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ISSUE 207 OCT 2012

 IDG | UNITED KINGDOM

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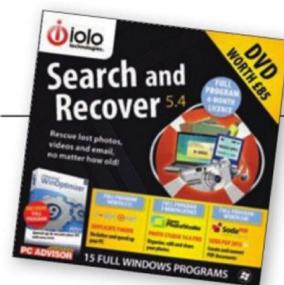
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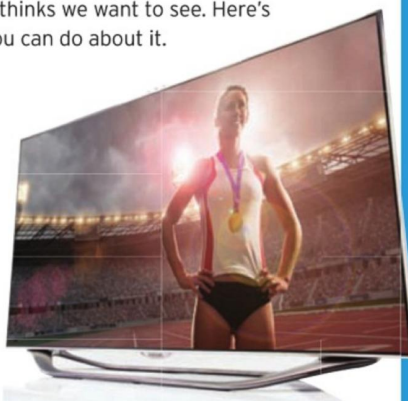
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## Microsoft plays its hand

By radically overhauling its entire product line, Microsoft has a chance of clawing back market share and staying relevant for another generation of PC users. If the products are good...

With the announcement of Office 2013 and the upgraded Office 365 (see page 10), Microsoft has finally shown its complete hand. Windows 8, Windows Phone 8, Internet Explorer 10.0, Xbox with Kinect, and Office 2013 is the family of products Microsoft wants you to use throughout your computing life. The Windows Store is where it wants you to spend your money.

Roll back just a few years and Microsoft was in the creative doldrums. Windows Vista, Office 2007, Internet Explorer 6.0, Windows Mobile... The world's largest software company had a pile of cash with which to play and, in most cases, a huge chunk of market share, but not even the most poker-faced employee could honestly claim that Microsoft had the best products in a world in which Apple and Google were constantly innovating. In fact, with the exception of Xbox, its portfolio was tired, and its products barely fit for purpose. Microsoft was attempting to bluff.

“

**Microsoft believes that it is holding aces**

”

Kudos to Microsoft for recognising and acting on this. More importantly, the products it is launching are radically new; we are witnessing the equivalent of Apple upgrading from OS 9 to OS X, and Google launching Android. At the same time, Microsoft believes that it is holding aces.

It takes serious strategic thinking, creativity and forceful management to draw such a line in the sand, keep your products ticking over, and aim for a date in the future at which all major product lines will be radically overhauled. It takes a bit of bottle, too, to stay in the game and wait until you have the right cards to play. The creative turnaround attempted by Microsoft flies in the face of its popular image as a character-free, faceless conglomerate living off past glories.

How well it can deliver on this promise remains to be seen. And there are, of course, victims. Recent purchasers of Windows Phone 7 devices, such as the Lumia 900, can be forgiven for feeling underwhelmed by Windows Phone 8, as they simply won't get it (see *Outbox*, page 146).

And people who are intent on purchasing one of the Ivy Bridge laptops and gaming PCs we review on pages 56 and 72 should be aware that, although the upgrade from Windows 7 to 8 will be inexpensive, the new OS won't feel like an upgrade. For traditional PCs and laptops, Windows 8 offers only a new way of interacting with the Start menu (now known as 'Charms'), the Metro interface, and access to the Windows Store. If you have existing software you want to use, you'll find that you spend little time in Metro, and touch controls have few uses on devices that don't have touch interfaces.

Nonetheless, Microsoft is playing a bold and necessary game, and at least Windows 8 is perfectly usable on any Windows 7 system. I sense a confidence and coherence in Microsoft that hasn't been there since Vista launched.

With Xbox, Windows Phone 8 and the x86 and ARM flavours of Windows 8, plus the Surface, Bing, Internet Explorer and Office, Microsoft has a coherent line-up of exciting products that, crucially, all play together nicely. Microsoft now has a chance of staying relevant for another generation of PC users. It's played all its cards, and it's going to be fun seeing whether it holds aces or jokers. ☒



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## Reader comments



Whether it's with useful tips, pithy observations, or a good old moan, we're always happy to hear from PC Advisor readers. For your chance to appear here, keep in touch via email, our forums, comments on our news stories, and via Facebook, Google+, Twitter and LinkedIn

letters@pcadvisor.co.uk

### Windows Vista II

In its desperation to merge two interfaces and two ways in which a PC is used, I believe Microsoft has with Windows 8 in fact created yet another 'Vista': a system that promised a lot, but delivered virtually nothing and left its users totally cold.

Windows 7 will become the new XP - a system that is stable, easy to use, has thousands of software titles (including freeware) and does everything its users require of it. **Maccyroot**

### PCs vs laptops and tablets

Nothing beats a desktop PC, in my opinion. It has multiple USB sockets for attaching peripherals, and only desktops have processors fast enough to rip MP3s and manipulate video. Of course, which format is best simply depends on the type of PC user you are; most people will find a tablet or laptop is sufficient for their needs. **Phillip Roberts**

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### Windows 8 gamble

Microsoft is taking a gamble with its forthcoming touch-optimised Windows 8 OS. That it will be offering upgrades from just \$39 in the US could be evidence of an attempt to minimise the risk (see page 21).

"The bargain-basement price may be because Microsoft has realised that Windows 8 is going to go the way of Vista - or even worse. I have no wish to put an interface designed for touchscreen smartphones and tablets on my desktop machine where I need a proper desktop interface, and nothing I've seen about Windows 8 apps strikes me as an advance over Office 2007, Firefox and Thunderbird running under Windows 7," wrote **Peter**.

"If Internet Explorer 10.0 and Office 2013 both work on Windows 7 then I'll stay with that. If Microsoft was to say they will be compatible only with Windows 8 then that would have been a gamble... A hell of a gamble," wrote **Chris A**.

"I want to buy a touchscreen monitor so I can lean awkwardly over my desk and get fingerprints all over the display. I can't imagine how anyone could possibly live without Windows 8," wrote **Mombasa69**.



### Apple on the naughty step

A judge has ruled that Apple must buy advertisements in major UK newspapers stating that Samsung didn't copy its iPad design patents (see [tinyurl.com/bt9dhxz](http://tinyurl.com/bt9dhxz)). "A bit of common sense in this country at last! Now go and sit on the naughty step and do as you're told, Apple," wrote **Cdtplug**.

### Kindle Fire comes to the UK

The exact details remain unknown, but Amazon will be launching its Kindle Fire in the UK ([tinyurl.com/c4jbajm](http://tinyurl.com/c4jbajm)). **HTTP500** took a guess at its pricing: "The exchange rate is around \$1.5 to £1, so \$199 is £199. I'm glad I got my maths right there!"

## Flagged: Star letter

### Smarter shopping or another excuse?

The Star letter in your August issue got me thinking. The entertainment industry is in serious trouble and blocking access to sites such as Pirate Bay won't solve the problem. The consumer has become smarter: no matter how many resources are used to make a product, they won't buy it if the finished article is no good.

The entertainment industry spends so much on movies and games that it simply has to break even, which puts huge pressure on each product to be a success and stifles creativity. It would rather play it safe with a well-known product than produce something

original. If the entertainment industry wants my money then it needs to create some new ideas worth buying! **Ben Egerton**

*Matt Egan, editor, writes: You're not wrong about the way market forces stifle creativity. In part because of the globally unifying nature of the internet, there has never been more choice for the consumer. But instead of forcing content producers to stand out, the crowded marketplace means that those with most money invested spend their cash on marketing to ensure they get a return. But as unpalatable as it is, it's no justification for piracy!*



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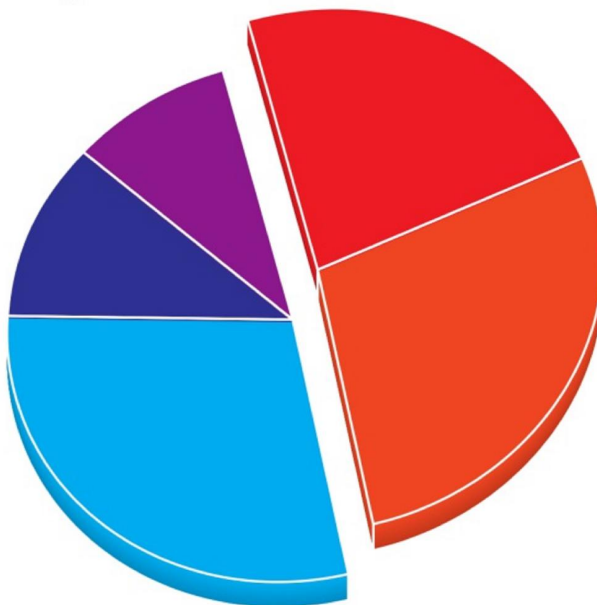


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Can Microsoft's Surface tablet beat Apple's iPad?

- 23%**  
Yes, eventually all Apple's innovations are overtaken
- 28%**  
Yes, Surface looks fantastic
- 29%**  
No, the iPad is too dominant
- 11%**  
No, Android is the iPad killer
- 9%**  
Don't know



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### Battle of the mobile OSes

Apple addicts and Android admirers frequently lock horns over which smartphone should hold the Best Buy crown: the Samsung Galaxy S III or Apple iPhone 4S. But there's a great deal more to the smartphone market than Android and iOS. We asked you which smartphone platform is your favourite ([tinyurl.com/d76zyg4](http://tinyurl.com/d76zyg4)).

**Quickbeam** I learn to live with whatever my phone runs, the operating system doesn't influence my choice unless it's total pants.

**wiz-king** I don't want any of them; I'm quite happy with my Amplicon. It sends and receives texts and calls, and cost me less than £15 last year.

**alan14** I think that for most users the OS is the least of their worries - they want the phone their friend or some micro-celeb is touting.

**Condom** A Nokia running Windows is the most comfortable to use of all the phones I have handled for many years. The software is also a delight to use and much faster than iOS.

**Aitchbee** I have never owned a smartphone... because I'm not stupid. A mobile phone that allows calls and texts, and fits in my shirt pocket, is smart enough for me.

**ams4127** BlackBerry for me, purely because of the keyboard.

**mammak** Definitely BlackBerry for me - especially since using Blackberry Bridge with my PlayBook. It's truly an amazing feature.

**SparkyJack** At least with computing hardware we can swap around the Microsoft variants if the current vogue is not to the user's liking or, like me, dump Windows altogether in favour of a Linux system.

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### 'Free' 3G broadband

Samba is rewarding UK users willing to watch the odd advert on its site with free 3G broadband. Several of our Facebook fans would jump at the chance to get something for almost nothing, including *Sebastian Ereira*, *Robert Masuka*, *Joe Friswell* and *Mark Rogers*, but *Daniel Le Dosquet-Bergquist* is dead against it. "No, no chance," he wrote, "I would rather pay for uninterrupted browsing (data is usually included in the tariff anyway). Also, you can bet that it would be targeted advertising, whereby your browsing habits are recorded. You become the product instead of the customer. Yuck."

### Not just for Christmas

A 26 October launch has been confirmed for Windows 8, but not everyone will be rushing out to buy it. "An operating system should be for life, you should not have to buy a new one every 10- to 12 months," wrote *Mick Bradley*.

### iPhone 5, anyone?

Apple hasn't even confirmed that it will release an iPhone 5, yet Chinese retailers are already taking pre-orders and countless

fake photos have leaked online. *Jonny Jones* has far more patience than most of us in this regard. "All these renders and rumours are pointless. Just wait until the actual phone is released," he wrote.

### You want me to pay for software?

As Microsoft unveiled a Customer Preview of its Office 2013 suite (read more on page 10), we wanted to know whether any of our Facebook fans were still paying for their productivity software. "No," wrote *Stephane Trahan*, "there are too many good and free suites. Microsoft would have to ask £29.99 for the Professional edition to grab a large part of the market."

### Olympic apathy

When we alerted our Facebook fans to the best mobile apps for keeping up to date with the Olympic Games (two of which you can read about on page 42), *Brett Nocturnus Caporato* voiced his annoyance at all the hype. "Kudos for checking the best apps for your readers, but I can't be the only person in the country who is sick of hearing about the London 2012 Olympics - and it hasn't even started yet," he wrote. ☒





## Customer Preview

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# MICROSOFT UNVEILS NEW OFFICE 365 & 2013

The software giant's latest productivity apps are built for the cloud, but leave out Vista and XP users

The next version of Microsoft Office is a dramatic departure from the software that millions of users have come to know. It's built for the cloud and touch-based computing, and packed with features that make it more social and, Microsoft hopes, more intuitive to use.

CEO Steve Ballmer announced that a technical preview of the new Office 365 – the online version of the product – is now available to download at [office.com/preview](http://office.com/preview). He said it's the first version of Office built from the ground up for online use, and called it "the most ambitious release of Office we've ever done". There will also be a desktop version, Office 2013.

The company demonstrated revised versions of Word, PowerPoint, Excel and Outlook. OneNote and Lync are the first Office apps made for Windows 8 and tailored for touch input. The apps will also work with a keyboard and mouse, and

Microsoft demonstrated their use on a Samsung tablet running Windows 8.

Microsoft hasn't confirmed pricing or a release date for its new Office software. We do know that some apps will be bundled with Windows RT, and that Office 2013 is compatible with only Windows 7 and 8.

Each app has a cleaner user interface, with far more white space than in previous versions, and the programs have been optimised for touch, using fingers or a stylus. Many apps support pinch-to-zoom, and documents can be moved around and off the screen with a fingertip.

Word exemplifies some of the bigger changes. Upon opening the online version you must log in; you then see your recently used documents and templates. Because it's now a cloud-based service, Word can remember what you were doing when you last closed the program, regardless of what system you were using it on.

Documents are stored in Microsoft's SkyDrive service by default, but can also be stored locally.

Microsoft has also embedded into Word some communications functions. For example, if users are collaborating on a document and one of them edits a sentence, another user can tap the sentence and a box pops up showing who made the edit.

Word also includes a new reading mode that mimics some of the features in Amazon's Kindle. Tapping the screen lets you dim the background or change its colour. For example, in the dark, you can make the background black and the text white for easier readability.

The cloud apps can also be accessed from a smartphone; in which case Word will format the text to fit the screen and put it in landscape mode if that's how the device is oriented.



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## GOOGLE LAUNCHES ANDROID 4.1 JELLY BEAN

Smoother performance • Improved camera functionality • More informative notifications • Better search

Google has launched the next version of its Android OS, 4.1 Jelly Bean.

The latest iteration of its operating system for smartphones and tablets was launched in July. Google debuted Jelly Bean at its Google I/O conference on its Nexus 7 tablet.

Android 4.1 Jelly Bean builds on Android 4.0 Ice Cream Sandwich with smoother performance via 'Project Butter'. The mobile operating system predicts where your fingers are going to move for enhanced responsiveness.

Google said the first devices to be updated include the Galaxy Nexus, Nexus S and Motorola Xoom.

The voice-dictation feature no longer needs a data connection to work and the

keyboard prediction has been advanced. An updated camera app lets you swipe across to reveal recently taken photos and upward to delete. An undo feature is also new.



Notifications have been updated, too, automatically expanding and collapsing and showing more information about each alert. You can carry out tasks without opening the associated app. For example, you can call someone back from a missed call notification without entering the Call Log.

Jelly Bean also takes on iOS' Siri with improved search. With a new information card the Google bar can now fetch answers to your questions and respond in speech.

Google Now is another addition. This feature gives you information based on what it knows about you, such as your calendar and where you go. It will automatically tell you how long your commute will take, for example, or if your scheduled flight is delayed.

## Microsoft sets Windows 8 release date for 26 October

Friday release will allow new Windows 8 owners to enjoy a weekend of upgrading- and tinkering fun

Microsoft has announced that Windows 8 will launch on 26 October.

Steven Sinofsky, Microsoft's Windows president, made the announcement at the firm's annual sales meeting. Usefully, the launch date falls on a Friday, meaning Windows 8 hopefuls will have the weekend to properly back up their data, upgrade to the new operating system and then get used to the radically different platform.

The news follows the recent announcement that Windows 8 would

launch by the end of October. The next version of the operating system was on track to hit release-to-manufacturing (RTM) as we went to press.

Eager consumers will be able to upgrade to Windows 8 on 26 October or purchase it preinstalled on a new PC, Microsoft said. The OS will be available in 109 languages across 231 markets worldwide.

Those upgrading from Vista, XP and Windows 7 will be able to do so for \$39, while those buying a new Windows 7 PC

now will be able to upgrade to the Pro version for \$14. UK pricing has yet to be confirmed.

The OS will be available in four versions: Windows 8, Windows 8 Pro, Windows 8 RT and Windows 8 Enterprise.



## Firefox mobile OS confirmed for 2013

Mozilla confirms details of its Firefox smartphone operating system

Mozilla has confirmed details of its Firefox mobile operating system. It expects the first devices that use Boot to Gecko, aka Firefox OS, to launch in Brazil in early 2013.

Gary Kovacs, CEO of Mozilla said: "The introduction of the open mobile OS continues the Mozilla mission to promote openness, innovation and opportunity on the web for users and developers. As billions of users are expected to come online for the

first time in the coming years, it is important to deliver a compelling smartphone experience that anyone can use."

Mozilla's smartphone OS has gained backing from mobile operators Telefónica, Deutsche Telekom, Etisalat, Smart, Sprint, Telecom Italia and Telenor. TLC Communication Technology and ZTE said they will make Firefox OS devices with Qualcomm Snapdragon processors.





## 4G broadband trials in Cumbria

Everything Everywhere has launched a 4G LTE mobile broadband trial in Cumbria. The UK's first 4G LTE trial in the North of England is being tested by local businesses, which are seeing speeds of 20Mbps. The trial is said to be key to understanding how 4G technology will perform in real-life conditions.

**MORE:** [tinyurl.com/cwLt6ef](http://tinyurl.com/cwLt6ef)

## Virgin Wi-Fi live at 41 tube stations

Virgin Media has installed free Wi-Fi hotspots at more London Underground stations, taking the total number of connected stations to 41. The project began in June, and is now a third complete, available at stations including Tower Hill, Paddington and Canary Wharf. By year end Virgin Media will offer free Wi-Fi internet at 120 Tube stations, it says.

**MORE:** [tinyurl.com/7g6u3s7](http://tinyurl.com/7g6u3s7)



## Rural broadband under scrutiny

The UK government is likely to miss its deadline to provide super-fast broadband to 90 percent of the UK by 2015, according to a report by the Country, Land & Business Association. It could also fail in its bid to make 2Mbps internet available to every home and business in the UK, including those in rural areas.

**MORE:** [tinyurl.com/7vsxvq6](http://tinyurl.com/7vsxvq6)

# O2 SUFFERS 24-HOUR NETWORK OUTAGE

Mobile operator offers discounts after leaving users with no service

Mobile operator O2 suffered a severe network outage in July, leaving thousands of users without service for 24 hours or more.

The failure prevented scores of O2 users from making calls, sending text messages and using mobile internet.

Subscribers to GiffGaff and Tesco Mobile, which use O2's infrastructure, were also affected.

"The issue we had was unprecedented, and we recognise that it caused inconvenience and frustration to those impacted over that one-day period," said O2.

The mobile operator said the fault was related to one of its network systems, but has not



confirmed how many of its 23 million customers were affected.

It claims to have identified all the customers who were directly affected, giving those on pay-monthly contracts a 10 percent discount on their July subscription, to be applied on their September phone bill, while

those using pay-as-you-go tariffs will receive 10 percent extra on their first top-up in September.

O2 is also giving away £10 vouchers to spend via the Priority Moments app or online.

GiffGaff also offered its customers 10 percent extra on any top-up for a limited time.

## VIRGIN MEDIA LAUNCHES PREMIERE UNLIMITED DATA TARIFF

Virgin Media is now offering its Premiere tariff with unlimited mobile internet for smartphones.

The mobile operator is looking to undercut its rivals by lowering the price of an unlimited data tariff. Its Premiere tariff starts at £21 per month for existing Virgin Media customers, and combines unlimited data, text messages and calls to UK landlines with 2,500 anytime minutes.

Jamie Heywood, director of mobile at Virgin Media, said:

"When we launched more than 10 years ago as the world's first mobile company of its type, we revolutionised the market; this is another such landmark.

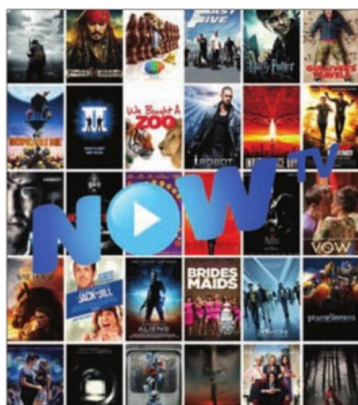
"We're rewarding loyalty with some amazing tariffs and unlimited offerings that our customers can enjoy without worrying about hidden extras, as well as helping to combat bill shock," he said.

Virgin Media has undercut rivals such as T-Mobile and

Three, which offer The Full Monty for £36 per month and The One Plan for £36 per month respectively. A SIM-only version of the Premiere tariff starts at £20 per month.

Customers must sign a 24-month contract that includes insurance and Mobile Rescue backup, worth £7.99. As an additional benefit, subscribers will continue to receive free access to London Underground Wi-Fi hotspots after the summer.

## Sky launches Now TV content-streaming service



Satellite dish- and contract-free television from Sky

Sky has launched its Now TV content-streaming service, which it hopes will rival Netflix and LoveFilm. It currently features only content from Sky Movies, but Sky Sports, Sky 1, Sky Atlantic, Sky Arts and Sky Living programming will be added over the coming months.

Simon Creasey, director of Now TV said: "Now TV will bring more choice to UK consumers and an easy way to enjoy amazing movies."

Now TV is accessible from a PC, Mac, iPhone, iPad or Android device. Xbox support will come later this summer, while PlayStation 3 and Roku apps are said to be in development.

Movies cost 99p for classics and £3.49 for new releases. Alternatively, the £15-per-month Sky Movies Pass gives unlimited access to more than 600 films. A 30-day free trial is available. ☐



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## Analysts cool on Google Nexus 7

Some are grumbling about what the tablet doesn't offer and say it will do little to help Android in the market. Agam Shah reports

**A**t £159 for the 8GB version, Google's Nexus 7 may seem like a tempting tablet, but some potential buyers and analysts say it lacks hardware features and is a feeble attempt to energise Android in a market dominated by Apple.

Google recently released the Nexus 7, which you can order at Google Play for £159 with 8GB of storage or £199 for 16GB. The tablet, made in collaboration with Asus, has a 7in screen and runs Google's latest Android 4.1 Jelly Bean operating system.

The Nexus 7 joins a crowded tablet market that includes the iPad and a range of Android devices from Samsung, Lenovo, Asus, Acer, Toshiba and others.

It's often been suggested that Apple's huge success with the iPad is largely due to its ownership of both the hardware and software involved. In this sense, many analysts believe Google is following Apple's lead, centralising control over the device's hardware, software and services.

Google offers apps, music, books and movies through Google Play, but analysts

say that Nexus 7 is more a competitive threat to Amazon's \$199 Kindle Fire tablet, which is based on Android and closely bundles services, entertainment and cloud offerings. The first-generation Kindle Fire never made it to the UK, of course.

Calling Google's announcement "out of character", Richard Shim, senior analyst at NPD DisplaySearch, said the Nexus 7 makes the search giant a competitor in the hardware space. This will continue as products roll out from the now Google-owned Motorola Mobility.

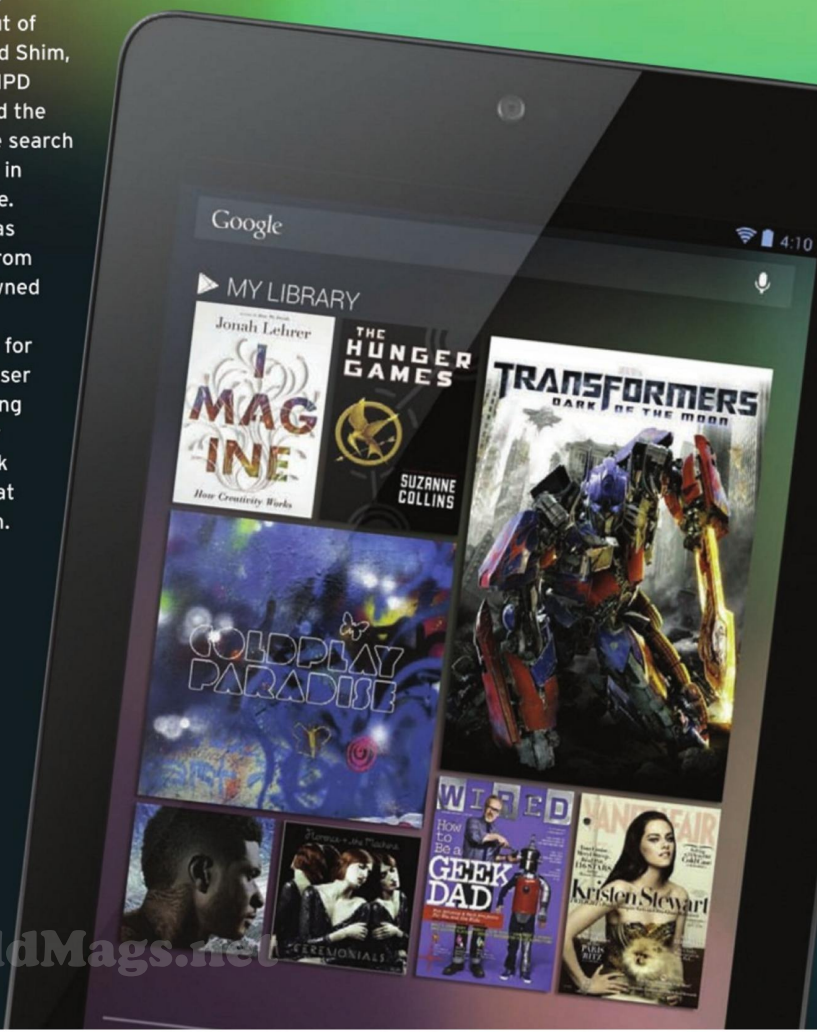
It will take time for Google to build a user base that's as strong as that of Apple or Amazon, said Frank Gillett, an analyst at Forrester Research.

"Google's real tablet problem is the lack of compelling tablet-optimised apps. It has yet to address how to motivate developers to fill the gap. Nor has Google addressed the continuing and growing fragmentation problem where few devices are updated to

“

There's nothing here that forces the main players to play catch-up

”







**NEXUS 7  
REVIEW**  
See page 32

the current OS, because carriers and device makers don't push out the new versions or users don't take them," said Gillett.

### What you get

The 10.2mm-thick, 317g Nexus 7 has a 7in (1280x800) screen. Connectivity options include Wi-Fi, Bluetooth and near-field communications, and there's a front-facing camera for video chat. Google claims the battery runs to nine hours with video playback or 300 hours in standby mode.

But the Nexus 7 lacks a decent amount of storage and mobile-broadband support which, according to Geoff Kratz, who runs Canadian technology consulting company FarWest Software, makes it less useful.

Nevertheless, Kratz has pre-ordered the Nexus 7, which he plans to use as a test platform. He already owns a 7in Samsung Galaxy Tab.

"The Nexus 7 features, other than CPU and graphics processing, aren't radically different from what you can get from Samsung, Sony or Apple. There's nothing here that forces the main players to play catch-up," said Kratz.

Kratz thinks this could be a one-off device from Google, which doesn't have a consistent history of maintaining hardware devices. He also wondered why Google had to partner with Asus to make the tablet, instead of making a product

through Motorola, which sells tablets such as the Xoom.

"Google has this habit of releasing a device and, once it sells out, never selling another one," Kratz said. "This one looks a bit like a one-off."

### Rejected

The Nexus 7 is an intriguing move by Google into the tablet world, and it could bring a level of credibility to the Android tablet ecosystem after initial failures, said Vishal Sood, a technology enthusiast in Washington. But while the price is good, he's not been persuaded to buy the tablet.

"As an owner of an iPad, I'm not totally convinced to move to or buy an additional tablet," Sood said.

Sood uses his iPad to watch video, read blogs on Flipboard and also while travelling. Everything he needs is on the iPad, and he feels the Nexus' 7in screen is too small for an app such as Flipboard to be effective.

Beyond the lack of RAM, the device also omits a microSD slot, which limits storage, said Mark Damon Hughes, a developer in Seattle. He owns iPads and iPhones, plus an HP TouchPad.

The tablet also does little to address the many concerns facing third-party Android developers, including a lack of apps, content and ability to earn money from their wares.

"There's no money in the Google market, and ads bring in pennies per dollar invested. There's zero incentive for me to waste time developing for Android," Hughes said.

### Extinguishing the Fire?

While users who were interviewed agreed that Nexus 7 will not unseat Apple's iPad, they also noted that its hardware is better than Amazon's Kindle Fire. But Amazon's main business is content, and that's where it has the advantage.

"Amazon doesn't have a particular need to catch up to the Nexus: all its high-value content will work on the Nexus, and Amazon's business is content not hardware. Amazon can sell the Fire at a loss, and a Nexus sale helps Amazon as much as a Kindle Fire purchase," said Kratz.

But given the £159 starting price, the Nexus 7 is attractive to some.

Ned Perkins, an Australian student, is considering buying the Nexus 7 - but it won't replace his iPad 2.

The micro SD slot being non-existent is disappointing, but he's happy with the features in the tablet at the price, and likes the portability of a 7in tablet.

"I'm considering buying the 16GB model from the Play store in a couple of weeks as Jelly Bean appears to be smooth and I like to keep up with new technology," Perkins said by email. ☐

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# iPad mini could disrupt tablet market

Apple's iPad with a smaller screen could hurt Android tablets and the 9.7in iPad, explains Agam Shah

**A**n Apple iPad with a smaller screen, if released, could create tough decisions for buyers and slow the momentum of the current 9.7in iPad and a number of Android devices with 7- and 8in screens, according to analysts.

Speculation surrounding Apple's plans to launch an iPad with a smaller screen than its current 9.7in display is gaining steam, with *The Wall Street Journal* reporting that Apple's component suppliers were preparing to produce such a device starting in September 2012. The story, which cites sources familiar with the situation, did not provide specific details about the tablet, but said the screens would be manufactured by LG Display and AU Optronics. A separate story by Bloomberg reported the product would launch in mid-October.

If such an iPad is released, it would enter a crowded market of small-screen tablets that includes Google's recently released Nexus 7 (see pages 14 and 32), and Amazon's

Kindle Fire (in the US, at least). Both tablets run versions of Google's Android OS.

Analysts said some who already have an iPad may buy a smaller one, but new buyers won't purchase both and instead will decide what they want based on price, portability and usability. Consumers may buy the smaller iPad for use as an e-reader and to access media content if it's priced at roughly £200 to £300, analysts said.

## Backtracking on size

Apple launched the iPad in 2010 and the company originally dismissed the idea of a 7in tablet because of the small screen size. Things may have changed following the release of the Fire, which was relatively successful in the US, and the Nexus 7, said Frank Gillett, a Forrester Research analyst.

"Having something you can hold in one hand seems to matter to some people and may matter in emerging markets," Gillett said, adding that the lower pricing of competitive tablets may have changed Apple's position.

Apple is not afraid of disrupting its own products, and the company will chase an opportunity if it sees a different value proposition, Gillett said. Apple would rather see the iPads dominate the market than leave open an avenue for Android to take away its market share.

Analyst firm IDC has predicted Apple's grip on the tablet market will grow if a mini iPad is released this year. In June, IDC said it expected 107.4 million tablets to ship in 2012, and 142.8 million in 2013.

A £199-to-£299 price range would be attractive to buyers, analysts said. A lower price may create an attractive entry point into Apple's iOS devices, but functionality will also matter in purchasing decisions.

The smaller-screen iPad would be highly portable and fit between Apple's iPhone and 9.7in iPad, said Roger Kay, principal analyst at Endpoint Technologies Associates.

"It may be more portable than the 9.7in iPad, and it may have more functionality than the iPhone," said Kay.

Users may prefer the portability of a smaller-screen iPad, especially those who use the iPhone for work. However, watching a movie or gaming would be better on a larger iPad with a Retina display, he added.

"It's a test on how form-factors will play out and what models users need for work and play," Kay said.

Using a smaller-screen tablet may be better for reading e-books or using custom apps designed for the display size, said David Daoud, research director at IDC. But it could also be stressful on the eyes when playing games or watching a HD movie.

A smaller-screen iPad would be attractive to students and also fit well in schools and universities. Apple earlier this year started offering iBooks 2, a tablet application that brings multimedia textbooks to students.

Decisions about which tablet to buy will also be tied to mobile-broadband contracts with carriers. It remains to be seen if Apple will be able to sell both iPads to users who have 3G or 4G subscriptions, which are usually tied to specific devices.

Analysts said that Google and Amazon are selling tablets at a loss in an effort to promote their entertainment, application and cloud services, and Apple usually makes profits off its hardware. The company is unlikely to get into a pricing battle with Android devices. ☒





## Microsoft Surface to hurt PC makers

Microsoft's new Surface tablets could bite into sales of tablets from Windows 8 and Windows RT licensees, says Agam Shah



Microsoft's Surface tablet is a measured gamble to enter the cut-throat tablet business, but the company could be alienating long-term hardware partners that are also expected to announce Windows 8 devices this year.

The Surface tablet models come with a 10.6in display and will be sold via Microsoft stores and the company's online store. Microsoft's goal is to offer a package of hardware and software built around Windows, enabling it to effectively compete with Apple, whose iPad and iPhone devices run on its own iOS platform, analysts said.

Microsoft is offering two tablets, the Surface with Windows RT for ARM processors, and the Surface Pro with Windows 8 Pro for x86 Intel processors. The Surface tablet with Windows RT is lighter and comes with Office 15, which includes widely used productivity applications such as Word and Excel. Microsoft's new tablets will come with a kickstand and a thin cover that doubles as a keyboard and trackpad.

The creation of its own tablet is a sign that Microsoft has lost faith in PC manufacturers to develop devices that can take advantage of the Windows OS, analysts said. Apple has dominated the tablet market, and Microsoft had to take hardware development into its own hands as PC makers were not generating enough excitement to drive interest in Windows 8. Companies such as Dell, HP, Acer, Asus and Lenovo are expected to launch tablets running the forthcoming Windows 8 and Windows RT operating systems.

If the Surface tablets become successful, Microsoft could potentially be stealing future revenues from its hardware partners, said Roger Kay, principal analyst at Endpoint Technologies Associates.

"I have to believe that the partners are fairly discontent about it," said Kay. "The tablet is the heart and soul of Windows 8, and it looks like Microsoft has reserved it."

Microsoft has licensed Windows to PC makers since the 1980s, but that business model may be getting antiquated, said Kay. Microsoft may be seeking a new business model around tablets but, at the same time, the PC market isn't going anywhere and it wants to retain its Windows licensing business. Microsoft may be experimenting with a new tablet business model, but the company will have to strike the right balance in maintaining a relationship with PC makers on tablets and PCs.

“It has to do something, it can't just sit there and let Apple take over the world”

Shaw Wu, a financial analyst at Sterne Agee, agreed, saying Microsoft's tablets could eat into the sales of devices from Windows partners. The full impact on PC makers has yet to be determined, he said.

The Surface is crucial for Microsoft to establish a presence in the tablet market and to compete with Apple, said David Daoud, research director for personal computing at IDC. Microsoft's move to tablets probably came because PC makers failed to take the lead in making tablets good enough to compete with Apple, he added.

"Device makers have been lagging in terms of creativity," Daoud said.

Apple's iPad dominates the market while competitors have stopped making certain

tablet models or are trying to catch up. HP last year discontinued the TouchPad, while Dell killed off the Streak; both companies are now planning to re-enter the consumer tablet market with Windows RT devices.

### Leading hardware development

Microsoft had to take the lead in development as device makers were not willing to spend on research and development, Daoud said. Device makers are making razor-thin margins on consumer PCs and tablets, and have limited spending on innovation in tablets. Ultimately, Microsoft's lead with the Surface tablets could inspire device makers to release the next-generation Windows hardware and get a better understanding of the software and hardware ecosystem, Daoud said.

"The move is somewhat predictable. What is unpredictable is Microsoft taking the lead on the hardware side," Daoud said.

At the start, Surface tablets will be available only through Microsoft Stores and online, which limits adoption potential, said Sarah Rotman Epps, an analyst at Forrester Research. But a larger struggle for buyers revolves around distinguishing Windows 8 and Windows RT tablets, she added.

"Selling x86-based tablets in the same retail channels as Windows RT tablets will confuse consumers and sow discontent if consumers buy x86 and think they're getting something like the iPad. Microsoft and its partners need to articulate a compelling strategy for how they will manage consumer expectations in the channel," she said.

But with or without the help of device makers, Microsoft is now gearing up to battle Apple. "It has to do something, it can't just sit there and let Apple take over the world," said Daoud. ☒



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# Microsoft gambles on Windows 8 upgrade



Microsoft could see both benefits and drawbacks from encouraging people to upgrade an existing PC to Windows 8, as Juan Carlos Perez explains

**B**y offering users of Windows 7, XP and Vista discounts to upgrade to Windows 8, Microsoft is putting itself in a position to reap both benefits and criticism in the consumer OS market.

Giving PC owners an incentive to put Windows 8 on their machines helps Microsoft because, if they upgrade, they will be less likely to switch to a competing platform.

However, because Windows 8's main innovation is its Metro interface, designed with touchscreens in mind, consumers who upgrade now could be disappointed if their machine can't take advantage.

Microsoft has announced two offers for consumers to upgrade existing PCs to the new OS, which is expected to ship in October. An upgrade from Windows XP, Vista or 7 will cost just \$39 for a download or \$69 for a boxed copy in the US. UK pricing is unknown.

"The low-cost upgrade to Windows 8 is a wise strategy for Microsoft. The cost of upgrading is the main reason people stay on outdated versions of Windows," said David Johnson, a Forrester Research analyst.

The offers show that Microsoft is finally beginning to understand the strategic cost of having huge numbers of consumers on old versions of Windows, he said. Windows XP, for example, first shipped in 2001.

"Being forced by their employers to work on Windows XP has been driving people toward Macs and tablets," said Johnson. "Microsoft's future viability depends on how fast it can get new value in the hands of users. A high cost of upgrading has been slowing them down."

## This computer isn't ready yet

However, the upgrade incentives can be a double-edged sword, because touchscreens, touchpads and mice that support gestures are important to providing a good experience with Windows 8, according to Michael Silver, a Gartner analyst.

"Most computers that will really make Windows 8 work well won't ship until the OS does. People upgrading older PCs is actually a risk for Microsoft because they may not be as happy as users that have new PCs tuned for Windows 8," Silver said. "Users that upgrade should ensure they have either a touchscreen or a touchpad or touch mouse that supports gestures in Windows 8."

Microsoft should help users understand how suitable their existing system is for Windows 8, but it's unlikely the company will go as far as to advise users to reconsider their input devices during a Windows 8 compatibility check.

"People who don't have the right devices for working with Metro will be wondering why they upgraded, at best, or regretting the decision, at worst," Silver said.

Consumers who buy new Windows 7 PCs between 2 June and 31 January will also be offered a discounted upgrade to Windows 8 Pro, at just \$14 (UK pricing unknown). At the time of writing Microsoft hadn't disclosed retail prices for boxed versions of Windows 8, but the current equivalent to Windows 8 Pro, Windows 7 Professional, is priced at \$199 in the US, and £189 in the UK.

Windows 7 editions that qualify for this offer are Home Basic, Home Premium, Professional and Ultimate. It doesn't cover Windows 7 Starter, nor Windows 7 Enterprise.

Consumers who qualify don't necessarily have to install the Windows 8 Pro upgrade on the Windows 7 PC they bought during the offer period. They could install the OS on an older PC running Windows XP, for example.

Both offers end 31 Jan and are available in 131 markets, including the UK.

Windows 8 Pro is the most sophisticated of the two versions of the OS for PCs and tablets running x86 chips from Intel and AMD. The other version is called simply Windows 8. Both come with Metro and the option to use the traditional desktop. ☑



## Office 365 faces an uncertain future

Microsoft hasn't provided many concrete details about sales and adoption of its cloud email, productivity and collaboration suite, leading to speculation about Office 365's success, as Juan Carlos Perez explains

A mixture of excitement and scepticism followed last year's launch of Office 365, as backers and critics debated whether the cloud collaboration, productivity and communication suite would succeed.

Sceptics said Office 365 was arriving too late as a unifying and superior replacement to Microsoft's weaker and disjointed offerings, such as Business Productivity Online Suite (BPOS), Office Live Small Business (OLSB) and Live@edu.

Microsoft and its supporters countered that it was still early days in the cloud collaboration, productivity and communication market, and that Office 365 would tower over its competitors.

One year later, as Office 2013 is announced complete with a new version of 365, it's hard to say whether Office 365 has been a success or a failure, and Microsoft isn't making the task easier.

"We're not breaking out customer, user, or revenue numbers at this time," said a company spokeswoman. She reiterated the statement Microsoft has previously made that Office 365 is "on track" to be one of the company's "fastest-growing offers" ever.

One thing seems clear: Office 365 hasn't blown competitors out of the water.

"It hasn't swept the market by storm," said IDC analyst Melissa Webster.

She expects Microsoft to release concrete data about Office 365 sales once the product makes significant revenue contributions.

"Microsoft will give metrics when the metrics are meaningful, demonstrating scale and depth," she said.

### Successful for who?

Beyond its ability to dominate - or not - the market, Office 365's success will also be measured against other criteria.

For starters, Office 365, whose most common configuration includes online versions of Office, SharePoint, Lync and Exchange, must help Microsoft make inroads into the small-business segment.

There, most prospective customers have lacked the money and expertise to buy and install in their offices products such as Exchange, SharePoint and Lync.

It was in this underserved segment that Google Apps found most of its customers in the first three or four years after its 2007



launch, attracting them with a free suite that included email, calendar, instant messaging, productivity applications, a website builder and additional pay-for features including IT management and security features.

Microsoft's free OLSB, which focused on website hosting and email, couldn't hold back Google Apps, but in this respect it seems Office 365 has been effective. According to Microsoft, more than 90 percent of Office 365 customers are small businesses with 50 or fewer employees.

"So many of these wins are new customers for Microsoft," Webster said.

Free or moderately-priced suites such as Office 365 and Google Apps give many small and medium-size businesses the opportunity to have better email and collaboration software than they've been able to afford. Because the applications are hosted and managed by vendors, there is also much less IT maintenance work, said Webster.

"Smaller companies can have the same type of environment major corporations give their employees.

"A real strength of Office 365 is its breadth - voice, conferencing, document collaboration, email, calendar - everything the knowledge worker needs," she said.

However, it hasn't all been rosy. Many OLSB customers, faced with a recent

deadline to migrate to Office 365 or to another website and email hosting provider, complained that Microsoft could have made the transition smoother.

### Angry users

In discussion forums, blogs and other outlets, upset OLSB users said Microsoft should have automated and handled more of the work, and provided migration tools, especially to transfer websites.

Similar complaints have been voiced by some BPOS customers regarding their move to Office 365. BPOS was aimed at mid-sized and large companies, and included online versions of SharePoint, Exchange and Lync based on their 2007 editions. By contrast, Office 365's components are based on the newer 2010 editions of the products.

"I heard from some smaller businesses I've talked to that Microsoft could have done more to automate the migration process," said Michael Fauscette, an IDC analyst.

With the recently launched Office 365 for Education, schools and universities that have been using Live@edu will have to engage in a similar transition over the next 18 months or so; it remains to be seen whether these customers also raise objections.

"You'd hope that Microsoft has learned from the feedback it's gotten about this



“

Every CIO in the world is looking at a cloud strategy

”

over the past year now that the Live@edu migrations are starting,” Fauscette said.

Because the Office 365 suite was designed to work in hybrid cloud/on-premise environments and to thus be able to interact with on-premises instances of Outlook, SharePoint, Office, Exchange, Lync and other Microsoft products, it often requires on-premises upgrades to desktop and server-side software.

### Moving up

The statistic that more than 90 percent of Office 365 customers are small businesses also raises the question of whether Office 365 has been successful in a different but critical mission: protecting Microsoft's vast installed base of Exchange/SharePoint/Lync/Office on-premises customers as they move to a cloud model for email, productivity apps and collaboration.

“Every CIO in the world is looking at a cloud strategy,” Webster said. “Microsoft needs to be able to answer ‘Yes’ when they ask if it can help them move to the cloud.”

Anecdotal evidence suggests mixed results in this area for Microsoft.

In January, Spanish bank Banco Bilbao Vizcaya Argentaria (BBVA) announced its plan to roll out Google Apps to its 110,000 employees, a project that involves turning off various on-premises email systems, including Exchange, which was used by about 35,000 employees in the company's headquarters.

Unsurprisingly, Google trumpeted the win, saying the implementation would be the largest to date for Google Apps.

In May, the US Department of the Interior announced its choice of Google Apps for about 90,000 users, a loss for Office 365, which was also considered, and for Exchange, which was one of the on-premises email systems replaced. That deal was not only a business win for Google, but also a legal victory, because the company sued the agency in 2010, alleging that the contract requirements unfairly favoured Microsoft.

Simultaneously, Microsoft has also counter-punched, landing its share of large Office 365 contracts. “Office 365 has been at least moderately successful in protecting Microsoft's customer installed base,” said industry analyst Michael Osterman from Osterman Research.

The executive branch of the Minnesota state government in the US is an example of a customer that has followed an ideal path for Microsoft. It consolidated about 40 disparate email systems into a single on-premises Exchange 2007 platform and later moved its circa-40,000 users to Office 365.

In May, Microsoft announced that it had struck a deal with the Catholic International Education Office to roll out Office 365's Education edition to about 4.5 million Catholic school students this year.

Another recent big win was hardware store chain Lowe's, which will roll out Office 365 to 200,000 employees in 1,745 stores and offices in the US, Canada and Mexico.

Office 365 has also bumped Google Apps from some accounts. Brazilian clothing store chain Renner adopted Google Apps in 2009, but replaced it with Office 365. The Microsoft suite is better suited to its plan to link its cloud email and collaboration platform with a variety of third-party, on-premises transaction systems and enterprise applications. The firm is now in its first phase of deployment to 2,500 staff, and will later expand the project to cover 10,000 users.

Microsoft did well to design Office 365 with hybrid deployments in mind, Osterman said. Some companies are more comfortable keeping certain email and collaboration

software on-premises, and it lets Microsoft build on its large installed base.

Industry analyst Rebecca Wettemann from Nucleus Research concurs. “Most businesses are used to Office and Outlook, and this hybrid approach lets them take advantage of the economies and flexibility of the cloud while working in the environment they're comfortable with,” she said.

Office 365 applications offer a subset of the functionality of the on-premises versions, but that subset has been more than adequate, Wettemann said. “The core functionality is there,” she said.

### Too many options

Another particularity of Office 365 is the broad variety of bundling options Microsoft offers, which may be counter-productive and confusing to prospective clients.

With its various options, Office 365 is certainly more complex to understand from a licensing perspective; at the same time, it offers customers more flexibility to mix-and-match versions to better suit different types of users, said Fauscette.

“It's not the simplest thing but, in general, people have gotten it,” he said. “The channel partners are really good about working with the customers and helping them decipher the details.” ☒

The screenshot shows the Microsoft Office 365 website. The header includes the Microsoft logo and 'Office 365' text. A navigation menu contains links: Home, What is Office 365, Plans & pricing, Customer Stories, Resources, and Support. A large orange banner with the text 'The easiest way to work together' is prominent. Below this, a green button says 'FREE TRIAL' with a right arrow, and smaller text says 'or buy now'. To the right of the banner is a photo of a man in a red shirt working on a laptop. Below the banner are three white boxes with blue icons and text: 'Office and Office 365', 'Compare all plans', and 'Learn more'. At the bottom, a 'Featured Videos' section is visible with the text 'See for yourself how Office 365 can help your business work smarter'.



# NEWPRODUCTS

Chris Martin reveals some of the best new tech gadgets we've seen this month



## Google Nexus 7 <<

### Tablet

The Nexus 7 is Google's first attempt at a tablet, although it had a little help from Asus. Despite its budget price, the Nexus 7 boasts a 7in in-plane switching display with a 1280x800-pixel resolution, 8- or 16GB of internal storage and the latest version of Android, 4.1 Jelly Bean. See our full review on page 32.

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**[play.google.com](http://play.google.com)**



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[tinyurl.com/pcgadgets](http://tinyurl.com/pcgadgets)

### >> **Asus Taichi**

#### *Laptop*

The Asus Taichi is among the first Windows 8 laptops to be announced. It's an Ultrabook laptop with a unique dual-screen design making it also usable as a tablet. The two touchscreens sit back-to-back. The Taichi is powered by an Intel Ivy Bridge processor.

Price TBC  
[uk.asus.com](http://uk.asus.com)



### << **Acer Aspire S7 Ultrabook**

#### *Laptop*

The Aspire S7 Ultrabook is another Windows 8 laptop; this one can fold completely flat. It will be available in two screen sizes, 11.6- and 13.3in, both with full-HD touchscreens and slim aluminium unibody cases.

Acer touts a battery life of 12 hours.

Price TBC  
[acer.co.uk](http://acer.co.uk)





### << Samsung EX2F Smart Camera

#### Digital camera

Samsung describes the EX2F as a Smart Camera because its built-in Wi-Fi connectivity lets you upload and share images online. The camera features a 12Mp sensor, full-HD video recording and a flip-out 3in AMOLED screen.

£429 inc VAT

[samsung.com/uk](http://samsung.com/uk)

### >> Sony NSZ-GS7 Google TV

#### Smart TV set-top box

The NSZ-GS7 by Sony is the first Google TV box to launch outside the US. This shiny black box aims to fuse your existing TV content with, as Google says, the best of the internet: YouTube, Google Play and Chrome. It comes with an innovative dual-sided remote control.

£199 inc VAT

[sony.co.uk](http://sony.co.uk)



### Nintendo 3DS XL ^

#### Handheld games console

The 3DS XL is available in black and blue, red or silver. At 4.88in, it has a screen 90 percent larger than the original 3DS. Like its predecessor, it offers glasses-free 3D. Despite the increased screen real estate, however, the console boasts longer battery life than the 3DS - up to 10 hours.

£179 inc VAT

[nintendo.co.uk](http://nintendo.co.uk)

### >> Logitech G600 MMO

#### Gaming mouse

Logitech has created the G600 for massively multiplayer online (MMO) gamers. To this end, the mouse has 20 buttons, customisable lighting, and DPI and profile switching. The G600 MMO is available in black or white.

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[logitech.com/en-gb](http://logitech.com/en-gb)





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### Archos 97 Carbon

Tablet

Archos' Elements tablet range starts with the 97 Carbon, an Android 4.0 Ice Cream Sandwich device with an Apple iPad-esque 9.7in in-plane switching screen. The 97 Carbon is powered by a 1GHz ARM Cortex A8 processor and has 16GB of internal storage.

£219 inc VAT  
archos.com



### Sony SA-NS510

Wireless speaker

The SA-NS510 may look like a turbine, but it is in fact a wireless speaker powered by a built-in battery. Four tweeters fire out sound in all directions, while a large woofer provides the bass. Music can be streamed wirelessly to the unit from an iPhone, iPad or Android device.

£299 inc VAT  
sony.co.uk

### Motorola Motosmart

Smartphone

The Motosmart is a simple Android 2.3 Gingerbread smartphone aimed at the masses. The sleek design features a 3.5in touchscreen and a 3Mp rear-facing camera. The Motosmart only has 512MB of internal storage, but there's a microSD card slot for expansion.

£99 inc VAT  
motorola.com



### Chordette Index

Network music player

The Index, shown here with the Scamp and housing, is a network music player with a high-grade digital-to-analogue converter (DAC). It will play music from a NAS drive, a PC or USB storage. Wi-Fi and ethernet connectivity are onboard, and the Index can be controlled from a smartphone or tablet.

£990 inc VAT  
chordelectronics.co.uk



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# REVIEWS



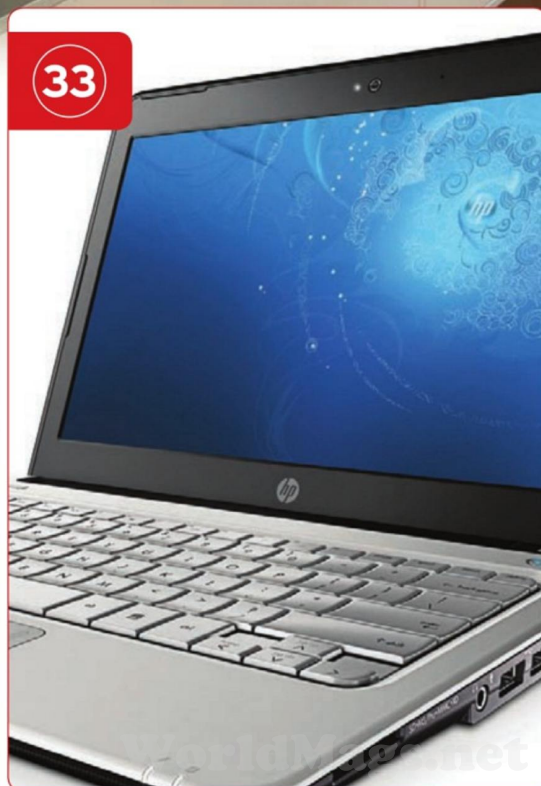
Ferguson Hill FH009

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ANDREW  
HARRISON

# Google's dreams of electric sheep

For the past two years, the iPad has ruled the tablet PC roost. Competing tech brands were quick to jump on the bandwagon, yet none could offer a product as good for the same money. The cheap-and-cheerful pitched below £200 have been universally dreadful.

That status quo of iPad defining the tablet space is about to change, though, with Google determined to claw its way to some market share – not to mention mindshare – of this key category. And it now has the means to do so.

In case you missed the memo, the Google Nexus 7 is the spearhead for this campaign. It's a relatively low-cost handheld tablet that launched in July, selling from just £159 in the UK.

We've seen tablets around or even below this price before, but found that low-grade components, sloppy build quality and incompetent software design have rendered them, at best, a distant second choice; at worst, fodder to prop doors ajar.

Google has spotted the void and, with the help of a compliant Asus, filled it with a working example of what a 7in-screen tablet running Android software can do.

The manufacturing costs have been subsidised to hit that magic retail price, an option not previously available to the likes of HP, RIM, Huawei and countless other brands that have tried to compete in this space to actually make money. That's not an issue for Google – a company that gives away free stuff in order to expand the number of people it can peddle to its customers, the advertisers.

Hardware analyst iSuppli pulled apart the Nexus 7 to gauge its true cost, ringing up a bill of materials with manufacturing costs of £101. That may sound significantly short of the £159 retail price, but it doesn't include the share of distribution costs, marketing, taxes, even patent royalties payable to other companies.

Since Android is alleged to infringe on many patented technologies – and, in the case of Microsoft, has settled by paying royalties for every Android device sold – a proportion of the hardware's cost passed to the customer is made up of licensing costs.

Several analysts have done the maths and calculated that Microsoft makes more money from Google Android in IP tax than it does from selling its own Windows Phone handsets. It's hard to



decide whether that's a reflection on just how many Android devices are hitting the market, or how few Windows phones are sold.

Now Google is following the Amazon model, which built its subsidised Kindle Fire as a vehicle to sell books and media – a loss-leader to open a new revenue stream as users subsequently spend money on digital content to load on to the device.

Google is using its deep pockets to bankroll the Nexus project. Its goal will be to recover its investment through a snowballing product portfolio of consumers that's converted into ad sales income.

The strategy is a marketing masterstroke that will put a working tablet into the hands of people previously stalled at the £329 entry cost. And it will inflate the brand as consumer champion as we flock to the unmissable bargain.

Read our review overleaf to see how well the Nexus 7 works as a tablet, but keep in mind that the cost to the device buyer may be more than just the cash you hand over at the point of sale. ☒

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## Contact

■ [play.google.com](http://play.google.com)

Read more

■ [tinyurl.com/cgba439](http://tinyurl.com/cgba439)

## Specification

1.3GHz nVidia T30L Tegra 3 quad-core processor; Google Android 4.1 Jelly Bean; 1GB DDR3 RAM; 8GB or 16GB flash storage; 7in (1280x800) capacitive IPS display; 802.11b/g/n; Bluetooth with A2DP; 3.5mm headphone jack; Micro-USB; 16Wh battery; 120x199x10.9mm; 336g

**PC ADVISOR**  
**GOLD**

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



## TABLET

# Google Nexus 7 by Asus

Google has finally entered the tablet market with its Nexus 7, an Asus-made slate tipped as a game-changer. It's available from just £159 and is also the spearhead for Android 4.1 Jelly Bean.

A 7in screen makes for a small tablet. It's respectably thin at 10.9mm, and very light at 336g. Designed to be predominantly used in portrait mode, we found one-handed use in either orientation comfortable. Its compact 120x199mm chassis makes the Nexus 7 pocketable, too.

The front takes the form of a single sheet of glass, surrounded by a silver metal frame. On the rear is a dark brown - almost black - textured cover with a rubbery feel. It aids grip and feels nice to the touch.

Buttons and ports are kept to a minimum: on the right are a power button and volume rocker, while a Micro-USB port and headphone jack are found at the bottom. A four-pin side dock will be useful for accessories; stereo speakers are concealed behind a long slot.

## Build quality

We've come to expect sub-£200 tablets to display lousy build quality. The Nexus 7 bucks the trend, and this well-made slate feels like a premium product. Scratch-resistant Corning glass lies flush with the metal frame, and the buttons and ports feel solid. We did see rippling at the top and bottom edges of the screen when pressed, though.

The Nexus 7 has a surprisingly good specification for the money. It uses the same 1.3GHz nVidia Tegra 3 quad-core processor found in many top-spec Android devices, backed with a healthy 1GB of RAM.

The Nexus 7 scored highly in Geekbench 2, where it averaged 1,452 points. This result was reflected in its smooth operation.

The in-plane switching (IPS) panel is a highlight, and provides excellent contrast, brightness and viewing angles. A 1280x800 resolution and 216ppi pixel density translates to very good detail levels.

We found the screen good for web surfing and playing games, but even more so for watching films.

Storage is limited to 8- or 16GB, at £159 and £199 respectively.



Note that the Android OS gobbles up around 2GB of this capacity.

There's no microSD slot for storage expansion, nor is there a 3G option for connectivity. You could potentially tether the Nexus to a smartphone for mobile data. Also onboard are Bluetooth, GPS and near-field communications (NFC).

Unlike most tablets, the Nexus 7 doesn't have a rear-facing camera. There is a 1.2Mp front-facing cam for video chat, however.

## Software

Android 4.1 is an incremental update to 4.0 Ice Cream Sandwich. There's little change in the interface, but Google has improved the OS' performance and responsiveness. Jelly Bean is slick, and closes the gap between Android and iOS.

We experienced no lag when moving between home screens, navigating menus and scrolling through video. Web surfing with the default Chrome browser is smooth; pages load quickly, while zooming and scrolling are similarly speedy.

Enhancements have been made to the Notification bar, now showing more information about each alert and letting you carry out tasks without launching the associated app. For example, Gmail notifications group email messages and display their subject lines.

Widgets automatically resize to fill the available space, while app shortcuts and other widgets tidy themselves out of the way when you place a new widget over the top. Few are preloaded, but the

Play Store has plenty to offer. The Nexus 7's Home screens display only in portrait mode.

Dictation is now available offline, and Google Search gives results in information cards - you can ask questions and receive answers in spoken form, as you do with Siri.

Google Now is another addition, and taps into the data Google holds about you. It aims to stay a step ahead, predicting the information you need before it's requested. For example, it might offer train times.

We found Google Now very useful, offering us the information we'd usually search for and more, including local attractions based on our location. Its downfall is the need for an active internet connection; when you're on the road and out of range of a Wi-Fi hotspot you'll need to tether the Nexus 7 to your phone.

Missing from Android 4.1 is any Flash support. This rules out inline video content on websites and, until the iPlayer app is updated, there's no BBC catch-up TV either.

Google touts an iPad-matching 10-hour battery life when browsing the web. The Nexus 7 endured two and a half days' of intermittent use in our tests.

## Verdict

Google sets a new standard for budget tablets with the Nexus 7. It's an unbelievably well-equipped device for the price. Silky-smooth performance and a high-resolution IPS screen are highlights in the best budget tablet we've seen yet.

✉ Chris Martin



**£350** inc VAT

**Contact**

■ [hp.com/uk](http://hp.com/uk)

**Read more**

■ [tinyurl.com/cts2zw8](http://tinyurl.com/cts2zw8)

**Specification**

1.6GHz AMD E-350, dual-core; Windows 7 Home Premium; 3GB DDR3 1,333MHz RAM; 320GB HDD; 11.6in (1366x768) glossy LCD; AMD Radeon HD 6310, 384MB; 802.11b/g/n; gigabit ethernet; Bluetooth 3.0; 3 x USB 2.0; VGA; HDMI; Kensington lock slot; SD slot; stereo speakers; webcam; 55Wh lithium-ion battery; 290x214x21-31mm; 1.54kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



**LAPTOP**

## HP Pavilion dm1-3200sa

This 11.6in-screen portable may not have the wow factor associated with the thinnest ultraportables, but it gets the job done for just £350.

The dm1-3200sa runs a 1.6GHz AMD E-350 dual-core CPU with 3GB of RAM. Its resulting performance in our WorldBench 6 speed test took us by surprise, with an impressive 138 points scored. This budget HP offers excellent performance.

While the HP will make a great on-the-go companion for most computing tasks, don't expect it to satisfy gamers. Its AMD Radeon HD 6310 graphics recorded a mediocre 18fps in our basic Fear test.

Key specifications include a 320GB Seagate 7,200rpm hard drive and an 11.6in (1366x768) display. The screen offers a decent image with good viewing angles, but we noticed some reflections due to its glossy finish, and low maximum brightness.

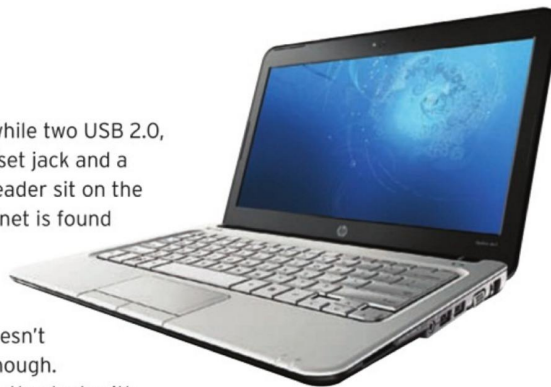
A compact chassis hasn't forced HP to skimp on the ports it provides. A power inlet, Kensington lock slot, HDMI and USB 2.0 connections are

found on the left, while two USB 2.0, a VGA port, a headset jack and a multifunction card reader sit on the right. Gigabit ethernet is found behind a flap, and the HP also offers 802.11n Wi-Fi and Bluetooth 3.0. It doesn't support USB 3.0, though.

The HP looks pretty sleek with the lid down, but rather plain with its innards on show. A black patterned lid with rounded corners lifts up to reveal a silver plastic case and a standard keyboard and trackpad. The 1.54kg chassis adopts a wedge shape, which is 21mm at its thinnest and 31mm at its fattest.

We found typing a comfortable experience. The keys are of a good size, well-spaced and with good feedback. The wristrest area and arrow keys feel small, though.

The trackpad has a smooth texture and is reasonably responsive. Despite its small size, it often got in our way when typing. Fortunately, you can disable it.



Build quality is where the HP underwhelms. The plastic shell is worryingly weak and flexible. We could bend the main body and display with barely any effort.

A small 55Wh battery can be released via a simple catch. We saw nearly seven hours life - 408 mins - in MobileMark 2007.

### Verdict

The Pavilion dm1-3200sa is an excellent budget choice. For just £350 you get fast performance, a good range of ports and decent battery life. It looks good, but would benefit from better build quality. **Chris Martin**

**£380** inc VAT

**Contact**

■ [samsung.com/uk](http://samsung.com/uk)

**Read more**

■ [tinyurl.com/codnrvr](http://tinyurl.com/codnrvr)

**Specification**

1.3GHz Intel Celeron 867, dual-core; Google Chrome OS; 4GB DDR3 1,333MHz RAM; 16GB SSD; 12.1in (1280x800) matt LCD; Intel HD Graphics; 802.11b/g/n; gigabit ethernet; 2 x USB 2.0; DisplayPort++; Kensington lock slot; SDXC slot; stereo speakers; 1Mp webcam; 40W adaptor; 51Wh lithium-ion, non-removable battery; 292x217x21-31mm; 1.39kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



**LAPTOP**

## Samsung Series 5 550 Chromebook

We were disappointed by the first Chromebook - a laptop concept that operates entirely in the cloud. It was slow, clunky and Chrome OS was too limited to be practical. Without a net connection it was a paperweight. Google has now revised the OS and incorporated new hardware.

Externally, little's changed.

A strange key layout catches the Fn buttons and replaces Caps Lock with a Google key. Short-travel keys have stiff springs that slow typing, while the short spacebar is frustrating and gesture support is lacking. Two-fingered scrolling is possible, but not pinch-to-zoom or swiping.

The 12.1in screen is average. It's non-reflective, with reasonable brightness and contrast, but viewing angles are poor, with the colours shifting as you tilt your head.

One USB port lives on each side, and there's an SDXC reader to the right. On the left is a headset jack, ethernet and DisplayPort. The latter is an odd choice - you'll need an adaptor for HDMI, DVI or VGA.

Gone is the puny Intel Atom processor, here replaced by a dual-core Celeron. The RAM allocation has doubled to 4GB, but there's the same low-capacity 16GB SSD.

Google Drive means limited storage is now less

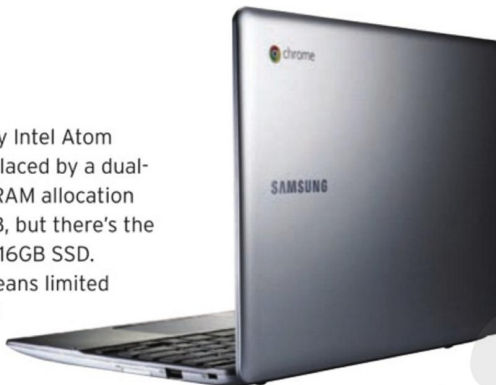
of an issue, with 5GB free or 25GB for \$30 per year. You can also add an SD card or USB drive.

The Chromebook felt sprightly running 10 browser tabs. It was also fast to boot and resumed from standby in a few seconds.

Chrome OS has changed, with a new desktop joining the browser window. It'll feel more familiar to Windows PC users, especially when launching apps. Some are pinned to the bottom; the rest are available through a Rubik's cube icon.

Offline apps help address the unconnected ordeal. These include Google Docs, Gmail, Calendar and Drive, plus Angry Birds.

Offline you can view, but not edit, local files, and Chrome OS supports



most popular file formats. Edit may be too strong a word, though, as you can only crop, rotate and adjust the brightness of images.

The non-removable battery lasted around six hours in our tests - a working day that mixed email, cruising websites, creating documents and watching video.

### Verdict

Updates have made Chrome OS more usable, but the offline mode is limited and the file manager desperately needs work. Samsung's Series 5 is also too expensive at £380; closer to £200, we'd be more interested. **Jim Martin**



£399 inc VAT

Contact

■ wdc.com  
Read more  
■ tinyurl.com/c6tadad

Specification

4TB external desktop drive; 2x 2TB WD Caviar Green SATA disks; 2x Thunderbolt; Raid 0/1/JBOD; 12V DC mains adaptor; 165x157x99mm; 2.15kg

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



EXTERNAL DRIVE

## Western Digital My Book Thunderbolt Duo

If there's one thing faster than a hard disk attached to a Thunderbolt cable, it's two disks attached to the lightning-speed connector.

That's how Western Digital has managed to garner SSD-like speeds from the My Book Thunderbolt Duo, a desktop storage solution that sports two 3.5in internal hard disks.

The unit follows Western Digital's book-as-storage metaphor, as a broad volume with a rounded spine and a series of Morse dashes tracing the page leaves. The build quality isn't as upmarket as the mock-metal case might suggest, though, and the Thunderbolt drive is an all-plastic affair sprayed silver.

Depress the top of the case and a lid pops open to offer access to the disks. We tested a model with two 2TB Caviar Green drives; the Duo is also available in 6TB form.

These disks aren't the fastest of SATA drives, but they run quiet and cool; combined with a fanless design, they prevent the My Book from driving you to distraction.

Unlike the G-Tech Thunderbolt drive (see page 141), this drive is supplied with Western Digital's own setup software for Windows and Mac. You can use this software to switch between Raid 0 for 4TB of speed and capacity, Raid 1 for 2TB of data security, and JBOD to use the two disks independently.

Format options include HFS+ with Journaling, and ExFAT, an updated version of FAT that can address the huge disks and the larger-than-4GB files you'll want to store on them.

The software can also execute a secure wipe and give diagnostic information on drive health.

To use the My Book you simply need to plug in the 12V external power adaptor and hook it up to a Mac or Windows PC using a Thunderbolt cable (not supplied).

We tested the Thunderbolt Duo in JBOD mode to check performance with a single disk. Running the QuickBench test in OS X, we recorded 110MBps read/write speeds across a range of file sizes, from 256kB to 100MB. Peak speeds were found with the largest files in this range, reaching up to 112MBps.

Another useful performance gauge is the sequential and random speeds of small-file transfers. The Duo averaged 90/92MBps sequential and 17/64MBps random transfers for read/write speeds respectively.

In Raid 0 mode we measured up to 223MBps sequential reads and 217MBps writes. This setup also saw faster small-file performance, averaging 154/158MBps sequential and 46/63MBps random, for datasets from 4kB to 1024kB.

To confirm the drive's real-world performance, we copied a Blu-ray



film from an SSD-equipped Mac mini to the Duo. The 23.24GB directory transferred in 1 min 46 secs, suggesting an average rate of 220MBps. That's a great result and almost twice the write speed of Elgato's Thunderbolt SSD (page 40).

### Verdict

Huge storage capacity and terrific performance make the Western Digital My Book Thunderbolt Duo an easy recommendation. It doesn't have the premium build quality of the Thunderbolt Raid drive from the company's newly acquired sub-brand Hitachi, and its eco drives make it a touch slower, but the Thunderbolt Duo runs quieter and costs around £100 less for the same capacity.

✉ Andrew Harrison

SPEAKERS

## Ferguson Hill FH009

PC ADVISOR  
GOLD

£795 inc VAT

Contact

■ fergusonhill.co.uk  
Read more  
■ tinyurl.com/bgrwyf

Specification

2.1 stereo speaker system; 2x 130mm bass drivers; 45Hz-20kHz frequency; 2x analogue, 1x digital USB, 3.5mm jack inputs; remote; 560x170x360mm

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



Ferguson Hill makes loudspeakers like no other specialist brand. Its first product was the FH001, a high-end speaker standing 1.65m tall. The size makes the system more efficient, and thereby louder at a given amp setting, plus it extends the lower bass.

In the case of the FH009, the horns have been scaled down to one-tenth size - just 17cm high - and are joined by a separate box that reproduces the bass.

Available with a white or black glossy finish, this system includes two 32W amplifiers for woofers, and a 32W stereo amp for the satellites. These amps are full-blooded Class AB designs.

A USB port lets you plug in a flash drive. Also at the front is a tiny LCD that reveals the input source and volume level.

Up to four sources can be connected via two line-ins at the back, a 3.5mm mini-jack and the aforementioned USB port. Another pair of phono inputs at the rear can connect to a subwoofer if required.

The horns are crafted from clear acrylic, and finished with machined metal components that support the tiny drive units within. These are mounted on metal poles with heavy bases. You can hide wires by running them through the poles.

A credit-card-size remote control operates the system, with clicky

membrane buttons that don't reflect the FH009's high-end feel. With no controls on the cabinet, you must be careful not to lose the remote.

You can step up or down the bass by four steps using the volume keys. We found -4 returned an even sound.

Whereas modern speakers use a two-way woofer/tweeter arrangement, this semi-full-range setup gives a more natural sound. A single drive unit reproduces the important band, from around 500Hz to 18kHz. An active crossover diverts the lower frequencies to the bass box.

The FH009 has a compelling, open sound, bereft of high-frequency tizz. It is a quality that laps up the sound of the singing voice.



**£150** inc VAT**Contact**■ [dlink.co.uk](http://dlink.co.uk)**Read more**■ [tinyurl.com/82kwLjo](http://tinyurl.com/82kwLjo)**Specification**

Dual-band wireless router; 4x gigabit LAN ethernet ports; 1x gigabit WAN port; 802.11a/b/g/n; 2.4GHz and 5GHz concurrent wireless; 3x3 MIMO antenna configuration; IPv6 support; SharePort iOS/Android mobile app; WPA/WPA2 security; WPS button; 1x USB 3.0 port; SD slot; VPN passthrough; NAT/SPI firewall; UPnP support; 212x160x34mm; 342g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**WIRELESS ROUTER****D-Link DIR-857 Dualband HD Media Router**

D-Link's DIR-857 is the most advanced wireless router in the company's portfolio. Almost every feature you could hope for is crammed into its slim plastic chassis.

It supports simultaneous 2.4GHz and 5GHz 802.11n wireless networks, and a 3x3 MIMO antenna configuration allows for theoretical 450Mbps connection speeds. An SD slot and a USB 3.0 port are included for shared storage. Advanced DNS filtering and comprehensive IPv6 support are also offered, along with more typical features such as gigabit ethernet, port forwarding, quality of service (QoS) traffic prioritisation and support for dynamic DNS.

'Click n Connect' setup software eases configuration. A step-by-step guide offers clear diagrams showing which cables to connect, followed by advice on securing access to the router with a password.

No Mac software is provided, but an HTML guide appears the first time you connect to the DIR-857. The simplicity stops there, though.

The DIR-857's admin interface is functional and full of useful settings, but its sickly orange/grey design and dated appearance are offputting.

Text-heavy menus and multiple options dominate the interface. Explanations are provided on the right for some settings, but they assume a certain level of prior

networking knowledge. The D-Link DIR-857 is certainly not a router we'd recommend to novice users.

We measured some good speeds when wirelessly transferring files from a NAS connected to the D-Link. Over its 5GHz network, a 5GB file transferred at 27.1MB per second (MBps), pointing to a good wireless speed of 217Mbps that approaches real-world USB 2.0 performance. This was at a distance of 1m; the effective range of 5GHz is limited to just a few metres.

Using the router's 2.4GHz wireless radio, we measured 125Mbps at the same distance - a speed that still outperforms much of the competition (see page 140).

The DIR-857 managed 37Mbps in a 10m long-range test and, given the solid wall through which it had to pass, this is acceptable and better than many competing routers have performed in the same test.

Under the Parental Control heading are four options to filter DNS addresses, and these aren't just for preventing youngsters from viewing adult content. You can set the router to block an OpenDNS blacklist of phishing sites, protecting everyone on the network. You can



also block access to specific sites you don't want the kids to visit.

IPv6 support extends to a separate firewall and routing page from the main IPv4-based settings, along with its own setup wizard. You can also create guest networks.

Topping the DIR-857's feature list are its media-sharing options, where the single USB 3.0 port is a handy addition. Using an external hard disk or an SD card, the DIR-857 can be turned into a basic NAS. Options can be set for group permissions and there's an excellent DLNA SharePort mobile app for accessing files.

**Verdict**

Although the D-Link DIR-857 is an excellent wireless device, we question whether it's worth spending so much on an 802.11n router when the potentially faster 802.11ac standard is just around the corner. But if you're after excellent performance today, you won't be disappointed with D-Link's DIR-857.

✉ **Orestis Bastounis**

The top end is as smooth as butter. Some horns can be a little quacky, but that wasn't evident here - just some mild thickening of sound in the lower mid-range, which could be tuned out by moving the bass box. Thanks to the foundation-setting bass cabinet, the system can sound even visceral when required.

Lana Del Ray's second album relies on plenty of deep-down bass instrumentation, layered with wet reverb as a backwash to her schizoid voice. The FH009 captured the little-girl voice well, hanging vocals ethereally in the air; Ray's darker, vamp voice was as captivating, if a little coloured by the low-mid opacity mentioned earlier.

Some upbeat Pink Floyd confirmed the system's credentials for rock, the driving echoed bass guitars of 'One Of These Days' showing this system could play loud, clean and tight.

We tried some sparser acoustic material, including extracts from Purcell's 'The Fairy Queen'. It served to highlight the wide open soundfield and unforced sound you can expect from these horns.

**Verdict**

Craftsman engineering and beguilingly smooth and natural sound made us peg this system at more than £1,000, not £795. If you want to hear the magic of old-school horns



mashed with modern-day materials and production techniques, we'd urge you to hear the Ferguson Hill FH009.

✉ **Andrew Harrison**



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**£180** inc VAT**Contact**■ [htc.com/europe](http://htc.com/europe)**Read more**■ [tinyurl.com/cs948oc](http://tinyurl.com/cs948oc)**Specification**

600MHz Qualcomm Snapdragon (single-core); 3.5in (320x480, 165ppi) LCD; Google Android 4.0.3; 512MB memory; 4GB storage; microSD slot; 802.11b/g/n; Bluetooth 4.0; GSM/GPRS/EDGE 850/900/1,800/1,900MHz, HSDPA/WCDMA 900/2,100MHz; A-GPS; 5Mp camera; 640x480 video; Micro-USB; NFC; 4.6Wh, removable battery; 60x107x12.5mm; 100g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**SMARTPHONE****HTC Desire C**

This is the first Desire we've had since last year's S. The design is similar, yet shrunk down and more akin to the new One S.

It's pebble-like in shape and feel, fitting nicely in the hand - it's little bigger than a credit card, at 60x107mm. It's chubbier at 12.5mm thick, but doesn't seem overly stout. The Desire C weighs just 100g.

We like the simple and elegant design, which is available in black or white. It's made entirely from plastic, although its budget build isn't immediately obvious. The smooth matt finish is nice, and the removable rear cover isn't overly thin. There is some creak as you squeeze the phone, though.

The Desire C doesn't boast sock-blowing specs. It's powered by a single-core 600MHz processor and 512MB of memory. In the Geekbench 2 test the phone averaged a meagre 333 points.

Moving between Home screens is smooth, as is navigating the app and Settings menus. The Desire C

does lag somewhat, although web browsing is surprisingly smooth.

Onboard storage is limited to 4GB, but there's a microSD slot for expansion. HTC also offers 25GB of storage at Dropbox for two years.

The 3.5in screen is the same size as that of the iPhone 4S, but with lower resolution - just 480x320. The screen doesn't look awful, but it's far from detailed, with fuzziness edging screen text and images.

Connectivity is basic, stretching to a 3.5mm headset jack, Micro-USB, 802.11n Wi-Fi and Bluetooth 4.0. Near-field communications (NFC) is a surprising addition.

There's a lonely rear-facing 5Mp camera, with which we took some reasonable-looking snaps. Video is recorded at just 640x480.

Google Android 4.0.3 and HTC Sense 4.0 make up the interface. HTC has done a good job blending the two. There are plenty of widgets to customise the Home screen, while the lock screen can display information and four app shortcuts.



Smartphone battery life tends to fit into one of two categories: one- or two-day. HTC fits only a 4.6Wh battery, but it lasted 48 hours before dropping below the 10 percent mark.

**Verdict**

The HTC Desire C is a budget Android handset with a nice design that would make a good first smartphone. It doesn't have any outstanding features, save for the price. If you won't use NFC, consider paying an extra £20 for the One V, which has a superior screen and better performance. **Chris Martin**

**£329** inc VAT (16GB)**Contact**■ [toshiba.co.uk](http://toshiba.co.uk)**Read more**■ [tinyurl.com/bua6nrm](http://tinyurl.com/bua6nrm)**Specification**

Texas Instruments OMAP 4430 1.2GHz dual-core processor; Android 3.2 Honeycomb; 10.1in (1280x800) capacitive touchscreen; 1GB DDR2 RAM; 16/32GB storage; PowerVR SGX540; 802.11a/b/g/n; Bluetooth 2.1; 5/2Mp rear/front cameras; Micro-USB; Micro-HDMI; microSDHC slot; lithium-polymer battery; 256x176x7.7mm; 502g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**TABLET****Toshiba AT200**

Toshiba has taken another stab at the tablet market with the AT200, its follow-up to the AT100.

Also known as the Excite, the AT200 is touted as the world's thinnest tablet, at 7.7mm. It's also exceptionally light for a 10.1in-screen tablet, at just 502g.

It looks great in its ultra-thin chassis with silver/black stripes, and the rear cover looks sleek with a brushed-aluminium finish.

A scratch-resistant screen and metal sides give the AT200 strength and durability, although we could easily bend the device lengthways and widthways.

The AT200 runs a Texas Instruments OMAP 4430 1.2GHz dual-core processor with 1GB of RAM. Performance is good, but not up to that of the Asus Transformer Prime or iPad (see page 138). It recorded 979 points in Geekbench.

We noticed some lag when opening apps and carrying out tasks. Web browsing was also sluggish and tiresome on the AT200. Pages

rendered in a reasonable time, but scrolling and zooming were painful. Games ran more smoothly.

The AT200 comes with 16- or 32GB of storage, expandable via a microSDHC card. Connectivity comprises Wi-Fi and Bluetooth, but not 3G; there are also headset, Micro-USB and Micro HDMI ports.

The 10.1in TruBrite touchscreen has a resolution of 1280x800. The screen is bright, colourful and responsive, but the brightness level drops when viewed from the side.

We also found graphical glitches in some apps, mostly noticeably in the Google Play Store, where parts of the interface would randomly flash on the screen.

Installed software includes Toshiba Places, McAfee Mobile Security, ThinkFree Office, PrinterShare and Evernote.

The front 2Mp webcam and 5Mp rear cameras are nothing special. The camera app ran slowly, taking



an age to capture a single photo, and the results didn't impress.

The AT200 runs with Android 3.2 Honeycomb, although Toshiba promises a future upgrade to Android 4.0 Ice Cream Sandwich.

The AT200 lasted around two days between charges with light use.

**Verdict**

The AT200 looks good in its sleek, lightweight metal case. We enjoyed good battery life and connectivity, but the device was let down in key areas, such as web browsing speed. We'd also like to see Android 4.0 Ice Cream Sandwich (or even 4.1 Jelly Bean) in place. **Chris Martin**



£50 inc VAT

Contact

■ philips.co.uk

Read more

■ tinyurl.com/87pf8q8

Specification

Set-top box for internet services; Netflix/YouTube/Facebook; 24bit/192kHz audio DAC; 12bit/108MHz video DAC; 1x USB 2.0; HDMI; remote control; separate 5V DC power plug; 90x100x50mm



SET-TOP BOX

## Philips HMP2000

If you have a decent TV, there's no reason to replace it with a smarter model for the sake of getting internet TV services. The Philips HMP2000 is a set-top box that will allow services such as Netflix to be streamed to your existing telly.

Like the similar Apple TV set-top box, the Philips won't take up much space in your living room at 90mm wide and 100mm deep. This black box is taller at the back to give a sloping top surface.

Its credit-card style remote control is also very small, but that becomes less of a benefit the first time you lose it between the sofa cushions. Its clunky buttons that demand you click with your nails are another source of irritation.

The unit itself is very easy to install: just plug the external power plug and HDMI cable into the TV, then log into your wireless network; you'll be up and running in a few minutes. There's no ethernet option, nor a separate sound output beside audio over HDMI.

The picture quality on Netflix is very good, provided that you have a strong internet connection. The Netflix service itself, which offers a catalogue of TV programmes for £5.99 per month, would seem to be the main justification for buying the HMP2000. It has a limited selection of films, though.

Besides Netflix, the box offers Facebook and YouTube services. If you're used to using these sites on your computer, be prepared for some gnashing of the teeth as you attempt to enter text with the aforementioned remote.

Finally, the HMP2000 allows you to play media files from a USB memory stick or hard drive. A bonus here is its wide format compatibility - it will play a good variety of media, including DVD rips and MKV files. The only common file type the Philips refused to play is Apple Lossless, which is a shame now that



the popular Alac format is open source and available to all.

For such a modest sum, this device could be recommended for its Netflix access alone. But anyone who has a media library on their home network would be better served by a DLNA-compatible unit.

### Verdict

If all you want is to access Netflix on your existing TV, the Philips HMP2000 can be recommended - but other devices costing only around £40 more offer better functionality. BBC iPlayer and DLNA compatibility are glaring omissions. **James Barnes**

£900 inc VAT

Contact

■ gainward.de

Read more

■ tinyurl.com/d7a2xu3

Specification

nVidia GeForce GTX 690; 4GB GDDR5 RAM; 915MHz core clock; 6,008MHz DDR effective; 400MHz Ramdac; 2x 256bit memory interface; 2x 1,536 stream processors; 2x 128 texture units; 2x 32 ROP units; PCI Express; needs 2x 8-pin power connectors; DirectX 11; 3x DVI; Mini DisplayPort; 2-year warranty



GRAPHICS CARD

## Gainward GeForce GTX 690 4GB

The GTX 690 is a dual-GPU version of the GTX 680, nVidia's best single-GPU graphics card. It costs £900, making this a luxury buy for even the most dedicated gamers.

Running the GTX 690 isn't the same as having two decent GTX 680s. You get a base clock speed of 915MHz across the two, rather than the 1,006MHz of, for instance, the Zotac GeForce GTX 680 - even the GTX 670 offers 915MHz.

In other respects, though, there's little reduction in performance. Whereas the GTX 680 offers a memory bandwidth of 192.3GBps, the 690's two 256bit memory interfaces boost this to 384.5GBps.

You get two lots of 128 texture units, too, so while the GTX 680 has a texture fill rate of 128.8GTps, the 690 has a stunning 234.2GTps.

You also get double the ROP units and stream processors. And the GTX 690 comes with a sizeable 4GB of GDDR5 memory.

Power requirements are significant but, while the older

GTX 590 specified a thermal design power (TDP) of 375W, the 690 requires just 300W. Given that the 680 lists 195W, and the 690 is almost twice as powerful overall, that figure is remarkable. And while the GTX 680's real-world consumption was in the low 180s, the 690 averaged around 261W.

The noise levels don't jump up much either, with the GTX 690 typically just over 2dB louder than the 680. It does require that you have two spare 8-pin connectors on your PSU, however.

Unsurprisingly, the GTX 690 butchered the competition in our tests. A circa-70 percent increase over the 680 was common.

In BattleForge, it notched up 113.2- and 82.3fps at 1920x1200 and 2560x1600 respectively. The 680, in contrast, produced 68- and 47.7fps.

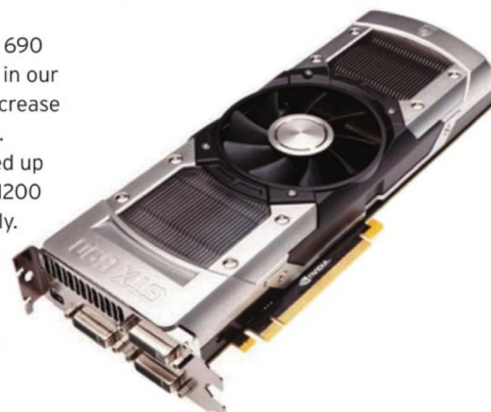
In Crysis 2, the 680's figures of 75.8- and 53.1fps far outstripped the 680's 45.6- and 31.2fps.

In Stalker, the difference was 137.3- and 101.6fps against 86.4- and 62.1fps. In every test, the 680 was easily beaten by the 690.

### Verdict

The GTX 690 is a high-end product. It costs more than twice the price of two GTX 680s, but offers only around three-quarters more speed than a single card. The lucky few who can afford such an item will find it offers pulsating performance.

**Robin Morris**





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Contact

■ [elgato.com](http://elgato.com)  
Read more  
■ [tinyurl.com/c866w2v](http://tinyurl.com/c866w2v)

Specification

Thunderbolt external portable drive; 120/240GB capacities; SanDisk Ultra SSD; bus power; 131x83x20.8mm; 265g

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



PORTABLE DRIVE

## Elgato Thunderbolt SSD

Elgato's Thunderbolt SSD is one of very few portable drives able to use the emerging Thunderbolt desktop interface. Thunderbolt is specified up to 10Gbps (equivalent to 1,250MBps), which should comfortably allow best performance from current 2.5in SSDs that hit around 550MBps.

The Elgato drive comprises a 2.5in SSD in a compact all-metal enclosure, with a single Thunderbolt port at one end. Power comes over the Thunderbolt bus.

Elgato's Thunderbolt SSD is a solid-feeling hunk of metal, with its two halves of cast aluminium secured by four hex-head screws. The drive is finished in gunmetal paint, although we found this could chip off in use.

The SSD inside is an older SATA Revision 2.0 type, a SanDisk Ultra 120, selected due to power restrictions. Thunderbolt's spec provides 10W but the SSD is short-changed by the high power requirements of the supporting

electronics, leaving only 3.5W available for the SSD.

The drive is quick by the standards of portable hard disks: QuickBench revealed write speeds up to 264MBps, and sequential reads up to 271MBps. The SanDisk SSD 120 takes a SandForce controller to accelerate write performance, so compressed media files will return much slower results: the CrystalDiskMark test recorded 205MBps reads and just 118MBps in sequential writes.

Elgato clearly warns against opening the case and using any other drive with the Thunderbolt SSD. With the company's agreement, we did so anyway, and experienced the expected issues. Using a Patriot Wildfire 256GB, a third-generation SATA SSD, connections became erratic as the drive was starved of sufficient peak current.



In addition to the power constrictions that deny fast SSDs, the top speed is limited by a single-lane PCI Express chip. This meant the best-case speed we saw between disconnects was 382MBps, which is well short of the 500MBps or higher capabilities of SATA 6Gbps SSDs.

### Verdict

The Elgato Thunderbolt SSD is undoubtedly a quick device, but current limitations from available electronics mean it can work only at SATA 2.0 speeds. It's not optimal for a drive that's likely to be writing media files either. Otherwise, the Elgato is solidly constructed and works well. **Andrew Harrison**

£236 inc VAT

Contact

■ [eyespy247.com](http://eyespy247.com)  
Read more  
■ [tinyurl.com/cLq3am3](http://tinyurl.com/cLq3am3)

Specification

Indoor/outdoor IP camera; infrared night vision with infrared LEDs; 802.11b/g/n; 10/100 ethernet; QuickTime/MJPEG video; 1280x720, 640x480, 320x240, 160x120 resolutions; 32MB SD card; Bi-directional audio; 103x94x37mm; 900g

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



IP CAMERA

## EyeSpy247 EXT+

PC ADVISOR  
RECOMMENDED

EyeSpy247 sells IP cameras and offers a cloud-based home and office video-monitoring system to use with them. This online service removes some of the hassle from setting up a surveillance system, as it can be used to remotely check a camera's feed, send automated email and SMS alerts and store a limited number of images and video.

The EXT+ can be used independently or in conjunction with this online portal. It's designed to function indoors or outdoors, and has a more rugged design than many IP cameras, made from a strong polycarbonate material. The supplied power and ethernet cables have a tough rubber connector that completely covers the port, leaving no electrical parts exposed. It comes with a mounting stand, too.

The bundled software is basic, with a video viewer and a simple tool to set up the camera. This tool works only in Windows; the Mac version directs you to the camera's admin page for registration and setup.

As with the EyeSpy247 HDSD ([tinyurl.com/5wuy7q2](http://tinyurl.com/5wuy7q2)), we ran into problems with the automatic registration process. We had to manually forward two ports on our router, then copy our user details on to the website. We could then view its feed, and it began sending us emails with a screen capture attached whenever it detected motion in the room.

You can create three presets for recording quality and adjust them as required. Bitrates range from 512kbps to 10Mbps, at up to 30fps, with a choice of H.264 or MJPEG encoding and Flash or QuickTime formats.

The EXT+ can record in 720p video, with three lower resolutions also available. At its highest setting video quality is clear, although audio quality is muffled – especially from a distance. Subtle infrared lights permit night-time recording, with short-range objects clearly visible, even in pitch black.

A non-removable 32GB SD card is fitted, and there's support for



uploading a stream to an FTP server or a Samba device on the network. Recordings are then triggered manually, via audio or motion detection, or at certain times of day.

EyeSpy247 gives 512MB of online storage space for £24/year (first year free) and 20MB free thereafter.

### Verdict

When used in conjunction with the online portal, the EXT+ works smoothly. A robust build should protect the internal electronics from the elements. **Orestis Bastounis**



**£79** inc VAT**Contact**

■ [apple.com/uk](http://apple.com/uk)  
 Read more  
 ■ [tinyurl.com/6Lh6oos](http://tinyurl.com/6Lh6oos)

**Specification**

Wireless dual-band router; 802.11a/b/g/n; 1x 10/100 WAN port; 1x 10/100 LAN port; USB 2.0 for printers; 3.5mm audio jack with Toslink optical out; NAT firewall; MAC address filtering; WEP; WPA 2; 802.1X/PEAP/LEAP/TLS/TLS/FAST; 2.4GHz: channels 1-13, 5GHz: 36-64 and 100-140; 98x98x23mm; 240g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



## WIRELESS ROUTER

**Apple AirPort Express****PC ADVISOR  
RECOMMENDED**

The original AirPort Express was a basic 802.11g wireless router that majored on portability. It was built into a white plastic case very much like the MacBook power charger.

Along with Apple's complete refresh of its MacBook line in June 2012 came a new-look AirPort Express. This third-generation product loses the convenience of being able to plug it directly into a mains wall socket, but gains a sleek new flat and square look.

If you've seen the latest Apple TV, the AirPort Express will look familiar - it's the exact same shape and size, only finished in virgin white rather than black.

Whereas the Mark I was limited to 802.11g, and the second device to single-band operation of either 2.4GHz or 5GHz 802.11n, the new 2012 model is capable of concurrent 2.4/5GHz 802.11n coverage.

Setup really is a breeze. Apple is the only router maker we've encountered that doesn't use a web browser to set up the device.

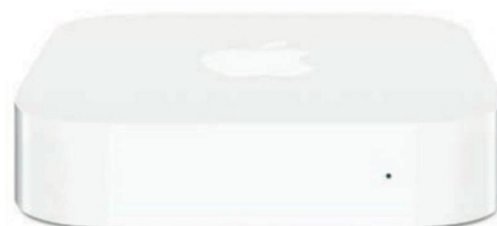
Instead, you get a dedicated app for Windows and Mac, and an iOS app will allow limited management of AirPort devices, too.

When the Express is first powered up, the AirPort Utility software automatically opens on nearby Macs. This guides you through setting up the network.

The AirPort Express remains a versatile unit: you can use it as a main router connected to an external ADSL or cable modem, leaving you with one LAN network port for direct connection to a PC, or add a network switch to expand your LAN connections.

A popular use for the Express is as a repeater to extend the wireless network. But the AirPort Express has another very useful capability as an audio-distribution system.

Using iTunes on one computer, you can send your music to an AirPort Express in another room



in the house. The system has been expanded to include AirPlay from iOS devices and Mountain Lion Macs.

As with most things Apple, the AirPort Express system works simply and reliably, with next to no technical knowledge required.

We tested the AirPort Express for performance and could comfortably transfer files at around 94Mbps using 5GHz band.

**Verdict**

The move to the new Apple TV case makes the 2012 AirPort Express cute as well as compact, while dual-band capability expands the usefulness of this easy-to-use wireless router.

✉ **Andrew Harrison**

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- VGA and 2 x HDMI input connectivity
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## WEB BROWSER

### Mozilla Firefox for Android

**PC ADVISOR  
RECOMMENDED**

**Free**

#### Contact

- mozilla.org
- Read more
- tinyurl.com/cee9z3a

#### System requirements

Google Android 2.2 or later; 17MB storage

Mozilla has updated its free Firefox web browser for Android smartphones running version 2.2 or later, claiming dramatic performance improvements from startup and page-load times to panning and zooming. We took version 14.0 of the mobile browser for a spin to verify those claims.

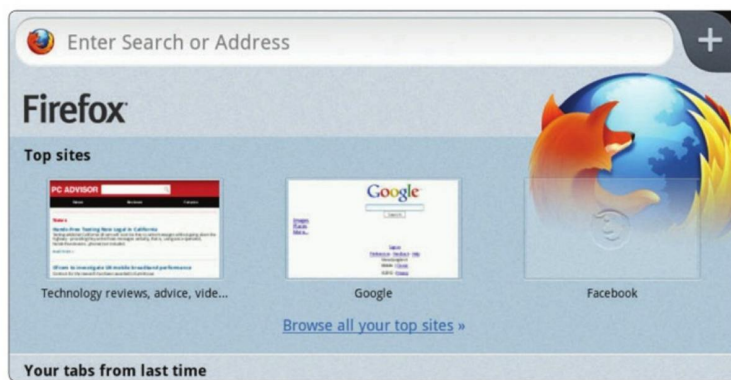
Mozilla has tough competition in the desktop browser market in the form of Google Chrome, but its latest Firefox for Android release reveals several steps the company has taken in damage limitation for when Google replaces the stock Android browser with Chrome.

#### A fresh look

First up is a redesigned user interface, now referred to as the Awesome Screen. It's fresh and good-looking, but a little busy. From here you can quickly navigate to your top sites and tabs from your previous session, access bookmarks, tabs and history through the Awesome Bar, access Firefox Sync, and install add-ons. To open a new tab you simply click the +, and we ran 14 simultaneously with no problems. The only thing missing is instant search results for sites not previously visited.

Firefox Sync is very easy to set up. Simply tap the button on the Awesome Screen, then enter into your desktop browser the code it returns. If you haven't already signed up for Sync you'll need to do so. You can specify what data should be synchronised, but only through the desktop browser's settings.

We found it took only seconds to import the 350 bookmarks, extensive browsing history and other data stored on our handset. Once configured, having this data to hand will make mobile browsing a far more familiar experience.



#### New features

The number of add-ons available to download is limited; for example, we found just one in the Experimental category and none in 'Device Features & Location'. However, the configuration process is a doddle.

Featured add-ons on the Awesome Screen include Full Screen, URL Fixer, CloudViewer and Phony; you can also access the Add-ons Manager through your smartphone's Menu key. URL Fixer is perhaps the most useful, given the difficulties some of us experience in accurate typing on a smartphone.

The mobile browser uses the same code as the desktop version of Firefox; therefore, many features found in the latter are also present here. In terms of security, Mozilla offers Do Not Track, to discourage websites keeping tabs on your whereabouts for the purposes of behavioural advertising, and Master Password, to safeguard the various other passwords you use on your Android smartphone and leave you with just a single login to remember. You can also clear your history and browsing data and disable cookies from the Settings menu.

Other features include the ability to save pages to PDF, utilise a download manager, share web pages via social media, email or send them to an offline reader app, and zoom in using pinch-to-zoom or a double-tap. The browser is also said to include smart font inflation, making it easier to read small text.

#### Fleet fox

And then there's the performance. When we first looked at Firefox for Android in August 2011, we found it sluggish. It took around 3 seconds to load on our Samsung Vibrant, and was a relatively large download at 14MB. The updated version is larger still, at 17MB, but our first impressions are much improved.

Better yet, in tests the browser loaded in less than half the time on our Sony Ericsson Xperia Arc, and websites also feel snappier in use.

In Mozilla's own documentation, it cites faster website panning performance than its predecessor. We recorded 20.5fps when panning cnn.com using a Samsung Galaxy Nexus running Android 4.0.4 Ice Cream Sandwich; its predecessor, just 10.2fps. The next closest rival, the Dolphin Browser, hit 14.2fps.

Mozilla has also measured Firefox's canvas rendering performance - using its own Eideticker Canvas Benchmark. It cites a score of 39.3fps in this test, whereas its predecessor scored 13.2fps and the next fastest browser, Opera, 21.6fps. In fact, based on these results, Mozilla says Firefox is now two times faster than the stock Android browser.

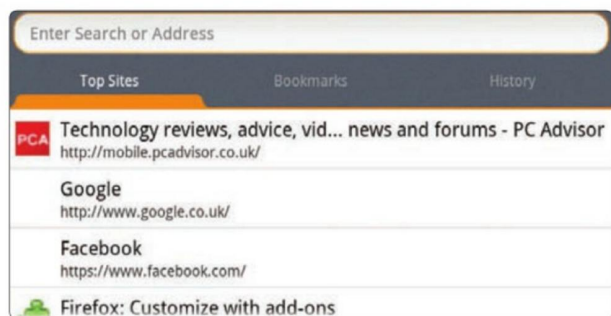
Firefox certainly feels faster than the Android browser, and we've been impressed with the apparent performance of this release, but we weren't about to take Mozilla's word for it. We used the independent SunSpider test on our own Android 2.3 handset to measure JavaScript performance; we recorded 2,880ms using Firefox 14.0, and 3,383ms using the stock browser.

Mozilla has also built into the browser Flash and HTML5 support, making the platform more appealing to web developers and opening up a range of content for playback on your Android smartphone.

#### Verdict

If you're still using the stock Android browser that came preinstalled on your smartphone, stop! Firefox for Android 14.0 is significantly faster, and comes with several useful features. Firefox Sync and Add-ons make this a strong companion to the desktop browser.

✉ Marie Brewis





## REFERENCE APP

## London 2012 Official Results App

Free

## Contact

■ london2012.com

## Read more

■ tinyurl.com/bu855as

## System requirements

Android 2.1/iOS 4.2 or

later; storage: 4.7MB

Android, 7.8MB iOS

The London 2012 Official Results App is the official app for this year's Olympics. It puts all the news, schedules and results in a single place, accessible from your iPhone, iPad or Android device.

We tried the app before the games had started, so clicking the Live button merely produced a countdown to the opening ceremony. Eventually, you'll be able to view London 2012 results, news, photos and social commentary in real time.

A second button, Schedule & Results, lets you view on a calendar any events on a particular day between 25 July and 12 August. Morning, lunchtime, afternoon and evening events are grouped by type; click on any of these to view individual events. An alarm icon adds an item to your Favourites and acts as a reminder.

Third up is Sports, which lists all the activities for which athletes will compete. Select a sport to view competitions in that category, plus news and photos (when available),

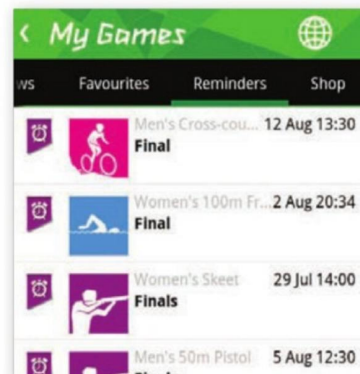


including the venue and rules for that particular competition.

Tap the star next to an event to add it to your Favourites, although we struggled to accomplish this on our Android smartphone.

A Medals button will reveal the individual winners, which can be filtered by person and sport. The Athletes section is also awaiting completion; a Featured tab offers in-depth info on top British athletes.

Finally, My Games brings up various news and medal winners for your home country. You can quickly access more details on your sports Favourites, while a Reminders tab brings up flagged events.



The Official Results app starts at bootup, which could slow startup time and performance, and increase your phone's battery drain.

Push notifications are also supported, allowing you to receive alerts with daily summaries for the top countries or your home country, plus news of any medals won.

## Verdict

This app should prove a useful tool for those wanting to follow the games, putting at their fingertips all the information they need. If you have tickets for the games, look out for the London 2012 Join In companion app. Marie Brewis



## REFERENCE APP

## BBC Olympics

Free

## Contact

■ bbc.co.uk/sport

## Read more

■ tinyurl.com/d3LbLuu

## System requirements

Smartphone running

Android 2.2/iOS 5.0 or

later; storage: 1.7MB

Android, 3.6MB iOS

As part of its pledge to broadcast 5,000 hours of London 2012 Olympic Games coverage, utilising all its digital channels, the BBC has launched an app with almost identical functionality to the London 2012 Official Results App (above).

Except this version doesn't work with the iPad or Android tablets. Neither is it available to Windows Phone or BlackBerry.

The app borrows its content from the BBC's mobile site, but adds the ability to download stories for offline reading and lets you more easily control your 3G data usage.

We weren't as impressed by BBC Olympics as we were by the official Results app, but it does offer some decent functionality.

At the top of the screen are Home and Schedule buttons, plus a link to more options. The Home screen has links to the latest Olympics news from the BBC, filtered by Team GB if you prefer. Video content is offered through its own iPlayer catch-up TV service.



The Schedule isn't as intuitive as that of the official app, but it does the job. You choose a date, then a sport, and are presented with a complete schedule for that sport throughout the entire games. It makes you wonder why you bothered to specify the date.

Several features are accessible via the options button, including a Live section. This will offer 2,500 hours of coverage, up to 24 streams of live video, and daily live text commentaries. A Medals section will also be populated as each is won.



All Sports covers all 36 Olympic activities, serving up related news stories and videos. You can't add sports to a favourites list, though.

We found the BBC Olympics app very slow to load pages on our Android Gingerbread smartphone.

## Verdict

The BBC's Olympics app is neither as intuitive nor as informative as the Official London 2012 Results App, but it is free and worth a look – particularly if you're worried about 3G data usage. Marie Brewis





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## DOCUMENT SOFTWARE

### Qoppa Software PDF Studio 7.0 Pro

**\$125 (£80)**

#### Contact

■ qoppa.com  
Read more  
■ tinyurl.com/crmskxx

#### System requirements

Intel Celeron processor or better; Windows XP/Vista/7/Server/Mac OS X (10.4 to 10.7 Lion)/Linux/Unix; Java

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★



PDF Studio 7.0 Pro is a Java-based application that lets you author, view and edit PDF files. It runs on Windows, Mac and Linux.

While Adobe Acrobat Pro sets the benchmark in this field, it's twice the price of Qoppa's offering. PDF Studio doesn't feature Acrobat Pro's 3D or video support, but all the standard PDF-handling tools are present.

You can manipulate existing PDF documents, correcting text, splitting, merging and rotating individual pages and adding headers and footers. There are the usual security features for password-protecting documents, but also some nice document-review tools, such as a loupe for magnification.

PDF Studio also features typewriter (for adding text), watermark and rubber-stamp tools, which are less sophisticated than those offered by Acrobat, but we found them quicker to apply.

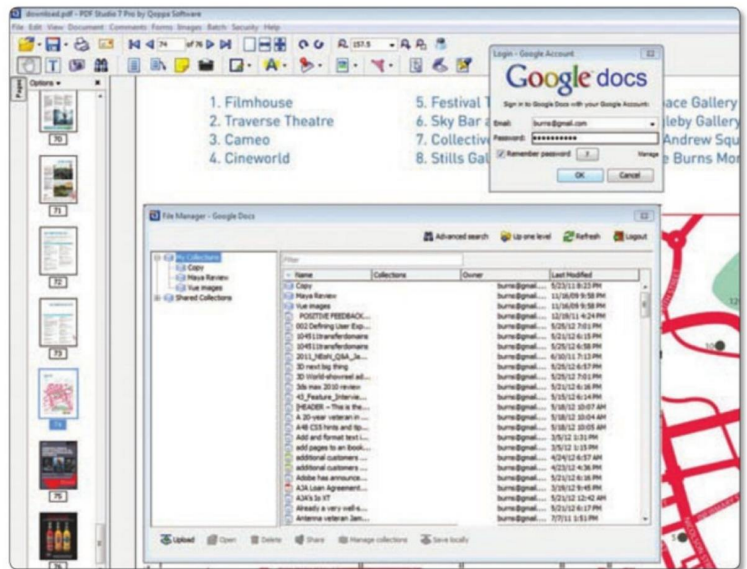
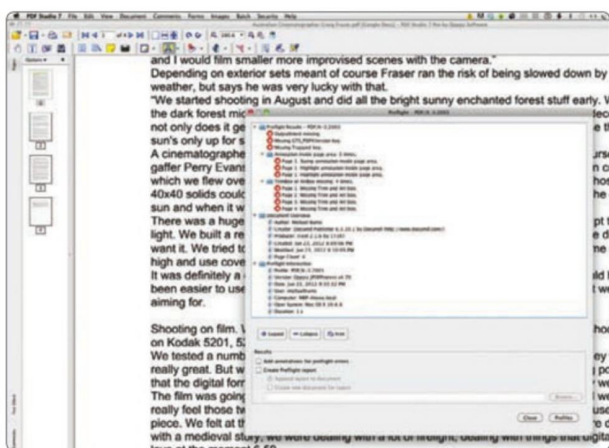
#### Scanning and sharing

Scanning to PDF is a quick and efficient process. However, you can't search the scanned text for specific words or phrases, as you can using Acrobat's Recognize Text workflow or the OCR features in more evenly priced Windows packages, such as PDF-Xchange Pro from Tracker Software, Nitro Pro 7.0, and Expert PDF 8.0 from Visagesoft.

It's worth noting that there is less competition on the Mac, with ABBYY's FineReader Express Edition and PDF OCR X being notable OCR-equipped, cheaper exceptions.

Unlike most of these, however, PDF Studio is able to sign into an Acrobat.com workspace and access the files stored therein, although the

**PREFLIGHT** lists any content in the document that is not compliant with your chosen PDF spec



**PDF STUDIO** seamlessly integrates with Acrobat.com, Docs and Sharepoint

full collaborative abilities of Acrobat Pro aren't matched.

It can do the same for Google Docs and Sharepoint accounts, allowing you to upload files, manage collections and invite other users to view the cloud-based documents. Only Nitro Pro 7.0 seems to offer something close to this facility.

#### Converting

When importing from either online or local sources, PDF Studio is able to convert several non-PDF file types into PDF documents.

The supported file types are limited, with PDF Studio listing only basic image formats, Word .doc and .docx files and standard text (.txt) files. If rich multimedia assets are important in your PDF workflow, PDF Studio won't be of interest; however, adding a sound clip via a microphone is an option when using the annotation toolbar.

Most of the rival PDF suites mentioned offer greater Microsoft Office integration, including a toolbar add-in. Qoppa hasn't followed suit.

#### Preflight

PDF Studio offers a preflight feature, which can quickly check that a PDF complies with various PDF/X standards before you send it to a printer.

Running this rapidly threw up a preflight dialog box listing

information about the file and the errors that we needed to action. It's also possible to append the Preflight report to the document for use in the pre-press workflow.

#### Signatures

PDF Studio 7.0 Pro will validate any existing digital signatures upon opening a document, but it's easy to add new, unsigned digital-signature fields with a right-click. Into this we could import existing digital IDs or create a self-signed digital ID; Qoppa Software is recognised as a trusted certificate authority.

As in Acrobat Pro, it's possible to modify the signature appearance, in our case using a graphic of a handwritten signature. The program also offers support for PDF forms, but this is limited to the export and import of form data, and the ability to reset, highlight and flatten fields.

#### Verdict

Given the tough competition, the absence of any Office integration, OCR and simple features such as an Undo command put Qoppa behind the curve. In its favour, one licence of PDF Studio 7.0 Pro can be run simultaneously on two platforms. It's also easy to use, and having a preflight facility at this price point is a bonus. Its integration and conversion with Google Docs, Sharepoint and Acrobat.com is welcome. **Michael Burns**



GENEALOGY SOFTWARE

# Family Historian 5.0

**PC ADVISOR  
RECOMMENDED**

**£35 inc VAT**

**Contact**

■ family-historian.co.uk  
Read more  
■ tinyurl.com/6uofjq6

**System requirements**

Windows XP/Vista/7/8;  
40MB drive space; DVD  
drive

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



You can add **DETAILS**  
for even the most  
complicated families

Many of us are keen to delve into the past and find out where we came from. There may not be a royal connection or a notorious rogue in your ancestry, but it's still fascinating to unearth details of forebears' lives.

The internet is great for research, but less useful for storing and managing the details uncovered. It makes sense to catalogue your findings and log how you were able to crosscheck details, though.

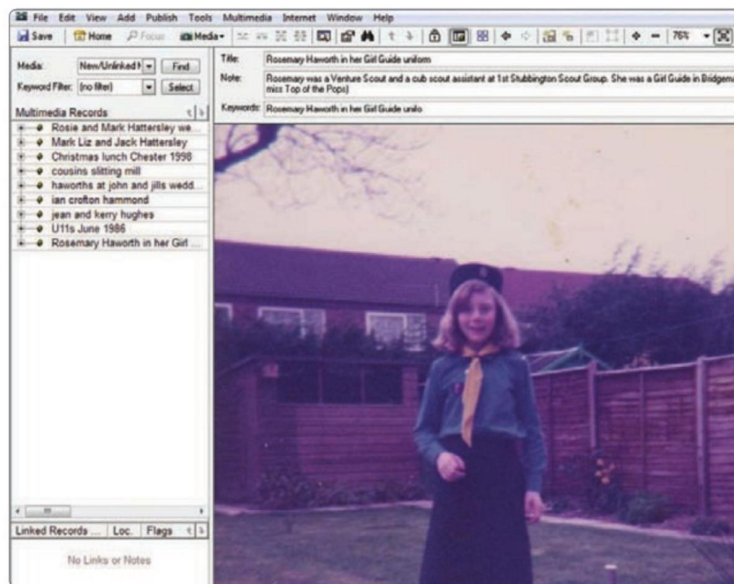
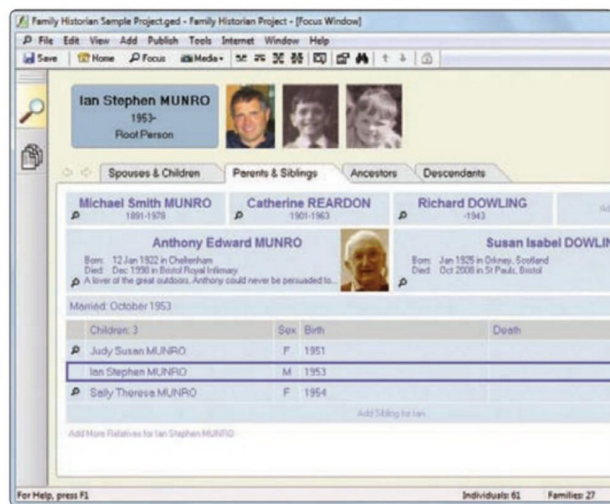
Some family-tree programs offer to present your findings on an 'antiqued' background with sepia vignettes of ancestors peering out; Family Historian instead focuses on helping you document and manage your research.

## Finding your family

If you're serious about researching and documenting your ancestry, it's one of the best options for UK users. Family Historian has a powerful database- and querying tool that helps you fill in the knowledge gaps and make useful associations.

In almost any field you can flesh out details with free text. In the sample database provided, for example, people have a one-line description of something unique about them that gives an instant flavour of what they were like.

You can build up trees of people just as quickly as with more visual genealogy programs, but you have more control over the views and associations. A useful set of shortcuts and tips is provided, as is a detailed PDF manual of how to get the most from the program.



**FAMILY HISTORIAN** makes it easy to add multimedia to your family tree

People within a tree are identified by terms such as grandparent and great-grandchild, although we found ourselves missing a sister-in-law option. People can be viewed as ancestors or descendants, or by their relationship to the 'root' member of the family tree. Family Historian also applies logic to your data, and pointed out our error in providing the same birthdate for both a father and his son.

## Multimedia

Research materials can easily be added to the database via a multimedia import screen or by adding a photo or document to a person's entry.

When importing photos, the filename is automatically included, but the image is simply listed as 'picture'. You can edit this and add detailed notes about when and where the photo was taken.

If you insert a photo directly to a person's record, adding a date automatically prompts Family Historian to list their age at the time. A face-tagging feature means people in group shots can be automatically recognised and their names suggested. Mapping is also now supported by a separate plug-in.

## Real families

Family Historian 5.0 goes to great lengths to ensure what you enter is as accurate as possible, allowing

entries for multiple marriages and sets of children from the same parents, divorce, cohabiting and same-sex relationships.

Other family-tree software we've tried wouldn't cater for some of these details, or would assume a wife took her husband's name, for example. An overview of a person's immediate family is provided in a focus window on the right of the screen, where you can add more detail about each member without changing the 'root' person and reordering the database.

When you've gathered enough detail and have photos, dates and brief biographies of a family branch, you can create a photobook by exporting the file as a booklet.

Alternatively, if you started your research in another genealogy program, you can import a Gedcom file - a popular plain-text format for family databases - and merge it with the research you add to your Family Historian database.

## Verdict

Family Historian 5.0 is a flexible program that allows you to record and confirm details of the lives of your immediate family and ancestors. Its multimedia handling, face-recognition and entry logic are real assets and help make an already impressive program even more user-friendly.

✗ Rosemary Hattersley



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E&OE. All specifications subject to change. Please check web site for current model specifications.

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## OPTIMISATION UTILITY

# Ashampoo WinOptimizer 9.0

**£30** inc VAT (1 PC)

### Contact

■ [ashampoo.com/uk](http://ashampoo.com/uk)

### Read more

■ [tinyurl.com/8ye3wbp](http://tinyurl.com/8ye3wbp)

### System requirements

Windows XP/Vista/7;  
90MB drive space

GRAB A FREE COPY  
OF ASHAMPOO  
WINOPTIMIZER 9.0  
ON OUR DVD!

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



Windows PCs can be choked by programs that don't properly uninstall, with temporary files and Registry entries often left behind. Optimisation suites such as WinOptimizer aim to clear out the redundant data and keep your PC running smoothly.

To our knowledge, no other optimisation suite offers more analysis and tuning tools than WinOptimizer. Even so, the interface is arranged in such a way that the wealth of options on offer won't be offputting to novice users.

The 29 separate modules are divided into six groups: Maintain system, Improve performance, Customize Windows, Analyse system, File tools and General. Each category encompasses both major and minor tweaks.

One-Click Optimizer, which has its own desktop icon, has three components: Internet Cleaner, Drive Cleaner and Registry Optimizer. The first clears out temporary files and cookies, the second removes temporary and redundant files from your drives, and the third finds and deletes redundant Registry entries. The tool did all the above in 33 secs on our Windows 7 machine.

But system optimisation doesn't always result in huge performance improvements. We ran three tests before and after the One-Click



**WINOPTIMIZER** provides useful tools for boosting system performance

Optimizer, and found starting up Windows took 20 percent longer following optimisation. Shut down time was a third faster, while the Norton 360 scan time was constant.

Some of the suite's other tools, such as its ability to alter what programs load with Windows, will affect the startup time, of course.

Other modules that caught our eye include Process Manager, Tuning Assistant and System Benchmark.

Process Manager offers more information than Windows' Task Manager, and helpfully includes the source of each process.

Tuning Assistant makes recommendations for altering your Windows configuration, such as allowing hibernation, removing administrative network shares and changing the polling rate on USB

ports from every millisecond to every five milliseconds.

System Benchmark performs a number of speed tests and returns scores that can tell you whether the machine is slowing down over time.

Some suites simply link to Windows' own disk defragmenter tool, process controller and other tools; WinOptimizer provides its own. Its defragmenter, for example, is quick, apparently thorough and shows a useful display as it works.

All optimisation duties can be scheduled using the Taskplaner (sic).

## Verdict

WinOptimizer 9.0 is a comprehensive suite of useful optimisation utilities. Our performance improvements were small, but your experience may be different. **Simon Williams**

## SECURITY SOFTWARE

# Bitdefender Antivirus Plus 2013

**£25** inc VAT (1 PC, 1 yr)

### Contact

■ [bitdefender.co.uk](http://bitdefender.co.uk)

### Read more

■ [tinyurl.com/bscugbL](http://tinyurl.com/bscugbL)

### System requirements

800MHz processor;  
Windows XP/Vista/7/8;  
1GB RAM; 1.8GB storage

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



Bitdefender's 2013 security product is available in several incarnations, from Total Security, down through Internet Security, to the subject of this review: Antivirus Plus. You can choose the number of PCs you want to protect: one, three, five or 10.

This is a lovely piece of software to use, with its well-designed black-and-grey control panel and a Windows Vista/7/8 widget that shows scan and update activity, as well as any security events and current security status. You can also drag-and-drop files on to the widget for a simple file scan. (Of course, Microsoft is now warning against the use of Gadgets due to security vulnerabilities in Windows.)

The main control panel has four sub-panels: Antivirus, Privacy, Update and Safego. Antivirus includes a switch to enable auto-scanning, which can be scheduled as required, and can start quick, full, custom and vulnerability scans.

Privacy offers anti-phishing software and a secure file shredder, while Update specifies when the program should check for new virus definitions and software updates.

Safego is designed to make social networking safer, by checking links on Facebook and Twitter before you can click on them.

In an effort to prevent hacking, Bitdefender offers Safepay as a separate icon on the desktop. This

opens banking pages in a secure browser. Bookmarks can be entered into the utility, so it recognises when you're about to make a transaction.

AV-Test has yet to examine Bitdefender's 2013 antivirus engine, but it awarded the 2012 product 17/18 - the highest score it has awarded this year.

That version scored full marks for protection against malware and for the repair of damaged systems, but lost a point in usability. It was slightly below average in terms of its hit on system performance, but better than most in avoiding false positives.

From our own tests, it seems extra work has been put into the performance aspects of the program.



## BACKUP UTILITY

## Novosoft Handy Backup 7.0

**\$39 (£25)****Contact**■ [novosoft.net](http://novosoft.net)**Read more**■ [tinyurl.com/bnLaa9d](http://tinyurl.com/bnLaa9d)**System requirements**

Windows 2000/XP/  
Vista/7; 256MB RAM;  
14MB drive space

Usability: ★★☆☆☆

Features: ★★☆☆☆

Value: ★★☆☆☆



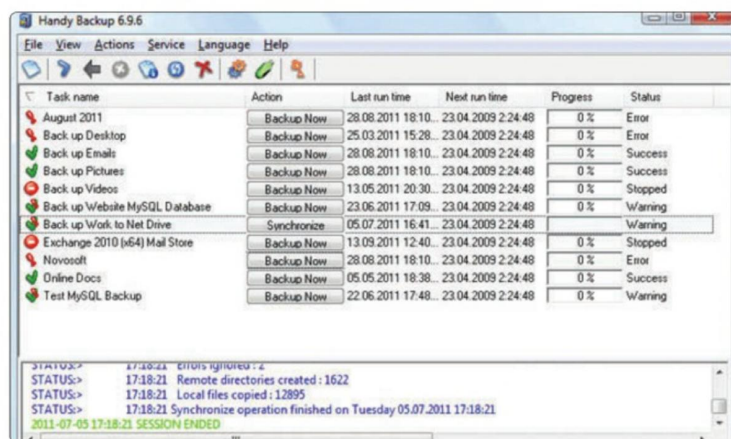
Handy Backup 7.0 is potentially useful for those who want to create a quick, serviceable file backup from which they can recover their PC or laptop. It can back up to internal and external hard drives, CDs, DVDs and network drives.

According to the Novosoft site, database backup and drive-image backup are the product's two headline features. In fact, neither are available in the Home Standard version. By comparison, Acronis True Image offers both features in its £25 Home version.

Oddly, database and disk images are displayed within the program as objects you can back up. If you select to back up a disk image, the program doesn't inform you that the feature is unavailable because you haven't paid for the appropriate version; rather, it says you need to run the program as administrator, even when you're already doing so. It's all rather confusing.

On first run, Handy Backup presents a wizard to guide you in setting up a general-purpose backup. The first step offers backup, restore or synchronise tasks, and the second enables you to select the objects you can backup. Choose Computer if you want to select specific drives, folders or files.

Next is backup destination, followed by the choice of full,



**HANDY BACKUP 7.0** has its uses, but far too many annoying glitches

incremental or differential backup. Finally, there's an option for zip compression and 128bit encryption.

A scheduler is also available, enabling you to configure automated backups at predefined times.

On our second day of using the program, Handy Backup launched in a miniature window. We could open the program to full screen, but not to its original window size.

The main screen shows the file categories being backed up and a scrolling history pane that indicates what the program is currently doing.

Handy Backup took 27 mins to back up 50GB of files between two hard drives on a Windows 7 PC. That's a respectable time.

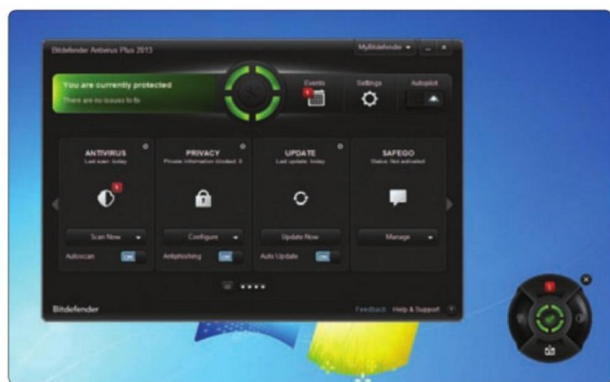
We were less impressed when we added zip compression to the backup, though, and the program

repeatedly produced an empty zip file. We thought we'd got it working on a second PC, but it took a couple of hours to produce a 6GB zip file that both Windows and 7Zip claimed was corrupt and from which Handy Backup couldn't restore.

A repeat test showed the same result. It looks as though Novosoft needs to do some more work on its compression routine.

**Verdict**

Handy Backup is effective at a variety of backup tasks, but it's full of worrying glitches, it isn't the easiest of programs to set up and use, and it's designed for those with some technical expertise. While there's a useful setup wizard, this is still a seven-step process. Look to Acronis instead. **Simon Williams**



**BITDEFENDER** is very thorough in its scans, if a little slow

It took 41 seconds to complete a 1GB file transfer with Bitdefender's background processes running, but still only 43 secs when a full system scan was running in the background.

Our 50GB file scan, in which Bitdefender reportedly scanned 76,689 files, took 29 mins 16 secs to complete. This translates to a 45-files-per-second scan rate; we've certainly seen faster security suites.

Interestingly, when pitted against the same 50GB file basket, the older Bitdefender Total Security 2012 checked 98,483 files in 19 mins 39 secs. That test was run under Windows XP, while this was under Windows 7, but that doesn't account for the lower number of files checked, nor the slower speed.

The Auto-Pilot facility works well, and we saw very few pop-ups of the 'xyz is trying to access the internet; what should I do?' variety.

Getting the balance right between this kind of annoyance and satisfactory protection is very important, and Bitdefender looks to have done a good job with Antivirus Plus 2013.

**Verdict**

Bitdefender Antivirus Plus 2013 is a great piece of software to use, and one that should work well in terms of protection, repair and system impact. It can be a set-it-and-forget-it solution if that's what you need, or you can tweak most settings on demand. It offers good value if you have two or three PCs, but is a bit expensive for protecting a single machine. **Simon Williams**



GAME

## Lego Batman 2: DC Superheroes

£19 inc VAT

Contact

■ [videogames.lego.com](http://videogames.lego.com)

Read more

■ [tinyurl.com/coqnopr](http://tinyurl.com/coqnopr)

System requirements

2GHz processor;  
Windows XP/Vista/7;  
1GB RAM; 10GB drive  
space; ATI 1950/nVidia  
7600 or better

It's no coincidence that Lego Batman 2 (LB2) arrived just ahead of The Dark Knight Rises' inevitable stranglehold on the box office. But you'd struggle to imagine two more opposed interpretations of Batman. While the film is all portentous glowering, apocalypse and threatening soliloquies, this is a joyfully manic cartoon caper.

In the vein of previous Lego games (Star Wars, Harry Potter, Indiana Jones), the only surprise is full dialogue instead of wordless gobbledegook. LB2 doesn't rest on its laurels, ramping up presentation and scale without sacrificing the series' hallmark gonzo humour and family-friendly challenges.

Calling it Lego Batman is a misnomer - this is really the DC Comics pantheon playing together in an absurdist marathon of destruction and construction.

While Wonder Woman and Green Lantern get time in the spotlight, Superman is the most prominent cast addition - adding a mile-wide



**LEGO BATMAN 2: DC SUPERHEROES** is a joyfully manic cartoon caper

smug streak and snarkily passive-aggressive relationship with Batman.

The game isn't reverential, distilling DC characters to their core essence: Batman is grumpy; Superman is vain; Robin is desperate for attention; and the Joker's just amusing himself.

LB2 is a mixture of simple action and lateral-thinking puzzles, with shared-screen two-player in mind. It's playful throughout, and much more about the joy of what happens

next than the frustration of figuring out how to do it.

The levels can run a little long, with few save points, but it's hard to begrudge that of a game that keeps throwing new gags and supervillains at this hitrate.

### Verdict

Neither breaking with convention nor resting on its Lego laurels, this is a massively endearing celebration of Batman for all ages. **Alec Meer**

### OVERALL



iPHONE/iPAD GAME

## Batman Dark Knight Rises

£4.99 inc VAT

Contact

■ [itunes.apple.com](http://itunes.apple.com)

Read more

■ [tinyurl.com/c8vtaw7](http://tinyurl.com/c8vtaw7)

System requirements

iPhone/iPod touch/iPad;  
iOS 4.0 or later; 819MB  
storage

Gamers will be pleased to hear that Batman Dark Knight Rises for iOS has more than a passing nod to the videogame classics Arkham Asylum and Arkham City. This is by no means a bad thing, since both are highly acclaimed sandbox adventures with solid fisticuff action.

Gameloft has done a good job here. Both Batman and Gotham are rendered in superb detail. A virtual stick and onscreen buttons control Batman, while moving a finger around onscreen adjusts the camera.

The Jump and Punch buttons are almost always on display. Either a Grapple (which enables you to hook on to nearby buildings and zoom up) or Glide (which enables you to launch from a building and glide to earth) appear when needed. Tap the top-right icon to open up a menu with all Batman's gadgets.

Fighting is mostly a case of running up to the bad guys and tapping the Punch button, with Jump acting as a diving escape. It lacks the finesse of Arkham Asylum.



**BATMAN DARK KNIGHT RISES** has the look and feel of console titles

In particular, you can't use multiple gadgets to fight with ease, and it doesn't have the finely tuned countering system of its console equivalent. But it's an entertaining game to play nonetheless.

Between the exploration and fighting are puzzle elements to be solved, and vehicle sections that serve as a diversion.

Gameloft has steadily made a name for itself in the world of iOS

gaming - not necessarily with the most original titles, but by turning around products that reproduce much of the quality of Xbox and PS3 titles, without the £40 price tag.

### Verdict

While Batman Dark Knight Rises has the look and feel of the similar console titles, it lacks the depth. But hey, it's Batman for £4.99!

**Mark Hattersley**

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#### Contact

■ [canon.co.uk](http://canon.co.uk)  
Read more  
■ [tinyurl.com/77f6q4w](http://tinyurl.com/77f6q4w)

#### Specification

Printer, scanner, copier, fax; 9600x2400dpi; quoted print speed: B=12.5ppm, C=9.3ppm; actual print speed: B=12.7ppm, C=5.9ppm; 2400x4800dpi scanner resolution; USB 2.0; 802.11b/g/n; ethernet; memory card slot; 150-sheet input tray; 2.4in screen; 35-sheet ADF; toner costs: B= £21 (combined), C=£8.33 x 3; print life (pages): B=340, C=514; 2-year warranty; 491x448x218mm; 11.7kg

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



## PRINTER

### Canon Pixma MX715

The Canon Pixma MX715 follows the MX515 multifunction inkjet, a faster yet much cheaper printer. It looks very similar to its older sibling, with a chunky chassis and a battery of buttons for accessing the scanner, copier and fax facilities.

Extra girth is added by the automatic document feeder (ADF) – at 35 sheets, it offers an extra five pages over the MX515. The control panel is also vast, with the available options appropriate to the current working mode. There's a full numeric keypad for faxing, for example.

The 2.4in colour screen is attractive, although touchscreen control would have been welcome.

The paper feeds have been bolstered, with the MX515's single 100-sheet input replaced with two 150-sheet feeders. You can load it from the front or in through a back door. The latter isn't the most secure option, and the paper holder wasn't as robust as we'd have liked. Nonetheless, we found the multiple feed options to be a useful addition.

The MX715 feels very roomy, and the output tray is rather more substantial than that of the MX515.

Connectivity options cover 802.11b/g/n and wired ethernet. Like many a 2012 model, the MX715 can be hooked up to an iPhone,

iPad, a variety of Android devices or a PlayStation. Bluetooth is available as an option, and the MX715 also supports PictBridge and Apple AirPrint.

The MX715 works well as a scanner, and we found very decent colour fidelity for a sub-£200 model.

Interestingly, the Canon's real-world print speed exceeded the manufacturer's estimates. It knocked out copy in the fast and normal modes at 12.7- and 8.9 pages per minute (ppm) respectively. Canon specifies 12.5ppm in fast mode and, while the difference isn't great, its honesty is appreciated.

The text quality is improved over that of the MX515, too. Text isn't the cleanest in normal mode, but it's thick and easy to read.

The auto duplexing is poor, though, and cut the speed to a mere 4.9ppm in fast mode. That's slow enough to deter many users from regularly using the feature.

The graphics speeds of 5.9- and 3.2ppm in the fast and normal modes demonstrate a much faster pace than that of which the MX515 is capable. The results are satisfactory, if a touch light in the palette. We'd



like to see more fizz here, although the results are great when used with photographic paper.

The MX715 uses five cartridges, two of which are black. We estimate a page of text to cost around 3.1p, while the MX715 falls slightly behind the MX515 in colour running costs; at 4.9p per page it still offers reasonable value, though.

The cartridges produce good colour, and these prices are modest compared to many inkjets.

#### Verdict

The Canon Pixma MX715 is a bigger and better version of the MX515. The flexible control panel is good, and paper handling has been improved. Text output is stronger, too, although we aren't as impressed with the Canon's print quality on normal paper. The auto duplexing was also disappointingly slow. The MX715 is heavily featured, and will prove a decent buy should its price drop a little. **Robin Morris**

## SCANNER

### Brother ADS-2100

The Brother ADS-2100 is one of the more rugged document scanners we've seen. Resembling a small inkjet, its brushed black finish makes for a nice change over the dull greys that usually dominate such models.

The paper holder and output tray can slide in and out although, even at its most compact, the Brother's 299x220mm footprint is relatively sizeable for such a device.

The extra heft goes to good use, though, and the trays feel tough and durable, even if they don't stretch out far enough to be sure of catching all the paper.

The input and output capacities are both rated at 50 sheets, an assessment with which we'd tend to

agree. The device has a daily duty cycle of 500 sheets; it isn't intended to be a heavy-duty model, but it can certainly cope with a good number of bundles each day and would be ideal for a small- or medium-size business.

The ADS-2100's control panel has just three buttons and two lights. There are dedicated controls for cancelling a scan and invoking one-touch scanning, while a third button lends access to one of the Brother's more cunning features: direct scanning to a USB drive.

Rather than sending the results to a connected PC, you can simply download them on to a USB drive and copy them to a PC later.

The Brother aims for versatility all round. A special carrier sheet adds support for A3 documents. By folding the A3 document in half and placing it in the carrier sheet, the Brother can scan both sides at once and combine them into one complete document.

The software bundle is pulled together by the Brother Control Center. It isn't the most user-friendly of software interfaces, although there are plenty of options and the interface is highly customisable.

Other programs include Nuance PDF Converter and PaperPort 12.0 SE, as well as the NewSoft Presto Biz Card application. These are solid programs, although they

**£294** ex VAT  
**£353** inc VAT

#### Contact

■ [brother.co.uk](http://brother.co.uk)  
Read more  
■ [tinyurl.com/7krwxj0](http://tinyurl.com/7krwxj0)

#### Specification

A4 desktop sheet-fed scanner; 600dpi; 24bit colour; colour duplex; 50-sheet feeder; USB 2.0; 299x220x179mm; 3.3kg

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





**£162** ex VAT  
**£195** inc VAT

#### Contact

■ [xerox.co.uk](http://xerox.co.uk)  
Read more  
■ [tinyurl.com/7kjq3vn](http://tinyurl.com/7kjq3vn)

#### System requirements

A4 sheetfed scanner;  
300dpi; 24bit colour;  
single-sheet feeder;  
4GB Eye-Fi card;  
802.11b/g/n; USB 2.0;  
mobile device  
compatibility; battery  
lasts 300 scans;  
70x293x51mm; 638g

## SCANNER

### Xerox Mobile Scanner

The Xerox Mobile Scanner is rather more special than your usual grey lump of scanning plastic. Its sculpted exterior lets it stand out from the crowd and, at 638g, it's a good deal lighter than the likes of the Canon DR-C125 and DR-M160, too. More significantly, the Xerox offers a few extra features that make it portable in a way its rivals aren't.

The battery-operated Xerox can be used in almost any situation, all without a PC. It's rated for 300 scans, which is plenty of scanning time before the juice runs dry.

A 4GB Eye-Fi card is included. This neat device doubles as both storage card and 802.11b/g/n Wi-Fi adaptor, allowing you to connect to a PC via a wireless network. In Direct Mode you can wirelessly connect the Xerox to a laptop even if you don't have an available network.

This being the age of cloud computing, Xerox is keen to allow you to send your files through the ether, and you can wirelessly divert scans to sites such as Evernote, Picasa, Shutterfly or Facebook. The device can also communicate with most mobile devices, and an Airplane Mode button allows you to switch off the Wi-Fi radio.

For traditionalists, or those looking for the most reliable

connection, the Xerox can be hooked up with a USB cable. We found the Wi-Fi erratic in our tests.

The trade-off for portability and connectivity is an absence of features such as an ADF. You must insert one page at a time, which makes working with large documents a chore.

A button on the scanner lets you cycle through different output formats, and the process of feeding in pages is convenient. Insert a new page within a few seconds of the previous one, and the Xerox will automatically add each page to the existing document, rather than create separate files. High-volume users should look elsewhere, though.

The software bundle is well designed. Nuance's PaperPort takes care of the general organisation, while the excellent OmniPage Pro 17.0 works very well for OCR.

The Xerox works best as a text scanner. Its 300dpi resolution is limited for detailed graphics, although it should prove sufficient for web-destined content.

As a text scanner, the Xerox is extremely adept, and it turned most of our test documents into PDFs



without problems. Business cards were accurately reproduced, too.

Xerox's speed claims held up well in our tests. It claims the Mobile Scanner requires 10 seconds per page, and we found sheets took no more than 11 secs over USB 2.0.

If you want to take advantage of the wireless, you can expect it to take almost a minute to complete a scan. We preferred to stick with USB even when a wireless connection was available.

#### Verdict

Most users will find the Xerox Mobile Scanner's wireless too slow to use on a regular basis, although there may be times at which it comes in handy. If you have only the odd document to scan, the portable Xerox should prove an attractive and convenient product. Hunt it down online and you may well be able to improve on our quoted price of £162.

✉ Robin Morris

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



don't surpass the selection provided with some cheaper models.

At low levels, the Brother worked reasonably swiftly. In 300dpi mode, it turned a bundle of 10 double-sided black-and-white sheets of text into

a searchable PDF at 38.7 pages per minute (ppm). This dropped to a still impressive 15.8ppm at 600dpi.

But the Brother struggled with colour-magazine articles; another bundle of 10 double-sided sheets saw the speed drop to 25.5ppm at 300dpi, but just 4ppm at 600dpi.

It's questionable whether you would want to frequently use this scanner for high-resolution work. The performance is impressive at 300dpi, where the quality is generally very acceptable. We didn't spot many mistakes, although the Brother's output isn't always entirely accurate.

Colour images are adequately reproduced by the Brother, even if

the colour isn't especially sharp or sparkling.

The Brother was noisy at the lower resolution levels, adding more than 20dB to the room noise. This may not be a problem in an office, although it could be annoying if the scanner was close to your desk.

#### Verdict

As a 300dpi scanner, the Brother works reasonably well. It has some neat features hidden away, and its scanning speed at 300dpi is good. The quality isn't the best available but, as a robust - if noisy - addition to the office, the Brother would make an acceptable purchase.

✉ Robin Morris



**£699** ex VAT  
**£838** inc VAT

#### Contact

■ [dell.co.uk](http://dell.co.uk)  
Read more  
■ [tinyurl.com/dxvawrg](http://tinyurl.com/dxvawrg)

#### Specification

A4 Colour laser printer/  
copier/scanner/fax;  
600x600 print; 600x600  
copy; 1200x1200 scan;  
4.3in colour touchscreen;  
claimed print speed:  
B=35ppm, C=35ppm,  
duplex=23ppm; 80,000-  
page monthly duty cycle;  
four colour tanks; USB  
2.0; ethernet; wireless  
port (for optional dongle);  
Android direct printing;  
558x439x530mm; 32.6kg

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



#### PRINTER

### Dell C3765dnf

Medium- and large-size businesses would do well to consider Dell's C3765dnf multifunction printer if production speed is a priority.

Although it weighs a chunky 32.6kg, the Dell is relatively compact at 558x439x530mm. Styled in chic black, the only burst of colour comes from its 4.3in LCD touchscreen.

This display is bright and clear, offering separate menus for copy, fax, print and scan modes. There are dedicated buttons for Job Status and Power Saver, plus a full number pad. A USB port below lets you plug in a flash drive to directly print PDF, JPEG and TIFF files.

Plenty of other print options are available: Dell has included a 50-sheet duplex automatic document feeder on the unit's top, concealed a 150-sheet multipurpose feeder behind the drop-down front panel, and placed a 550-sheet paper tray at the bottom. A second paper tray can be added if required.

Round the back of the machine are connectors for phone and

power, a USB port and an ethernet connection. You can also make use of wireless connectivity, but you'll need to separately purchase Dell's Wireless Adaptor plus hard drive kit (£177) to link this printer with your router.

It's rare for a manufacturer's claimed print speeds to be consistently accurate, but Dell's estimates of 35 pages per minute (ppm) for both black text and colour documents proved to be spot-on in tests.

The same was true for duplex prints, which hurtled out at the specified 23ppm. Print quality with the C3765dnf was exceptionally high in mono, although colour prints had a distinctly reddish hue.

The four toner cartridges (cyan, magenta, yellow and black), which slide in easily from the front, come in three yield sizes: Standard (3,000 pages, £49 black, £96 colour); High Capacity (£79 black, 7,000 pages; £128 colour, 5,000 pages) and Extra High Capacity (£92 black, 11,000



pages; £160 colour, 9,000 pages). This translates to impressively low running costs, although the base cost of the C3765dnf is considerably more than, say, the HP LaserJet Pro 400 Color MFP M475dw (reviewed at [tinyurl.com/bpxzfhh](http://tinyurl.com/bpxzfhh)).

#### Verdict

Dell's C3765dnf scores high on print speed and quality, but those requiring wireless connectivity will find it an expensive option.

✉ Martyn Clayden

**£45** ex VAT  
**£54** inc VAT

#### Contact

■ [brother.co.uk](http://brother.co.uk)  
Read more  
■ [tinyurl.com/79m5p9h](http://tinyurl.com/79m5p9h)

#### Specification

Colour inkjet printer/  
copier/scanner; 32MB  
memory; 6000x1200dpi  
max print resolution;  
1200x2400dpi maximum  
scanner resolution;  
quoted print speed:  
33ppm (mono), 27ppm  
(colour); 4 individual  
colour tank printer;  
A4 max document size;  
USB 2.0; 802.11b/g/n;  
390x360x150mm; 6.8kg

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



#### PRINTER

### Brother DCP-J140W

Brother's DCP-J140W inkjet printer is its cheapest wireless all-in-one to date, targeted squarely at small-business and home-office users working to a tight budget. It offers print, scan and copy modes, but there's no fax capability.

It has a rather compact design at 390x360x150mm, yet still weighs in at a solid 6.8kg. A textured finish to the scanner cover masks Brother's attempts to jazz up the otherwise entirely matt black casing.

Available for just £45 ex VAT, we found plenty of evidence of cost-cutting in the Brother's spec. In place of a touchscreen is a 16-character, one-line LCD with no backlighting, for example.

In the base is a relatively flimsy 100-sheet A4 feeder tray, and a USB port (for connection with the PC) is found below the scanner. There are no memory card slots, PictBridge or ethernet connections, yet the Brother DCP-J140W does offer easy-to-configure wireless connectivity. There's also an

iPrint&Scan mobile app for printing from a smartphone.

We found mixed results in our tests. In the printer's standard mode, our test document comprising text and colour graphics dawdled out at 5 pages per minute (ppm), albeit with bold lettering and strong colours.

Draft mode is much faster - 17ppm in our tests - if still some way off Brother's performance claims. The trade-off is grainy text and washed-out colours. Fast-mode A4 colour photos zapped out in 1 minute 30 seconds, but display a notable red tinge. Meanwhile, fine-quality A4 prints took 3 mins 50 secs and offer authentic tones and good detail.

We found 10x15cm prints generally took around 30 secs to output, and are of consistently good quality. Copies of A4 photos emerge with only slightly paler hues than the originals.



The Brother requires four individual ink tanks, with running costs typical at around 4.2p for a page of text and 12p for colour. Despite this and its low asking price, however, the DCP-J140W offers only average value for money in the face of less expensive and more fully featured multifunction printers such as the Epson Stylus SX445W.

#### Verdict

This cheap all-in-one offers wireless support and decent print quality for documents and photos. Sluggish speeds and a dearth of features are less welcome. ✉ Martyn Clayden



£232 ex VAT  
£279 inc VAT

#### Contact

■ [istorage-uk.com](http://istorage-uk.com)  
Read more  
■ [tinyurl.com/bmgksvy](http://tinyurl.com/bmgksvy)

#### Specification

External desktop hard drive; data encryption with 0-9 numberpad; AES-256 encryption; USB 3.0 Type B port; 12V DC power inlet; 12V DC power plug; Kensington lock slot; 183x112x40mm; 1.18kg

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



#### EXTERNAL DRIVE

### iStorage diskAshur DT 3TB

**PC ADVISOR  
RECOMMENDED**



The iStorage diskAshur DT 3TB is a high-capacity desktop drive with hardware encryption, locked down using a number keypad.

A 3.5in desktop SATA disk is not only faster than a 2.5in laptop drive, but it lets you break the 1TB ceiling of such models. iStorage offers 1TB, 2TB and 3TB capacities.

Disadvantages include size, weight and power. Whereas a portable 2.5in drive will weigh around 200g, the diskAshur is more brick-like in its dimensions and weight. It also has a 158g PSU.

Number keypads are a fitting way to lock down encrypted hard drives. In contrast to software-based solutions, they have better longevity in the field and can be more secure.

Encryption is through a hardware chip, with passcodes entered only through the drive's keypad. This reduces the likelihood that your code can be recorded and your drive and data hacked.

The diskAshur DT can be easy to use. The Quick Start instructions

cover the creation of a single admin PIN code; delve deeper and you'll find separate user- and self-destruct codes, plus auto-timeout locks. All are accessible through arcane key presses and signalled with an array of flashing LEDs.

The unit is very well constructed from extruded aluminium, and finished with a tough-feeling black paint. A perforated front plate allows ventilation; no fan is present.

The buttons are rubber-topped and have a confident click action. A telephone-style keypad adds letters to help you construct a PIN based on a memorable word or phrase.

Data connection is through a USB 3.0 Type B port, and a Kensington lock slot provides security against casual theft.

We tested the 3TB version and recorded superb read/write performance. In the Blackmagic Disk Speed test, sequential read speeds hit 140MB per second (MBps), with writes of 150MBps. QuickBench

showed similar large-file results, peaking at 155MBps reads with 4MB files, and 158MBps writes with 2MB files. Averaged across the 2- to 10MB range, read/writes measured 143- and 149MBps respectively.

Down at the small file level, sequential read/writes averaged 100- and 104MBps, while random read/writes hit 24- and 45MBps.

#### Verdict

The diskAshur DT comes highly recommended as static secure storage with huge capacity. Its easy-to-operate locking mechanism keeps data safe under AES-256 lock and key. **Andrew Harrison**

#### Free

#### Contact

■ [radmin.com](http://radmin.com)  
Read more  
■ [tinyurl.com/c932pc2](http://tinyurl.com/c932pc2)

#### Specification

Windows PC

Usability: ★★★★★  
Features: ★★★★★



#### NETWORK UTILITY

### Famatech Advanced IP Scanner 2.2

Advanced IP Scanner is a potentially useful free Windows network scanner.

The program can display the IP addresses of all connected devices on a local network. It aims to locate all the computers on your wired or wireless local network, and scan their ports.

Advanced IP Scanner promises easy access to resources such as HTTP, HTTPS, FTP and shared folders, as well to detect all wireless devices. It's designed to work with Famatech's Radmin remote-desktop software, too.

In terms of sophistication, this is no Nmap port scanner or Wireshark packet analyser, but it does provide a simple and basic overview of what's connected to your network.

When we tested it on our office subnet, we could see several hundred connected Windows and Mac computers, as well as network printers and switches.

In the case of Windows PCs, the program can see some additional information about the client, such

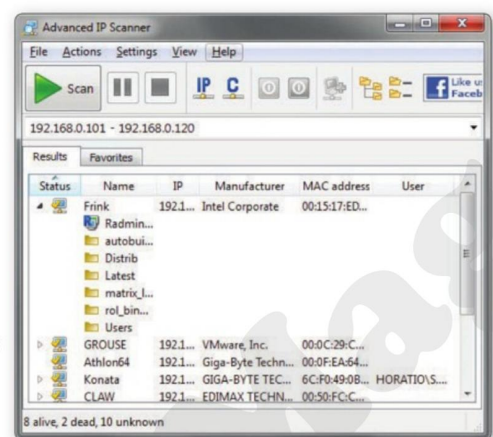
as its NetBios name and group. And if you're already using Radmin, right-clicking on a machine gives you a shortcut to commands such as Full Control, View Only, Shutdown and Text Message.

For Macs, you can view only the MAC address of the active NIC; in some cases we also saw Public folder shares.

We tried the Shutdown PC command.

This proved successful on the Windows virtual machine hosting the program, but we couldn't get it to work on a real Windows laptop, even after authentication.

A facility to Expand All/Collapse All entries is handy for seeing additional services, such as a router's HTTP admin web interface. Double-click the entry and Advanced IP Scanner opens that page in a new browser window.



#### Verdict

Unless you run an all-Microsoft shop with suitably configured Windows PCs, Advanced IP Scanner has limited reach. But it could prove useful in Windows environments, especially when Famatech Radmin is already part of the sysadmin's toolkit. As a free Windows app it provides simple but useful basic feedback about your network landscape. **Andrew Harrison**



We round up six rather different laptops with one thing in common: Intel Ivy Bridge, the greatest CPU series ever made

Contributors: Stephanie Andrews, Andrew Harrison, Chris Martin

**S**ometimes we group laptops by price; other times by usage category. This issue, the common denominator is the processor series: Intel's third generation of Core chips, better known as Ivy Bridge.

Internally, Intel characterises its annual evolution of products as either tick or tock - that is a die-shrink tick, such as moving from 45- to 32-nanometre (nm) transistors, or a microarchitecture tock, such as the change from Core 2 Duo to Core i5.

With Ivy Bridge Intel has retained the Core microarchitecture introduced with its 2008 Nehalem series, but shrunk last year's 32nm Sandy Bridge chips to 22nm. As crucial to this revision is a new Tri-gate '3-D' transistor that helps reduce power consumption.

The main processor sees some lift in performance per clock, which translates to better application performance at the same gigahertz rating. But the bigger step-up is in the integrated graphics processor, which makes a stronger case for doing without a discrete graphics chip and relying solely on this facility for onscreen action. Inspired by the larger graphics improvement over Sandy Bridge, Intel refers to this upgrade as 'Tick-Plus'.

## Core facts

The first Ivy Bridge mobile CPUs released by Intel were quad-core designs, clocked between 2.1GHz (the 3612QM) and 2.9GHz (the 3920XM). You can usually spot these quad-cores by their 'QM' suffix.

Quad-core processors are the most capable, and doubly so when you consider the effect of Hyper-Threading. This lets recent software operate as if it was running on an eight-core processor. The Intel parts we've tested here are the middle-order Core i7 chips running at 2.3GHz (3615QM) and 2.6GHz (3720QM). An added speed boost is provided by Turbo mode, which allows short-term auto-overclocking on a single core to 3.3GHz and 3.6GHz respectively.

The down side of these chips is higher power consumption and greater heat output. But even with their 45W thermal design power (TDP) we're finding comparatively cooler and longer-running laptops than last year's already impressive Sandy Bridge generation.

For the thin-and-light brigade, very low battery drain and minimal surplus heat are paramount. Filling that need for ultraportables are Core i5 processors with a U suffix (for ultra-low voltage), such as the 1.7GHz 3317U. This is the processor chosen by Apple for its MacBook

Air and Samsung for its Series 9.

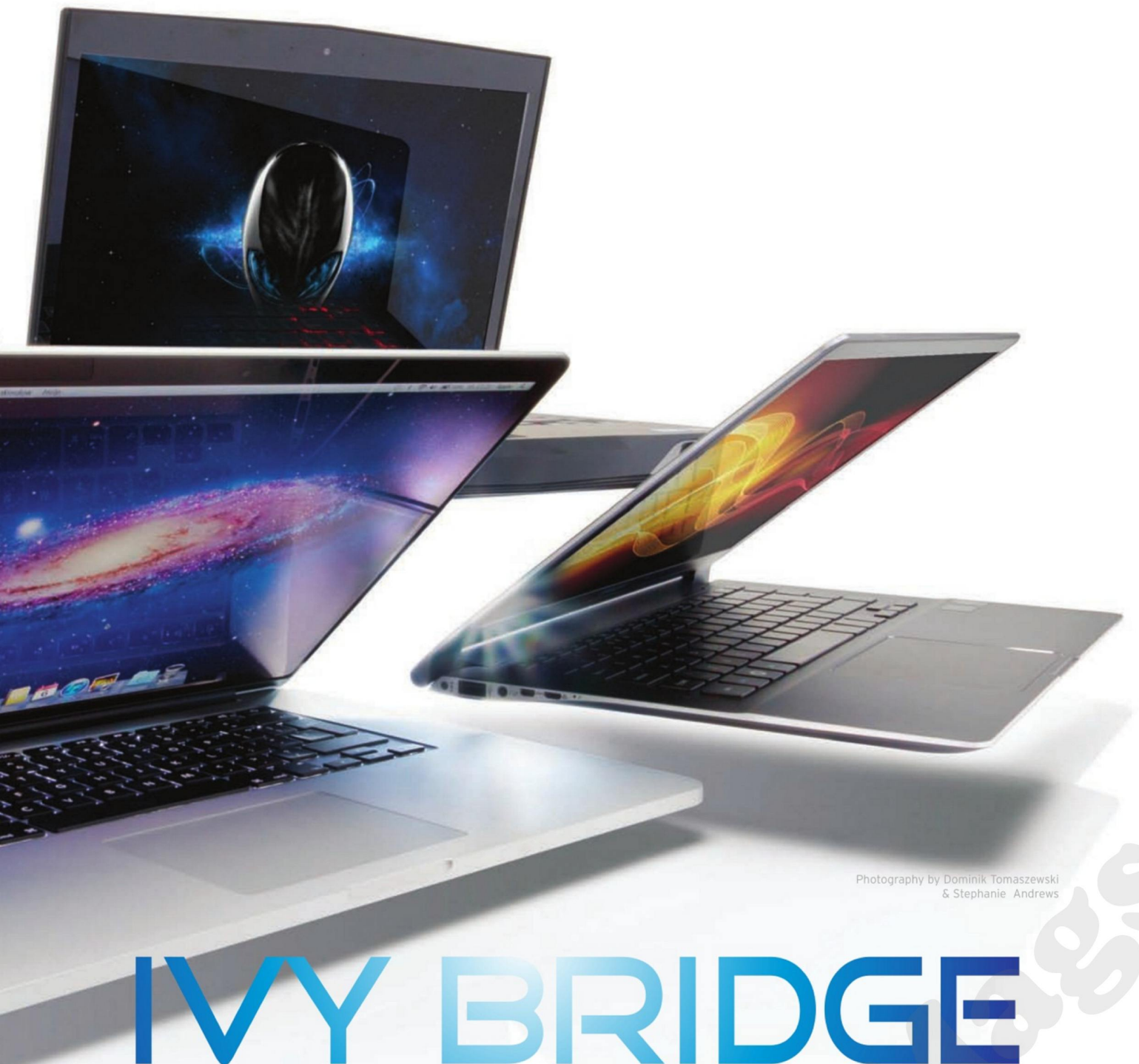
Between the fastest quad-core Core i7 and the most frugal Core i5 'U' series is a range of dual-core chips. The Dell Inspiron 15R, for example, takes a 2.5GHz Core i5-3210M.

Note the names Intel uses to market its processors, where a Core i7 can be a quad- or dual-core chip, while Core i5 for mobile are always dual-core. Unlike earlier generations, all i5 and i7 chips include Turbo and Hyper-Threading. There is now only one Core i3 listed by Intel, the 1.8GHz 3217U, which omits Turbo mode.

Any Ivy Bridge processor will unlock terrific speed and great battery economy. If your needs include video editing, virtualisation or workstation activities, you'll likely benefit from a QM version.







Photography by Dominik Tomaszewski  
& Stephanie Andrews

# IVY BRIDGE LAPTOPS





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

## ALIENWARE M14X

**£1,398** inc VAT • [alienware.co.uk](http://alienware.co.uk) • [tinyurl.com/79aeq6p](http://tinyurl.com/79aeq6p)

Alienware is renowned for high-end gaming systems with geek-chic designs. The M14x gaming laptop is on the chunky side, although it's the smallest and most portable in the company's line-up. Our sample came in matt 'cosmic black'; it's also available in 'nebula red'.

The finish combines plastic and rubber, which feels nice to the touch and aids grip. The lid can become marked rather easily, although Alienware supplies a plush bag for transportation.

The keyboard and trackpad are of a decent size, and unearthly lights are spread all around the laptop. These include four light-up sections on the bottom of the chassis, which can be customised in hue and react to onscreen action.

Available built-to-order, you can get this laptop for as little as £999 if you drop below the default spec. Our sample features a 2.6GHz Intel Core i7-3720QM, 8GB of 1,600MHz RAM, a 64GB mSATA SSD for booting Windows, and a 500GB hard disk.

The Alienware scored a fantastic 168 points in WorldBench 6. It was beaten by the MacBook Pro, but this is still one of the highest scores we've seen from any laptop.

Dedicated nVidia GeForce GT 650M graphics take care of the gaming show. The Alienware M14x breezed through our basic Fear test with an average 180fps framerate. And it managed 107fps in Crysis at 1024x768 resolution with Low detail and DirectX 9.

A relatively high 1600x900 pixel count underscores a 16:9 aspect ratio. The screen offers crisp detail, but its double-gloss finish hinders viewability; we'd prefer a matt anti-glare option.

Connectivity is well rounded, with VGA, HDMI, Mini DisplayPort, USB 2.0, microphone, headset and headphone ports, plus full-size SD and microSD slots, all on the left side of the laptop. On the right is a Kensington lock slot, gigabit ethernet, two USB 3.0 ports and a slot-load DVD±RW drive (Blu-ray is optional).

We managed to get just over five hours (307 minutes) from the M14X's 63Wh battery in the MobileMark 2007 Productivity test.

**VERDICT:** The Alienware M14X offers style, high levels of gaming performance and plenty of connectivity inside a portable shell that has a screen big enough for gaming sessions. **CM**



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

**PC ADVISOR  
BEST BUY**

## APPLE MACBOOK AIR 11in (MID-2012)

**£849** inc VAT • [apple.com/uk](http://apple.com/uk) • [tinyurl.com/86v2end](http://tinyurl.com/86v2end)

Apple's 11in MacBook Air was revised in June, and now benefits from a faster Ivy Bridge processor, 4GB of memory and USB 3.0 ports. It's available with a 64GB SSD for £849, or a 128GB SSD for £929. Both versions run Intel's 1.7GHz Core i5-3317U dual-core processor, with various CPU, memory and storage upgrades also offered.

The 11in model isn't just the cheapest Air, it's also the Mac maker's most affordable laptop. While 64GB is a relatively paltry amount of storage space, Thunderbolt and now USB 3.0 ports allow you to easily add fast external storage. And you still get the same peerless build quality and features as with any other MacBook Air.

We noticed a few other changes around the Air. The built-in webcam is now specified for 1280x720 HD use, and the power connector has been revised to MagSafe 2 - a slimmer take on Apple's original magnetic power connector.

Far less welcome is the loss of the reflection-reducing coating on the glossy screen. While shiny screens are the enemy of comfortable viewing, every Air until now had a thin optical coating that helped mitigate against the worst of mirror reflections. Without this coating, reflections are an annoying reality for 2012's MacBook Air.

An upgraded processor and more memory inevitably introduce better application performance - and much improved graphics too, thanks to Intel's HD Graphics 4000 integrated processor.

Tested while running Windows 7, the 2012 11in Air scored an impressive 129 points in WorldBench 6. When we benchmarked the 2011 64GB 11in model we saw a more than useful 111 points, so this is a significant step up on an already fast laptop.

The graphics are also improved, and the Air recorded 28fps in our basic Fear gaming test against its predecessor's 17fps.

Battery life has also received a boost, according to the MobileMark 2007 Productivity test. We recorded 370 mins here, while the previous Air lasted just 278 mins. As ever, with Mac portables, the runtime is likely to be longer when running native OS X.

**VERDICT:** Looking beyond our misgivings over the cheaper screen, the 2012 MacBook Air 11in shows improvements in every direction and is the smallest and cutest Mac portable ever made. **AH**





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

**PC ADVISOR**  
RECOMMENDED

## APPLE MACBOOK PRO RETINA 2.6GHz

**£2,399** inc VAT • [apple.com/uk](http://apple.com/uk) • [tinyurl.com/bv6pkqa](http://tinyurl.com/bv6pkqa)

If you want to know which innovative features will appear in next year's Windows laptops, look at today's MacBook computers. The clue here is in the name: the Pro boasts a superb Retina display.

We've previously looked at the entry-level 2.3GHz, 256GB SSD model (see [tinyurl.com/7yc3kj](http://tinyurl.com/7yc3kj)); this is the top-end Pro, with a 2.6GHz processor and 512GB of storage.

In terms of ports we find two Thunderbolt, two USB 3.0, HDMI and an SDXC card slot. You also get dual mics, an HD webcam, 802.11n wireless connectivity and a silky glass trackpad.

And then there's the ultra-high-definition IPS panel, with 2880 pixels across and 1800 pixels running down its 15.4in glossy screen.

The build quality of this streamlined laptop is unimpeachable. Its unibody construction comprises a main chassis milled from solid aluminium, with a sculpted bottom plate precision-set below. Lid down, it's just 18mm thick and weighs exactly 2kg.

Potential niggle points for a would-be purchaser may include the removal of the optical drive, FireWire and even ethernet. The last two are covered with Thunderbolt adaptors (not supplied), and you can easily add an external DVD drive. Business users may balk at the omission of a Kensington security slot, though.

Running WorldBench 6 in Windows 7, The MacBook Pro put in the fastest showing here. In fact, its 176-point score confirmed it as the most powerful laptop we've ever tested anywhere.

Graphics performance is outstanding, too - as it must be to drive the 5.2Mp display. In OS X the nVidia GTX 650M automatically hands over to integrated Intel HD Graphics 4000 when it isn't needed, although only the nVidia processor is available in Windows. Our graphics tests results were strong, but a little more horsepower wouldn't go amiss: the OS X interface isn't as fluid as it should be.

Totalling 95Wh, the massed array of non-removable internal batteries led to a Windows runtime of 6.5 hours. Back in Lion, we found this machine could outlast our working day.

**VERDICT:** The specifications and benchmark results excel, and that's before you consider the precision build and meticulous design. If the price alarms, the £1,799 Pro is as worthy of consideration. **AH**



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

## DELL INSPIRON 15R 5520

**£579** inc VAT • [dell.co.uk](http://dell.co.uk) • [tinyurl.com/6v8cs84](http://tinyurl.com/6v8cs84)

The 15.6in Inspiron 15R is one of Dell's first laptops to feature an Ivy Bridge CPU. It's neither the slimmest nor the lightest laptop here, but its rounded curves and dark-grey metal-effect finish are likeable.

The keyboard is of a reasonable size, while good spacing and a smooth action mean the keys are easy to type on. The two-button trackpad includes multitouch capabilities for scrolling and zooming.

Given the Inspiron's £579 price, which makes it the cheapest in our Ivy Bridge laptop round-up, we weren't surprised to find a plastic build. The chassis feels solid, but the screen is too bendy.

A dual-core i5-3210M chip powers the laptop, running at 2.5GHz under normal conditions or 3.1GHz with Turbo Boost. Combined with 4GB of DDR3 RAM and a 1TB hard disk, the Dell was able to record a very good 150-point score in WorldBench 6.

An advertised advantage of Ivy Bridge is improved integrated graphics, and in the Inspiron 15R we find the Intel HD Graphics 4000 processor. Its performance was disappointing in our lowly Fear gaming test, where we measured an average 20fps. Interestingly, the Dell fared much better in intensive game Crysis, where it scored a playable 53fps (Low detail, 1024x768, DirectX 9).

The Inspiron 15R is equipped with a 15.6in twisted-nematic screen with a 1366x768-pixel resolution. The detail level is average, but the screen's glossy finish results in too many reflections, and viewing angles are severely restricted, making it impossible to clearly view the Dell's screen from the side.

Other hardware features include four USB 3.0 ports, HDMI and VGA video outputs, gigabit ethernet, an SD card reader, a 3.5mm line-in/out and 802.11n Wi-Fi. The Inspiron 15R also has a 1Mp webcam and tray-load DVD±RW optical drive.

A 48Wh battery located at the back of the laptop is easily removable, secured by two thumb catches. We squeezed out nearly 6.5 hours of runtime, with the Dell able to endure 384 mins of the MobileMark 2007 Productivity test.

**VERDICT:** Dell's Inspiron 15R doesn't have the wow factor, but it's a well-rounded, reasonably stylish laptop with impressive application speed. At £579, it offers excellent value. **CM**





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

**PC ADVISOR  
RECOMMENDED**

## SAMSUNG 900X4C

**£1,299** inc VAT • [samsung.com/uk](http://samsung.com/uk) • [tinyurl.com/6vz5tog](http://tinyurl.com/6vz5tog)

Judged by the standards of most 15in laptops, the Samsung 900X4C is small, sleek and stylish. It's one of the better ultraportables now flooding the market. A shade under 1.7kg, it boasts unique portability and a crisp style that's starting to tread on Apple's toes.

The curved chassis has resulted in some compromises. The mains-charger plug, for example, has a very narrow barrel that will easily snap if someone trips over the wire. You'll need to use supplied adaptors for ethernet or HDMI video, too.

A 16:9 widescreen spreads across the top panel and boasts great quality: it's LED-backlit, extraordinarily bright and anti-reflective. With 1600x900 pixels making up the screen, resolution stands above budget laptops fitted with coarse 1366x768 screens.

The touchpad is large and responsive, a buttonless type with hidden left- and right-click buttons. You can instead elect to use a two-finger tap for right-clicking if you prefer.

The keyboard has incredibly low-profile keys, so minimal effort is required for typing. The intensity of its white backlight can be controlled; buttons for adjusting this and screen brightness sit on the Function keys, minimising button clutter elsewhere.

Powering the Samsung is a third-generation Intel Core i5 – the same processor we now find inside the entry-level 11in Air. Combined with 8GB of memory, this 'Series 9' laptop was able to score 125 points in our WorldBench 6 real-world speed test.

Storage is solid-state, as you'd expect of something this thin, light and expensive, although the Korean semiconductor specialist has opted for a SanDisk U100 rather than one of its own SSDs.

Thanks to Intel's super-charged HD Graphics 4000 chipset, you can dabble with some gaming on this laptop. We saw a playable 28fps in the basic Fear game at Maximum detail.

Battery life is outstanding at more than 8 hours, although we did note that the Samsung runs slower on battery power.

**VERDICT:** A great anti-glare display and crisp aluminium shell lift the Samsung Series 9 above the Ultrabook rabble, and speedy Intel silicon keeps the laptop fast and very far from ephemeral. Ideal if you need a light and limber laptop with a great 15in screen. **SA, AH**



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

## TOSHIBA QOSMIO X870-11Q

**£1,699** inc VAT • [toshiba.co.uk](http://toshiba.co.uk) • [tinyurl.com/c3f8xp2](http://tinyurl.com/c3f8xp2)

The Toshiba Qosmio X870-11Q is a 17.3in desktop-replacement laptop with an impressive roster of hardware. A Core i7-3610QM processor is clocked at 2.3GHz, and capable of 3.3GHz with Turbo Boost. There's also a whopping 16GB of 1,600MHz RAM, 3D technology and two storage drives – a 128GB SanDisk SSD and a 1TB HDD.

The specification sets a great standard, but it's one to which the Qosmio's build quality simply can't live up. The Toshiba's all-plastic shell is somewhat graceless, prone to fingerprints and victim to a flimsy screen and weak trim.

This monster laptop measures 44mm thick and weighs more than 3.4kg. Its matt black finish is embossed with a diamond-patterned texture for grip. This looks okay... until you spot the dodgy tinsel side trim, which has all the bling of a crimson Christmas-tree bauble.

A wide backlit keyboard has a separate numberpad, and is joined by a large off-centre trackpad and what Toshiba calls "2x2 Harman Kardon speakers" – that is, two drivers on each side.

We found the Scrabble-style keys easy to use, but the trackpad veers between unresponsive and erratic. Two-finger scrolling was smooth and you can use pinch-to-zoom gestures.

Thanks to the allied strengths of Intel, nVidia and SSD storage, the Qosmio scored very well in our lab tests. It failed to complete one sub-test in WorldBench 6, but we estimate it would achieve 170 points, putting it right up there with the Alienware and MacBook Pro. The GTX 670M with 3GB VRAM managed a cool 205fps in Fear, and an impressive 76fps in Crysis at its native resolution (Medium).

A headline feature is the 17.3in full-HD glossy screen with active-shutter 3D technology. We liked the 3D effect, but the supplied nVidia glasses look like welding goggles.

Other features include a Blu-ray rewritable drive, four USB 3.0 ports, an HDMI connection and a 3D webcam.

Toshiba touts a battery life of only 2 hours from the undersized 47Wh battery. We recorded a marginally longer 2 hours 14 mins.

**VERDICT:** The Toshiba Qosmio X870-11Q has an impressive specification and offers excellent performance. Blu-ray and 3D playback are unique in this round-up. But the build quality really lets down this laptop. **CM**



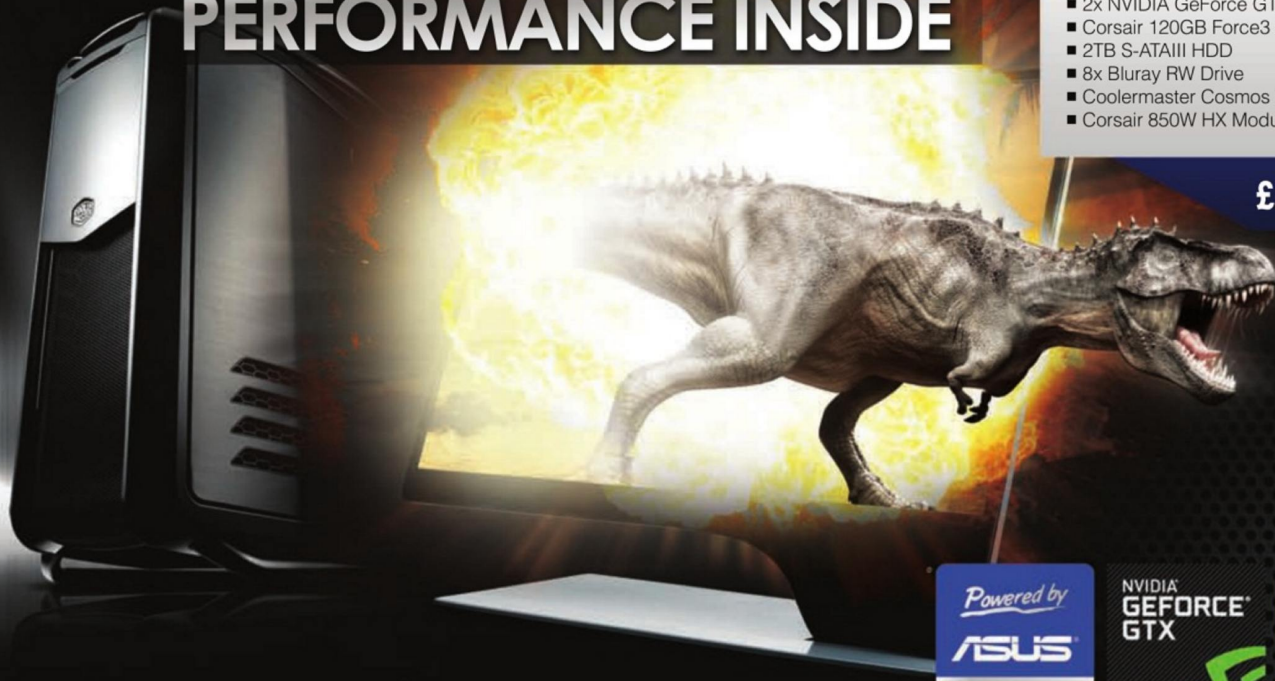
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- Asus Sabertooth Z77 Motherboard
- Microsoft Windows 7 Home Premium 64-bit
- Corsair 16GB Vengeance 1600Mhz RAM
- 2x NVIDIA GeForce GTX 670 2GB
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- 2TB S-ATAIII HDD
- 8x Bluray RW Drive
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## Conclusion

Gaming enthusiasts will be well served by the Alienware M14x, a smart and sturdy 14in laptop with plenty of raw power in Windows and games. Hooked up to an external monitor, its nVidia graphics processor should allow detailed rendering on a larger screen.

We weren't convinced by the Toshiba Qosmio X870-11Q. It has all the bells and whistles necessary to entice a spec-checking buyer, along with the gaudy finish of a boy-racer machine, Blu-ray and 3D playback, but it's expensive, poorly built and has a short runtime.

Dell's Inspiron 15R is another plasticky affair, with several cost-cutting measures on display. It's by far the cheapest Ivy Bridge laptop here, though, at just £579.

Whereas most rivals to the MacBook Air are building 11- and 13in Ultrabooks, Samsung hit the Enlarge button for the 15in Series 9.

It's remarkably similar to the Air, but offers a decent 15.6in widescreen and has a darker anodised finish across its metal jacket.

Two MacBooks feature in this group: the cheapest and most expensive models in Apple's catalogue.

The £849 MacBook Air delivers on what the netbook only promised - a fast booting, speedy, lightweight and extremely portable laptop. The most affordable model packs only 64GB of storage, but new USB 3.0 ports ease the addition of external storage.

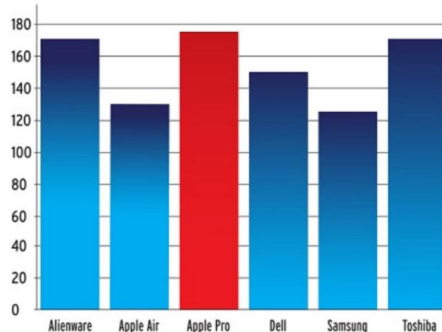
The MacBook Pro Retina will spearhead a revolution in high-res displays for personal computing. Apple's use of IPS technology should raise the game for competitors to improve their own screens. With the help of Intel's 2.6GHz Ivy Bridge chip, plenty of memory and a fast GPU and SSD, it's also the fastest laptop around. ☒

	<b>ALIENWARE</b> <b>£1,398 inc VAT</b> <b>★★★★★</b>	<b>APPLE</b> <b>£849 inc VAT</b> <b>★★★★★</b>	<b>PC ADVISOR</b> <b>BEST BUY</b>	<b>APPLE</b> <b>£2,399 inc VAT</b> <b>★★★★★</b>	<b>PC ADVISOR</b> <b>RECOMMENDED</b>
Product name	<b>M14x</b>	<b>MacBook Air 11in (Mid-2012)</b>		<b>MacBook Pro Retina 2.6GHz</b>	
Product code	P18G002	MD223B/A		MC976B/A	
Processor	2.6GHz Intel Core i7-3720QM (3.7GHz Turbo), quad-core with Hyper-Threading	1.7GHz Intel Core i5-3317U (2.6GHz Turbo), dual-core with Hyper-Threading		2.6GHz Intel Core i7-3720QM (3.7GHz Turbo), quad-core with Hyper-Threading	
Graphics	nVidia GeForce GT 650M with 1GB GDDR5 RAM	Intel HD Graphics 4000		nVidia GeForce GTX 650M with 1GB GDDR5 and Intel HD Graphics 4000	
Display	14.1in (1600x900) TN gloss	11.6in (1366x768) TN gloss		15.4in (2880x1800) IPS gloss	
Operating system	Windows 7 Home Premium 64bit	OS X 10.7.4 Lion		OS X 10.7.4 Lion	
Storage	64GB mSATA SSD + 500GB HDD SATA	64GB SSD SATA 6Gbps		512GB SSD SATA 6Gbps	
Memory	8GB DDR3 1,600MHz RAM	4GB DDR3L 1,600MHz		8GB DDR3L 1,600MHz	
Ports	2x USB 3.0, 1x USB 2.0, VGA, HDMI, Mini-DisplayPort	2x USB 3.0, Thunderbolt		2x USB 3.0, 2x Thunderbolt, HDMI	
Connectivity	Dual-band 802.11a/b/g, gigabit ethernet, Bluetooth 4	Dual-band 802.11a/b/g, ethernet via Thunderbolt/USB 2.0 adaptor, Bluetooth 4		Dual-band 802.11a/b/g, ethernet via Thunderbolt/USB 2.0 adaptor, Bluetooth 4	
Optical drive	DVD±RW SuperMulti slot-load	None		None	
Audio	Stereo speakers, built-in mic, 3.5mm line-in	Stereo speakers, built-in mic, 3.5mm headset jack		Stereo speakers, 2x built-in mics, 3.5mm headset jack with Toslink optical out	
Card slot	SD, microSD	SDXC		SDXC	
Other features	Kensington lock slot, multicolour backlit keyboard, 1.3Mp webcam	Backlit keyboard, 0.9Mp webcam		Backlit keyboard, 0.9Mp webcam	
Trackpad	82x44mm, two-button, multitouch	105x63mm, buttonless, multitouch glass		105x77mm, buttonless, multitouch glass	
Other software	None	Apple iLife '11		Apple iLife '11	
Power adaptor	150W adaptor	45W adaptor with MagSafe 2 connector		85W adaptor with MagSafe 2 connector	
Battery	63Wh lithium-ion, non-removable	35Wh lithium-polymer, non-removable		95Wh lithium-polymer, non-removable	
Dimensions	337x258x38mm	300x192x3-17mm		359x247x18mm	
Weight	2.94kg	1.07kg		2kg	
Battery life <sup>1</sup>	5 hrs 7 mins	6 hrs 10 mins		6 hrs 38 mins	
WorldBench 6 <sup>2</sup>	168	129		176	
Gaming scores (fps) <sup>4</sup>	180/107/-/-/-	28/-/-/-/-		120/159/63/19/28	

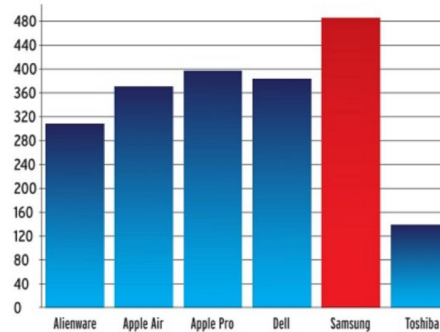
<sup>1</sup>Tested using the BAPCo MobileMark 2007 Productivity benchmark <sup>2</sup>For an explanation of WorldBench 6 see page 78 <sup>3</sup>Estimated due to one sub-test failing to complete <sup>4</sup>Tested using the following games and settings: Fear, Max; Crysis, DirectX 9, 1024x768, Low; Crysis, DirectX 9, 1024x768, High; Crysis, DirectX 10, 1680x1050, V High; Crysis, DirectX 10, native screen resolution, Medium



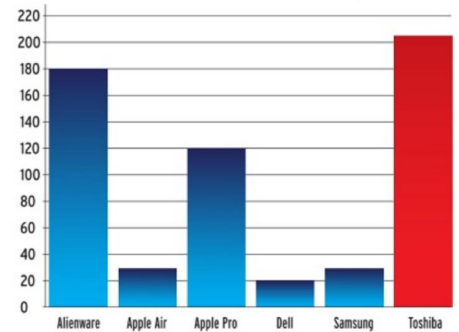
WorldBench 6 score



Battery life (mins)



Framerates in Fear (Max detail)


**DELL**  
**£579 inc VAT**

**Inspiron 15R 5520**

5520-3985

2.5GHz Intel Core i5-3210M (3.1GHz Turbo), dual-core with Hyper-Threading

Intel HD Graphics 4000

15.6in (1366x768) TN gloss

Windows 7 Home Premium 64bit

1TB HDD SATA 3Gbps

4GB DDR3 1,600MHz

4x USB 3.0, VGA, HDMI

802.11b/g/n, gigabit ethernet, Bluetooth 4

DVD ±RW tray-load

Stereo speakers, built-in mic, 3.5mm line-in, 3.5mm line-out

SDHC, MS Pro

Kensington lock slot, 1Mp webcam

107x58mm, two-button, multitouch

InterVideo Win DVD 8.0, Dell Stage, Dell DataSafe

64W adaptor

48Wh lithium-ion, removable

378x252x35mm

2.75kg

6 hrs 24 mins

150

20/53/18/5/21

**SAMSUNG**  
**£1,299 inc VAT**

**900X4C**

NP900X4C-A01UK

1.7GHz Intel Core i5-3317U (2.6GHz Turbo), dual-core with Hyper-Threading

Intel HD Graphics 4000

15in (1600x900) TN matt

Windows 7 Home Premium 64bit

128GB SSD SATA 6Gbps

8GB DDR3 1,600MHz

2x USB 3.0, 1x USB 2.0, Micro HDMI

Dual-band 802.11a/b/g/n, ethernet via supplied adaptor, Bluetooth 4

None

Stereo speakers, built-in mic, 3.5mm headset jack

SDHC

1.3Mp webcam

buttonless, multitouch

Samsung Recovery Solution

40W adaptor

62Wh lithium-ion, non-removable

375x237x15mm

1.67kg

8 hrs 3 mins

125

28/26/13/-/16

**PC ADVISOR**  
**RECOMMENDED**
**TOSHIBA**  
**£1,699 inc VAT**

**Qosmio X870-11Q**

PSPLXE-01P003EN

2.3GHz Intel Core-i7-3610QM (3.3GHz Turbo), quad-core with Hyper-Threading

nVidia GeForce GTX 670M with 3GB GDDR5 memory

17.3in (1920x1080) 120Hz 3D-capable

Windows 7 Home Premium 64bit

128GB SSD + 1TB HDD SATA 3Gbps

16GB DDR3 1,600MHz

4x USB 3.0, VGA, HDMI

802.11b/g/n, gigabit ethernet, Bluetooth 4

BD-RE/DVD ±RW DL tray-load

2x2 Harman Kardon stereo speakers, built-in mic, 3.5mm line-in, 3.5mm line-out

SDHC

Kensington lock slot, HD 3D (1280x800) webcam

112x78mm, two-button, multitouch

Toshiba Blu-ray Disc Player

180.5W adaptor

47Wh lithium-ion, removable

417x272x43.7mm

3.45kg

2 hrs 18 mins

170<sup>3</sup>

205/148/80/27/76



## 3D TVs on test

Join the 3D revolution by treating yourself to a new TV. Steve May tests six of the latest models to find out which is best

**Y**ou've probably heard this before, but there has never been a better time to upgrade your TV. The latest sets offer DLNA-fuelled connectivity, ultra-stylish design and plenty of new technology. The only tough decision is in deciding which TV will serve you best.

Here, we round-up six 46- and 47in models, a category fast becoming the battleground of choice for TV manufacturers as people upgrade from older 42in sets. With bezels verging on Lilliputian, these large-screen TVs tend not to occupy much more space than their smaller brethren.

### 3D playback

All our chosen combatants are 3D-ready. (Whether you want to watch programmes in 3D is academic; stereoscopy has become a standard feature on virtually all big-brand TVs of this size.)

Two types of 3D technology are seen in consumer electronics: active shutter and passive polarisation. Both offer 3D playback from supporting Blu-rays and satellite and terrestrial broadcasts, but active shutter offers better picture quality and is able to present full-HD images. However, the 'shuttering' glasses required to enjoy the effect are expensive, prone to flicker and, in the case of LCD TVs, nearly always display crosstalk (double images).

Passive 3D (also known as Cinema 3D and Easy 3D) is a cheaper alternative, with the necessary glasses often handed out free to spectators of the latest 3D blockbusters. It delivers only half the horizontal resolution of the standard image, making diagonal and curvy object edges appear jagged.

Note that not all 3D-ready TVs are supplied with 3D glasses; those that are often come with only

one pair. Be sure to factor in the price of additional specs - up to £80 each - unless you intend your 3D experience to be a solitary one.

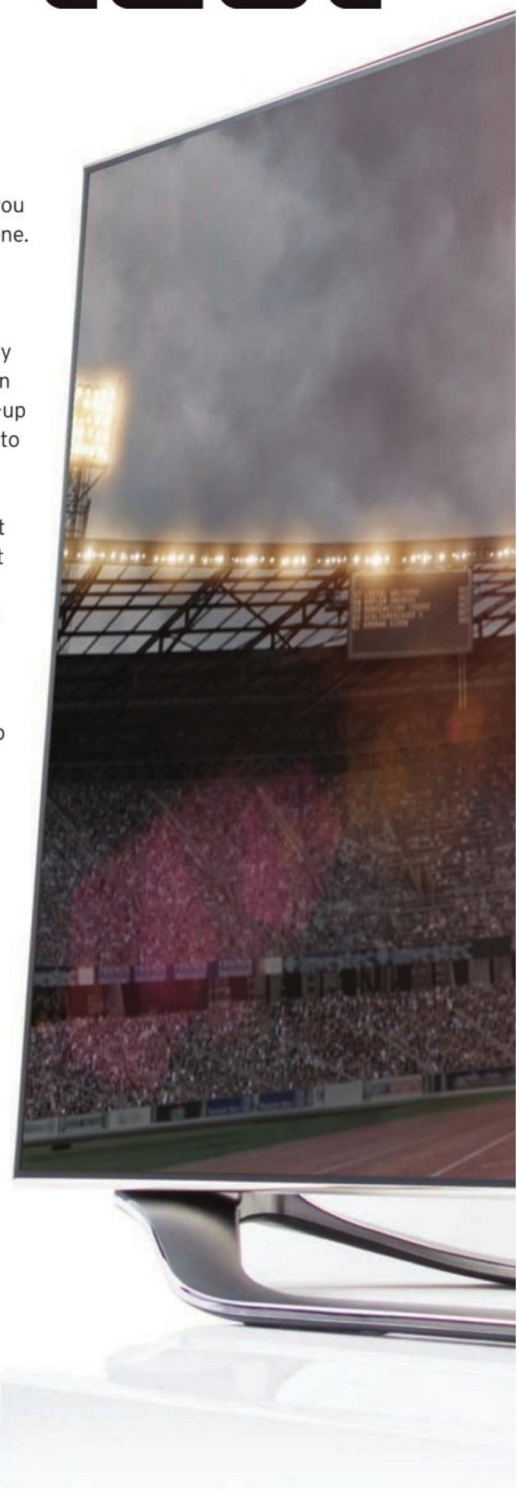
### Internet connectivity

With BBC iPlayer and YouTube now almost ubiquitous on Smart TVs, people increasingly expect to be able to get online via the telly in their living room. Having experienced catch-up content on a TV, you'll never want to return to streaming programmes on a laptop.

Many of today's TVs offer movie-rental services, but you should check what content is on offer if this will form an important part of your buying decision. Premium movie operators, such as Acetrax and Sony Movies Unlimited, tend to have a wider choice of new movies than LoveFilm, while Netflix doesn't offer any new films at all.

Wi-Fi connectivity isn't always a given, so be sure to check if you run a wireless home network or intend to site the TV in a place difficult to reach with an ethernet cable. Some screens now offer Wi-Fi Direct or WiDi technology - handy if you want a simple hook-up for a phone or tablet - that doesn't impose itself on your main network resources.

Modern TV sets are able to play a range of video and audio files, but the results can vary dramatically between brands - a potential dealbreaker if you have a hard drive filled with MKV files. In general, media playback via USB offers the widest compatibility.







Product photography by Dominik Tomaszewski





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

## LG 47LM670T

**£1,249** inc VAT • [lge.com/uk](http://lge.com/uk) • [tinyurl.com/7xjw54r](http://tinyurl.com/7xjw54r)

For sheer visual panache, you can't fault LG's 47LM670T. With its metal-ribbon stand, miniscule bezel and edge-to-edge glass, it's a real head-turner. But it's not just the exterior of this screen that's slick.

The user interface has been reworked, to better integrate LG's streaming TV and app portal. The result is an easy-to-navigate dashboard, with swift access to terrestrial TV, apps, video-on-demand and catch-up TV. Programme listings are accompanied by a live channel window, so you won't miss the action in EastEnders as you find out what's on next.

Online entertainment options are also good. Joining BBC iPlayer are YouTube, DailyMotion, Acetrax, Blinkbox, Viewster and LoveFilm. Netflix was absent during our trial, but is scheduled to feature.

Multimedia file support is first class. The 47LM670T plays all popular video formats from local USB and networked NAS drives.

The 47LM670T has four HDMI ports, plus component, Scart, VGA, three USBs, ethernet, a CI slot and a digital optical audio out. Wi-Fi is built-in, alongside WiDi for wireless playback from a compatible laptop.

The image quality is less impressive. The screen offers vibrant hues and appears to have great contrast, but shadow detail and nuance are blotted out; images are just too black. While Freeview broadcasts tends to look 'fizzy', HD looks considerably better. However, motion resolution is limited, topping out at around 800 lines. This translates to characteristic blur when things get lively.

Cinema 3D is passive-polarisation technology, and LG supplies five pairs of 3D glasses in the box. The drop in resolution is noticeable, but at least the glasses are comfortable to wear.

There's also a Dual Play gaming mode. This takes a split-screen console input and presents it as two full-screen images when viewed through the provided Dual Play glasses. It's a neat idea, but the breakthrough from one screen to the other can be intrusive.

Audio quality is best thought of as functional; the LG's 20W sound system isn't the best we've heard.

**VERDICT:** LG's 47LM670T is arguably the best-looking 3DTV of 2012. It has an excellent internet portal, great file support, and bright, inexpensive 3D. However, image quality lacks finesse.



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

**PC ADVISOR  
RECOMMENDED**

## PANASONIC TX-L47WT50

**£2,099** inc VAT • [panasonic.co.uk](http://panasonic.co.uk) • [tinyurl.com/76cobek](http://tinyurl.com/76cobek)

Panasonic may be a long-time champion of plasma, but it's now flying the LCD flag with equal gusto. The TX-L47WT50 sits at the top of its range – you can buy 42- and 55in models as well as this 47in version.

This smart-looking set packs serious image-enhancing hardware, including a dual-core processor – the benefit of which is most evident when using the Viera Connect internet portal, home to iPlayer, YouTube, DailyMotion, Netflix and Fetch TV. The extra processing grunt allows multiple streaming services to stay live.

Freeview HD and Freesat HD tuners are built-in. The latter is helpful if you have a spare Sky feed and limited terrestrial reception.

The TX-L47WT50 has four HDMI ports, Scart, component and VGA connections, an SD card slot and a digital optical audio output. You also get built-in Wi-Fi. There are three USB ports, with the option to timeshift direct from the EPG to an external hard drive.

While the user interface is slick, with an engaging use of animated graphics, the Freeview EPG is extremely basic, with no thumbnail image of what you're watching, nor ongoing audio.

Picture quality is excellent. The Neo Black LED-edgelit panel delivers convincing blacks, subtle gradations and vibrant hues. While standard-definition programmes look fine, it's terrestrial HD that sparkles. The in-plane switching Alpha panel means there should be less colour and contrast loss when viewed from the side, too.

The TX-L47WT50 is a good choice for both films and sport. Motion resolution holds fast at 1080 lines with the Intelligent Frame Creation mode engaged, and shadow detail is preserved.

Stereoscopic 3D images are bright and offer entertaining parallax effects. However, crosstalk is sporadically problematic. The TV works with active-shutter 3D glasses; two pairs are supplied.

Video file playback from local USB is possible, and the Panasonic supports many file types. It can't handle MKV across a network, however. Audio quality is remarkably well balanced, although the speakers don't go particularly loud.

**VERDICT:** Offering razor-sharp HD and a well-stocked internet portal, Panasonic hits the ground running with this 47in LED show-stopper. Cheaper sets abound, but few offer this level of sophistication.



**PHILIPS 46PFL9706****£2,200** inc VAT • [philips.co.uk](http://philips.co.uk) • [tinyurl.com/7hsfkv8](http://tinyurl.com/7hsfkv8)

The 46PFL9706 is not your average flatscreen TV. It showcases a couple of innovations unique to Philips: the Ambilight mood-lighting system is featured here in a two-strip Spectra XL mood guise; there's also a Moth Eye filter, which borrows from nature to reduce onscreen reflections and create better contrast. Both work well.

The Moth Eye treatment consistently delivers deep blacks, but you'll need to invest in Philips' cleaning kit to remove fingerprints.

Aesthetically, this TV is like Marmite. The brushed-aluminium cabinet is decidedly chunky, stretching back 43mm, and it has an unfashionably fat bezel. This is partly due to a true LED-backlight array, rather than edge-lighting.

Connections include four HDMI, component, Scart, ethernet, two USB (one can be used for timeshifting), VGA, phono stereo and optical digital, plus a CI slot. Wi-Fi connectivity is here, too.

Philips' Net TV internet portal is a basic affair, comprising BBC iPlayer, YouTube, Acetrax and Vimeo. File playback from USB is better, with all the key video file formats supported. You can't play MKV files from a NAS drive, though.

Images are extremely clear, particularly from HD sources, but you'll need to spend time tweaking the TV's menus. Philips' picture processing notoriously emphasises edges. We moved the Sharpness setting to zero and disabled Natural Motion for best results.

The panel's Clear LCD mode is well suited to fast-moving sport, delivering a full 1080 lines of motion resolution. But moody movies reveal limitations with the 46PFL9706's dimming system, which often causes brightly lit items to halo unnaturally when caught against a dark background.

The 46PFL9706's 3D playback is notable for its brightness and detail, but crosstalk is apparent. Two pairs of active-shutter glasses are included in the box.

Audio quality is outstanding. The 20W sound system built into the stand creates a loud, well-rounded soundstage.

**VERDICT:** This TV is uniquely rewarding, with a terrific Ambilight system and outstanding picture quality, but there are issues regarding the Moth Eye filter and dimming. And it's so expensive.

**SAMSUNG UE46ES8000****£1,899** inc VAT • [samsung.com/uk](http://samsung.com/uk) • [tinyurl.com/d3vv547](http://tinyurl.com/d3vv547)

Samsung's 46in UE46ES8000 is arguably the most audaciously specified TV in the world. Not only does it come loaded with all the usual toys, it also breaks new ground with motion- and voice-control.

To attract the set's attention, you need to wave in an exaggerated fashion at its webcam. If it isn't as bright as day in your room, or the TV doesn't like your wallpaper, it'll ignore you.

The voice-control system works well, though. It's activated by the command "Hi TV" and, provided you've not mumbled, will offer up a string of vocal prompts.

The Samsung has three HDMI ports, Scart, component, VGA, three USB ports (one can be used for timeshifting to a hard disk), a CI slot, ethernet and an optical digital audio output. Wi-Fi is built-in, and there's even a 'Smart Evolution' port. From 2013, Samsung will sell modules that upgrade the set's graphics and processing capabilities.

HD imagery is razor sharp. Details twinkle and colours pop; contrast and black levels are profound. Motion resolution is also very good, but don't overdo the set's MotionPlus processor: ramp it up too high and the consequences are ugly. Freeview content looks acceptable and the sound quality is decent, thanks to some effective processing and good stereo separation.

The Samsung's 3D performance is bright and immersive. Crosstalk lurks amid the zombies in *Resident Evil: Afterlife*, but it's easy to lose yourself in the depth of this TV's images. Two pairs of active-shutter glasses are included in the box.

Samsung's online portal offers a wide variety of streaming video, plus more than a thousand downloadable apps. Content services include Netflix, DailyMotion and Vimeo, although BBC iPlayer and LoveFilm were conspicuous by their absence during our testing. They were added via an update as we went to press.

One area of significant improvement over Samsung's 2011 TV line-up is file support. The UE46ES8000 plays all popular formats from local USB and across a network from a NAS.

**VERDICT:** This is a bold stab at redefining the high-end TV market, and one that almost pays off. Even without voice- and motion-control, it's a desirable set. Expensive, certainly, but the future never comes cheap.





## SONY KDL-46HX853

**£1,449** inc VAT • [sony.co.uk](http://sony.co.uk) • [tinyurl.com/7nazsgo](http://tinyurl.com/7nazsgo)

The KDL-46HX853 marks a dramatic return to form for Sony. The brand, which has been confusingly inconsistent over the past two years, appears to be back on the right track.

The design is sublime. The 35mm-thin panel reclines at a 6-degree angle on a thin pedestal, which also houses the sound system.

There are four HDMI inputs, plus Scart, component, VGA, two USB inputs (timeshifting is supported), ethernet and a CI slot. Wi-Fi is resident, as is Wi-Fi Direct for mobile device connection.

The brand's online entertainment portal, the Sony Entertainment Network (SEN), has had a makeover. A clean Metro-style interface gathers content into groups, with streaming services including iPlayer, YouTube, Demand 5, LoveFilm, Netflix, Crackle and Mubi. Currently, SEN offers the widest choice of IPTV services. Multimedia support lags behind rivals, though, with MKV not invited to the party.

Sony is promising an enhanced meta-rich EPG firmware update for the KDL-46HX853; until that arrives, you'll have to make do with a standard Freeview offering, albeit one with a live preview window.

The best reason to invest in this TV is its image quality. HD pictures are astoundingly sharp, while motion processing is peerless, delivering a full 1080 lines with no obvious artefacting. Black levels are deep and colour fidelity excellent. Much of this can be attributed to the high-end X-Reality Pro picture engine and Motionflow XR800 motion processing. This combination also enhances Freeview content and removes the rough edges from low-resolution internet content.

Active-shutter 3D technology gets one thumb up. It's sharp and bright, although some issues remain with crosstalk. And, even at this price, 3D glasses are optional accessories at £50 each.

The KDL-46HX853's ultra-slim dimensions inevitably wreak havoc with the set's audio. A third mid-range driver on the rear of the set brings the total audio output to 30W, but it can't save from a perfunctory performance. It's best used with home-cinema speakers.

**VERDICT:** Any quibbles relating to file-playback limitations or undernourished audio are quickly silenced by this TV's storming image quality. Without question, the KDL-46HX853 is the best on test.



## TOSHIBA 46TL963B

**£699** inc VAT • [toshiba.co.uk](http://toshiba.co.uk) • [tinyurl.com/cnmxxhk](http://tinyurl.com/cnmxxhk)

The 46TL963B is Toshiba's high-street champion. Neither supermarket fodder nor high-end hero, it combines internet-connected Smarts with 3D compatibility, and has a trendy, slimline chassis. At first glance it should be a no-brainer purchase.

The set is certainly well specified. It also has two tuners (Freeview HD and a generic DVB-S2 satellite), plus generous connectivity options: four HDMI, component, Scart, phono AV, VGA, a digital audio output, a CI slot, ethernet and a pair of USBs.

This is also the first Toshiba model we've seen to offer Rovi's enhanced EPG. You can flip between the regular Freeview TV guide (no live thumbnail, but ongoing channel audio) to this detailed online version via a menu toggle. The Rovi guide allows you to nose through contextual information, including plot synopsis, cast and crew. The only catch is the slow load time - typically around 18 seconds.

The 46TL963B's image quality is above average, thanks to a solid HD performance and adept motion handling. With standard ActiveVision processing the screen delivers a respectable 1000 lines of moving resolution, creating very few artefacts in the process.

Black levels aren't perfect, due to uneven LED edge-lighting, but the contrast is good. Standard-definition Freeview performance is average and highly channel-dependant, but audio quality is surprisingly good, thanks to some decent speakers that deliver welcome volume for speech.

The Toshiba isn't so hot on 3D. Active-shutter 3D images look dark, and crosstalk is evident. Toshiba's internet TV proposition, Places, is reasonable, with BBC iPlayer, DailyMotion, YouTube, Facebook, Twitter, Flickr and more.

The 46TL963B can play AVI, MKV, WMV, MPEG, MOV and VOB files from USB, but across a LAN things rather deteriorate - none of the aforementioned video suffixes are accessible. A firmware update to enable USB timeshift recording is promised.

**VERDICT:** You get a lot of screen for your money with the 46TL963B. It looks swish and there's a reasonable selection of IPTV services, but don't buy this set for its 3D or networked multimedia file playback.





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## How we test




All the 3DTVs in this group test were challenged with a barrage of industry-grade test images, comprising an assortment of patterns and charts. Particular emphasis was placed on motion resolution, black levels and greyscale.

All 1080p screens deliver perfect full-HD resolution with static images, but show their true colours when motion is introduced. Screens with limited motion resolution produce characteristic 'now the image is sharp/now the image is blurred' discrepancies, often within the same frame. This trait is particularly irritating when watching fast-moving sports. Our tests considered how much clarity was lost when high-resolution test patterns travelled at 6.5 pixels

per frame, and the impact of fast-refresh technologies, such as backlight blinking, black frame insertion, interpolation and so on.

We also assessed the TV sets with real-world content, via their onboard tuners and Blu-ray movies. 3D performance was principally assessed with *Tangled*, *Resident Evil: Apocalypse* and *Monsters vs Aliens*. Helping to divine 2D shadow detail and motion clarity were *Monsters and Drive*.

File-playback tests comprised a motley collection of audio and video clips, played both from USB and a DLNA-capable NAS. All 3DTVs were all placed on the same network and tested with the same file collection and NAS drive.

	<b>LG</b> <b>£1,249 inc VAT</b> 	<b>PANASONIC</b> <b>£2,099 inc VAT</b>  <b>PC ADVISOR</b> <b>RECOMMENDED</b>	<b>PHILIPS</b> <b>£2,200 inc VAT</b> 	
Model name	<b>47LM670T</b>	<b>TX-L47WT50</b>	<b>46PFL9706</b>	
Product code	47LM670T	TX-L47WT50	46PFL9706	
Screen size	47in	47in	47in	
Screen resolution	1920x1080	1920x1080	1920x1080	
Specified dynamic contrast ratio	8,000,000:1	Infinite	150,000,000:1	
Brightness	Not stated	Not stated	500cd/m <sup>2</sup>	
Speakers	2x 10W	10W, 2x 4W	2x 20W	
Tuner	Freeview HD	Freeview HD, Freesat HD	Freeview HD	
EPG	7-day	7-day	8-day	
Inputs	4x HDMI, component, composite, Scart, VGA	4x HDMI, component, composite, Scart, VGA	4x HDMI, component, composite, Scart, VGA	
Outputs	Digital optical audio, headphone jack	Digital optical audio, headphone jack	Digital optical audio, headphone jack	
Networking	Ethernet, Wi-Fi	Ethernet, Wi-Fi	Ethernet, Wi-Fi	
Ports & slots	3x USB, CI	3x USB, SD, CI	2x USB, CI	
Dimensions	1,063x627x33mm	1,066x630x27mm	1,083x660x43mm	
Weight	15.3kg	13kg	16kg	
Warranty	1-year return-to-base	5-year return-to-base	1-year return-to-base	



## Conclusion

While it's fair to say that all six screens displayed strengths, there were clear winners and losers in this group test.

LG's 47LM670T may have futuristic design flair and a strong online content portal with a bright and breezy user interface, but it disappoints with its image quality. Its passive 3D technology offers an immersive, comfortable experience.

Conversely, Toshiba's 46TL963 offers ghostly 3D and half-baked multimedia support. But it's a nicely finished set that's capable of a perfectly watchable HD picture – and it's cheap for the size, too.

For sheer technical audacity, Samsung's UE46ES8000 takes some beating. While we're not convinced of the benefits of its Xbox

Kinect-style exertions, there's promise when it comes to voice control. Similarly, while the Moth Eye filter on Philips' eye-wateringly expensive 46PFL9706 isn't for everyone, there's no arguing with the clarity of its images.

Garnering a Recommended award is Panasonic's TX-L47WT50. This LED flagship offers fabulous image quality, a well-developed internet portal and dual-core processor-powered visuals.

Ultimately, though, our Best Buy winner is the effortlessly stylish Sony KDL-46HX853. It pushes its way to the top slot thanks to a combination of unbeatable 2D image quality, extensive internet TV services and a sensible price. A worthy winner. ☒

<b>SAMSUNG</b> <b>£1,899 inc VAT</b>  <b>PC ADVISOR</b> <b>RECOMMENDED</b>	<b>SONY</b> <b>£1,449 inc VAT</b>  <b>PC ADVISOR</b> <b>BEST BUY</b>	<b>TOSHIBA</b> <b>£699 inc VAT</b> 
<b>UE46ES8000</b>	<b>KDL-46HX853</b>	<b>46TL963B</b>
UE46ES8000	KDL-46HX853	46TL963B
46in	46in	46in
1920x1080	1920x1080	1920x1080
Not stated	More than one million	1,000,000:1
Not stated	Not stated	400cd/m²
2x 10W	3x 10W	2x 20W
Freeview HD, DVB-S2	Freeview HD	Freeview HD, DVB-S2
7-day	7-day	7-day
3x HDMI, component, composite, Scart, VGA	4x HDMI, component, composite, Scart, VGA	4x HDMI, component, composite, Scart, VGA
Digital optical audio, headphone jack	Digital optical audio, headphone jack	Digital optical audio, headphone jack
Ethernet, Wi-Fi	Ethernet, Wi-Fi	Ethernet
3x USB, CI	2x USB, CI	2x USB, CI
1,038x615x31mm	1,077x640x35mm	1,056x555x38mm
12kg	16.6kg	16kg
1-year return-to-base	1-year return-to-base	1-year return-to-base



# GROUP TEST



Photography by Dominik Tomaszewski



# GAMING PCs

Only the fastest, most powerful PCs can handle the intensive frames of hardcore gamers' dreams. Paul Monckton looks at six such beasts, rating them on performance, features, build quality and value

**G**aming PCs aren't about following rules; we want power, excitement and flat-out speed. This is our only PC category in which we allow overclocking.

All the systems here use an Intel Core i5-3570K processor; any differences in performance can therefore be attributed to the level of overclocking, the amount and speed of the system memory, and the performance of the internal storage. If your budget allows, the Intel Core i7-3770K is slightly faster still.

Both chips come from Intel's Ivy Bridge series, the third generation of its Core processors. Second-gen Sandy Bridge processors are slower but support greater overclocking, so a PC running one of these older chips could potentially keep up with an Ivy Bridge machine.

Cooling is essential if an overclocked CPU is not to overheat. You won't see stock coolers fitted in any of these PCs. Instead, expect large heatsinks, often with multiple fans. Liquid cooling systems can also offer greater cooling capacity than airflow alone.

The dust filters attached to a PC's fans can help prevent debris from clogging up your PC and causing it to overheat.

Any self-respecting gamer will demand a system case that looks the part, but it also needs to be practical. Good internal cable management aids airflow, while fan controllers let you tweak their speeds to reduce noise or boost cooling as necessary.

The graphics card is the single most important component in a gaming PC. It may be worth trimming your budget in areas such as storage capacity and connectivity, then splashing out on the

graphics subsystem instead. nVidia is our current champion with its GeForce GTX 670. It's almost as fast as the more expensive GeForce GTX 680.

If the GTX 670 is out of your price range, buy the best you can afford and reduce your render quality settings accordingly. If you choose a motherboard that supports SLI or CrossFireX, you can add a second card when the funds become available.

nVidia's GeForce GTX 560 Ti is a cheaper card that still offers very good performance. You may need to drop the display options to maintain the fastest framerates in some games, however.

Look for a monitor that's large, clear and offers a fast response time; getting the best colour quality is of less importance. Pricey in-plane switching panels, for example, are less important unless you intend to view the screen from the side or use the PC for image and video editing. If you're a console gamer, you may want a display with multiple inputs.

If you're playing competitively, the keyboard and mouse can make a huge difference to your performance. You'll benefit from wired rather than wireless devices, which tend to be more responsive. Look for high-resolution mice and keyboards with programmable keys and backlighting. Some draw attention to the W, A, S, D keys with different labelling or texture. Also consider a gaming headset with a built-in mic.

Warranty terms are critical in this category. The longer the better, and look for a collect-and-return rather than return-to-base option.



## ARBICO ELITE 5357 OCX

**£1,200** inc VAT • [arbico.co.uk](http://arbico.co.uk) • [tinyurl.com/7cL6865](http://tinyurl.com/7cL6865)

With its Intel Core i5-3570K CPU overclocked from 3.4GHz to 4.4GHz, Arbico's Elite 537 OCX turns in some impressive performance scores.

Despite competing systems in this group running faster overclocks, the Arbico produced the biggest numbers in both our application-based benchmark and those all-important gaming tests.

The Arbico scored 214 points in WorldBench 6, putting it just inches ahead of Dino PC's Maxosaurus 3570K. The inclusion of a high-end GeForce GTX 680 graphics card gives it a boost in gaming speed, making it the best all-round performer here.

The PC is housed in a black CIT Jupiter case, with the blue LED on the large front fan clearly visible through a mesh panel. Two more 120mm fans are found inside: a bright red one at the rear and a blue-lit transparent one at the top; there's space here for another fan to be fitted, too. The CPU is cooled by a large Xigmatek Gaia heatsink, with yet more 120mm fans fitted on either side.

Internal slots allow cabling to be tucked out the way, with the remaining slack tidied with cable ties.

A 2TB hard drive and 120GB SSD are mounted in perpendicular drive bays, allowing for easy access.

The Asus P8Z77-V LX is similar to the P8Z77V and P8Z77-V Pro models used elsewhere, but a few compromises are evident. Without support for SLI or CrossFireX you won't be able to add a second graphics card, for example. The board also features fewer SATA 6Gbps ports and has only four USB 3.0 ports. Wi-Fi is absent,

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

**PC ADVISOR  
RECOMMENDED**



as are Asus' advanced automatic overclocking features. The latter isn't particularly worrying on a vendor-overclocked system (especially one that performs as well as the Arbico), although tinkerers may prefer a more versatile motherboard.

**VERDICT:** The Arbico is a superbly fast PC and delivered the best application- and gaming-performance results across the board, despite not having the fastest overclock. The price is lower than some of its rivals here, but you'll need to add your own monitor and peripherals. Its motherboard isn't the best for tweekers.

## CYBERPOWER FANG III RATTLER

**£1,399** inc VAT • [cyberpowersystem.co.uk](http://cyberpowersystem.co.uk) • [tinyurl.com/bsc6rb2](http://tinyurl.com/bsc6rb2)

The Fang III Rattler is a huge water-cooled beast of a machine. Housed in an imposing Azza Fusion 3000 system case, it resembles some sort of futuristic body armour.

Concealing the top two 5.25in drive bays is a metal panel featuring the CyberPower logo and a blue-illuminated window through which you can check the cooling fluid level.

Three 120mm fans blow air through a large radiator fitted to the top of the case, chilling the liquid as it flows to the CPU. This Intel Core i5-3570K chip has been overclocked from 3.4GHz to 4.5GHz - the joint-highest overclock here. It performed well in our tests.

Red details adorn the inside of the case, including a rear fan guard and brightly coloured mesh rear backing plates. The sheer size of the case means there's plenty of room to work inside.

Unique in this group are its easy-swap drive bays: you can slide the supplied drive trays directly into a backplane, without plugging in cables or even opening the case's side panel. You can install up to six 3.5in drives and four 2.5in drives in this manner, which is particularly useful when using a fault-tolerant Raid setup.

Rubber-sealed holes let you route cables behind the motherboard, resulting in one of the tidiest-looking interiors we've seen in a while.

CyberPower has selected the cheaper GeForce GTX 670 for its Fang III system. The difference in framerates when compared to the GTX 680 is minimal. Unfortunately, though, the graphics card isn't hooked up to the CyberPower's water-cooling system.

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



An Asus P8Z77-V Pro motherboard offers built-in Wi-Fi and enhanced overclocking features; it's a significant improvement over the standard and LX versions found elsewhere.

**VERDICT:** Enthusiasts will love this great-looking PC. The build quality is excellent, and you get a premium motherboard and easy-swap drive bays. Performance is good but, given the water-cooling system, more oomph could be squeezed from the CyberPower's CPU.



## DINO PC MAXOSAURUS 3570K

**£1,399** inc VAT • [dinopc.com](http://dinopc.com) • [tinyurl.com/6rsjey2](http://tinyurl.com/6rsjey2)

Dino PC tames its Maxosaurus' Intel Core i5-3570K processor with a large Xigmatek Prime SD1484 cooler. This is fitted with a pair of fans in a push-pull configuration, enabling the chip to be overclocked from its stock 3.4GHz to 4.4GHz. It's not the fastest overclock, but throw in 16GB of DDR3 RAM and the Dino PC can keep up with the best of them: it recorded a very good 213 points in WorldBench 6.

Dino PC has plumped for nVidia's cheaper GeForce GTX 670 graphics card rather than the top-end GTX 680. Performance differences between the two are small, and Dino PC has been able to spend more money elsewhere in the Maxosaurus' specification.

The Maxosaurus 3570K is the first PC we've reviewed for some time to include a plug-in soundcard rather than relying on the audio capabilities of the motherboard. The Asus Xonar DGX isn't an expensive addition (retailing for around £25), but it adds a useful headphone amplifier that's aimed at gamers who want to hear every shell casing hit the ground and know precisely where it lands.

Unlike much of the competition here, you also get a 23.6in Asus VS247H full-HD monitor and a decent keyboard and mouse. These input devices are 'proper' gaming models, with editable function buttons and fast, accurate action.

Corsair's Carbide 300R system case holds everything together. It's designed specifically with gaming computers in mind and incorporates plenty of fan-mounting points, removable dust filters and cable management.

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

**PC ADVISOR**  
RECOMMENDED



The Dino PC Maxosaurus 3570K is neither as large, nor as feature-rich, as CyberPower's Fang III Rattler, but it offers everything you need for an enjoyable gaming experience.

**VERDICT:** The Dino PC Maxosaurus 3570K is a mid-priced gaming machine, with a well-rounded selection of components enabling a complete system straight out the box. It's well built, very fast and designed from the ground-up for gaming. Dino PC offers a very good price-performance ratio.

## QUIET PC SERENITY Z77 GAMER

**£1,149** inc VAT • [quietpc.com](http://quietpc.com) • [tinyurl.com/88yw8tb](http://tinyurl.com/88yw8tb)

We've come to expect Quiet PC to submit something a little different to our PC group tests, and the Serenity Z77 Gamer is no exception.

Serenity and gaming may not be concepts you'd expect to find together, but even hardcore gamers spend some of their time enjoying more peaceful activities. This system's low-noise design will be appreciated when you aren't busy blowing up stuff.

The system is still overclocked (it is a gaming PC, after all): Quiet PC has pushed the 3.4GHz Core i5-3570K to a modest 4.2GHz. Ivy Bridge processors quickly heat up as they're fed extra voltage, so the slower overclock means less cooling is required than with competing systems. The Gelid Tranquillo cooler is very quiet in use.

The DarkForce system case is also made by Gelid. It incorporates a pair of ultra-quiet fans, with room for up to eight. There's also intelligent cable management; combined with the modular cabling of the PSU, the case interior is kept very tidy, with good airflow.

The graphics card is another quiet model. The MSI N560GTX-Ti Twin Frozr II/OC uses a pair of cooling fans and custom heatpipes to allow faster operation than the standard GeForce GTX 560 Ti.

Although it's quieter than the GTX 680 and 670, it's nowhere near as fast. The Quiet PC can cope with many games at 1080p, but it won't run challenging titles above 60fps at their highest settings.

The £1,149 price is lower than others here, but you'll need to supply your own monitor, keyboard, mouse, Blu-ray drive and, most surprisingly, hard drive. The 128GB SSD will quickly fill up.

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



The Gigabyte motherboard adds support for dual-band 802.11n wireless and Bluetooth 4.0.

**VERDICT:** Quiet PC's Serenity Z77 Gamer is a well-built and quiet gaming machine. It offers adequate performance in Windows and games, but it lags behind the competition in this group test. You'll want to add a hard drive at the earliest opportunity, since the 128GB SSD will quickly fill up.



## VIBOX JUGGERNAUT XL

**£1,499** inc VAT • [vibox.co.uk](http://vibox.co.uk) • [tinyurl.com/76qwzkk](http://tinyurl.com/76qwzkk)

The Juggernaut XL, our first chart entry from Vibox, created a promising first impression. We were already a fan of its Cooler Master CM 690 II system case (although this 'Lite' version lacks a top-mounted SATA dock), and this Ivy Bridge PC appears to be very well put together. It takes full advantage of the internal cable management and makes use of a Corsair Hydro H60 liquid cooler.

Vibox has overclocked the Intel Core i5-3570K processor from 3.4GHz to 4.4GHz and teamed it with an Evga-branded nVidia GeForce GTX 670 graphics card.

The Juggernaut failed to impress in WorldBench 6; in real terms its 200-point score is very fast, but it matches that of the Quiet PC - a system clocked at only 4.2GHz and with half the system RAM.

Thankfully, its gaming framerates were much better in our tests. The Juggernaut XL easily kept up with the rest of the pack.

Unlike some of the competition here, Vibox supplies a 24in BenQ G2420HDBL monitor. You also get a decent input devices in the form of the Arctosa Black keyboard and Death Adder Re-Spawn mouse.

The Gigabyte motherboard offers fewer goodies than the similar model selected by Quiet PC. Audio support is inferior, while Wi-Fi is provided by a plug-in card.

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



**VERDICT:** Despite an excellent build quality and some superb gaming peripherals, the Vibox Juggernaut XL is expensive in the face of its rivals - particularly when you consider its lower application performance and less versatile motherboard.

	<b>ARBICO</b> <b>£1,200 inc VAT</b> ★★★★★ <b>PC ADVISOR</b> <b>RECOMMENDED</b>	<b>CYBERPOWER</b> <b>£1,399 inc VAT</b> ★★★★★	<b>DINO PC</b> <b>£1,399 inc VAT</b> ★★★★★ <b>PC ADVISOR</b> <b>RECOMMENDED</b>	
Model name	<b>Elite 5357 OCX</b>	<b>Fang III Rattler</b>	<b>Maxosaurus 3570K</b>	
Processor (overclocked)	3.4GHz (4.4GHz) Intel Core i5-3570K	3.4GHz (4.5GHz) Intel Core i5-3570K	3.4GHz (4.4GHz) Intel Core i5-3570K	
CPU cooler	Xigmatek Gaia	CyberPower advanced watercooling	Xigmatek Prime SD1484	
Memory	16GB DDR3 1,600MHz	8GB DDR3 1,600MHz	16GB DDR3 1,333MHz	
Storage	2TB HDD + 120GB OCZ Vertex 4 SSD	1TB HDD + 128GB Crucial m4 SSD	1TB HDD + 60GB Corsair Force 3 SSD	
Power supply	Xilence 580W	Cooler Master GX650W	Xigmatek 700W	
Motherboard	Asus P8Z77-V LX	Asus P8Z77-V Pro	Asus P8Z77-V	
USB ports	4x USB 3.0, 12x USB 2.0	6x USB 3.0, 3x USB 2.0	6x USB 3.0, 2x USB 2.0	
Screen	Not supplied	Not supplied	23.6in Asus VS247H (1920x1080)	
Graphics (core/memory/shader speeds)	Palit nVidia GeForce GTX 680, 2GB VRAM (1,006/1,502/nsMHz)	Palit nVidia GeForce GTX 670, 2GB VRAM (915/1,000/1,344MHz)	Zotac nVidia GeForce GTX 670, 2GB VRAM (915/1,502/nsMHz)	
Sound	Onboard	Onboard	Asus Xonar DGX PCIe	
Connectivity	Gigabit ethernet	Gigabit ethernet, 802.11n	Gigabit ethernet, 802.11n	
Ports	2x DVI, HDMI, DisplayPort, eSATA	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	
Case	CIT Jupiter	Azza Fusion 3000	Corsair Carbide 300R	
Keyboard & mouse	Not supplied	Not supplied	Razer Arctosa, Gigabyte M8000X	
Optical drive	BD-ROM/DVD ± RW	BD-ROM/DVD ± RW	BD-ROM/DVD ± RW	
Operating system	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	
Extras	None	Microsoft Office 2010 Starter Edition	None	
WorldBench 6 score	214	205	213	
Gaming performance (fps) <sup>1</sup>	110/75/57/118	105/66/51/109	102/67/52/110	
MediaEspresso time	4 mins 1 sec	N/A	4 mins 13 secs	
Power consumption <sup>2</sup>	63W/192W	98W/160W	83W/194W	
Warranty	2-year return-to-base (labour only)	3-year return-to-base (labour only)	3-year return-to-base (2-year parts and labour)	

<sup>1</sup>Tested in Crysis at 1080p, High (no AA)/V High (no AA)/V High (16x AA) and Stalker: Call of Pripyat at 1080p, Ultra respectively <sup>2</sup>Tested when idle and in Crysis • ns: not specified



**YOYOTECH Warbird 3570XTA****£1,149** inc VAT • [yoyotech.co.uk](http://yoyotech.co.uk) • [tinyurl.com/7kpqcy6](http://tinyurl.com/7kpqcy6)

The Warbird 3570XTA is one of the least expensive systems in our group test, and on looks alone you'd probably guess that. However, this is a complete and solid-performing system out of the box.

The Gigabyte Luxo X10 system case includes minimal cable management, and there are no perpendicular drive bays for easy access. Oddly, its motherboard sits upside down.

An Arctic Freezer cooler has enabled YoYoTech to push its 3.4GHz i5-3570K to an impressive 4.5GHz, equal to that of CyberPower's liquid-cooled PC. It was still beaten by the Arbico and Dino PC in WorldBench 6, but it turned in a respectable 209-point score – an impressive result for a system with 'only' 8GB of RAM.

YoYoTech has selected the same Asus P8Z77V-LX motherboard as Arbico. It's a feature-rich board, but not as enthusiast-friendly as the non-LX or Pro editions, which offer additional features and superior overclocking assistance.

A PNY nVidia GeForce GTX 670 graphics card delivered very good gaming performance in our tests. It's a little slower than the Arbico's GeForce GTX 680, but a lot less expensive, enabling YoYoTech to include a 23.6in Asus VS247H full-HD monitor and a wired mouse and keyboard, yet still keep the price reasonably low.

**PC ADVISOR  
BEST BUY**

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

**VERDICT:** Offering excellent value for money and strong performance, the YoYoTech Warbird 3570XTA is a complete gaming machine costing just £1,149. The system case leaves a little to be desired, but looks aren't everything.

<b>QUIET PC</b> <b>£1,149 inc VAT</b> <b>★★★★★</b>	<b>VIBOX</b> <b>£1,499 inc VAT</b> <b>★★★★★</b>	<b>YOYOTECH</b> <b>£1,149 inc VAT</b> <b>★★★★★</b>	<b>PC ADVISOR</b> <b>BEST BUY</b>
<b>Serenity Z77 Gamer</b>	<b>Juggernaut XL</b>	<b>Warbird 3570XTA</b>	
3.4GHz (4.2GHz) Intel Core i5-3570K	3.4GHz (4.4GHz) Intel Core i5-3570K	3.4GHz (4.5GHz) Intel Core i5-3570K	
Gelid Tranquillo cooler	Corsair Hydro H60 water cooler	Arctic Freezer cooler	
8GB DDR3 1,600MHz	16GB DDR3 1,600MHz	8GB DDR3 1,600MHz	
128GB Crucial m4 SSD	1TB HDD + 120GB Kingston V+200 SSD	2TB HDD + 120GB Intel 520 Series SSD	
Nexus 630W	Corsair 700W	OCZ 550W	
Gigabyte GA-Z77X-UD5H-WB WIFI	Gigabyte GA-Z77X-D3H	Asus P8Z77V-LX	
5x USB 3.0, 6x USB 2.0	6x USB 3.0, 4x USB 2.0	3x USB 3.0, 5x USB 2.0	
Not supplied	24in BenQ G2420HDBL (1920x1080)	23.6in Asus VS247H (1920x1080)	
MSI N560GTX-Ti Twin Frozr II/OC, 1GB VRAM (870/1,020/1,740MHz)	EVGA nVidia GeForce GTX 670, 2GB VRAM (915/1,502/915MHz)	PNY nVidia GeForce GTX 670, 2GB VRAM (915/1,502/915MHz)	
Onboard	Onboard	Onboard	
2x gigabit ethernet, dual-band 802.11n, Bluetooth 4.0	Gigabit ethernet, 802.11n	Gigabit ethernet	
2x DVI, Mini DisplayPort, FireWire, eSATA	2x DVI, HDMI, DisplayPort, eSATA	2x DVI, HDMI, DisplayPort	
Gelid DarkForce	Cooler Master CM 690 II Lite	Gigabyte Luxo X10	
Not supplied	Razer Arctosa, Razer Death Adder Re-Spawn	Microsoft Wired Desktop 400	
DVD±RW	BD-ROM/DVD±RW	BD-ROM/DVD±RW	
Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	
External SATA dock	Three free game downloads from Steam	None	
200	200	209	
61/36/28/62	106/68/53/110	106/68/53/111	
4 mins 10 secs	4 mins 1 sec	4 mins 3 secs	
55W/178W	61W/182W	89W/185W	
2-year collect-and-return	3-year return-to-base (labour only), 90-day collect-and-return	3-year return-to-base (labour only)	

&gt;&gt; How we test and our conclusion



## Conclusion

Ivy Bridge chips don't overclock to the same extent as their older Sandy Bridge siblings, yet they offer increased performance as standard and at any given speed.

The processor speed isn't always a good indicator of overall system performance in any case, so don't jump at the chance to buy a 4.5GHz machine over a potentially faster 4.4GHz system.

For gaming systems, the graphics card has a greater impact on performance than the processor. nVidia's GeForce GTX 680 is the fastest money can buy, but the GTX 670 is significantly cheaper and only slightly behind in performance.

Our group test covers gaming machines costing from £1,149 to £1,499. If that's way out of your price range, you can customise the specification to include a less powerful graphics card – often the most expensive component in a desktop PC.

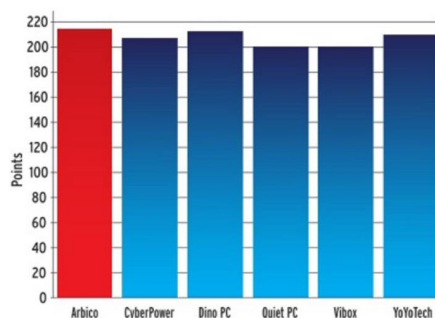
If you want all-out speed, Arbico's Elite 5357 OCX is unbeatable both in application performance and those crucial gaming framerates. It's one of the least expensive PCs here, but you'll need to factor in the price of a monitor, keyboard and mouse if you don't already have them.

If you love to upgrade and tinker with your PC, CyberPower's Fang III Rattler offers

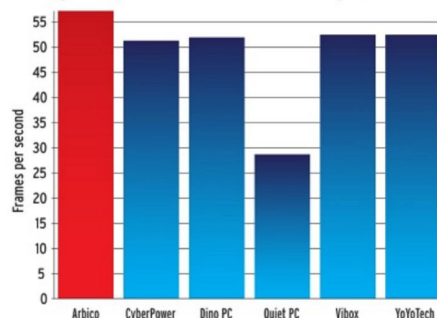
by far the most impressive system case in our round-up. With plenty of room inside and easy-swap drive bays, it'll prove a doddle to upgrade the components. It also comes with a superior Pro version of Asus' popular P8Z77 motherboard.

If you want the minimum spend, but crave high performance, take a look at YoYoTech's Warbird 3570XTA. It comes in a less impressive case and isn't as easy to upgrade, but delivers great performance and a full set of peripherals. Watch out for dust build-up over time, though, as the 4.5GHz overclock is rather ambitious for an air-cooled system in such a small case.

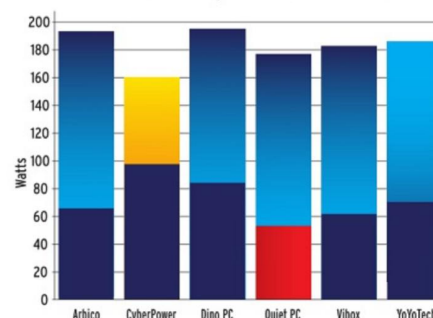
WorldBench 6 score



Crysis performance (V High, 16x AA)



Power consumption (idle/max)



## How we test

### Application performance

Core system performance is measured using WorldBench 6. This customised test suite runs several desktop Windows applications with real-world workloads, mimicking how PCs are used on a daily basis.

Results from 10 individual tests are combined and weighted to produce a numerical score relative to a baseline PC.

Our baseline configuration runs a 2.4GHz Core 2 Duo E6600 processor, 2GB of DDR2 RAM, an nVidia GeForce 7900 GS graphics card, twin Western Digital Caviar WD3200KS hard drives in a striped Raid array, and Windows Vista Home Premium 32bit. This PC scored 100 points in WorldBench 6.

### Gaming performance

We use two games to evaluate performance. Stalker: Call of Pripyat was chosen for its DirectX 11.0 requirement and simple-to-use benchmarking tool, while the older game Crysis remains sufficiently intensive to stretch modern graphics cards to their limit.

We crank up the quality levels to 1080p, then record framerates in Crysis at High, V High and V High (16x AA) settings, plus Ultra in Stalker.

### Transcoding performance

Because you'll often be working with more than one video file format, we set each PC the task of converting a batch of 1080p Mpeg4 video clips for use on the iPad 2 and recorded how long it took to complete. We use CyberLink's MediaEspresso software.

### Overclocking

Because gamers demand the best performance from their hardware, we allow vendors to overclock PCs in this category. We require that any tweaked component is designed for overclocking, and that the PC vendor offers a comprehensive warranty.

### Power consumption

Overclocking and high-end graphics cards can place considerable demands on power. We measure the power consumption of the base PC unit and keyboard, excluding the monitors and speakers.

We set the PC to 'High Performance' mode in Windows, ensuring that its hard drive won't power down mid-test. We then measure the power consumption of the computer as it's sitting idle, since it's important that graphics subsystems don't

consume unnecessary power when they're not driving games.

Next, we measure power consumption while the PC is running MediaEspresso.

### Subjective assessment

We pay close attention to the physical characteristics of each PC, its noise output and its build quality, delving inside the case and taking note of the quality of components used, cabling and airflow.

Good-quality peripherals are also important, and where they are supplied we note the ergonomics of the keyboard and mouse. Ordinary wireless keyboard and mouse combos are frowned upon, whereas fast, responsive peripherals will impress.

### Support

Differences in warranty terms can impact our scoring. Long warranties are sought after, but we also look at the terms and conditions – specifically, whether faulty systems must be returned to the vendor at your own cost and if both parts and labour are included. Ensure the vendor offers full software support and preferably a home installation for more complex systems. ☒





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## Delete & recover data

Whether you need to permanently remove all traces of certain files or restore them following an accidental deletion, let Mike Bedford be your guide

**T**he most valuable part of your PC is not the hardware itself, but the wealth of personal and often irreplaceable data stored on its hard drive. From family photos and video, through emails and household accounts to reports and presentations for work, their loss could involve time-consuming recovery at best, or be gut-wrenching at worst.

Yet it's so easy to make a mistake. All it takes is one press of the Delete key and your valuable data is consigned to oblivion. And it gets worse: spinning at 7,200rpm for eight or more hours per day, it's a minor miracle that hard disks are so reliable – but nothing is immune from failure. If your disk suffers a crash it could take with it all your data. Even

something as apparently innocuous as a power failure could wreak havoc if Windows was writing to your disk at the time.

Before you get too depressed at the prospect of impending doom, we have good news. Windows may not be able to see a file that you accidentally deleted or was the victim of a disk failure, but it's possible that the data could still be there. And if it is still present, there are several ways in which you can retrieve it.

Of course, there's a flip side to this. Sometimes you really do want to delete a file, so it's worrying that apparently deleted files can be recovered with ease. If you swap PCs with a work colleague or sell your laptop, for example, you need to be sure that the new

user won't be able to access the personal data you've previously stored on its hard disk.

Even dumping an ancient computer at the local tip or recycling centre could be risky. By using some of the techniques we discuss in the first part of this feature, anyone could gain access to your passwords, financial details and home address – even if you think such details have been erased.

Again, with our help, we'll show you in the second half of this feature how to ensure that sensitive data is impossible to recover. You could guarantee this by subjecting the hard disk to some serious abuse, but we'll also show you how to securely delete your data in a slightly less spectacular but more environmentally responsible fashion.



## RECOVERING DATA

Chances are you're well aware of Windows' Recycle Bin; it's the first place to look if you've accidentally deleted a file. When you select a file and press the Delete key (or right-click and choose the Delete option from the context menu), Windows makes no attempt to actually delete it.

Instead, it moves it to a special folder called the Recycle Bin, which has its own icon on the desktop. Restoring a file from the Recycle Bin is a matter of double-clicking the desktop icon to display its contents, then right-clicking a file and selecting Restore.

Don't rely on the Recycle Bin as a safety net, though: it has a size limit and, once exceeded, older files will in fact be deleted. The default size is more than adequate for most people, so there's a very good chance that any files you want to restore will still be present in the Recycle Bin. To check or alter the capacity, right-click the Recycle Bin and choose Properties.

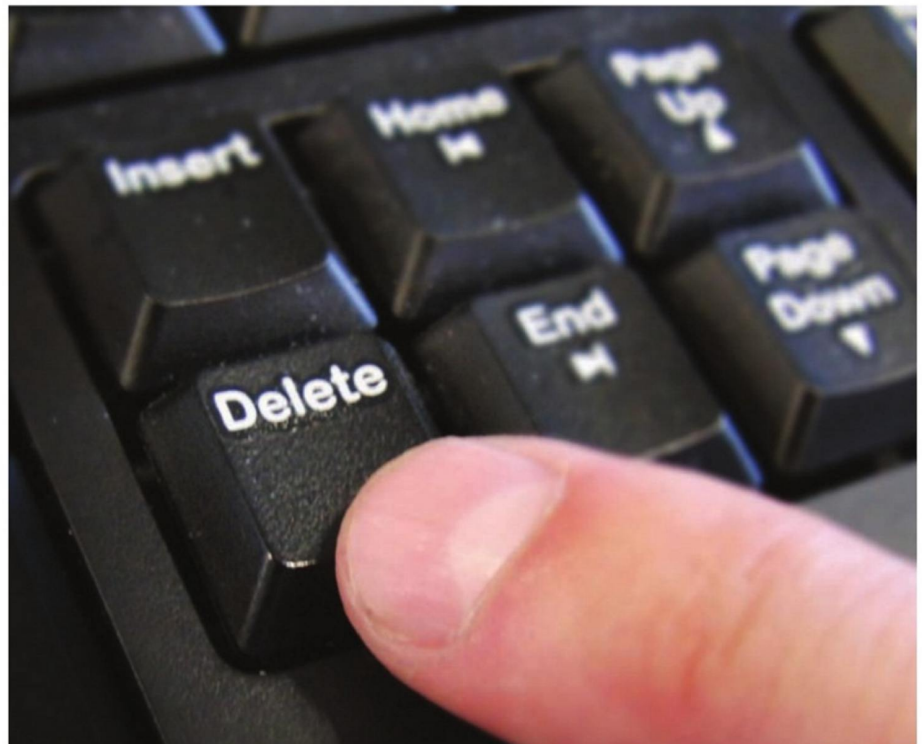
If you're in the habit of deleting files by holding down Shift as you press Del or select Del from the context menu, files are deleted rather than moved to the Recycle Bin. Similarly, if you choose to empty the Recycle Bin by right-clicking it and selecting 'Empty Recycle Bin', the files will be deleted and no longer available to Windows.

### When gone isn't for good

The term 'delete' is something of a misnomer here, though. Details differ depending on the file system in use (hard disks often use a different format to flash drives, for example) but, in essence, all that happens when Windows deletes a file from the hard disk is the Master File Table (a system file Windows uses to keep track of the physical area of the disk occupied by each file) is modified. The areas of the disk occupied by the deleted file are marked as available for re-use.

It should come as no surprise, therefore, that a software utility capable of delving into the Master File Table should be able to restore the 'deleted' files. Several programs can do this: turn the page for a step-by-step guide to using the free DiskDigger utility.

However, file recovery isn't always plain sailing, so it pays to understand its limitations. The most important thing to note is that time is of the essence. If the areas of the disk previously occupied by the file



are marked as available for re-use, Windows will eventually overwrite them; when that happens, your data is gone for good.

The sooner you realise you've accidentally deleted a file, the better your chances of recovering it. Don't save anything to the disk until after you've tried to recover your data. Given that installing a file-recovery utility involves writing to the hard disk, it's worth installing one now as a precaution. Failing this, look for software that you can run directly from a USB flash drive, so that downloading and installing it doesn't inadvertently overwrite the portions of the hard disk that contain your missing data. Even browsing the web to find an undelete utility causes files to be written to your disk so, if possible, use a different PC.

### Best practice

Undelete utilities are able to work reliably only with sequential files. If your disk is reasonably full, Windows will split new files across spare blocks around the disk. Such files are very difficult to recover.

Different types of drive use different file systems, and undelete utilities work only with particular types of file system. Hard disks in Windows PCs use the NTFS file system, but USB flash drives usually use some variant of FAT (FAT16, FAT32 or exFAT). Be sure to

select software with the necessary support for all your media.

Another drawback with most undelete utilities is that they won't work with networked storage, such as NAS drives. The disks in a NAS drive are under the control of the drive's own operating system (usually a Linux variant), so software running under Windows isn't typically able to attempt a recovery. If you've accidentally deleted a file then it might be in the NAS drive's own recycle bin (if enabled), in which case you should be able to recover it; check the documentation for your model. If it's not here, you have only two options.

Provided that you don't mind getting to grips with the insides of the NAS drive and your PC, it might be possible to remove the disks from the NAS and attach them directly to your PC. A Windows recovery utility may then be able to recover your files, but only if the drive uses the same file system.

Note that NAS drives that use a Raid array may split your data across more than one disk. Some recovery software supports Raid arrays, so it's worth bearing this in mind when making your selection.

If you don't fancy dismantling your NAS drive, the other option is to send it to a professional data-recovery company. We'll look at these services overleaf.



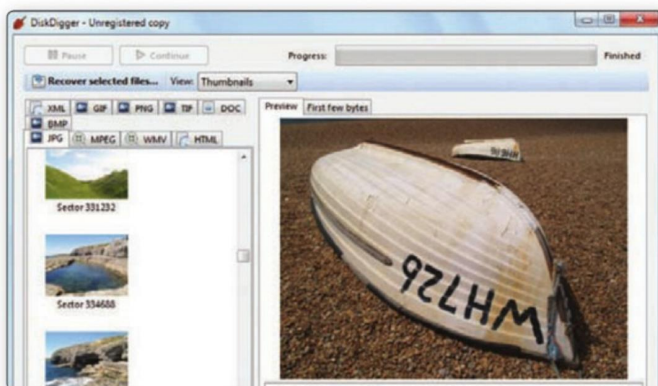
## RECOVERING FILES USING DISK DIGGER



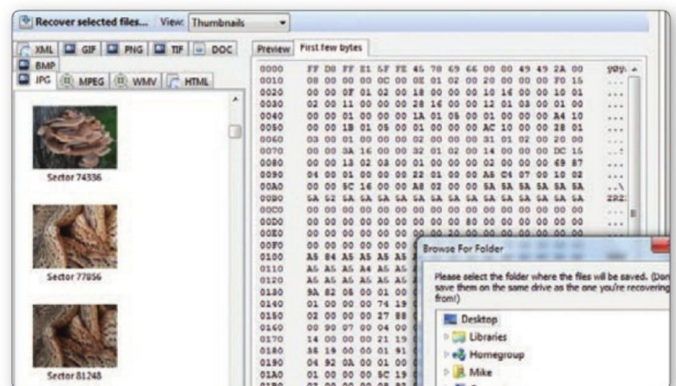
**START** Don't wait until you've lost data to install a data-recovery tool, since its installation can overwrite the very file you wish to recover. We like the free DiskDigger; download it now from [tinyurl.com/dx9a2ee](http://tinyurl.com/dx9a2ee). Next, simply extract the contents of the Zip archive and run the .exe file.



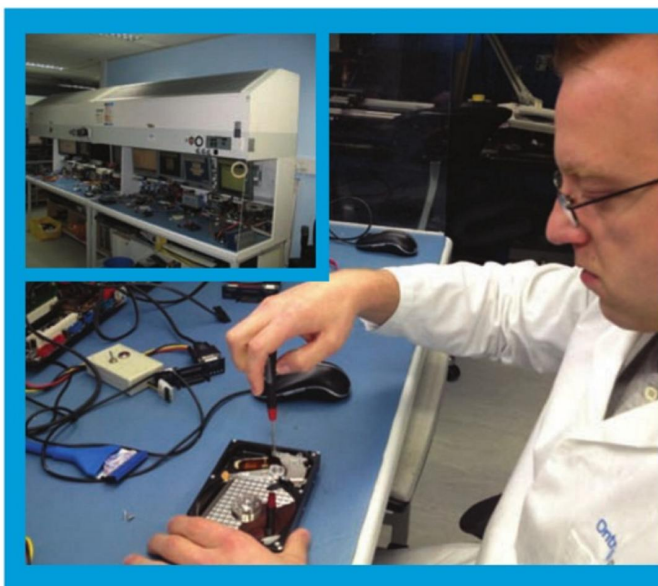
**2** DiskDigger lists all your drives on the main screen. Select the disk containing your deleted data, then click Next three times. DiskDigger will scan your drive and list any deleted files it finds, but note that this could take some time. Look for the relevant file in the list; if it's not there, try altering some options in its configuration.



**3** DiskDigger won't display the filenames you attributed to each file. A preview option is provided to help identify lost files, however. Select a file from the list on the left and choose Preview (for photos) or the 'First few bytes' tag. Also useful for photos is the Thumbnail option in the View menu.



**4** Once you've identified your lost file, select it in the list and click 'Recover selected files...'. Choose the device and folder to which you want to restore the data (not the original drive) and click Ok. DiskDigger will automatically generate filenames for your files, so be sure to rename them to avoid losing them a second time.



## HARD-DISK FAILURE

Having dispelled the myth that deleted and corrupted files are lost forever, we now come to the problem that all PC users dread: a hard-disk failure. This could manifest in several ways but, generally, Windows won't start, even in Safe mode, and turning on your PC might be accompanied by unhealthy clicking sounds. What you stand to lose isn't just a few of your treasured files, but the entire contents of the disk.

It's commonly suggested that putting a failing hard drive in the freezer can repair it. This has been known to work, although only ever to bring the drive back to life just long enough to extract your most important files. This solution is effective only with specific types of fault, of course, and you could potentially make matters worse. Our advice, if you want the best possible chance of recovering your data, is to avoid DIY fixes such as this.

Instead, as soon as you suspect a hardware failure, turn off your PC and make contact with a data-recovery company, such



## DEALING WITH CORRUPTED FILES

We've talked about recovering accidentally deleted files, but data can also be lost due to the hard disk's file structure becoming corrupted. This could happen, for example, if a power failure occurred while a file was being written, leaving the disk directory in an unpredictable state.

As with accidentally deleted files, the data may still be present on your drive but Windows has lost its link to its location. This will be confirmed by error messages when you try to open a file, or in the disappearance of data you're certain you haven't deleted.

Software utilities are available to identify and correct this sort of error, and some also offer to recover from logical errors in the file

system. Note that you'll usually have to pay for more fully featured products, however.

### You get what you pay for

Some paid-for utilities offer a free trial before you buy. We like Recover My Files' approach ([recovermyfiles.com](http://recovermyfiles.com), or read our walkthrough at [tinyurl.com/cLVnxep](http://tinyurl.com/cLVnxep)). You'll pay out only if it's file-recovery attempts are successful. You simply download and run the software in evaluation mode to find out what files it can recover; then, if it finds the file you need, you pay a fee to recover that data.

An exception to the rule is the free, open-source TestDisk ([cgsecurity.org](http://cgsecurity.org)), which has earned a good reputation.

TestDisk is available for Windows, Linux and Mac OS X. Whatever software you use, though, as with pure undeletion packages, install it to the offending hard disk only prior to the loss of your data.

Also bear in mind that packages will differ in their ability to recover lost data. It would be a good idea, therefore, to try out several (provided they have an evaluation mode that shows you what files they can recover without writing to your hard disk), then choose whichever product has the best success rate. If you don't find any software that meets your needs, the option of using a data-recovery service is always available as a last resort – if you can afford to.

## PURPOSELY DELETING DATA

The fact that accidentally deleted data isn't necessarily gone forever might come as something of a relief, but there are worrying consequences. If you can't properly delete the data on your hard disk prior to selling, swapping, lending or disposing of your PC, the consequences could be disastrous.

When you need to permanently destroy data, some extreme methods can render the entire disk unreadable (see page 87). These do rather depreciate the value of your PC, however. Here, we'll show you how to securely delete your data and keep your disk intact.

The method is simple enough and there are several software packages that provide secure-deletion facilities. In addition to removing references to the file in the hard disk's directory, the software overwrites with

random data any areas of the drive originally occupied by the file.

The exact process differs depending on the file system. Because flash drives tend to use a different file system from the hard disk, you should look for an application that supports both FAT and NTFS.

Interestingly, it's been suggested that overwriting a file with random data isn't enough. The argument is that when data is written to a disk, the resultant magnetic flux has a tiny contribution from the data previously occupying that part of the disk. It would follow, therefore, that if you extract the analogue signal directly from the disk's read/write head, and subtract the signal corresponding to the current data, you're left with that tiny contribution from the data.

For this reason, some secure-deletion software overwrites data not once but several times. We discussed this with an expert in hard-disk technology at Western Digital, who told us he didn't know of anyone ever having achieved it. And while not suggesting that it was impossible, it would be so expensive and time-consuming that he couldn't imagine it being attempted unless national security was at risk.

So although there's no reason to avoid software that claims to overwrite files 40 times, this shouldn't be a criterion in selecting a suitable product. You can see how simple this sort of package is to use, plus prove that a deleted file is gone beyond recovery in our step-by-step guide to using Eraser 6.0 overleaf.

as Kroll OnTrack ([krollontrack.co.uk](http://krollontrack.co.uk)). Such companies maintain vast stocks of spare parts, so they can open and repair your hard drive inside a clean room. A technician is then able to copy your data to encrypted removable media, such as a USB drive.

If the problem is with the hard drive's electronic circuit board, motor or read/write head, there's a good chance that specialists will be able to recover your precious data. However, if the drive platter is scratched or damaged, it's usually game over. This is the part of the hard drive on which your data is stored.

As always, it pays to shop around before deciding to which company you should



send your drive; it's also wise to look for a service that will diagnose the problem for free. As a guide, Kroll OnTrack charges

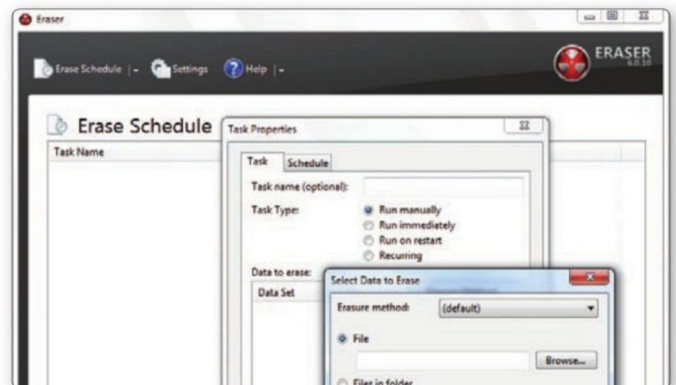
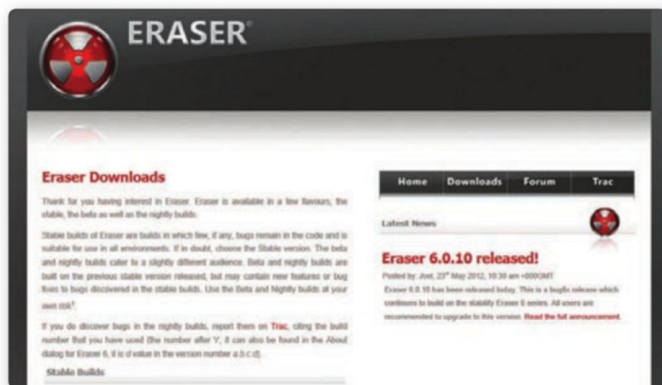
a fixed £599 fee to consumers; business rates differ depending on the exact nature of the problem.

### Just a little scratch

Although data can't usually be recovered if a hard disk's platter is scratched, the same isn't necessarily true of optical discs. Provided that the scratch is in the plastic protective layer and not the underlying data storage layer, chemical formulations and mechanical polishing machines are available to help repair your disc. Digital Innovations' SkipDR is one example, available for £14 from PC World (see [digitalinnovations.com](http://digitalinnovations.com) for more info).

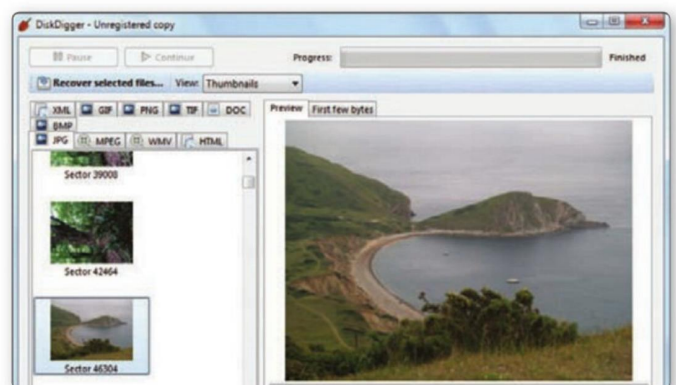


## SECURELY DELETING DATA USING ERASER 6.0



**START** Download and install the latest stable version of Eraser 6.0 from [eraser.heidi.ie](http://eraser.heidi.ie), accepting the default settings. Unlike with the DiskDigger undeletion utility, there are no concerns about overwriting data here; you can download it and install it to any convenient drive, including your main hard disk.

**2** Run Eraser 6.0 and you'll see an empty Erase Schedule. We're going to manually delete a file, though, so select New Task from the Erase Schedule menu. This will display the Task Properties dialog; ensure Run Manually is selected as the Task Type. Click Add Data to display the 'Select Data to Erase' dialog.



**3** Make sure File is selected, then click Browse to find the data you want to delete and press Ok. Note that we're choosing to delete the photo of a sign carrying the words 'Keep Out'. Click Open (a misnomer), then Ok and Ok again. Finally, right-click the file in the Erase Schedule menu and select Run now.

**4** The file will now be deleted without trace. Close Eraser 6.0. Just to prove the data isn't recoverable, we tried to unearth the file using DiskDigger (see page 84). Try as we might, though, even when using the Dig Deeper option the software was unable to recover our securely deleted photo.

## DESTROYING OPTICAL MEDIA

Optical discs, such as CDs, DVDs and Blu-rays, are rather different from magnetic or flash drives and most secure-deletion products won't touch them. For rewritable discs this really isn't an issue, since you're not going to be disposing of them along with your computer as you would with the hard drive. If you do decide to give an optical disc to someone, it's usually because you want to share with them some data.

However, write-once discs such as CD-R, DVD-R and DVD+R tend to be thrown away once you've finished with them. In this case, the only way you can prevent your data falling into the wrong hands is to physically destroy the disc. You can buy paper shredders that also shred optical discs and, if you're paranoid

about your data security, that may be an ideal solution. However, in our experience, low-cost home shredders aren't tough enough for this sort of treatment, and shredding CDs on a regular basis will probably contribute to their premature failure.

No-one is going to spend a fortune on bleeding-edge data-recovery technology on the off-chance that a CD-R they found in your bin contains something valuable; just ensuring that it's in two pieces will be enough. Cutting it with



scissors (not your best pair, mind) is one option, or you could just snap it in two, having first wrapped it in a cloth to protect yourself from flying shards of plastic.





## DESTROYING HARD DISKS

We've seen that data can be effectively deleted from a hard disk using nothing more than a secure-deletion utility. However, if you take the view that anything less than physically destroying the hard drive isn't good enough, here are a few suggestions.

Bear in mind that we're not recommending the methods discussed here (there's really no need) and they all carry the risk of injury. Remember that some disks contain glass platters, which could shatter and cut you. If your computer no longer has any value to you, it's also possible that a charity could benefit from it. With these caveats in mind, let's get on to the fun stuff.

When you remove a disk from a PC, the most easily accessible part will be the circuit board on the bottom; as such, the easiest way to abuse the drive would be to get to work on that board with a hammer and chisel. But while that might

be the simplest approach, your attempts would be futile. This isn't where the data is stored. If someone were to replace that board, they'd still be able to read your data. Instead, any attempt at destroying a disk should concentrate on the platter or platters – the silver disk(s) that you'll see when you remove the screws (some of which may be hidden under labels, and use security heads) and take the drive apart.

Just scratching the platter(s) with a screwdriver will suffice, even though it's not a particularly satisfying experience. If you really want to release that pent-up energy, a sledgehammer would be sure to do the trick. If, on the other hand, you consider yourself something of a pyromaniac, a conflagration will also ensure that your data never sees the light of day again – heating up the platters to a red glow with a blow torch would be ideal, as would dropping it into the heart of a garden fire. If you have an angle grinder



to hand, you may find it rather effective in drive destruction, too.

These are just a few of our favourites, but all that stands between you and an exciting way to wipe your data from the face of the earth is your imagination. ☑

## ENCRYPTING DATA

None of the methods we've seen thus far will prevent your data from falling into the wrong hands if your computer is stolen. Although it's not directly related to the main theme of this feature, it's worth encrypting your sensitive files if you're worried about possible theft. Turn to page 114 to find out how.





# REDEFINING STORAGE PERFORMANCE FOR THE **4<sup>TH</sup>** TIME.

**Ver-tex** (vur-tek): noun, singular.

- 1.) The highest point
- 2.) Anatomy: the crown of the head
- 3.) Astronomy: a point in the sky towards which a star stream appears to move
- 4.) Computer Technology:
  - a. the pinnacle of storage performance: *Vertex offers a superior computing experience.*
  - b. continually sets the bar for SSDs each year
  - c. the culmination of SSD expertise, obsession, and evolution
  - d. does not follow the lead of another to obtain greatness; trailblazer



Four years in the making, the OCZ Vertex 4 Solid State Drive Series redefines the modern day computing experience with enhanced performance and endurance. Ingeniously engineered to deliver industry-leading file transfer rates and superior system responsiveness, the fourth generation Vertex Series was designed to unleash ultimate productivity, gaming, and multimedia applications like no other storage solution.



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Fast boot times and ultra-low latency



Industry-leading 5 year warranty



# 50 TIME-SAVING TIPS



The PC Advisor team shares its favourite tips for working faster, not harder

**T**ime is money, as Benjamin Franklin once said. Your time is precious, and we reckon we can help you save plenty of it with these 50 great tips.

You may think you can get around Windows pretty swiftly, and find the search results you want from Google. But unless you're using keyboard shortcuts rather than a cumbersome mouse-and-menus approach, the chances are you're not working as fast as you could be.

Plus, there are lots of hidden shortcuts to using Google and Gmail, which can save minutes on the repetitive chore of finding information.

Whether you're sitting in front of a PC or on the move using a laptop, smartphone or tablet, you're bound to find some time savings over the next few pages. They may save you only seconds, but add those up over a day, a week or a month and they'll prove significant.

We've collated the 50 best tips that we use to on a daily basis to help you save hours and become more productive.



# WINDOWS



Most of the following tips work with all versions of Windows, but some are reserved for Vista and Windows 7. Some shortcuts also work in third-party applications.

**1 Use keyboard shortcuts:** Most Windows users know about using Ctrl, C to copy, Ctrl, V to paste, and Ctrl, Z to undo, but other Windows keyboard shortcuts can be just as helpful. For example, pressing the Windows key and L will lock your machine, while Ctrl, Y lets you redo the last action you undid using Ctrl, Z. You can use the Tab key to jump to the next field in a form, and Shift, Tab to jump back to the previous field.

If you work with Excel, familiarise yourself with switching between worksheets by holding down Ctrl and tapping Page Up or Page Down. You can flip between open documents in Photoshop and other programs by holding down Ctrl and tapping Tab. Look in an application's menus to see the keyboard shortcuts assigned to different commands.

**2 Assign keyboard shortcuts:** If the default shortcut for one of your most frequently used actions is unduly complicated or doesn't exist, make your own. Photoshop is one of several programs that has its own keyboard shortcut mapper (go to Edit, Keyboard shortcuts). You could, for example, create a shortcut for cropping an image, which has no default shortcut.

Windows 7 lets you map keys to program shortcuts, too. Right-click the program shortcut, select the Shortcut tab, choose the Shortcut key box, and assign a keyboard shortcut that will open the program when you tap it in conjunction with Ctrl and Alt.

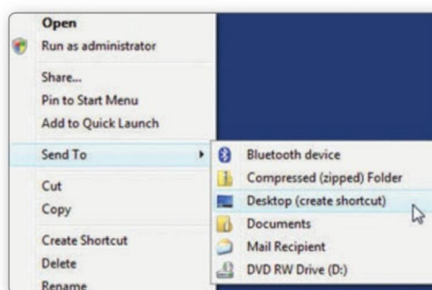
**3 Quickly navigate between windows:** Use Alt, Tab to bring up an overlay in the centre of the screen showing all your open windows. Keep holding Alt and press Tab or the cursor keys to toggle between them.

In Windows Vista and later, Flip 3D turns open windows into a virtual stack. Press Windows, Tab to activate Flip 3D. For additional control, use Windows, Left arrow or Windows, Right arrow to snap your window to the left or right side of the screen,



Windows, Up arrow to maximise the window, or Windows, Down arrow to minimise it.

**4 Use keys to open programs without a mouse:** In Windows 7, press the Windows button to open the Start menu. Start typing the name of a program and it will appear in the All Programs list; press Enter to open the top result.



**5 Adjust your laptop's screen brightness:** Windows doesn't make it easy to change your display brightness - at least not in the places you might expect. Press the Windows key and X to bring up the Windows Mobility Center. Here, a slider lets you adjust screen brightness. It's particularly handy when you reinstall Windows and find the brightness control on the keyboard doesn't work due to the absence of the necessary driver.

**6 Create desktop shortcuts:** Save time navigating to the programs and folders you most often use by setting up desktop shortcuts. In Windows, right-click the item and choose Send To, Desktop (Create Shortcut). Be sure to save shortcuts rather than the



folder itself to your desktop, or you'll be at greater risk of accidentally deleting that data.

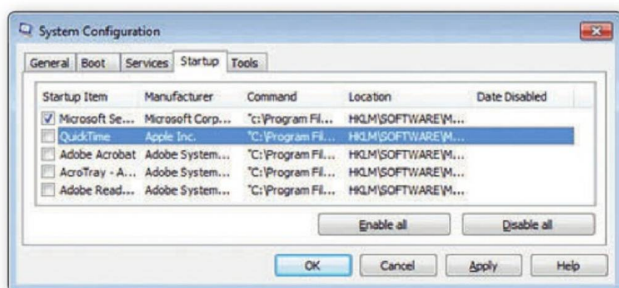
**7 Startup programs:** Many of the programs you install on your PC or laptop will set themselves to launch automatically at startup. With several programs adopting this behaviour, you'll find Windows increasingly slow to boot up. This is easily solvable: run msconfig (type it into Windows' search box and press Enter) and uncheck any unnecessary programs from the Startup tab. Be careful, though: some programs must launch for your computer to work properly.

**8 Free up hard drive space:** If your hard drive is nearly full, this will have a knock-on effect on your PC's performance. One way to prevent Windows slowing down is to store any files you don't regularly use on an external drive. Video and other media are prime candidates.

**9 Get a second monitor:** In some applications you'll find you spend a lot of time scrolling or minimising and maximising windows. Windows has great multimonitor support and, with full-HD displays so cheap these days, you can add another desktop for less than £100.

**10 Create a PDF for sharing:** It's easy to email someone a Word or Excel file, but it can be easier to send them a PDF. After all, most computers have the necessary software installed for reading PDFs, and those that don't can take advantage of Adobe Reader and countless other free PDF readers. People will no longer need to request that you send documents in specific formats when they can't, for example, view your .xlsx file.

The easiest way to create PDFs in any application is to install a PDF printer driver, such as Bullzip ([tinyurl.com/dyLexs3](http://tinyurl.com/dyLexs3)). When you next print something, you'll see a new printer option: Bullzip. Select this rather than your physical printer to save the file as a PDF.





## WEB



We spend a considerable amount of time on the web, for work and pleasure. Here are a bunch of tips that should save you time.

**11 Save time typing website addresses:** When typing a website address into your web browser you don't always need to enter the 'www.' and '.com' parts. Simply type the main part of the address, for example 'google', then press Ctrl, Enter.

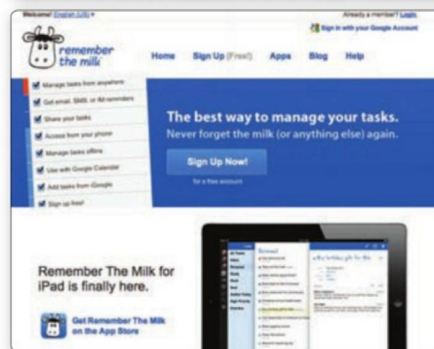
**12 Use App Tabs in Firefox:** If you visit certain websites on a regular basis, Firefox lets you create App Tabs that keep them permanently open. Right-click the desired tab and choose 'Pin as app tab'.

**13 Control your tabs:** In a browser, press Ctrl, T to open a new tab. Use Ctrl, Tab to switch between open tabs; and Ctrl, Shift, T to reopen an accidentally closed tab.

**14 Pin key pages:** Get to your favourite sites without having to open a browser. Click the icon to the left of the web address in Internet Explorer's One Box, the tab for the website, or the website's icon on the New Tab page, then drag it to Windows 7's taskbar. When a site is pinned it has its own thumbnail and Jump List. Some sites also have thumbnail preview controls, or icon overlays providing live information such as the number of new messages in your inbox.

**15 Get a better web browser:** Our recent group test of the six most popular web browsers found Chrome and Firefox to lead the pack ([tinyurl.com/7pngo4r](http://tinyurl.com/7pngo4r)). If you often find your browser is slow to load your favourite sites, try downloading and installing an alternative tool. You may find some sites are optimised for particular browsers, and it won't hurt to install more than one.

**16 Get faster broadband:** If you're still using a slow dialup or 3G broadband - or even if you have an entry-level home broadband package - you could be losing precious time from your online working day. The difference in page-load times may only be seconds, but all those seconds add up. Check you're getting the speed you're paying for at



[speedtest.pcadvisor.co.uk](http://speedtest.pcadvisor.co.uk), then see if you can do better at [tinyurl.com/2enbje8](http://tinyurl.com/2enbje8).

**17 Enable your browser's bookmark bar:** You probably have a small number of websites that you regularly visit. Rather than typing out the same website address over and over, add them to your bookmarks bar. You'll be able to get to the page you need in a single click. Reveal the bookmarks bar in Google Chrome by pressing Ctrl, Shift, B. In Firefox, click the Firefox button and choose Options, then enable the Bookmarks Toolbar. And in Internet Explorer 9.0, click the star icon at the top-right corner of the browser.

**18 Use your browser's autofill and password manager:** As long as you're the only user of your PC (or you have separate password-protected user accounts), you can save time by letting your browser remember your details - address, email, phone number and even partial credit-card details (never save the security code). When you're buying things online, these details can be automatically entered. The same goes for usernames and passwords for website logins.



**19 Turn your browser into a productivity tool:** Use the free Timer Tab app. Open a new tab in your browser of choice and navigate to [timer-tab.com](http://timer-tab.com), where you can set up a custom alarm or timer to keep you on track while you're working. Set the timer for 25 minutes and focus on work for the full time period, then take 5 minutes to relax and browse the web.

**20 Write a to-do list:** By working smarter and becoming more productive, you can save time in the long run. Writing a to-do list will prevent those thumb-wiggling moments as you wonder what to do next, and stop you starting one thing only to become distracted by another. We like Remember The Milk ([rememberthemilk.com](http://rememberthemilk.com)) as it's online, but countless other free utilities are available.

If you have lots of different duties to remember, which have other information attached (such as a job's status and cost), try using an Excel spreadsheet and using different colours to highlight cells.

**21 Edit PDFs for free:** Use Google Docs to alter PDFs. Upload your document, then enable 'Convert text from PDF and image files to Google documents'. Docs will convert your PDF into an editable rich-text document, which you can edit online then download the document as a PDF or text file.

## POWER SEARCH USING GOOGLE

You can reduce the amount of time you spend searching for information by using advanced Google search strings.

**22 Convert weights and measures:** To convert five pounds of weight into kilograms, simply pop '5lbs to kg' into Google's search bar and the search giant will make the conversion for you. Searches for similar queries, such as '5in to mm' and even '£5 to \$', work in the same way, although the currency conversion should be used only as a guide.



**23 Ditch the calculator:** As with weights and measures, Google can do maths for you. If you need to know the answer to 4.2 multiplied by seven, simply type '4.2 \* 7' and hit Enter. Google also understands plain English, such as 'million' rather than 1,000,000, and can handle fractions. For more advanced sums, try entering '2\*8+(sqrt 27)^3= '.

**24 Follow your flight:** To see your flight status without having to hunt through your airline's website, enter the name of the airline and flight number (for example 'EasyJet 8871') into the Google search bar. Google will provide your flight information, with an update as to whether the plane is on time.

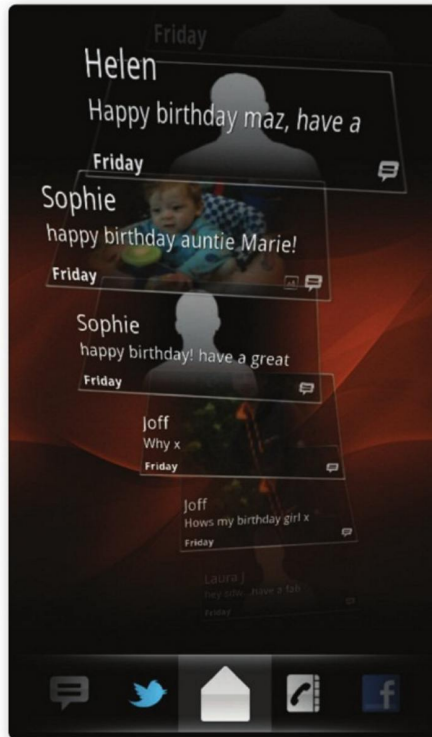
**25 Watch the weather:** To check the weather before you leave the house, enter weather and your destination (for example 'weather London') into Google's search bar. Google will supply the relevant area's four-day forecast. If Google Instant is enabled, the forecast could appear even before you've finished typing.

**26 Find films fast:** To get movie times at your local cinema, type films followed by your postcode into the Google search bar. Google will display a list of what's playing at every nearby cinema. You can also enter the movie title and your postcode to narrow the search to a single film.

**27 Search any site:** Google's search engine often works better than those built into other sites. If you think a site will have the information you're looking for, but you can't find it on the site itself, use Google's site search. Enter 'site:' followed by the website address, such as site:PCAdvisor.co.uk, then your search term.

**28 Search for an exact phrase:** Finding a specific item is made easier if you wrap your search term in quotes. It's useful for finding song lyrics, for example, when a general search doesn't turn up what you need.

**29 Exclude words from search results:** You can exclude certain search results from your query by preceding the



term with a dash. For example, 'jaguar -car' will offer results for the animal, not the four-wheeled saloon.

**30 Fill in the blanks:** When you can't remember an exact phrase or cliché, use a wildcard search to find it. For example, 'Don't look a \* in the mouth'.

## EMAIL



If you receive a lot of email, it's easy to waste time dealing with it. Here's how to manage your email, and use it in different ways.

**31 Make email work for you:** Close your email program for all but a small portion of each hour, during which time you delete or file everything that doesn't require a response. Set aside time each day to reply to email, disciplining yourself not to respond outside of this time. If someone needs a quick response, call them.

**32 Go mobile with mail:** You shouldn't let mobile email tie you to work at all hours, but if used judiciously it can save you



time in the office. Check and triage email on your way to- and from work, deleting or filing anything that doesn't require a response.

**33 Use webmail as a to-do list:** A Gmail account makes for a perfect to-do list. Whenever you check your work email account, forward on anything that requires action to a Gmail account. Check Gmail each morning for a ready-made to-do list.

**34 Sync your email accounts:** Don't waste time checking multiple email accounts for new mail several times a day. Gmail lets you sync multiple addresses to a single account. Simply log into your account and click the gear icon at the top left to access Settings. Choose the 'Accounts and Import' tab, then select 'Add a POP3 mail account you own' under 'Check email from other accounts (using POP3)'. Enter your email address and click Next step, then enter your password and choose Add account.

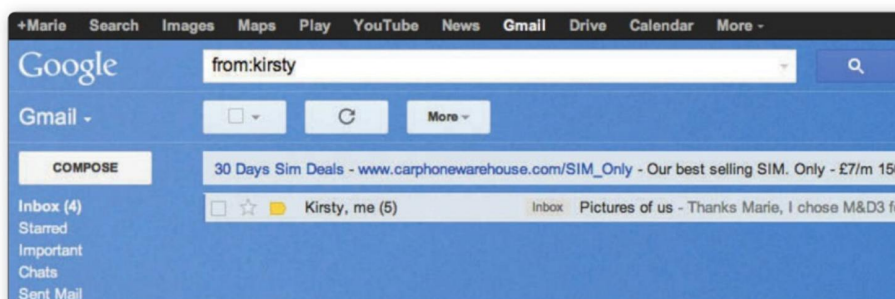
## USE GMAIL LIKE A PRO

Gmail is one of the most popular webmail services, not least because - with the tips below - it can be much faster than what you're currently using.

**35 Search. Don't use folders:** In Gmail, you can quickly find the exact message you want by typing keywords into the search box, or you can rely on the program's search autocomplete to specify the attributes you want. Try typing 'from:[sender]' or 'has photos'.

**36 Let Gmail do your filing for you:** Rather than individually finding and filing messages, try searching in Gmail for a specific type of message (for example, all email messages 'from:Freecycle'). Select 'Filter messages like this' from the More drop-down menu to set up a filter that will automatically label, archive, delete, or star similar types of incoming messages.

**37 Use Priority Inbox:** If you receive a lot of email, use Gmail's Priority Inbox to automatically separate your important mail from the rest, based on various signals. Google's own research found that Priority Inbox users spend 43 percent more time reading important messages than





unimportant ones, and 15 percent less time reading email overall than do Gmail users working without Priority Inbox.

**38 Keep your contacts up-to-date:** Nothing saps time like having to deal with bounced email messages or waiting for a reply to a message that you sent to an outdated email address. You can ensure that you have the latest and most accurate contact information by taking advantage of Gmail's new profile integration with Google+, which automatically brings any information that your contacts share with you through Google+ into your Contacts list in Gmail.

## MOBILE



Smartphone interfaces are getting better and better, but it can still take longer to accomplish tasks on one compared with a PC or laptop.

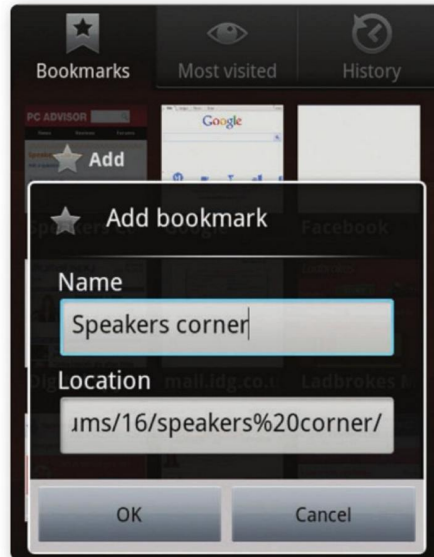
Here are our top tips on efficient usage.

**39 Manage all your messages in a single place:** Most mobile devices have an app that lets you manage your text messages, social media feeds and call logs in a single place. Sony Ericsson smartphones include Timescape, and the Samsung Galaxy Tab has Social Hub, for example.

**40 Quickly access apps in Android:** You can quickly access your most frequently used apps on some smartphones without unlocking the device. This can either be configured via the security section of the Settings menu or the apps shown will be those in the app tray on the home screen.

**41 Sony NFC Xperia SmartTags:** These keyring-type devices can change sound and connectivity settings and launch apps, simply by touching them on a compatible phone. You could have different settings for the home, office and car.

**42 Save time while browsing:** Enable 'Quick Controls' in the stock Android browser. First confirm that you're using Android version 3.1 (Honeycomb) or later, then open your browser settings menu, tap Labs and enable Quick Controls for faster browsing. This will eliminate the address and status bars from the top of your display,

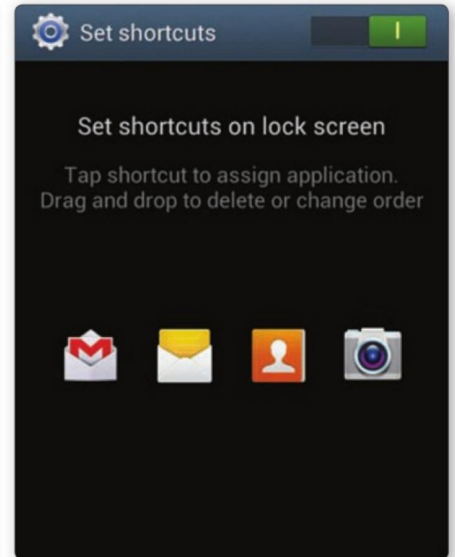


giving you more screen space for browsing the web. To access browser settings, perform a search, or open a new page, simply place your thumb on the left or right edge of the screen and a circular menu will pop up with full navigation options.

**43 Save time and your data allowance:** Bookmark your favourite website sections rather than the home pages (for example [pcadvisor.co.uk/news](http://pcadvisor.co.uk/news) rather than [pcadvisor.co.uk](http://pcadvisor.co.uk)). You won't have to wait for a page to load, only to click a link to go to the page you really wanted.

**44 Answer only important calls:** Many phones let you choose a ringtone for a particular contact, so you know who's calling without looking at the screen. Some even allow per-contact text-message alerts. On the iPhone, for example, find a particular person in the Contacts app, tap Edit at the top, then scroll down until you see Ringtone and Text tone. Both will be set to Default; tap each in turn to specify a new tone.

**45 Use your iPhone faster:** When reading a long web page, Facebook Timeline or Twitter feed, tap the status bar to jump back to the top of the page without scrolling. The Mail and Messages apps automatically convert numbers and times/dates to links; tap these to call phone numbers or add dates to your calendar.



more than one photo to an email, open the Photos app, tap the sharing icon and select up to five photos. Finally, tap Share at the bottom and choose Email.

## OS X



OS X is already a slick operating system, but there are still ways in which you can use it faster and become more productive.

**47 Sleep and wake your Mac:** To quickly put your Mac to sleep, just press Shift, Cmd, Eject. You can switch off only the screen with Shift, Ctrl, Eject. To restart, press Ctrl, Cmd, Eject, and to effect a full shutdown use Ctrl, Alt, Cmd, Eject.

**48 See your Library folder:** In Lion 10.7, OS X hides the user's Library directory where all user preferences and application support data is stored. To quickly reveal this folder, hold down Alt and click Go in Finder's top menu; you should now see the ~/Library directory listed between Home and Computer.

**49 Show the Desktop with one click:** Hold down Cmd, Alt and click anywhere on the desktop. Every open application will be hidden to reveal the entire desktop and, more importantly, let you access shortcuts without having to first minimise each open application.

**50 Use Find Any File:** Spotlight is great for searching for files if you know a phrase or word they contain, but not all files are included. Install Find Any File ([tinyurl.com/8w6bup](http://tinyurl.com/8w6bup)) and you'll quickly locate what you need, even if the file is hidden or inside a bundle or package. You can also search for files based on name, size or date. ☑

**46 Share iPhone photos faster:**

After taking a photo on an iPhone or iPod touch with iOS 5.0 or later, swipe right to see it and continue swiping to review older images and videos. To attach





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# The personalised internet

The internet increasingly shows us only what it thinks we want to see. Jim Martin investigates what's happening, and what you can do about it

**B**efore the internet existed, our main sources of current affairs information were newspapers and TV broadcasts. We read and saw only what the editors decided we should, and our view of the world was shaped by this information. If a story was deemed not newsworthy, it wouldn't be reported on.

The internet changed all that. There were no editors, so information became freely available: all you had to do was search for it. However, the increasingly personalised nature of search results now means you won't necessarily get the same view of the world as everyone else.

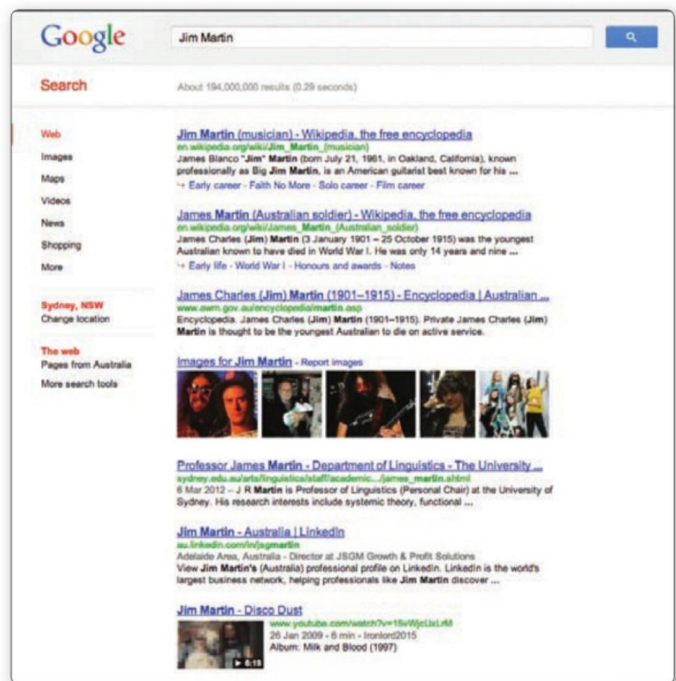
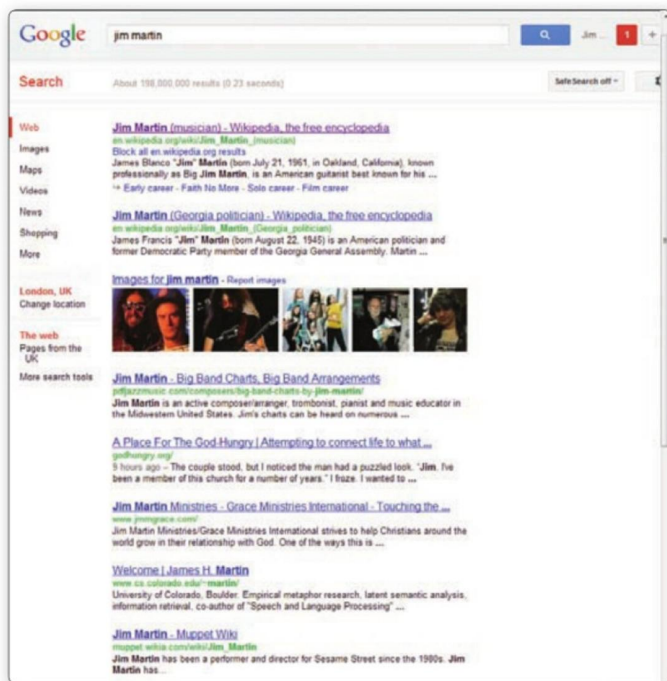
Algorithms and filters use data about you, such as your location, age, gender and preferences, to deliver search results they think you'll want to see. But is this a good thing?

In some cases, it may be exactly what you want. Social networks such as Facebook filter out the stuff you would have skipped over and let you quickly digest updates from close friends. However, since all this personalisation is largely invisible, how do you know what you're missing out on? Can an algorithm be trusted to make the right choices about the information you see?

Here, we look at what's happening and explain some of the steps you can take to avoid or disable these filters.







You'd be forgiven for thinking that a Google search for a particular word or phrase would return the same results, regardless of user. That's far from the case, though, and rightly so. If you search for 'passport application' in the UK, you want to find only information that relates to applying for a UK passport. Google uses your location data and tailors its results to provide the information it thinks is the most relevant.

This has been happening on a country- or continent-basis for years, but the algorithm has recently been updated. Today, it isn't only your location that search engines use to filter results; your search history, contacts, the browser and type of computer you're using are all factored in. While the change in results is usually subtle, some search terms produce radically different information.

Take the two screenshots at the top of this page as an example. Both depict Google searches for the same query - 'Jim Martin' - and were taken at the same time. The difference here is that the first search was conducted in London, and the second in Sydney. Both top the list with a Wikipedia entry for 'Faith No More' guitarist Jim Martin, and offer the same set of images (in a different order, note). The remaining results are very different. It's clear which is the Australian search, but the UK search is filled with US- rather than UK-based results.

You don't need to be signed into a Google account to see personalised results, although you'll see a more radical change if you are. As we explained in last issue's *Ultimate Guide to Google* ([tinyurl.com/7kspjwr](http://tinyurl.com/7kspjwr)), the search giant's many services are all connected by a single Google account. Some of its services net Google more personal information than others; its Google+ network bags it the most.

**Two GOOGLE SEARCHES** for Jim Martin taken at the same time, one in the UK and the other in Australia. The results are very different

Thanks to Google's social network, it has as much information on you as you care to reveal. All kinds of useful data can be gleaned from your status updates, the links and videos you deem worthy of sharing, and the photos you upload. Google knows exactly what makes you tick; as such, it can prioritise certain sites over others in your search results.

If this comes as something of a revelation, you might decide to stop using Google. But what do you use instead? Yahoo, Microsoft Bing and just about every other search engine provide personalised results, and gather the data that enables them to do so in much the same way. Yahoo's engine has an element of human input, however.

The problem with personalised search is few people realise that automatic filtering is taking place: there's no warning message and no obvious way to opt out. You're no longer in the driving seat for your online experience, and you may not even know it.

Some people argue that it's a form of censoring, while others - including the father of the internet, Sir Tim Berners-Lee - believe it presents a twisted view of the world.

## Social networks

This is especially true of Facebook, which has filtered its News Feed for a while now. It intends to put the information you want at your fingertips, so what's the big deal?

Facebook uses an algorithm called EdgeRank, which decides what's shown in your News Feed. If you're a long-term user of the social network, you'll have noticed

when EdgeRank was introduced (and likely been confused or upset by the change). Rather than presenting a chronological list of status updates, the News Feed now offers 'important' posts at the top of the page.

Without getting into the technical details, the algorithm attempts to calculate what you want to read about. It looks at who you interact with the most and puts their posts up high in your News Feed. It also tries to figure out what you'll want to see from the people with whom you don't regularly engage, such as family members or brands you've 'Liked'.

This is all well and good, but it doesn't encourage you to maintain friendships: the people with whom you don't regularly interact tend to disappear from view, so you won't be prompted to get in touch.

To appreciate how much filtering is taking place, browse your friends list and see how many of them appear in your News Feed. Chances are it's only a fraction of the total. Naturally, there will be some people who rarely update their status, but it will still be obvious if you're not seeing the full picture.

Even Twitter has been accused of filtering, since its trends pander to a supposed user obsession with what's new rather than what's important. Twitter also tailors search results in the name of making it easier to "get a sense of what's happening right now, wherever your curiosity takes you". But rather than enabling you to discover things, personalisation tends to do the opposite and prevents you seeing new things.

Filtering also affects online advertising. It can be unnerving when you realise you're looking at adverts for a product you searched for on Amazon last week. It's clever, but perhaps you'd prefer to see an alternative product you weren't aware existed.



## Are personalised results bad?

It's easy to have a one-sided view of content filters, and entire books have been written on the subject: Eli Pariser's *The Filter Bubble*, for one. Pariser warns that "algorithmic gatekeepers" can leave us isolated in a "web of one" if they mean the internet no longer connects us together, introduces us to new ideas, new people and different perspectives (see [tinyurl.com/4xkj8hm](http://tinyurl.com/4xkj8hm)).

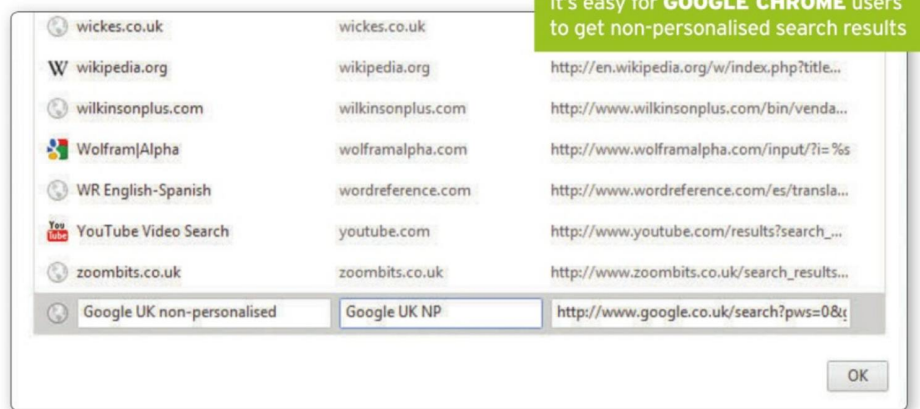
It's true that filtering mechanisms can mean you see more and more of the same type of content – a kind of ever-decreasing circle that reinforces your views and limits your ability to discover new websites (which might challenge your prejudices) because they've been excluded from your results.

However, it's important to remember that these algorithms take your lead. They're not actively censoring content, but merely using data held on the links you do and don't click to predict what you'll want to see next time. You could argue that your level of exposure isn't any more limited, because you wouldn't have clicked on certain news stories even if they were shown in a set of search results. Filters simply mimic your online behaviour.

Filtering content can be a big time-saver – an undeniable benefit in today's hectic world. Finding the information you need faster is a good thing, and Google's localised results help to ensure UK users, for example, aren't bombarded with an irrelevant list of restaurants in Birmingham, Connecticut when they search for 'restaurants in Birmingham'.

Being able to see at a glance what the people you care about are saying on Facebook, without having to scroll through the content from your 650 'friends', makes things considerably easier, too. It's possible to disable filtering (more on this later), but a better step might be to browse through your friends list every so often to ensure you haven't accidentally forgotten anyone.

If everyone saw the same search results worldwide, we'd be in a similar situation to



It's easy for **GOOGLE CHROME** users to get non-personalised search results

the one where TV and newspaper editors decide what we see. Google would decide what's relevant to everyone. Would you rather be reading a personalised version of *PC Advisor* that included only the topics for which you had previously expressed a preference, or have the version you now hold in your hands where we decide what content to include? There are pros and cons for both approaches.

Without filtered data on the web, some argue that we would be overloaded with irrelevant information and unable to locate what's important. On the flip side, as Pariser points out, important and relevant shouldn't be the only factors considered by these algorithms. They shouldn't, for example, block content that might make you uncomfortable or challenge your point of view.

Our main concern is that companies such as Twitter, Facebook and Google should make it more obvious to users that content filtering is taking place, and enable them to opt out of personalised search results if they so wish.

## What you can do

It's not possible to entirely escape content filters, but there are some steps you can take.

**GOOGLE:** It's easy for Chrome users to get non-personalised search results. Click the

Spanner icon and choose Settings. Click 'Manage search engines...' and scroll down to the bottom of the list. Enter 'Google UK non-personalised' in the 'Add a new search engine' field, and 'Google UKNP' as the keyword. Finally, enter 'http://www.google.co.uk/search?pwd=0&gl=uk&q=%s' in the last field. This tells Chrome not to provide search results specific to you, but that you do want to see UK results. Click Make default and your next Google search will return a 'standard' set of results.

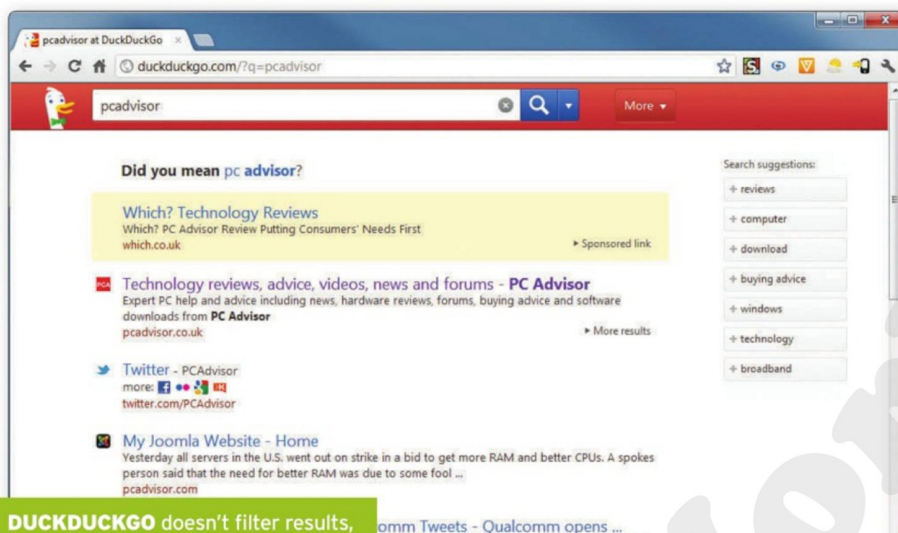
Google recently introduced 'Search plus your world', which increases the level of personalisation applied to your search results when you're signed into a Google+ account by adding in items from the social network. Click the globe icon at the top-right of the browser window to hide personal results.

If this sounds like too much hassle, consider using a different search engine, such as [duckduckgo.com](http://duckduckgo.com). This doesn't filter results, but you can set the region to UK via the More button to the right of the search bar (it defaults to US).

**FACEBOOK:** This social network regularly changes its interface and options, but at press time there were a few things you could do to view a slightly less filtered News Feed. At the top is a Sort link; click this to toggle between Top stories and Most Recent.

This takes you only so far, though. A drop-down menu at the top-right of each post allows you to choose whether you see All updates, Most updates or 'Only important posts' from that person. You can also click on a person's name to go to their Timeline, then hover over the Friends button to add them to a list: Close friends, Acquaintances or other. Click Settings... in this same menu to choose what type of updates are displayed.

If you really want to see posts from all your friends, hover your cursor over Friends in the left panel of the Home page and click More. Click Create list and enter a name, such as Everyone. Add each of your friends and click Create. It may take a while if you have hundreds of friends, but clicking on this list will then reveal posts from everyone.



**DUCKDUCKGO** doesn't filter results, but you can set the region to UK



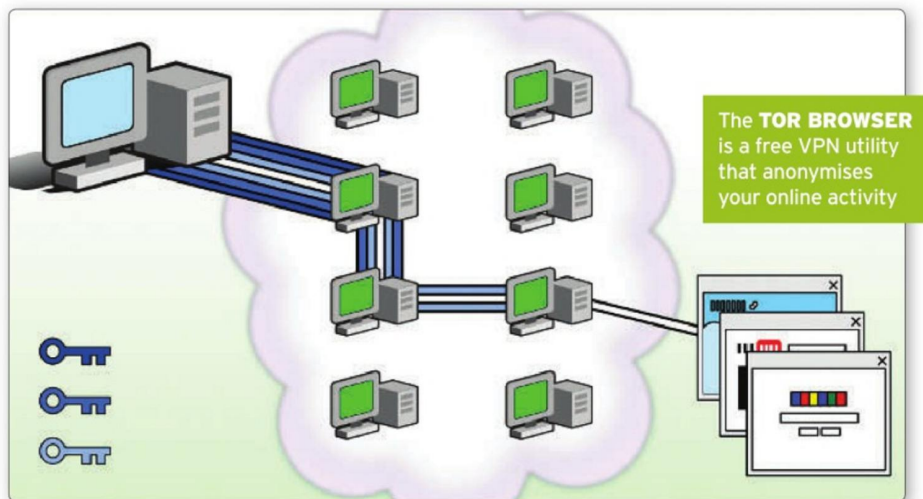
Other changes to make in Facebook include ensuring that your privacy settings (click the down arrow at the top-right corner of the website) are correctly set. One recent change, for example, is that friends of anyone tagged in your posts can see that post. To disable this, choose Custom, then untick the box marked 'Friends of those tagged'. You can also limit who can see past posts.

In your profile, and in other online profiles, it's worth removing your birthday - or at least the year you were born. This information enables tracking companies to more easily identify you from others with the same name.

**AVOID TRACKING:** If you don't want to be tracked, start by enabling your browser's private mode. With Internet Explorer 8.0 or later, you can enable InPrivate browsing by pressing Ctrl, Shift, P. The same shortcut works in Mozilla Firefox, too.

Google Chrome users can click the Spanner icon and choose New incognito window (or press Ctrl, Shift, N). When you browse in an incognito window, pages won't be added to your web or search history. No cookies will be saved and pages won't leave behind any traces, other than the bookmarks you save and files you download.

Bear in mind that if you sign into your Google account from an incognito page,



your web searches will still be saved in your Google Web History. To stop this happening, go to [google.com/history](http://google.com/history) and click 'Turn Web History off'.

Unfortunately, no browser's private mode is sufficient to stop companies tracking and seeing what you're looking at online. Factors such as your screen resolution, browser plug-ins and the version of Windows you're running are fingerprints left behind.

To prevent this, switch to a 'standard' browser such as Firefox, or use a smartphone browser. Disabling JavaScript is a powerful

tool in preventing tracking, but it's needed to make most websites work properly.

Another option is to use the Tor Browser from [torproject.org](http://torproject.org). This is a free Virtual Private Network (VPN) utility that anonymises your online activity, preventing websites from identifying your location. Tor is available for Windows and Android devices, while a Tor browser bundle can be run from a USB flash drive in Windows, Mac and Linux.

Cookies are a hot topic at the moment, with a new EU law (the e-privacy directive) that came into force in May. Now, users must be made aware that a website uses cookies, and must accept them to continue using the site. Cookies can be useful, allowing websites to remember your preferences. However, they can also be used to track you, and it's worth occasionally clearing out your cookie cache.

In Chrome, click the Spanner icon, then Settings, 'Show advanced settings...'. Click Content Settings... In the Privacy section to find the cookie settings. Finally, click 'All cookies and site data...', Remove all.

Firefox users should click the orange Firefox button, then Options, and choose the Privacy tab. Enable the option to 'Tell web sites I do not want to be tracked' and click 'clear your recent history'.

In Internet Explorer 9.0, click the cog icon, then choose 'Safety and Delete Browsing History'. You can choose what to delete, and remove only cookies if you so wish. ☒



**NEXT ISSUE:** Online privacy has become an increasing concern in recent years. From the way companies such as Facebook and Google use our data to the government that wants to closely monitor our online communication, our privacy

is under threat. In the next issue, we'll find out how your status updates are being used to make money, and your online activities are being spied on to deliver targeted adverts, and explain what you can do about it.





JIM MARTIN

**Tech  
Help**

## Faster, more secure storage

Solid-state drives, or SSDs as they're better known, are a great upgrade for your laptop. As they have no moving parts, they're more resistant to drops and shocks than mechanical hard disks, and they're much faster, too. Although not cheap, it's now possible to buy one without breaking the bank. Troubleshooter (page 100) shows you how to fit an SSD and rev up a flagging laptop.

If you can't afford an SSD with a huge capacity, you can take advantage of online storage. Turn to page 118 to find out how to use Microsoft's SkyDrive. The service has just been updated and is better than ever – and it's free to use.

Some of your files are bound to contain sensitive data, so it makes sense to encrypt them. We show you how to install and use the free Cryptainer LE software to encrypt any files you save to your Cryptainer drive on page 114.

Photo-editing software can be costly, but Pixlr is a powerful online editor that's free to use. Learn how to use it to bring out the best in your images on page 112.

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## QUICK TIP: CUSTOM VIBRATIONS

An iPhone can use custom vibration patterns in conjunction with personalised ringtones to alert you to new calls and text messages from a specific contact. Here's how to set it up.

To enable custom vibrations on your iPhone, choose Settings, General and scroll down to Accessibility. Find and enable Custom Vibrations.

You can now open the Contacts menu and assign a custom vibration pattern to individuals, or you can set one for everyone in the Sounds sub-menu of General settings.

In the Contacts menu, tap the Edit button at the top of a particular individual's entry. Scroll down to and tap Vibration. This should be set to default; you can instead select Alert, Heartbeat, Rapid, SOS, Symphony or

Custom. Before you can choose Custom, though, you'll need to record a vibration.

Tap 'Create New Vibration', then record your own pattern by tapping the screen; hit Stop when you've finished. You can replay the recording, save it or tap Record to start over. When you tap Save, you'll be asked to name your vibration so you can identify it as a Custom option.

### Custom ringtones and text tones

You can also select ringtones and text tones on a per-person basis. Find the contact for whom you want to set a custom tone and tap the Edit button at the top of the screen. Scroll down to find the ringtone and text tone options. Tap each and select the tone you want for that contact. ☑





## Fit an SSD to your laptop

Jim Martin explains how to give your laptop a speed and storage boost with a simple SSD upgrade

**S**olid-state drives (SSDs) have dropped in price to the point where you can start to consider replacing your laptop's hard disk with one of roughly equal capacity. It's possible to buy a 256GB SSD for around £150, or a 128GB SSD for £80.

SSDs are still more expensive per gigabyte than a hard drive, but they offer additional benefits. You'll immediately see faster boot- and application-load times, for example. SSDs can also be spectacularly fast at reading data, although their write performance varies depending on whether they're dealing with large or small files, and whether those files can be compressed.

With no moving parts, SSDs are more resistant to shocks and vibration than a traditional hard disk. This also means they consume less power and are silent in use.

### IS YOUR LAPTOP COMPATIBLE?

Before you splash out, do some research to find out whether your laptop is a good candidate for an SSD upgrade.

### Operating system

Only Windows 7 supports TRIM, which helps to maintain the performance of your SSD. Some manufacturers include utilities that can overcome Vista's lack of TRIM support.

### Hardware

Check that your laptop has an internal SATA connector. As a general rule, if your laptop was made in 2008 or later, it will indeed.

There are three SATA standards: 1, 2 and 3, running at 1.5-, 3- and 6Gbps respectively. The latest SSDs support SATA 3 and are backwards-compatible, meaning you can install one in a laptop that has only SATA 1 support. However, unless your laptop also supports SATA 3, the SSD's performance will be limited. Check the manual or search online for your laptop's exact specification.

You should also ensure that your laptop's drive bay is accessible.

### Bios

Some laptop Bioses don't support SSDs. Search online to find out whether other owners of your particular laptop model



have been able to successfully upgrade to an SSD. You could also try directly contacting the laptop or SSD manufacturer.

### Warranty

An SSD upgrade could void your laptop's warranty; carefully check the small print before you begin.

### PREPARING YOUR LAPTOP

Unless you're planning on backing up your data and reinstalling Windows from scratch, you'll need some way to clone your existing hard disk on to the SSD. Many SSDs come with data-transfer kits, but are often sold £10-£15 cheaper as bare units.

The Crucial m4 SSD we're using here is available in both forms, plus there's a third option that includes an adaptor bracket for mounting in a 3.5in desktop drive bay. The data-transfer kit includes the cloning software and a cable that connects the SSD to your laptop's USB port.

It's possible to transfer data from a large-capacity HDD to a smaller-capacity SSD, but you'll need to ensure there's enough room for all your stored data. You may have to copy off your music, photo and video collections to save space; buy an inexpensive

**CRUCIAL's m4 is supplied with a Data Transfer Kit or as a bare solid-state drive**

drive enclosure and you can use your HDD as an external USB drive following the upgrade.

Check for Bios updates for your laptop, which may be critical to the proper working of your SSD. Performance can be hindered if the Bios thinks a standard HDD is in use.

Finally, back up any data you can't afford to lose. In theory, the data on your old hard disk won't be removed, but it's not worth taking the risk.

For later comparison, you might also like to benchmark your laptop in its current state using Crystal Disk Mark, or simply time how long it takes to boot into Windows.

### INSTALLING THE SSD

Connect the cable provided in the m4 kit from the SSD to a free USB port on your laptop. This is by far the easiest method of cloning your hard drive, since the process is largely automatic and all your programs, settings and data will remain intact. You might instead decide that now is a good time to reinstall Windows and get rid of the detritus that may have been slowing it down; here, though, we'll describe how



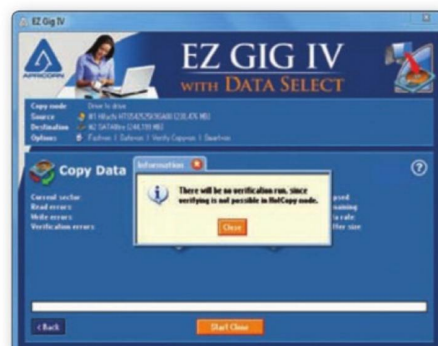
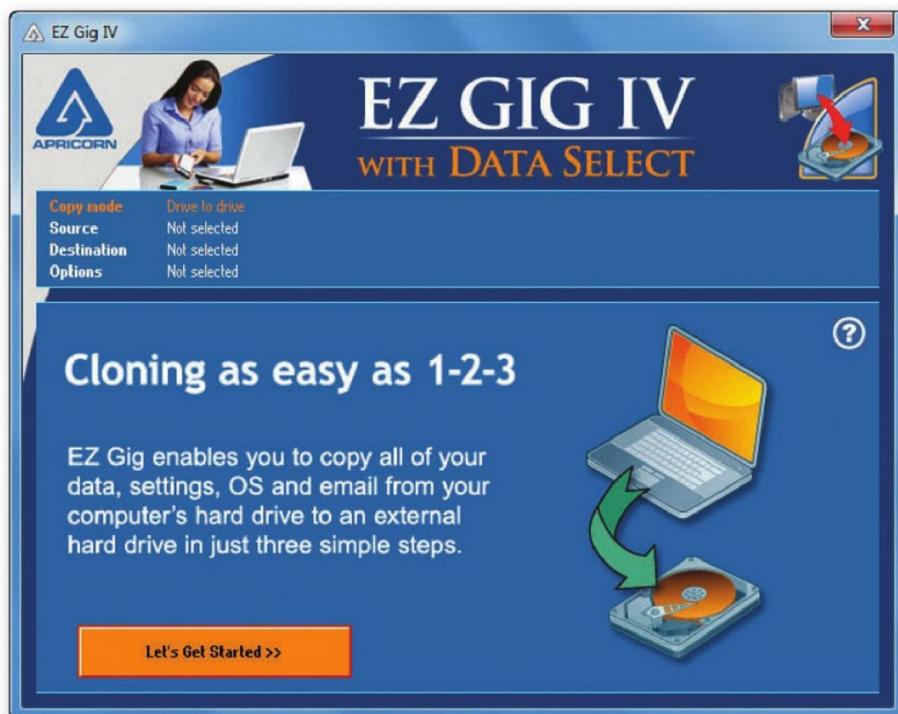


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## Tech Help



**EZ GIG IV** software is supplied with the Crucial m4 for cloning your hard drive

to use Crucial's Data Transfer Kit, which comes with Apricorn's EZ Gig IV software.

**Step 1.** Run the EZ Gig IV software on the supplied CD. It should autorun; if not, open Windows Explorer, browse to the CD and double-click autorun.exe. Click the 'Let's Get Started' button.

**Step 2.** Select the source drive. You should be able to identify your hard disk by its make and model or capacity. Click the Speed Test icon if you want to run a brief benchmark. Click Next and select the SSD as the destination drive. The Crucial m4 appears as 'SATAWire', connected via USB.

**Step 3.** By default, the software will create an exact copy of your hard disk. Click Next, Start Clone. An analysis of the file system will precede the data transfer. Our 250GB HDD contained 200GB of data and took roughly 2.5 hours to clone.

**Step 4.** With the HDD cloned on to the SSD, shut down your laptop. Do not allow it to reboot with the SSD still connected via USB; unplug this cable now.

**Step 5.** Remove your laptop's power cord and battery and remove the HDD. Note its orientation in the caddy, as the SSD will need to be fitted in the same position.

**Step 6.** Screw the SSD into place and re-fit the caddy, ensuring it slides on to the SATA connector. Replace the cover and screws.

**Step 7.** Boot your laptop (have a stopwatch handy if you want to record the boot time). If it doesn't boot into Windows, restart, enter the Bios and check that the boot order

regards the SSD as the primary boot device. Bioses vary, so consult your laptop manual or manufacturer's website for assistance.

That's it. Now you can check everything is working as it should, and revel in the fact that your laptop feels much faster, games load quicker and files copy faster. Once you're happy that the cloning process has been successful, you can install your old HDD in a SATA enclosure, format it and start using it as an external USB drive.

## BENCHMARK RESULTS

Our Sony Vaio FW11E laptop took exactly 60 seconds to boot up Windows prior to our upgrade; the m4 SSD reduced this to just 19 secs. That's three times quicker.

As you can see from the screenshots of performance in Crystal Disk Mark, the Crucial m4 is vastly faster than the 5,400rpm Hitachi 5K250 it replaced. ☒

CrystalDiskMark 3.0.1			
File	Edit	Theme	Help Language
All	3	50MB	C: 86% (201/233GB)
	Read [MB/s]	Write [MB/s]	
Seq	42.90	42.13	
512K	20.74	20.23	
4K	0.289	0.971	
4K Qb32	0.832	0.958	

CrystalDiskMark 3.0.1			
File	Edit	Theme	Help Language
All	3	50MB	C: 85% (201/238GB)
	Read [MB/s]	Write [MB/s]	
Seq	260.5	203.6	
512K	234.7	202.1	
4K	16.10	45.08	
4K Qb32	156.5	130.0	

**CRYSTAL DISK MARK** results: Hitachi 5K250 (left), Crucial m4 (right)





YOUR QUESTIONS ANSWERED

## Expert computing advice

**Paul Monckton** tackles readers' hardware and software conundrums

### NOISY GRAPHICS

**Q** My AMD Radeon HD 5870 graphics card makes a screeching noise for around 10 minutes following startup. I think the noise is coming from the card's fan, which still spins and seems to operate normally once things have quietened down. What can I do? *Sarah*

It sounds as though the bearing in the fan may be on its way out. While the HD 5870 is now rather old, it's still powerful enough that attempting a repair may be worthwhile.

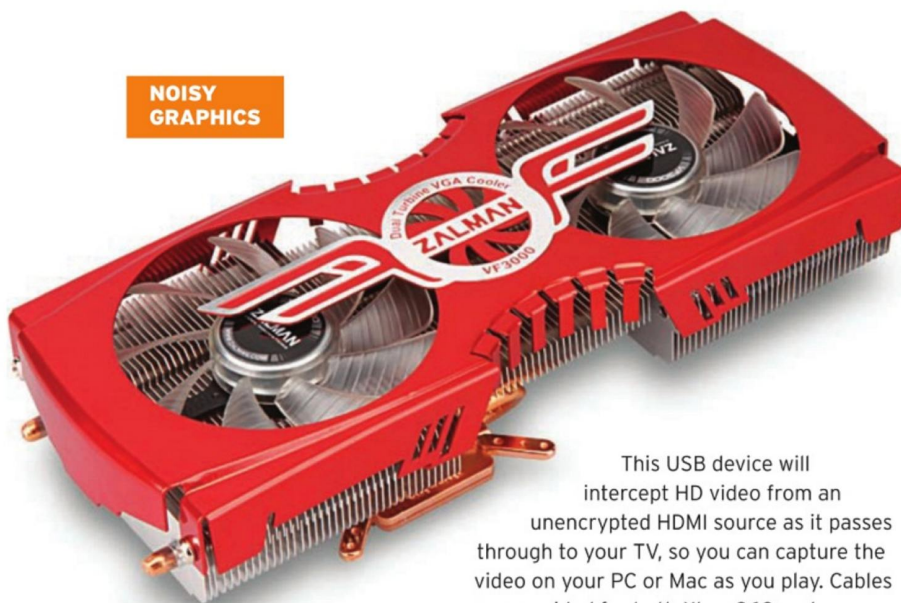
Depending on how good you are at tinkering, you may like to consider replacing the card's cooler and fan. If the new part runs cooler and quieter than the original, you may also be able to eke out some extra performance through overclocking.

You'll need to check that the new cooler is compatible with your particular version of the Radeon HD 5870. Such products are designed to fit standard AMD reference boards, but third-party manufacturers often customise their design and can offer altogether different coolers.

Zalman's circa-£30 VF3000A cooler ([tinyurl.com/68mqsem](http://tinyurl.com/68mqsem)) is designed to fit the Radeon HD 5870. Fitting the cooler may take some time, since a few small heat sinks will have to be individually applied to components on the board. A good place to look for a replacement cooler would be QuietPC.com or any other vendor that specialises in quiet PC components.

If you don't fancy fitting a new cooler, replace the card with a faster and slightly cheaper Radeon HD 7850.

### NOISY GRAPHICS



This USB device will intercept HD video from an unencrypted HDMI source as it passes through to your TV, so you can capture the video on your PC or Mac as you play. Cables are provided for both Xbox 360 and PlayStation 3 consoles.

### CAPTURE MY CONSOLE IN HD

**Q** I'd like to record my PlayStation 3 gameplay to share on YouTube. I want to be able to play in HD on my TV while capturing video to my PC. Is there a way I can do this without reducing the picture quality? *Mark*

Yes, there are devices that will enable you to do this. You don't say whether you're using a desktop PC or a laptop. If you're using a desktop you can use a capture card such as Avermedia's AverTV CaptureHD H727, which also includes a digital TV tuner and FM radio.

If you're using a laptop or would rather not install a card inside your PC, try Elgato's game capture HD ([tinyurl.com/bmqdwt9](http://tinyurl.com/bmqdwt9)).

### REPLACING MY SLOW HDD

**Q** The 2TB hard drive in my relatively new PC is both slow and noisy. There's nothing wrong with it - it's designed to be eco-friendly. I want to add a 256GB SSD, on to which I will install Windows 7, Office and a few games. I'll probably retain the hard drive for media storage. How do I do this and what parts do I need to buy other than the SSD and an external enclosure for my HDD? *Ivesy*

Drive manufacturers appreciate that there are many people in your situation, so they often bundle their SSDs with a cable and some data-migration software to help you transfer the data from your HDD to SSD.

Kingston's SSDNow Upgrade kit will provide all you need to perform the transfer, including a mounting bracket, cables, software and an external USB enclosure. You can use the software to clone your existing drive on to the SSD via the USB cable, then physically swap over the drives. You can then use your old hard disk as a handy external USB drive. We'll explain how to do this in our next issue.

Apicorn makes a selection of SSD upgrade kits for both desktop PCs and laptops, and you'll find such a kit bundled with a Crucial m4 SSD (see Troubleshooter, page 100); otherwise, you can buy the basic kit for use with your own choice of drive.

### CAPTURE MY CONSOLE IN HD





If you're using a laptop then you'll need to use a drive enclosure (or caddy) to continue using the HDD. If you're using a desktop PC, however, there may be space inside the case to install both HDD and SSD. This way, you can clone the system partition from the hard drive on to the SSD, then switch the boot order in the Bios to boot from the SSD. All you'll need to do this is a SATA cable for your SSD – make sure you get a SATA 3 cable if you're intending to use it on a SATA 3 motherboard connection.

If your chosen SSD doesn't come with drive-cloning software, you can copy the partition using a tool such as MiniTool Partition Wizard ([partitionwizard.com](http://partitionwizard.com)).

Your 2TB hard drive holds far more data than a 256GB SSD, so make sure you have enough space to copy over all your files. You may find you need to reorganise your data somewhat before you begin.

## FREAK DUSTING ACCIDENT

**Q** My Samsung R580 laptop was running hot, so I decided to dust the insides using compressed air. I earthed myself, then removed the RAM cover, hard drive, optical drive and part of the casing to get to the affected areas. I left the laptop a while for any condensation to evaporate, then switched it on. A buzzing noise is now audible from what I think is the hard drive, and startup won't proceed further than the Bios screen.

I used Windows 7 Image Backup to back up my data to an external hard drive. I also have my original Windows 7 installation disc, but no product key. What can I do? *Anon*



**FREAK  
DUSTING  
ACCIDENT**

It sounds as though you've taken the proper precautions, so we suspect your problem is likely to have been caused by a component becoming dislodged during the cleaning process rather than as a result of static damage or liquid from the spray duster entering the case.

Because the system is hanging at the Bios screen, we don't believe the hard drive is at fault. Try removing it from the laptop to help narrow down the problem. You will then know for certain whether the buzzing sound comes from this component.

A likely culprit is your memory. Carefully remove and re-seat the memory chips, then try to boot the laptop without the hard drive installed. The system won't boot, but you should at least be able to enter your Bios setup and perhaps receive an error message about the missing drive.

If this doesn't solve the problem and you have more than one stick of memory installed, try it with just one and then with

the other, then repeat the process in the other memory slot. This will help you determine whether one of the sticks of memory or memory slots is faulty.

If everything seems to be working without the hard drive installed, then the hard drive could be at fault. If possible, check the hard drive by connecting it to another computer. You can do this by fitting the drive into an external drive enclosure, usually available for around £10, then connecting it to a second computer via USB. You can then check the drive for errors and perform any data recovery that may be necessary.

If the laptop appears to be working but the drive isn't functioning, you'll need to buy a new hard drive. You could use this opportunity to upgrade to a faster or higher-capacity model, or even an SSD.

If the drive is functioning, but the laptop still doesn't work, you may have to send it to a local PC shop for repair. Keep hold of your hard drive so you can reinstall it in the repaired laptop with your data intact.

If you do need to replace the hard drive, you'll be able to use your image backup to restore your data to the new drive. You will need your Windows 7 installation disc, but you won't need to know your product key – this will also have been backed up.

Boot from the Windows installation disc and select 'Repair your computer', then choose 'System Image Recovery'. This should allow you to restore the system image from your external hard drive.

It's a good idea to jot down your Windows product key. Use The Magical Jelly Bean Keyfinder ([tinyurl.com/72pexug](http://tinyurl.com/72pexug)) to decrypt the product key stored in the Registry.



**REPLACING  
MY SLOW HDD**



## RESTORED TO AN EARLIER TIME

**Q** When I back up my Windows 7 PC I get the following message: 'Your computer has been restored to an earlier point in time. As a result your backup settings might be out of date'. I ran `sfc /scannow`, which reported: 'Windows Resource Protection did not find any integrity violations'. What could the problem be? *Malc*

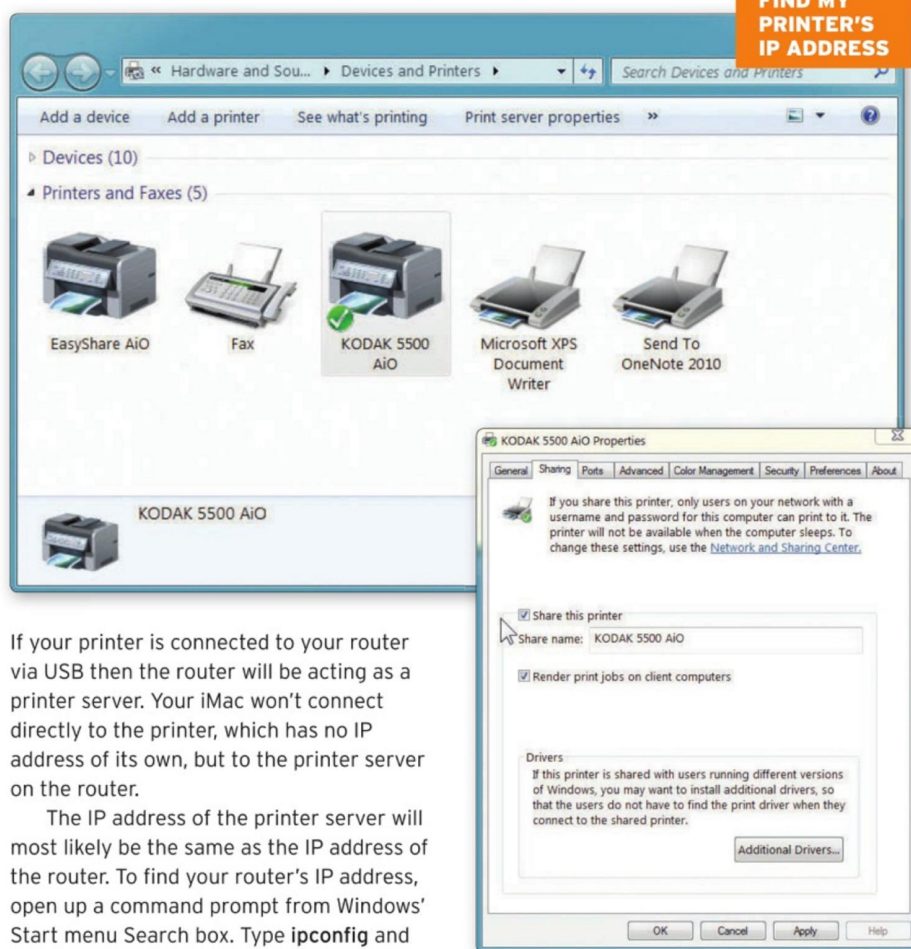
This message should not appear when performing a backup, but it's normal during a restore operation. We're assuming this is what's happening here.

The message isn't anything to worry about - it's not describing an error. It's simply letting you know that because you've restored your PC to the state it was in when you performed the backup, your backup settings will now be as they were then.

So, if you didn't have any backups scheduled at the time you made that backup, you won't have any configured now. You should check your backup settings to make sure they are correctly configured and that future backups will occur as planned.

## FIND MY PRINTER'S IP ADDRESS

**Q** Where do I find the IP address for my Epson RX620 printer? It's connected to my Windows 7 desktop PC and Netgear router via USB, and works wirelessly with my laptop. I need to know the IP address to configure a wireless connection with my iMac. *Funkymonkzz*



If your printer is connected to your router via USB then the router will be acting as a printer server. Your iMac won't connect directly to the printer, which has no IP address of its own, but to the printer server on the router.

The IP address of the printer server will most likely be the same as the IP address of the router. To find your router's IP address, open up a command prompt from Windows' Start menu Search box. Type `ipconfig` and hit Enter. The IP address will be listed under the entry marked Default Gateway.

If your printer is connected to a Windows PC and needs to be shared with an iMac, the

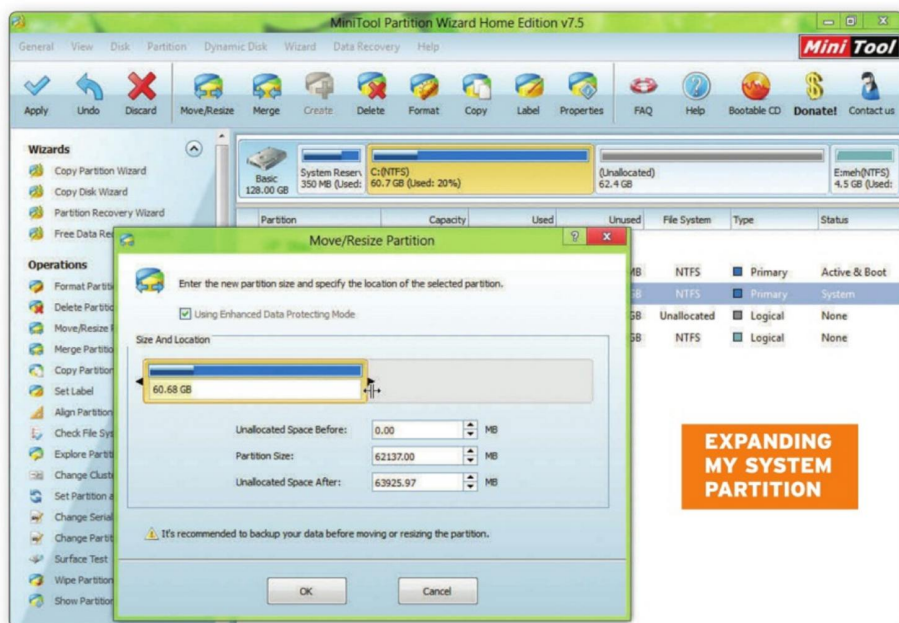
process is a little more involved. Because it's connected via USB, it must be shared by the PC to which it is connected. The Windows PC must also be turned on for the shared printer to be accessible via the network.

Macs use a different protocol to Windows PCs, called LPD, to print via a network. For the iMac to be able to see your printer you'll first need to enable this protocol.

Click the Start button and start typing 'Turn Windows features on or off' into the Search box. This option will appear as one of the search results. Select it and click the '+' next to 'Print and Document Services'. Look for 'LPD Print Service' and check the box to enable it.

Ensure printer sharing is enabled in Windows 7 by opening the Control Panel and selecting 'Network and Sharing Center'. Click 'Change advanced sharing settings', then click the downward arrow next to 'Home or Work' to expand the details for your home networking profile.

Make sure file- and printer sharing is enabled by selecting 'Turn on file and printer



EXPANDING MY SYSTEM PARTITION



sharing', then save your changes and exit. You may be prompted to enter an Admin password to complete this step.

Head to the 'Devices and Printers' section in Control Panel and locate the printer you wish to share. Right-click it and select Printer Properties. Now select the Sharing tab and check the box marked 'Share this printer'. Give the printer a name by entering it into the Share name field. This should be a short name and contain no special characters or spaces, which may confuse other computers attempting to access the printer - especially Macs.

## EXPAND MY SYSTEM PARTITION

**Q** I inadvertently made the partition size of my laptop's C drive too small. I have 400GB of free space on the drive, but I can't get Windows 7 to expand the partition. I logged in as an Administrator and tried right-clicking the partition, but the option to expand it was greyed-out. How can I expand the partition? *GOs/p*

Under some conditions the disk manager built into Windows isn't able to perform its operations, such as when the partition you wish to resize is in use. You may find it easier to download a third-party disk-management tool to do this for you.

As always with tasks such as this, we recommend you make a full image backup of your hard drive before you start. If something goes wrong you can be sure that your system and data are safe.

One such tool is MiniTool Partition Wizard Home Edition, which is available as a free download from [partitionwizard.com](http://partitionwizard.com).

Partition Wizard is available both as an program you can install and run within Windows, and as an ISO image you can burn to a bootable CD with which to launch the PC.

To resize your partition using Partition Wizard, launch the program and identify the partition you wish to expand.

You should see a section of your drive marked as '(Unallocated)'. You will be expanding your system partition to make use of this unallocated space, but for this to work the unallocated space must be located immediately after your system partition. If any other partitions are located between the system partition and the unallocated space, they will first need to be moved to the other side of the unallocated space.

Once you've moved these other partitions there should be no partitions

or gaps between the system drive and the unallocated space.

Now select the system drive and choose the Move/Resize option. You'll be able to grab the right edge of the system partition and drag it to the right to expand it into the unallocated space.

Once you've arranged the drive and partitions to your liking, click the Apply button to simultaneously make all the changes to your drive.

If you're trying to resize your system partition from within Windows, MiniTool Partition Wizard Home Edition will offer to perform the operation for you upon rebooting windows. Select this option and your computer will restart and launch Partition Wizard in boot mode to complete the operation.



**CADDY PROBLEMS**

Once your PC has restarted you should find all the previously unallocated space has now been added to your system drive.

## CADDY PROBLEMS

**Q** My PC's motherboard died, but I rescued the hard drive before getting rid of it. I put the drive into a caddy and tried to format it. In the old PC the drive used the letter C, which is also used by the main hard drive in my new PC. I was worried that using two drives with the letter C would cause problems, so I cancelled the formatting and attempted to assign a new drive letter in Disk Management. I don't appear to have done so successfully, though, since the drive letter flashes up intermittently. Is there anything I can do to format this drive? *Dangerus1*

You seem to be following the right steps to resolve the issue, but it sounds as though

there may be a problem with the drive enclosure. We're not sure what you mean when you say "the letter flashes up intermittently"; it could be that the drive enclosure isn't receiving enough power via the USB port and is repeatedly turning itself on and off.

Some caddies come with cables that have two USB connectors (known as Y-cables) to help get around this problem. If this is the case with yours, make sure both are plugged into your computer and, if possible, into USB ports located as far away from each other as possible.

Sometimes USB connectors on the front of a PC don't offer as much power as those at the back, so it's worth connecting the caddy to a rear port. If USB 3.0 ports are available, these often provide more power.

If none of these solutions work then you may need an external power supply for your caddy - some support these; others don't. If yours doesn't, then perhaps try an external drive enclosure that comes with a plug-in power adaptor.

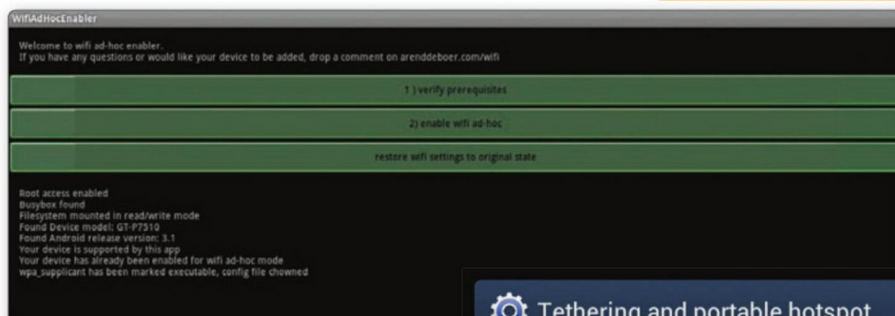
If you can, try the enclosure on a different computer to see if it works more reliably there - this would also point to a power supply issue.

Once the external drive is working correctly, you should be able to delete all partitions from the external drive using Windows Disk Management. Your boot disk will probably show up as Disk O, with the external drive appearing as something else. You should be able to correctly distinguish between the old and new hard drives by checking their capacities (assuming they are not identical).

After you've deleted all the partitions from the drive, you should be able to format it and use it as you wish.



## ANDROID CAN'T SEE MY NETWORK



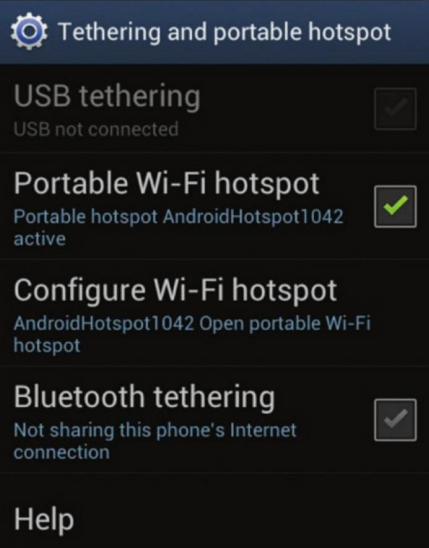
### ANDROID CAN'T SEE MY NETWORK

**Q** I've set up a Wi-Fi network on my Windows laptop and want to connect to it from my Android phone. I scanned for Wi-Fi networks on my handset, but my network didn't appear. Other devices such as laptops are able to see and connect to it. On my Windows laptop my connection reports that it is 'Waiting for users', but my Android device just can't find it. Can you help? *theinlinaung2010*

It sounds as though you're setting up an Ad Hoc network on your laptop. By default, Android won't connect to Ad Hoc networks, so these networks won't show up when you search for new wireless connections.

Third-party Ad Hoc enablers are available for Android, but they have many known problems and incompatibilities. You could try one from [tinyurl.com/87ypmzd](http://tinyurl.com/87ypmzd), or the solution given at [tinyurl.com/7tdc3ks](http://tinyurl.com/7tdc3ks).

We haven't tried either, so use them at your own risk. They also require a fairly high level of technical knowledge to install.



Depending on the capabilities of your smartphone, you may find it easier to set up your phone as a Wi-Fi hotspot and connect the laptop to that.

On our Samsung Galaxy S II this is possible by opening Settings and selecting More, 'Tethering and portable hotspots' and enabling 'Portable Wi-Fi hotspot'. ☒

## CONTACT US

Email your Helproom questions to [helproom@pcadvisor.co.uk](mailto:helproom@pcadvisor.co.uk). Please use 'Helproom' as the subject header and give your full name, the operating system you're using and other product details. We will let you know by email if your query has been selected for inclusion in these pages. If your query is urgent, you may find it useful to visit our forum at [pcadvisor.co.uk/helproom](http://pcadvisor.co.uk/helproom).

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](http://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.

[helproom@pcadvisor.co.uk](mailto:helproom@pcadvisor.co.uk)  
[pcadvisor.co.uk/helproom](http://pcadvisor.co.uk/helproom)



# 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](http://orbitsound.com)

**orbitsound**<sup>®</sup>  
BELIEVE YOUR EARS



## Troubleshooting from a distance



Martyn Casserly comes to the aid of the family tech expert with a troubleshooting solution that involves no hassle, no cost, and no train rides to Aberystwyth



If you've ever let it slip that you're computer-savvy, chances are you'll find yourself being coerced into providing free tech support for an ageing relative or technophobic friend. Although this can be a satisfying experience, as you ride into town armed only with a USB flash drive and heroically save the day, it can also be time-consuming and often inconvenient. Chocolate Hobnobs and a cup of tea don't really cut it after a few of these outings.

So harassed technical support engineers thought of a better way – one that involved no travel, minimal contact, and the foreknowledge that they'd have to buy their own biscuits: remote-access software.

It allowed them to monitor and interact with PCs over the internet rather than in person. But the software was often complicated, expensive and aimed solely at the business market. Microsoft has included Remote Desktop Connection in Windows since XP, but only in the Professional, Business and Ultimate versions. This meant supporting your dear old mum from afar remained something of a challenge.

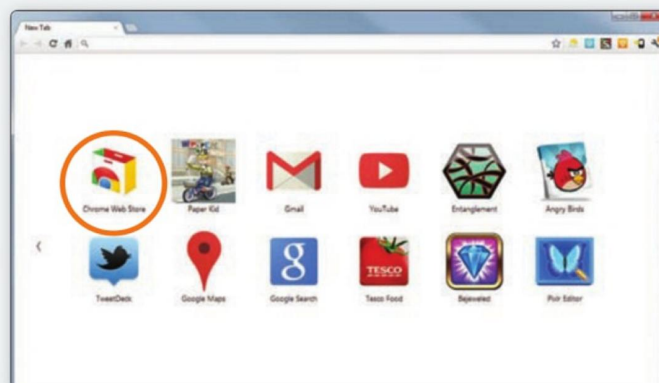
Google, the purveyor of all things free, has seen fit to include a remote-desktop app in its Chrome ecosystem. It's still in beta, but offers comprehensive access to a remote PC and is a doddle to get running. The fact that it isn't out of beta is no problem – you could level that accusation at many of Google's offerings – and we found it perfectly reliable in use.

Setup is mercifully straightforward and requires no knowledge of such things as IP addresses and other technical details. This makes the experience simpler for you – and less confusing for the person being assisted.

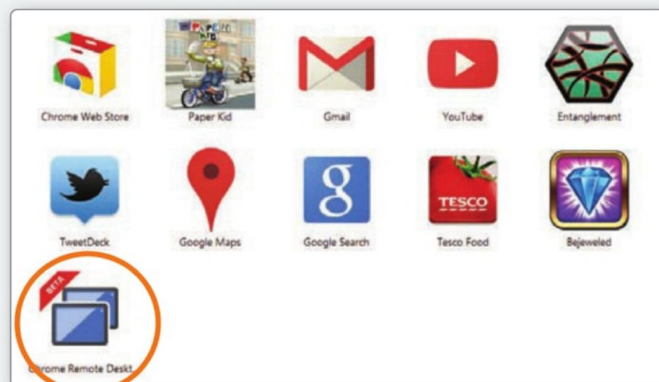
Install Google's Chrome browser ([chrome.google.com](http://chrome.google.com)), then visit the Chrome Web Store and grab Remote Desktop. Next, launch the app, answer a couple of simple questions, and you're up and running. No hassle; no cost; no train rides to Aberystwyth.

Of course, if your friends or relatives keep calling for your help, perhaps the real issue isn't with their computer at all. In this case, you can download that other great free app: Skype.

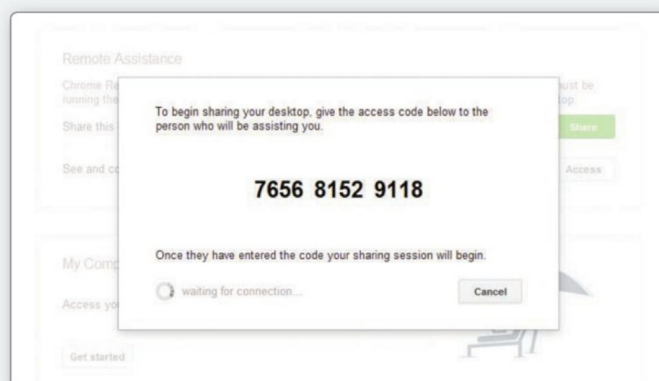
## REMOTELY FIX PC PROBLEMS WITH CHROME REMOTE DESKTOP



**START** You'll need to be running Google's Chrome browser (free from [chrome.google.com](http://chrome.google.com)) to use the Remote Desktop app. Install and launch Chrome, then click on the shopping bag icon to access the Chrome Web Store.

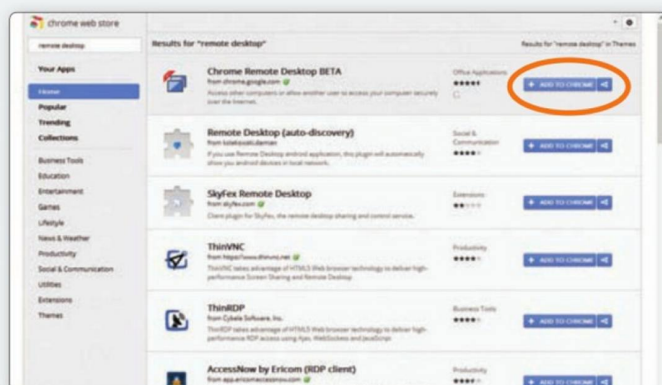


**4** Return to the browser's home screen and you'll see that a Remote Desktop icon has appeared; this will be present each time you open a new tab or window. Click the Chrome Remote Desktop icon to launch the app.



**7** Select Access if you want to do a spot of remote technical support. You'll be prompted to enter a code number, which is generated by the person you're helping. They will need to click Share, then pass on the number that's given to them.





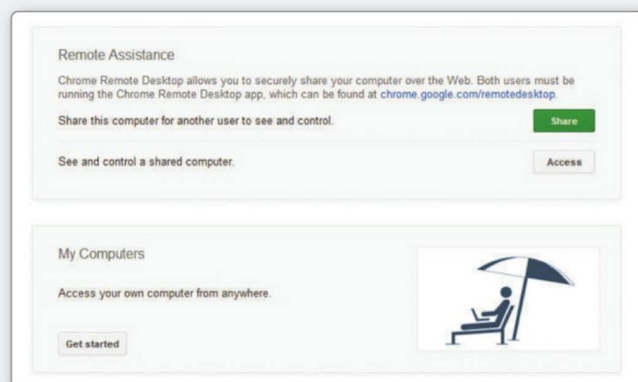
**2** Use the search bar in the top-left corner of the browser window to find Chrome Remote Desktop. It will appear at the top of the list of search results as 'Chrome Remote Desktop BETA'. Click the blue 'Add to Chrome' button to install the app.



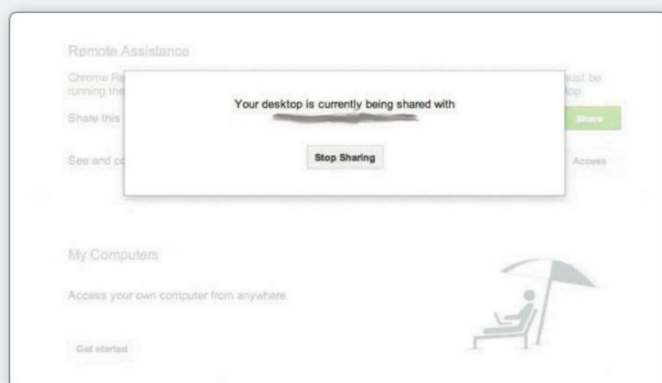
**3** Next, you'll be warned that Chrome Remote Desktop wants to access your data and website information. This might sound bad, but it's more to do with how the program works than a privacy trap. Click Add.



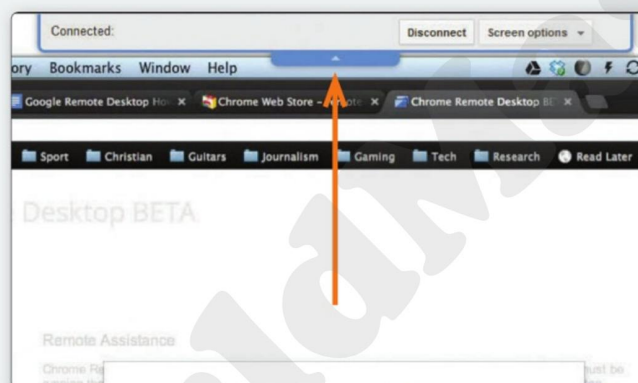
**5** The first time you run Remote Desktop a message asking for access permissions will pop up; agree to this. You'll then be taken to the main menu, where you can choose to access your own computer from afar or provide remote assistance.



**6** Choose Remote Assistance. You'll be offered two options: share your computer or control another machine. The second computer will also need to be running Remote Desktop; instruct its owner how to install and launch the app.



**8** Enter the single-use code and Remote Desktop will establish a connection with the 'target' PC. The app displays an onscreen message to let the other person know what's happening, and they can watch as you inspect their system configuration.



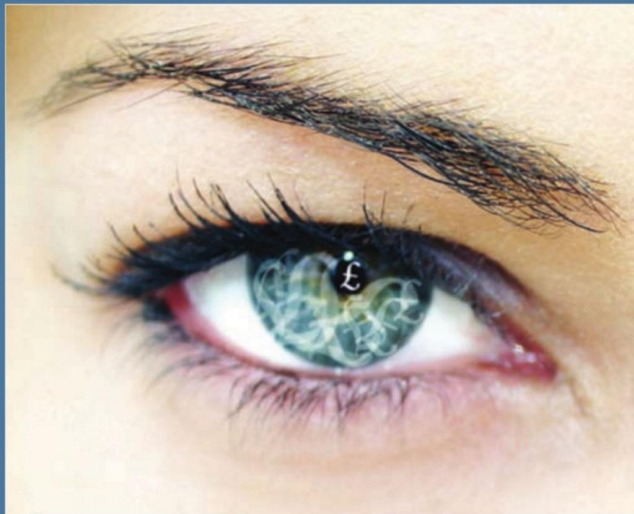
**9** When you've successfully fixed their problem or given some useful advice, click the blue drop-down tab at the top of the window and select Disconnect. Now sit back and bathe in the glory of your tech prowess. ☑



## Cash in on your tech recommendations



Fancy earning some rewards from your product recommendations and tech advice? Jim Martin explains how to set up shop for free with Morefrom.me



As experts in tech, the PCA team is frequently quizzed by family, friends and even friends of friends on what kit to buy. Chances are, it's the same for you as the resident IT guru in your home.

Whether it's a new laptop, tablet, PC, printer or smartphone, people trust you to give them buying advice. You might be happy to give away that advice for free, but now there's a way you can cash in on your recommendations. You can set up your own website and tell your friends to buy their kit directly from you.

Don't know anything about setting up a website? Haven't got time? With Morefrom.me, you don't need any HTML knowledge, and it takes only minutes to set up a shop with 140,000 products in stock.

It sounds impossible; it's not. Your site will in effect be a rebranded version of Morecomputers.com, personalised with your logo and colour scheme. When someone orders from your

store, payment is processed by Morecomputers and the team also handles shipping.

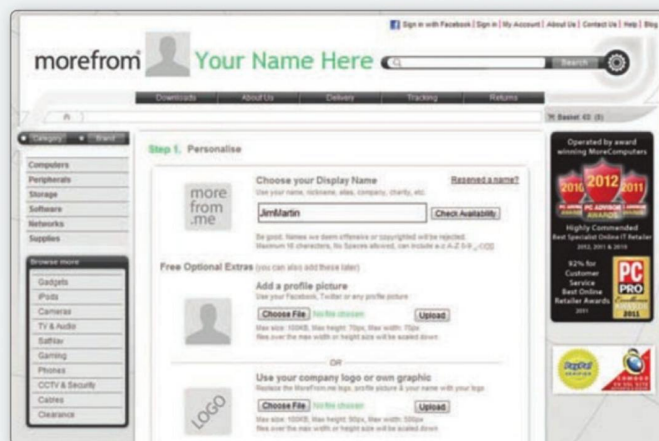
Best of all, it's free. There are no monthly fees, and you get 1 percent commission for every product purchased through your site.

There's only one catch: you're paid not in cash, but with credit that you can spend at Morecomputers.com. Of course, this also means you can buy from your own shop to maximise your earnings. For those who buy a lot of computer kit each year, it makes for an attractive loyalty scheme.

Here, we'll show you how to create your site, and explain how you can increase the prices and get up to 13.5 percent commission. Of course, the idea of making extra money from your friends and family may not sit too well, and you should be careful not to drive away customers looking for the best price.

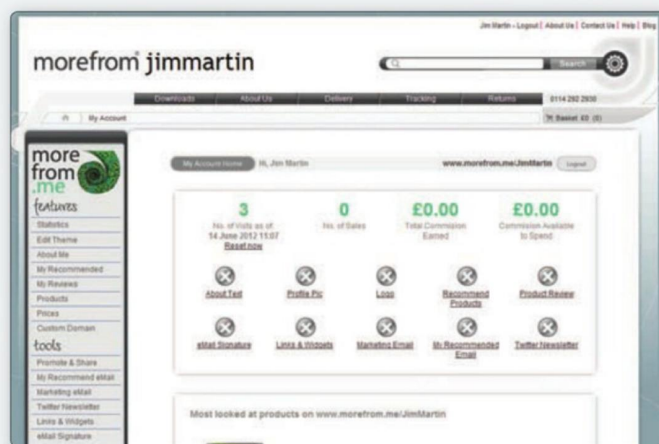
If you're a small business looking to sell tech without hassle, head to morefrom.biz.

## EARN MONEY FROM YOUR OWN TECH WEB SHOP



**START**

Browse to morefrom.me and click the 'FREE Get started' button. Enter your name, a nickname or company name and click the Check Availability button. You can also upload a photo of yourself or a company logo. Click Next.



**4**

Log into your account while you're waiting for your site to be approved. Click My Account at the top-right of the browser window, and enter your details in the fields on the left. Click Manage to view your commission and settings.

## OTHER WAYS TO EARN ONLINE

Morefrom.me offers an easy way to earn credit to spend on tech kit, but what if you want to make real money online?

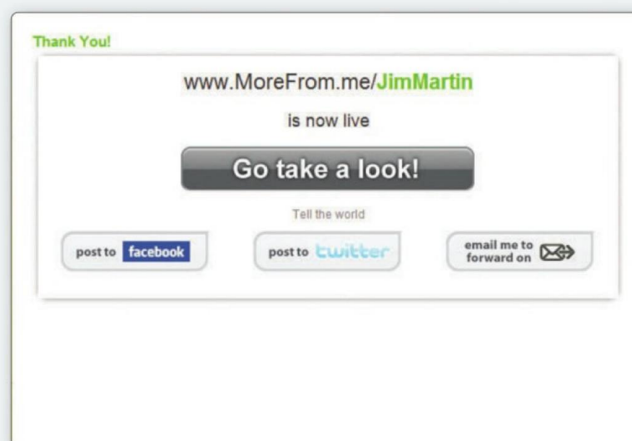
### Advertising

If you have a website, Google AdSense (google.com/adsense) can place adverts on your pages that are relevant to their content; you get paid when people click on them. The amount you earn depends on the type of ads, how you offer them (via a search on your site, live feeds and so on) and how many visitors click on them. As AdSense is free, the best way to find out if it will work for you is to give it a try.





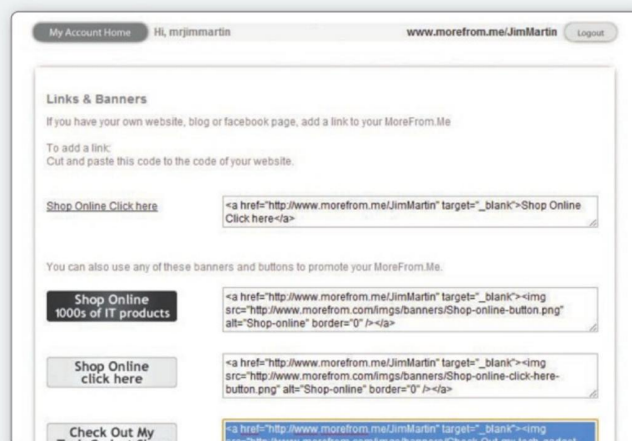
**2** Choose one of the colour schemes offered or customise your own. You can preview what the site will look like by clicking on a suggested theme. A colour wheel and square let you pick colours when creating your custom theme. Click Next.



**3** Enter your real name and email address, tick the box to accept the conditions of use and click Next. Enter a password for your account, then click Next again. The site will return your site's URL; click 'Go take a look!' to preview your shop.



**5** Click Recommended Products and choose how many products you want to promote on your home page (up to 20). Click the 'Add to My Recommended' link on a product's page to make it appear on your home page for friends to more easily find.



**6** Plenty of tools are offered to promote your shop. Head to My Account, eMail Signature to download various signatures. You can also copy and paste a link to your shop from 'Links & Widgets' to Google+, Facebook, Twitter, a blog or another site. ☒

Amazon has a similar program: Associates (tinyurl.com/2r63dg). It's free to sign up and you'll get up to 10 percent of the value of any resulting sale when people click links or banners on your site.

## Tech support

You could use your wealth of computing knowledge to help others and earn cash. Some sites allow you to sign up for free as an expert, then pay you to answer questions. Others, such as crossloop.com, offer a way to provide remote assistance so you can fix customers' problems. You can set your own rates and offer free quotations.

Yet more sites, such as microworkers.com, will pay you to vote on YouTube videos, post in forums and other 'micro' tasks. They pay pennies - but if you're comfortable doing such jobs and have plenty of free time, you can earn some extra cash.

Finally, there's always money available in exchange for filling out surveys, writing reviews and articles and even offering translation services - handy if you're fluent in two or more languages.

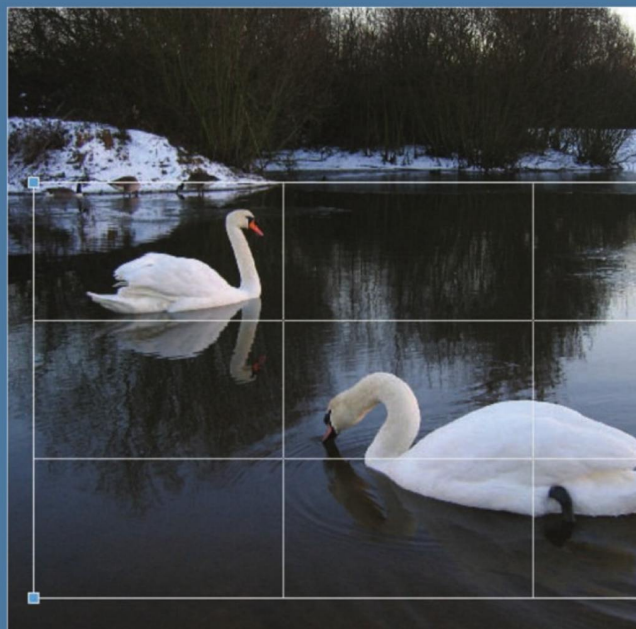
Browse to tinyurl.com/6thtLfp for a list of websites to check out. Be mindful of scams, though, and thoroughly research your chosen site before signing up.



## Edit photos online



Now there's no excuse for sub-par shots: you can edit your images free online with Pixlr. Sandra Vogel shows you how in this simple step-by-step guide



Not so long ago, you needed a dedicated photo editor to manipulate images. That's still the case for advanced tasks, but a huge range of basic editing tools are now available via free online utilities. Here, we show you how to use one such service: Pixlr.

Online photo editors offer several advantages over traditional desktop software – not least that you won't waste time or disk space on their installation. Because Pixlr is web-based, new features are automatically added and immediately available to use.

You can access Pixlr from any web-connected PC with Flash support. This makes it ideal for multi-computer homes, or for those who want to be able to edit snaps on another machine at work or during their holiday.

Other online options are available, but we like Pixlr for its flexibility and extensive

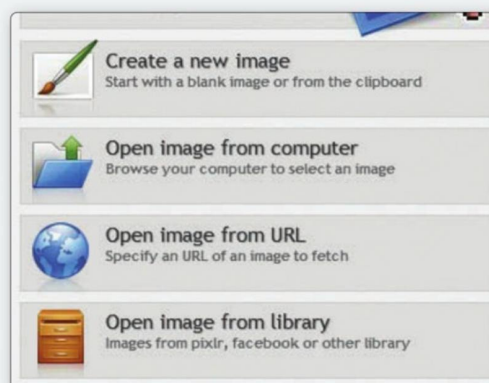
feature set. Its clean, easy-to-navigate interface will be instantly familiar to anyone who has used Photoshop, and it even uses the same keyboard shortcuts for many tasks.

No matter where your images are stored, you'll be able to edit them in Pixlr. You can upload photos from your PC or locate them in the cloud – you need only enter a URL.

Pixlr offers a huge range of editing options that caters to users at all experience levels. It can enhance your photos or hand-drawn images, with everything from resizing and cropping tools to fun filters. You can even draw on to a blank canvas.

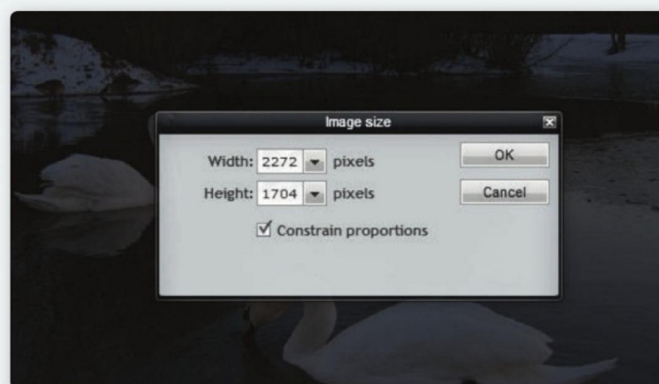
A companion web app, Pixlr-o-matic, applies vintage effects to your photos. Simply click the 'Retro vintage effects' link on Pixlr's home page to access it. Pixlr-o-matic is also available as a free app for Android and iOS devices.

## GET STARTED WITH PIXLR



**START**

Head to [pixlr.com](http://pixlr.com) and click 'Open photo editor'. You'll be prompted to either create a new image or open one stored on your computer, online or in a library. We're going to upload a photo from our computer.



**4** You can also resize and rotate your images in Pixlr. Choose the Image tab in the top menu to see what's on offer. When resizing images, the aspect ratio will be maintained when Constrain proportions is enabled.

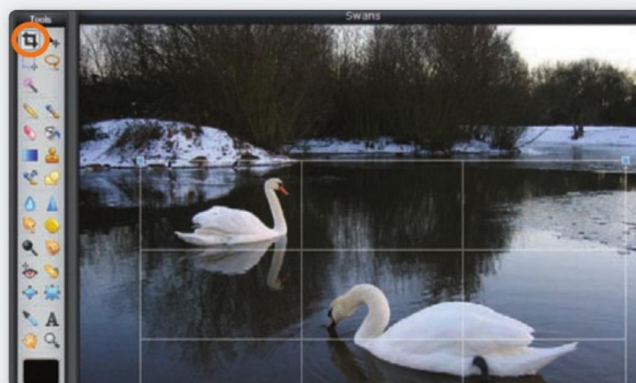


**7** There are some very easy ways to improve or alter the quality of an image without much effort. Selecting Curves, Increase Contrast from the Adjustment menu is one way to give your photo some extra visual punch.

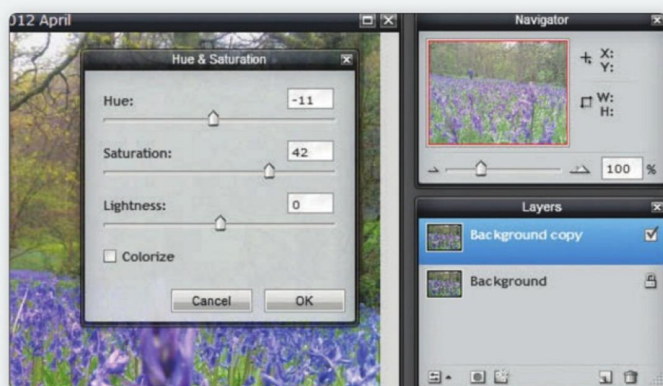




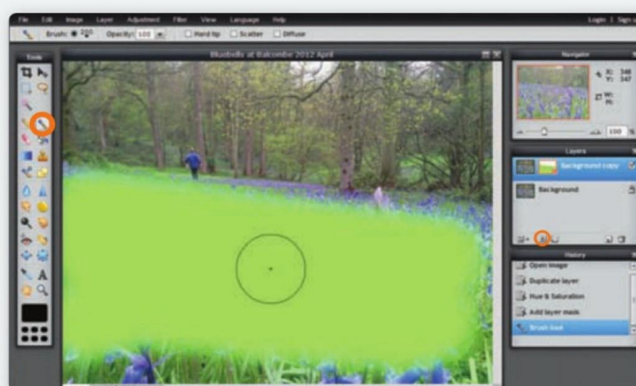
**2** Browse to your photo and double-click it to open the file in Pixlr. A Tools bar that bears more than a passing resemblance to Photoshop's toolbar appears to the left of your image; a top menu is similar to that which you'd see in any desktop image editor.



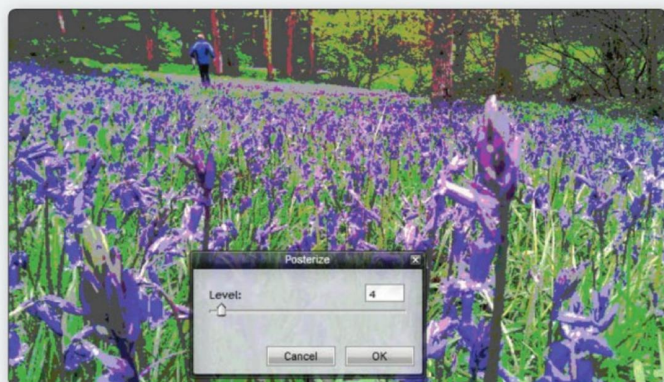
**3** Let's start by cropping the image. Choose the Crop tool from the Tools bar, then click and drag to select the area of the image you wish to retain. Double-click to apply the crop. If you don't like the change, press Ctrl, Z to undo the previous edit.



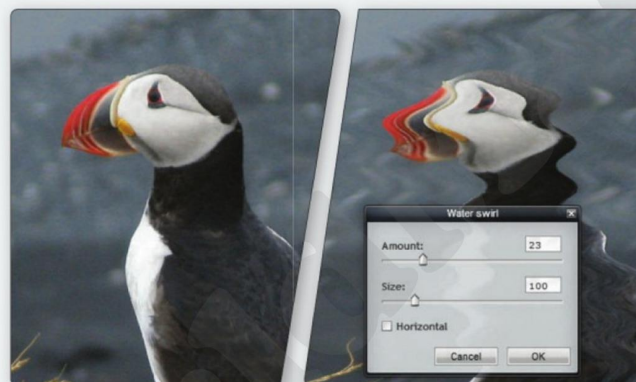
**5** One of Pixlr's most powerful features is its support for adjustment layers and layer masks. Press Ctrl, J to duplicate the background layer, then choose 'Hue & Saturation' from the Adjustment menu to tweak the settings.



**6** Add a layer mask by clicking the icon at the bottom of the Layers palette (it depicts a black circle inside a white square). Use the Paintbrush tool to paint over areas of the layer in which the Hue & Saturation adjustment should be applied.



**8** Pixlr also offers a whole range of effects that you're probably more used to seeing as presets on your digital camera. In the Adjustment menu you'll find Sepia, Solarise, Old Photo, Posterise and other settings with which you can experiment.



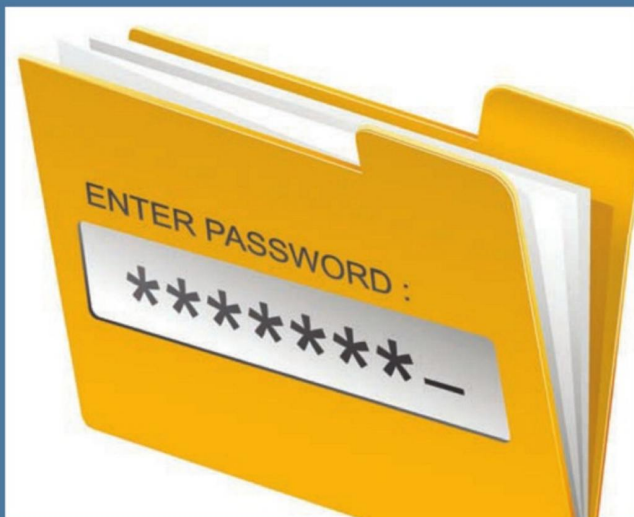
**9** Pixlr's range of distortion effects and filters is even more impressive, though. Take a look in the Filter menu and you'll find blurs, swirls, embossing and plenty more, each with a range of internal settings. ☒



## Protect your data from prying eyes



Encrypting files is easy, secure and free with Cryptainer LE. With Mike Bedford's help, your sensitive data will stay private, even if your computer is stolen



When you consider data security, you probably think of online security. But it's not only when your sensitive data is transferred across the internet that it's at risk. The data stored on your hard disk also raises concerns.

Elsewhere in this issue (see page 80) we provide guidance on how to delete data beyond recovery. This is essential if you plan to sell or give away your PC, and don't want others to be able to unearth your financial details, passwords and email.

There are other ways in which you may be separated from your PC, though, and in such cases you won't have taken the precaution of securely deleting your files. If you leave your laptop on a train or someone breaks into your house, for example, your computer will be an open book to those with unscrupulous intentions.

The only way you can ensure the security of your out-of-sight files is to encrypt them. This way, anyone

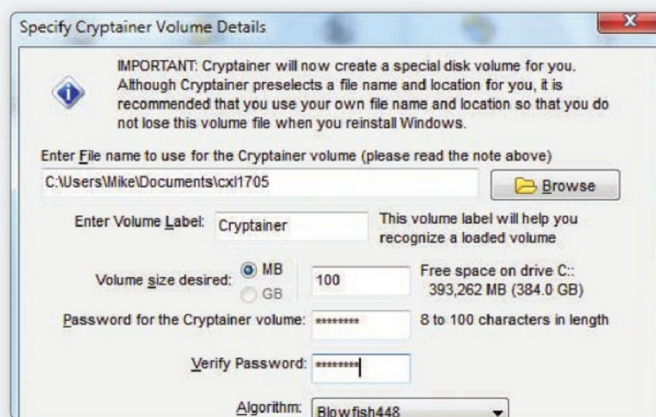
wanting to access your data will first have to unlock the files using a security code.

Today's encryption algorithms are sufficiently sophisticated that it would take years of computing power for an unauthorised person to crack the code. But despite its efficiency, most people regard encryption as a hassle. It can be a pain to have to decrypt and later encrypt a file every time you want to access it.

The latest generation of hard-disk encryption tools greatly simplifies the process, leaving you with no excuse not to take advantage. Here, we'll show you how to use the free Cryptainer LE utility ([tinyurl.com/bkmhf](http://tinyurl.com/bkmhf)).

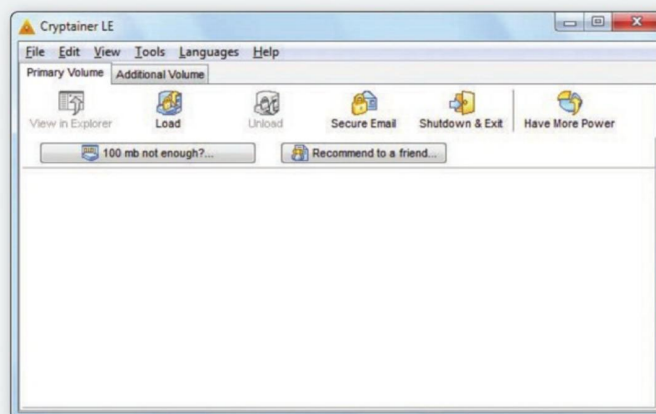
As we're about to see, encrypting and decrypting individual files is a thing of the past. All you now need to do is provide a password each time you start up your PC to access your encrypted files. Shutting down your PC is then all it takes to protect your data from prying eyes.

## ENCRYPT YOUR FILES WITH CRYPTAINER LE



**START**

The first time you run Cryptainer LE you'll need to specify the size of the volume (the total storage required for all your encrypted files) and a password, then click 'Proceed to Create Volume'. Cryptainer will create and load an encrypted volume, which will appear as a virtual disk drive.



**4**

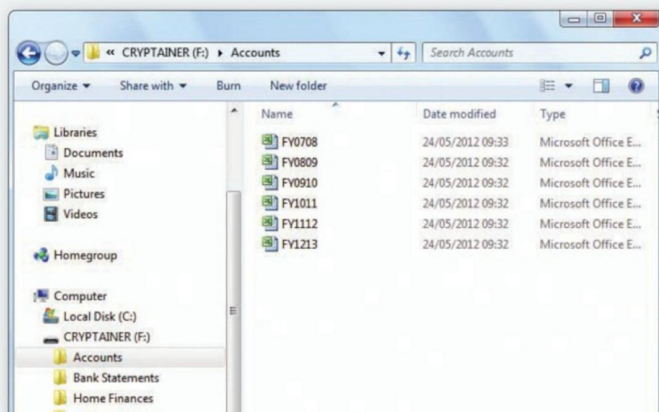
The Cryptainer volume is automatically unloaded when you shut down the computer. You can also unload the drive if you wish to step away from the PC for a few moments: simply click the Unload button. To verify the security of your data, launch Windows Explorer and you'll see that the Cryptainer volume has disappeared.

## ENCRYPT YOUR INSTANT MESSAGES

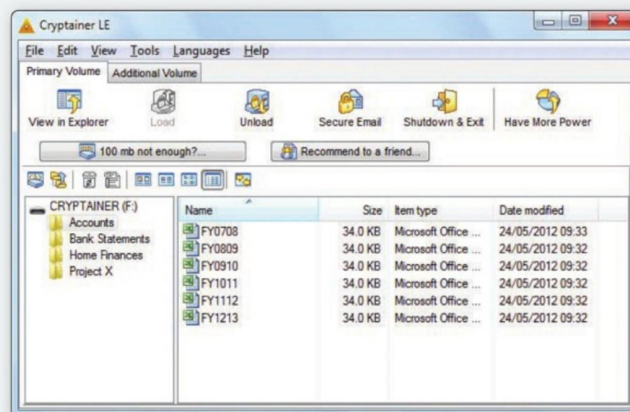
Having followed our instructions above and installed Cryptainer to protect the most important files on your PC, plus those sent by email, you're half way to securing your sensitive data. Your bank and any major online stores you shop with will also encrypt your account details before passing them across the internet. So that just leaves unprotected one important part of your digital life: instant messaging.

Depending on your choice of instant-messaging service, it's possible that someone who has hacked into or otherwise gained access to your account could find that some of your conversations make for interesting reading. Fortunately, there are services that can

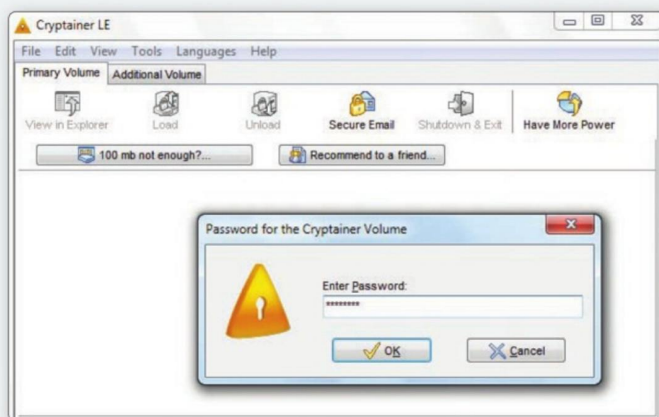




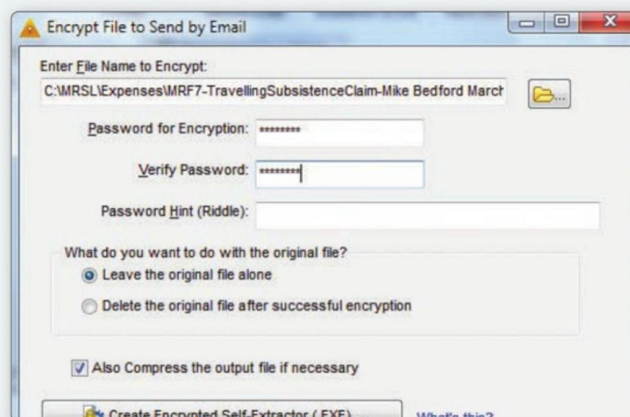
**2** Launch Windows Explorer and look at the available disks. In addition to the usual contenders, such as your hard disk, a DVD drive and perhaps a USB flash drive, a virtual drive referred to as 'Cryptainer' will also appear in the list. This drive is currently empty; drag into it a few of the files you wish to protect.



**3** Return to Cryptainer LE. The main window will list the files and folders you copied into the Cryptainer virtual disk in Step 2. You can access and work with files in this volume in the usual manner; the only difference is you'll be safe in the knowledge that they are secure from prying eyes.



**5** Upon your return to the PC, you'll need to load the Cryptainer volume to continue working with your files. Any attempt to open the encrypted files in the meantime will produce garbled results. To load the volume, launch Cryptainer, click the Load icon, enter your password and click Ok.



**6** Cryptainer also lets you encrypt individual files for emailing. Select Tools, 'Encrypt File to Send by Email...'. Browse to the file, enter a password that will be used to decrypt it, then click Encrypt File... The recipient will need to install Cryptainer, then choose Tools, Decrypt File... and enter the password. ☒

encrypt your instant-messaging conversations, and any traffic picked up by an eavesdropper would be impossible to decipher.

Many - but far from all - instant-messaging services employ their own encryption, which for most people will be perfectly adequate. For a list of services that offer built-in encryption, see the Wikipedia article at [tinyurl.com/dyp322x](http://tinyurl.com/dyp322x). Note that some of the popular clients, including Windows Live Messenger, Yahoo Messenger, Google Talk and Empathy, do not offer encryption.

If you strive for ultra-secure online conversations, some instant-messaging clients have been designed from the ground up as security

products. In addition to providing encryption, some offer a whole host of additional security-related services - for example, a means of ensuring that you know for certain with whom you're chatting. Such products can also provide a peer-to-peer link, meaning your traffic doesn't pass through online servers.

X-IM (x-im.net) is one such free instant-messaging service, although it uses a server rather than a peer-to-peer connection. BitWise IM (bitwiseim.com) is a peer-to-peer service, but the free BitWise Personal software doesn't provide identity verification, something you get only with BitWise Plus.



## Sell products with Google Checkout



You'll attract more customers if they can pay in ways other than PayPal. Rosemary Hattersley explains how to set up a Google Checkout account



The web is a great place to make money, but setting up as an e-commerce operation can be costly. Running a website through which to sell direct can cost thousands of pounds, while using a template-based site operated by a web host can tie you into that platform.

If you've only a few items to sell, eBay could be a good choice. The problem is your shopfront is lumped in with all the other traders', and it's hardly a classy-looking haunt.

Amazon and its associated Marketplace gives you more space in which to describe and sell your items, but takes a significant cut of the proceeds from your already aggressively priced products.

Vendors of specialist products are often better off using specialist sites where customers will flock to find items of a similar type.

Asos has become the UK's largest clothing store and has its own marketplace for both new and vintage lines, while crafters and interior

designers have Etsy, Bouf and Notonthehighstreet as useful online portals through which to sell their wares. A natural partner to such sites is Pinterest, which helps you share items of interest with followers via online pinboards.

For maximum exposure, though, you can't do better than Facebook. With 900 million active users, having people 'Like' your products is an excellent method of promotion. And now you can sell directly to your fans through the social network.

Ecwid is a widget you embed in your Facebook profile to do precisely this. You can also use it with a Blogger or Wordpress site. The advantage of its Facebook application is its wider scope and the fact you can more easily spread the news via friends. Google+ and Twitter also work well in this respect.

Here, though, we'll look at how to set up a merchant account with Google, PayPal or another secure service.

## SET UP A MERCHANT ACCOUNT WITH GOOGLE CHECKOUT

**START** Setting up a Google Checkout account requires you to create or log into your existing Google account, detail where your business is based and its owner's credentials. You must provide a public business website address through which buyers can get in touch. You'll then be assigned a merchant ID.

**4** Sign into Google Docs and click 'Create a new inventory spreadsheet'. Choose a title and bring up the spreadsheet fullscreen for editing. Add your items, along with any photos you have available, then save the document. Click to publish it to the web so it's publicly available.

## USING GOOGLE WALLET

We've chosen Google Checkout (now part of Google Wallet) for our online merchant account. The shopping cart can be integrated into your website or blog in several ways but, unlike Amazon Marketplace or eBay, it's not a shopfront in its own right. Sales terms and conditions vary depending on what you're selling and where you're based. UK users can view a comprehensive list of forbidden items at [tinyurl.com/7bn6v7p](http://tinyurl.com/7bn6v7p). Google Wallet requires buyers to be logged into a Google account to use its online purchasing platform.

Google's transaction fees depend on your monthly sales volumes. If the total is under £1,500, physical products sold within the UK are



Tech  
Help

**2** Next, you need to provide details of the bank account into which payments will be made (and from which refunds will be issued). You also need to indicate the web address from which you'll be trading. If you don't already have an online product catalogue, you can use the Google Checkout store widget to create one.

**3** Regardless of whether you use the widget, you need to provide your financial details to Google Checkout to complete the setup. You can also provide your business details as held by Companies House. Accept the terms and conditions, allow the widget to appear on your site and you can begin.

**5** It's easy to embed the finished product catalogue in your website. Simply click the URL that is generated, navigate to your site, create a new post or page and paste in the link. Alternatively, you can publish the product spreadsheet to your Facebook page or Twitter feed.

**6** One of the simplest options - ideal if you have only a few items for sale - is a Buy now button that lists the stock choices. In the Google Checkout Tools menu, add the price, product name and description for each item, then paste the resulting code into your website via the HTML dashboard. ☒

charged at 3.4 percent plus 20p per item, with an extra 1 percent for overseas orders. Google Play apps can be sold internationally and have a standard transaction fee of 30 percent.

Google monitors the behaviour of new merchants. You graduate to a fully blown merchant after 60 days of successful trading.

### Buy Now button generator

There are several ways to add Buy Now buttons to your site. The Google Checkout Button URL Generator is one of the simplest. Sign into your Google Wallet account, locate your merchant ID in the

Settings menu, and paste it into the button generator for the chosen button size (small, medium or large).

Press the Get Code button to have Google generate the HTML needed to add the Buy Now button to your site. Using Blogger, you can then paste the code into the body of a blog post in HTML view. Save and press Preview to check the button has been added (it won't work until the post has been published). Once created, clicking the Buy Now button on your site will take the customer to a login page where they can confirm their purchase and view the contact details you provided when you set up your merchant account.



## Store your data in the cloud



Microsoft has introduced to its SkyDrive online storage service some new features that make it well worth a second look. Cliff Joseph explains how to get started



When Microsoft launched SkyDrive it offered a whopping 25GB of free online storage, putting it way ahead of rivals such as Dropbox with its modest 2GB. But early adopters were put off by messy syncing through Live Mesh and ads for 'hot Russian girls'. It was no surprise to see them giving up and returning to Dropbox to back up their most important files.

Not wanting to be left behind as cloud computing becomes ever more popular, Microsoft has revamped its online storage service. You now get 7GB of free storage space, which is available to PCs, Macs, Windows phones and iOS devices. SkyDrive is also easier to use - because it takes its lead from Dropbox.

When installed on your PC a SkyDrive folder is added to your user folder. Any files placed here are automatically uploaded to your online account, then synced with

your other devices that have SkyDrive installed.

You can also log into your SkyDrive account via a web browser, which is handy if you're using someone else's PC to access your files.

So far, so Dropbox; but SkyDrive does have a few good ideas of its own. When accessed through a browser, you can take advantage of Microsoft's Web Apps - slimmed-down versions of Word, Excel and PowerPoint. This means you can work with your files even if the PC you're using has no productivity software installed.

SkyDrive also lets you collaborate on documents with other users, allowing you to share files and grant various access permissions.

Finally, Microsoft has introduced Fetch files, a clever remote-access solution that allows you to get to the entire contents of your main PC's hard disk from afar.

## STORE FILES ONLINE WITH MICROSOFT SKYDRIVE

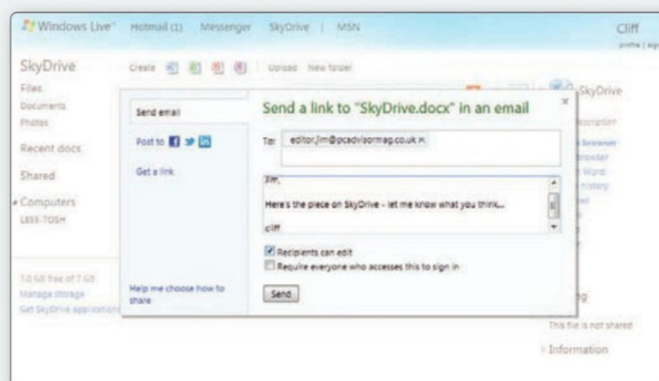


**START**

Head to [tinyurl.com/cwbn264](http://tinyurl.com/cwbn264) to get started with SkyDrive. You'll find an introductory video, along with links to additional pages that cover SkyDrive's various features in more detail. Click 'Get SkyDrive' to download the software.



**4** Once they've been successfully uploaded to the cloud, the files in your SkyDrive folder are automatically synced with all your other devices on which SkyDrive is installed. Two folders are set up by default, but you can create more.

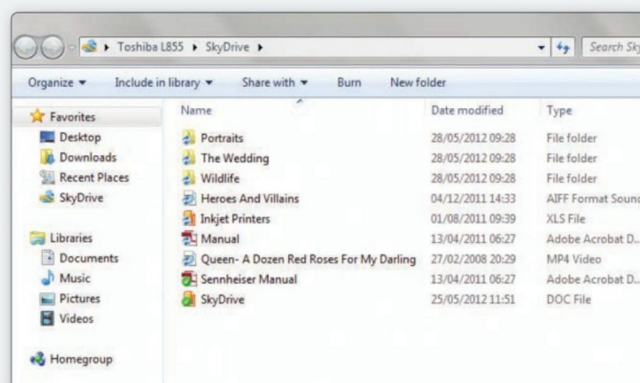


**7** You can share documents through SkyDrive: right-click any file in the browser view and select Share. Next, email the provided link to a colleague. Be sure to enable the 'Recipient Can Edit' option if you want to enable them to work on the document.





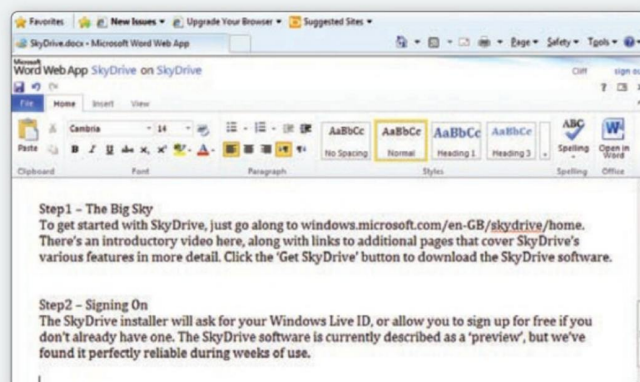
**2** The SkyDrive installer will prompt you to enter your Windows Live ID; you can register free if you don't already have one. SkyDrive is currently described by Microsoft as preview software, but we found it perfectly reliable during our testing.



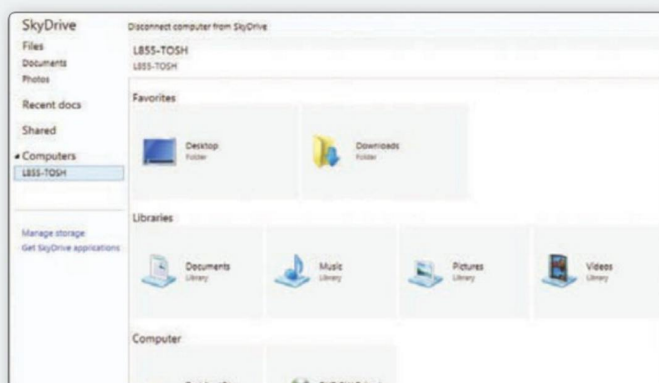
**3** A SkyDrive folder will be created in your user folder, and visible in the Favorites list in Windows Explorer. Any files placed in this folder will be automatically uploaded to SkyDrive, with a progress indicator available in the Notification area.



**5** If you're using a computer that doesn't have the SkyDrive software installed, you can log into your SkyDrive account through its web browser. Head to [skydrive.live.com](http://skydrive.live.com) and sign in. You can even stream music and video files via the browser.



**6** Microsoft's Web Apps are available to the online version of SkyDrive. Click one of the icons near the top of the screen to create and edit a Word, Excel, PowerPoint or OneNote document in your browser. Office does not need to be installed on the PC.



**8** SkyDrive allows you to retrieve any file from your PC - even those not located in your SkyDrive folder - provided that it's switched on. Click on your computer in the list on the left and enter the security code that's subsequently sent to you via email.



**9** You can access your SkyDrive files from your Windows Phone- and iOS devices, too. The iOS app works with both the iPhone and iPad, and allows you to browse, download or stream files. There's no app for Android yet. ☒



## iolo Search and Recover FULL PROGRAM

The Cover disc is free with print issues of *PC Advisor* magazine, available in all good newsagents



### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\ iolo Search and Recover 5.4 and open the install file

**Online registration required:** follow the links during installation. Offer ends 5 Sep 2012.

**System requirements**  
200MHz processor; Windows 2000/XP/ Vista/7; 128MB RAM (512MB XP); 10MB drive space; Internet Explorer 6.0 or higher; internet connection

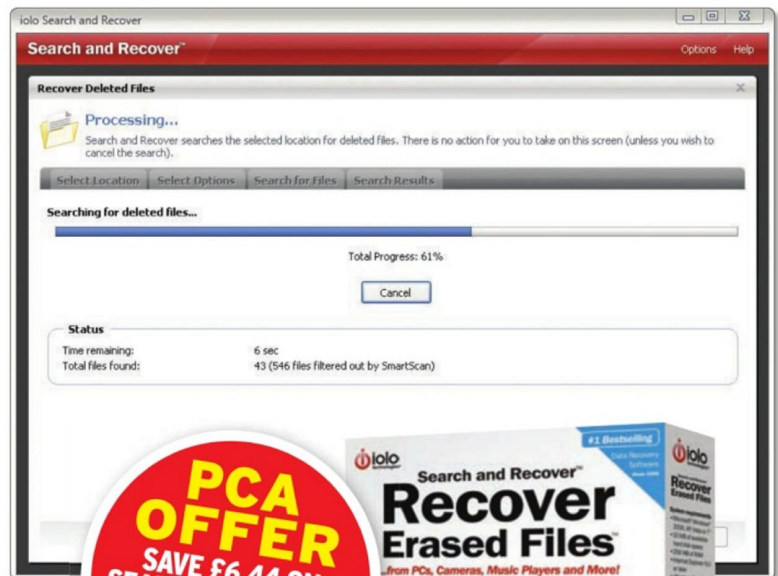
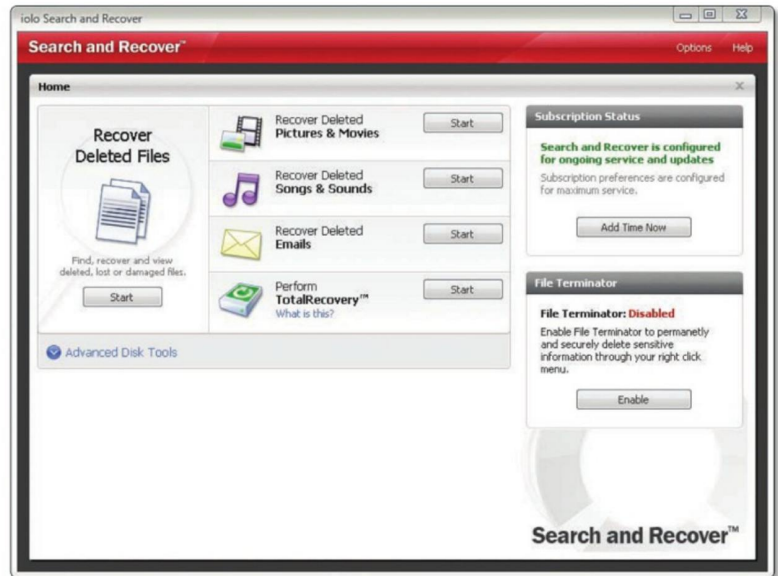
Search and Recover from iolo technologies instantly recovers deleted files, documents, email messages, photos, movies and music, from hard drives, floppy disks, CDs/DVDs, music players, cameras, memory cards and virtually any other portable device. Its easy-to-use interface offers one-click recovery.

StrongScan and SmartScan technologies allow recovery of information after the worst PC accidents and disasters - sometimes years after it was lost.

Advanced data-imaging options enable the creation and maintenance of virtual drives and backup copies from damaged or inaccessible media, as well as any hard drive, CD, or DVD.

### Features

- **Recover data to a CD or DVD.** Create safe storage and backup for your files
- **Immediate recovery.** Run rescue tools directly from the disc to prevent further damage to accidentally deleted data
- **Secure file deletion.** Permanently erase sensitive information from your PC or digital device, so even Search and Recover can't find it
- **Keep data safe.** Make recovery effortless and avoid future data loss by creating mirror copies of entire drives
- **Gain speed and eliminate lag.** Create virtual drives to run CD or DVD content at faster drive speeds
- **Extended Outlook recovery.** Recover deleted tasks, notes, contacts and more from Outlook



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## iolo Search and Recover 5.4

### FULL PROGRAM (SIX-MONTH LICENCE)



#### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\ iolo Search and Recover 5.4 and open the install file

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#### System requirements

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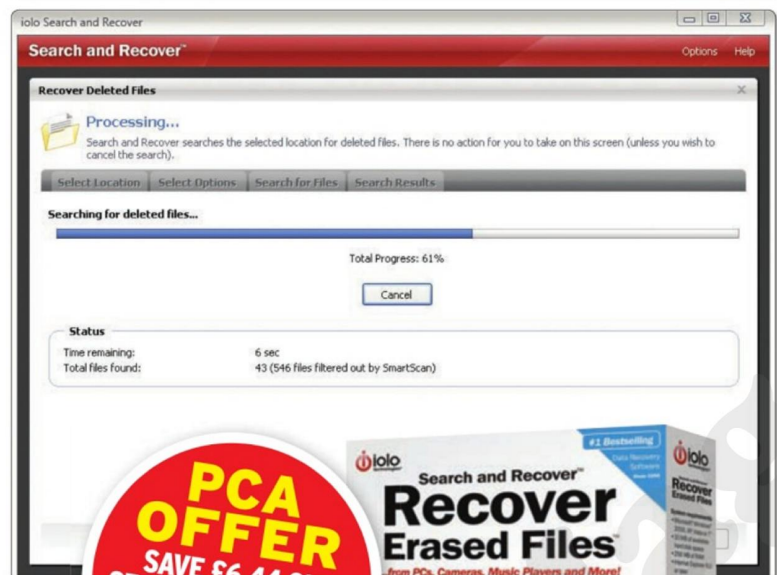
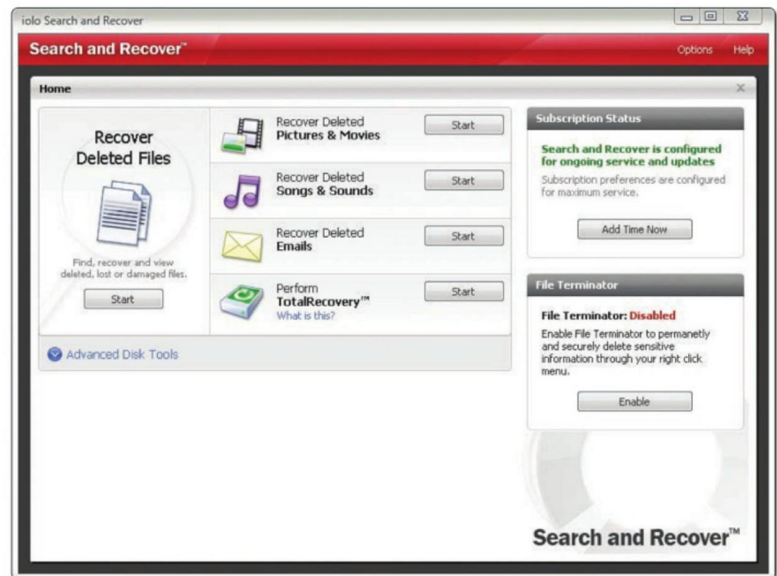
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# Ashampoo

## EXCLUSIVE FULL

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### Installation details

Go to My Computer. Right-click the DVD and open the disc. Select Files 207\Ashampoo WinOptimizer 9 and open the install file

**Online registration required:** follow the links during installation. Offer ends 5 Sep 2012.

### System requirements

Windows XP/Vista/7; 512MB RAM; 90MB drive space

READ OUR FULL REVIEW ON PAGE 48

Ashampoo WinOptimizer 9.0 optimises your PC in a single click.

Remove the unnecessary data and services that slow down your Windows PC. WinOptimizer 9.0 performs a complete system analysis, then lets you sift through the results. Ashampoo backs up your data in case important files are accidentally deleted.

### Features

- **One-Click Optimizer.** Quick system optimisation in a single click
- **Drive Cleaner.** Finds and deletes unnecessary files
- **Registry Optimizer.** Deletes unnecessary or faulty entries
- **Internet Cleaner.** Removes traces of your internet activity



- **Defrag 3.** Defragmentation of hard-disk drives

- **NEW Registry Defrag.** Analyses and defragments the Registry

# Zoner Photo Studio 14.0 Pro

## FULL PROGRAM (THREE-MONTH TRIAL)



### Installation details

Go to My Computer. Right-click the DVD and open the disc. Select Files 207\Zoner Photo Studio 14 Pro and open the install file

**Online registration required:** follow the links during installation. Offer ends 5 Sep 2012.

### System requirements

Intel Pentium 4 processor or better; Windows XP/Vista/7; 1GB RAM; 350MB drive space; 1024x768 screen; DirectX 9; Internet Explorer 7 or later

Zoner Photo Studio 14.0 is a one-stop solution for downloading photos, correcting and removing defects, adding creative effects, organising and tagging snaps, and sharing your creations.

This professional-grade tool supports every imaging standard and technology, and you can get the most out of your computer with support for SSE, MMX, multiple cores, 64bit and GPU acceleration.

Zoner's streamlined interface is as powerful as it is attractive. You can simultaneously bring in and edit as many pictures as you want.

Photo Studio 14.0 offers countless sorting, searching and filtering features, including a Catalog view that lets you quickly view your snaps on a timeline. Extensive output options include 3D, panorama and Tone Mapping HDR.

You can rely on Zoner for all your digital photography needs. ☑





# Ashampoo WinOptimizer 9.0

## EXCLUSIVE FULL PROGRAM (100-DAY LICENCE)

**ONLINE  
REGISTRATION  
REQUIRED**

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1-abc.net  
FULL PROGRAM

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ONLINE  
REGISTRATION  
REQUIRED

#### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\1-abc.net Duplicate Finder and open the install file

#### Online registration

**required:** follow the links during installation. Offer ends 5 Sep 2012.

#### System requirements

Windows XP/Vista/7

With thousands of files stored in various folders and sub-folders on your PC's hard drive, it can be difficult to keep track of duplicates. Duplicate Finder is an easy-to-use program that can spot duplicate files on a PC, an external hard drive, a CD, DVD, USB stick or memory card.

Not all duplicate files will have the same filename, so Duplicate Finder is also able to look at various attributes such as the file size and last modification time - you decide what it should look for.

Point Duplicate Finder to a drive, and it'll immediately go to work comparing files in all folders and sub-folders - no stone will be left



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turned. A list of duplicate files in size order is returned, from which you can delete items or view the folder in which they are stored.

With 1-abc.net Duplicate Finder you'll never have to worry about duplicate files wasting storage space on your computer again! ☑

## Soda PDF Standard Edition

FULL PROGRAM

ONLINE  
REGISTRATION  
REQUIRED

#### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\SodaPDF Standard Edition and open the install file

#### Online registration

**required:** follow the links during installation. Offer ends 5 Sep 2012.

#### System requirements

Windows XP/Vista/7;  
1GB RAM (512MB XP);  
100MB drive space

Soda PDF Standard is an easy-to-use tool designed to simplify PDF creation and management. It's equipped with all the tools you need to open, edit, create, convert and print PDFs. Soda PDF Standard's intuitive interface means you'll be mastering PDFs in no time.

Soda PDF Standard is fully compatible with any PDF, no matter in which software it was created - your PDFs will always display correctly. Choose from several viewing modes, including full screen, facing and 3D View to experience PDFs in a whole new way.

Create PDF files from more than 300 file types, including Word, Excel, PowerPoint and HTML. With the



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ability to create PDF files from scratch, from templates or from other file formats, Soda PDF Standard makes the creation of PDF documents a breeze. Need to convert a PDF document to another format? No

problem, Soda PDF Standard can do that too. And it's just as easy!

Edit PDF files directly in Soda PDF Standard. From simple text edits to page modifications, Soda PDF Standard can do it all. ☑

## DISC INSTRUCTIONS

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# 1-abc.net Duplicate Finder 5.0

## FULL PROGRAM

**ONLINE  
REGISTRATION  
REQUIRED**

### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\1-abc.net Duplicate Finder and open the install file

### Online registration

**required:** follow the links during installation. Offer ends 5 Sep 2012.

### System requirements

Windows XP/Vista/7

With thousands of files stored in various folders and sub-folders on your PC's hard drive, it can be difficult to keep track of duplicates. Duplicate Finder is an easy-to-use program that can spot duplicate files on a PC, an external hard drive, a CD, DVD, USB stick or memory card.

Not all duplicate files will have the same filename, so Duplicate Finder is also able to look at various attributes such as the file size and last modification time - you decide what it should look for.

Point Duplicate Finder to a drive, and it'll immediately go to work comparing files in all folders and sub-folders - no stone will be left



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turned. A list of duplicate files in size order is returned, from which you can delete items or view the folder in which they are stored.

With 1-abc.net Duplicate Finder you'll never have to worry about duplicate files wasting storage space on your computer again! ☑

# Soda PDF Standard Edition

## FULL PROGRAM

**ONLINE  
REGISTRATION  
REQUIRED**

### Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 207\ SodaPDF Standard Edition and open the install file

### Online registration

**required:** follow the links during installation. Offer ends 5 Sep 2012.

### System requirements

Windows XP/Vista/7;  
1GB RAM (512MB XP);  
100MB drive space

Soda PDF Standard is an easy-to-use tool designed to simplify PDF creation and management. It's equipped with all the tools you need to open, edit, create, convert and print PDFs. Soda PDF Standard's intuitive interface means you'll be mastering PDFs in no time.

Soda PDF Standard is fully compatible with any PDF, no matter in which software it was created - your PDFs will always display correctly. Choose from several viewing modes, including full screen, facing and 3D View to experience PDFs in a whole new way.

Create PDF files from more than 300 file types, including Word, Excel, PowerPoint and HTML. With the



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ability to create PDF files from scratch, from templates or from other file formats, Soda PDF Standard makes the creation of PDF documents a breeze. Need to convert a PDF document to another format? No

problem, Soda PDF Standard can do that too. And it's just as easy!

Edit PDF files directly in Soda PDF Standard. From simple text edits to page modifications, Soda PDF Standard can do it all. ☑

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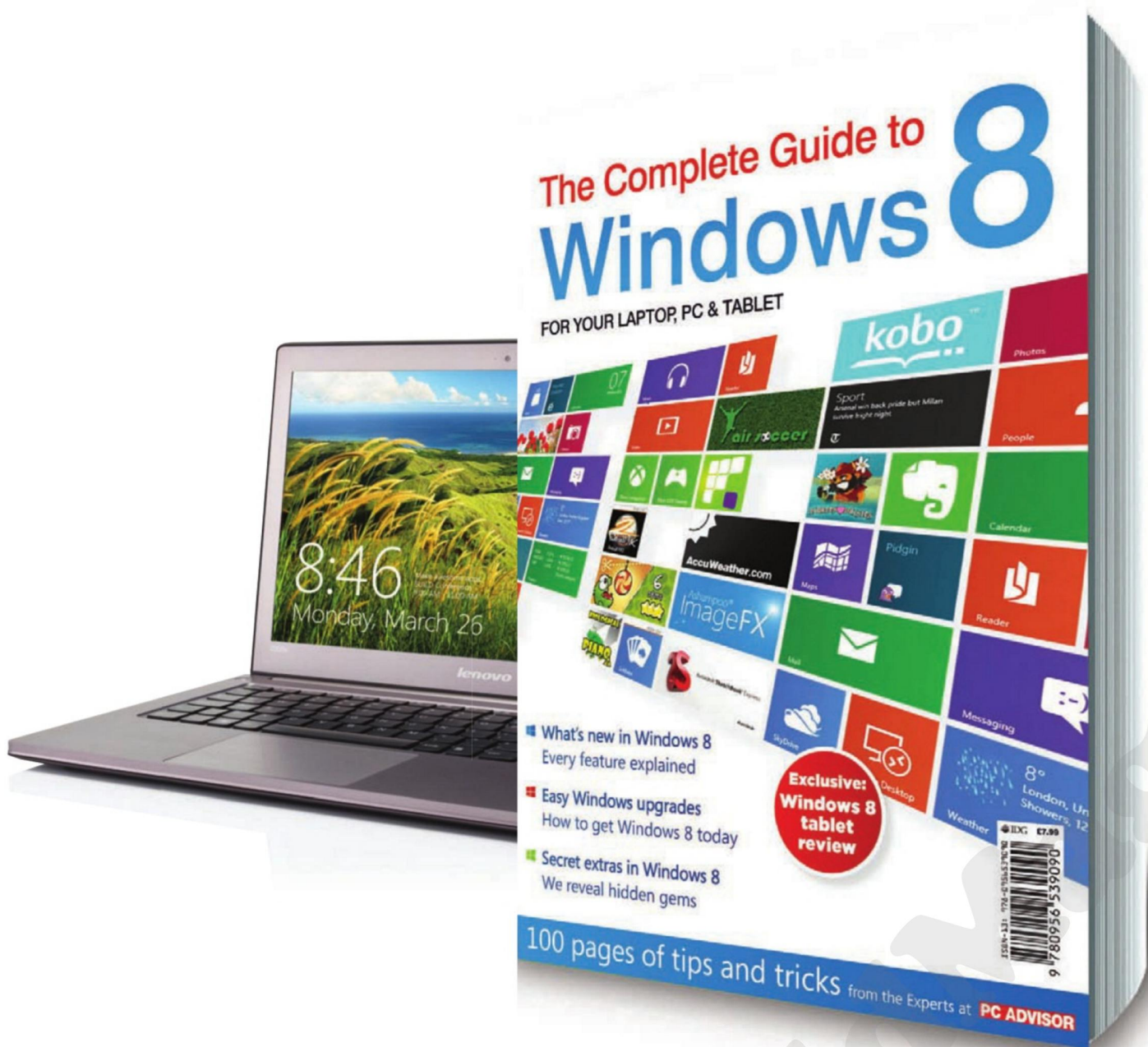
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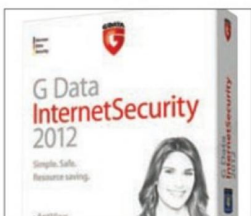
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Flat-panel displays

## Prices

### Laptops

Laptops up to £600  
£601 to £1,000  
£1,001 and over

### Printers

Printers under £150  
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Graphics cards under £150  
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Netbooks	1	2	3	4	5
	Samsung NC110	Kogan Agora Pro	Samsung NS310	Acer Aspire One Happy 2	Dell Latitude 2120 Advanced
Price	£250 inc VAT	£300 inc VAT	£310 inc VAT	£250 inc VAT	£598 inc VAT
Website	Samsung.com/uk	Kogan.co.uk	Samsung.com/uk	Acer.co.uk	Dell.co.uk
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	1.5GHz Intel Atom N550	1.3GHz Intel Pentium SU2700	1.5GHz Intel Atom N550	1.66GHz Intel Atom N570	1.5GHz Intel Atom N550
RAM	1GB DDR2	2GB DDR2	1GB DDR3	1GB DDR3	2GB DDR3
Storage	250GB hard drive	500GB hard drive	250GB hard drive	250GB hard drive	320GB hard drive
Screen size	10.1in	11.6in	10.1in	10.1in	10.1in
Screen resolution	1024x600 pixels	1366x768 pixels	1024x600 pixels	1024x600 pixels	1366x768 pixels
Graphics	Intel GMA 3150	Intel GS40	Intel GMA 3150	Intel GMA 3150	Intel GMA 3150
Video memory	N/A	N/A	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	10/100Mbps	10/100Mbps	10/100Mbps	10/100Mbps	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 2.0	3x USB 2.0	3x USB 2.0	3x USB 2.0	3x USB 2.0
FireWire	×	×	×	×	×
Thunderbolt	×	×	×	×	×
DisplayPort	×	×	×	×	×
HDMI	×	✓	×	×	×
DVI	×	×	×	×	×
VGA	✓	✓	✓	✓	✓
eSATA	×	×	×	×	×
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 7 Starter 32bit	Ubuntu Linux 11.04	Windows 7 Starter 32bit	Windows 7 Starter 32bit	Windows 7 Pro 32bit
Bundled software	None	None	None	None	Microsoft Office Starter 2010
Fear (Max detail)	Not tested	Not tested	Not tested	Not tested	Not tested
Battery	48Wh lithium-ion	31Wh lithium-ion	Three-cell lithium-ion	42Wh lithium-ion	56Wh lithium-ion
Battery life	7 hrs 52 mins	2 hrs 22 mins	3 hrs 41 mins	Not tested	6 hrs 24 mins
WorldBench 6 score	36	N/A <sup>1</sup>	37	32	33
Dimensions	259x180x28mm	290x195x26mm	275x188x31mm	259x185x24mm	265x187x23mm
Weight	1.2kg	1.3kg	1.1kg	1.3kg	1.3kg
Warranty	1 year return-to-base	1 year collect-and-return	1 year return-to-base	1 year international	1 year collect-and-return
Verdict	<ul style="list-style-type: none"> <li>Attractive styling</li> <li>Excellent battery life</li> <li>Only DDR2 RAM</li> <li>Non-reflective 10in screen</li> </ul>	<ul style="list-style-type: none"> <li>Above average screen size</li> <li>2GB RAM</li> <li>Runs Ubuntu not Windows</li> <li>Battery life very poor</li> <li>Hi-res matt screen</li> </ul>	<ul style="list-style-type: none"> <li>1GB DDR3 RAM</li> <li>Only 250GB hard drive</li> <li>Glossy screen</li> <li>Low battery life</li> <li>Expensive for the spec</li> </ul>	<ul style="list-style-type: none"> <li>Good overall build quality</li> <li>Glossy screen</li> <li>Adequate performance</li> <li>A little hot in use</li> <li>Difficult to access innards</li> </ul>	<ul style="list-style-type: none"> <li>Business netbook</li> <li>2GB DDR3 RAM</li> <li>Average performance</li> <li>Windows 7 Professional</li> <li>Solid battery life</li> </ul>
FULL REVIEW	TINYURL.COM/7QZAPKM	TINYURL.COM/43MN2OB	TINYURL.COM/444SKTX	TINYURL.COM/7D4ZP3C	TINYURL.COM/7WNFF7T

<sup>1</sup>Not tested. Note: WorldBench 6 works only in Windows

## >> 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 is a popular processor. It consumes little power and gets the job done. Just don't expect massive processing muscle.



**Storage:** Netbooks usually come with 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](http://tinyurl.com/yerjwpc)). A

smaller complement than found in more capable machines, this is just sufficient for single tasks.

**Wireless:** 802.11b/g was standard on netbooks, sometimes with Bluetooth, but most new models now also support the faster 802.11n standard. As they are designed to be used on the move, the faster wireless technology comes in handy when copying large files.



Sub-£600 laptops	    				
	1	2	3	4	5
	Lenovo G570	Samsung RV511	Samsung NP300E5A-A01DX	Lenovo IdeaPad S205-1038	Lenovo ThinkPad X121e 3045
Price	£450 inc VAT	£510 inc VAT	£400 inc VAT	£350 inc VAT	£492 inc VAT
Website	Lenovo.com/uk	Samsung.com/uk	Samsung.com/uk	Lenovo.com/uk	Lenovo.com/uk
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.5GHz Intel Core i5-2450M	2.53GHz Intel Core i3-380M	2.2GHz Intel Core i3-2330M	1.6GHz AMD E450	1.4GHz Intel Core i3-2367M
RAM	6GB DDR3	6GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3
Storage	750GB hard drive	640GB hard drive	500GB hard drive	500GB hard drive	320GB hard drive
Screen size	15.6in	15.6in	15.6in	11.6in	11.6in
Screen resolution	1366x768 pixels	1366x768 pixels	1366x768 pixels	1366x768 pixels	1366x768 pixels
Graphics	AMD Radeon HD 6370M	nVidia GeForce 315M	Intel HD 3000	AMD Radeon HD 6310M	Intel HD Graphics 3000
Video memory	1GB	1GB	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	4x USB 2.0	3x USB 2.0	3x USB 2.0	3x USB 2.0	1x USB 3.0, 2x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	x	x	x	x	x
DisplayPort	x	x	x	x	x
HDMI	✓	✓	✓	✓	✓
DVI	x	x	x	x	x
VGA	✓	✓	✓	✓	✓
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	2x BD-ROM, 8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM	8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM	8x DVD ±R, 4x DVD ±RW, 8x DVD-ROM	N/A	N/A
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Pro 64bit
Bundled software	None	None	None	None	None
Fear (Max detail)	32fps	33fps	12fps	18fps	13fps
Battery	48Wh lithium-ion	48Wh lithium-ion	48Wh lithium-ion	48Wh lithium-ion	54Wh lithium-ion
Battery life	5 hrs 1 min	5 hrs 15 mins	5 hrs 21 mins	5 hrs 38 mins	6 hrs 15 mins
WorldBench 6 score	96 (with an i3 processor)	105	101	53	72
Dimensions	377x250x35mm	382x256x34mm	368x243x33mm	290x168x29mm	289x208x24mm
Weight	2.6kg	2.4kg	2.3kg	1.5kg	1.57kg
Warranty	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base
Verdict	<ul style="list-style-type: none"> <li>• Blu-ray drive</li> <li>• Now has a Core i5 CPU</li> <li>• Can play some games</li> <li>• Now a 750GB hard drive</li> <li>• Heavy</li> </ul>	<ul style="list-style-type: none"> <li>• Good performance in WorldBench 6</li> <li>• Large hard disk</li> <li>• Light gaming potential</li> <li>• Reflective screen</li> </ul>	<ul style="list-style-type: none"> <li>• Decent turn of speed</li> <li>• Useful feature set</li> <li>• Business-like looks</li> <li>• Low price tag</li> <li>• Poor gaming performance</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely portable</li> <li>• More powerful than a netbook</li> <li>• Glossy screen</li> <li>• Rather slow</li> </ul>	<ul style="list-style-type: none"> <li>• Business portable</li> <li>• Excellent matt screen</li> <li>• No optical drive</li> <li>• Relatively lightweight</li> <li>• Good battery life</li> </ul>
FULL REVIEW	TINYURL.COM/6FZZ4XE	TINYURL.COM/5TVT8AE	TINYURL.COM/7KAN7BW	TINYURL.COM/6G5EKQK	TINYURL.COM/7R5WOAR

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 often sacrifice dedicated function keys.

**Extras:** To keep down cost and weight, mini-laptop manufacturers tend to compromise heavily on extra features – don't expect to get a CD/DVD drive, a FireWire port or an ExpressCard slot, for example. You'll usually 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.



£601-£1,000 laptops		1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4 PC ADVISOR RECOMMENDED	5
		Apple MacBook Air 11in	Dell XPS 14z	HP Folio 13-1000ea	Asus Zenbook UX31E-DH53	Toshiba Satellite Z830-10U
Price		£849 inc VAT	£949 inc VAT	£650 inc VAT	£999 inc VAT	£899 inc VAT
Website		Apple.com/uk	Dell.co.uk	Hp.com/uk	Uk.asus.com	Toshiba.co.uk
Build rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating		★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor		1.6GHz Intel Core i5-2467M	2.8GHz Intel Core i7-2640M	1.6GHz Intel Core i5-2467M	1.8GHz Intel Core i7-2677M	1.6GHz Intel Core i5-2467M
RAM		2GB DDR3	8GB DDR3	4GB DDR3	4GB DDR3	6GB DDR3
Storage		64GB SSD	750GB hard drive	128GB SSD	256GB SSD	128GB SSD
Screen size		11.6in	14in	13.3in	13.3in	14in
Screen resolution		1366x768 pixels	1366x768	1366x768	1600x900	1366x768 pixels
Graphics		Intel HD Graphics 3000	nVidia GeForce GT 520M	Intel HD Graphics 3000	Intel HD Graphics 3000	Intel HD Graphics 3000
Video memory		N/A	1GB	N/A	N/A	N/A
Wireless		802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n	802.11a/b/g/n
Ethernet		100Mbps with USB adaptor	Gigabit	Gigabit	N/A	Gigabit
Bluetooth		✓	✓	✓	✓	✓
USB		2x USB 2.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0
FireWire		x	x	x	x	x
Thunderbolt		✓	x	x	x	x
DisplayPort		✓	✓	x	x	x
HDMI		x	✓	✓	✓	✓
DVI		x	x	x	x	x
VGA		x	x	x	✓	✓
eSATA		x	x	x	x	x
Media card slot		x	✓	✓	✓	✓
Audio		Headphone jack, mic	Headphone jack, mic	Speakers, headphone jack	Headphone jack, mic	Speakers, headphone jack
Optical drive		N/A	8x DVD±R, 6x DVD-RW, 8x DVD+RW	8x DVD±R, 6x DVD-RW, 8x DVD+RW	N/A	N/A
Extras		HD webcam, multitouch trackpad, backlit keyboard	Webcam	Webcam	Webcam	Webcam
Operating system		Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Bundled software		iLife 11	None	HP apps	None	None
Fear (Max detail)		17fps	46fps	13fps	Not tested	16fps
Battery		35Wh lithium-ion	58Wh lithium-ion	60Wh lithium-ion	50Wh lithium polymer	46Wh lithium-ion
Battery life		4 hrs 38 mins	6 hrs 46 mins	7 hrs 0 mins	7 hrs 17 mins	6 hrs 10 mins
WorldBench 6 score		111	143	119	119	106
Dimensions		300x192x3-17mm	335x234x23.8mm	319x220x18mm	326x223x18.1mm	316x227x16mm
Weight		1.07kg	2.1kg	1.5kg	1.4kg	1.09kg
Warranty		1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year return-to-base
Verdict		<ul style="list-style-type: none"> <li>Reasonable price tag</li> <li>Very light and compact</li> <li>Strong performance for size</li> <li>Great hi-resolution, low-glare screen</li> </ul>	<ul style="list-style-type: none"> <li>Modern and stylish looks</li> <li>Impressive battery life</li> <li>Good features for money</li> <li>Low-resolution screen suffers from glare</li> </ul>	<ul style="list-style-type: none"> <li>Superb looks</li> <li>Strong battery life</li> <li>Over-reflective screen</li> <li>Poor gaming speed</li> <li>Only 128GB storage</li> </ul>	<ul style="list-style-type: none"> <li>Superb design</li> <li>Nice range of connectors</li> <li>Impressive battery life</li> <li>MacBook Air is faster and has a better display</li> </ul>	<ul style="list-style-type: none"> <li>Highly portable</li> <li>Rather fragile</li> <li>Poor gaming speed</li> <li>Usable keyboard</li> <li>Only 128GB storage</li> </ul>
FULL REVIEW		TINYURL.COM/CCPOANM	TINYURL.COM/6P2AVFP	TINYURL.COM/6VBMNJM	TINYURL.COM/6PG68Z3	TINYURL.COM/7WTKM8G

## >> Buying advice



### Laptops

**Processor:** Intel processors remain the dominant force in our laptop charts. The best options are the Core i3, i5 and i7 processors, although budget laptops use slower Intel Celeron-branded chips. The Core i-series are very efficient, allowing

speedy performance and good battery life. Some Core i7 chips are also available as quad-core processors – look for a ‘Q’ after their part number.

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.

**Memory:** The minimum offering if you’re paying more than £600 should be 2GB of memory. Most laptops offer more. The more memory you have, the smoother your laptop will likely run.



£1,001+ laptops	1	2	3	4	5
	Apple MacBook Pro Retina	Alienware M14x	Apple MacBook Air 13.3in	Dell Latitude E6420 ATG	Rock Xtreme X685-i5-2540M
Price	£1,799 inc VAT	£1,398 inc VAT	£1,369 inc VAT	£1,293 inc VAT	£1,229 inc VAT
Website	Apple.com/uk	Alienware.co.uk	Apple.com/uk	Dell.co.uk	Rockdirect.com
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.3GHz Intel Core i7-3615QM	2.66GHz Intel Core i7-3720QM	1.8GHz Intel Core i7-2677M	2.8GHz Intel Core i7-2640M	2.6GHz Intel Core i5-2540M
RAM	8GB DDR3L	8GB DDR3	4GB DDR3	4GB DDR3	6GB DDR3
Storage	128GB SSD	64GB SSD, 500GB HDD	256GB SSD	128GB SSD	500GB hard drive
Screen size	15.4in	14.1in	13.3in	14in	15.6in
Screen resolution	2880x1800	1600x900	1440x900 pixels	1366x768 pixels	1920x1080 pixels
Graphics	nVidia 650M, Intel HD 4000	nVidia GeForce GT 650M	Intel HD Graphics 3000	Intel HD Graphics 3000	AMD Radeon HD 6990
Video memory	1GB	1GB	N/A	N/A	2GB
Wireless	802.11a/b/g/n	802.11b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n
Ethernet	x	Gigabit	N/A	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0, 1x USB 2.0	2x USB 2.0	3x USB 2.0	2x USB 3.0, 2x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	✓ (2)	x	✓	x	x
DisplayPort	✓	✓	✓	x	x
HDMI	✓	✓	x	✓	✓
DVI	x	x	x	x	✓
VGA	x	✓	x	✓	x
eSATA	x	x	x	✓	✓
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, Toslink out	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	8x DVD±R, 2.4x DVD-RW, 4x DVD+RW, 8x DVD-ROM	N/A	8x DVD±R, 2.4x DVD-RW, 4x DVD+RW, 8x DVD-ROM	6x BD-ROM, 8x DVD±R, 2.4x DVD-RW, 4x DVD+RW
Extras	HD webcam, multitouch trackpad, backlit keyboard	N/A	HD webcam, multitouch trackpad, backlit keyboard	Webcam, fingerprint reader	Webcam, fingerprint reader
Operating system	Mac OS X 10.7.4 Lion	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Pro 32bit	Windows 7 Home Prem 64bit
Bundled software	iLife 11	None	iLife 11	None	None
Fear (Max detail)	N/A	84fps	17fps	17fps	275fps
Battery	99Wh lithium-polymer	63Wh lithium-ion	50Wh lithium-ion polymer	60Wh lithium-ion	76Wh lithium-ion
Battery life	N/A	5 hrs 7 mins	6 hrs 20 mins	6 hrs 24 mins	2 hrs 30 mins
WorldBench 6 score	N/A	168	130	155	124
Dimensions	359x247x18mm	337x258x38mm	325x227x17mm	352x241x35mm	376x256x43mm
Weight	2.02kg	2.9kg	1.3kg	2.7kg	3.1kg
Warranty	1 year return-to-base	1 year in-home support	1 year return-to-base	3 years onsite	3 years onsite
Verdict	<ul style="list-style-type: none"> <li>• Gorgeous super-resolution Retina display</li> <li>• Outstanding build quality</li> <li>• Wonderfully light and slim</li> <li>• Effortless to use</li> </ul>	<ul style="list-style-type: none"> <li>• Great gaming system</li> <li>• Stunning WorldBench score</li> <li>• Cool looks</li> <li>• Glossy screen can be difficult to read</li> </ul>	<ul style="list-style-type: none"> <li>• Thunderbolt, DisplayPort</li> <li>• Very strong performance</li> <li>• 256GB SSD</li> <li>• Exceptional build quality</li> <li>• Lengthy battery life</li> </ul>	<ul style="list-style-type: none"> <li>• Rugged build quality</li> <li>• Fantastic general speed</li> <li>• Lacklustre for gaming</li> <li>• Long battery life, given the performance</li> </ul>	<ul style="list-style-type: none"> <li>• Great performance</li> <li>• 2GB AMD Radeon graphics</li> <li>• Incredible gaming machine</li> <li>• Very poor battery life</li> <li>• Wonderful glare-free screen</li> </ul>
FULL REVIEW	TINYURL.COM/7YGC3KJ	TINYURL.COM/CLGSCMV	TINYURL.COM/729FHEZ	TINYURL.COM/CBA725B	TINYURL.COM/BTQSQ97

**Hard drive:** It can be difficult to upgrade a laptop's hard drive, so get as much storage space as you can. For the best performance and increased reliability, look out for a solid-state drive. Expect lower capacity than with a hard drive, however.

**Screen:** If you're after a desktop-replacement machine, go for a model with at least a 15in screen. For film playback, 17in widescreen



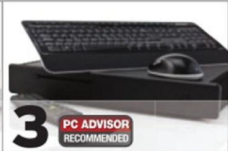


models are even better. For ultraportables, 13in or smaller is best.

**Graphics card:** If you need a laptop as a design workstation or for playing games, you'll need a dedicated graphics processor. AMD and nVidia make more efficient chips for the task, such as the AMD Radeon HD 6700 series and nVidia GeForce 500 series, both ending with an 'M' suffix.

The integrated graphics in Intel Core i-series processors 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 graphics processor to maintain battery life and the discrete card for maximum performance.



Media PCs	 1 PC ADVISOR BEST BUY	 2 PC ADVISOR RECOMMENDED	 3 PC ADVISOR RECOMMENDED	 4 PC ADVISOR RECOMMENDED	 5 PC ADVISOR RECOMMENDED
	Chillblast Fusion Vacuum Mini	Apple Mac mini	Quiet PC Streacom FC5-Z77	Tranquil PC Media One	Quiet PC Zeno NT-H67
Price	£999 inc VAT	£896 inc VAT	£1,491 inc VAT	£1,009 inc VAT	£1,444 inc VAT
Website	Chillblast.com	Apple.com/uk	Quietpc.com	Tranquilpc.co.uk	Quietpc.com
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.1GHz Intel Core i5-3450S	2.53GHz Intel Core i5-2520M	2.5GHz Intel Core i7-3770T	2.5GHz Intel Core i3-2100T	3.3GHz Intel Core i3-2125
RAM	8GB DDR3	4GB DDR3	8GB DDR3	4GB DDR3	8GB DDR3
Storage capacity	240GB SSD	500GB 2.5in HDD	128GB SSD	80GB SSD	1TB 2.5in HDD
Motherboard	Asus P8H77-I	Apple Mac mini board	Gigabyte GA-Z77M-D3H	Intel DH61AG	Gigabyte GA-H67N-USB3-B3
CPU cooler	Passive cooler	Custom active cooler	Heatpipes built into case	Tranquil cooling solution	Zeno heatpipe cooling
Power supply	External 150W Pico	85W Delta Electronics	External 160W Pico	External 19V DC supply	1,000W Zeno
Graphics	Intel HD Graphics 4000	AMD Radeon HD 6630M with 256MB video memory	Intel HD Graphics 4000	Intel HD Graphics 3000	Intel HD Graphics 3000
TV tuner	BlackGold BGT3620	x	TBS 6284 Quad DVB-T2	x	Black Gold BGT3600
Wireless	802.11n via adaptor	Dual-band 802.11n	x	x	x
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	x	✓	x	x	x
USB	2x USB 3.0, 8x USB 2.0	4x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 3.0, 4x USB 2.0
Ports	S/PDIF, HDMI, VGA	S/PDIF, HDMI, FW800, TB	HDMI, VGA, DVI	S/PDIF, HDMI, DVI	S/PDIF, HDMI, VGA
Case	Streacom FC8 Black fanless	Apple Mac mini unibody	Streacom FC5	Tranquil PC Media One	Zeno NT-TX2000
Keyboard and mouse	Xebec	Bluetooth Keyboard, Magic Trackpad	Microsoft Wireless Desktop 3000	x	Microsoft Wireless Desktop 3000
Remote control	✓	✓	✓	✓	✓
LCD screen	x	x	x	x	x
Optical drive	Sony BD-ROM	SuperDrive DVD ± RW	Sony BD-ROM	Sony DVD ± RW	BD-ROM/DVD ± RW
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Operating system	Windows 7 Home Prem 64bit	Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Media software	WMC	iLife	WMC, ArcSoft TotalMedia	WMC	WMC, ArcSoft TotalMedia
Crysis (Low/Medium)	40/19	77/48fps	48/31	27/13	45/20fps
MediaEspresso time	1 min 57 secs	8 mins 33 secs	1 min 42 secs	4 mins 14 secs	3 mins 14 secs
WorldBench 6 score	169	123	172	123	141
Idle consumption	26W	10W	28W	19W	36W
Max consumption	73W	Not tested	74W	45W	Not tested
Warranty	2-year collect-and-return	1 year collect-and-return	2-year collect-and-return	3-year return-to-base	2 years collect-and-return
Verdict	<ul style="list-style-type: none"> <li>Generally noiseless operation</li> <li>Cute looks and great build quality</li> <li>SSD is fast, but more storage is needed</li> <li>Xebec keyboard replaces a remote control</li> </ul>	<ul style="list-style-type: none"> <li>Beautifully compact</li> <li>Great for graphics</li> <li>Good performance</li> <li>No DVD drive</li> <li>Very low power consumption</li> <li>Quiet and elegant</li> </ul>	<ul style="list-style-type: none"> <li>Generally noiseless operation</li> <li>Great performance</li> <li>SSD is fast, but more storage is needed</li> <li>Price tag is high</li> </ul>	<ul style="list-style-type: none"> <li>High-quality looks</li> <li>No Blu-ray or TV support</li> <li>External storage needed</li> <li>Not great performance</li> </ul>	<ul style="list-style-type: none"> <li>Blu-ray drive included</li> <li>Silent, fanless operation</li> <li>Best multimedia playback of group</li> <li>Dual digital TV tuners</li> <li>Stylish Zalman case</li> <li>Expensive</li> </ul>
FULL REVIEW	<a href="http://TINYURL.COM/BQM62QH">TINYURL.COM/BQM62QH</a>	<a href="http://TINYURL.COM/88GUG5H">TINYURL.COM/88GUG5H</a>	<a href="http://TINYURL.COM/D9GP87X">TINYURL.COM/D9GP87X</a>	<a href="http://TINYURL.COM/C4NPQ5F">TINYURL.COM/C4NPQ5F</a>	<a href="http://TINYURL.COM/7S2ZWXD">TINYURL.COM/7S2ZWXD</a>

GLOSSARY: FW800: FireWire 800 TB: Thunderbolt WMC: Windows Media Center

## » Buying advice



## Media PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

You can use any PC to create a media centre, but a quiet system is preferable. It's important to strike a balance between power consumption and performance -

not only will the PC probably be left switched on for long periods, but a high-performance processor will generate large amounts of heat, and cooling that chip can involve noisy whirring fans.

Fanless systems can be built using large passive heat sinks or heat pipes, although you can find ultra-quiet tweakable fans if fitting one is unavoidable.

SSDs have no moving parts, making them silent in use. They're expensive, mind, so consider setting up a NAS elsewhere in your home for extra storage.

A TV tuner is desirable; you'll need a dual-tuner to watch and record shows simultaneously.

Also look for a Blu-ray drive and a wireless keyboard and mouse.

READ MORE: [TINYURL.COM/CGFOD2K](http://TINYURL.COM/CGFOD2K)



Business PCs	1	2	3	4	5
	Chillblast Fusion Obsidian	Apple Mac mini	PC Specialist MPC-2120	Eclipse eBiz i321r755	Arbico FX4130 Office PC
Price	£549 inc VAT	£529 inc VAT	£539 inc VAT	£599 inc VAT	£500 inc VAT
Website	Chillblast.com	Apple.com/uk	Pcspecialist.co.uk	Eclipsecomputers.com	Arbico.co.uk
Build rating	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	3.4GHz Intel Core i5-3570K	2.3GHz Intel Core i5-2415M	3.3GHz Intel Core i3-2120	3.1GHz Intel Core i3-2100	3.6GHz AMD FX-4100
RAM	8GB DDR3	2GB DDR3	4GB DDR3	8GB DDR3	8GB DDR3
Storage capacity	1TB SATA 6Gbps	500GB SATA	1TB SATA 6Gbps + 120GB SSD	1TB SATA 3Gbps	500GB SATA 6Gbps
Motherboard	Asus P8H61-M LE/USB3	Apple Mac mini board	Intel DH67CF	Asus P8H61-M LE/USB3	Asus M5A78L M/USB3
CPU cooler	Standard Intel cooler	Custom active cooler	Standard Intel cooler	Standard Intel cooler	Xigmatek Apache
Power supply	500W EZCool	85W Delta Electronics	160W Power Man	450W unbranded	650W Ace
Screen	21.5in Asus VE228T	N/A	N/A	2x 21.6in AOC F22+	N/A
Screen resolution	1920x1080 pixels	N/A	N/A	1920x1080	N/A
Graphics	Intel HD Graphics 4000	Intel HD Graphics 3000	Intel HD Graphics 2000	AMD Radeon HD 7750	Asus nVidia GT 430
Video memory	N/A	N/A	N/A	1GB	1GB
USB	2x USB 3.0, 8x USB 2.0	4x USB 2.0	2x USB 3.0, 7x USB 2.0	3x USB 3.0, 6x USB 2.0	2x USB 3.0, 4x USB 2.0
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	Built into monitor	Not supplied	Not supplied	Not supplied	Not supplied
Case	Cit Shade	Apple Mac mini unibody	In-Win BM643	Generic 437-16 series	Ace Ecco 250
Keyboard	Logitech MK260 (wired)	Bluetooth Keyboard, Magic Trackpad (optional)	Logitech K200 (wired)	Logitech MK120 (wired)	Logitech MK120 (wired)
Optical drive	24x Sony DVD±RW	N/A	8x Samsung DVD±RW	22x Samsung DVD±RW	24x Sony DVD±RW
Operating system	Windows 7 Professional 64bit	Mac OS X 10.7 Lion	Windows 7 Professional 64bit	Windows 7 Home Prem 64bit	Windows 7 Professional 64bit
Bundled software	Microsoft Office 2010 Starter	iLife	Microsoft Office 2010 Starter	Microsoft Office 2010 Starter	None
WorldBench 6 score	176	117	154	139	128 (est)
Power consumption	39W/97W/9,603J	9W	22W/55W/11,440J	43W/93W/48,081J	63W/163W/73,676J
Warranty	2-year collect-and-return	1-year collect-and-return	3-year RTB (labour only)	1-year RTB	2-year RTB (labour only)
Verdict	<ul style="list-style-type: none"> <li>Packs the latest Ivy Bridge processor</li> <li>Strong components and performance</li> <li>Superior 22in flat-panel</li> <li>HD 4000 a cut above the usual onboard graphics</li> </ul>	<ul style="list-style-type: none"> <li>Beautifully compact</li> <li>Good performance</li> <li>No DVD drive</li> <li>Very low power consumption</li> <li>Quiet and elegant</li> <li>Versatile OS X operating system</li> </ul>	<ul style="list-style-type: none"> <li>Small-form-factor PC takes up little desk space</li> <li>Very low power consumption</li> <li>Performance is adequate, but not stunning</li> <li>Graphics card only an onboard HD 2000</li> </ul>	<ul style="list-style-type: none"> <li>Dual-screen system</li> <li>Neither of the screens are of great quality</li> <li>CPU isn't very powerful</li> <li>Windows 7 Home Premium not aimed at office users</li> </ul>	<ul style="list-style-type: none"> <li>Sound-damping materials keep noise to a minimum</li> <li>Low price for a system with Windows 7 Professional</li> <li>Performance some way behind the fastest here</li> <li>No monitor included</li> </ul>
FULL REVIEW	TINYURL.COM/CNOALAZ	TINYURL.COM/88GUG5H	TINYURL.COM/CT9ZR4J	TINYURL.COM/CVFKRRZ	TINYURL.COM/CRTC8M8

## » Buying advice



## Business PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

Provided you have sufficient RAM (at least 2GB, but preferably 4GB), any modern CPU will provide enough power for low-level admin tasks. Intel's Core i3 provides

ample performance for general use and come with integrated graphics, saving you the cost of buying an additional card.

In a typical networked business environment there will be storage available on the LAN, so you're unlikely to need a large hard drive. A 500GB drive should be ample.

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.

For small businesses with just one or two PCs, Windows 7 Home Premium is cheaper but can't connect to servers. The Pro edition is a better option for businesses, especially if you need compatibility with older software.



Family PCs	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	Chillblast Fusion Longbow	PC Specialist Fusion FX-41	Arbico eXcel 2568HD	Eclipse Matrix i323R685	Quiet PC Nofan IcePipe A40-Z77
Price	£799 inc VAT	£649 inc VAT	£849 inc VAT	£699 inc VAT	£1,124 inc VAT
Website	Chillblast.com	Pcspecialist.co.uk	Arbico.co.uk	Eclipsecomputers.com	Quietpc.com
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-3570K	3.6GHz AMD FX-4100	3.3GHz Intel Core i5-2500	3.3GHz Intel Core i3-2310	3.3GHz Intel Core i5-2500K
RAM	16GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Storage capacity	1TB HDD	1TB HDD	1TB HDD, 60GB SSD	1TB HDD	120GB SSD
Motherboard	Asus P8H77-M Pro	Asus M5A78L-M	Asus P8Z68-V LX	Asus P8H61-M LE	Gigabyte GA-Z77-D3H
CPU cooler	Standard Intel cooler	Standard AMD cooler	Standard Intel cooler	Standard Intel cooler	Nofan CD-100A
Power supply	700W Cit	450W FSP	500W Cooler Master	650W EZCool	400W Nofan
Screen	23.6in Asus VS247H	23.6in Edge 10 M240	23.6in Hanns-G HH241H	23in AOC E2350SDA	N/A
Screen resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	N/A
Graphics card	AMD Radeon HD 6850	Powercolor Radeon HD 7750	AMD Radeon HD 6870 OC	AMD Radeon HD 6850	Intel Graphics HD 3000
Video memory	1GB	1GB	1GB	1GB	N/A
Wireless	802.11b/g/n	802.11b/g/n	N/A	802.11b/g/n	N/A
USB	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0	4x USB 3.0, 4x USB 2.0
Media card slot	✓	✓	✗	✗	✗
Sound card	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech S220	2x Logitech S220	2x Logitech S120	2x Logitech S220	N/A
Case	Cit Vantage	PCS Enigma Piano Black	Revoltex 67	Unbranded model 437-16	Nofan CS-30
Keyboard	Logitech Cordless MK260	Microsoft Optical Desktop 400	Logitech Cordless MK260	Microsoft Optical Desktop 400	Microsoft Wired Desktop 600
Optical drive	Samsung Blu-ray/DVD combo drive	Samsung Blu-ray/DVD combo drive	LG Blu-ray/DVD combo drive	LG Blu-ray/DVD combo drive	Samsung SH-S222 DVD drive
Operating system	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Bundled software	Free utilities	Office 2010 Starter, BullGuard	CyberLink PowerDVD	Office Starter 2010, BullGuard	N/A
Crysis (Low/Medium)	156/109	104/68	161/113fps	122/84fps	37/19
WorldBench 6 score	189	134 (estimated)	175	151	177
Warranty	2 years collect-and-return	3 years RTB (1 year parts)	1 year return-to-base	1 year return-to-base	2 years collect-and-return
Verdict	<ul style="list-style-type: none"> <li>Ivy Bridge technology</li> <li>Superb performance</li> <li>Great feature set includes 16GB of memory and a capable graphics card</li> <li>Strong display</li> </ul>	<ul style="list-style-type: none"> <li>Appealing price tag</li> <li>Good features for the money</li> <li>Speed figures not the highest in our tests</li> <li>Lengthy warranty</li> </ul>	<ul style="list-style-type: none"> <li>Fantastic gaming machine</li> <li>Top-notch all-round Windows performance</li> <li>SSD is fast, but the 60GB of storage needs management</li> <li>Speakers and peripherals not the best</li> </ul>	<ul style="list-style-type: none"> <li>Cheapest Intel system here</li> <li>AMD systems are better for tasks that benefit from multiple CPU cores</li> <li>Solid gaming capabilities</li> <li>Capable all-round list of components</li> </ul>	<ul style="list-style-type: none"> <li>Completely silent operation</li> <li>Strong overall performance</li> <li>Fast but small-capacity SSD, with no HDD to supplement storage needs</li> <li>High asking price</li> </ul>
FULL REVIEW	TINYURL.COM/CALEP8W	TINYURL.COM/CWKY96A	TINYURL.COM/BUS9XJP	TINYURL.COM/CPJR64T	TINYURL.COM/CFJJ4J2

## >> Buying advice



## Family PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

A family PC needs to offer decent performance in every area, able to cater for the needs of each individual - but there are some areas where you can cut costs.

If you're not itching to play the latest games, opt for integrated rather than dedicated graphics. AMD processors are more adept in this regard, while Intel CPUs offer faster application performance.

Intel's Core i5-3570K will form the core of a powerful home PC, although the older Core i5-2500K may be offered at lower cost and supports easy overclocking.

Consider 4GB of RAM and a 500GB hard drive as the minimum; both are easy to upgrade later.

Screen quality is crucial, with the best displays using IPS tech. A Blu-ray drive will help make the most of a 23.6in full-HD monitor.

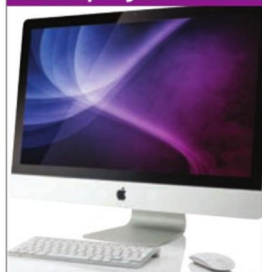
For Skype, watching films and listening to music, decent speakers and a webcam are essential.

READ MORE: [TINYURL.COM/BL4UREB](http://TINYURL.COM/BL4UREB)



All-in-one PCs					
	1  PC ADVISOR BEST BUY	2  PC ADVISOR RECOMMENDED	3 	4 	5 
	Apple iMac 27in 2.7GHz	Asus ET2700INTS	Packard Bell oneTwo L i5871	Toshiba Qosimo DX730-10U	HP Touchsmart Pro 610
Price	£1399 inc VAT	£1,399 inc VAT	£950 inc VAT	£999 inc VAT	£1,200 inc VAT
Website	Apple.com/uk	Uk.asus.com	Packardbell.co.uk	Toshiba.co.uk	Hp.com/uk
Build rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	2.7GHz Intel Core i5-2500S	2.5GHz Intel Core i5-2400S	2.5GHz Intel Core i5-2400S	2.5GHz Intel Core i5-2450M	3.2GHz Intel Core i5-650
RAM	4GB DDR3	6GB DDR3	4GB DDR3	6GB DDR3	6GB DDR3
Storage capacity	1TB hard drive	2TB hard drive	1TB hard drive	1TB hard drive	1.5TB hard drive
Screen	27in IPS glossy	27in glossy	23in TN glossy touchscreen	23in TN glossy touchscreen	23in glossy touchscreen
Screen resolution	2560x1440	1920x1080	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics card	AMD Radeon HD 6770M	nVidia GT540M/Intel HD 2000	Intel HD Graphics 2000	Intel HD Graphics 3000	AMD Radeon HD 5570M
Video memory	512MB	1GB	N/A	N/A	1GB
Wireless	802.11a/b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	✓	✓	✓	✓	✓
Bluetooth	✓	×	×	✓	✓
USB	4x USB 2.0	2x USB 3.0, 3x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	2x USB 3.0, 4x USB 2.0
FireWire	✓	×	×	×	×
Thunderbolt	✓	×	×	×	×
HDMI	×	✓	×	✓	✓
Media card slot	SD	SD	SD	SD	SD/SDHC/MS/MS Pro/xD
Max disc speeds	8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	6x BD-ROM, 8x DVD±R, 6x DVD±R DL, 8x DVD-ROM	8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	6x BD-ROM, 8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	4x BD-ROM, 8x DVD±R, 6x DVD±R DL, 8x DVD-ROM
Extras	Webcam, wireless keyboard	Remote control, webcam, wireless keyboard	Remote control, webcam, TV tuner, wireless keyboard	Remote control, webcam, TV tuner, wireless keyboard	Webcam, wireless keyboard, TV tuner, Beats Audio, remote
Operating system	Mac OS X 10.7 Lion	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Power consumption	67W (idle), 180W (under load)	47W (idle), 114W (under load)	51W (idle), 84W (under load)	35W (idle), 44W (under load)	67W (idle), 112W (under load)
Crysis (720p)	133fps	99fps	29fps	39fps	72fps
Crysis (1080p)	12fps	6fps	Not tested	Not tested	36/22fps
WorldBench 6 score	147	140	137	133	122
Dimensions	650x517x207mm	660x508x233mm	557x421x299mm	561x190x439mm	584x103x450mm
Weight	13.8kg	13.4kg	8kg	8kg	11.8kg
Warranty	1 year return-to-base	1 year return-to-base	1 year return-to-base	1 year collect-and-return	1 year return-to-base
Verdict	<ul style="list-style-type: none"> <li>Peerless design and build quality</li> <li>Fantastic high-quality 27in screen</li> <li>Great general and gaming speed</li> <li>OS X operating system</li> </ul>	<ul style="list-style-type: none"> <li>Good-quality 27in panel</li> <li>Decent performance</li> <li>Rear design is ugly and impractical</li> <li>Not as good overall as iMac</li> </ul>	<ul style="list-style-type: none"> <li>Good speed</li> <li>TV tuner welcome addition for multimedia</li> <li>Touchscreen not as effective as it might be</li> <li>Plenty of software</li> </ul>	<ul style="list-style-type: none"> <li>Lots of memory and hard-drive space</li> <li>TV tuner</li> <li>Blu-ray drive</li> <li>Superior sound system</li> <li>Perfect for HD movies</li> </ul>	<ul style="list-style-type: none"> <li>Solid performer</li> <li>Generous 23in screen</li> <li>Nice Beats Audio sub-system</li> <li>Blu-ray playback</li> <li>TV tuner</li> <li>Two USB 3.0 ports</li> <li>Bulky design</li> </ul>
FULL REVIEW	<a href="http://TINYURL.COM/7THNXU8">TINYURL.COM/7THNXU8</a>	<a href="http://TINYURL.COM/7ZTAQH7">TINYURL.COM/7ZTAQH7</a>	<a href="http://TINYURL.COM/7WSLOEK">TINYURL.COM/7WSLOEK</a>	<a href="http://TINYURL.COM/7AQL5CY">TINYURL.COM/7AQL5CY</a>	<a href="http://TINYURL.COM/69TVUKZ">TINYURL.COM/69TVUKZ</a>

## » Buying advice



### All-in-one PCs

Changes in exchange rates and component supply issues mean we can't guarantee PCs listed here will be available as specified. All our prices include delivery charges.

All-in-one PCs build into a large (21- to 27in) monitor all the components they require to run, making them an excellent and stylish solution for saving space.

However, with limited internal space for cooling, all-in-one machines tend to include less powerful components than traditional desktops. Expect to find integrated or laptop graphics processors and mobile CPUs inside.






All-in-ones aren't usually easy to upgrade, but many are pre-packed with Wi-Fi, Bluetooth, speakers and even Blu-ray players.

Touchscreen displays are likely to become more desirable once Windows 8 is released. If you buy one now, ensure the image quality hasn't been compromised and that it's sufficiently responsive to touch.






The quality of the supplied keyboard and mouse (usually wireless) is critical. TV tuners and HDMI ports are welcome additions.

[READ MORE: TINYURL.COM/87VW5KJ](http://TINYURL.COM/87VW5KJ)

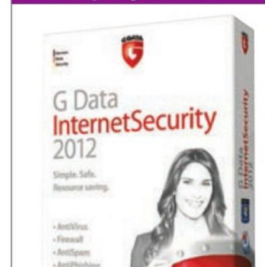


Internet security suites	    				
	G Data InternetSecurity	Norton Internet Security	Bitdefender Internet Security	Kaspersky Internet Security	Trend Micro Titanium IS
Annual price	£34 inc VAT	£49 inc VAT	£29 inc VAT	£39 inc VAT	£39 inc VAT
Licence terms	1 PC, 1 year	1 PC, 1 year	1 PC, 1 year	1 PC, 1 year	3 PCs, 1 year
Website	Gdatasoftware.co.uk	Uk.norton.com	Bitdefender.co.uk	Kaspersky.co.uk	Uk.trendmicro.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Signature-based detection	100 percent	99.9 percent	100 percent	99.3 percent	97.5 percent
Malware blocking (full)	100 percent	100 percent	96.2 percent	100 percent	92.3 percent
Malware blocking (partial)	N/A	N/A	0 percent	N/A	3.8 percent
Clean-up of malware	60 percent	50 percent	90 percent	60 percent	70 percent
On-demand scan speed	109 secs	68 secs	116 secs	71 secs	93 secs
On-access scan speed	116 secs	154 secs	265 secs	280 secs	314 secs
Interface design	Good	Very good	Superior	Very good	Very good
Verdict	<ul style="list-style-type: none"> <li>Excellent detection rates</li> <li>Good value</li> <li>Low impact on resources</li> <li>Confusing interface</li> </ul>	<ul style="list-style-type: none"> <li>Good all-rounder</li> <li>Fast scan times</li> <li>Clean interface</li> <li>Flagged some false-positives</li> </ul>	<ul style="list-style-type: none"> <li>Impacts system resources</li> <li>Very strong malware blocking and removal</li> <li>Intuitive interface</li> </ul>	<ul style="list-style-type: none"> <li>Strong block rate</li> <li>Above-average scan times</li> <li>Can affect PC performance</li> <li>Interface needs tweaking</li> </ul>	<ul style="list-style-type: none"> <li>Set-it-and-forget-it security</li> <li>Flagged some false-positives</li> <li>Reasonable scan speeds</li> <li>Ideal for novice users</li> </ul>
FULL REVIEW	TINYURL.COM/7CZT5XB	TINYURL.COM/CVVDWUR	TINYURL.COM/75H3WUK	TINYURL.COM/6UEHPMW	TINYURL.COM/7QTBA66

GLOSSARY: • IS: Internet Security

Antivirus software	    				
	Norton AntiVirus	Bitdefender Antivirus Pro	G Data AntiVirus	Kaspersky Anti-Virus	Trend Micro Titanium AV+
Annual price	£39 inc VAT	£24 inc VAT	£34 inc VAT	£39 inc VAT	£39 inc VAT
Licence terms	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year	3 PCs, 1 year
Website	Norton.com	Bitdefender.co.uk	Gdatasoftware.com	Kaspersky.co.uk	Uk.trendmicro.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Signature-based detection	98.7 percent	97.5 percent	99.4 percent	95.7 percent	98.4 percent
Malware blocking (full)	96 percent	68 percent	84 percent	88 percent	88 percent
Malware blocking (partial)	0 percent	20 percent	4 percent	4 percent	8 percent
Clean-up of active malware	80 percent	80 percent	80 percent	80 percent	80 percent
On-demand scan speed	121 secs	126 secs	111 secs	103 secs	187 secs
On-access scan speed	272 secs	327 secs	336 secs	310 secs	249 secs
Interface design	Very good	Very good	Very good	Very good	Very good
Verdict	<ul style="list-style-type: none"> <li>Smooth user interface</li> <li>Large 'Fix Now' button</li> <li>Moderate impact on system performance</li> </ul>	<ul style="list-style-type: none"> <li>Very good performance for malware removal</li> <li>Average scan speeds</li> <li>Three interface tiers</li> </ul>	<ul style="list-style-type: none"> <li>Strong malware detection, blocking and removal</li> <li>Good user interface, but poorly translated</li> </ul>	<ul style="list-style-type: none"> <li>Well-designed interface</li> <li>Easy to use</li> <li>On-demand single-file scans</li> <li>Impacts PC performance</li> </ul>	<ul style="list-style-type: none"> <li>Set-it-and-forget-it security</li> <li>Cloud-based protection</li> <li>Requires web connection</li> <li>Good performance</li> </ul>
FULL REVIEW	TINYURL.COM/4P5YXCP	TINYURL.COM/66SK77U	TINYURL.COM/6BFXWCS	TINYURL.COM/6HQAZWB	TINYURL.COM/4HUORV3

## >> Buying advice



## Security software

Every connected PC should have at least antivirus, antispyware and a firewall, and it's important that each is kept up to date. Avoid installing more than one real-time scanning component.

We work with world-renowned independent security testing lab AV-Test.org to evaluate the effectiveness of security software.

No security software is foolproof, but some are significantly better than others. And factors such as ease of setup, scan speeds, interface design and ability to deal with new threats set them apart.

The best products will offer parental controls, cloud protection, anti-phishing, anti-rootkit, virtual web browsers and keyboards, link

and file scanners, gaming modes, online backup and more.

The best value is usually offered by a three-user licence, but you can save some cash if your household has only one PC.

There are some good free antivirus products but, as in life, you get what you pay for.

READ MORE: [TINYURL.COM/7NR8FSM](http://TINYURL.COM/7NR8FSM)

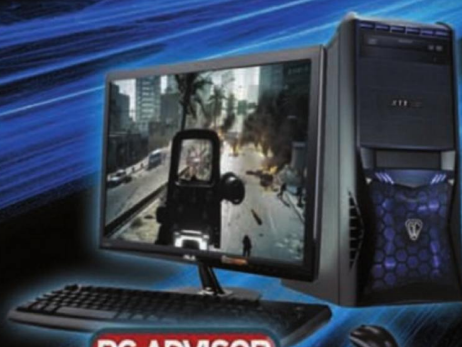


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- 1000GB SATA III 7200rpm Hard Disk
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Tablets	1  PC ADVISOR GOLD	2  PC ADVISOR GOLD	3  PC ADVISOR RECOMMENDED	4  PC ADVISOR BEST BUY	5  PC ADVISOR RECOMMENDED
	Apple iPad (3rd gen)	Apple iPad 2	Asus Eee Pad Transformer Prime	BlackBerry PlayBook 2.0 7in	Samsung Galaxy Tab 10.1
Price	£399 inc VAT	£329 inc VAT	£510 inc VAT	£199 inc VAT	£399 inc VAT
Website	Apple.com/uk	Apple.com/uk	Uk.asus.com	Uk.blackberry.com	Samsung.com/uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 5.1	Apple iOS 5.0	Google Android 3.0 Honeycomb <sup>2</sup>	BlackBerry PlayBook OS 2.0	Google Android 3.1 Honeycomb
Screen size/resolution	9.7in/2048x1536	9.7in/1024x768	10.1in/1280x800	7in/1024x600	10.1in/1280x800
Storage/media card slot	16GB/none	16GB/none	32GB/microSD	32GB/microUSB	16GB/none
Connectivity	802.11a/b/g/n, Bluetooth <sup>1</sup>	802.11a/b/g/n, Bluetooth <sup>1</sup>	802.11b/g/n, Bluetooth	802.11a/b/g/n, Bluetooth	802.11b/g/n, Bluetooth <sup>1</sup>
Processor	1GHz Apple A5X	1GHz Apple A5	1.4GHz nVidia Tegra 3	1GHz Cortex-A9	1GHz nVidia Tegra T20
RAM	1GB	512MB	1GB	1GB	1GB
Claimed battery life	10 hrs	10 hrs	12 hrs	10 hrs	9 hrs
Cameras (front/rear)	0.3/5Mp	0.3/0.7Mp	1.2/8Mp	5Mp/3Mp	2/3Mp
Dimensions	241x186x9.5mm	241x186x8.8mm	263x181x8.8mm	194x130x10mm	257x173x8.7mm
Weight	652g	597g	596g	425g	559g
Warranty	1 year	1 year	1 year	1 year	1 year
Verdict	<ul style="list-style-type: none"> <li>Breathtaking display</li> <li>Seamless performance</li> <li>32GB version recommended</li> <li>Supports 4G where available</li> </ul>	<ul style="list-style-type: none"> <li>Exceptional touchscreen</li> <li>Beautiful design and build</li> <li>Best selection of apps</li> <li>10-hour battery life</li> </ul>	<ul style="list-style-type: none"> <li>Fast quad-core processor</li> <li>Excellent Super IPS panel</li> <li>Stunning battery life</li> <li>Best Android tablet</li> </ul>	<ul style="list-style-type: none"> <li>Very good 1024x600 screen</li> <li>Excellent value for money</li> <li>Comfortable to grip</li> <li>Good navigation system</li> </ul>	<ul style="list-style-type: none"> <li>Good real-world battery life</li> <li>Impressive 10in touchscreen</li> <li>Plasticky construction</li> <li>3Mp main camera</li> </ul>
FULL REVIEW	TINYURL.COM/6MTG9OW	TINYURL.COM/4XV7Q4K	TINYURL.COM/7U67UBN	TINYURL.COM/79QB7PP	TINYURL.COM/3LH239C

<sup>1</sup>3G available at additional cost <sup>2</sup>Android 4.0 available

Smartphones	1  PC ADVISOR GOLD	2  PC ADVISOR BEST BUY	3  PC ADVISOR RECOMMENDED	4	5
	Apple iPhone 4S	Samsung Galaxy S III	HTC One S	Sony Xperia P	Huawei Ascend G 300
Price	£499 inc VAT	£500 inc VAT	£449 inc VAT	£330 inc VAT	£110 inc VAT
Website	Apple.com/uk	Samsung.com/uk	Htc.com	Sony.co.uk	Vodafone.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 5.0	Android 4.0 ICS	Android 4.0 ICS	Android 2.3 Gingerbread	Android 2.3 Gingerbread
Processor	1GHz ARM Cortex A9	1.4GHz Exynos 4212 Quad	1.5GHz Qualcomm Snapdragon	1GHz NovaThor U8500	1GHz Qualcomm MSM7227A
Storage/media card	16GB/none	16GB/microSDXC	16GB/none	16GB/none	2.5GB/microSD
Screen size/resolution	3.5in/960x640	4.3in/800x480	4.3in/960x540	4in/960x540	4in/480x800
Input method	Capacitive multitouch	Capacitive touchscreen	Capacitive multitouch	Capacitive touchscreen	capacitive touchscreen
Connectivity	HSDPA, Bluetooth, Wi-Fi	HSPA+, GSM, Bluetooth, Wi-Fi	HSDPA, Bluetooth, Wi-Fi	HSDPA, Bluetooth, Wi-Fi	HSDPA, GSM, Bluetooth, Wi-Fi
Battery life (talk/standby)	8 hrs/200 hrs	11 hrs/750 hrs	Not specified	8.5 hrs/470 hrs	5 hrs/350 hrs
Camera	8Mp, 1080p video	8Mp, 1080p video	8Mp, 1080p video	8Mp, 1080p video	5Mp, 480p video
GPS	A-GPS, Glonass	A-GPS, Glonass	A-GPS	A-GPS	A-GPS
Dimensions, Weight	59x101x115mm, 140g	70x137x9mm, 133g	65x130.9x7.8mm, 119.5g	59x122x10.5mm, 121g	63x123x11mm, 130g
Warranty	1 year	2 years	1 year	1 year	1 year
Verdict	<ul style="list-style-type: none"> <li>Superb Retina display</li> <li>Fast graphics</li> <li>Responsive touchscreen</li> <li>Siri voice-recognition</li> </ul>	<ul style="list-style-type: none"> <li>Best choice for Android</li> <li>Superb 4.8in screen</li> <li>Strong build</li> <li>Difficult to use one-handed</li> </ul>	<ul style="list-style-type: none"> <li>Very good for multimedia</li> <li>Excellent build quality</li> <li>Good performance</li> <li>Sense interface</li> </ul>	<ul style="list-style-type: none"> <li>Good all-round handset</li> <li>Attractive value</li> <li>Sturdy design</li> <li>Mid-range hardware</li> </ul>	<ul style="list-style-type: none"> <li>Excellent price tag</li> <li>Screen can be unresponsive</li> <li>Good battery life</li> <li>Camera captures VGA video</li> </ul>
FULL REVIEW	TINYURL.COM/62TEB9G	TINYURL.COM/CQ4FM7X	TINYURL.COM/BSXFL6G	TINYURL.COM/C2KJ8Y3	TINYURL.COM/D5OQ55X

## >> Buying advice



### Tablets

Tablet PCs combine the mobility and connectivity of a smartphone with a larger screen and more powerful processor. Rather than struggle with Windows, they run a lightweight, touch-focused OS.

You have two main choices: a tablet running iOS or Android. iOS is slick, supremely easy to use, and has a library of hundreds of

thousands of apps. But the iPad is expensive, it doesn't support memory cards, and the whole system is locked down.

Android tablets are available at lower prices. Many have ports for adding storage and connecting devices, and plenty of apps are available via Google Play - although Google doesn't vet them.

Look for a dual-core processor for smooth operation and good multi-tasking. Opt for a capacitive rather than resistive touchscreen if possible, and consider a smaller screen to minimise weight.

3G tablets are available on subsidised tariffs, but it's usually cheaper to buy them outright.

READ MORE: [TINYURL.COM/7YGVBO6](http://TINYURL.COM/7YGVBO6)



Sub-£150 printers	    				
	Oki C110	Samsung ML-2955DW	Kodak Hero 5.1	Canon Pixma MG4150	Canon i-Sensys LBP-7010C
Price	£110 inc VAT	£90 inc VAT	£77 inc VAT	£60 inc VAT	£108 inc VAT
Website	Oki.co.uk	Samsung.com/uk	Kodak.co.uk	Canon.co.uk	Canon.co.uk
Overall rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Technology	Colour laser	Mono laser	Colour inkjet	Colour inkjet	Colour laser
Max print resolution	1200x600dpi	1200x1200dpi	9600dpi	4800x1200dpi	5760x1440dpi
Actual print speed	B=15.8ppm/C=2.5ppm	B=22.2ppm	B=12.2ppm/C=6.8ppm	B=8.6ppm/C=3.8ppm	B=13ppm/C=3.3ppm
Scan/fax facilities	None	none	1200dpi scans	1200x2400dpi scans	None
Supported interfaces	USB 2.0	USB 2.0, 802.11b/g/n, ethernet	USB 2.0, 802.11b/g/n, cloud	USB 2.0, 802.11b/g/n	USB 2.0
Cost per page	B=3.6p/C=5p	B=2.7p	B=1.8p/C=3.3p	B=2.8p/C=4.5p	B=3.8p/C=13.8p
Media card/auto duplex	xx	x✓	✓✓	✓✓	xx
Input capacity	100 sheets	251 sheets	100 sheets	100 sheets	150 sheets
Dimensions	396x380x275mm	348x338x197mm	422x399x183mm	449x304x152mm	400x398x223mm
Weight	14.4kg	7.2kg	6.3kg	5.7kg	12.3kg
Warranty	3 years	1 year	1 year	2 years	2 years
Verdict	<ul style="list-style-type: none"> <li>Attractive pricing</li> <li>Performs better than an equivalent inkjet</li> <li>No duplex mode</li> </ul>	<ul style="list-style-type: none"> <li>Speedy for the price</li> <li>Slim but well-defined text</li> <li>Reasonable running costs</li> <li>Wi-Fi/wired network support</li> </ul>	<ul style="list-style-type: none"> <li>Printer/scanner/copier</li> <li>Lowest cost per print</li> <li>Built-in Wi-Fi</li> <li>Could be faster</li> </ul>	<ul style="list-style-type: none"> <li>Excellent value at £60</li> <li>Decent middle-mode speeds</li> <li>Complex control panel</li> <li>High text running costs</li> </ul>	<ul style="list-style-type: none"> <li>Great value colour laser</li> <li>High-quality colour prints</li> <li>Slow colour performance</li> <li>Expensive replacement inks</li> </ul>
FULL REVIEW	TINYURL.COM/YLNO5RV	TINYURL.COM/CCLSZDM	TINYURL.COM/6S5BW3B	TINYURL.COM/6UJBGDJ	TINYURL.COM/7TLXCBK

£151+ printers	    				
	Kyocera Mita FS-1320D	Kyocera FS-C5250DN	Samsung ML-3710ND	Epson WP-4535 DWF	HP LaserJet Pro 400 M451nw
Price	£170 inc VAT	£450 inc VAT	£185 inc VAT	£174 inc VAT	£300 inc VAT
Website	Kyoceramita.co.uk	Kyoceramita.co.uk	Samsung.com/uk	Epson.co.uk	Hp.com/uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★☆
Technology	Mono laser	Colour laser	Mono laser	Colour inkjet	Colour laser
Max print resolution	1200x1200dpi	600x600dpi	1200x1200dpi	4800x1200dpi	600x600dpi
Actual print speed	B=26.1ppm	B=24.8ppm/C=18.3ppm	B=28.6ppm	B=15.4ppm/C=7.5ppm	B=14.3ppm/C=9.1ppm
Scan/fax facilities	none	none	none	Scanner and fax	none
Supported interfaces	USB 2.0	USB 2.0, ethernet	USB 2.0, ethernet	USB 2.0, 802.11b/g/n, ethernet	USB 2.0, 802.11b/g/n, ethernet
Cost per page	B=1.4p	B=1.2p/C=5.2p	B=1.4p	B=1p/C=3.6p	B=2.1p/C=11.3p
Media card/auto duplex	✓✓	x✓	x✓	x✓	xx
Input capacity	250 sheets	500 + 50 sheets	250 + 50 sheets	250 + 80 sheets	250 + 50 sheets
Dimensions	375x393x250mm	390x523x397mm	366x368x253mm	460x420x341mm	405x454x322mm
Weight	12kg	30kg	10kg	13.8kg	22.8kg
Warranty	2 years	2 years	1 year	1 year	1 year
Verdict	<ul style="list-style-type: none"> <li>No frills business laser</li> <li>Lacks Wi-Fi and ethernet</li> <li>Modest running costs</li> <li>Auto-duplex support</li> </ul>	<ul style="list-style-type: none"> <li>Blistering speed</li> <li>Huge paper capacity</li> <li>Colour printing isn't perfect</li> <li>Hefty</li> </ul>	<ul style="list-style-type: none"> <li>Fast mono page churn</li> <li>Modest running costs</li> <li>Ethernet and USB ports</li> <li>Generous paper trays</li> </ul>	<ul style="list-style-type: none"> <li>Exceptional value for money</li> <li>Great connectivity</li> <li>Very low running costs</li> <li>Text not up to laser-quality</li> </ul>	<ul style="list-style-type: none"> <li>Fast for its price</li> <li>Smart Install feature</li> <li>Strong for text</li> <li>Colour costs are high</li> </ul>
FULL REVIEW	TINYURL.COM/6GG9UKV	TINYURL.COM/7QMXVZA	TINYURL.COM/75RB5NZ	TINYURL.COM/C82FY6K	TINYURL.COM/7D366WF

GLOSSARY: • B: mono • C: colour • ppm: pages per minute

## » Buying advice



## Printers

Most printers are inkjet or laser models, and there are colour and mono flavours of each. Lasers tend to be more expensive to buy, but provide better-quality output, particularly where text is involved.

The price you pay instore is only the beginning; also consider the cost of replenishing the ink and paper. Duplexing lets you print to

both sides of a sheet, saving paper but slowing output.

Multifunction printers can save you money if you also require scanning facilities; some models include copy and fax functions, too.

A USB port lets you connect a printer to a single PC, but built-in wireless networking allows it to join a home or office network.


A memory card slot will let you bypass a PC for printing.

Never trust a manufacturer's claimed print speeds; we run our own tests to properly assess each printer's performance.

High-capacity paper trays and auto document feeders are also worth looking for.

READ MORE: [TINYURL.COM/BUX9QMO](http://TINYURL.COM/BUX9QMO)



Blu-ray drives					
	LG BE12LU38	LG BH10LS38	Asus SBW-06C1S-U Slim	Lite-On iHBS212	Buffalo BR3D-12U3
Price	£125 inc VAT	£65 inc VAT	£130 inc VAT	£90 inc VAT	£199 inc VAT
Website	Uk.lge.com	Uk.lge.com	Uk.asus.com	Liteonit.eu	Buffalotech.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Blu-ray speeds	12x -R, 12x -R DL, 2x -RE, 12x -ROM	10x -R, 8x -R DL, 2x -RE, 10x -ROM	6x -R, 4x -R DL, 2x -RE, 6x -ROM	12x -R, 8x -R DL, 2x -RE, 8x -ROM	12x -R, 12x -R DL, 2x -RE, 8x -ROM
DVD speeds	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	8x ±R, 6x ±R DL, 6x -RW, 8x +RW, 5x RAM, 8x ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 12x -RAM, 16x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 5x -RAM, 8x -ROM
Max storage	50GB	50GB	50GB	50GB	50GB
Interface type	USB 2.0, eSATA (external)	SATA (internal)	USB 2.0 (external)	SATA (internal)	USB 3.0 (external)
Label technology	LightScribe	LightScribe	None	LightScribe	None
Software	PowerDVD, PowerProducer	(OEM - add £5 for software)	PowerDVD, PowerProducer	CyberLink Blu-ray Suite	PowerDVD, PowerProducer
Dimensions	163x260x50mm	146x170x41mm	157x142x21mm	146x170x41mm	160x220x50mm
Weight	1.38kg	749g	364g	650g	1.1kg
Warranty	1 year	1 year	2 years	2 years	2 years
Verdict	<ul style="list-style-type: none"> <li>12-speed external writer</li> <li>Stocks now limited</li> <li>Supports eSATA, USB 2.0</li> <li>Awkward to carry</li> </ul>	<ul style="list-style-type: none"> <li>10-speed internal writer</li> <li>Attractive front panel</li> <li>Reliable performance</li> <li>Very good value</li> </ul>	<ul style="list-style-type: none"> <li>Super-slim six-speed drive</li> <li>No power supply required</li> <li>Portable</li> <li>Slow but reliable</li> </ul>	<ul style="list-style-type: none"> <li>12-speed internal writer</li> <li>Issues during testing</li> <li>Noisy during operation</li> <li>Average with 4x media</li> </ul>	<ul style="list-style-type: none"> <li>12-speed external writer</li> <li>Power supply required</li> <li>Bulky design</li> <li>Expensive</li> </ul>
FULL REVIEW	TINYURL.COM/8YVFLFP	TINYURL.COM/8YTUJEF	TINYURL.COM/7S3WPV6	TINYURL.COM/65PXHUJ	TINYURL.COM/453BX7L

Wireless routers					
	Cisco Linksys E4200	AVM FritzBox Fon 7390	TP-Link TL-MR3020	DrayTek Vigor 2850Vn	Zyxel Nbg4615
Price	£102 inc VAT	£190 inc VAT	£40 inc VAT	£235 inc VAT	£60 inc VAT
Website	Linksysbycisco.com	Fritzbox.eu	Tp-link.com/en	Draytek.com/uk	Zyxel.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Standards supported	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11a/b/g/n	802.11b/g/n
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz	2.4GHz/5GHz (non-concurrent)	2.4GHz
WEP/WPA/WPA2	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
USB port/Network port	✓✓	✓✓	✓✓	✓✓	✓✓
Firewall	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI	NAT/SPI
Eco mode	x	x	x	x	✓
Ethernet ports	10/100 WAN, 4x gigabit LAN	4x gigabit LAN	1x 10/100 WAN/LAN	10/100 WAN, 4x gigabit LAN	10/100 WAN, 4x gigabit LAN
Throughput (near/far)	226/92Mbps	92/38Mbps	Not tested	120/111Mbps	94/32Mbps
Dimensions	225x160x25mm	226x160x48mm	74x67x22mm	241x166x44mm	162x106x28mm
Weight	335g	not specified	250g	360g	237g
Warranty	1 year	5 years	3 years	2 years	1 year
Verdict	<ul style="list-style-type: none"> <li>Excellent wireless performance</li> <li>Dual-band Wi-Fi</li> <li>Guest login feature</li> </ul>	<ul style="list-style-type: none"> <li>Supports landline and internet telephony</li> <li>Dual-band Wi-Fi</li> <li>USB port</li> </ul>	<ul style="list-style-type: none"> <li>Portable 3G router</li> <li>Tiny and lightweight</li> <li>Mains-/USB-powered</li> <li>Reliable performance</li> </ul>	<ul style="list-style-type: none"> <li>Massive feature set</li> <li>Good performance</li> <li>Support for BT VDSL line</li> <li>Setup process is complex</li> </ul>	<ul style="list-style-type: none"> <li>Good-value router</li> <li>Strong Wi-Fi performance</li> <li>Single-band Wi-Fi</li> <li>Compact design</li> </ul>
FULL REVIEW	TINYURL.COM/6Z7BDKM	TINYURL.COM/3QUJZBX	TINYURL.COM/85P7R9P	TINYURL.COM/D5QSWB3	TINYURL.COM/6HACKNN

## >> Buying advice



### Blu-ray drives

A single Blu-ray Disc holds the equivalent of 35 CDs or five DVDs. It might look like a DVD, but its shorter wavelength and narrow blue laser beam allow it to hold greater capacity. It's the storage method of choice for HD and 3D video content.

External drives are easier to install, portable, and can be shared

between PCs, but they will cost you considerably more than internal models, and may not be as quick.

If you opt for an internal drive, ensure you have enough space inside your PC. Most internal drives use the SATA interface, so check you've got a compatible port.

Look for a drive that also supports several DVD formats, but don't obsess about write speeds.




You should be able to get 16-speed DVD writing, but it's not worth paying more to save seconds.

You may find that the Blu-ray media currently on the market isn't fast enough to enjoy your chosen drive's maximum write speeds. Six-/eight-speed BD-R capabilities are standard, but even six-speed BD-R media is still rare.

READ MORE: [TINYURL.COM/70EPYL6](http://tinyurl.com/70EPYL6)



External hard drives					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR GOLD	3 PC ADVISOR BEST BUY	4	5
	Seagate FreeAgent GoFlex	G-Tech G-Raid Thunderbolt	WD My Passport Studio	Buffalo MiniStation Extreme	Iomega Prestige
Price	£190 inc VAT	£750 inc VAT	£130 inc VAT	£110 inc VAT	£100 inc VAT
Website	Seagate.com	G-technology.com	Wdc.com/en	Buffalotech.com	lomega.co.uk
Overall rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Capacity tested	3TB	8TB	1TB	1TB	1TB
Capacity range	1TB to 3TB	4TB to 8TB	500GB to 1TB	500GB to 1TB	1TB to 2TB
Disk size	3.5in	3.5in	2.5in	2.5in	3.5in
Spin speed	7,200rpm	7,200rpm	5,400rpm	5,400rpm	5,400rpm
Transfer speed	94MBps (USB 3.0)	329MBps	76MBps (FireWire 800)	94MBps (USB 3.0)	94MBps (USB 3.0)
Encryption	192bit	None	256bit	256bit	256bit
Other interfaces	Optional FireWire 800	None	FireWire 800, USB 2.0	None	None
Software	Memo Backup	None	WD utilities	Backup, RAMdisk	Iomega Protection Suite
Dimensions	158x124x44mm	235x130x85mm	126x84x22mm	128x89x18mm	188x124x31mm
Weight	1kg	2.3kg	334g	230g	1kg
Warranty	2 years	3 years	3 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> <li>Great speed for USB 3.0</li> <li>Great value for capacity</li> <li>Separate storage drive and USB 3.0 dock</li> </ul>	<ul style="list-style-type: none"> <li>Fast Thunderbolt interface</li> <li>Real-world speed can exceed 200MBps</li> <li>Pricy, but huge capacity</li> </ul>	<ul style="list-style-type: none"> <li>Superbly built</li> <li>FireWire 800 and USB 2.0 interfaces</li> <li>AES encryption</li> </ul>	<ul style="list-style-type: none"> <li>Military-grade rugged design</li> <li>Lightweight 2.5in drive</li> <li>Solid 256bit encryption</li> </ul>	<ul style="list-style-type: none"> <li>Good-value USB 3.0 drive</li> <li>256bit encryption</li> <li>Metal case</li> </ul>
FULL REVIEW	TINYURL.COM/BN2Z92F	TINYURL.COM/CXEF6MH	TINYURL.COM/6FAWBNE	TINYURL.COM/CE4Z9YM	TINYURL.COM/D4KALCW

NAS drives					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4	5
	Synology DS412+	Zyxel NSA325	Qnap TS-419P II	Netgear ReadyNAS Pro 6	Iomega StorCenter px6-300d
Price	£520 inc VAT (diskless)	£145 inc VAT (diskless)	£492 inc VAT (diskless)	£877 inc VAT (diskless)	£576 inc VAT (diskless)
Website	Synology.com	Zyxel.co.uk	Qnap.com	Netgear.co.uk	Go.iomega.com
Overall rating	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★★
Drive bays	4	2	4	6	6
Processor	2.13GHz Intel Atom D2700	1.6GHz processor	2GHz Marvell 88F66282	2.66GHz Intel Pentium	1.8GHz Intel Atom D525
Memory	1GB DDR3	512MB DDR2	512MB DDR3	2GB DDR2	2GB DDR3
Remote access	✓	✓	✓	✓	✓
eSATA	✓	x	✓	x	x
USB port	2x USB 3.0, 1x USB 2.0	2x USB 2.0	4x USB 2.0	2x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0
Raid options	0/1/5/5+s/6/10/JBOD	0/1/JBOD	0/1/5/6/10/JBOD	0/1/5/6/10	0/1/10/5/5+s/6
Software	DSM 4.0	zPilot	TurboNAS 3.6.1	Netgear RAIDiator	EMC LifeLine, Iomega Link
Dimensions	165x203x233mm	108x205x147mm	177x180x235mm	170x250x285mm	257x176x270mm
Weight	2kg	1.8kg	3kg	7.3kg	4.9kg
Warranty	2 years	1 year	2 years	5 years	3 years
Verdict	<ul style="list-style-type: none"> <li>Superb read/write performance</li> <li>Powerful options</li> <li>Attractive and intuitive</li> </ul>	<ul style="list-style-type: none"> <li>Cheapest drive here</li> <li>Decent performance and features for the money</li> <li>Complex interface</li> </ul>	<ul style="list-style-type: none"> <li>Well priced</li> <li>Robust cabinet construction</li> <li>Solid performance</li> <li>Old but effective interface</li> </ul>	<ul style="list-style-type: none"> <li>Most expensive NAS here</li> <li>Mostly strong performance</li> <li>Internal power supply</li> <li>Complex admin interface</li> </ul>	<ul style="list-style-type: none"> <li>High-quality construction</li> <li>Features suitable for home and business use</li> <li>Decent performance</li> </ul>
FULL REVIEW	TINYURL.COM/6UUL4DE	TINYURL.COM/7B9EPW8	TINYURL.COM/72N4GBN	TINYURL.COM/84JD226	TINYURL.COM/7AT8HA5

## >> 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. Many NAS drives are

typically supplied without disks, letting you add your own selection.

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-plus drives and combines both advantages.

READ MORE: [TINYURL.COM/7H3HCNR](http://TINYURL.COM/7H3HCNR)



Projectors	 1	 2	 3	 4	 5
	InFocus ScreenPlay SP8600	Vivitek Qumi Q2	Dell M110	NEC NP43	ViewSonic PJD7383i
Price	£660 inc VAT	£435 inc VAT	£400 inc VAT	£610 inc VAT	£1,129 inc VAT
Website	Infocus.com	Vivitek.co.uk	Dell.co.uk	Nec-display-solutions.co.uk	Viewsoniceurope.com/uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1920x1080	1280x800	1280x800	1024x768	1024x768
Brightness <sup>1</sup> , Contrast	1,800, 5,000:1	300, 2,500:1	300, 10,000:1	2,300, 1,600:1	3,000, 3,000:1
Image size	300in	30-90in	80in	300in	30-300in
Supported aspect ratios	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:9, 4:3	4:3
Noise levels (dB)	30 (26 eco)	32 (28 eco)	36 (32 eco)	37 (32 eco)	32 (27 eco)
Connections	VGA, HDMI, CM, CP, SV, USB	VGA, HDMI, USB	VGA, HDMI, CM, CP, USB	VGA, SV, USB	VGA, CP, SV, USB
Lamp/lamp life	230W/4,000 hrs	LED/30,000 hrs	LED/10,000 hrs	200W/1,000 hrs	210W/4,000 hrs
Dimensions	326x254x104mm	162x102x32mm	105x104x37mm	246x72x177mm	290x126x254mm
Weight	3.4kg	635g	360g	1.7kg	3.5kg
Warranty	5 years	3 years	2 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> <li>• Smooth video playback</li> <li>• Full-HD resolution</li> <li>• Great contrast levels</li> <li>• Bright, colourful image</li> </ul>	<ul style="list-style-type: none"> <li>• Now fantastic value</li> <li>• Lightest model here</li> <li>• DLP-Link enables 3D display</li> <li>• Exceptional lamp life rating</li> </ul>	<ul style="list-style-type: none"> <li>• Ultra-small and -light</li> <li>• Good colour</li> <li>• Long-life LED lamp</li> <li>• Remote control costs extra</li> </ul>	<ul style="list-style-type: none"> <li>• Portable business model</li> <li>• Strong Auto Focus</li> <li>• Customisable settings</li> <li>• Decent image quality</li> </ul>	<ul style="list-style-type: none"> <li>• Ultra-short throw</li> <li>• Gets very warm in operation</li> <li>• Lacks HDMI and DVI</li> <li>• Creston RoomView software</li> </ul>
FULL REVIEW	TINYURL.COM/3HQANPV	TINYURL.COM/3TXMWPK	TINYURL.COM/77S8D6D	TINYURL.COM/62W3796	TINYURL.COM/3BW7ZZW

<sup>1</sup>Ansi lumens GLOSSARY: • CM: component • CP: composite • SV: S-Video

Digital camcorders	 1	 2	 3	 4	 5
	Kodak PlaySport Zx5	Sony Bloggie Touch MHS-TS20	JVC Everio GZ-HM650	Canon Legria HF R106	Kodak Playfull ZE1
Price	£90 inc VAT	£70 inc VAT	£300 inc VAT	£275 inc VAT	£106 inc VAT
Website	Kodak.co.uk	Sony.co.uk	Jvc.co.uk	Canon.co.uk	Kodak.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Maximum resolution	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080
Aspect ratio	16:9	16:9	4:3, 16:9	16:9	16:9
Display	2in	3in	2.7in	2.7in	1.5in
CCD sensor	1/3.2in	1/2.5in	1/4.1in	1/5.5in	1/3.2in
Zoom	4x digital	4x digital	200x digital, 40x optical	80x digital, 20x optical	4x digital
Supported formats	Mpeg4, Jpeg	Mpeg4, Jpeg	Mpeg4, Jpeg	AVCHD, Jpeg	Mpeg4, Jpeg
Storage (media card)	128MB (SD/SDHC)	8GB (SD/MS)	8GB (SD/SDHC/SDXC)	none (SD/SDHC)	128MB (SD/SDHC)
Connections	Micro-HDMI, MicroUSB	HDMI, USB 2.0	HDMI, USB 2.0	HDMI, USB 2.0	Micro-HDMI, MicroUSB
Dimensions	58x112x18mm	47x9x106mm	51x55x111mm	60x64x124mm	42x100x16mm
Weight	125g	125g	195g	319g	95g
Warranty	1 year	1 year	1 year	1 year	1 year
Verdict	<ul style="list-style-type: none"> <li>• Ruggedised design</li> <li>• Comfortable to hold</li> <li>• 2in screen rather small</li> <li>• Takes AAA batteries</li> </ul>	<ul style="list-style-type: none"> <li>• Useful 8GB memory</li> <li>• Awkward to hold</li> <li>• Ideal for video; stills less so</li> <li>• No built-in flash</li> </ul>	<ul style="list-style-type: none"> <li>• Lightweight, easy to use</li> <li>• Excellent 40x optical zoom</li> <li>• 6.5-hour recording memory</li> <li>• Supports 32GB SDXC cards</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent-value HD model</li> <li>• 2.7in flip-out LCD</li> <li>• Smooth 20x optical zoom</li> <li>• Great colour balance</li> </ul>	<ul style="list-style-type: none"> <li>• Simplicity itself to use</li> <li>• One-touch record and share</li> <li>• Tiny LCD</li> <li>• Rather toy-like</li> </ul>
FULL REVIEW	TINYURL.COM/3U3Y2CA	TINYURL.COM/332UOQJ	TINYURL.COM/453U838	TINYURL.COM/2VFVLQX	TINYURL.COM/79HCGJC

## >> Buying advice



## Projectors

Projectors designed for home use don't tend to be as bright as office models - anything offering fewer than 1,000 Ansi lumens will be usable only in a dark room. And don't forget that the brightness drops as the image size increases.

The cheapest home-cinema models offer a 720p resolution, but you'll notice the extra detail

of 1080p when watching Blu-ray films on a large screen.

If you can't place the projector square-on to the screen, look for a model with lens shift. Keystone correction is a cheaper alternative, altering the image digitally, but degrading quality in the process.



A zoom function offers more flexibility over how far from the

screen you can site the projector. If it's to go in a small room, get a short-throw model that produces a large image over a short distance.

DLP projectors offer better contrast and punchier colours than LCD models, but can suffer from the distracting and sometimes nauseating 'rainbow effect'.

READ MORE: [TINYURL.COM/6MTMWJX](http://tinyurl.com/6MTMWJX)



Compact digital cameras	1	2	3	4	5
	 PC ADVISOR RECOMMENDED	 PC ADVISOR BEST BUY	 PC ADVISOR RECOMMENDED		
	<b>Nikon Coolpix S9100</b>	<b>Panasonic Lumix DMC-TZ20</b>	<b>Nikon 1 J1</b>	<b>Samsung MV800</b>	<b>Canon PowerShot G12</b>
Price	£190 inc VAT	£170 inc VAT	£380 inc VAT	£170 inc VAT	£400 inc VAT
Website	Nikon.co.uk	Panasonic.co.uk	Nikon.co.uk	Samsung.com/uk	Canon.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Megapixel rating	12.1Mp	14.1Mp	10.1Mp	16.2Mp	10Mp
Maximum resolution	4000x3000 pixels	4320x3240 pixels	3872x2592 pixels	4608x3456 pixels	3648x2736 pixels
Optical zoom	18x	16x	3x	5x	5x
Maximum aperture	f3.5-f5.9	f3.3-f5.9	N/A	f3.3-f5.9	f2.8-f4.5
LCD size	3in	2.8in	3in	3in	2.8in
Media card	SD/SDHC	SD/SDHC	SD/SDHC	MicroSD	SD/SDHC
Battery/life	1x lithium-ion/270 shots	1x lithium-ion/260 shots	1x lithium-ion/230 shots	1x lithium-ion/not specified	1x lithium-ion/370 shots
ISO range	160 to 3200	100 to 1600	100 to 3200	125 to 3200	80 to 3200
Dimensions	106x35x62mm	105x33x58mm	106x30x61mm	92x18x56mm	112x48x76mm
Weight	214g	219g	274g	124g	401g
Warranty	2 years	1 year	2 years	2 years	1 year
Verdict	<ul style="list-style-type: none"> <li>• Excellent photo quality</li> <li>• Longest zoom range here</li> <li>• 1920x1080-pixel video</li> <li>• Incredible 240fps slow-mo</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive menu</li> <li>• Warm, natural colour range</li> <li>• GPS geotagging support</li> <li>• AVCHD or Mpeg video</li> </ul>	<ul style="list-style-type: none"> <li>• Mirrorless semi-compact</li> <li>• Solid construction</li> <li>• Good range of video modes</li> <li>• Deep colours</li> </ul>	<ul style="list-style-type: none"> <li>• Flip-up touchscreen LCD</li> <li>• Limited 5x optical zoom</li> <li>• Better for video than photos</li> <li>• Great panorama mode</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive feature set</li> <li>• High dynamic range setting</li> <li>• Ideal step-up from compacts</li> <li>• Easy to use</li> </ul>
FULL REVIEW	<a href="http://TINYURL.COM/6E457PY">TINYURL.COM/6E457PY</a>	<a href="http://TINYURL.COM/6XNRWUO">TINYURL.COM/6XNRWUO</a>	<a href="http://TINYURL.COM/7ZC25FY">TINYURL.COM/7ZC25FY</a>	<a href="http://TINYURL.COM/83SSNQX">TINYURL.COM/83SSNQX</a>	<a href="http://TINYURL.COM/4QHAF66">TINYURL.COM/4QHAF66</a>

Compact system cameras	1	2	3	4	5
	 PC ADVISOR BEST BUY	 PC ADVISOR RECOMMENDED	 PC ADVISOR GOLD		
	<b>Nikon D5100 (18-55mm)</b>	<b>Panasonic DMC-G3 (14-42mm)</b>	<b>Sony Alpha NEX-5 (18-55mm)</b>	<b>Canon EOS 600D (18-55mm)</b>	<b>Olympus E-PM1 (14-42mm)</b>
Price	£500 inc VAT	£420 inc VAT	£510 inc VAT	£600 inc VAT	£390 inc VAT
Website	Nikon.co.uk	Panasonic.co.uk	Sony.co.uk	Canon.co.uk	Olympus.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Megapixel rating	16.2Mp	16Mp	14.6Mp	18Mp	12.3Mp
Maximum resolution	4923x3264 pixels	4592x3448 pixels	4592x3056 pixels	5184x3456 pixels	4032x3024 pixels
Optical zoom	3x	3x	3.1x	3x	3x
Maximum aperture	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6	f3.5-f5.6
LCD size	3in	3in	3in	3in	3in
Media card	SD/SDHC/SDXC	SD/SDHC/SDXC	MS/SD/SDHC	SD/SDHC/SDXC	SD/SDHC/SDXC
Battery/life	1x lithium-ion/660 shots	1x lithium-ion/270 shots	1x lithium-ion/not specified	1x lithium-ion/440 shots	1x lithium-ion/330 shots
ISO range	100 to 6400	100 to 6400	200 to 12800	100 to 6400	200 to 12800
Dimensions	124x97x79mm	115x84x47mm	111x59x38mm	133x100x80mm	110x64x34mm
Weight	510g	336g	229g	570g	217g
Warranty	3 years	3 years	1 year	1 year	2 years
Verdict	<ul style="list-style-type: none"> <li>• Excellent stills and video</li> <li>• Suitable for novice and intermediate photographers</li> <li>• Plenty of lenses available</li> </ul>	<ul style="list-style-type: none"> <li>• Great dSLR alternative</li> <li>• Rotating touchscreen</li> <li>• Strong video-capture mode</li> <li>• Very fast autofocus</li> </ul>	<ul style="list-style-type: none"> <li>• Compact</li> <li>• Great performance</li> <li>• Great colour fidelity</li> <li>• Takes clean, sharp shots</li> </ul>	<ul style="list-style-type: none"> <li>• Top-notch photo results</li> <li>• Fully auto/manual modes</li> <li>• Articulated LCD screen</li> <li>• Strong video capture</li> </ul>	<ul style="list-style-type: none"> <li>• Compact camera</li> <li>• Likable art filter modes</li> <li>• High ISO suffers noise</li> <li>• No built-in flash or EVF</li> </ul>
FULL REVIEW	<a href="http://TINYURL.COM/6UTE9KK">TINYURL.COM/6UTE9KK</a>	<a href="http://TINYURL.COM/7JCXJCR">TINYURL.COM/7JCXJCR</a>	<a href="http://TINYURL.COM/37XOZX5">TINYURL.COM/37XOZX5</a>	<a href="http://TINYURL.COM/72STE88">TINYURL.COM/72STE88</a>	<a href="http://TINYURL.COM/BLMYMJW">TINYURL.COM/BLMYMJW</a>

## >> Buying advice



### Compact system cameras

Compact system cameras (or interchangeable-lens cameras) bridge the gap between compacts and digital SLRs. They are ideal for those who want the versatility and quality of a digital SLR, with the ease of use of a compact.

A mirrorless design allows compact system cameras to be smaller than digital SLRs, while the

lack of an optical viewfinder means an LCD is used for composition and review. Large sensors allow them to rival an SLR for image quality.

Compact system cameras are ready to shoot in seconds, and most offer burst modes that capture several frames per second.






Although the camera lens can be swapped, not all will be compatible with your chosen




model. Panasonic and Olympus both use the Micro Four Thirds system, but Sony has its own E-mount system and Samsung uses NX-mount lenses.

Most compact system cameras record HD video, but the quality varies. If this is a priority, choose a model that can record 1080p video and also has a microphone input.

**READ MORE:** [TINYURL.COM/7DPM3SX](http://TINYURL.COM/7DPM3SX)



Sub-£150 graphics cards	    				
	MSI HD 6850	Gigabyte HD 7770 OC	Sapphire Radeon HD 7750	PowerColor Radeon HD 6790	Asus Radeon HD 6670
Price	£97 inc VAT	£100 inc VAT	£80 inc VAT	£90 inc VAT	£60 inc VAT
Website	Uk.msi.com	Uk.gigabyte.com	Sapphiretech.com	Powercolor.com	Uk.asus.com
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆
Graphics processor	AMD Radeon HD 6850	AMD Radeon HD 7770	AMD Radeon HD 7750	AMD Radeon HD 6790	AMD Radeon HD 6670
Installed RAM	1GB GDDR5	1GB GDDR5	1GB GDDR5	1GB GDDR5	1GB DDR3
Memory interface	256bit	128bit	128bit	256bit	128bit
Core/memory clock	775MHz/1GHz	1.1GHz/1,250MHz	800MHz/1,125MHz	840MHz/1,050MHz	800MHz/900MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	960	640	512	800	480
Power connectors	1x 6-pin	1x 6-pin	None	2x 6-pin	None
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.1	11.0	11.0	11.0
Digital interface	DVI, HDMI, DisplayPort	DVI, HDMI, Mini-DisplayPort	DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, HDMI
Warranty	3 years	3 years	2 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> <li>The best 6850 available</li> <li>Powerful card for the price</li> <li>Good memory bandwidth</li> <li>256bit memory interface</li> </ul>	<ul style="list-style-type: none"> <li>Faster than 7750</li> <li>Good value at just £20 more</li> <li>Only 128bit memory</li> <li>Low sound levels</li> </ul>	<ul style="list-style-type: none"> <li>Better value for money than the 6790 and 6770</li> <li>Uses some 7970 architecture</li> <li>Light on power</li> </ul>	<ul style="list-style-type: none"> <li>Playable framerates</li> <li>Strong memory bandwidth</li> <li>6800-series cards faster</li> <li>256bit memory interface</li> </ul>	<ul style="list-style-type: none"> <li>Great-value video card</li> <li>800MHz core clock memory</li> <li>128bit memory limits appeal</li> <li>6570 card is a better deal</li> </ul>
FULL REVIEW	TINYURL.COM/3XRUQW5	TINYURL.COM/BWJ7BL9	TINYURL.COM/7ZB5OE3	TINYURL.COM/6P9B7KZ	TINYURL.COM/3LM8HGE

£151+ graphics cards	    				
	MSI GeForce GTX 670	Zotac GeForce GTX 680	XFX 7970 3GB GDDR5	Asus HD 7870 DirectCU II	Zotac GeForce GTX 570
Price	£310 inc VAT	£410 inc VAT	£380 inc VAT	£275 inc VAT	£270 inc VAT
Website	Uk.msi.com	Zotac.com	Xfxforce.com	Uk.asus.com	Zotac.com
Overall rating	★★★★★	★★★★★	★★★★☆	★★★★★	★★★★★
Graphics processor	nVidia GeForce GTX 670	nVidia GeForce GTX 680	AMD Radeon HD 7970	AMD Radeon HD 7870	nVidia GeForce GTX 570
Installed RAM	2GB GDDR5	2GB GDDR5	3GB GDDR5	2GB GDDR5	1,280MB GDDR5
Memory interface	256bit	256bit	284bit	256bit	320bit
Core/memory clock	915MHz/1,502MHz	1,006MHz/1,502MHz	925MHz/1,375MHz	1010MHz/1210MHz	732MHz/950MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	1,344	1,536	2,048	1,280	480
Power connectors	2x 6-pin	2x 6-pin	1x 6-pin, 1x 8-pin	2x 6-pin	2x 6-pin
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.0	11.1	11.1	11.0
Digital interface	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DisplayPort	DVI, HDMI, 2x Mini-DP	2x DVI, Mini-HDMI
Warranty	2 years	5 years	2 years	2 years	2 years
Verdict	<ul style="list-style-type: none"> <li>Almost on a par with 7970</li> <li>Low power consumption</li> <li>Same memory bandwidth as GTX 680</li> </ul>	<ul style="list-style-type: none"> <li>Fastest single-GPU card</li> <li>Low power consumption</li> <li>Better value than HD 7970</li> <li>Low on RAM</li> </ul>	<ul style="list-style-type: none"> <li>Good performance</li> <li>Not as powerful or as efficient as GTX 680</li> <li>Better value than HD 7870</li> </ul>	<ul style="list-style-type: none"> <li>Affordably priced</li> <li>Cheaper than GTX 670, but behind on framerates</li> <li>Modest power consumption</li> </ul>	<ul style="list-style-type: none"> <li>Now looking dated next to the GTX 670</li> <li>Impressive detail rendering</li> <li>320bit memory interface</li> </ul>
FULL REVIEW	TINYURL.COM/CRDW78J	TINYURL.COM/C6C37Q0	TINYURL.COM/6UZRVXC	TINYURL.COM/BUFMAFF	TINYURL.COM/3UB8U3G

## >> Buying advice



## Graphics cards

The key feature of a graphics card is its GPU. Produced by AMD or nVidia, this determines the quality of images displayed and their refresh speed. The more powerful the GPU the better, but you can get away with a lesser card by turning down a game's detail levels.

Even those on a budget should be able to get at least 1GB of DDR

video memory. Look for GDDR5 rather than GDDR3 RAM. This in effect quadruples the clock speed (GDDR3 merely doubles it).

The memory interface (or bus) governs how much data can be sent at once, so a 256bit interface lets through twice as much data as a 128bit interface. Graphics cards with the best combination of memory interface size and

clock speed should produce the best performance.

DirectX 11.x support is required for advanced, modern games; cheaper cards lack the firepower to do such titles justice, however.

Check that a card will fit inside your PC and you have sufficient connections from the power supply unit before you buy.

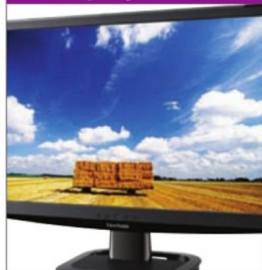
READ MORE: [TINYURL.COM/7BPUHQE](http://TINYURL.COM/7BPUHQE)



Sub-£200 flat-panels	1	2	3	4	5
	Viewsonic VX2336s-LED	AOC i2352Vh	AOC i2353Fh	Hanns-G HL249DPB	Iiyama ProLite XB2472HD
Price	£132 inc VAT	£132 inc VAT	£145 inc VAT	£110 inc VAT	£190 inc VAT
Website	Viewsoniceurope.com	Aoc-europe.com	Aoc-europe.com	Hannsg.com	Iiyama.co.uk
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	23in	23in	23.6in	24in
Panel type	In-plane switching	In-plane switching	In-plane switching 3D	Twisted nematic	Vertical alignment
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.27mm	0.27mm	0.27mm	0.28mm
Brightness	233cd/m <sup>2</sup>	258cd/m <sup>2</sup>	225cd/m <sup>2</sup>	247cd/m <sup>2</sup>	Not measured
Static contrast ratio	710:1	731:1	666:1	740:1	Not measured
Response time	14ms	5ms	5ms	5ms	8ms
Digital connector	DVI	DVI, HDMI, VGA	2x HDMI, VGA	DVI	DVI, HDMI
Dimensions	548x426x201mm	247x185x399mm	550x388x188mm	563x211x403mm	570x215x438mm
Weight	3.6kg	3.2kg	5.6kg	3.8kg	6.2kg
Warranty	3 years	3 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> <li>Excellent value IPS panel</li> <li>Strong image quality</li> <li>No HDMI or speakers</li> <li>Slow response rate</li> </ul>	<ul style="list-style-type: none"> <li>Good value IPS panel</li> <li>Accurate colours</li> <li>Plain styling</li> <li>Few extras</li> </ul>	<ul style="list-style-type: none"> <li>Wide viewing angles</li> <li>Excellent colours</li> <li>Attractive, slimline design</li> <li>No DVI connection</li> </ul>	<ul style="list-style-type: none"> <li>Extremely low price</li> <li>Pleasing image quality</li> <li>Low power consumption</li> <li>Only a TN panel</li> </ul>	<ul style="list-style-type: none"> <li>Wonderful 24bit colour reproduction</li> <li>Viewing angles not great</li> <li>Height-adjustable stand</li> </ul>
FULL REVIEW	TINYURL.COM/86JF4W2	TINYURL.COM/7HXTVPV	TINYURL.COM/7TWLB2A	TINYURL.COM/C95859A	TINYURL.COM/3DYX75Z

£200+ flat-panels	1	2	3	4	5
	ViewSonic VP2365-LED	Philips Brilliance 241P4QPYES	Acer V273HL	NEC MultiSync EA232WMI	ViewSonic VP2765-LED
Price	£205 inc VAT	£252 inc VAT	£220 inc VAT	£246 inc VAT	£360 inc VAT
Website	Viewsoniceurope.com/uk	Philips.co.uk	Acer.co.uk	Nec-display-solutions.co.uk	Viewsoniceurope.com/uk
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	24in	27in	23in	27in
Panel type	In-plane switching	Advanced MVA	Twisted nematic	In-plane switching	Advanced MVA
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.28mm	0.31mm	0.27mm	0.31mm
Brightness	238cd/m <sup>2</sup>	299cd/m <sup>2</sup>	315cd/m <sup>2</sup>	Not measured	1,200cd/m <sup>2</sup>
Static contrast ratio	681:1	1,691:1	850:1	Not measured	378:1
Response time	6ms	12s	5ms	14ms	25ms
Digital connector	DVI	DVI, DisplayPort	DVI, HDMI	DVI, DisplayPort	DVI, DisplayPort
Dimensions	548x433x250mm	565x220x395-518mm	644x445x195mm	550x220x379mm	642x365x474-608mm
Weight	5.4kg	5.9kg	6.9kg	5.8kg	8.5kg
Warranty	3 years	3 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> <li>Premium IPS panel</li> <li>Superb colour reproduction</li> <li>Wide viewing angles</li> <li>DVI port only</li> </ul>	<ul style="list-style-type: none"> <li>Very strong image quality</li> <li>Excellent viewing angles</li> <li>Rotate, height adjustability</li> <li>Four-port USB hub</li> </ul>	<ul style="list-style-type: none"> <li>Large screen for the money</li> <li>Average viewing angles</li> <li>Reasonable colour quality</li> <li>Functionality over style</li> </ul>	<ul style="list-style-type: none"> <li>High-calibre IPS screen</li> <li>Impressive colour depth</li> <li>Poor 14ms response rate</li> <li>Height/tilt-adjustable stand</li> </ul>	<ul style="list-style-type: none"> <li>Large 27in display</li> <li>Low resolution for size</li> <li>Poor viewing angles</li> <li>Slow response for games</li> </ul>
FULL REVIEW	TINYURL.COM/5WMJLR9	TINYURL.COM/6VVODAP	TINYURL.COM/7J3N055	TINYURL.COM/4CQGNVW	TINYURL.COM/86T3PFM

## >> Buying advice



### Flat-panel displays

You'll spend most of your working day staring at the screen, so it makes sense to choose one that's comfortable to view.

The panel size will largely depend on your budget and amount of desk space, but those measuring 22in and above tend to offer a full-HD resolution. All but the cheapest models also have at

least one digital interface (DVI, HDMI or DisplayPort). VGA (or D-Sub) is an analogue interface, and won't provide as clean a signal.

The panel technology is important. Twisted nematic (TN) is the budget option, offering fast response times but limited viewing angles. Multiple vertical alignment (MVA) and patterned vertical alignment (PVA) screens offer

better viewing angles and higher contrast ratios than TN, but slower response times. Advanced MVA screens are more responsive.

In-plane switching (IPS) panels offer excellent viewing angles, contrast and colour accuracy, but they can be rather pricey.

Get a matt rather than gloss coating for fewer reflections.

READ MORE: [TINYURL.COM/6RMBV96](http://TINYURL.COM/6RMBV96)





JIM MARTIN

## Windows Phone 8 leaves existing users behind

In a couple of months, Microsoft will launch Windows Phone 8. It's the smartphone version of its forthcoming desktop OS, and should integrate seamlessly with a Windows 8 laptop, PC or tablet.

That's the good news. The bad news is Windows Phone 8 won't run on existing Windows Phone 7 devices.

Having long avoided phones running Windows Mobile, I was surprised by how good Windows Phone 7 was when it launched in late 2010. The slick tiled interface looked fresh and meant Microsoft was back on track in the smartphone world.

Well, almost. While the software was decent and hardware manufacturers were churning out desirable handsets, app developers avoided Windows Phone, preferring to stick with iOS and Android. With a relatively small customer base, it's easy to see why there's a dearth of apps in the Windows Marketplace.

That should all change, though. Thanks to a shared core between the desktop and mobile OSes, Windows 8 Metro apps will work with Windows



Marketplace; plenty more are still missing, including Flipboard, Dropbox and Google+.

Such apps are bound to turn up shortly after Windows Phone 8 launches, but there's every chance app developers won't bother to release a separate version for Windows Phone 7.

The only consolation for existing owners is a token update: Windows Phone 7.8. It brings the new home screen to your Windows Phone 7 device, but it's still a kick in the teeth.

Nokia hasn't sold nearly as many Windows Phones as it had hoped, and there's precious little chance of selling many more Lumia 900 handsets unless people are tempted by the knock-down prices.

A clean break is necessary from a technical point of view. But Microsoft developed Windows Phone 8 in parallel with 7, so it knew all along that Windows Phone 7 was doomed. At least Apple has the decency to give hardware one or two updates before it's good for the scrapheap. Let's hope those who invest in Windows Phone 8 don't suffer the same fate. We'll have to wait and see. ☒

**“A clean break is necessary from a technical point of view”**

Phone 8 devices. Developers can produce one app that will run on Windows smartphones, tablets, laptops and PCs. Marvellous.

It's not so great if you've recently bought a Windows handset, though. Launched only a few months ago, the Nokia Lumia 900 is now in effect obsolete - it won't get the upgrade.

Apps are the be all and end all for many smartphone users, and it isn't simply about having the latest version of Angry Birds. Apps for Spotify, Skype, Facebook and Twitter are only just appearing on the Windows

## >> Next issue

ISSUE 208 ON SALE 6 SEPTEMBER 2012

**TEST CENTRE**

### Laptops round-up

Whether it's for school, college or just for fun, now's a great time to bag a bargain laptop. We look at a range of great-value models.

**TEST CENTRE**

### Powerline networking

HomePlug turns your mains wiring into a home network from as little as £35. We test six starter kits.

**TEST CENTRE**

### All-in-one PCs group test

Today's all-in-one PCs are both stylish and powerful, and will make a great addition to your living room. We review six machines.

### They're watching you

Information on the things you like and what you buy is very valuable. We investigate who is spying on your internet activity and how you can hide from trackers.

### Join the 3D revolution

We explain how to experience 3D on your laptop, PC and even TV, be it games, video, photos or movies.

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## PALICOMP Alpha Detonator

★★★★★

£1,300 inc VAT

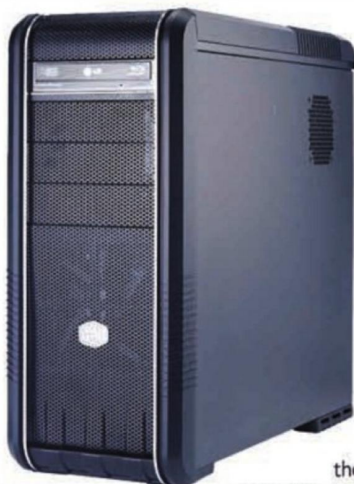
From Palicomp 01270 898104

Palicomp's Alpha Detonator is the first PC we've seen with one of Intel's third-generation Core 'Ivy Bridge' processors (see *What's New Components*, page 53). At £1,300 without a monitor, keyboard or mouse, this system is around twice the price of most Core i5-based gaming PCs. However, the high price is due to more than just the processor; this PC has an impressive specification all round.

Intel's Core i5-3570K processor is the natural successor to our beloved i5-2500K chip. In this PC, the processor has been overclocked to 4.7GHz from its native 3.4GHz, and it's a strong performer. The PC scored 153 overall in our 2D application benchmarks, making it even faster than the PCs we've seen with overclocked Core i5-2500K processors, which have scored around 140.

The graphics card is Nvidia's latest – a 2GB Nvidia GeForce GTX 680. It's massively powerful and typically costs around £400, which goes some way towards explaining the PC's high price. Its performance is certainly up to scratch, with frame rates of 116fps in Dirt 3 and 50.5fps in Crysis 2, both at 1,920x1,080 and with Ultra detail levels. That's staggering by any definition.

The Detonator has a 2TB hard disk for storage and a 120GB SSD for the operating system to increase boot speeds, plus a Blu-ray reader/DVD re-writer. That's a lot of storage space, but there's room for even more in the three vacant 5¼in drive bays and four spare 3½in bays. The Gigabyte Z77X-D3H motherboard



has four SATA3 and four SATA2 ports, only three of which are in use. There's plenty of room for expansion cards, too. Although one PCI-E x1 slot is blocked by the graphics card, two more are accessible, as well as a pair of PCI-E x16 slots – which actually run at x8 and x4 respectively – and a PCI slot. All four memory slots are occupied, but the system's 16GB of 1,600MHz RAM should be enough for anybody. The PC has a good selection of rear ports, with six USB3 ports, two USB ports, a PS/2 port and 5.1 analogue and optical S/PDIF audio outputs. The case also has an extra external bay for a SATA drive on top, with two USB and two USB3 ports alongside it.

This is a phenomenally powerful gaming PC, but it's also very expensive for a base unit. Despite the brand-new processor – which turns out to be a minor upgrade over the powerful Core i5-2500K when

overclocked, rather than an epic game-changer – the graphics card is the real star. Gamers who want to be at the cutting-edge of technology will do well with this system and it's reasonably priced for what it is. However, unless you have a burning desire to own a PC that's more powerful than any current software or game really needs, you're better off spending less money on a full system such as Palicomp's Phoenix i5 Shinobi (*What's New, Shopper 287*), which costs £300 less and comes with a monitor, speakers and peripherals.

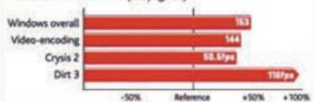
Kat Orphanides

### SUMMARY

**VERDICT** A powerhouse of a PC, but most users don't need this much power

**DESKTOP PC** Intel Core i5-3570K, 16GB RAM, 120GB+2TB hard disk, 2GB Nvidia GeForce GTX 680, DVD+/-RW +/-DL, BD-ROM, Windows 7 Home Premium 64-bit, 495x210x525mm, three-year RTB warranty  
**POWER CONSUMPTION** 3W standby, 109W idle, 270W active  
**PART CODE** IVY1  
**DETAILS** [www.palicomp.co.uk](http://www.palicomp.co.uk)

### PERFORMANCE (see page 64)



# Alpha Detonator

## Price = £1299.99

## Code = IVY1

### CPU UPGRADE

FROM Ivy Bridge i5 3570K

TO Ivy Bridge i7 3770K

£95 Inc Vat

### RAM UPGRADE

FROM 16GB DDR3 1600

TO 16GB DDR3 1866

£30 Inc Vat

### TFT MONITORS

HKC 19" VGA, LED @ £75

AOC 22" DVI, LED @ £110

ASUS 22" HDMI, LED @ £140

HKC 24" DVI, LED @ £120

ASUS 24" HDMI, LED @ £145

ASUS 27" HDMI, LED @ £230

### CASES UPGRADES

ThermalTake Level 10 GTS @ £20

CoolerMaster Silencio @ £25

CoolerMaster HAF922 @ £35

ThermalTake Overseer @ £35

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### CPU BUNDLE 1

Intel Core i3 2100  
ASUS P8Z68-V LX  
4GB DDR3 1333MHz  
£199.99 Inc Vat

### CPU BUNDLE 2

Intel Core i5 3570K  
ASUS P8Z77-V LX  
4GB DDR3 1600MHz  
£279.99 Inc Vat

### CPU BUNDLE 3

Intel Core i5 3570K  
Overclocked To 4.6Ghz  
ThermalTake Contac29  
ASUS P8Z77-V LX  
8GB DDR3 1600MHz  
£309.99 Inc Vat

### CPU BUNDLE 4

Intel Core i7 3770K  
Overclocked To 4.4Ghz  
ThermalTake Contac29  
ASUS P8Z77-V  
8GB DDR3 1600MHz  
£399.99 Inc Vat

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SAMSUNG

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