the streets and it's staggering how often you'll now find yourself in range of a wireless network. As time goes by this will only increase, with city-wide Wi-Fi planned for many major conurbations.

Of course, Wi-Fi has its down sides. It's a major security risk, for a start, and its very usefulness means that if your router fails you lose a lot. If you're lucky enough to live in a house with sturdy walls or multiple floors, you'll find that even the best connection struggles to reach every corner, and it's easy to use a lot of power, and even more of your data allowance, with an always-on connection.

But walk around your house, go on a journey, and try to imagine life without 802.11 connectivity. Things would be a lot more constrained, and a lot less fun. ☒

The ZyXEL logo is displayed in white text on a blue rectangular background in the top left corner.

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Unleash the power of your HDTV, Blu-ray™ player, DVR's and game consoles with ZyXEL's Media Streaming Product Family! Enjoy the ultimate home entertaining experience with a stable high-performance network for multiple HD streams, multiplayer gaming and Web surfing simultaneously. Simply, 'plug-and-play' and start creating your own digital ZyXEL home!

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10 BEST PRODUCTS OF THE PAST 200 ISSUES

How do you choose 10 great products from the thousands we've reviewed? Simple: you look for innovation, longevity and popularity, then back away slowly and let the arguments begin. Matt Egan explains

Trying to choose only 10 great products from the thousands we've reviewed is an impossible task. We've been testing and ranking all the technology we can get our hands on each month since *PC Advisor* launched in 1995. We've had a dedicated online reviews section only since 2004, but head to PCAdvisor.co.uk/reviews and you'll find in excess of 10,100 products - we now post more than 100 each month! So we've had to make some brutal choices, and your favourites may not have made our short list.

Perhaps in another 200 months Google Android will make the grade, or even Windows 8. But for now, you'll find no BlackBerrys or products from tech giants such as Dell, Canon, Adobe and HP here. We've focused only on the products that have stood out for innovation and longevity.

We looked for the devices, software and services that surprised us when they emerged, proved popular, and paved the way for future technology.

Not all of our 10 great products remain popular, although a surprising number do. It's intriguing to note how few Microsoft products made our list - and how many of those that did are deadly rivals to Microsoft releases. Microsoft is at or near the top of a number of product categories, but the twin phenomena of *PC Advisor's* lifetime have been Apple and Google. Hats off to them.

We hope you'll enjoy our 10 best products, and we're sure you'll want to have your say. Head to tinyurl.com/cqd2k52 and let us know what you think, and which products you think should be here.





Google Web Search

You know something is a success when its brand name becomes the de facto noun for a generic type of product or service - think Hoover and vacuum cleaner. Google goes one step further: to 'Google' is the verb commonly used to describe a web search, by any means. Google doesn't like this, but the fact remains that for many people, any web search is 'Googling'.

So Google is a success, with its hundreds of millions of queries each day. But is it one of the 10 best products of *PC Advisor's* lifetime? We'd say so. For all that web search remains an imperfect science, the internet without Google is a bizarre idea - like computers without the internet.

Launched in 1997 as the brainchild of Larry Page and Sergey Brin, Google orders search results by 'PageRank', a metric by which the search engine's web crawlers rank pages on the net. Initially, Google Search's success was down to three factors: it was nice to look at, easy to use, and it ranked sites in a way that more closely resembled the opinions of web users. Whereas other search engines paid attention to the keywords and URLs website operators uploaded, Google cared about user-led factors such as the links people place on websites and blogs.

Now Google is the biggest seller of advertising in the world. Website owners spend huge fortunes attempting to improve their ranking, and every time Google so much as tweaks its PageRank algorithm it has the potential to affect the bottom line of almost every business in the western world.

More importantly, the web user's experience has changed forever. Google lets you search for synonyms, currency and metric conversions, weather forecasts, time-zone information and so on. Users interact with a much wider variety of online sites and services, knowing that if the information is out there, a Google search is likely to find it. And because Google meticulously records data on who is searching for what, when and where, we all know a great deal more about what matters to people, as it happens.

Google Web Search changed the world, and made several fortunes. And that's not bad for something that was initially set up as a tool for academics.

Apple iPhone

The original version of Apple's smartphone hit shop shelves in 2007. It lacks many of the aspects that make more recent models great, such as 3G connectivity, so why would the first-generation iPhone be one of our 10 top products?

Like other great Apple products, the iPhone took ideas and technologies available elsewhere and combined them in one desirable, reliable product. By creating a good-looking and intuitive gadget that anyone could use as a mobile phone, web browser and MP3 player, Apple re-invigorated and redefined the mobile market.

Apple already had the mobile audio players market sewn up with the iPod, and moved lock, stock and barrel its seamless music-playing ecosystem from 'Pod to 'Phone.

iPhone web browsing was a world beyond that experienced on other handsets, and the original iPhone introduced Visual Voicemail, multitouch gestures, HTML email, threaded text messaging and YouTube video. Indeed, even 'missing' functions such as cut and paste, push email and multimedia messages made it on to the iPhone after a couple of software updates. And that's before we get to Apps. Apple's App Store is the home to a staggering array of software services, and it all started with this device.

Look around now and you'll see smartphones of all flavours that resemble the original iPhone. The principal innovation the iPhone brought to

the world was its use of multitouch input. It's strange to recall that many sage observers at the time Steve Jobs announced the iPhone thought it couldn't succeed without a hardware keyboard. The iPhone had then, and retains now, only a handful of hardware buttons - and now RIM is increasingly isolated in including qwerty keyboards on its BlackBerry mobile devices.

When Jobs announced the iPhone, he described it as a "widescreen iPod with touch controls", a "revolutionary mobile phone", and a "breakthrough internet communicator". That it was all of these things, and in each case successfully so, makes the first-generation iPhone one of the 10 best products we've covered.



Microsoft Windows XP

Like the footballer whose team loses when he doesn't play, Windows XP looks better the longer it's absent from the front line of desktop OSes. During its lifetime as Microsoft's number-one OS, XP was respected rather than loved. A useful tool, present on almost all PCs – but not a product anyone got excited about – XP launched in 2001.

But XP is great because it represents a brief period when Microsoft focused not on what it might be able to do, but on building a product that worked. With none of the instability and incompatibility issues that plagued Vista and Windows 95, XP shines because it is better than both those OSes, as well as predecessors Windows 2000 and 98.

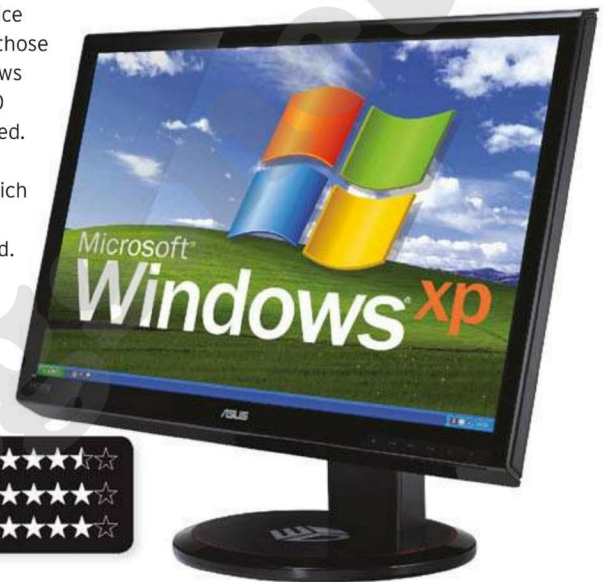
It is the best of Windows: relatively stable and full of useful features. And XP has stood the test of time. Only time will tell whether Windows 7 can come close to matching XP's success – if it does, it will be a great product. After all, Windows is used on the vast majority of PCs throughout the world for a reason: when it's good, it's very good.

XP was the first Windows OS to include task panes, tiles and filmstrip views. It had built-in CD burning, and would let you search by document type. Windows Picture and Fax Viewer made their debuts alongside faster startup, better power management and various kernel enhancements that added to that sense of speed and stability. System Restore and Recovery functions were added, as well as USB 2.0 and FireWire 800 connectivity. The Windows Firewall made its first appearance in SP2, as did wireless-networking capabilities.

Built on the Windows NT kernel, XP was noticeably more stable than 9x versions of Windows. It also looks unlike any previous versions

of Windows, featuring an overhauled graphical user interface. What's innovative and user-friendly to one person is a hideous change to the next, but XP's popularity and longevity suggest its usability is considered good by most.

Windows XP made its bow in 2001, and was succeeded in 2006. And yet 27 percent of all visitors to PCAdvisor.co.uk still use XP – more than twice the number of those who use Windows Vista, Me, 2000 and 98 combined. XP remains the standard by which other Windows OSes are judged.



INNOVATION	★★★★☆
LONGEVITY	★★★★☆
POPULARITY	★★★★☆

Apple Mac OS X

We can't praise XP without offering a paean to Windows' great rival: Apple Mac OS X. OS X is, of course, a series of OSes, more fairly compared with Windows in general rather than XP as a particular product. But part of OS X's charm is that although it has gone through seven releases in the time Windows has jumped only from XP to Vista to Windows 7, each has been an iterative development rather than a radical overhaul.

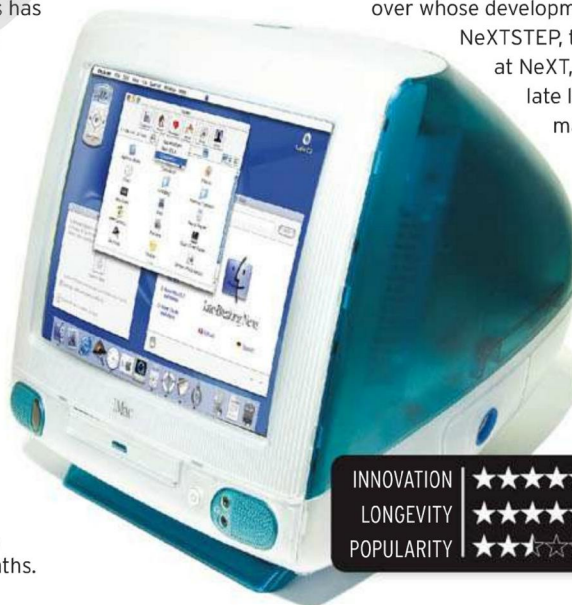
That revamp may be due when Apple decides iOS is ready for the multi-platform primetime, but even if that happened tomorrow OS X has had a good run. And iOS can be fairly described as the offspring of OS X in any case.

When it launched, OS X (10.0 Cheetah) was a radical departure for Apple. Steve Jobs' gift to Apple from his time with NeXT, OS X replaced OS 9, the final version of the even longer-lived 'Classic' series of OSes. It did so in a time of crisis for Apple, then running out of money and losing market share.

The first desktop OS X launched in 2001, beating XP to the punch by a matter of months.

Its success is all the more remarkable when you consider that Apple's previous inhouse attempt to replace OS 9 ended in failure, and with no product to show. But that was never likely to be the case with OS X, a product for which Steve Jobs retained an evangelical fervour, and over whose development he was notoriously picky. Based on NeXTSTEP, the OS developed by Jobs and his team at NeXT, OS X is a personal triumph for Apple's late leader. An occasion where the myth matched the man.

Legends abound of Jobs insisting on revision after revision of OS X, so that when it appeared it was stable and reliable, intuitive, and better-looking than any OS that had gone before or since. In this Apple has the advantage of making both hardware and software, and XP's success at a similar time suggests the world was waiting for stability at least. But, for many people, even after 10 years OS X represents the best of Mac computing – an end-to-end experience that is stable, intuitive, and just works.



INNOVATION	★★★★★
LONGEVITY	★★★★★
POPULARITY	★★★☆☆

Google Gmail

It seems so straightforward now, but when it first appeared the Gmail proposition was staggering: a free webmail account, with up to 1GB of online storage (each message was limited to 25MB). Given that Microsoft's rival market-leading product Hotmail was offering only 4MB in total, Google's product seemed improbably large.

That 1GB limit started growing almost exactly a year after launch, has kept increasing since and, according to Google, will never stop doing so. At the time of writing it's approaching 8GB. Full marks to Google for spotting the value of cloud computing good and early.

Gmail launched as an invitation-only beta in 2004, and pretty soon other webmail providers stretched their limits to try to match it. They had to try, but Google's online mail service remains the daddy in this space, in part because Google can afford to innovate at scale.

There are bespoke Gmail apps for mobile phones and tablets, and today Google claims around 260 million users – that's a lot of email.

Gmail also pioneered features we'd now like to see in other email clients, including messages grouped together in conversations, the Priority Inbox that selects the emails you are likely to want to read, and suggested contacts to copy on to messages that appear as you compose. It remembers people without you having to add them to your contacts, and is unusually adept at weeding out spam, too.

How Google does this is not without controversy. Gmail, after all, introduced the concept of contextual advertising, whereby adverts are served at you within the message pane that relate to the content of your messages. This led to some commenters decrying Google for 'reading private emails'. The reality is that if you don't want Google to know what you're writing, you probably shouldn't use Gmail.

You could make a similar point about all cloud computing: by placing your data on someone else's servers, you have to put your trust in that third party. In this, as in many other aspects, Google's mail service pre-empted the move toward the cloud that is today reshaping the personal-computing landscape.



Apple iPod

Launched in 2001, Apple's iPod wasn't the first portable digital music player to hit the market. But you know that a product has passed into legendary status when people who would normally run a mile from anything resembling cutting-edge technology start lecturing you about how great it is.

The iPod rapidly devoured the nascent digital music industry, and then spread the word the world over so that the terms 'iPod' and 'MP3 player' became one and the same, and digital became the way to access your tunes. Apple even convinced some people that leaky, poor-quality white headphones were a fashion statement. What would every other tech company give for some of that magic?

What made the iPod such a success is classic Apple. Out of the box iPods are easy to use, and great to look at. Other MP3 players were unreliable, messing up track listings and duplicating songs, and horrible to use, requiring you to squint at a two-tone screen and fiddle about with tiny buttons to navigate. Apple solved these problems by moving the means of administering the portable device to your Windows PC or Mac, via iTunes, and introducing the iPod scrollwheel – one of many interface innovations that have given the house that Jobs built an enviable reputation for intuitive design. And, crucially, Apple didn't release the iPod until all the elements were ready for a good out-of-the-box experience.

Subsequent to the first iPods, Apple has introduced flash storage and touchscreens, over-the-air updates, games and video. That the iPod is a success can be seen in the stratospheric sales figures and market share it has enjoyed, as well as the commercial and critical success of later product lines such as the iPad and iPhone. But the reason it's so great and other digital music players of the time weren't can best be summed up thus: when Steve Jobs introduced the iPod, he described the initial 5GB device as '1,000 songs in your pocket'. And with no messing about or fuss, that is exactly what it was, from day one.



Mozilla Firefox

Firefox is a great product, with a strong financial model and a history of developing innovative features. But it's chiefly famous for breaking Internet Explorer's hegemony in the web-browsing world.

An open-source web browser born out of a frustration with the perceived over-commercial nature of Netscape, Firefox made its debut in November 2004. Initially far from a success, the Mozilla Foundation's browser began to turn a corner when version 1.5 appeared a year later. Firefox 1.5 was stable and represented a viable alternative to other web browsers.

Of course, just being different would never be enough to guarantee success, but Firefox's developers successfully introduced a string of innovations only later seen in other browsers. Tabbed browsing was popularised by Firefox, as were extensions and add-ons.

Indeed, these latter features – mini software programs that allow the user to customise their web browser – were crucial to Firefox's success. While other browsers shipped with all functionalities bolted on, making them feel bloated in a still partially dialup world, Firefox was a lean, mean fighting machine. If you wanted to add a feature, the chances were someone had written an extension that met your needs.

Thus, as the internet became the primary computing tool for most users, many found that Firefox allowed them the opportunity to create a bespoke window on that world. And because cybercriminals tend to attack the lowest-hanging fruit, IE was more frequently targeted.

Mozilla funds its browser via search, feeding from the crumbs that drop from Google's table, and doing very nicely thank you. Every time

you use the search bar at the top of the browser window, or search from the Firefox home page, Mozilla gets a fraction of the revenue generated by Google (or other search provider). Tiny amounts of cash this may be, but Firefox has around a quarter of the world's web-browser market, and it quickly adds up – Firefox 3.0 was downloaded 8 million times on its first day of release, for instance.

Chrome is catching up with Firefox in terms of market share, as Google's browser claims the stripped-down, lightweight moral high ground (and Google's marketers push their own product). Truth be told, more recent iterations of Mozilla's Firefox browser have started to feel a little bloated, and the increased release cycle may represent a product getting old. But the story of Firefox is a story of innovation, and a great product winning massive market share almost by word of mouth alone.



Apple iPad

Unless you've been in a deep sleep for the past 18 months, you may have noticed that the tablet market has exploded into life. Tablets have been around for a lot longer than you'd think, but their viability was uncertain for a long time. It took the iPad to unlock that potential.

Despite Microsoft's long history trying to develop a tablet platform, it was Apple's device that set the world of tablet computing on fire. By taking the already phenomenally successful iPhone and stretching it to tablet size, Apple turned Microsoft's ideas on their head. Less

than 18 months after its launch, the iPad is the dominant player

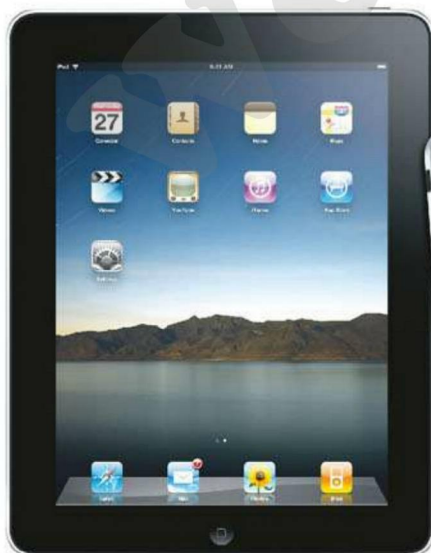
in the tablet market and the device that its competitors want to emulate – in terms of design, and also sales.

The most recent of the 10 best products in this round-up, the original iPad launched in early 2010. It was bigger than a smartphone and smaller than a laptop – a connected web-browsing and home-entertainment gadget, portable enough to slip into your bag, but ideal for surfing the web on the sofa. And the iPad is equally suited to business tasks and gaming. The iPad concept introduced a putative third device to the arsenal of all tech fans. And yet its success is such that for many people it is now the one device to rule them all.

Rival manufacturers have queued up to take on the iPad. It's no surprise: in the first year it was on sale Apple sold 15 million units, wiping other tablet makers off the face of the earth. But only latterly

have tech giants such as Samsung and Sony been able to get close to what consumers now expect from a tablet. And in at least one of those cases, Apple alleges the credit is all its own.

Apple has earned a deserved reputation as the maker of some of the most elegant and user-friendly computers, music players and smartphones in the business. Yet the iPad may be the most impressive piece of Apple hardware we've handled. More important than that: the iPad has both redefined and reinvigorated the tablet market, and then took it all for itself. A staggering achievement.



Asus Eee PC

The first Asus Eee PC, the 701, was a milestone in personal computing. It was the original netbook.

Small, low-cost laptops, netbooks became for a while the de facto weapon of choice for business road warriors, students and first-time computer buyers who needed a simple device on which to surf the web. Tablets and cheaper full-spec laptops have now taken back those markets, but even today netbooks have an interesting afterlife as first PCs for children, and student word processors.

Asus announced its Eee PC 701 and Eee PC 1001 models in 2007, sending shockwaves around the rest of the computing world with both their low price and tiny size, almost single-handedly queering the pitch for makers of Ultra-Mobile PCs. Initially running Linux, the 7in Eee PCs ran underclocked Intel Celeron M processors, eventually graduating to Intel Atom chips. They had tiny SSDs for storage, and cramped keyboards at around 90 percent of a standard model's size.

This combination of cheap price, small size and low power consumption was popular, with Asus selling almost 2 million models in a little over a year on sale. Pretty soon it was releasing 8in and 10in Eee PCs running Windows XP, and other PC makers were scrambling to catch up, producing eerily similar models.

But Microsoft wasn't keen on XP gaining a new lease of life, and limited the spec allowed in order to force vendors and purchasers to select the unloved Windows Vista. As time went by the makers of 'proper' laptops found it easier to make cheaper and lighter Vista and



INNOVATION	★★★★★
LONGEVITY	★★★☆☆
POPULARITY	★★★★★

Windows 7 models than be restricted by Microsoft's stringent rules, and as component prices dropped full-sized laptops became a better deal.

By the time the iPad arrived and pointed users in the direction of tablet PCs, netbooks were good at nothing more than being cheap.

An underpowered device in an outmoded category, when placed next to more recent portable computing devices such as the iPad, the Eee PC looks like a relic. But when Asus first launched this low-power, lightweight laptop, it changed the world, introducing what became known as the 'netbook', driving a massive amount of PC sales, and setting in train the drive toward true mobile computing.



Facebook

Facebook is so good they made a movie about it, although its inclusion here won't be universally popular. Whether the service constitutes a 'product' is one issue, and whether it is a good one is another, given the security issues that have bugged the site

as it has grown. But Facebook itself is hugely popular and, unlike almost every other similar service, it continues to grow at a rapid rate more than seven years after it was born.

According to Facebook's stats, it has more than 800 million active users. The user demographic holds a healthy number of users in age groups from 13 up to 64 and over, each of whom can exchange messages and share photos, join common interest user groups, play games, promote events and more.

Not only the most popular online social network in the world, Facebook is the biggest photo-sharing site on the planet. It's the fastest-growing gaming platform around, and a staggeringly popular means of communication for users on every corner of the planet. Of course, that very success means that it is the world's biggest timesink, and a world-class medium for spreading scams and malware. It's also home to the profiles of at least 7.5 million children, in violation of Facebook's own terms of service.

And all this from a site founded by Mark Zuckerberg with his college roommates in 2004. Not even Zuckerberg could have seen Facebook's potential, but after initial success with his fellow Harvard students, Facebook was opened to other US college students, then high schools and, finally, the world. A combination of good technology and perfect, fortunate timing, it's often forgotten that Facebook's very existence was revealed to great numbers of the outside world only when Virginia Tech students live-blogged the massacre of 32 of their fellow students by a crazed gunman in 2007.

But Facebook's biggest achievement is handling an exponential growth in users and features, without imploding or selling out. Facebook is an incredible achievement. ☐



INNOVATION	★★★★★
LONGEVITY	★★★★★
POPULARITY	★★★★★

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Our predictions for future tech

Hoverboards, a race of robots that rise up and take over the world, and excellent broadband provision in the UK. These are the ridiculously far-fetched concepts Matt Egan rejected in picking out 10 things we'll see over the next 200 issues...

Given the exponential pace of technological change over the past 16 years or so, it's virtually impossible to accurately predict what life will be like in another 200 issues from now, in 2028. But that hasn't stopped us trying. So in the great tradition of *Tomorrow's World* we've donned our thinking caps, spread some jam on a Compact Disc, and highlighted what we think are 10 trends and developments likely to shape the way we use tech in that time.

Some will happen soon, others may take a few years, but we guess that all of these 10 changes will occur in the next 16 years and eight months. Why not play along at home, and bury this copy of *PC Advisor* in a time capsule in the garden, not to be dug up before August 2028?



Every surface will be a display

Microsoft has already shown us a glimpse of this with its much-vaunted Surface technology, now seen primarily in shops and showrooms, but intended as a forerunner of the way we'll interact with our computers. In the future table-tops will become touchscreen computers, like PacMan machines for the 21st century, wirelessly linked to a central computer that will pull in data from the cloud. The TV will be banished to the cellar as standard windows and mirrors morph from doing their day job to being touchscreen digital displays, adept at showing emails, movies, stock prices and live TV. Satnav data will appear on the inside of your windscreen, the kids will be able to watch movies on car windows, and taxi drivers will display localised ads to offset the price of your journey. Even humble household objects such as mugs, plant pots and pans will display contextual information, ranging from the temperature of the contents to how much water your poor old plant needs.

Plausibility rating: ★★★★★



Smartphones will fit in your wallet

Ever wondered why a 10in tablet costs the same or less than a 7in device? In part it's because making something smaller requires in turn tinier components, which are much harder to produce. Shrinking down already small devices is tough: a tiny phone still requires a power source, a processor and storage. And anyway, below a certain size, smaller isn't always better. You need a fairly large screen, for instance, to be able to comfortably interact with the information displayed on it. That's why Dell and Samsung are betting the family farm on 5in tablet/smartphone hybrids. The Holy Grail is a mobile device with a decent size screen that you can fold up and slip into your wallet. Foldable displays are possible today, but the issue is getting the other gubbins that make up a device to fit into a virtually 2D object. But it will happen, and as mobile payments become an increasingly important part of the worlds of on- and offline commerce, slipping your phone out of your wallet to pay a bill will become the norm.

Plausibility rating: ★★★★★



Data will be in the cloud, and you'll access it from the nearest device to hand

We've explored on page 108 how much cheaper storage has become over the past 16 years. But as information and entertainment grows in definition and complexity, and as we all get more demanding and wish for more flexibility in our lives, storing files, movies, music, photos and books on discs and disks will become increasingly old hat. Far more than just a safe, remote backup, pushing and pulling data to and from the cloud is set to become the most convenient way of enjoying access to everything, everywhere. It'll be a monumental security nightmare, but if we've learned anything over the past 200 months it's that convenience always trumps security concerns. It's not even that far fetched. From webmail to social networks to online photo-sharing and music streaming, most of us already throw a ton of information into the cloud.

Plausibility rating: ★★★★★



You'll be able to transfer data and payment by touching devices

In the weird-and-whacky world of the HP TouchPad, this has already happened. HP's Touch-to-Share technology was supposed to be the killer app for HP's putative iPad rival, as a means by which you could transfer files and folders simply by touching the TouchPad to a compatible device. The trouble, and this was very much the trouble with the TouchPad and WebOS per se, was that there weren't many compatible devices. Still, the technology is out there, and if the "oohs" and "aahs" from those who saw it were anything to go by it has popularity potential. Throw in the convenience of touching your smartphone to a scanner to make payments, and the future of touch transfer becomes exciting. The key will be making a universal touch-transfer protocol that all manufacturers can get behind, so the public can feel comfortable with it. Getting a standard everyone can agree to is, traditionally, a tortuously slow business. But as the success of USB and Wi-Fi prove, it's eminently doable, where the will exists.

Plausibility rating: ★★★★★



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Social will get scary

The days of a genius piece of malware holding the connected world to ransom will draw to a close. Cybercriminals look for the lowest-hanging fruit, and blasting through the combined defences of ISP, Windows and internet security suite is no longer the percentage play. The weakest link in any digital security setup is you, dear reader. And you are never more likely to make a miss-step than when you're on a social network site, publicly chatting with your 'friends'. Get ready for increasingly sophisticated scams, aimed at parting social networkers with their cash at the point they feel least vulnerable. Poisoned links, fake friends, the hacked accounts of genuine acquaintances... all will be used to target your account to get your details. Information you've publicly placed on one site will be automatically combined with details from another to spoof your ID and guess your passwords. And as more cash is transacted over social-media sites, you'll have more to lose.

Plausibility rating: ★★★★★



...and so will mobile

As mobile devices and connectivity improve, the amount of time and money we spend online on our mobiles will increase. And as more cash and data is shared across the mobile space, expect crooks to get interested. The biggest bar to malware on mobiles right now is the sheer variety of platforms a cybercriminal would have to cover in order to make a profit. But as the market matures, expect platform-agnostic web-based worms to appear. Piggy-backing on the work of legitimate developers, aimed at making it easier to share sites and apps across a variety of devices, malware writers will find ways of finagling their net nasties on to every phone and tablet out there. And as we increasingly use our handhelds as payment device, data store and encryption key, the smartphone will be the most valuable target for criminals. Right now antivirus makers are trying to sell you mobile products that you probably don't need, but don't let their crying wolf fool you. The risk is coming.

Plausibility rating: ★★★★★



The UK will go wireless... everywhere

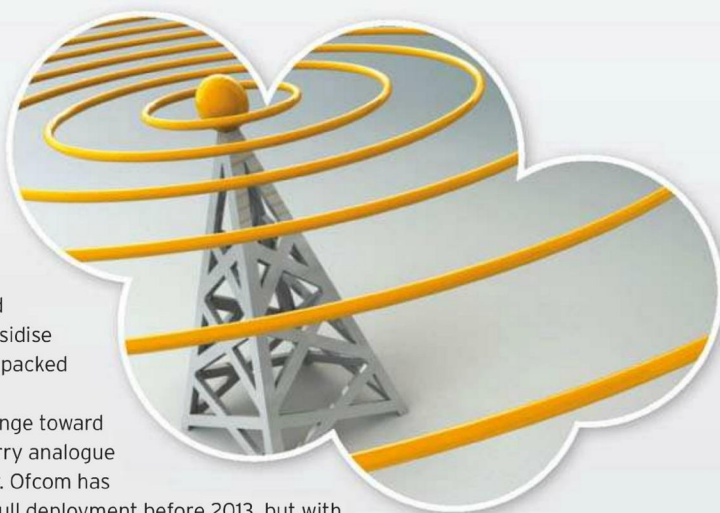
The UK's broadband provision is shocking. Down among the sick men of the connected world, we rely on ageing copper wiring, built to carry a light smattering of phone calls, to quickly deliver large amounts of data. By and large, it doesn't. The trouble is that we're a long way from our own industrial revolution, and the means to dig up roads and fields and lay down fat pipes countryside simply isn't there.

Nor is the political will to ask the tax payer to fund increased hardwired infrastructure. Those who are happy with their setup see no reason to subsidise the rest, and BT and Virgin Media are interested only in supplying densely packed and lucrative suburban areas (on which, see our next prediction).

What the previous government did, however, was set in motion the change toward a better wireless connection for everyone, phasing out the signals that carry analogue TV and radio in order to free up bandwidth for nationwide 4G connectivity. Ofcom has managed to bodge the job to the extent that we are unlikely to see 4G in full deployment before 2013, but with luck it will be just the beginning.

Satellite broadband is now available wherever you can see the sky, and several local governments are at least tentatively investigating the possibility of WiMax networks. It's unlikely that we'll ever have the fixed broadband we need on this island, but there's a better than even chance we'll be able to pluck something approaching a decent connection out of the ether. Whether individuals will be able to afford it is another matter.

Plausibility rating: ★★★★★☆



There'll be amazing connectivity - in only the right places

There's little incentive for BT and Virgin Media, Vodafone, O2, Three, T-Mobile and Orange to support rural areas. The nature of the privatised telecommunications industry pits them against each other in the fight for customers.

This means that densely populated urban areas will continue to be better served for connectivity, and those out in the sticks or in deprived areas will be left further behind. And we're not just talking about fixed-line broadband.

Mobile operators will take on the task of providing service to less populated areas, only with big wedges of tax-payer cash. Imagine how long that's likely to last in this age of austerity.

Extending mobile coverage involves installing masts or base stations, which provide the signal. Each station is then connected to the network to enable traffic to be back-hauled and forwarded on around the network, or sent to the mast nearest the user. Such connections are usually fibre, and they can be shared along the same connection using time-division multiplexing (TDM), in which two or more signals take it in turns.

Rather than each operator having their own network in rural areas, the connection is often owned by a carrier that shares or leases a third-party pipe back to wherever they have a point of presence (POP). The question is who will own and maintain the new masts, and how usage will be paid for by the operators.

So expect some form of shaky wireless for the masses, and ultra-fast fibre connectivity for those lucky enough to live in commercially viable areas, with the wonga to pay.

Plausibility rating: ★★★★★☆



Google will become Microsoft

Google's gone from a tiny glint in two academics' eyes, to a globe-dominating cash-raking machine in 10 short years. As odd as it seems now, for most of that period Google was perceived as the cool outsider taking on the technology establishment.

Google was once as famous for quirky office complexes and enlightened working practices as it was for innovation. With the world's best-loved corporate value - 'don't be evil' - Google seemed the very antithesis of faceless corporate technology. Just a few years ago, Larry and Sergey were still approving every single appointment to the workforce. Google never advertised jobs, instead directly targeting the best and the brightest of the tech industry and making them an offer they couldn't refuse.

But such working practices, all well and good in a startup, are impossible to retain as a fully fledged multinational corporate. Google's halo has slipped as it has made brutal business decisions in the key market of China, got tough on YouTube copyright issues, and as its Labs have failed to lay golden eggs. It's been a while since Google has had a genuine hit and, with Android set to proliferate, it's starting to look a lot like Microsoft: dominant, fantastically rich, but unloved. Expect the next 10 years to see Google post a succession of massive profits, but few successful and innovative profits. And just how evil can it be with the world's largest store of user data?

Plausibility rating: ★★★★★



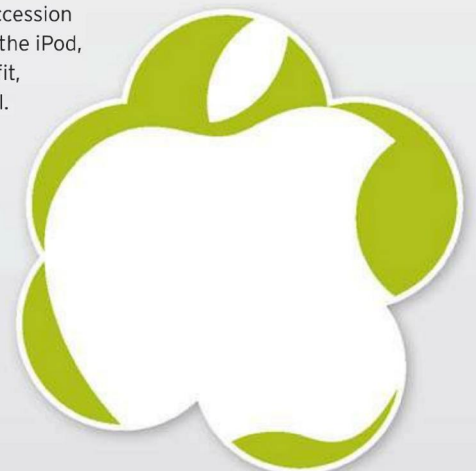
Apple will succeed... on its own terms

Google's only serious rival to the title of 'top tech company of *PC Advisor's* first 200 issues' is Apple: the comeback kid. If you'd have asked us as we went to press with issue 50, we wouldn't have held out hope for Apple making it to issue 200. But the past 10 years have been phenomenal for the company, as a succession of hero products revived its fortunes under the watchful eye of the late CEO Steve Jobs - Mac OS X, the iPod, iPhone and iPad, even the Apple Store. Each claimed increased market share and turned a hefty profit, in some cases dominating markets in a way Apple had failed to do since the heady days of the Apple II. And taking tablets into consideration, Apple may yet become the world's leading PC maker.

So Apple's future is assured, but how will it succeed in the absence of Steve? Contrary to popular belief, Jobs wasn't directly involved in the design and build of many Apple products. Apple employs a huge number of talented people, and Jobs created an ethos and structure that promoted research and design above all else. Apple products are never released unfinished or ill thought out, and the company is happy to miss out on the first blush of a new technology wave - it doesn't see the value in being in the mix just for the sake of it.

Apple goes its own sweet way, and will continue to do so. Whether this means we'll see more market-dominant products like the iPad and iPod, profitable niche products like Macs, or more likely a mixture of both, expect Apple to continue to delight and infuriate in equal measure, inspiring devotion in some, while maintaining a massive bottom line.

Plausibility rating: ★★★★★☒



200 ISSUES OF PC ADVISOR

Indulge us. It's a milestone for a computer magazine to reach 200 issues and still be going strong. The years are littered with one-time *PC Advisor* rivals who are no longer, and we've been partying like it's issue 199, planning out the next 200 issues.

Taking stock of what *PC Advisor* has become, and where it has come from, we've had great fun looking over all 200 issues, laughing at some of the predictions we made, designs we used and headlines utilised to entice readers.

Check out the different styles of covers, the way the subjects covered changes and expands, and the way in which some messages remain constant. What we want from personal computing doesn't really change, even as the medium of delivery grows ever more sophisticated.

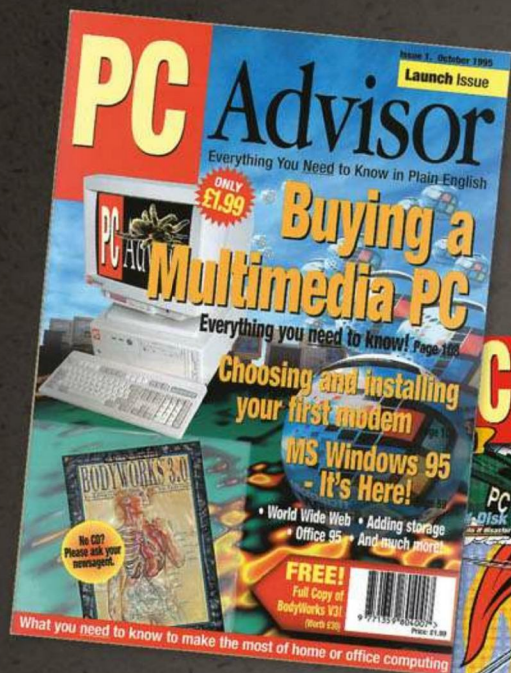
Technology has come a long way in the 16 years we've been on the newsstand, and *PC Advisor* has come a long way with it. Far from the Windows-only book it once was, the magazine now reflects the increasingly divergent way we all interact with personal-computing devices, from smartphones and tablet PCs to desktops and workstations.

In that time we've morphed from being a magazine only in print, to a publication with the UK's most popular technology magazine website (pcadvisor.co.uk), Europe's most popular online technology forums (pcadvisor.co.uk/forums), our own digital magazines (tinyurl.com/6su6sdy), Facebook (facebook.com/pcadvisor) and Twitter (twitter.com/pcadvisor) publications, and mobile sites and apps on Android and iOS.

There have never been more ways of enjoying *PC Advisor*, and the future has never been more exciting. So join us as we flick through some of our favourite issues.

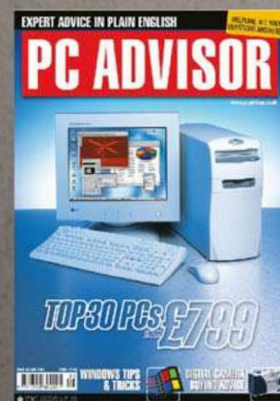
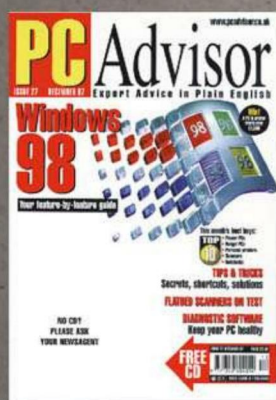
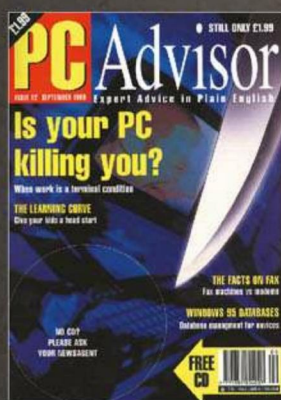
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Win a 12-month subscription to *PC Advisor*, worth up to £59.88! Choose to enjoy *PC Advisor* in print, digital edition, or via the iOS newsstand, for free, for a year. All you have to do is head over to our Facebook page, Like us - if you haven't already - then take a look the album of all 200 *PC Advisor* covers called 'It's our 200th birthday!'. Leave us a note telling us which is your favourite cover, and why, and we'll enter you into the prize draw. We'll pick a winner at random after 2 February 2012.



Issue 1: October 1995

Not that it's dated, but 'MS Windows 95 - It's here!' is a lead headline, and we explain how to choose your first modem. Another headline is simply: 'World Wide Web'. That's right, we explained the internet. All of it.



1995

1996

1997

1998



Issue 100: December 2003

There's 100 reviews, £100 gadgets and 100 questions answered. As if these days we'd be so unsophisticated. We love the bonus of two software CDs. Or, as we call it now, just over a third of a DVD.

1999

2000

2001

2002

2003



Issue 101: January 2004

Over the next 100 issues *PC Advisor* became less a Windows PC magazine, and more a personal-computing tome. Look for brands such as Google, eBay, YouTube and the iPad, reflecting the divergent world of tech.



2004

2005

2006

2007

2008



Issue 200: March 2012

A completely different beast to the magazine launched all that time ago, but covering more subjects, across print, online, mobile, social media and digital magazines. It's been a blast making 200 issues of *PC Advisor*, and here's to the next 200. ☒

2009

2010

2011

2012

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WINNER 2012

PC ADVISOR AWARDS NOMINEES

As we head toward a new year, we are proud to present our roll-call of honour: the best of the past year's technology, and our guide to the brands you can trust and the sites from which to buy

The votes are still coming in and the arguments raging, but the nominees for the *PC Advisor* Awards have been decided for another year. As with last year's awards, there are nearly two-dozen prizes. Many of our award categories have been wrangled over by our team of reviewers and writers, while the rest will be decided by *PC Advisor* readers before the winners are announced in early 2012.

The purpose of the *PC Advisor* Awards is to showcase excellence across the diaspora of products and services we cover online, in

digital magazines and apps, and right here in the *PC Advisor* print magazine. Nominees and winners have been chosen from a year's worth of reviews, so each represents the best of the best in its particular category.

For the hardware awards, we've split up the categories along similar lines to the Top 5 charts we update every month, while we've divided the software section by program type.

In each case, products in contention had to have been reviewed by *PC Advisor* editors during 2011. Those reviews could have been online or in print - or most often both.

In addition, there are five *PC Advisor* Reader Awards. We will be running an online survey, inviting UK consumers to have their say on the best laptop and desktop PC brands, the best online retailers, and the gadget of the year. From the votes we receive we'll be able to deduce valuable feedback about the brands you favour and how well they live up to expectations. So don't forget to have your say! Head to pcadvisor.co.uk/awards.



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IN AMAZON VOUCHERS
PCADVISOR.CO.UK/AWARDS

HARDWARE



★ Best Desktop PC Brand

- Arbico
- Chillblast
- CyberPower
- Dino PC
- Eclipse

★ Best Monitor

- Iiyama ProLite XB2472HD
- LG IPS236V
- NEC MultiSync EX231W
- Philips 273E3LH
- ViewSonic VP2365-LED

★ Best Budget Laptop

- HP Pavilion dv6-6103sa
- Kogan Agora Pro
- Lenovo IdeaPad G570
- Lenovo ThinkPad Edge 11
- Packard Bell EasyNote TS11HR039

★ Best Graphics Card

- Asus GTX 560 Ti
- HIS ATi Radeon HD 6950
- HIS Radeon 6970 IceQ 2GB
- PNY GeForce GTX 570
- Sapphire Radeon HD 6770

★ Best Power Laptop

- Apple MacBook Air 11in (Mid 2011)
- HP EliteBook 8540w
- Rock Xtreme X 685-I5-2540M
- Samsung NP900X3A
- Toshiba Satellite R830-143

★ Best Smartphone

- Apple iPhone 4S
- HTC Sensation
- RIM BlackBerry Bold 9900
- Samsung Galaxy S II
- Samsung Omnia 7

★ Best Storage Device

- Crucial M4 256GB
- Qnap TS-419P+
- Synology DS211
- Promise Pegasus R6
- Corsair Performance Pro 256GB

★ Best Tablet

- Acer Iconia Tab A100
- Apple iPad 2
- Asus Eee Pad Transformer TF101
- Samsung Galaxy Tab 10.1
- Sony Tablet S

★ Best Compact Camera

- Canon Ixus HS 230
- Fujifilm FinePix HS20
- Nikon Coolpix S9100
- Panasonic Lumix DMC-TZ20
- Sony Cyber-shot DSC-HX9V

★ Best Audio Product

- ADL GT40
- Arcam rCube
- Etymotic Research hf3
- Naim Audio UnitiQute
- Orbitosound T12v3

★ Best Printer

- Brother HL 2130
- Canon iSensys LBP7750Cdn
- Epson Workforce Pro WP-4535DWF
- Kodak Hero 7.1
- Kyocera Mita FS 1320D

★ Best Digital Camera

- Canon EOS 600D
- Nikon D5100
- Olympus PEN E-P3
- Panasonic DMC-G3
- Sony Alpha A55

★ Best Digital Home Device

- Apple TV
- Cryo PC Alto
- Elgato Netstream
- InFocus ScreenPlay SP8600
- WD My Book Live

★ Best Wireless Networking Product

- AVM FritzBox Fon WLAN 7390
- Cisco Linksys E4200
- D-Link W307AV
- Netgear N600 DGND3700
- TP-Link TL-WR1043ND

★ Best Portable Storage Device

- Apricorn Aegis Pro SSD
- Buffalo MiniStation Extreme
- Hitachi Touro Mobile Pro
- WD My Passport Studio 1TB
- Seagate FreeAgent GoFlex UltraPortable

★ Best Portable Entertainment Device

- £89 Amazon Kindle
- Apple iPod touch (2011)
- Kodak PlaySport Zx5
- Pure Move DAB 2500
- Sony Ericsson Xperia Play

SOFTWARE

★ Best Security Software

- Bitdefender Internet Security 2011
- Kaspersky Small Office Security
- Panda Internet Security
- Symantec Norton Internet Security 2011

★ Best Photo or Video Software

- Adobe Photoshop Elements 9.0
- Adobe Premiere Elements 10.0
- Corel Painter 12.0
- Sony Vegas Movie Studio HD Platinum 10.0
- Xara Photo & Graphic Designer 6.0

★ Best Game

- Assassin's Creed: Brotherhood
- Dead Space 2
- DIRT 3
- Need for Speed: Hot Pursuit
- Super Street Fighter IV 3D

★ Best App

- Camera+
- ESPN Goals
- Facebook for iPad
- The Guardian for iPad
- Napster



- Sky Go
- Skype 3
- Spotify for iPhone
- TripAdvisor
- WhatsApp

READER AWARDS

★ Best Desktop PC Brand

★ Best Laptop Brand

★ Gadget Of The Year

★ Best Online Retailer

★ Specialist IT Retailer Online



HAVE YOUR SAY AND YOU COULD WIN £250 IN AMAZON VOUCHERS!

So don't delay - for your chance to win £250 in Amazon vouchers, and to have your say on the latest technology and services, head over to the *PC Advisor Awards* page and vote now:

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Express yourself

We can now capture every aspect of our lives, thanks to the cameras on our phones or stashed in our bags and pockets. Even the cheapest smartphone comes with at least a rudimentary stills camera, while just £50 will buy you a 5Mp compact.

On page 170 our *How to: Mobile* workshop focuses on making the most of your photos on an iPad 2. Taking the free Blurb photobook-creation app as its basis, we look at how to showcase your best shots and turn them into a stunning slideshow you can play on your tablet and share online or by email.

For an extra dimension, you can take a series of photographs and build up a 3D image of an object that is then translated by the Sculpteo 3D-printing service into a physical item. See page 166 for our step-by-step guide.

We can't ignore the importance of voice recognition now that Apple's Siri assistant is making such an impact. *How to: Upgrade* on page 162 explores the possibilities of increasingly sophisticated speech-recognition technologies and explains how voice commands can give you greater control. ☒

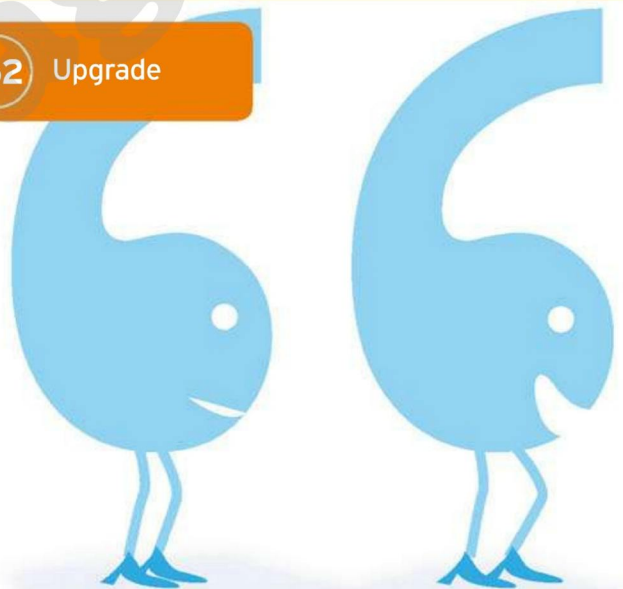
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How to: Mobile	170

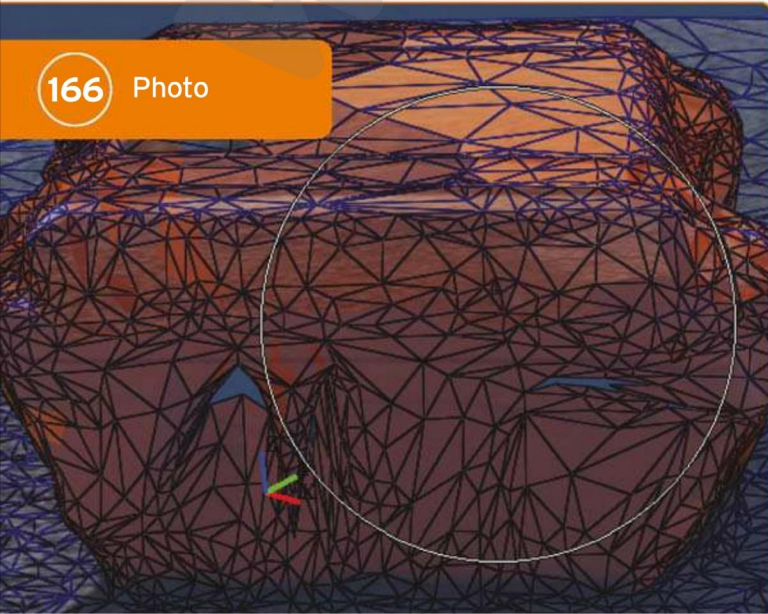
155 Troubleshooter



162 Upgrade



166 Photo



170 Mobile



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Using iCloud in Windows

Rosemary Hattersley explains the ins and outs of using Apple iCloud on a Windows PC

Millions of us own iPods and iPhones. Until a few months ago, when Apple launched its iOS 5 mobile platform, we were dependent on iTunes to manage the content downloaded to our iDevices. iCloud, introduced with the OS, allows simple management of files, contacts, calendars, music and photos across multiple Macs and iDevices. But it's no secret that iTunes and Windows have never been on particularly good terms, nor that Apple's synchronising tool is a partial appeasement to those fed up with the tyranny of iTunes.

iCloud is an online file-synchronisation service. For people who aren't keen on tying their music, photos and files to iTunes, it offers a useful alternative. You can use iCloud to back up your iPhone or iPad over Wi-Fi to Apple's server, then download any files you wish to whichever PC you log in from.

Aside from having a compatible iDevice – an iPod touch, iPhone or iPad or a Mac – all you need to do by way of preparation is to update to iOS 5. This upgrade will be offered



when you next plug in your device to a PC. Back up your content before you begin, both through iTunes itself and using Windows' own tools for storing and saving photos. Depending on your Autoplay options, your iPod should pop up as an icon and you can simply confirm that you'd like to import your photos and video.

iCloud allows you to back up much more than this, though. You can back up your email messages and import contacts, notes and other items that – apps aside – could easily be lost in an upgrade to a new device. Apple makes it easy to re-download items you've bought through iTunes; less so for those you brought to the party yourself.

iTunes Match is a service available only in the US. It functions as one workaround: if you import music you bought from a non-Apple store such as AmazonMP3 or MSN Music, iTunes Match may recognise those items as having been legitimately purchased and allow them houseroom. If you sideloaded your albums by ripping them from CD to iTunes, you'll be able to update them to Apple's chosen format of AAC at 256kbps after you sign up to a \$25 annual iTunes Match subscription. This matches your tracks to copies stored in Apple's global

iTunes library; if the song in question can't be found on its servers, Apple will allow you to upload it.

If you're making the switch from an older iPhone handset to the 4S, there's no obvious mechanism for getting your contacts from one phone to the other. The need to change from a standard SIM to a micro SIM leaves the ball in your court as to how to manage the migration.

If you want to sync your contacts and email, go to the iCloud menu on your existing iDevice and move the slider to On. You'll be prompted to create a me.com email address. This account name can't be changed later, so choose it carefully. If you were logged into the iCloud account on your PC, you'll need to log in again using your @me.com account. Click the Contacts icon and a list of your friends and acquaintances will now appear.

Other items you may want iCloud to import include any Notes you've tapped into your iPhone or iPod touch, as well as any documents you may have created and stored on your iPad. Go to Settings, iCloud on the device and turn on that feature, taking note of the warnings regarding data transmission charges if you specify 3G as well as Wi-Fi as means of transferring content. ☒





YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

INACCESSIBLE DRIVE

Q My CPU cooler became detached, resulting in the PC overheating and shutting down. I can no longer access the partition on which I store my photos. The 230GB IDE disk is partitioned into H: 128GB RAW Healthy Primary Partition and K: 104.89GB NTFS Healthy Logical Drive. Windows 7 reports that H is inaccessible and the file or directory is corrupted and unreadable. Is there anything I can do to regain contact with the H partition and all my photographs? My backup is a few weeks out of date.
Malcolm Sharpe

Given the right tools, data can be easily recovered from almost any hard drive. For severely damaged drives this can be an expensive process, but users all too often give up on valuable data that's far easier and less expensive to restore. Even data stored on a hard drive that's no longer recognised by the PC's Bios can occasionally be recovered using software tools alone.

Thankfully, the relatively small file size and self-contained nature of Jpeg images makes partial recovery possible, even if sections of the drive can't be read.

Basic and freeware utilities such as Piriform Recuva (tinyurl.com/3kt2dau) are ideal tools for recovering photos from damaged hard drives, but will often struggle to bring back data from a RAW partition.

One free utility that can achieve this task is EaseUs Data Recovery Wizard. Head to tinyurl.com/7cpgyjx to download the free version; the full program costs \$69 (£44). You could also try ZAR (z-a-recovery.com).

You may need to take additional steps to start recovering your data from a RAW partition, such as 'unformatting' the drive. ZAR provides a tutorial for completing this process at tinyurl.com/25azwn. The tool's image-recovery feature is free to use.



A further option is to try the Damaged Partition Recovery module of MiniTool Power Data Recovery (powerdatarecovery.com). It will recover 1GB of data for free, after which you'll need the \$49 (£31) full version.

SUSPICIOUS SECURITY SENTINELS

Q Several programs vanished from my PC, including AVG Free, Windows Firewall, ZoneAlarm Firewall and Microsoft Security Essentials. I've managed to reinstall only the latter two services. A full system scan detected and removed a virus, and ZoneAlarm now reports that everything is working as it should. However, System Restore refuses to restore to an earlier point or create any new ones unless I restart the PC, yet doing so returns the same error message. *A Hall*

It sounds as though you're experiencing the aftermath of a malware infection. Although your antivirus software has probably removed the offending program, some of its damaging effects seem to still be in place.

It's not a good idea to roll back your machine to a previous point following a malware infection, since System Restore's archive may include infected files. You can

delete these files, along with all previous restore points, by turning off System Restore and turning it back on again.

Use the System File Checker to restore any system files that may have been deleted or corrupted by the malware. Click Start and type cmd in the Search box. Right-click the 'cmd' or 'cmd.exe' entry that's returned and choose 'Run as Administrator'. This will open a new command prompt with the word 'Administrator' displayed at the top left.

Type SFC /SCANNOW and hit Enter. This process may take several minutes depending on the speed of your computer. If there are any files that need to be reinstalled, the utility may ask you to insert your Windows disc - ensure you have it to hand.

REGISTRY PROBLEM

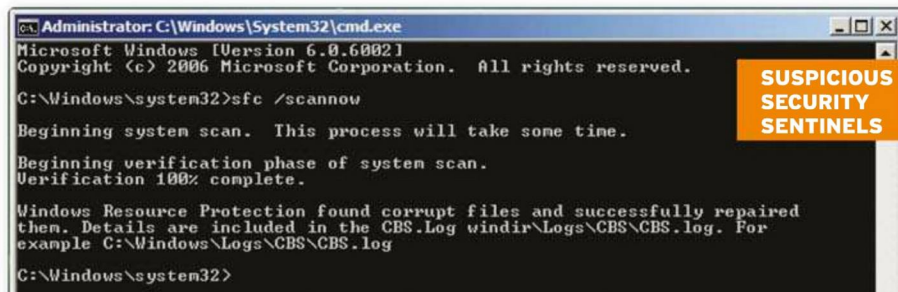
Q CCleaner frequently removes three entries from my PC's Registry - SMax4.exe, SMax4Wiz.exe and SMWizard.exe. Every time I reboot the machine they reappear. How can I delete them? *Edward V Wilkinson*

These files are part of the SoundMax audio system and don't need to be removed from your PC. If you really want them gone, uninstall any SoundMax audio applications you find at Start, Control Panel, 'Uninstall or change a program'.

BOOTUP FAILURE

Q My PC refuses to boot, and emits one slow bleep followed by two fast bleeps. What does this mean? *Mike Ilsey*

The bleeps you hear are a coded message designed to tell you what's preventing your system from completing its Power On Self





Test (Post). The codes used vary from one motherboard to the next, so before the meaning can be determined we need to know what model is fitted in your PC.

If you have the motherboard manual to hand, you should find the Post error codes listed inside. Otherwise, determine the make and model of your motherboard and download the manual from the maker's website - you may find this an easier option in any case, since the PDF file containing the manual will be searchable.

One long beep followed by two short beeps is usually indicative of a problem with the graphics card. Try removing and re-seating the graphics card, making sure that its power connectors are plugged in firmly. If this doesn't solve your problem, you may need to buy a new graphics card.

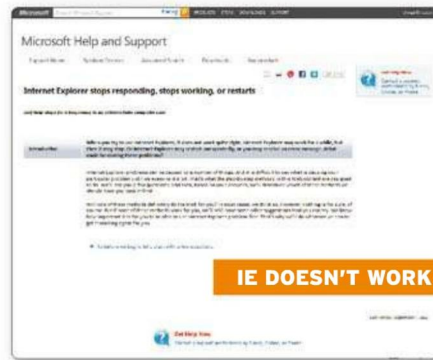
COMPUTER SYNCHRONISATION

Q I often use my laptop on the road and need a way to transfer files to my desktop PC when I return home. Is there any software that will keep track of the changed files and synchronise the two PCs automatically? *Jerry Sheard*

Software to do this ranges from free basic utilities to sophisticated business-oriented syncing applications. We've reviewed a number of backup and synchronisation tools at tinyurl.com/44pkyk9.

You could also take a look at Microsoft's free SyncToy (tinyurl.com/82hsq8n). This creates pairs of folders for synchronisation and applies sophisticated rules for dealing with conflicts - such as what to do when a file is renamed on one machine, but deleted on the other.

Windows Task Scheduler will be useful if you want SyncToy to run at predetermined times or in response to a system event.



You will need to ensure that both the laptop and the desktop PC are connected via a network. Also check that the computer running SyncToy can access the necessary folders on the other PC over this network, with the relevant file permissions to allow files to be written and deleted as necessary.

A couple more options include GoodSync (tinyurl.com/chhpu65) and FreeFileSync (tinyurl.com/d7umf5k).

IE DOESN'T WORK

Q 'Internet Explorer dropping out' messages keep popping up at the most inconvenient moments, informing me that 'Internet Explorer has ceased working' and 'We are checking to find the problem'. I'm sure this is due to something I've done, but I have no idea how to put it right. *William Yates*

Mysterious crashes can have any number of causes and are often difficult to diagnose, especially without more specific details of your PC and software configuration.

A good starting point is Microsoft's self-help page (tinyurl.com/3b3kcx). You'll

be asked a series of short questions, after which it will attempt to rectify your problem.

This troubleshooter works only for versions of Internet Explorer up to and including 8.0. If you aren't running version 9.0 and this troubleshooter can't solve your problem, try upgrading Internet Explorer.

ROXIO-ARCHOS FRUSTRATION

Q Roxio Creator 2009 is unable to stream video to my Archos TV+. The Archos can see the video but can't play it, while photos display okay. I think the problem may lie with my wireless router - do I need to enter port information and, if so, what and where? I know other streaming options are available, but the problem with this program is irritating. *Stephen Tame*

This problem may in fact be due to the Archos' incorrect configuration in Windows Media Player. The company's support site suggests that Windows Media Player 11.0 must detect the TV+ as a UPnP device, and you should see an icon with the TV+ label in the Sharing Parameters when you select Library, 'Share Multimedia Files'.

Check that you've properly set up your media player's sharing options and that any firewall software you use isn't preventing your PC from sharing multimedia content from Windows Media Player.

Another issue could be that you're missing the required video codecs. Some of these, such as H.264 and Mpeg4, must be purchased as separate plug-ins. Archos no longer seems to support the TV+ via its website; for support visit the Archos Fans forum instead, at tinyurl.com/8aympkq.





WINDOWS 8 AND BLUETOOTH

WINDOWS 8 AND BLUETOOTH

Q My Microsoft Bluetooth Mobile Keyboard 6000 worked fine with a Belkin Bluetooth dongle until I decided to dual-boot the Windows 8 Developer Preview. The Bluetooth drivers don't load in the new OS until after Windows has itself loaded, so I'm unable to press Enter to boot into Windows 8 directly, F2 to enter the Bios or F8 for Safe mode. Wireless keyboards that come with a dedicated Bluetooth dongle don't have this problem - how can I get around it on mine? *Alok Modi*

Many other users have reported the same issue with this keyboard. The short answer is that you probably won't be able to make it work in the way you would like.

Your PC's Bios doesn't have built-in support for Bluetooth devices. Until the operating system has started up and the Windows drivers have loaded, there can be no communication between your Bluetooth keyboard and the PC.

When a Bluetooth keyboard is bundled with a USB adaptor, the two items are designed to work together to get around this problem. This often involves the Bluetooth adaptor itself managing a wireless connection with the keyboard, and then tricking the PC into thinking it's a standard USB keyboard. Once the OS has loaded the adaptor can switch to full Bluetooth mode, often enabling additional functions.

It may be possible to get your keyboard to work in Bios mode by purchasing a new dongle that's able to spoof the USB protocols to the PC and set up its own Bluetooth pairing with the keyboard. However, we don't know of a device that's capable of functioning in this way with the Microsoft Bluetooth Mobile Keyboard 6000.

The cheapest solution would appear to be to buy a budget USB keyboard (possibly a

compact mini model for convenience), which you can use for those rare occasions when you need to access the Bios or Safe mode.

LAPTOP IS CAMERA-SHY

Q My laptop running Windows 7 Starter Edition is only a few months old, but a recent crash caused me to lose everything. I reinstalled the OS, and soon discovered that the webcam had stopped working. How can I fix this? *Bekithemba Nhlamba*

It's more than likely that your webcam is simply missing the software drivers it requires to function correctly. Head to your laptop manufacturer's website and search through the downloads or support section for a Windows 7 webcam driver. Once you've installed this on your laptop, you should find the webcam is working normally again.

Having installed Windows 7 from scratch, you may well be missing other drivers that you won't realise you need until something else breaks. Have a look through what else is available on the manufacturer's site.

WINDOWS LICENCE ISSUE

Q A technician built a PC for me. I paid him for his time, the parts and a 'legitimate' copy of Windows XP. He then installed the OS under a 'volume' licence, which I've since come to understand as being legal only in a corporate setting. The technician offered to 'fix' the issue, but this was done at the expense of my Vista partition.

To make matters worse, I then loaded a new copy of XP and accidentally clicked Yes to format the C drive. I lost access to the contents of my external backup drive, and am now unable to open any of the documents on my D drive or my external drive. Windows claims I do not have administrator privileges, even though I am the sole user. I suspect this is because XP was reactivated on my C drive and the new copy of the OS has a different serial number. *Ronald Edberg*

As an end user you should never accept a volume-licensed version of Windows - unless you're paying for your own volume licence, which is highly unlikely. For installation on a single PC, Microsoft provides instructions on how to tell whether your copy of Windows is genuine at tinyurl.com/6prbzru.

We don't have much detail about the external drive to which you've lost access, but we presume that you have some sort of backup system in place that copies your data from drive C to drive D.

Product : Laptops & netbooks - IdeaPad Y430

Operating system: All types

Category: Camera

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Multi-Driver Download Manager

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Driver download help

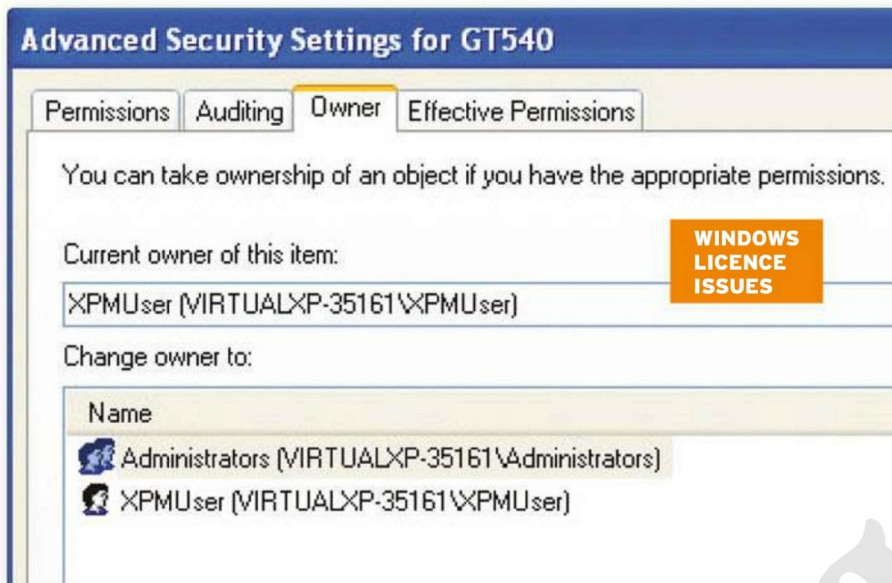
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	Driver Version	Release Date	File Size	Applicable OS	Download	Add to list
LAPTOP IS CAMERA-SHY						
Camera(3)						
Camera Driver	1.9.0808.01/6.96.3419.03.1	2009-10-22	12.7 MB	Windows 7 32bit	Download	Add to download list
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Lenovo Easy Camera Driver	6.32.714	2008-11-12	11.01M	Windows Vista 64bit	Download	Add to download list



The issue with changing drive letters is a frustrating one. Booting from a CD to install an operating system can often result in your drives and partitions being assigned different letters to the ones they have inside Windows. It's therefore of the utmost importance to take great care when selecting a partition for formatting. Looking at the drive letter alone may not be enough; also look at the reported size of the volume and whether it has any existing volume name associated with it. It's also a good idea to unplug any external drives before you begin, as they can simply confuse matters.

If you accidentally format the wrong drive, immediately stop the installation and attempt file recovery using one of the tools described on page 156. Formatting doesn't destroy your data - it simply tells the OS to treat all usable space as available. It's not until you place new files on the drive that your original documents will be overwritten. Once new data is written to the drive, however, your original files will become irretrievable. If you're not familiar with the data-recovery process, the best option is to hand over your drive to someone who is.

Files created under a previous installation of Windows may have permissions configured that, by default, are not accessible to other operating systems installed on the same PC. To get around this you need to take ownership of the files. This must be executed from an Administrator account.

To take ownership of a folder you will first have to turn off simple file sharing if you have it enabled. Open Windows Explorer

and choose Tools, Folder options. Click on the View tab and look in the Advanced Settings section for the 'Use simple file sharing (Recommended)' entry. Deselect this option and click Ok.

Next, right-click the folder over which you want to take ownership. Select Properties, then click the Advanced button on the Security tab. Select the Owner tab in the new window that appears and choose your account name (or Administrator) under 'Change owner to'. Also select the 'Replace owner on subcontainers and objects' entry, then click Ok. Click 'Yes' if Windows asks any further questions about taking full control.

You should now be able to access your files and folders. Note, however, that this won't be possible if you encrypted your files in the previous installation of Windows.

For full details and information on how to perform similar procedures in different versions of Windows, read Microsoft's support article at tinyurl.com/6jxps.

FACEBOOK IDENTITY ISSUE

Q Please explain how I can post as myself on a Facebook page of which I'm an admin. It's foxing me and I can't find an easy way to do so. *Anonymous*

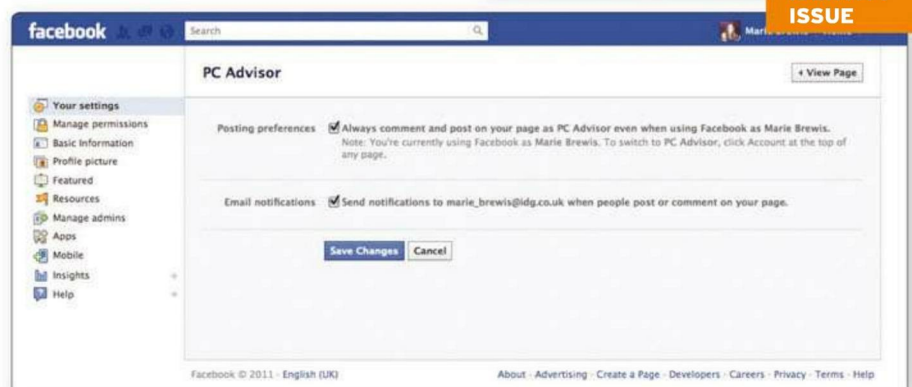
Facebook Groups and Pages function differently in this regard. If you're a group admin, your posts should appear under your own name.

However, as the owner of a Facebook page, the default settings are such that any posts you make on the page's wall are made under the name of the page even though you're signed in under your own account.

Facebook allows you to change this default behaviour by taking the following steps. Go to your page, click the 'Edit page' button at the top right, then select 'Your settings' from the menu on the left.

Next, clear the box marked 'Always comment and post on your page as [page name]' even when using Facebook as [your name]' under Posting preferences.

Now, when you're logged into Facebook as yourself, your page posts will be entered under your own name. To post as the page




```
C:\C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\KPMUser>replace *.* N:\MyBackup /U /S
```

CAUGHT IN DATA TRANSIT

owner, switch to using Facebook as the page by clicking the small down arrow next to the Home menu at the top right and then select 'Use Facebook as Page'. Choose the Page you want to use from the list. Alternatively, click the 'Use Facebook as [page]' link under Admins when viewing that page.

CAUGHT IN DATA TRANSIT

Q I've been trying to transfer a large amount of data from one PC to another using a USB drive. However, Windows keeps reporting that some of the files are duplicated on the USB drive, and wants to know whether to replace them or create new versions. Windows recognises that some files have since been updated, but still lumps together these instances with the identical file cases. Therefore, I must manually specify my preference in each case. With many gigabytes of data to get through, is there a better solution? *Jenny Wallis*

A simple way around this would be to create a new folder on your external USB drive and then copy all your data into it. This will leave the drive's original files untouched, and Windows won't report any conflicts during the file-copy process. It's always safer to do it this way if there's any risk of accidentally overwriting the wrong file.

Windows 7 also has a Replace command, which can be used to replace one set of files with another. The /U switch will instruct the command to replace only files that are older than those you are copying.

Using C as the drive letter for the files you want to copy and N as an example letter for your USB drive (replace these with your actual drive letters), open up a command prompt. Go to Start, type **command** in the search bar and click on the 'command prompt' icon which pops up in the results.

This will bring up a command window. In this window type the following commands, pressing Enter after each:

C: (change to your source drive)
CD <Folder> (where <Folder> is the folder containing your files)
replace *.* N:\<Folder> /U /S (where <Folder> is the path to the folder on your USB drive where you want to copy your files)

The command will overwrite only the older versions of your files. A list of which files have been copied is displayed onscreen.

We urge you not to use this method unless you're absolutely sure you don't need both copies of any of your files, and that you're sure the newer version is the one you want to keep and not in fact a different file that happens to have the same name. ☒

CONTACT US

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Helproom aims to give you the best assistance possible. But, given the

limitations of this type of advice, we can't guarantee what we say will work and we can't accept responsibility for any damage arising as a result.

Always back up your system before you make any changes, including software installations.

Please note that we are unable to respond to letters or telephone requests, but we will endeavour to answer queries submitted by email or via our Helproom forum.

For more PC help go to:
pcadvisor.co.uk/helproom



SEARCH THE PC ADVISOR FREE ONLINE HELPROOM



The *PC Advisor* online Helproom contains an indispensable database of answers to common questions regarding all aspects of PC problems. This ranges from general Windows issues to problems with specific apps, and covers all types of PC hardware and software, including system components and peripherals.

Alternatively, you can ask for help from the experts on our online forums. Sign up to be a registered user - which is free - and then browse to one of the discussion forums. In the Helproom your first stop should be the searchable database of frequently asked and previously answered queries. With more than 1.5 million forum posts, you'll almost certainly find your answer in this archive of queries - just enter a few keywords.

If our online database can't solve your problem, try posting a question in the Helproom forum, where more than 200 queries are answered every day. The forum is manned by our team of Helproom Angels, who are ready and willing to lend a hand with anything from system crashes to virus alerts.

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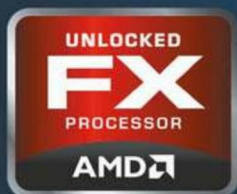


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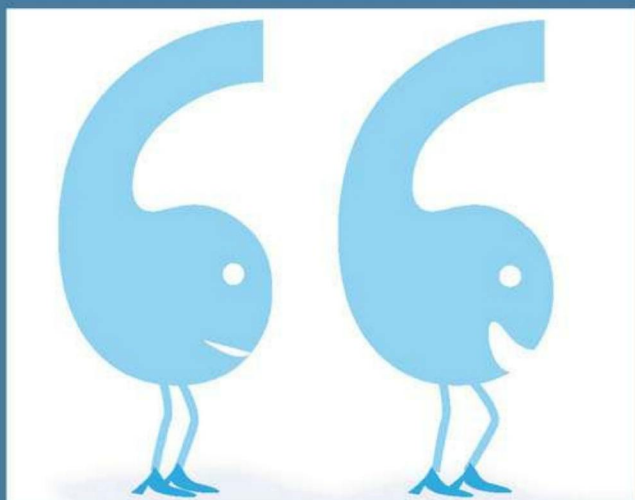
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Speak easy with voice commands



Voice commands offer an alternative way of controlling your computing kit. Tom Norton explains how to pitch requests to get the response you want



The devil makes work for idle hands, but the past decade has seen several advances in voice-recognition software that aim to ensure our mouths rather than hands do the talking when using a PC or smartphone.

The transition from hand to mouth hasn't been particularly smooth. For too long operating your phone with fingers and thumbs has been preferable to repeatedly articulating "Call John" into a hands-free set that then calls Tom, Dom or even mum.

Times have changed, and a huge leap in voice-recognition software means that what once was cumbersome is now cutting-edge. Now heralded as one of the fastest-growing areas in technology, vocal-command software has transcended from individual devices to smartphones and computers.

Advances in Bluetooth technology have propelled some of this progression - at least in hands-free devices. No longer are we reliant on yelling into a microphone attached to a flimsy cord in

order to reach our contacts. Instead, state-of-the-art earpieces are easily synched with, say, a mobile phone.

And whereas a headset's use was once restricted to dealing with incoming and outgoing calls, today's headset offers many more useful services. We recently reviewed the Plantronics M1100, for example, which enables hands-free aficionados to update their Facebook status, post a Tweet to Twitter and even dictate email messages. Head to tinyurl.com/6s2mpve for our full review.

Smartphones have also joined the technological furore with a host of apps geared toward voice commands. The antiquated times of 'voice training' are over, and these sophisticated apps are able to learn your verbal quirks and accent. Such services are available in the form of Siri for iPhone, Vlingo, Nuance and Microsoft's own 'Tell Me'. Here, we'll explain what each has to offer, as well as looking at voice-recognition software on a PC.

CONTROL YOUR iPhone USING SIRI



START

With Siri configured on your iPhone 4S, simply press and hold the Home button to launch the application. Alternatively, head to Settings, General, Siri and turn on the 'Raise to speak' option. Siri will now activate when you pick up the handset and hold it to your ear.

“Do I need a raincoat today”

Yes, it's likely to rain today:



4 If you hanker after a weather forecast, Siri is intelligent enough to deal with far more than outright requests. Questions such as "Will I need an umbrella?" and "Will it be chilly in Edinburgh on Saturday?" bring up climate information in your current location or a particular destination you've mentioned.

SIRI AND LiSA

Apple's much-lauded Siri is one facet of voice-recognition software with which you're probably familiar. Siri prides itself not only on understanding what you say, but knowing what you mean.

Utilising all the apps in your iPhone arsenal, Siri has the intelligence to text your chums when you're going to meet them down the pub, it can set reminders, call a cab and even tell you whether you'll need an umbrella. So comprehensive is its understanding and execution of day-to-day tasks and requests, it's in danger of rendering our alarm clock or personal assistant useless.



2 Ask Siri to perform a task simply by saying aloud what you want it do - no doubt this will initially feel a little strange. For example, we said: "Tell Steve I'm running late". The service automatically detects when you've finished speaking, or you can press the microphone icon to manually indicate as much.



3 Setting up meetings is possible as Siri's intelligence system syncs with other apps. If you plan to meet a friend later, you can ask Siri to text that friend and state the time and place. The event will be placed in your calendar, too. If you later refer to this meeting, Siri knows what you're talking about and sets a reminder.



5 Text messaging is also enabled through speech. Mention a friend's name and Siri will offer to text that individual on your behalf. Unfortunately, it isn't clever enough to let you set a default email or text preference for individual contacts, and you'll need to specify which service it should use each time.



6 Negotiating your way through your music collection is simple. No matter in which menu you're currently viewing, simply say "Play gym playlist" (or whichever of your mixes you'd like to listen to) and you'll be rocking out to 'Eye of the Tiger' in no time. The transition is seamless. ☒

Another important app for Mac OS X users is LiSA (also known as Liquid Information Speaking Assistant). Offering a real human voice, as opposed to a synthetic one, LiSA tells you who an email is from as and when it arrives, according to the relationships you've designated for your particular contacts: such as brother, friend or boss. It then can assign importance to these individual relationships and whether or not you'd want a particular email read out, so the latest corker from sexist Uncle Keith can stay quiet whereas anything from your demanding boss is vocalised.



GET MORE FROM YOUR PC WITH DRAGON NATURALLYSPEAKING



START

Once you've installed Nuance's Dragon NaturallySpeaking 11.5 voice-recognition software, it pays to spend a bit of time getting to grips with how it works. The Profile Creation wizard will automatically pop up the first time you launch the program. Click New profile to get started.



2

To help it learn the tone of your voice, Dragon will ask a series of questions relating to your age, region, microphone type and accent. Be honest: you may think you've lost that Irish twang since moving from Dublin, but indicating its possible influence helps the software learn how you pronounce your words.



5

Honing Dragon's accuracy is an important step. It performs a one-time scan of your existing emails/documents, adding your contacts and getting used to your vocabulary and writing style. You can then schedule accuracy tuning for language and acoustic optimisation. This takes time, so consider setting it to run overnight.



6

Dragon's Vocabulary Editor lets you add new and edit existing entries. This is useful for adding place names the software may not recognise, as well as products, company names or institutions and contacts with unusual surnames. Any slang can be personalised and formatted here, which will save time later.

VLINGO FOR ANDROID, BLACKBERRY AND iOS

Those using a BlackBerry, iPhone or Android handset can make use of Vlingo, a free 'personal assistant' and voice-recognition app. It integrates with a host of other apps found on the majority of smartphones, such as email, maps, text messaging and social-networking sites such as Facebook and Twitter – an undoubtedly good selection, but not as expansive as that of Siri.

Vlingo's voice recognition is based on an innovative 'intent system', and is able to easily cope with the inflection of various accents. We also like the app's Safereader function, which

can read aloud emails and text messages and is an ideal tool for keeping you out of trouble with the boys in blue if you're driving. A great deal of Vlingo's functionality requires the use of your hands, however, so don't attempt too much when you're sitting behind the wheel.

As is often the way, many of these functions are available only through the paid-for Vlingo Plus service (standard Vlingo is free). BlackBerry users should note that RIM is currently offering this app for free by way of recompense for the data outage experienced in September.

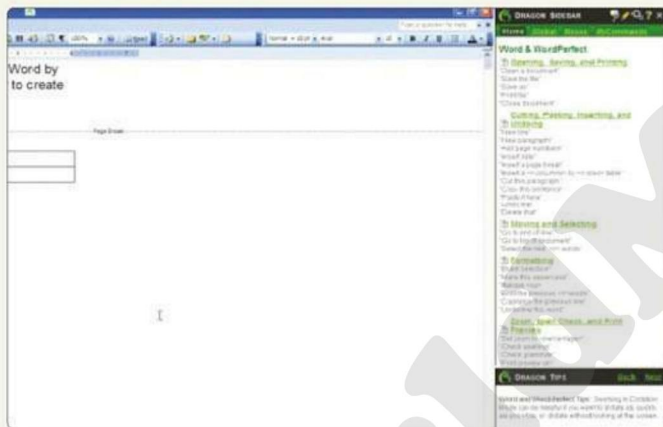




3 Now to test the quality of your volume and audio. Read aloud the text shown onscreen. Dragon will let you know when it has heard enough and adjust the volume accordingly. Next up is the audio check, to ascertain the quality of your microphone. This takes just a few seconds, and you'll hear a beep when it's finished.



4 Choose one of the training text options (Kennedy's inaugural speech was our favourite) and read it aloud in a clear, measured tone. The words turn grey as Dragon hears them. Using your normal everyday voice and volume will help the software recognise your tones in the future.



7 One of the most common pairings of NaturallySpeaking is with Microsoft Word. Here, a staggering number of actions can be called up and carried out via a voice command, including transcription, requesting a word count, inserting a page break, opening and closing documents, and saving your work.



8 Shortcuts let you launch a program or task, even if you're already working on something else. Say "Email Jack Rouss" to bring up a blank message in Outlook, or "Search", followed by a keyword, to begin surfing the web. You'll be able to while away hours on the internet, without lifting a finger. ☒

NUANCE AND MICROSOFT TELME FOR WINDOWS

No stranger to the world of voice recognition software, Nuance's latest technological offering is Dragon NaturallySpeaking 11.5. The Dragon range has long been heralded for its incredible accuracy, and the latest version continues this accomplishment. The Dictation component transcribes words spoken at normal speed, an impressive feat that's absent in some of its rivals.

If you've already got a copy of NaturallySpeaking, you can upgrade to the latest version for free; otherwise, it's rather pricey at £72 inc VAT. But if flawless voice commands are on your priority list, this software should be, too.

Microsoft's TellMe is an alternative voice-recognition app that's available as a free download for tablets, phones, PCs

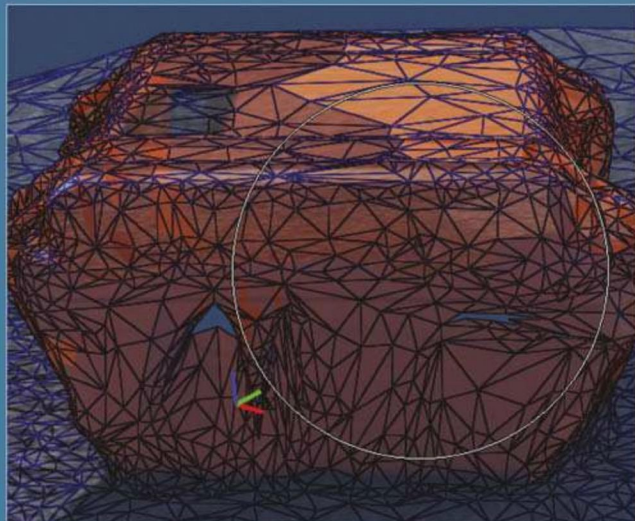


and even cars. The technology is very much akin to what we've seen from the other programs mentioned here, but its short and simple commands are useful for composing email, finding a route home using Ford Sync (the in-car option), launching Call of Duty on your Xbox and more.

Bring a series of photographs to life



Mike Bedford explains how to turn a sequence of photographs into a virtual 3D model you can manipulate onscreen and even turn into a solid object



Software for drawing 3D models is nothing new: such tools are readily available and range from prohibitively expensive to free. Your first steps in 3D design will require a considerable investment of time. Even experienced designers will acknowledge that there's a learning curve associated with the extra dimension - not to mention a greater demand on your PC's processor.

You don't have to start with a blank canvas and a digital illustration package, though. You could instead create a computer model of an object that exists in the real world. You can take a series of photos of that object, captured from all possible angles, then use sophisticated software to stitch them together and create a 3D virtual model.

Suitable stitching software is available as a free online service, which also relieves your PC's processor of the gruelling number-crunching. That's just as well, since the

pattern recognition involved could keep your PC occupied for many an hour.

You can edit your model as necessary, and spin it around onscreen for viewing from any angle. Such models are commonly used by online stores and virtual museums - they could enhance your website, too.

The basic method we explain over the following pages is just the start for 3D modelling. If you're prepared to invest a modest amount of cash, you can use 3D printing technology to turn a virtual object into a physical item.

3D printers are rather expensive, so you're likely to be better off instead submitting your virtual model to a 3D printing bureau. We've chosen the Sculpteo service (sculpteo.com), which offers reasonable prices and a six-day turnaround.

In a world in which just about everything has gone virtual, using your PC to create a real-world object is a refreshing idea.

CREATE AND PRINT 3D MODELS FROM PHOTOS



START

Take a sequence of photos of your object from all possible angles, including the top - 40 to 50 is a good number, although too many is better than too few. Ensure that there's plenty of overlap between adjacent shots. See *3D photography guidelines* (below) for advice on choosing an appropriate scene.

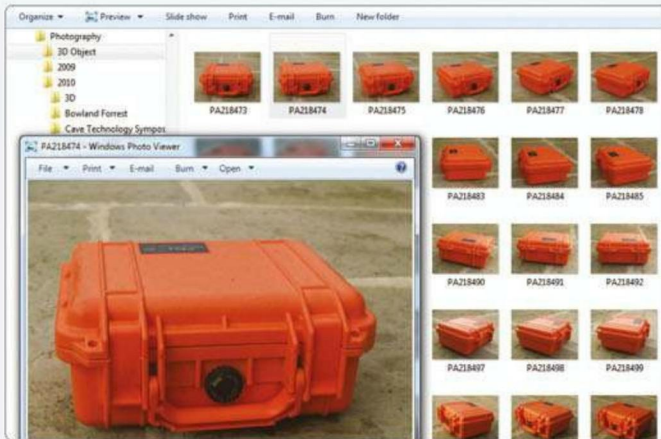


4 Click 'Compute Photo Scene', then choose whether you want to wait or be notified by email when your 3D object is complete. We found that the process took around a quarter of an hour, and preferred to opt for email notification. The following instructions assume that you also chose this option.

3D PHOTOGRAPHY GUIDELINES

The automated process by which Photofly builds a 3D model requires the software to recognise the parts within each photograph that correspond to the same part of a real-world object. This requirement for sophisticated pattern recognition places some constraints on what can be photographed and how it should be captured.

- Make sure you photograph something that won't move
- Ensure the lighting doesn't change significantly between shots - changing shadows will cause problems



2 Download your photos and have a good look at the sequence of shots onscreen. Make sure they're all in focus and correctly exposed, that you haven't accidentally cropped your subject and that the sequence covers all angles of the object with plenty of overlap. If necessary, retake some photographs.



3 Register to use Photofly at tinyurl.com/28m6t87, then download and install the Photo Scene Editor. Launch the program and click 'Create a new Photo Scene'. Select all your photos in the 'Select Photos' dialog box (hold down Ctrl as you click the mouse to select multiple images), then choose Open.



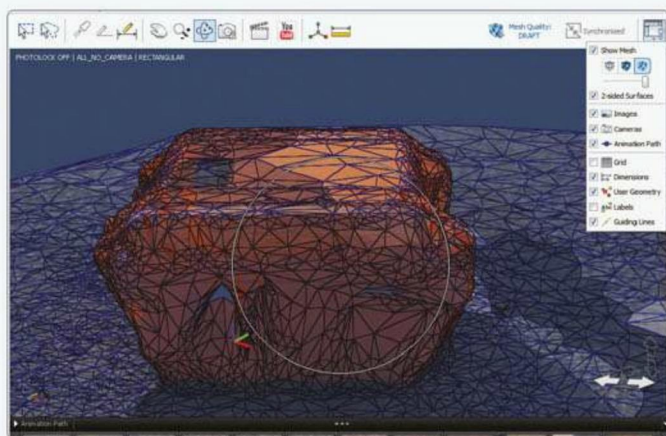
5 Your photos will be uploaded to Photofly, which will begin constructing your 3D object. This involves a large amount of pattern matching, so it may take some time to complete. Once you receive the email message, click the link within the message body and save the Photo Scene data file to disk. Now open this file.



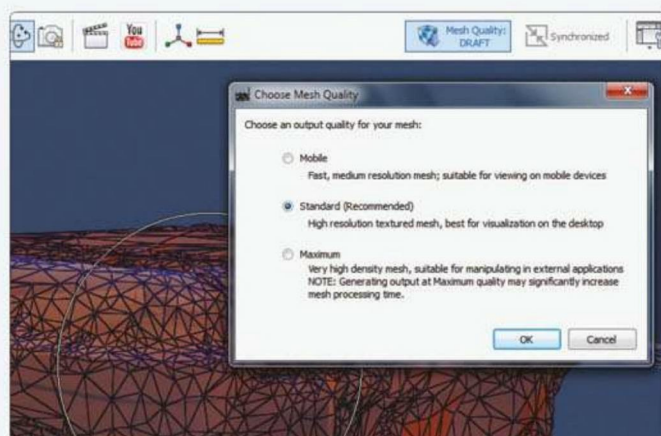
6 A 3D model appears in the Photo Scene Editor as a polygon mesh superimposed on a photo-realistic texture. A dialog box informs you that you're viewing a draft-quality mesh. You'll see thumbnails of your photos at the bottom. The position from which each shot was taken is shown as a camera icon.

- Don't zoom in or out or change the distance to the object unduly from one shot to another, since this could alter the perspective
- Avoid transparent or shiny objects and refrain from using the flash - this, too, might cause the object's appearance to change as you move around it
- Bear in mind that the object or scene needs to have identifiable features or texture. Sculpteo warns that photographing the back of someone's head can often cause problems because one area of hair looks much like any other

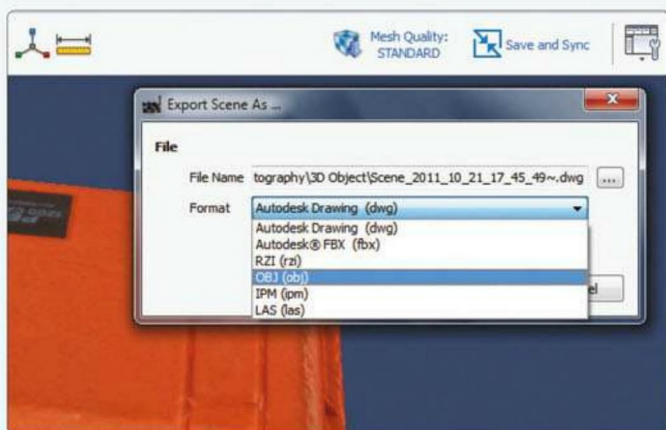
We created a model of a modest-sized object in our walkthrough. Photofly can also be used to model large objects such as buildings. In addition to creating a 3D model of the outside of a building, it's possible to work with a set of photos of the inside of a room - although, in this case, creating a solid 3D-printed object wouldn't be possible. You can also work with people, but remember that you'll have to ask them to adopt a stiff Victorian-like pose while you capture the sequence of photographs - any movement and your subject will ruin the effect.



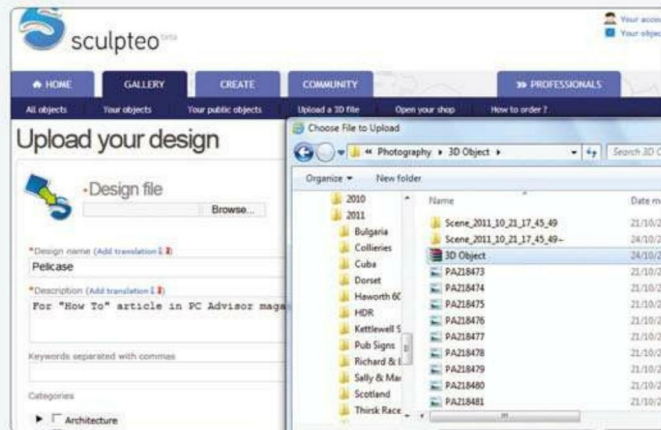
7 Get used to the navigational tools and the 'Display Settings' menu. Have a good look at your model to make sure it looks okay. We noticed some significant holes in our first model, so opted to reshoot the object with greater overlap. Don't worry about the ground showing for now - we'll remove this later.



8 Click the 'Mesh Quality' icon (which will currently show 'DRAFT') and, when the dialog box appears, select Standard, Ok. Calculating a higher-resolution model is carried out remotely; once again, you're asked whether you want to wait for the process to complete or prefer to be notified by email.



11 Select 'Export Scene As ...' from the File menu and choose 'OBJ (obj)' as the format. Photofly will create .obj, .mtl and one or more Jpeg files from your finished model; add these to a compressed Zip file using PKZIP (pkware.com) or one of the many compatible compression utilities.



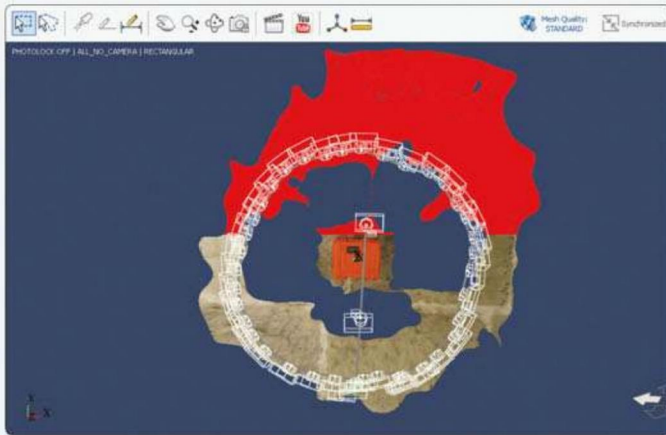
12 Your exported model can now be viewed and manipulated using third-party software. However, we're going to create a 3D printed object. Visit sculpteo.com and click 'Upload' under 'Make your own 3D objects'. Choose 'Browse...' next to 'Design file' and upload your Zip file. Fill in the required information and click Ok.

CREATE A PERSONALISED MANNEQUIN

If you fancy trying out 3D printing but you want an easier solution to the one we described in the above walkthrough, Sculpteo also lets you customise mannequins. These are fun and easy to make, and could make an unusual gift for a loved one. The personalised figurines are each between 70 and 100mm high, and cost from €60 (£51). All you need to provide is a head-and-shoulders photograph of yourself or a friend taken from the front and, for the best results, another one taken from the side.

The photographs are used to create a model of the figurine's head using an automated process that's similar to - but much simpler than - the one used in the main part of our workshop to create a 3D object from a sequence of photographs. However, photographs aren't used for the body, and here the skill of Sculpteo's artists come into play.

Using a textual description of the required clothing and accessories that you provide when placing the order, Sculpteo



9 With your standard-quality mesh object onscreen, it's time to clean it up. This will mainly involve removing the ground. Rotate the object so you're looking straight down and zoom out. Using the selection tools, select anything you want to remove (it'll turn red) and press the Del key.



10 By a combination of zooming in and rotating, select and delete ever smaller areas of the ground or any other unwanted objects until you're left with a clean 3D model. Take care with this process and be prepared to take your time. When you're happy with your cleaned-up model, go to the File menu and choose Save.



13 Sculpteo will process your file, which will be viewable onscreen once complete. It will attempt to correct any geometric issues. Save your image when Sculpteo says it's printable. The object will be saved in your gallery from where you can order a print. The price will be updated as you alter the size and material.



14 Having placed your order, all you need to do is sit back and wait for a parcel to drop through your letter box. In the meantime, 3D printing machines at Sculpteo build up your model in layers by solidifying plastic powder. If you ordered a coloured object, the colour is applied to the solid object using a printing process. ☒

creates a cartoon-esque body. The head and the body are then merged, and you get the opportunity to approve the design before giving the go-ahead.

The figurine, which is printed in full colour, will be delivered within 10 working days. If you're really pleased with your mini-me, you can order additional prints from just €30 since the initial outlay includes the design cost. Figurines of couples or family groups are available, too.



Creating the best Stories on an iPad



Need to whip up a visual storm? Alice Ross explains how to create multimedia albums with impact using Blurb Mobile on an iPad



Blurb is best known for its BookSmart software, a program that lets you create professional-looking books from your own photos and text. Offering a range of templates and the ability to print copies you want as and when you need them, it won't favour among professional designers looking to produce slick portfolios, and doting parents looking for an enduring memento of their little darling's first months in the world.

So *PC Advisor* was rather excited to discover that Blurb was releasing an iOS app; we hoped it would allow you to create BookSmart titles from within your iPad.

Blurb Mobile provides a twist on the self-publishing concept. Rather than creating books, you create 'Stories' - short multimedia albums, comprising photos, text and even sound and video clips. These can be played as slideshows, or as a presentation through which you can swipe.

The brevity of Stories forces some tough choices: you're allowed up to 15

images, some concise text, and a couple of minutes of audio for each. But used smartly, this could help you hone in on your best work.

There's the same slick aesthetic and emphasis on intuitive, enjoyable user experience as in BookSmart. We were also pleased to discover that Blurb Mobile offers a good degree of control over how images and other elements are presented. Some of the templates are rather cheesy, but it's also brilliantly easy to create a classy piece of work.

When you've compiled a Story, you can share it publicly in the Story Stream - which features some stunning work by other users. Alternatively, you can share with friends through Twitter, Facebook, Tumblr or email.

It's easy to see how Blurb Mobile could be handy for knocking together quick holiday albums or portfolios on the hoof, or for using as a digital scrapbook. It's a highly versatile and fun way to share your work, housed in an app that's well suited to the iPad's tactile interface.

GETTING STARTED WITH BLURB MOBILE FOR iOS



START

You can start creating Stories without registering for the Blurb Mobile community, but you'll need to sign up for a free account if you wish to share them through the public Story Stream, Facebook, Twitter or Tumblr. If you already have a BookSmart account, Blurb Mobile will recognise your existing login details.



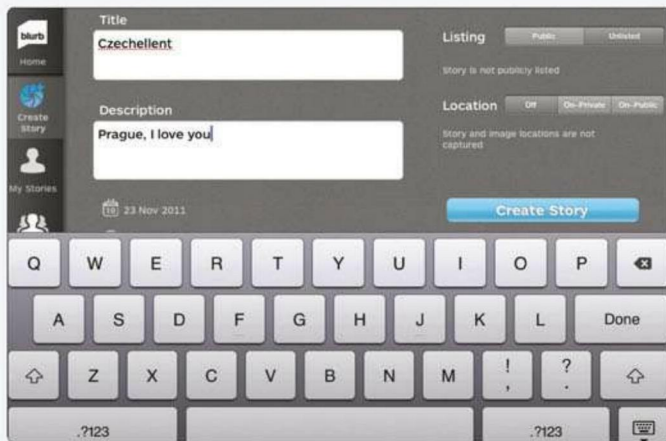
4

Add some images: one option is to shoot using either of the iPad's cameras (tap the camera icon for this), although the iPad makes a rather unwieldy camera and the image quality isn't amazing. We prefer to save the images we want to use into the Image Library in advance and tap the square icon to select them.

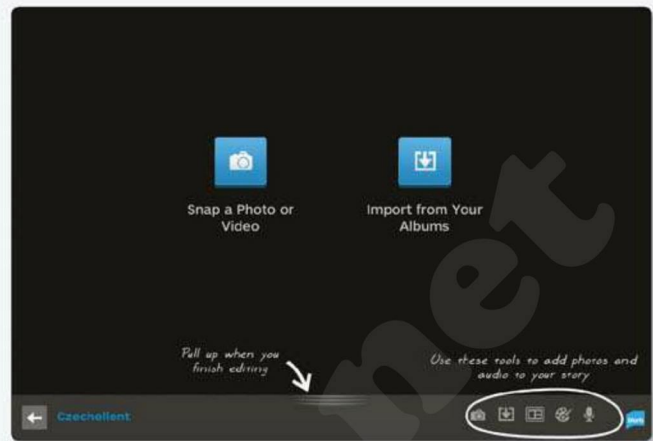
GETTING IMAGES ON TO AN iPad

The iPad 2's built-in cameras are fine for snapshots, and a wealth of photography apps offer cool effects such as vintage or retro films (see page 172). But if you find the idea of using the iPad to take photos or shoot video ridiculous - or even if you simply prefer a more sophisticated camera - there are several ways to get the photos into the images gallery, ready to import into Blurb Mobile.

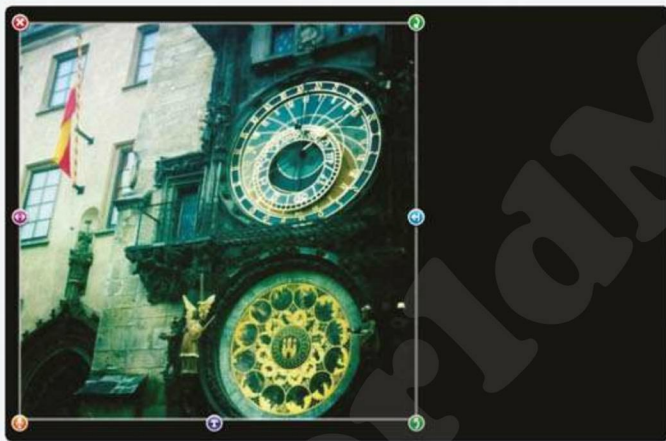
The most straightforward way, of course, is to upload them to your computer, then import them via iTunes: connect your iPad, and in iTunes on your computer click Photos, 'Sync photos from'



- 2** Tap 'Create Story' to get started assembling your own project. Give the Story a name, add a brief description, then specify whether you'd prefer to keep your masterpiece private or share it with the world through the Story Stream. This is also where you specify whether to tag your content with location information.



- 3** Welcome to your Story-creation space. When you're viewing any of your own projects, you can access the full range of editing tools, swap and rearrange images, or add more content by pulling down the bar from the top of the screen to the bottom - even after the project has been published.



- 5** Once you've added an image, corner handles will appear that allow you to modify the size and position of your image. You can also access these controls when you're in Editing mode by tapping on an image. Pinch to zoom in and out, and swipe to adjust which section of the image you want to appear in the frame.



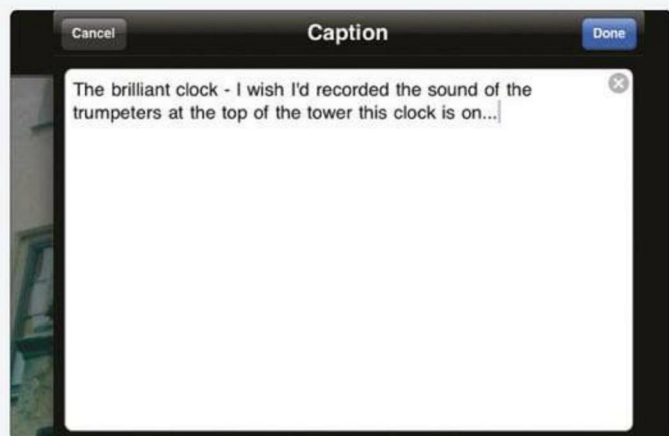
- 6** The arrows in the righthand corners let you rotate the image. Using the arrow in the centre right you can toggle between a narrow image frame, the default square and a wider one, for a portrait, landscape or square picture. The purple arrow on the left allows you to change an image's position in the Story.

and navigate to your images. For uploading shots from your phone, Dropbox is quick and fuss-free: upload your files using the dedicated folder it adds to your computer, or via the iPhone app, and they'll be waiting for you in the Dropbox app on your iPad.

Plenty of other apps offer a similar service - if Dropbox isn't to your liking, try the prosaically titled Photo Transfer App (£1.99),

which works in much the same way but is designed with image transferring in mind. If you're knocking together Stories on the road and want to download images from your camera or memory card straight to your iPad, there's the iPad Camera Connection Kit (£25 inc VAT; tinyurl.com/39y4agd). This allows you to download images straight from your digital SLR or memory card to your iPad.

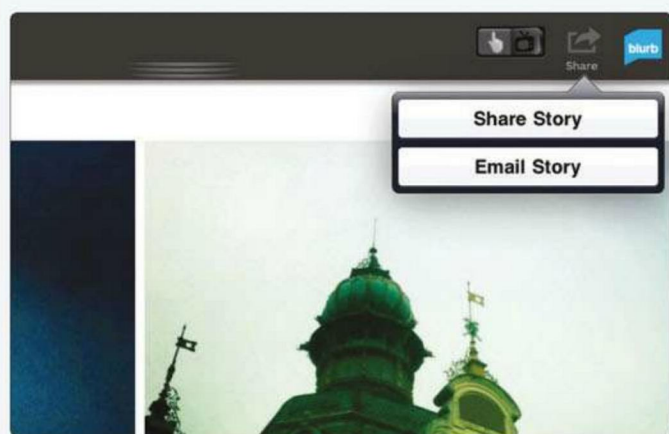




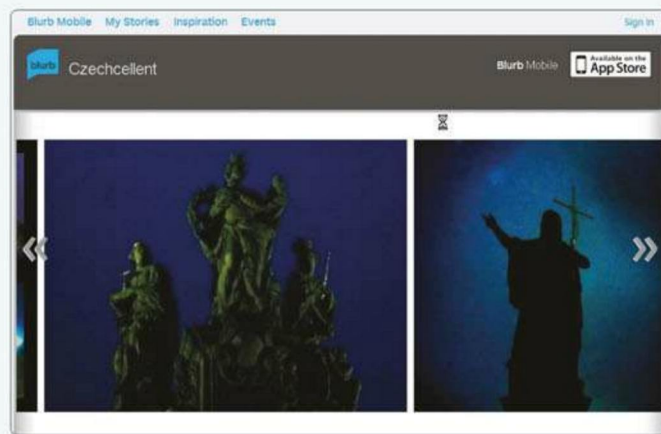
7 Tap the 'T' icon at the centre of the bottom of the picture frame to add a caption to each image in your Story. Don't get too excited by the possibilities offered by the expansive text box that pops up, however, since the maximum length of text Blurb Mobile allows is only about 60 words.



8 The microphone icon at the bottom left allows you to tag a photo with an audio clip or commentary of up to 30 seconds, recorded through the iPad's microphone. You can also record a 30-second audio clip to set the scene for the entire Story. To do so, simply tap the icon at the bottom right of the screen.



11 Once you've finished a Story, push the bar from the bottom of the screen to the top to start publishing. Tap the TV icon to review your handiwork as a slideshow, or use the finger icon to swipe through it. Then hit Share, and email your Story to a contact or share it with the Blurb Mobile community and your social networks.



12 When you email a Story or share it via Facebook, it displays as a link that leads to a dedicated web space featuring your Story. Note that once you've shared a Story - even if only by email - you can't control how private it is. Recipients can forward on your Story or share it via Twitter or Facebook.

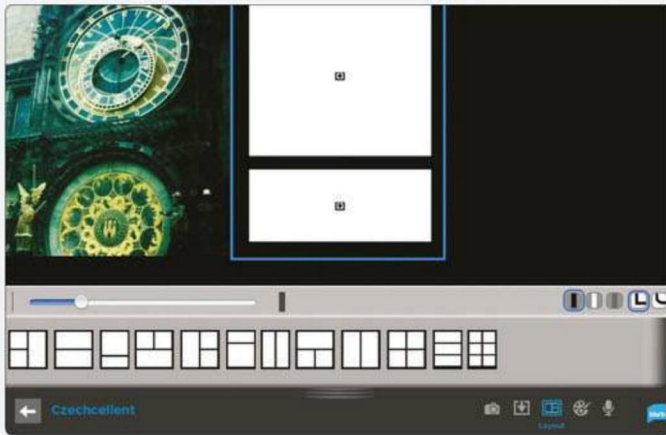
IMAGE-EDITING APPS FOR IPAD

For professional images, the iPad doesn't have anything to compete with the likes of Adobe's Photoshop. However, there are some useful tools for making quick image adjustments on the fly.

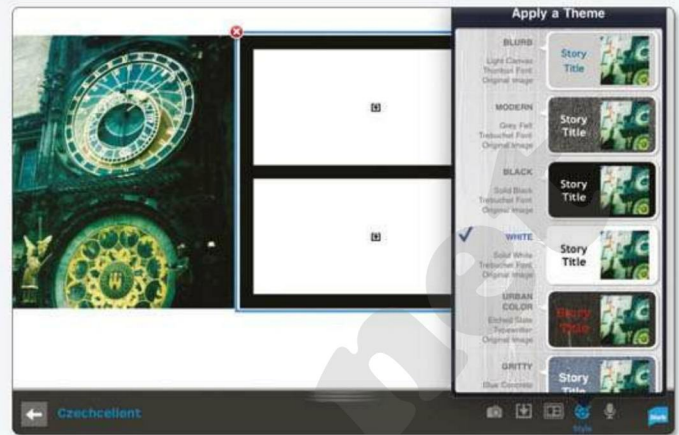
At the more sophisticated end of the scale, FilterStorm Pro (£8.99) offers curves adjustments, batch-editing and masking, and much more. If this is all a little overwhelming - some of FilterStorm Pro's controls do take some getting used to - Photoshop Express (free) is the stripped-down version of

Photoshop for iPad. It allows you to tweak exposure, saturation and tint in an enjoyably un-fiddly swipe interface.

Filters and retro photo effects are ubiquitous right now thanks to the popularity of Instagram, Hipstamatic and other such effects apps. In fact, the App Store offers hundreds of apps for jazzing up your images. Take a look at TiltShift Generator for iPad for creating dreamy, toy-like tilt-shift effects (£1.99), while CameraBag (£1.19) offers dozens of different looks to play with.



9 For more complex layouts, tap the grid icon to the right of the Import icon. This brings up a selection of configuration options. Pull the slider to set how much border the grid of images has, or adjust the corner and border styles by selecting from the options on the bottom righthand side.



10 Tap the paint palette to select the theme. This defines the look of the backdrop, caption font, and so on. We preferred to keep things simple with either the Black or White, each of which allows the images to speak for themselves. Gritty is also effective, adding an edgy, roughed-up twist that complements darker subjects.



13 The free version of Blurb Mobile is rather limited - the app allows only up to eight images per Story, audio clips of up to 30 seconds, just one 15-second video, and eight themes. Upgrading to Blurb Mobile Plus costs £1.49 and enables you to add 15 images as well as more capacity for video and up to 2 mins of audio per photo.



14 The Story Stream is a good place to share your own Stories. It's also a good place to get inspiration and spot the creative uses others have found for Blurb Mobile. Some of the work here is gorgeous - and much of it underlines the point that less is more when it comes to themes, frames and so on. ☒

PORTFOLIO-CREATION APPS FOR iPad

One of Blurb Mobile's key attributes is the sheer brevity of Stories - it makes for fun, approachable albums that even the busiest person can flip all the way through. But if you want to display your creative prowess in a more comprehensive manner, the iTunes Store has plenty of other portfolio apps.

Viewbook is aimed at pro photographers, offering the scope for uploading thousands of high-res images and organising them into albums within a sleek, minimal interface. It's free for 30 days.

Also aimed at professionals, Portfolio for iPad (£10.49) enables you to create branded pages, and to create galleries and slideshows to share with the contacts of your choice.

Mediapad Pro (£10.49), meanwhile, is a turbo-charged app for multimedia work, allowing you to combine video, images, music and more into slideshows and albums. It's highly customisable, offering control over everything from fonts to transition times, making for dynamic portfolios.

O&O MediaRecovery 6.0

FULL PROGRAM



Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 200\O&O Media Recovery and open the install file for your OS

Online registration required: head to tinyurl.com/bogerc8

System requirements

Windows XP/Vista/7;
30MB hard-disk space

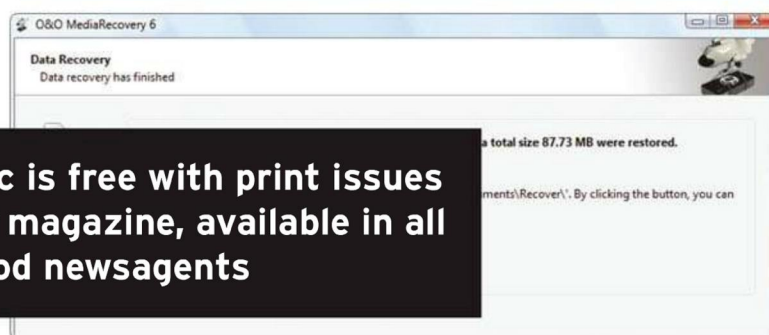
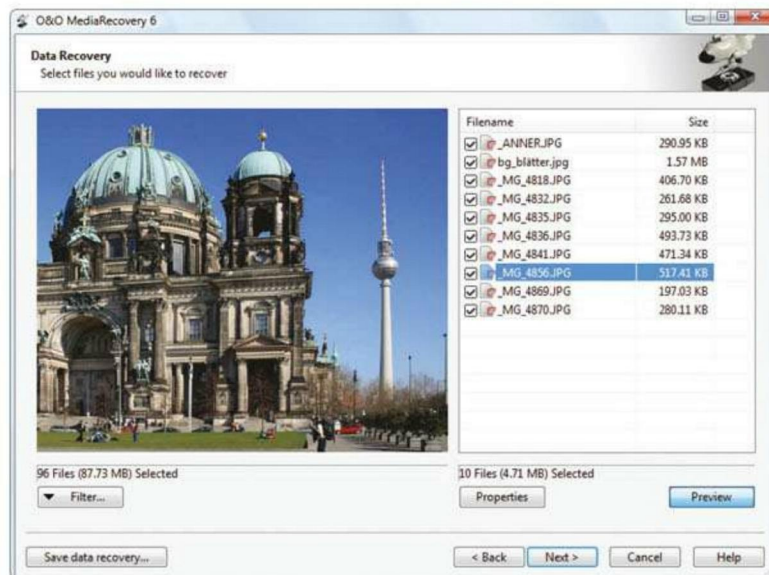
O&O MediaRecovery recovers multimedia files removed from your PC by a virus attack, program crash or simply through you pressing the wrong button.

Accidentally deleted photo, video and music files can be recovered directly from digital cameras, memory cards and USB sticks. All the software requires is that Windows recognises the media as a drive.

O&O MediaRecovery combines the powerful search processes of the company's DiskRecovery and UnErase programs. UnErase looks at various file information to recover your multimedia, while DiskRecovery is able to find files even when this information has been damaged.

To prevent a data loss through defective hardware, a forensic image can be created using the separate DiskImage software. This image also saves the free disk space so that a full data recovery can be carried out later, without touching the original hardware.

Search results are clearly presented, filtered by size or time (creation/last modified/last accessed). O&O filters can also blend out empty directories or files for refined search results. ☒



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BullGuard Internet Security 12.0

FULL PROGRAM (SIX-MONTH LICENCE)

**ONLINE
REGISTRATION
REQUIRED**

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 200\BullGuard Internet Security 12 and open the install file

Online registration required: follow the links during installation

System requirements

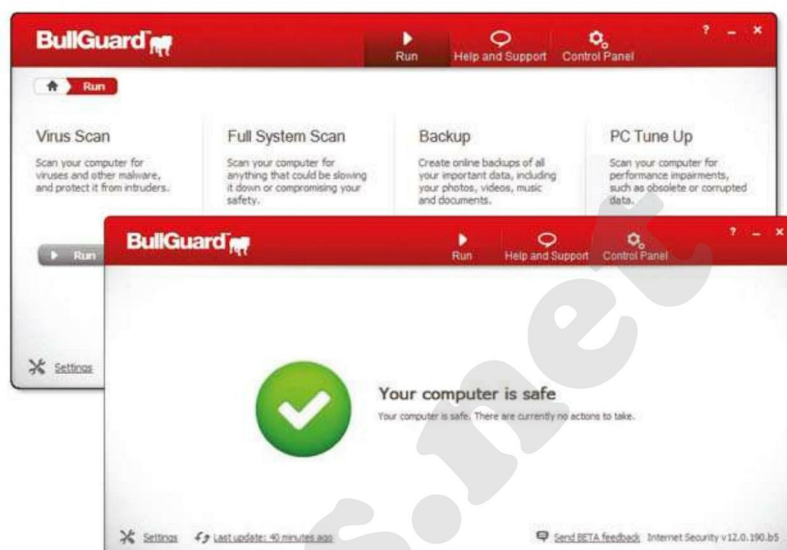
Windows XP/Vista/7;
200MB hard-disk space;
Internet Explorer 6.0
or later

With an increasing number of online threats gaining sophistication, running security software is no longer an option: it's a must.

BullGuard Internet Security 12.0 is a complete security solution. It protects you and your PC from online threats, including identity theft, credit-card fraud, hackers, spam, viruses and spyware.

With security features to cover every eventuality, you'll never need to worry about your digital safety again. You can bank, shop, socialise, surf, share files, download programs and play games with peace of mind.

With protection for three PCs, plus parental controls, BullGuard is the ideal solution for a family PC. ☒



Ashampoo Burning Studio 2012

FULL PROGRAM

**ONLINE
REGISTRATION
REQUIRED**

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 200\Ashampoo Burning Studio 2012 and open the install file

Online registration required: follow the links during installation

System requirements

1.2GHz CPU; Windows
XP/Vista/7; 128MB RAM;
200MB hard-disk space

Ashampoo Burning Studio offers everything you need to fast and effectively burn movies, music and data. An intuitive user interface focuses on the core competencies of burning software, letting you easily create data discs, burn backups, rip music, create audio CDs and burn existing film files to Blu-ray Disc.

Audio CDs can be ripped with ease. The integrated audio player lets you listen to audio files and CDs without launching another program.

A new video or music disc asks for a matching cover. Ashampoo offers everything for this task, too. You can design and print covers, labels and booklets in a jiffy. ☒



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Serif PhotoPlus 10.0

FULL PROGRAM

PHONE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 200\ Serif PhotoPlus 10.0 and open the install file

Registration required: please call (freephone) 0800 376 5467

System requirements

Windows 98/2000/XP/ Vista/7; 128MB RAM; 130MB hard-disk space

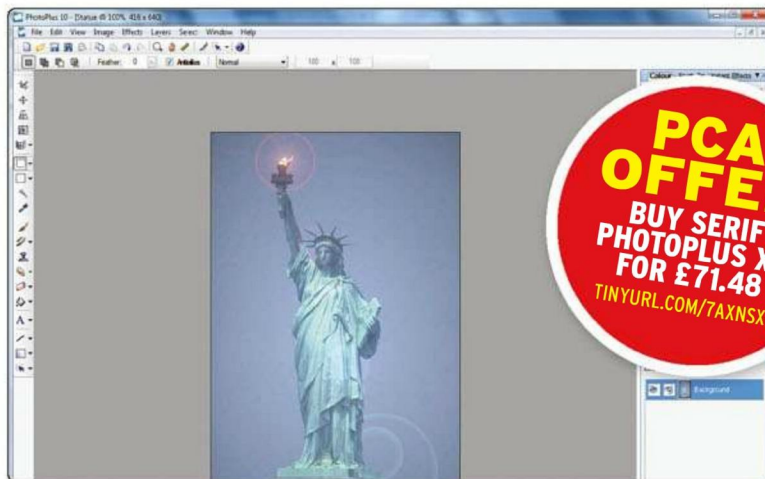
PhotoPlus 10.0 is a powerful image-editing suite that's designed to improve, enhance and restore your digital photographs. Combining ease of use with a powerful set of professional-level image-correction tools, PhotoPlus is ideal for editing images for the web or print.

Features

- **Easy enhancement tools:** Correct problems such as poor lighting and red-eye. Plus, remove people and objects with PhotoPlus' clone tool
- **Layers:** Edit non-destructively using layers and create layer groups to help you manage complex compositions
- **Image extraction:** Use edge-detection tools to cut out people and objects from your photos quickly and easily
- **Artistic effects:** Create instant works of art by transforming your photos into a watercolour, oil painting or pencil sketch
- **File compatibility:** PhotoPlus 10.0 works with all common image

formats, including Raw and Adobe Photoshop files

- **Batch processing:** Save time by processing groups of photos in a single operation or recording macros to automate edits



Paragon Backup & Recovery 2011 Special Edition

FULL PROGRAM

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 200\ Paragon Backup and Recovery 2011 SE and open the install file

Online registration required: follow the links during installation

System requirements

Windows 2000/XP/ Vista/7

Powerful Backup. Ultimate Recovery Whether you're saving data or creating a backup, Paragon's suite of useful tools covers all your needs. The Home Edition quickly backs up your files and folders, operating system and even your entire hard disk, to any storage medium you choose. It ensures that your system and valuable data are always protected, and can be restored in the event of disaster.

Note that the Special Edition on our DVD doesn't include WinPE. ☒



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“

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”

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performance, and the birth of the mobile- and cloud-computing eras.

Along the way we've seen false starts and spats, technology successes and failures, and malware that refused to die. We've watched as Microsoft slowly got to grips with PC security, Google swallowed the world whole, and Apple defied those who believe that substance always beats style (it doesn't).

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NEW: FAMILY PCs

The do-it-all desktop is becoming more specialised in the 21st century, and the family PC is now perhaps the closest to being a master of all trades. We recommend five general-purpose machines for your home on page 182.

PC ADVISOR
BEST BUY

PC ADVISOR
RECOMMENDED



All-in-one PCs



Family PCs



Netbooks



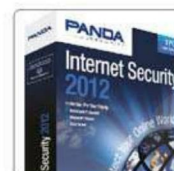
Sub-£600 laptops



£601-£1,000 laptops



£1,001+ laptops



Security software



Tablets



Projectors



Printers



Blu-ray drives



Wireless routers



NAS drives



Digital cameras



Graphics cards



Flat-panel displays

Prices

Laptops

Laptops up to £600
£601 to £1,000
£1,001 and over

Printers

Printers under £150
£151 and over

Graphics cards

Graphics cards under £150
£151 and over

Flat-panels

Flat-panels under £200
£201 and over

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Top 5 All-in-one PCs

PC ADVISOR
BEST BUY

- 

Apple iMac 21.5in
apple.com/uk
tinyurl.com/6276q4s
Last month 1

 - £999 inc VAT
 - £999 (RRP)
 - 1-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
2.5GHz Intel Core i5-2500	4GB DDR3 500GB HDD	4x USB 2.0, FireWire 800, Thunderbolt	802.11a/b/g/n, Bluetooth, gigabit ethernet	21.5in IPS glossy LED-backlit 1920x1080
>> WorldBench 6				139

PC ADVISOR
RECOMMENDED

- 

Sony Vaio VPC-L22Z1e
sony.co.uk
tinyurl.com/3r9ppg6
Last month 2

 - £1,600 inc VAT
 - £1,600 (RRP)
 - 2-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
2.2GHz Intel Core i7-2670QM	8GB DDR3 1TB HDD	2x USB 3.0, 3x USB 2.0, HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	24in glossy 3D touchscreen 1920x1080
>> WorldBench 6				n/a ¹

- 

Asus ET2400XVT
uk.asus.com
tinyurl.com/6Lxtn4
Last month 3

 - £1,277 inc VAT
 - £1,277 (RRP)
 - 1-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
1.73GHz Intel Core i7-740QM	6GB DDR3 1TB HDD	2x USB 3.0, 4x USB 2.0	802.11b/g/n, Bluetooth, gigabit ethernet	23.6in glossy 3D touchscreen 1920x1080
>> WorldBench 6				n/a ¹

- 

HP TouchSmart Pro 610-1130UK
hp.com/uk
tinyurl.com/69tvukz
Last month 4

 - £1,200 inc VAT
 - £1,200 (RRP)
 - 1-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
3.2GHz Intel Core i5-650	6GB DDR3 1.5TB HDD	2x USB 3.0, 4x USB 2.0, 2x HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	23in glossy touchscreen 1920x1080
>> WorldBench 6				122

- 


Sony Vaio VPC-J21L8E
sony.co.uk
tinyurl.com/42ykrur
Last month 5

 - £850 inc VAT
 - £899 (RRP)
 - 2-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
2.3GHz Intel Core i5-2410M	4GB DDR3 1TB HDD	2x USB 3.0, 2x USB 2.0, HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	21.5in glossy touchscreen 1920x1080
>> WorldBench 6				84

Top 5 Family PCs

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BEST BUY


- 

Chillblast Fusion Hotrod
chillblast.com
tinyurl.com/7q3p93n
New

 - £799 inc VAT
 - £799 (RRP)
 - 2-year collect-and-return warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (3Gbps)	2x USB 3.0, 7x USB 2.0	none	23.6in Asus VS247H 1920x1080
>> WorldBench 6				172

PC ADVISOR
RECOMMENDED

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Braebo Ares
braebo.com
tinyurl.com/6wm2drq
New

 - £611 inc VAT
 - £611 (RRP)
 - 1-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
2.9GHz AMD Fusion A8-3850	8GB DDR3 1TB SATA (3Gbps)	4x USB 3.0, 2x USB 2.0	none	21.5in AOC F22+ 1920x1080
>> WorldBench 6				115

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Arbico eXcel i5256 VX
arbico.co.uk
tinyurl.com/7ssrknr
New

 - £699 inc VAT
 - £699 (RRP)
 - 2-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (6Gbps)	2x USB 3.0, 4x USB 2.0	802.11b/g/n	23.6in AOC 2436Vwa 1920x1080
>> WorldBench 6				172

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Eclipse Solar i525n560Ti
eclipse-computers.com
tinyurl.com/d6qodth
New

 - £849 inc VAT
 - £849 (RRP)
 - 1-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (6Gbps)	2x USB 3.0, 6x USB 2.0	none	23.6in HKC 2412 1920x1080
>> WorldBench 6				169

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CyberPower Ultra 6 Core Silent Edition
cyberpowersystem.co.uk
tinyurl.com/88799nw
New

 - £999 inc VAT
 - £999 (RRP)
 - 3-year RTB warranty

Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
2.8GHz AMD Phenom II X6 1055T	8GB DDR3 2TB SATA (3Gbps)	2x USB 3.0, 4x USB 2.0	802.11b/g/n	23.6in HKC 2412 1920x1080
>> WorldBench 6				123

¹ Not tested

>> Buying advice

Family PCs

Desktop PC prices were correct at press time for issue 199 and include delivery. Vendors often honour the price of PCs longer than our onsale date. However, changes in exchange rates and component supply issues mean that not all the PCs listed here will be available as specified. These charts are intended only as a guide.

Processor: Intel's Core i5-2500K is a popular CPU, offering excellent performance at a good price. Its 'K' suffix means the chip can be easily overclocked in the EFI, provided that you're also using a motherboard with a Z68 chipset. It also includes integrated graphics, which are adequate for most users. AMD also sells CPUs with graphics built-in - its Fusion chips are faster for gaming than their Intel counterparts, but the trade-off is found in application performance. We like the A8-3850, a quad-core CPU running at 2.9GHz.



	Graphics card Maximum memory Fear (Max)	Dimensions Weight Power consumption	Max disc speeds	Operating system, software and extras	VERDICT
	AMD Radeon HD 6750M 512MB 100fps	528x189x451mm 9.3kg not tested	8x DVD ±R/ 4x ±R DL/ 8x -ROM	Mac OS X 10.7 Lion, FaceTime HD webcam, Magic Mouse, wireless keyboard	The iMac is preloaded with OS X 10.7 Lion. It excelled in our benchmarks, with its 139-point WorldBench score beating all others, while the AMD Radeon HD 6750M delivered strong games performance. You won't find a Blu-ray player or USB 3.0 support here, but you will find the faster Thunderbolt connection. Neither do you get a touchscreen, although the supplied Magic Mouse features a touch-sensitive body for scrolling. The 21.5in IPS panel is small, but it offers unparalleled image quality.
	nVidia GeForce GT540M 1GB 116fps	608x168x429mm 12kg 87W (idle), 135W (under load)	6x BD-ROM/4x -R 8x DVD ±R/ 6x ±R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, wireless keyboard	The Vaio has some of the best specs in our chart, including both 3D and Blu-ray support. The Core i7-2670QM quad-core processor usually runs at 2.2GHz, but climbs to 3.1GHz with Turbo Boost enabled. The Sony decimated its rivals in our gaming tests; we weren't able to run WorldBench, but it should be plenty fast for most tasks. The large 24in glossy display offers strong blacks, bright vivid colours and crisp text. This dream entertainment all-in-one computer carries a hefty price tag, though.
	nVidia GeForce GT460M 1.5GB 40fps	582x50x495mm 13kg 40W (idle), 78W (under load)	4x BD-ROM 8x DVD ±R/ 6x ±R DL/ 8x -ROM	Windows 7 Home Premium 32bit, webcam, 3D glasses, wireless keyboard	The ET2400XVT's strong specs include a 23.6in touchscreen, support for nVidia's 3D Vision technology (active-shutter glasses are supplied), and a slew of USB 3.0 and 2.0 ports. The i7-740QM quad-core CPU supports Turbo Boost, allowing the 1.73GHz processor to run at 2.93GHz when the PC is under load. However, it's significantly slower than the second-gen processors seen elsewhere in the chart. The 23.6in screen isn't the most accurate we've seen, displaying a slight oversaturation of some colours.
	AMD Radeon HD 5570M 1GB 72fps	584x103x450mm 11.8kg 67W (idle), 112W (under load)	4x BD-ROM 8x DVD ±R/ 6x ±R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, TV tuner, Beats Audio, wireless keyboard, remote	This chunky all-in-one offers great potential for entertainment and office productivity. Although the 23in screen is no larger than that of the competition, its chassis is much thicker, at 103mm. Input is via a wireless keyboard, mouse or remote control. The Beats Audio-branded speakers deliver crisp highs and mids, and excellent bass for their size. Blu-ray is also thrown in. Application performance is good, but the graphics card isn't particularly powerful. The TouchSmart's tilting stand is a nice touch.
	Intel HD 3000 n/a 17fps	525x185x398mm 9.8kg 41W (idle), 72W (under load)	8x DVD ±R/ 8x ±R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, wireless keyboard	Sony has copied the square edges and styling of its Bravia TVs with astonishing accuracy. This all-in-one is extremely compact, with a small 21.5in display. The specs are decent, although the WorldBench score of 84 is unimpressive. The touchscreen display is capable of two-point multitouch, but it's overly sensitive. We were surprised to find no Blu-ray drive. This PC also lacks a dedicated graphics card. The wireless keyboard is comfortable to type on, and the selection of USB ports is decent.

	Graphics card Maximum memory Crysis (Low/Medium)	Case Motherboard Power supply	Max disc speeds	Operating system, software and extras	VERDICT
	Sapphire AMD Radeon HD 6870 1GB 161/100fps	EZCool A200D Rev 2 Asus P8Z68-V LE 650W	12x BD-ROM 16x DVD ±R/ 8x ±R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, CyberLink PowerDVD, Logitech Cordless MK260 keyboard	Chillblast's Fusion Hotrod can turn its hand to almost any task in a home environment. Based on a 3.3GHz Intel Core i5-2500K processor, this PC offers very good application speed. Graphics are also impressive, with the AMD graphics card able to produce 100fps in Crysis. The 23.6in full-HD flat-panel is a good partner for the Blu-ray drive, while Chillblast bundles a set of Sweets speakers and a wireless keyboard and mouse. At £799 the Hotrod may be on the pricey side for a family desktop PC, however.
	AMD Radeon HD 6550D n/a 62/36fps	Inwin Dragon Slayer ASRock A75M-HVS 500W	12x BD-ROM 16x DVD ±R/ 8x ±R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter, Nero, Microsoft WD3000 keyboard	This budget desktop makes its presence felt like a Sherman tank crashing through your living room. With its striking looks, military colours and blue illuminated logo, it certainly looks ready to kill something. And that something was our benchmark, for the Braebon put in a very reasonable score of 115 points in WorldBench 6. Graphics performance from the integrated solution is less impressive, but playable nonetheless. A 21.5in screen is paired with a Blu-ray drive, external speakers and the best wireless peripherals here.
	Intel HD Graphics 3000 n/a 46/21fps	Gigabyte GZ-X6 Black Asus P8Z68-V LX RTL 500W	22x DVD ±R/ 12x +R DL/16x -R DL/ 22x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Nero, BullGuard Internet Security	Arbico's eXcel is a powerful yet practical home PC. Despite costing less than many PCs in this chart, it performs just as well. We recorded a staggering 172 points in WorldBench 6, but the Arbico delivered just 21fps in Crysis - gamers should look elsewhere. A Z68 chipset enables you to unlock an extra speed boost through the EFi, and the Asus motherboard also supports USB 3.0. It looks smart, and comes with a large 23.6in monitor but, unlike the competition, the Arbico omits a Blu-ray drive.
	nVidia GeForce GTX 560 Ti 1GB 162/110fps	Cooler Master Elite RC-430 Asus P8Z68-V LE 650W	10x BD-ROM 12x DVD ±R/ 8x ±R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit	Eclipse's E849 Solar offers more performance than most home users will ever need, while gamers will be in their element: it delivers faster framerates in Crysis than any other PC in this chart. This gaming performance comes at the cost of user-friendly features, though, such as wireless connectivity and a card reader. The keyboard and mouse are also disappointing, given this system's price. A 23.6in full-HD monitor is paired with a Blu-ray drive and a set of Logitech speakers that includes a subwoofer.
	PowerColor AMD Radeon HD 6750 1GB 96/58fps	Cooler Master Silent RC-551-KKN1 Asus M5A97 500W	12x BD-ROM 16x DVD ±R/ 8x ±R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter, Logitech MK320 keyboard	This expensive PC features superb build quality, decent peripherals, quiet operation, a built-in card reader and Wi-Fi. But did we mention that it's expensive? We had trouble getting the CyberPower to complete our benchmarks, and were even less impressed by its performance in Windows. Still, speed isn't a priority for everyone, and the Ultra 6 Core has much to offer - including a superior system case and cooling, a 23.6in display, a Blu-ray drive and an external speaker set that includes a subwoofer.

Prices are intended only as a guide and are correct at press time

Graphics: If you later find integrated graphics aren't fast enough for your needs, it's possible to boost your setup. An AMD Radeon HD 6870 or nVidia GeForce GTX 560 Ti graphics card can provide ample performance without breaking the bank.

Memory and storage: Consider 4GB of RAM and a 500GB hard drive as the minimum required. If you plan to upgrade the storage later, keep in mind that recent flooding in Taiwan has pushed up prices. Things should settle down within a few months, however.

Display: Screen quality is crucial. Look out for in-plane switching (IPS) panels where available, which offer better colour fidelity than budget twisted-nematic (TN) monitors.

Consider a full-HD 24in monitor rather than a get-you-by 21.5in model, especially if you'll be using the PC to watch video.

Multimedia: If you want a PC for watching films and video, listening to music and chatting with friends, a set of speakers is essential. For larger rooms or simply a bigger sound, a 2.1 stereo set that incorporates a






separate bass speaker or subwoofer will perform better than a cheap 5.1 setup.

A Blu-ray drive is becoming a more affordable option, but watching films isn't helped by a noisy PC. Quiet, sound-dampened cases can drastically cut down on the noise produced by fans and drives. Good-quality CPU coolers can also help.

Software: Beginners may find the automated setup process of systems from larger manufacturers useful, but a lot of unwanted preinstalled software can slow down your PC.






Top 5 Netbooks

PC ADVISOR
BEST BUY

1		HP Mini 210-3002sa hp.com/uk tinyurl.com/4yfd5ho Last month 1	<ul style="list-style-type: none">• £269 inc VAT• £269 (RRP)• 1-year collect-and-return warranty	1.66GHz Intel Atom N570	<div><div>3</div><div>0</div></div>	1GB DDR3 250GB	268x191x32mm 1.4kg	802.11b/g/n, Bluetooth	
>> WorldBench 6					38				
2		Samsung NC110 samsung.com/uk tinyurl.com/7qzapkm Last month 2	<ul style="list-style-type: none">• £250 inc VAT• £250 (RRP)• 1-year RTB warranty	1.5GHz Intel Atom N550	<div><div>3</div><div>0</div></div>	1GB DDR2 250GB	259x180x28mm 1.2kg	802.11b/g/n, Bluetooth	
>> WorldBench 6					36				
3		Kogan Arora Pro kogan.co.uk tinyurl.com/43mn2ob Last month 3	<ul style="list-style-type: none">• £280 inc VAT• £289 (RRP)• 1-year collect-and-return warranty	1.3GHz Intel Pentium SU2700	<div><div>3</div><div>0</div></div>	2GB DDR2 500GB	290x195x26mm 1.3kg	802.11b/g/n, Bluetooth	
>> WorldBench 6					n/a ¹				
4		Samsung NS310 samsung.com/uk tinyurl.com/444sktx Last month 4	<ul style="list-style-type: none">• £330 inc VAT• £330 (RRP)• 1-year RTB warranty	1.5GHz Intel Atom N550	<div><div>3</div><div>0</div></div>	1GB DDR3 250GB	275x188x31mm 1.1kg	802.11b/g/n, Bluetooth	
>> WorldBench 6					37				
5		Dell Latitude 2120 Advanced dell.co.uk tinyurl.com/7wnff7t Last month 5	<ul style="list-style-type: none">• £598 inc VAT• £598 (RRP)• 1-year collect-and-return warranty	1.5GHz Intel Atom N550	<div><div>3</div><div>0</div></div>	2GB DDR3 320GB	265x187x23mm 1.3kg	802.11a/b/g/n	
>> WorldBench 6					33				

Top 5 Sub-£600 laptops

PC ADVISOR
BEST BUY

1		Samsung RV511 samsung.com/uk tinyurl.com/5tvt8ae Last month 1	<ul style="list-style-type: none">• £530 inc VAT• £530 (RRP)• 1-year RTB warranty	2.53GHz Intel Core i3-380M	<div>30yes</div>	6GB DDR3 640GB	382x256x34mm 2.4kg	802.11b/g/n, Bluetooth	
				>> WorldBench 6		105			
2		Lenovo IdeaPad S205-1038 lenovo.com/uk tinyurl.com/6g5ekqk Last month 2	<ul style="list-style-type: none">• £350 inc VAT• £350 (RRP)• 1-year RTB warranty	1.6GHz AMD E350	<div>30yes</div>	4GB DDR3 500GB	290x168x29mm 1.5kg	802.11b/g/n, Bluetooth	
				>> WorldBench 6		53			
3		Lenovo G570 lenovo.com/uk tinyurl.com/6fzz4xe Last month 3	<ul style="list-style-type: none">• £500 inc VAT• £500 (RRP)• 1-year RTB warranty	2.1GHz Intel Core i3-2310M	<div>40yes</div>	6GB DDR3 640GB	377x250x35mm 2.6kg	802.11b/g/n, Bluetooth	
				>> WorldBench 6		96			
4		Dell Inspiron 17R dell.co.uk tinyurl.com/64nqqk8 Last month 4	<ul style="list-style-type: none">• £599 inc VAT• £599 (RRP)• 1-year RTB warranty	2.4GHz Intel Core i5-2430M	<div>30yes</div>	4GB DDR3 500GB	423x287x30mm 3kg	802.11b/g/n, Bluetooth	
				>> WorldBench 6		114			
5		MSI CR650 uk.msi.com tinyurl.com/5trk7f4 Last month 5	<ul style="list-style-type: none">• £500 inc VAT• £511 (RRP)• 1-year RTB warranty	1.6GHz AMD E350	<div>30yes</div>	4GB DDR3 500GB	383x250x38mm 2.3kg	802.11b/g/n, Bluetooth	
				>> WorldBench 6		54			

¹ Not tested Note: WorldBench 6 works only in Windows ² Not tested using MobileMark 2007

>> Buying advice

Netbooks

A light, compact chassis is a mini laptop's main asset. Portability, lengthy battery life and a low price tag are these modest machines' main selling points.

Processor: Intel's Atom N450 is a popular chip. It consumes little power and gets the job done. Just don't expect massive processing muscle.

Storage: Netbooks usually come with either 160GB or 250GB hard-disk drives. Some have solid-state drives instead. Smaller, less fragile and quieter, these are also expensive and you'll have to settle for far less capacity.

Memory: Most netbooks come with 1GB of RAM, but you can upgrade to 2GB for around £20 (see tinyurl.com/yerjwpc). A smaller complement than found in more capable machines, this is sufficient for basic tasks.

Wireless: 802.11b/g was standard on netbooks, sometimes with Bluetooth, but



	Screen size Native resolution (pixels)	Graphics card Maximum memory	Flash memory drive	Max disc speeds	Operating system, software and extras	VERDICT
	10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	Offering a very good mix of performance and battery life, the brightly coloured HP comfortably holds on to the top spot. It may not suit the boardroom, however - we reviewed the grey version; the pink version is more garish. With a WorldBench 6 score of 38, the HP is fast for a netbook, while the keyboard is 93 percent of a full-size version. This enables almost error-free typing. The speakers are good as well, and the 10.1in screen with an anti-glare coating offers a nice image. Battery life is very good.
>> Battery life					7:54	
	10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	After initial problems, eTailers now have good supplies of the NC110. That's good: this netbook is one of the better models on the market. The 1.5GHz CPU isn't as fast as the HP's, but 36 points is a good showing for a netbook. The 1GB of RAM is standard, but it's only DDR2. Battery life is excellent, with the Samsung lasting for almost 8 hours. The matt screen offers good quality, and won't suffer from distracting reflections. A small, light chassis and good battery life make the Samsung a road warrior.
>> Battery life					7:52	
	11.6in 1366x768	Intel GS40 n/a	yes	n/a	Ubuntu Linux 11.04 Natty Narwhal	Fitted with an 11.6in screen, the Agora Pro just about qualifies as a netbook (Kogan bills it as an ultraportable laptop). The single-core SU2700 Pentium is joined by a useful 2GB of RAM and a large 500GB hard disk. The matt screen works well in daylight, and its 1366x768 resolution is welcome. Buttons on the full-size keyboard are a little wobbly, but quick typing is easy. The Kogan Agora Pro was noisy in our tests, and battery life is poor. But its Ubuntu OS allows the Pro to run with ease.
>> Battery life					2:22 ²	
	10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	The NS310 is a brand-new netbook, yet appears to be stuck in a time warp. Rather than break free from the shackles of Microsoft, Samsung has chosen to trot out another Wintel notebook. The electric blue finish is interesting, but there's little else here that wasn't available three years ago, with the exception of Bluetooth 3.0. The low weight is pleasing, although a small battery reduces the runtime considerably. It's barely faster than its predecessors, while the low-resolution screen is glossy.
>> Battery life					3:41	
	10.1in 1366x768	Intel GMA 3150 n/a	yes	n/a	Windows 7 Professional 32bit, Microsoft Office Starter 2010	You can get cheaper versions of this netbook from Dell, and that's probably just as well - even given the ruggedised casing, the £598 price tag is exorbitant. The specs are good, with 2GB of DDR3 memory, a fast 320GB hard drive, and Windows 7 Professional rather than Starter. Nonetheless, performance is nothing to write home about, and even the battery life lacks endurance compared to some models here. The keys are almost full-size, but the touchpad is rather small. You can find better value.
>> Battery life					6:24	

	Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear) ¹	Max disc speeds	Operating system, software and extras	VERDICT
	15.6in 1366x768	nVidia GeForce 315M 1GB	33	8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit	The 6GB version of this laptop can be tricky to find - Laptopsdirect had good supplies at press time, albeit at the slightly inflated price of £530. It's worth hunting down, though, since it offers superb performance, with a sizzling WorldBench 6 score of 105 points. A 3GB version is available at lower cost, but performance won't be so great. Battery life isn't vast, but it compares reasonably with its rivals. The 15.6in display is reflective, with its shine concealing washed-out images. This is a very capable model.
>> Battery life					5:15	
	11.6in 1366x768	AMD Radeon HD 6310M n/a	18	n/a	Windows 7 Home Premium 64bit	This 11.6in-screen Lenovo IdeaPad is extremely portable, but has far more in the way of power and specifications than a similar-sized netbook. The screen is criminally glossy, but offers a sharp, well-defined image. The 1.6GHz AMD E350 processor shows its age, and a WorldBench score of 53 isn't great. Nor are the graphics capable of doing any justice to games. But the 500GB hard drive is capacious, and typing is very comfortable. Battery life is also very good. This Lenovo is an ideal travel companion.
>> Battery life					5:38	
	15.6in 1366x768	AMD Radeon HD 6370M 1GB	32	2x BD-ROM 8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit	This is exactly the sort of functional laptop you might expect from Lenovo, and it doesn't fare badly in the looks department either. Our sample developed a row of dead pixels, but otherwise impressed. Its score of 96 points in WorldBench 6 is adequate at this price, and the HD 6370M graphics controller makes this one of the few low-priced laptops that can handle games. The 640GB hard drive is capacious and this model can even handle Blu-ray playback. It's a little heavy at 2.6kg, however.
>> Battery life					5:01	
	17.3in 1366x768	Intel GMA HD n/a	n/a	8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter	A study in clean, simple design, the Inspiron 17R is highly configurable and supports many of the latest technologies, including USB 3.0 and Intel's Wireless Display (WiDi). Perhaps most startling at this price, though, is the giant 17.3in display. A Scrabble-tile-style keyboard is recessed into the desk, with the cursor arrows and numeric keypad delineated from the main keys. The 114 points notched up in WorldBench 6 is impressive. Battery life isn't great, but the Dell makes an ideal desktop replacement.
>> Battery life					3:30	
	15.6in 1366x768	AMD Radeon HD 6310M n/a	19	8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit	Creeping in at the bottom of the chart, the MSI is hamstrung by a high price and a weak processor. The latter is a dual-core 1.6GHz AMD E350, a chip that Lenovo also places in its IdeaPad. But while that laptop is designed primarily to be portable, the CR650 is intended as a primary PC. Gaming performance isn't fantastic either, while the 15.6in screen doesn't send out the sharpest picture. The sound quality is good and the keyboard fine. A better price is needed to make this a tempting purchase.
>> Battery life					5:42	

Prices are intended only as a guide and are correct at press time

newer models support faster 802.11n, too. As they are designed to be used on the move, the faster Wi-Fi technology comes in handy when copying large files. All the models currently in our chart support 802.11n.

Operating system: Windows 7 Starter Edition is now standard, with slightly reduced performance compared to Windows XP. Some earlier netbooks instead ship with a Linux operating system. All those we've tested have struggled with Vista, but Windows 7 will run on an Atom processor.

Display: Netbooks' small screens and lowly resolutions, plus the lack of dedicated graphics, mean they don't lend themselves to video playback or gameplay. However, most netbook screens are adequate for sending emails, web browsing and word processing.






Keyboard: Cramped keyboards go with the territory, and it's useful to try out typing on a netbook before you buy it. The keyboards on netbooks with smaller than 9in screens will make touch typing impossible. Watch out for non-standard layouts; mini laptops

sometimes sacrifice dedicated function keys, for example.

Extras: To keep cost and weight down, mini-laptop manufacturers compromise heavily on extras - don't expect to get a CD/DVD drive, a FireWire port or an ExpressCard slot, for example. You'll find three USB ports, but they may be crammed together tightly, which can make plugging in two devices side by side tricky unless you use a USB hub or an extension cable.



Top 5 £601-£1,000 laptops

PC ADVISOR
BEST BUY

1		Toshiba Satellite P750-137 toshiba.co.uk tinyurl.com/buhw64s New	<ul style="list-style-type: none">• £999 inc VAT• £999 (RRP)• 1-year carry-in warranty	2GHz Intel Core i7-2630QM	<div>40yes</div>	8GB DDR3 750GB	381x254x36mm 2.6kg	802.11b/g/n, Bluetooth		
					>> WorldBench 6					131
2		Asus U46SV-WX044X uk.asus.com tinyurl.com/c845t5y New	<ul style="list-style-type: none">• £699 inc VAT• £699 (RRP)• 2-year RTB warranty	2.3GHz Intel Core i5-2410M	<div>30yes</div>	4GB DDR3 640GB	333x245x27mm 2.1kg	802.11b/g/n, Bluetooth		
					>> WorldBench 6					114
3		Toshiba Satellite R830-143 toshiba.co.uk tinyurl.com/6xwtk99 Last month 1	<ul style="list-style-type: none">• £730 inc VAT• £749 (RRP)• 3-year RTB warranty	2.3GHz Intel Core i5-2410M	<div>20yes</div>	6GB DDR3 640GB	316x227x27mm 1.5kg	802.11b/g/n, Bluetooth		
					>> WorldBench 6					122
4		Apple MacBook Pro apple.com/uk tinyurl.com/5td25pq Last month 2	<ul style="list-style-type: none">• £999 inc VAT• £999 (RRP)• 1-year RTB warranty	2.4GHz Intel Core i5-2415M	<div>21yes</div>	4GB DDR3 500GB	325x241x23mm 2.1kg	802.11 a/b/g/n, Bluetooth		
					>> WorldBench 6					117
5		Medion Eraser X6811 medionshop.co.uk tinyurl.com/4mqoc8 Last month 5	<ul style="list-style-type: none">• £800 inc VAT• £979 (RRP)• 2-year RTB warranty	2.53GHz Intel Core i5-460M	<div>20yes</div>	4GB DDR3 640GB	390x265x46mm 3.2kg	802.11b/g/n		
					>> WorldBench 6					113

Top 5 £1,001+ laptops

PC ADVISOR
BEST BUY

1		Apple MacBook Air 13.3in 2011 apple.com/uk tinyurl.com/3gy2Lae Last month 1	• £1,349 inc VAT • £1,349 (RRP) • 1-year RTB warranty	1.7GHz Intel Core i5-2557M	2 0 yes	4GB DDR3 256GB SSD	325x227x17mm 1.3kg	802.11 a/b/g/n, Bluetooth	
					» WorldBench 6				122
2		Rock Xtreme X685-i5-2540M rockdirect.com tinyurl.com/btzsq97 New	• £1,229 inc VAT • £1,249 (RRP) • 3-year onsite warranty	2.6GHz Intel Core i5-2540M	4 0 yes	6GB DDR3 500GB HDD	376x256x43mm 3.1kg	802.11 a/b/g/n	
					» WorldBench 6				124
3		Toshiba Qosmio X770-107 toshiba.co.uk tinyurl.com/cLq5e99 New	• £1,399 inc VAT • £1,399 (RRP) • 1-year carry-in warranty	2GHz Intel Core i7-2630QM	4 0 yes	8GB DDR3 2x 500GB HDD	412x270x58mm 3.4g	802.11b/g/n, Bluetooth	
					» WorldBench 6				132
4		Apple MacBook Pro 15in Core i7 2.2GHz apple.com/uk tinyurl.com/4bd9Ljv Last month 2	• £1,749 inc VAT • £1,849 (RRP) • 1-year RTB warranty	2.2GHz Intel Core i7-2720QM	2 1 yes	4GB DDR3 750GB HDD	364x249x24mm 2.5kg	802.11 a/b/g/n, Bluetooth	
					» WorldBench 6				132
5		Sony Vaio F21Z1E/B sony.co.uk tinyurl.com/6kj4qLz Last month 3	• £1,700 inc VAT • £1,799 (RRP) • 1-year RTB warranty	2GHz Intel Core i7-2630QM	3 0 yes	8GB DDR3 640GB HDD	237x356x28mm 3.1g	802.11b/g/n, Bluetooth	
					» WorldBench 6				n/a ²

GLOSSARY • RTB: return to base • SSD: solid-state drive ¹Gaming framerate scores in fps, at 1024x768-pixel resolution and 'Maximum Quality' settings ²Not tested Note: Windows is not preinstalled on



>> Buying advice

Laptops

Processor: Intel chips remain the dominant force. The Intel Core 2 Duo CPUs offer strong battery life, but if you want the best performance then you'll have to look to the Intel Core i5 and i7 chips. The latter, in particular, are incredibly fast.

The Core i5-M520 and i7-620M are currently extremely popular choices in £1,001-plus laptops, offering a good mix of speed and battery life.

Processors in Intel's Core i3, i5 and i7 families include performance features such as Turbo Boost, for short-term overclocking, and Hyper Threading, which enables dual-core CPUs to function like quad-core processors.

	Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear) ¹	Max disc speeds	Operating system, software and extras	VERDICT
	15.6in 1366x768	nVidia GeForce GT 540M 2GB	54	6x BD-ROM 8x DVD±R/6x-RW/8x+RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	Boasting a quad-core i7-2630QM processor, the Toshiba Satellite scored 131 points in WorldBench 6. The Satellite comes with a generous 8GB of RAM and a capacious 750GB hard drive. Gaming performance is lower than some, but offers playable framerates. The screen is decent, but the shiny bezel and glossy panel add glare. The Blu-ray drive is useful for HD film playback, although the resolution maxes out at just 1366x768 pixels. The battery life is poor at around 3.5 hours.
>> Battery life 3:23						
	14.1in 1366x768	nVidia GeForce GT 540M 1GB	78	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Professional 64bit	The Asus is the cheapest laptop in this chart, yet its 10-hour battery life is remarkable. Combined with some relatively compact dimensions, this laptop will suit a life on the road. It looks smart too, and the 14.1in 1366x768-pixel screen does a good job. It is glossy, but the image is sharp and the colours resonant. The slim frame finds room for an optical drive, and you get plenty of ports. The Core i5-2410M processor is capable rather than brilliant, but graphics performance is rather good.
>> Battery life 10:01						
	13.3in 1366x768	Intel HD Graphics 3000 n/a	18	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	The Toshiba is a decent alternative to the highly portable Asus. It offers plenty of general speed, although the integrated graphics are underpowered for gaming. The Toshiba looks smart. Its keyboard has small keys, but is easy to use for prolonged periods. Battery life is excellent, and only the Asus lasted longer. The 13.3in screen has a matt finish and is usable in a variety of lighting conditions, even if the colour depth suffers slightly. Lighter than the Asus, this laptop will be a great road warrior.
>> Battery life 7:32						
	13.3in 1280x800	Intel HD Graphics 3000 n/a	18	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Mac OS X 10.6 Snow Leopard	Its £999 price tag means the MacBook Pro only narrowly makes it into our chart, but this doesn't stop it from offering very good value. Capable of dual-booting into Windows (although you will need to factor in the cost of the operating system), it produced a solid WorldBench 6 speed score of 117. It doesn't have a dedicated graphics card, and its gaming scores are poor. However, battery life is good, and the keyboard is comfortable to use. The Pro is attractive and superbly built.
>> Battery life 6:29						
	15.6in 1366x768	nVidia GeForce GTX 460M 1.5GB	158	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	The Medion Erazer X681t is built for business; gaming business. The nVidia GeForce GTX 460M is a meaty graphics processor. Combined with its 1.5GB of GDDR5 memory, it takes gaming at healthy resolutions in its stride. It's a hefty slab of a laptop, but the Core i5 CPU is efficient and the Medion lasted for longer than 4 hours in our tests. The keyboard is plasticky in feel, and the trackpad is a little small. The Medion's screen isn't glossy, but the low-grade image suffers from limited viewing angles.
>> Battery life 4:02						

	Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear) ¹	Max disc speeds	Operating system, software and extras	VERDICT
	13.3in 1440x900	Intel HD Graphics 3000 n/a	17	n/a	Mac OS X 10.7 Lion, iLife 09, multitouch trackpad, backlit keyboard	When Apple launched the original MacBook Air in 2008, some dismissed it as an overpriced toy. Now in its fifth generation, the Air is the leading ultraportable. The construction has changed little since the previous revamp, and the aluminium body is still highly desirable and ultra-thin. The backlit keyboard is back, and the video port has been replaced with a Thunderbolt connector. The screen is a glossy version, but with an anti-reflective coating. Application performance is strong.
>> Battery life 6:35						
	15.6in 1920x1080	AMD Radeon HD 6990 2GB	275	6x BD-ROM 8x DVD±R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Home Premium 64bit	The Rock focuses on gaming, and its HD 6990 blows much of the competition away with a blistering 275fps in Fear. The 15.6in screen is also a corker, with a full-HD resolution and an effective anti-glare coating. The model we reviewed didn't have a Blu-ray drive; this version does. Application performance is good, and the Core i5-2540M CPU and 6GB of RAM produced a respectable 124 points in WorldBench. A fingerprint reader adds security. Battery life isn't great, and the Rock is hefty.
>> Battery life 2:30						
	17.3in 1920x1080	nVidia GeForce GT 560M 1.5GB	166	6x BD-ROM/4x -R/2x -RE 8x DVD±R/6x -RW/ 8x +RW/8x -ROM	Windows 7 Home Premium 64bit	A beefy laptop with an equally impressive feature set, the Toshiba's beating heart is an Intel Core i7-2630QM processor (along with 8GB of RAM) that propels it to a score of 132 WorldBench points. The ample frame houses two Seagate 7,200rpm hard disks, and one is a solid-state hybrid. Gaming framerates are fast, too. The 17.3in screen is very good, offering a full-HD resolution. Its finish is glossy, but the anti-glare coating works a treat and 3D capabilities add to the allure. Battery life is poor, however.
>> Battery life 2:04						
	15.4in 1440x900	Intel HD 3000/ Radeon HD 6750M 1GB	92	8x DVD±R/2.4x -RW/ 4x +RW/8x -ROM	Mac OS X 10.6 Snow Leopard, iLife 09, multitouch trackpad, backlit keyboard	The MacBook Pro may have fallen down in rank, but this revamped model is worthy of your attention. It offers a Thunderbolt port, Intel's hyper-fast connection standard for uniting PCs and their peripherals. The Sandy Bridge CPU marks a step up in performance, while an AMD chip replaces the older nVidia graphics controller, but still offers graphics-switching technology. The Pro's performance is very good. If you need workstation power in an inch-thick slab, don't look anywhere else.
>> Battery life 5:18						
	16in 1920x1080	nVidia GeForce GT 540M 1GB	20	8x BD-ROM 8x DVD±R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Home Premium 64bit	This isn't the first laptop we've seen that's capable of rendering 3D, but it is the most luxurious. A heavy brute at 3.1kg, it has a raised rubbery platform that forms an extended wristrest. The screen's image quality is excellent. More importantly, the 3D experience is compelling with the supplied 3D active-shutter glasses. Gaming performance is decent - and automatically set up for 3D mode. Add Blu-ray and you have a fantastic home-entertainment centre. It is noisy and expensive, however.
>> Battery life n/a ²						

Apple Mac PCs, which are tested under Windows and Boot Camp for comparison only

Prices are intended only as a guide and are correct at press time

Memory: The minimum offering if you're paying more than £600 should be 2GB. Most offer more. The more memory you have, the smoother your laptop will run.

Hard drive: It's difficult to upgrade a laptop's hard drive, so get as much storage space as you can. For best performance and increased reliability, look out for a solid-state drive. Expect less capacity than with a hard drive.






Screen: If you're after a desktop-replacement machine, go for at least 15in. For film playback, 17in widescreen models are even better. For ultraportables, 13in or under is best.

Graphics card: When shopping for a more expensive laptop, the best cards include the two highest entries in the GeForce family, the 330M and 320M. The ATI Mobility Radeon HD 5650 graphics chip is also fast and

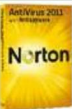




supports DirectX 11.0. Look for at least 256MB of graphics memory.

Integrated graphics in Intel Core i-series CPUs are now usable with some games too. Older Intel GMA 4500M graphics are sufficient only for games played at low resolutions.

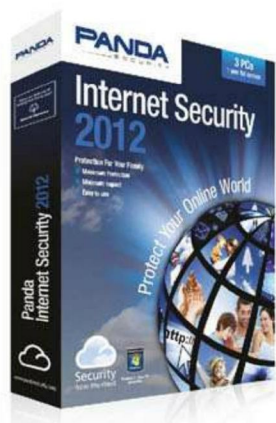
Some laptops feature switchable graphics, using the integrated chip to maintain battery life and the discrete card for maximum performance.

Top 5 Internet security suites			Signature-based malware detection	Malware blocking		Successful cleanup of active malware	Scan speed (secs)		Interface design	Extra features	
				Fully blocked	Partially blocked		On-demand	On-access			
PC ADVISOR BEST BUY	1	 Panda Internet Security 2012 pandasecurity.com/uk tinyurl.com/63sbhfn Last month 1	• 3 PCs, 1 year: £50 inc VAT	99.96%	85.4%	n/a	100%	n/a	n/a	Very good	USB vaccine, virtual keyboard, safe browser, parental controls
	Panda Internet Security 2012's interface is well-designed and easy to use, while the product itself offers very good protection and doesn't clobber your PC's performance. Panda led the way in cloud-based protection; while this is less significant now that Panda's competitors have followed suit, it's a commendable approach to online security. New signatures are automatically pushed to your PC.										
	2	 Kaspersky Small Office Security 2012 kaspersky.co.uk tinyurl.com/3cn9k8s Last month 2	• 5 PCs and 1 server, 1 year: £159 inc VAT	99.4%	94.6%	n/a	94.4%	n/a	n/a	Good	staff access limits, encrypted backups, file shredder
	If you run a small business with several PCs to protect, Kaspersky Small Office Security 2012 is a sensible purchase. It protects up to five PCs and a server. If you use a network server to share data and applications, it's a simple matter to share your security provision too. Small Office Security offers very good value, with centralised security and similar ease of use to the company's consumer product.										
	3	 Symantec Norton Internet Security 2011 norton.com tinyurl.com/5u49p8f Last month 3	• 3 PCs, 1 year: £49 inc VAT	98.7%	96%	4%	80%	126	291	Very good	rootkit/ID/network protection, parental controls, SafeWeb
Symantec Norton Internet Security 2011 is a streamlined and extremely effective anti-malware application. Symantec continues to update and advance its user interface and malware-detection rates incrementally. With solid protection across the board and some impressive results in our tests with AV-Test.org, Norton Internet Security 2011 easily earned our Best Buy crown. Highly recommended.											
PC ADVISOR RECOMMENDED	4	 Kaspersky Internet Security 2011 kaspersky.co.uk tinyurl.com/4us5hzq Last month 4	• 3 PCs, 1 year: £49 inc VAT • 1 PC, 1 year: £39 inc VAT	95.7%	92%	0%	80%	109	315	Good	anti-phishing, virtual keyboard, parental controls, SafeSurf
	Known for being a power user's anti-malware tool, Kaspersky has quietly developed its 2011 internet security suite into a somewhat kinder, gentler application. This excellent security suite will at last appeal to the masses. Some useful extras are included, but the installation is a headache. Kaspersky Internet Security 2011 provides solid defence against malware and has a friendly interface.										
	5	 Bitdefender Internet Security 2011 bitdefender.co.uk tinyurl.com/69wtdep Last month 5	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	97.5%	68%	20%	80%	131	305	Very good	online fraud and ID theft protection
	Bitdefender Internet Security 2011's overall protection levels are very good, but short of the topmost tier of security software products in this chart. Bitdefender's multiple-mode interface is complicated, but this fully featured suite blocks malware effectively. This is something of a budget option and, while it has its issues, Bitdefender Internet Security is still a good fit for almost any class of user.										

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Top 5 Antivirus software			Signature-based malware detection	Malware blocking		Successful cleanup of active malware	Scan speed (secs)		Interface design	Extra features	
				Fully blocked	Partially blocked		On-demand	On-access			
PC ADVISOR RECOMMENDED	1	 Symantec Norton AntiVirus 2011 norton.com tinyurl.com/4p5ycxp Last month 1	• 3 PCs, 1 year: £39 inc VAT	98.7%	96%	0%	80%	121	272	Very good	Pulse updates, Sonar 3 behavioural protection, Insight
	Symantec Norton AntiVirus 2011 does a very good job of detecting and removing malware, and it has a smooth user interface. We particularly like the way it alerts you to potential problems with a red warning message and large 'Fix now' button. Norton has a moderate impact on system resources compared with rival antivirus products, and earned solid scores in our system-speed tests.										
	2	 Bitdefender Antivirus Pro 2011 bitdefender.co.uk tinyurl.com/66sk77u Last month 2	• 3 PCs, 1 year: £24 inc VAT • 1 PC, 1 year: £14 inc VAT	97.5%	68%	20%	80%	126	327	Very good	gaming mode
	Bitdefender Antivirus Pro 2011 does a good job at detecting malware, and was the top performer in this chart at removing infections from our test machine, but it has some trouble blocking live malware attacks. Three interface tiers are available: Basic, Intermediate and Expert; the last of these is a convoluted mass of tabs but offers plenty of features for advanced users. Scan speeds are average.										
	3	 G Data AntiVirus 2011 gdatasoftware.com tinyurl.com/6bfxcws Last month 3	• 3 PCs, 1 year: £34 inc VAT • 1 PC, 1 year: £24 inc VAT	99.4%	84%	4%	80%	111	336	Very good	cloud security
G Data AntiVirus 2011 has muscle where it counts most, offering strong malware detection, blocking and removal capabilities, which it couples with a good user interface. However, it isn't as good as the other products in this chart at showing security status at a glance, and some of the text is poorly translated from German. Pleasingly, G Data AntiVirus 2011 flagged no false positives in our tests.											
PC ADVISOR RECOMMENDED	4	 Kaspersky Anti-Virus 2011 kaspersky.co.uk tinyurl.com/6hqa2wb Last month 4	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	95.7%	88%	4%	80%	103	310	Very good	Rescue CD, desktop gadget
	Once known as the power user's security tool, Kaspersky's Anti-Virus 2011 software offers a well-designed interface and is easy to use. We particularly like Kaspersky's 'hot spot', which lets you drag individual files to it for on-demand scanning. Kaspersky Anti-Virus 2011 is very good at blocking malware - particularly brand-new threats - but it noticeably slowed down other activities on our test computer.										
	5	 Trend Micro Titanium Antivirus Plus 2011 uk.trendmicro.com tinyurl.com/4huorv3 Last month 5	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	98.4%	88%	8%	80%	187	249	Very good	cloud security
Trend Micro Titanium Antivirus Plus 2011 is a set-it-and-forget-it security product that does a good job of blocking malware. The program is cloud-based, and dependent on an active internet connection. The upside is there's no need to worry about manual updates. Infections are consistently staved off and active malware is almost always removed. Advanced users may crave more control.											

Prices are intended only as a guide and are correct at press time



>> Buying advice

Security software

We work with world-renowned independent security testing lab AV-Test.org to evaluate the effectiveness of internet security and antivirus software. While many products offer similar results in terms of malware detection and disinfection, other factors such as their ease of setup, scan speeds, interface design and ability to deal with brand-new threats set them apart.

The best products will offer features that go beyond the traditional antivirus, antispyware, antispyware and firewall concoction of internet security suites – you might see parental controls, ‘cloud’ protection, anti-phishing, anti-rootkit, virtual web browsers and keyboards, link and file scanners, gaming modes, online backup and more included.

With many households now owning more than one computer, the best value is usually offered by a one-year, three-user licence. However, you can save some cash with a single-user licence if you have only one computer.

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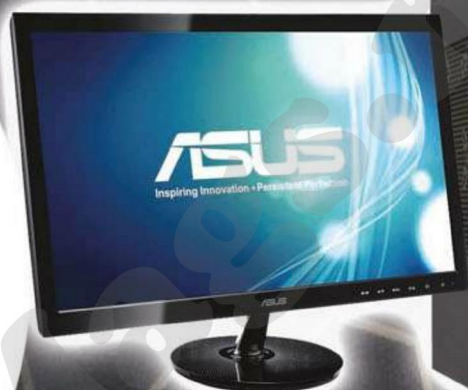
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Top 5 Tablet PCs






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Top 5 Tablet PCs			Platform	Screen size/res (pixels)	Storage/Media card slot	Connectivity ¹	Processor RAM	Claimed battery life (in use)	Other	Dimensions (wxdxh) Weight	
1		Apple iPad 2 apple.com/uk tinyurl.com/4xv7q4k Last month 1	• £399 inc VAT • £399 (RRP) • 1-year warranty	Apple iOS	9.7in 1024x768	16GB none	802.11a/b/g/n, BT	1GHz Apple A5 512MB	10 hrs	0.3/0.7Mp cameras	241x186x9mm 597g
The iPad 2 may not be hugely different to the original - although it is slimmer and faster - but the first iPad was stunning. Brilliant as a web-connected device that fits in the space between smartphone and PC, the iPad 2 also works well as an e-book reader or video player. Two cameras are useful for video chat with FaceTime or Skype. The iPad 2 can also come with 3G, and up to 64GB of storage.											
2		Samsung Galaxy Tab 10.1 samsung.com/uk tinyurl.com/3Lh239c Last month 2	• £399 inc VAT • £399 (RRP) • 1-year warranty	Android HC 3.1	10.1in 1280x800	16GB none	802.11b/g/n, BT	1GHz Tegra T20 1GB	9 hrs	3/2Mp cameras	257x173x9mm 559g
This is the tablet Apple wants to stop you buying, given its similarities to the iPad. The Tab 10.1 is ultra-slim and the best Android tablet we've seen yet. In essence a landscape device (the iPad excels in portrait mode as well), its display is almost as gorgeous. The battery life is good, although charging (by mains only) is slow. The screen needs a little more pressure to work, and web browsing is slower.											
3		Sony Tablet S sony.co.uk tinyurl.com/3tsqkp4 Last month 3	• £399 inc VAT • £399 (RRP) • 2-year warranty	Android HC 3.1	9.4in 1280x800	16GB SD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	8 hrs	0.3/5Mp cameras	241x174x20.76mm 598g
Hats off to Sony for its original design and for reskinning the Android Honeycomb interface. The plastic Sony Tablet S is just lighter than the iPad 2, with a page curl effect along one edge. This makes it easy to grip the tablet in one hand, and raises the display in landscape mode for convenient viewing and text entry. The lack of HDMI is less impressive, but offset by Sony Entertainment features.											
4		Acer Iconia Tab A100 acer.co.uk tinyurl.com/3t2bjqL Last month 4	• £280 inc VAT • £280 (RRP) • 1-year warranty	Android HC 3.0	7in 1024x600	8GB microSD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	5-8 hrs	2/5Mp cameras	241x186x9mm 612g
The 7in Acer is light but solidly built, and manages to look rather chunky. You get the full complement of connection options, while the screen is dark, bordering on brooding. Vertical viewing angles aren't great. We had no issues with accurately inputting text. The 5Mp camera and GPS module work well. Battery life is good too, and the Acer makes a good case for Android on a 7in-screen tablet.											
5		Packard Bell Liberty Tab packardbell.co.uk tinyurl.com/5w55ec6 Last month 5	• £299 inc VAT • £299 (RRP) • 1-year warranty	Android HC 3.2	10.1in 1280x800	16GB microSD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	10 hrs	2/5Mp cameras	177x260x13mm 760g
The Liberty Tab may be an imposing slab, but it's very well connected with slots for an SD Card, HDMI and docking. It looks smart, and Packard Bell has done a good job of disguising the Acer Iconia tablet that lies within. The interface is clean and uncluttered, and the admittedly rather reflective screen has good viewing angles. The tablet is muted during gameplay, although GPS is spot-on.											

GLOSSARY • BT: Bluetooth • HC: Honeycomb 13G available at additional cost

Top 5 Projectors

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Top 5 Projectors			Projection technology Resolution	Brightness (Ansi lumens) Contrast	Supported aspect ratios	Noise levels (dB) Battery	Connections	Lamp Lamp life	Dimensions (wxdxh) Weight
1	 InFocus ScreenPlay SP8600 infocus.com tinyurl.com/3hqanpv Last month 1	• £770 inc VAT • £799 (RRP) • 5-year warranty	DLP 1920x1080	1,800 5,000:1	16:10, 16:9, 4:3	30 (26 eco) no	VGA, HDMI, component, S-Video, composite, USB	230W 4,000 hrs	326x254x104mm 3.4kg
The ScreenPlay SP8600 may lack some of the pleasing design touches of more expensive InFocus models, but it's still a fantastic projector. Building on the Vivitek H1080FD, it adds several important upgrades, including a DarkChip 3 DMD engine. The zoom range is narrow, but the performance is impressive, with crisp images and clear motion. This is an excellent projector for smooth HD.									
2	 Vivitek Qumi Q2 vivitek.co.uk tinyurl.com/3txmwpk Last month 2	• £520 inc VAT • £670 (RRP) • 3-year warranty	DLP 1280x800	300 2,500:1	16:10, 16:9, 4:3	32 (28 eco) no	VGA, HDMI, USB	LED 30,000 hrs	162x102x32mm 635g
Although a full-size model like the InFocus offers greater power and quality, the Qumi is excellent for those on the move. It packs in better specs than many pico models. Compact and smooth, but offering a generous 1280x800 native resolution and 300 Ansi lumens, the Q2 can project an image in a reasonably well-lit room. It offers 3D facilities when plugged into a DLP-Link source.									
3	 BenQ W1000+ benq.co.uk tinyurl.com/6kfuemf Last month 3	• £830 inc VAT • £840 (RRP) • 1-year warranty	DLP 1920x1080	2,000 3,500:1	16:10, 16:9, 4:3	28 (26 eco) no	VGA, HDMI, component, S-Video, composite, USB	180W 4,000 hrs	325x254x95mm 3.4kg
Now beaten as a home-cinema model by the InFocus, and behind the Vivitek as an overall deal, this full-HD projector is still a decent and well-connected model. The BenQ also packs some strong specs, including a 3,500:1 contrast ratio and a brightness rating of 2,000 Ansi lumens that ensures you don't need to watch movies in a darkened room. Pictures aren't crystal clear, but the image is pleasing.									
4	 NEC NP43 nec-display-solutions.co.uk tinyurl.com/62w3796 Last month 4	• £610 inc VAT • £622 (RRP) • 2-year warranty	DLP 1024x768	2,300 1,600:1	16:9, 4:3	37 (32 eco) no	VGA, S-Video, USB	200W 1,000 hrs	246x72x177mm 1.7kg
With its crisp white casing, the NP43 looks attractive. Tipping the scales at just 1.7kg, it's highly portable, and its rating of 2,300 Ansi lumens gives it an impressive brightness to weight ratio. Its best feature is the Auto Focus, which kicks in every time you resize the screen. Add the highly customisable settings and decent image quality, and this is a great choice for businesses on the move.									
5	 ViewSonic PJD7383i viewsoniceurope.com/uk tinyurl.com/3bw7zzw Last month 5	• £1,129 inc VAT • £1,129 (RRP) • 3-year warranty	DLP 1024x768	3,000 3,000:1	4:3	32 (27 eco) no	VGA, composite, S-Video, USB	210W 4,000 hrs	290x126x254mm 3.5kg
Perfect for schools and businesses, combining networking with an innovative controller and an ultra-short lens, this is an extremely good projector - if not a cheap one. It's not small, but networking facilities let you manage it from a single location. A slightly darkened room is needed for the best results, and the palette lacks intensity when projecting dark images (particularly with films).									

Prices are intended only as a guide and are correct at press time

>> Buying advice

Tablet PCs

Tablet PCs bridge the gap between what PCs and mobile phones do. They couple the mobility and connectivity of a smartphone with elements of a laptop - in particular, larger screens and more powerful processors.

A tablet is a thin slab, dominated by its screen. Instead of struggling to run Windows, they run a






lightweight, touchscreen-focused mobile platform. The most developed and optimised is Apple iOS, with Google Android and OSes from HP and RIM following. Some tablets offer 3G connectivity, and are available on subsidised data contracts.

Tablets are ideal for web browsing, email, reading e-books, playing games and watching video. However, you won't be tempted to write long essays or reports on a tablet's onscreen keyboard.






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Top 5 Sub-£150 printers

			Technology Max printer resolution	Actual print speed (ppm)	Optical scanner resolution Fax capabilities	Supported interfaces	Cost per page	Memory-card slot/ Auto-duplex Input capacity	Dimensions (wxdxh) Weight
1	 Oki C110 oki.co.uk tinyurl.com/yLno5rv Last month 1	• £135 inc VAT • £152 (RRP) • 3-year standard warranty	Colour laser 1200x600dpi	B=15.8 C=2.5	no scanner no fax	USB	B=3.6p C=5p	no/no 100	396x380x275mm 14.4kg
A laser printer for £135 is a good deal; one that also offers colour is almost impossible to find. But the Oki C110 manages it. This version has no ethernet or auto duplexing options, but it's a very usable colour laser printer that produces cleanly defined text at 15.8ppm. Colour is realistic, but rather faint. The Oki C110 is slow in laser terms, but fast compared to inkjets working in high-quality modes.									
2	 Brother HL-2130 brother.co.uk tinyurl.com/4yrrdj Last month 2	• £68 inc VAT • £90 (RRP) • 1-year standard warranty	Mono laser 2400x600dpi	B=20 C=n/a	no scanner no fax	USB	B=3p C=n/a	no/no 250 sheets	368x360x183mm 6.7kg
Looking like a compact version of Brother's standard-sized printers, the HL-2130 lacks the Samsung's chic design. But it's robust, and very straightforward to service. The 250-sheet input tray is substantial, and noise levels are pleasingly low. There are no advanced features, but it prints text very well, producing 600dpi output that's clean and crisp - and at 15.8ppm. Graphics are less successful.									
3	 Kodak Hero 5.1 kodak.co.uk tinyurl.com/6s5bw3b New	• £100 inc VAT • £100 (RRP) • 1-year standard warranty	Colour inkjet 9600dpi	B=12.2 C=6.8	1200dpi no fax	USB, cloud, 802.11b/g/n	B=1.8p C=3.3p	yes/yes 100 sheets	422x399x183mm 6.3kg
The Kodak isn't the slickest or most stylish printer we've seen, but its running costs are exceptional. There are compromises, and the Kodak's printing speed is slightly uninspiring in places. Neither is it the most eye-catching of models, with a slightly clunky interface and understated looks. But it's very reliable and comes with a multitude of connectivity options. Print quality is generally good.									
4	 Canon Pixma MG6250 canon.co.uk tinyurl.com/3koof7a Last month 3	• £138 inc VAT • £150 (RRP) • 1-year standard warranty	Colour inkjet 9600x2440dpi	B=12.4 C=5.2	4800x4800dpi no fax	USB, cloud, 802.11b/g/n	B=2.9p C=6.7p	yes/yes 2 x 150 sheets	470x367x173mm 9.2kg
In terms of quality and features, the MG6250 is the best inkjet here. Indeed, it comes with almost every feature you might want - from dual paper trays and direct-disc printing to Wi-Fi and cloud computing via Canon's Image Gateway. Add to that the great print results, particularly on photographic paper, and this is a very good model. Scanning is good, too. However, the Kodak is cheaper to buy and run.									
5	 Epson Stylus SX525WD epson.co.uk tinyurl.com/3scrzpc Last month 4	• £74 inc VAT • £149 (RRP) • 1-year standard warranty	Colour inkjet 5760x1440dpi	B=15 C=4	2400x2400dpi no fax	USB, 802.11b/g/n	B=2.4p C=8.2p	yes/yes 150 sheets	455x359x164mm 6.2kg
It's not as strong on photographic results (although the text is very good) as the MG6250. Nor is the Epson as fully featured. However, it costs around half the price, and improves on the cheaper SX425W with auto-duplex, enhanced speed and quieter operation. It's not the prettiest printer, but you can scan and copy documents, and the Epson can be shared over a network. The running costs are competitive.									

Top 5 £151+ printers

			Technology Max printer resolution	Actual print speed (ppm)	Optical scanner resolution Fax capabilities	Supported interfaces	Cost per page	Memory-card slot/ Auto-duplex Input capacity	Dimensions (wxdxh) Weight
1	 Kyocera Mita FS-1320D kyoceramita.co.uk tinyurl.com/6gg9ukv Last month 1	• £160 inc VAT • £200 (RRP) • 2-year warranty	Mono laser 1200x1200dpi	B=26.1 C=n/a	no scanner no fax	USB	B=1.4p C=n/a	yes/yes 250	375x393x250mm 12kg
The Kyocera Mita isn't the most heavily featured of laser printers here but, for a mix of capable print quality and strong pricing, the FS-1320D is the perfect choice for text-hungry businesses. Paper handling is decent, although you'll need its sibling, the FS-1370DN model, if you want ethernet connectivity. Text quality is strong and performance very high. Running costs are lower than average.									
2	 Samsung ML-3710ND samsung.com/uk tinyurl.com/75rb5nz Last month 2	• £203 inc VAT • £203 (RRP) • 1-year standard warranty	Mono laser 1200x1200dpi	B=28.6 C=n/a	no scanner no fax	USB, ET	B=1.4p C=n/a	no/yes 250 + 50	366x368x253mm 10kg
The ML-3710ND is an excellent mono laser. It's ugly, with its two-tone ridged casing, but it has ethernet connectivity for easy network integration, and the paper input can be boosted to as many as 820 sheets. Text quality is good, and duplexing is usable. Add a feature that monitors your impact on the environment (among other things) and low running costs, and the ML-3710ND is a fantastic printer.									
3	 Brother MFC-J6910DW brother.co.uk tinyurl.com/4g8has5 Last month 3	• £335 inc VAT • £450 (RRP) • 1-year warranty	A3 colour inkjet 19200x19200dpi	B=13.3 C=3.6	1200x2400dpi 33.6kbps	USB, ET, 802.11b/g/n	B=1.5p C=5p	yes/no 2 x 250	540x489x331mm 18.5kg
No ordinary printer, the Brother MFC-J6910DW can print on A3 as well as A4 pages. It works better in this format, and the Brother's A4 print quality isn't a patch on A3. Dual 250-sheet paper trays are convenient. The printer's 3.3in TFT screen and USB and memory card slots aid non-PC access. Connectivity options are superb, with the Brother supporting both wired and wireless networking.									
4	 Epson Stylus Office BX925FWD epson.co.uk tinyurl.com/6bw3gu4 Last month 4	• £230 inc VAT • £260 (RRP) • 1-year warranty	Colour inkjet 5760x1440dpi	B=17.6 C=14.2	2400x2400dpi 33.6kbps	USB, ET, 802.11b/g/n	B=2.4p C=5.4p	yes/yes 2 x 250	446x368x300mm 9.8kg
The BX925FWD supports both wired and wireless networking, and has two paper trays. The touch-sensitive control panel is intuitive. The Epson works better as a colour graphics printer than it does as a text churner - it's just too slow when operating as the latter, while duplex is so slow as to be almost a waste of time. But colour images are eye-catching, and spectacular photos are possible.									
5	 Kyocera FS-C126MFP kyoceramita.co.uk tinyurl.com/3sbLhwj Last month 5	• £952 inc VAT • £1,000 (RRP) • 1-year warranty	Colour laser 600x600dpi	B=25.2 C=23.4	600dpi 33.6kbps	USB, ET	B=1.3p C=5p	yes/yes 250 + 50	514x550x580mm 36kg
A heavyweight in cost and bulk, the Kyocera is suitable for business use. It has strong security options, with SSL data encryption and IPsec allowing for private and secure network communications, plus Private Print. Its paper handling can be upgraded to 1,300 sheets, and the 1,024MB of memory doubled. Capable scanning, copying and fax facilities are included. Speed is very impressive.									

GLOSSARY • B: black • C: colour • dpi: dots per inch • ET: ethernet • ppm: pages per minute

Prices are intended only as a guide and are correct at press time

>> Buying advice

Printers

These days, many printers are multifunctional, offering printing, faxing, copying and scanning functions. The trade-off can be slower performance and a more limited resolution.

For some people it will make more sense to buy an efficient, single-function printer for producing documents, then use a copy shop or a separate photo printer for your best shots.

If you want to produce photos at up to A4 size and need a printer that can produce a combination of photos and documents, a colour inkjet or multifunction printer will be the best choice.

Long-term costs: On top of the initial outlay, consider the cost of consumables (ink/toner, paper and printheads), time and maintenance. Vendors often sell cheaply and make their money back later.

Speed concerns: Be wary of claimed print speeds, too: some printer manufacturers craftily quote print speeds based on Draft mode output.



Top 5 Blu-ray Disc drives

PC ADVISOR
BEST BUY

Lite-On iHBS112
liteonit.eu
tinyurl.com/65pxhuj
Last month 1

• £70 inc VAT
• £100 (RRP)
• 2-year warranty

PC ADVISOR
RECOMMENDED

LG BH10LS30
uk.lge.com
tinyurl.com/2bg4a37
Last month 2

• £65 inc VAT
• £130 (RRP)
• 1-year warranty



Plextor PX-LB950UE
plextor.be
tinyurl.com/43zvjlh
Last month 3

• £140 inc VAT
• £161 (RRP)
• 3-year warranty



Lite-On iHOS104
liteonit.eu
tinyurl.com/ycmty5
Last month 4

• £40 inc VAT
• £45 (RRP)
• 1-year warranty



Buffalo MediaStation BR3D-12U3
buffalotech.com
tinyurl.com/453bx7L
Last month 5

• £199 inc VAT
• £199 (RRP)
• 2-year warranty

Blu-ray speeds	DVD speeds	Max storage	Interface type	Label technology	Burning software & extras should include ¹
-R/8x -R DL/ 2x -RE/8x -ROM	16x ± R/8x ± R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	SATA (internal)	none	CyberLink Blu-ray Suite
The best mixture of price and performance, this Lite-On is a clear top buy. This Lite-On iHBS112 Blu-ray drive can also be found in a more expensive retail version (the iHBS212) with additional LightScribe facilities. Both drives are fast, with 12-speed BD-R facilities, although they're only marginally faster than the technically inferior LG. Nonetheless, the Lite-On proved the top performer.					
10x -R/8x -R DL/ 2x -RE/10x -ROM	16x ± R/8x ± R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	SATA (internal)	LightScribe	PowerDVD 8.0, PowerProducer 4.0
The Lite-On iHBS112 is newer, faster and only marginally more expensive but, should it become unavailable, this LG Blu-ray drive is a very close contender. Indeed, the difference between the two isn't as great as you might expect, and the LG was only slightly slower in our tests. The bundled PowerDVD 8.0 software suite is useful, and playback is smooth. You can even label discs using LightScribe.					
12x BD-R/8x -R DL/ 2x -RE/8x -ROM	16x ± R/8x ± R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	USB 3.0, eSATA	LightScribe	PowerDVD 9.0, PowerProducer 5.0
An external Blu-ray writer, the Plextor can be connected to a USB 3.0 or an eSATA port. USB 3.0 was faster in our test, but your choice of connection will rest on what you have built into your PC. The Plextor is a handsome drive, but requires an external power supply. Convenient and reasonably fast, it's a good alternative to the Best Buy for those who want portable 12x BD-R facilities.					
4x -ROM	8x -ROM	n/a	SATA (internal)	none	PowerDVD 8.0 BD
The key to the Lite-On iHOS104's low price is that it's a read-only internal Blu-ray drive. More expensive optical drives include the ability to write to DVD and CD, but Lite-On reasons that there's no sense in doubling up on features you probably already have. The playback quality is very good, video is vivid, and TrueTheater does an excellent job of upscaling standard-definition video.					
12x -R/12x -R DL/ 2x -RE/8x -ROM	16x ± R/8x ± R DL/6x -RW/ 8x +RW/5x -RAM/8x -ROM	50GB	USB 3.0	none	PowerDVD 9.0, PowerProducer 5.0
An external drive that can offer 12-speed BD-R writing over USB 3.0 (when the included TurboUSB utility is used), the Buffalo is an effective, if rather expensive, means of adding fast Blu-ray writing to multiple PCs or laptops. The speed is good, given the limitations of current media, and noise levels are low. The MediaStation's software bundle is comprehensive, even if it does take time to load up.					

GLOSSARY • BD-XL: triple- or quad-layer Blu-ray media ¹Always check before buying

Top 5 Wireless routers

PC ADVISOR
BEST BUY

Cisco Linksys E4200
linksysbycisco.com
tinyurl.com/6z7bdkm
Last month 1

• £130 inc VAT
• £170 (RRP)
• 1-year warranty

PC ADVISOR
RECOMMENDED

AVM FritzBox Fon 7390
fritzbox.eu
tinyurl.com/3qujzbx
Last month 2

• £210 inc VAT
• £210 (RRP)
• 5-year warranty



Zyxel NBG4615
zyxel.co.uk
tinyurl.com/6hacknn
Last month 3

• £63 inc VAT
• £65 (RRP)
• 1-year warranty



Edimax BR-6475Nd
edimax.co.uk
tinyurl.com/6xda648
New

• £65 inc VAT
• £65 (RRP)
• 2-year warranty



Tenda W307R
tenda.cn
tinyurl.com/d6tab8j
New

• £22 inc VAT
• £22 (RRP)
• 3-year warranty

Wi-Fi standards supported	Frequency modes	WEP/WPA/WPA2	USB port Network port	Firewall	Eco mode Average power use	Wireless-n throughput (near/far)	Dimensions (wxdxh) Weight
a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/yes	yes 4	NAT/SPI	no not tested	226Mbps 92Mbps	225x160x25mm 355g
A wireless router that requires a separate ADSL or cable modem, the E4200 offers four gigabit ethernet ports and stand-out wireless capabilities. Dual-band wireless, a special guest login web page (that gives visitors access to the internet but not your local network) and UPnP media serving are welcome features. Performance is also very good, and the E4200 is the fastest router we've seen.							
a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/yes	yes 4	NAT/SPI	yes not tested	92Mbps 38Mbps	226x160x48mm not specified
Far more than just a wireless router, the FritzBox supports landline and internet telephony, and will even help you manage your calls. It supports both 2.4GHz and 5GHz frequencies, while 512MB of internal memory and a USB port allow shared storage of larger files. The transfer speeds are good, too. Some features are overkill for a home user, but this is a very comprehensive router for the money.							
b, g, n	2.4GHz	yes/yes/yes	yes 4	NAT/SPI	yes not tested	94Mbps 32Mbps	162x106x28mm 237g
It might not look it, but this well-priced Zyxel is a powerhouse of a router. Its graphical menus make it easy to set up, and a dedicated WPS button is great for quickly hooking up other wireless devices. The design is compact if boring, although the nine LEDs are informative. The USB ports are versatile and the performance is extremely nippy. It lacks the ability to create 5GHz networks.							
a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/yes	no 4	NAT/SPI	no not tested	97Mbps 4Mbps	134x110x26mm 200g
Support for the 5GHz frequency allows you to avoid the congested 2.4GHz radio spectrum, while the Edimax also has four LAN ports and a single WAN port, specified for gigabit ethernet. Navigating the web interface isn't a pleasant experience, although you'll find all the settings you need. An enhanced QoS protocol, iQoS, is included. Performance is strong, and the Edimax offers good value.							
b, g, n	2.4GHz	yes/yes/yes	no 4	NAT/SPI	no not tested	78Mbps 35Mbps	172x110x31mm 900g
Cheap and similarly specced to the Tenda W300D, the W307R offers an improvement in speed. It's designed for use with cable rather than ADSL connections. The W307R has a poorly constructed web interface and no UK support; it also lacks gigabit ethernet and USB 2.0. Nonetheless, it's very cheap and the transfer speeds are strong. For the money, it's very good for those with basic needs.							

GLOSSARY • Mbps: megabits per second • SSID: service set identifier

Prices are intended only as a guide and are correct at press time

>> Buying advice

Blu-ray Disc drives

DVD formats: To handle the bewildering array of DVD recording and playback formats, we recommend buying a drive that supports as many as possible. Look for labels such as LG and NEC's SuperMulti or Lite-On's Super All Write.

Blu-ray Disc: Six-/eight-speed BD-R (Blu-ray Disc writable) capabilities are standard, but bear in mind that even six-speed BD-R media is still rare.

Speed: Don't obsess about the highest speeds. You should be able to get 16-speed DVD writing, but it's not worth paying over the odds to save seconds.






Internal or external? External drives are easier to install and can be shared between PCs, but will cost you considerably more than internal models. Most internal drives now use a SATA interface, so check you've got a compatible port. Older PCs may not be compatible.



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Top 5 Digital camcorders

Top 5 Digital camcorders			Max resolution (pixels) Aspect ratio	Display CCD sensor	Zoom	Formats	Internal storage Compatible media	Connections	Dimensions (wxdxh) Weight	
1		Kodak PlaySport Zx5 kodak.co.uk tinyurl.com/3u3y2ca Last month 1	• £110 inc VAT • £149 (RRP) • 1-year warranty	1920x1080 16:9	2in 1/3.2in	4x digital	Mpeg4, Jpeg	128MB SD/SDHC	Micro-HDMI, MicroUSB	58x112x18mm 125g
The Zx3 was our favourite compact camcorder of 2010, so this ruggedised Zx5 has a lot to live up to. The buttons on the rear are now better spaced, and Kodak's added a dedicated Share button, a speaker and a removable battery. Build quality is faultless, with the 125g PlaySport able to fit comfortably into one hand. Our outdoor test shots revealed lush green grass and punchy red and blues.										
2		JVC Everio GZ-HM650 jvc.co.uk tinyurl.com/453u838 Last month 2	• £300 inc VAT • £420 (RRP) • 1-year warranty	1920x1080 4:3, 16:9	2.7in 1/4.1in	200x digital 40x optical	Mpeg4, Jpeg	8GB SD/SDHC/SDXC	HDMI, USB 2.0	51x55x111mm 195g
It no longer offers such good value at £300, but this lightweight JVC Everio remains a decent model. The 8GB internal memory (room for up to 6.5 hours of video or 9,999 photos), is expandable via SD/SDHC/SDXC cards up to 32GB in capacity. It fits comfortably in the hand and is easy to operate, despite some rather small buttons. A small amount of noise is picked up by the mic during operation.										
3		Sony Bloggie Touch MHS-TS20 sony.co.uk tinyurl.com/332uoqj Last month 3	• £150 inc VAT • £220 (RRP) • 1-year warranty	1920x1080 16:9	3in 1/2.5in	4x digital	Mpeg4, Jpeg	8GB SD/MS	HDMI, USB 2.0	47x9x106mm 125g
A £25 price cut sees the Sony Bloggie Touch move up to third. This is an excellent model where the primary focus is video blogging. Its unconventional shape is potentially hampering, and the fixed camcorder-style lens isn't the best for setting up stationary shots. The intuitive interface makes the Sony Bloggie easy to use, though, and recording quality is generally good, even if there's no flash.										
4		Canon Legria HF R106 canon.co.uk tinyurl.com/2vfvLqx Last month 4	• £275 inc VAT • £425 (RRP) • 1-year warranty	1920x1080 16:9	2.7in 1/5.5in	80x digital 20x optical	AVCHD, Jpeg	none SD/SDHC	HDMI, USB 2.0	60x64x124mm 319g
Canon's build quality is as impressive as ever in this budget camcorder with a 2.7in flip-out LCD screen. A camcorder first and foremost, the Legria HF R106 has a large lens and a 20x optical zoom, enabling it to capture great-looking full-HD (1920x1080-pixel) video. Colour balance in natural light was superb in our tests, and we were also impressed with the Canon Legria's close-up shots.										
5		FlipVideo Flip UltraHD theflip.com/en-gb tinyurl.com/nesp78 Last month 5	• £98 inc VAT • £160 (RRP) • 1-year warranty	1280x720 16:9	2in 1/4.5in	2x digital	H.264, Mpeg4, Jpeg	8GB n/a	USB 2.0	109x56x30mm 168g
For sheer ease of use, the FlipVideo Flip UltraHD sprints ahead of the competition. The simple button layout enables anyone to pick it up and get shooting. The Flip UltraHD improves on its predecessor by adding HD (1280x720-pixel) capture, and the 8GB of storage (sufficient for 2.5 hrs filming) means no worrying about memory cards. The Flip's 2in screen is excellent and video quality is good.										

GLOSSARY • CCD: charge-coupled device

Top 5 NAS drives

Top 5 NAS drives			Capacity tested Capacity range	Internal drives Spin speed	UPnP DLNA Remote access	USB port Raid options	Operating systems	Software	Dimensions (wxdxh) Weight	
1		Synology DiskStation DS211 synology.com tinyurl.com/65s4v4u Last month 1	• £240 inc VAT • £240 (RRP) • 2-year warranty	n/a up to 6TB	2 n/a	yes/yes/yes	yes 0/1	Win 2000/OS X 10.3 or later	DSM 3.0	88x218x161mm 1kg
Synology has built this enclosure (to which you can add up to two hard drives) around its own OS, which allows almost unprecedented flexibility. Its 29 different control areas cover everything from DLNA, UPnP and iTunes server to firewalls and wireless connection. The security is excellent, and performance is very good. Noise levels are low, and this would make a great audio or video server.										
2		Qnap TS-419P+ qnap.com tinyurl.com/3zk5Ljg Last month 2	• £425 inc VAT • £450 (RRP) • 2-year warranty	n/a up to 12TB	4 n/a	yes/yes/yes	yes 0/1/5/6/10	Win XP or later/ OS X/Linux	TurboNAS 3.4	180x235x177mm 3kg
A NAS enclosure (you buy drives separately for it), the four-bay Qnap can support drives holding up to 12TB of data. Its 1.6GHz ARM processor consumes less power than Intel-powered devices, and just one cooling fan is needed. The software is sophisticated yet approachable, and the choice of Raid options is capable. Performance is better than that of many home and small-business models.										
3		Zyxel NSA310 zyxel.co.uk tinyurl.com/3voqrxx Last month 3	• £135 inc VAT • £135 (RRP) • 3-year warranty	2TB 2TB	1 n/a	yes/yes/yes	yes n/a	Win XP or later/ OS X	zPilot	58x196x130mm 662g
Zyxel's NSA310 is a modestly priced but high-storage device that offers an excellent way to share storage over a home network. Little bigger than a 3.5in hard drive, it offers gigabit ethernet, eSATA and two USB 2.0 ports. The versatile software and simple web interface generally work well, although the transfer speeds aren't the best we've seen. It offers good value for money, though.										
4		Western Digital My Book World Edition II wdc.com/en tinyurl.com/yh8xytc Last month 4	• £295 inc VAT • £430 (RRP) • 3-year warranty	4TB 2TB to 4TB	2 5,400rpm	yes/yes/yes	yes 0/1	Win XP/OS X 10.4 or later	WD Anywhere	173x147x58mm 1.1kg
Still available in steady numbers, this 4TB drive from Western Digital is a decent option. Based on the original Western Digital My Book, the My Book World Edition II has a pair of drives that can be used in Raid 0 or 1 arrays. Time Machine adds value for Mac users, and the web interface offers a choice of modes to satisfy all users. Ideal for cross-platform storage and media streaming.										
5		Synology DS1511+ New synology.com tinyurl.com/cbLh883	• £615 inc VAT • £615 (RRP) • 2-year warranty	1GB up to 15TB	5 n/a	yes/yes/yes	yes 0/1/5/6/SHR	Win 2000/OS X 10.3 or later	DSM 3.2	157x248x233mm 4.3kg
The Synology DS1511+ is a powerful, expandable storage solution that would suit a small or medium business, with the potential to form part of an even larger network. File copying performance is very good, although write speed is a little below Intel-based dual-core solutions. Its user interface is one of the best we've seen, accessible to home users as well as trained network admins.										

GLOSSARY • DLNA: Digital Living Network Alliance • ET: ethernet • NAS: network-attached storage • UPnP: Universal Plug and Play

Prices are intended only as a guide and are correct at press time

>> Buying advice

NAS drives

NAS drives are ideal for businesses or home users who require large amounts of dependable and secure storage, accessible to anyone logged into the local wired or wireless network.

Instead of connecting a hard disk directly to one PC, the NAS is typically connected to a network router. Drive enclosures are also available that let you add your own choice of hard drives.






Most NAS drives allow virtual partitions, letting you keep data such as PC backups separate from media files. Home-oriented NAS drives also include media servers to allow easy streaming of content.

To augment data integrity, access speed, capacity, or all three, individual hard disks can be combined in a number of Raid configurations. Raid 0 'stripes' data across multiple drives to increase access speeds. Raid 1 mirrors the contents of one drive on to another, providing a cloned backup. Raid 5 is available with three or more drives and combines both advantages.








Top 5 Compact digital cameras

PC ADVISOR
BEST BUY

1		Sony Cyber-shot DSC-HX9V sony.co.uk tinyurl.com/6cLaw3d Last month 1	<ul style="list-style-type: none">• £270 inc VAT• £299 (RRP)• 2-year warranty	16.2Mp 4608x3456	16x	f3.3- f5.9	3in	n/a (SD/SDHC) 1 x lithium/410 shots	100 to 3200	105x34x59mm 215g	Picture Motion Browser
This Cyber-shot model may omit RAW, aperture- and shutter-priority modes, but it compensates with innovative in-camera settings and superb still-image and video capture. It can grab 3D images, and you also get GPS for geotagging, plus a 10fps high-resolution burst mode. The lens remains steady, with optical stabilisation and Active Steady Shot. It's compact, but a little too big for the average pocket.											
2		Nikon Coolpix S9100 nikon.co.uk tinyurl.com/6e457py Last month 2	<ul style="list-style-type: none">• £200 inc VAT• £234 (RRP)• 2-year warranty	12.1Mp 4000x3000	18x	f3.5- f5.9	3in	74MB (SD/SDHC) 1 x lithium/270 shots	160 to 3200	106x35x62mm 214g	Nikon utilities
The sleek Nikon S9100 is a small camera with a very big 18x zoom. The sensor-shift anti-shake feature reduces blur, and a rubberised surface is effective at preventing slippage. Full-HD video shot at 30fps is smooth, and the Nikon can create slow-motion clips in standard resolution at a superb 240fps. The Coolpix is extremely accessible, with a fantastic 3in LCD screen, and the image quality is excellent.											
3		Panasonic Lumix DMC-TZ20 panasonic.co.uk tinyurl.com/6xnrvuo Last month 3	<ul style="list-style-type: none">• £220 inc VAT• £300 (RRP)• 1-year warranty	14.1Mp 4320x3240	16x	f3.3- f5.9	2.8in	18MB (SD/SDHC) 1 x lithium/260 shots	100 to 1600	105x33x58mm 219g	PhotofunStudio 6.1 HD Lite
The DMC-TZ20 has an excellent 14.1Mp resolution and 16x optical zoom. Geo-tagging is automatically embedded in an image file's Exif data. You can shoot full-HD video in AVCHD, or standard-definition in Motion Jpeg. The camera also features a 3D mode. A range of options is available for hands-on photographers, but the buttons can be confusing. Output is consistent, with colours veering between natural and warm.											
4		Canon Ixus 300 HS canon.co.uk tinyurl.com/35zg6bp Last month 4	<ul style="list-style-type: none">• £260 inc VAT• £379 (RRP)• 5-year warranty	10.3Mp 3648x2736	3.8x	f2.0- f5.3	3in	n/a (SD/SDHC) 1 x lithium/250 shots	125 to 3200	100x24x54mm 177g	Canon utilities
The Canon Ixus 300 HS remains a strong buy if you don't need long zoom facilities. The dedicated low-light setting works very well in both stills and video recording, and there's a high-speed, slow-mo playback setting. The Canon's 3.8x optical zoom is another asset, securing super-sharp shots. Colour reproduction was very pleasing in all conditions, and the battery life was good. Ideal for all users.											
5		Canon PowerShot G12 canon.co.uk tinyurl.com/4qhaf66 Last month 5	<ul style="list-style-type: none">• £400 inc VAT• £450 (RRP)• 1-year warranty	10Mp 3648x2736	5x	f2.8- f4.5	2.8in	n/a (SD/SDHC) 1 x lithium/370 shots	80 to 3200	112x48x76mm 401g	Canon utilities
By far the most expensive model in the chart, the G12 is a great option for those users who want something more powerful. An extremely advanced point-and-shoot camera, the PowerShot offers fantastic image quality, along with a good number of other useful features such as top-mounted dials and a high dynamic range scene mode. The Canon G12 is remarkably easy to use, despite its considerable complexity.											

Top 5 Interchangeable-lens cameras

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BEST BUY

1		Nikon D5100 (18-55mm) nikon.co.uk tinyurl.com/6ute9kk New	<ul style="list-style-type: none">• £599 inc VAT• £599 (RRP)• 3-year warranty	16.2Mp 4923x3264	3x	f3.5- f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/660 shots	100 to 6400	124x97x79mm 510g	Nikon software
The D5100 delivers superb image quality, particularly in low light. It offers excellent ease of use for the beginner, plus some advanced features so that the camera can grow with you. The display provides helpful and accessible information throughout, and the automatic digital correction of flaws is good. There aren't enough dedicated function buttons. Plenty of lenses and accessories are available.											
2		Panasonic Lumix DMC-G3 (14-42mm) panasonic.co.uk tinyurl.com/7jxcjcr New	<ul style="list-style-type: none">• £450 inc VAT• £468 (RRP)• 3-year warranty	16Mp 4592x3448	3x	f3.5- f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/270 shots	100 to 6400	115x84x47mm 336g	Photofun Studio, SilkyPix Developer
Combining the features and handling of an SLR with the reduced dimensions of a compact, the Panasonic is a tiny camera that serious photographers will love. Its 3in rotating touchscreen enables shooting from all angles. The viewfinder doesn't automatically activate when you look through it, but video capabilities are strong and images are surprisingly clean. The autofocus system is blisteringly fast.											
3		Sony Alpha NEX-5 (18-55mm) sony.co.uk tinyurl.com/37xox5 Last month 2	<ul style="list-style-type: none">• £400 inc VAT• £549 (RRP)• 1-year warranty	14.6Mp 4592x3056	3.1x	f3.5- f5.6	3in	n/a (MS/SD/SDXC) 1 x lithium/yes	200 to 12800	111x59x38mm 229g	Sony utilities
The Sony Alpha NEX-5 bridges the gap between compact and digital SLR with high-performance features. This petite camera's 14.6Mp, APS-C CMOS sensor, 25-point autofocus system and 7fps burst mode are unlikely to be found in your average compact. More importantly, the Sony Alpha NEX-5's exposure, colour fidelity, sharpness and lack of image noise are impressive. A very good deal at £400.											
4		Canon EOS 600D (18-55mm) canon.co.uk tinyurl.com/72ste88 New	<ul style="list-style-type: none">• £580 inc VAT• £585 (RRP)• 1-year warranty	18Mp 5184x3456	3x	f3.5- f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/440 shots	100 to 6400	133x100x80mm 570g	ZoomBrowser EX, ImageBrowser
The EOS 600D takes the entry-level EOS 1100D and adds to it a host of features. Shooting modes range from fully automatic to complete manual. The image quality is top-notch, and the camera is extremely flexible, with a fold-out articulated LCD screen that enables shooting from any angle. The video options are advanced, and the EOS 600D's larger range of control buttons makes it ideal for advanced users.											
5		Olympus PEN Mini E-PM1 (14-42mm) olympus.co.uk tinyurl.com/bLmymjw New	<ul style="list-style-type: none">• £390 inc VAT• £450 (RRP)• 2-year warranty	12.3Mp 4032x3024	3x	f3.5- f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/330 shots	200 to 12800	110x64x34mm 217g	Olympus Viewer 2.0
The mini maintains the core values of the stylish and expensive-looking Olympus PEN range in a considerably smaller package. Built-in flashes and electronic viewfinders are jettisoned to save size, although both are usable as attachments. The 3in LCD gives plenty of help, though. The PEN mini is surprisingly flexible - and fast. Image quality is fine, provided that you steer clear of the highest ISO settings.											

GLOSSARY • APS-C: Advanced Photo System type C • SLR: single-lens reflex

Prices are intended only as a guide and are correct at press time

>> Buying advice

Digital cameras

Excellent-value 10Mp-plus cameras may be available for £100 or so. However, sensor size may be a better indicator of quality than megapixels - read the full review online for detailed specs and testing.

LCD screen: A large 3in LCD screen is useful for previewing images on a compact, but a viewfinder is also useful on any model for use in bright sunlight. Consider a 260K-dot screen as the minimum.

Image stabilisation: This is standard on compact digital cameras, but less common on interchangeable-lens models. If you're to get crisp shots using a lengthy zoom, you'll want some form of anti-shake mechanism and a small tripod. Almost every camera has a tripod mount underneath.

Zoom: Look for a large optical rather than digital zoom. Digital zoom crops an image, losing detail.






Storage: SDXC removable memory cards can store 64GB of photos and video (note that not all cameras support it), but a high-speed SD Card is far better for capturing video.



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Top 5 Sub-£150 graphics cards

Top 5 Sub-£150 graphics cards			Graphics processor	Installed RAM	Memory interface Core clock	Memory clock DDR effective	Ramdac Stream processors	Power connectors	Interface	DirectX Digital interface
1	 HIS AMD Radeon HD 6850 sapphiretech.com tinyurl.com/3xruqw5 Last month 1	• £125 inc VAT • £160 (RRP) • 2-year warranty	AMD Radeon HD 6850	1GB GDDR5	256bit 775MHz	1GHz 4GHz	400MHz 960	1 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
The HIS version of the 6850 has fallen in price and now beats the previous XFX card in this slot. The Sapphire is another good alternative, also retailing for £125. A fantastic mid-range card, the 6850 has good memory bandwidth and high-quality architecture. Noticeably faster than the 768MB GTX 460, and not too far off the Radeon HD 6870, it's a very powerful card at this price.										
2	 Sapphire AMD Radeon HD 6790 sapphiretech.com tinyurl.com/6p9b7kz New	• £95 inc VAT • £100 (RRP) • 2-year warranty	AMD Radeon HD 6790	1GB GDDR5	128bit 840MHz	1,050MHz 4.2GHz	400MHz 800	2 x 6-pin	PCI Express	11.0 2x DVI, HDMI, DP
In essence a pared-down version of the 6850/6870 processors, the 6790 offers less in the way of stream processors and texture units. But the 256bit memory interface is good and the clock speeds are capable, with a strong memory bandwidth figure. In terms of performance it falls short of the 6850, but it still offers playable framerates. This is the best choice at around the £100 mark.										
3	 HIS Radeon HD 6770 hisdigital.com tinyurl.com/6feq6ap Last month 2	• £95 inc VAT • £110 (RRP) • 2-year warranty	AMD Radeon HD 6770	1GB GDDR5	128bit 850MHz	1.2GHz 4.8GHz	400MHz 800	1 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
Should this HIS version be sold out, Asus also does a similarly zippy version of the 6770 - in essence a rebadged 5770 with the HDMI version increased to 1.4a and better Blu-ray support. The 5770 remains a decent card for the money, so the 6770's similarities aren't a bad thing, with modest power requirements and an affordable price tag. Speed is relatively good too. The 6790 offers better value.										
4	 Sapphire AMD Radeon HD 6570 sapphiretech.com tinyurl.com/3h62tj3 Last month 4	• £65 inc VAT • £65 (RRP) • 2-year warranty	AMD Radeon HD 6570	1GB GDDR3	128bit 650MHz	900MHz 1.8GHz	400MHz 480	none	PCI Express	11.0 DVI, HDMI
Graphics cards don't get much cheaper than this. This tiny card consumes little power and has half-height dimensions that make it ideal for a media PC, but it still surprises with some of its specifications. The 1GB of memory is generous, even if it is of the DDR3 variety. Its overall capabilities are limited, but video playback is smooth - as an upgrade from onboard video, the 6570 works well.										
5	 Asus AMD Radeon HD 6670 uk.asus.com tinyurl.com/3Lm8hge Last month 5	• £65 inc VAT • £65 (RRP) • 3-year warranty	AMD Radeon HD 6670	1GB GDDR3	128bit 800MHz	900MHz 1.8GHz	400MHz 480	none	PCI Express	11.0 DVI, HDMI
Now priced at around £70, the Asus AMD Radeon HD 6670 remains competitive with a useful 1GB of video memory and an 800MHz core clock. However, the Asus' graphics performance is strangled by its 128bit memory interface. This version's memory is of the DDR3 variety rather than the GDDR5 seen elsewhere, which slices the effective memory clock in two. The 6570 offers better value.										

Top 5 £151+ graphics cards

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Top 5 £151+ graphics cards			Graphics processor	Installed RAM	Memory interface Core clock	Memory clock DDR effective	Ramdac Stream processors	Power connectors	Interface	DirectX Digital interface
1	 HIS AMD Radeon HD 6950 hisdigital.com tinyurl.com/6gqs8xc Last month 1	• £220 inc VAT • £240 (RRP) • 2-year warranty	AMD Radeon HD 6950	2GB GDDR5	256bit 800MHz	1250GHz 5GHz	400MHz 1,408	2 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
The 6950 has commanded a high position in our chart for several months now. This HIS version offers an 800MHz core clock and 5GHz memory clock speed. The specs sound impressive, with the narrower stream processor unit allowing for an increased number of SIMD engines. It isn't as fast as nVidia's GeForce GTX 570, but a big price difference allows the 6950 to take top spot.										
2	 MSI GeForce GTX 570 uk.msi.com tinyurl.com/3ub8u3g Last month 2	• £270 inc VAT • £275 (RRP) • 2-year warranty	nVidia GeForce GTX 570	1,280MB GDDR5	320bit 732MHz	950MHz 3.8GHz	400MHz 480	2 x 6-pin	PCI Express	11.0 DVI, Mini-HDMI
This MSI version is very similar to the PNY incarnation of the nVidia GeForce GTX 570 we originally reviewed. Gigabyte does a slightly slower version, too. Cheaper than a GTX 580, but still adding a bit of oomph to graphics, the 570 is a great graphics card. The memory bandwidth is good, while it outstrips the HD 6970 at lower resolutions and still matches it at higher detail levels.										
3	 Asus GeForce GTX 560 Ti uk.asus.com tinyurl.com/43uxnp8 Last month 3	• £175 inc VAT • £190 (RRP) • 3-year warranty	nVidia GeForce GTX 560 Ti	1GB GDDR5	256bit 830MHz	1GHz 4GHz	400MHz 384	2 x 6-pin	PCI Express	11.0 DVI, HDMI
The £175 560 Ti offers affordable gaming firepower. While it has two cores less than cards based on the 550 Ti, its specs are strong - and this Asus version has a core clock 8MHz higher than the generic version we reviewed. The 384 stream processors are great, and the huge texture fill gives the 560 Ti a significant boost over the 550. Smooth framerates are possible in almost every game.										
4	 Gigabyte GeForce GTX 560 Ti OC uk.gigabyte.com tinyurl.com/68q3avg Last month 5	• £200 inc VAT • £250 (RRP) • 3-year warranty	nVidia GeForce GTX 560 Ti	1GB GDDR5	256bit 900MHz	1GHz 4GHz	400MHz 384	2 x 6-pin	PCI Express	11.0 DVI, HDMI
An overclocked version of the 560 Ti, the Gigabyte pushes the core clock speed up to 900MHz. It is faster than the standard version, although not by enough to compensate for the £25 difference between the two cards. Power consumption is modest, though, and this card beats some tough competitors, such as the Radeon HD 6870. The standard 560 Ti offers better value.										
5	 Sapphire AMD Radeon HD 6950 Flex sapphiretech.com tinyurl.com/3nk8wfw Last month 4	• £240 inc VAT • £240 (RRP) • 2-year warranty	AMD Radeon HD 6950	2GB GDDR5	256bit 800MHz	1,250MHz 5GHz	400MHz 1,408	2 x 6-pin	PCI Express	11.0 DVI, HDMI, MDP
This version of the Radeon HD 6950 has a lower specification than the standard card. Its trump card is enhanced EyeFinity support, letting you connect three monitors - two connect via DVI, while a supplied adaptor is used for the third. This is a powerful card for such a feature, so it's an obvious choice if you want multi-screen brilliance. It's not likely to be available for a long time, however.										

GLOSSARY • DP: DisplayPort • MDP: Mini DisplayPort

Prices are intended only as a guide and are correct at press time

>> Buying advice

Graphics cards

Graphics processor: The GPU determines the quality and refresh speed of images. The GTX 570 is the highest-performing card here, while the 460 and Radeon HD 6850 represent excellent value. Gamers may have to switch off some detail settings with a cheaper card. Substituting one brand of card for another with the same graphics chip and memory allocation won't affect performance.

RAM: Even those on a budget should be able to get a minimum of 1GB of DDR RAM. For high-end cards, look for 1,280MB or even more.






Features: DirectX 11.0 support is required only for the most advanced games; cheaper cards are likely to lack the firepower to do justice to DirectX 11.0 games. Demand a DVI or HDMI connection.

Dual-display support: This useful feature adds a second HDMI port to your PC setup.



Top 5 Sub-£200 flat-panels






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			Screen size/ LCD type	Native resolution (pixels)	Pixel pitch	Dimensions (wxdxh) Weight	Brightness (candelas per m ²) Contrast ratio ¹	Response time (milliseconds)	Digital connector
1		LG IPS236V lg.com/uk tinyurl.com/cwmp7m8 New	23in IPS	1920x1080	0.27mm	549x230x422mm 4kg	250 1,000:1	5ms	DVI, HDMI
It isn't the easiest of screens to track down, but it's worth the effort. The LG showcases some fabulous features at a stunning price. The headline act is its IPS panel, which delivers wider viewing angles and considerably better image quality than TN versions. Colours were accurate out of the box. The casing looks great, too. Throw in the low price tag, and the LG IPS236V is an amazing deal.									
2		Iiyama ProLite XB2472HD iiyama.co.uk tinyurl.com/3dyx75z Last month 1	24in VA	1920x1080	0.28mm	570x215x438mm 6.2kg	250 3,000:1	8ms	DVI, HDMI
Relegated to second place by the LG, the Iiyama also benefits from an enhanced panel - in this case VA. This gives it wonderful 24bit colour reproduction, and the depth of the palette is a vast improvement over the competition. Viewing angles aren't without fault, but they're better than on TN models. The Iiyama offers height and rotation adjustments. A lovely screen, but it's no match for the LG.									
3		BenQ V920 benq.co.uk tinyurl.com/23thrLt Last month 2	18.5in TN	1366x768	0.3mm	355x157x457mm 2.4kg	250 1,000:1	5ms	DVI
BenQ's V920 continues to hold firm at a tempting price. The viewable screen size is a mere 18.5in but, assuming this is acceptable, this polished, nicely curved monitor is fantastic for the money. The monitor's tricky menu system and narrow viewing angles aren't ideal, but the colour is bold and punchy given the price. The BenQ V920 monitor also offers great value for money at £90.									
4		Hanns-G HL231DPB hannsg.com tinyurl.com/32mgmtc Last month 3	23in TN	1920x1080	0.27mm	547x189x352mm 3.3kg	250 1,000:1	5ms	DVI
Now offering even better value at £115, the Hanns-G HL231DPB boasts an astonishingly large 23in screen. The image quality isn't the best we've seen, but it looks nice. Power consumption is a modest 27W, and the 170-degree viewing angles are standard for TN technology. Hanns-G claims a dynamic contrast ratio of 8,000,000:1, but there's nothing else preposterous about this value screen.									
5		AOC e2352Phz aoc-europe.com tinyurl.com/6n4p4mc New	23in TN 3D	1920x1080	0.27mm	547x399x190mm 3.2kg	250 1,000:1	5ms	DVI
A 23in super-slim full-HD monitor with 3D support for both nVidia and AMD graphics cards, the AOC is appealing. However, its use of Windows-only TriDef software does make it a bad choice for those with 3D Blu-ray discs, and the glasses are of the cheaper passive type. 3D is convincing where it does work, although the effect is sensitive to your viewing angle. In 2D, the AOC is average.									

GLOSSARY • HDCP: High-bandwidth Digital Content Protection • IPS: in-plane switching • PVA: patterned vertical alignment • TN: twisted nematic • VA: vertical alignment

Top 5 £201+ flat-panels

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			Screen size/ LCD type	Native resolution (pixels)	Pixel pitch	Dimensions (wxdxh) Weight	Brightness (candelas per m ²) Contrast ratio ¹	Response time (milliseconds)	Digital connector
1		ViewSonic VP2365-LED viewsoniceurope.com tinyurl.com/5wmjLr9 Last month 1	23in IPS	1920x1080	0.27mm	548x433x250mm 5.4kg	250 1,000:1	6ms	DVI
Aimed at professionals, the 23in VP2365-LED combines premium-grade monitor technologies, ergonomic features and superior image quality. It's ideal for those who work regularly with HD video. The IPS panel delivers the best colour reproduction and widest viewing angles, while the LED backlight makes for a slim, lighter and less power-intensive design. There's no HDMI port, however.									
2		LG DM2350 lg.com/uk tinyurl.com/83hr2sb New	23in TN 3D	1920x1080	0.27mm	547x424x180mm 4kg	250 1,000:1	5ms	HDMI
A combined TV/monitor, the DM2350 can also handle 3D when used with either nVidia or AMD graphics cards. It uses passive polarised glasses to achieve this effect, and can play 3D films direct from a Blu-ray player. The Picture Wizard is user-friendly, and the display quality is good - with relatively accurate colours for a TN panel. Stylish and very versatile, this is a versatile choice.									
3		NEC MultiSync EA232Wmi nec-display-solutions.co.uk tinyurl.com/4cqgnvw Last month 2	23in IPS	1920x1080	0.27mm	550x220x379mm 5.8kg	300 1,000:1	14ms	DVI, DP
The ViewSonic offers slightly better value, but the NEC overcomes some sluggish response rates to establish itself as an excellent choice for general PC and graphical use. The high-calibre IPS panel provides for considerable depth of colour. The styling may be sober, but the features (which include a height- and pivot-adjustable stand) are immense. The menu options are impressive, too.									
4		Samsung C27A750 samsung.com/uk tinyurl.com/4xqkxpe Last month 4	27in TN	1920x1080	0.31mm	639x233x485mm 5.2kg	300 1,000:1	2ms	HDMI
Only just becoming available in the UK, this is a fascinating screen if you can find it. It's not just the astonishingly slim casing and all-in-one stand that makes this Samsung so different. A hub conceals USB 3.0 and ethernet ports, while UWB technology lets the screen connect to a laptop without cables. It's expensive for a twisted-nematic panel, but offers an interesting glimpse of the future.									
5		NEC MultiSync EX231W nec-display-solutions.co.uk tinyurl.com/45qt68e Last month 5	23in TN	1920x1080	0.27mm	540x215x401mm 4.2kg	250 1,000:1	5ms	DVI, DP
NEC's lightweight EX231W has a high-quality construction that suggests it's built to last. However, its twisted-nematic panel means colour reproduction isn't as good as on an IPS panel. The overall image quality is acceptable, though, with decent viewing angles. Human Sensing can detect when you're not sitting at the screen and dim the brightness, but needs tweaking for best results.									

¹Figures given are manufacturers' static contrast ratios unless otherwise stated

Prices are intended only as a guide and are correct at press time

>> Buying advice

Flat-panel displays

Response time: How quickly the pixels can switch, typically cited as grey-to-grey response time. The lower the figure, the smoother the motion.

Pixel pitch: How closely packed picture elements are and, consequently, how finely detailed the image will be. The lower the figure, the better.

LCD type: Most are TN; IPS and PVA offer better colour depth and viewing angles.

Colours, brightness and contrast: A spectrum of 16.7 million colours is the norm. Discount manufacturers' contrast-ratio claims greater than 1,000:1. This will usually be the dynamic ratio. Expect brightness figures of 250 candelas per square metre (cd/m²) or more.

Extras: A DVI, DP or HDMI connection is crucial to achieving a clean signal, but you may also need a VGA option. Flat-panels often feature integrated speakers, but quality varies. Height-adjustment and tilt facilities can be useful for avoiding a sore neck.





MATT EGAN

2012: year of Windows

In 2011 Apple and iPad continued to dominate, but Android Honeycomb was the big mover. In 2012 Windows 8 is coming, and there's going to be a three-way battle for your money.

In the 200 issues in which we've been putting together *PC Advisor*, one computing platform has stood head and shoulders above the rest: Windows. But the changing size and shape, and the sheer variety, of the personal-computing devices we now use is putting unprecedented pressure on Microsoft's OS. Sure, it still has comfortably the biggest market share in terms of desktop computing, but the real growth and development is in the mobile space. And while Microsoft is still in the process of persuading recalcitrant XP users to shift to Windows 7, yet another Windows refresh is coming down the tracks.

Irrelevant upgrade?

An IDC report described Windows 8 as "largely irrelevant" in terms of desktop computing. "Customers will be asking 'What value does Windows 8 bring to my desktops and laptops?'" warned Al Gillen. He believes access to the app store is the only real benefit.

To put it another way, Windows 7 is very successful although not particularly loved, and Windows 8 is, in essence, simply its predecessor with a bit of 'mobile' added on. An app store, a Windows Phone interface, and the ability to run on tablets and - potentially - smartphones. So why would people upgrade their desktop PCs and laptops to Windows 8?

In part because of the perceived failure of Vista, PC users have taken to Windows 7. A rough metric, granted, but in the past month 51 percent of visitors to PCAdvisor.co.uk ran Windows 7. Twelve months earlier, that figure was 32 percent. And as of September 2011 Microsoft claimed that it had sold 450 million Windows 7 licences - almost double what it had sold a year before. It might not be sexy, but that's a lot of volume.

Perversely that means it's going to be tricky to push traditional Windows



users into yet another upgrade, with all the compatibility issues a Windows update cycle traditionally heralds.

Microsoft is clearly aware of this, and has recently made great play of the fact that Windows 8 will, like Apple's OS X, be available as a download (see page 16). Indeed, the upgrade process from XP, Vista and Windows 7 will be, Microsoft tells us, a simple process. Visit a website, click a download, cross your fingers.

All well and good. But that the upgrade is relatively easy isn't in itself a reason to make the shift. The truth is, that may not matter. Because as much as Windows 8 is 'irrelevant' to the desktop, the desktop is much less important to Windows 8. Microsoft has the market share on PCs and laptops, but as the world goes mobile it needs more smartphone- and tablet users in order to stay out in front of Apple and Google. And the key benefit to Windows 8 will be seamless integration of desktop and mobile: a familiar platform across all devices, at work and play (or so Microsoft hopes).

In this Microsoft won't be alone. Mac OS X is long in the tooth and Apple's long-term future might well be iOS-flavoured. And between Google's online apps, Chrome OS and Android, the big G is determined to take as big as possible a slice of your computing life, regardless of what size screen you have. But Microsoft has the massive advantage of being the only OS most people know, which means Windows 8 doesn't have to be a better tablet and mobile OS than Android in order to be a viable alternative. ☐

>> Next issue

ISSUE 201 ON SALE 2 FEBRUARY 2012

TEST CENTRE

Blu-ray writers

A Blu-ray writer offers a cheaper method of archiving photos and documents than a hard disk, and adds entertainment options to your PC. We test eight internal and external drives.

TEST CENTRE

Media-centre PCs

A PC that can be used for entertainment duties - even doubling up as a TV - helps justify its expense and adds to its appeal. *PC Advisor* tests six models with 'The X Factor'.

Video on-demand

The past few months have seen a rush of content providers rolling out apps and dedicated services to capitalise on our interest in consuming digital media. We compare their video on-demand offerings.

Best sites and services

The riches of the web grow ever more impressive. We highlight some of the very best examples the online world has to offer.

How to: Web

Go interactive with QR codes and augmented reality by embedding content into your web and printed pages. We show you how to add value by making items literally leap off the page.

PC ADVISOR AWARDS 2012

The votes are in and the nominees are champing at the bit to find out whether they've snatched victory from their rivals. We bestow rosettes on the best retailers, laptop, printer, camera and tablet makers and recognise the best innovations of the past year.

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TAKE NOTE

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