

25 PAGES OF WINDOWS TIPS AND TRICKS

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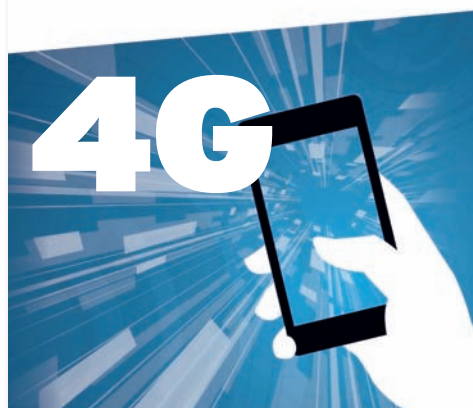
PC ADVISOR

FIRST WINDOWS 8 LAPTOPS AND PCs



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- Get 4G connectivity today
- How much you should pay
- 4G vs 3G speed tests



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ISSUE 210 JAN 2013

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 issue number in the subject heading



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MATT
EGAN



Welcome to the Windows 8 era

Windows 8 is here, but will it be a success like XP or a Vista-style flop? It all depends on the hardware

Predicting the success or failure of a technology product is a tricky business. Trying to second-guess the reaction to a new version of Windows is more difficult still.

Plenty of reviewers liked Windows Vista when first exposed to it. On a powerfully specified PC the updated design and new features seemed like worthwhile upgrades, and UAC a sensible precaution.

Vista was a dog. But it took lots of users being forced to rely on it to pinpoint the flaws. UAC was an irritant, not fit for purpose. The system requirements were ambitious, meaning Vista hobbled lower-specced systems. And compatibility issues? How long have you got...

If Windows 7 was Vista done right, Windows 8 is only the second genuinely new Windows OS in 13 years. How will it fare?

PC Advisor editors have been using Windows 8 for months now in an attempt to get a true picture of its strengths and weaknesses. The response is mostly positive. Windows 8 is not without quirks and irritations, but for PC- and laptop use the migration is smooth. Most people will spend most of their time in the Desktop mode, and may struggle to notice the difference when compared with Windows 7. You get a little more zip as you browse, and there's no Start menu. Windows 8 is stable, too.

Whether this means Windows 8 will succeed depends on the hardware. Unlike Apple, which launches platforms on its own hardware, Microsoft has to trust Intel to make great components and then PC makers to use them to create interesting products.

Windows 8 is an OS of two halves. It's designed to be comfortable to use on desktop and laptop PCs that utilise a mouse and keyboard, but also work well on touchscreen laptops, tablets and all-in-ones. As our feature on the future of 4G in the UK (page 96) shows, we all now want to be able to access everything, everywhere. But even before the launch of the iPad mini (see page 9) relatively few Windows PC users utilised Microsoft software when they were on the move - Windows 8 aims to redress that.

Microsoft needs PC makers to build products of various sizes and input devices. Get ready for thin and fast touchscreen laptops and tablets ranging in screen size from 5in to 25in and beyond. And expect to see slick living-room all-in-one PCs gunning for the space occupied by your TV.

The laptops and PCs in this issue are a snapshot of those available as Windows 8 launches (see page 60). They are not radically different to Windows 7 PCs, but already the signs are that computer makers are eager to embrace a platform that allows them to fight back against the smartphones and tablets that are eating away at PC sales.

Will Windows 8 succeed? It just might, but Microsoft will never dominate computing as it did when the desktop was king. The personal computing world is diversifying at pace, a process to which Windows 8 will only add. ☒



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60 Windows 8 PCs & laptops

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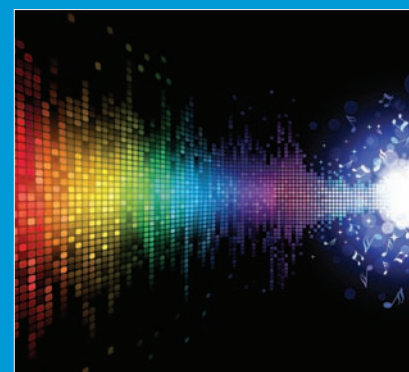
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Reader comments



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

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Fight, fight!

When mobile phones first came on to the mainstream market some 15 years ago, everybody I knew had a Nokia; fast-forward 10 years and everybody had a BlackBerry. Where are these mobile-phone giants today? If anyone has the knowledge and experience to take on Apple with its mighty iPhone it's them, yet they seem content in leaving it up to Google with Android. Come on guys, competition is the biggest driving force for innovation. **Peter Taylor**

Just passing the time

I'm intrigued to learn that Intel is muddying its hands in the smartphone CPU race. Perhaps it is getting bored now that AMD has clearly given up. **Jay Sands**

Vista to Windows 8

Thanks for your recent coverage of Windows 8. As a Vista user, it has certainly whet my appetite for an upgrade. **Brian Ragless**

Bullied into buying antivirus

We recently reported that a federal court had stopped the operations of several companies that allegedly used telemarketers masquerading as computer technicians to scare consumers into buying unneeded antivirus services (see tinyurl.com/9598ajp). "It's about time the authorities went after these scammers," wrote *Michael Dwells*. "I get the impression that scammers are able to perpetrate a scam and freely and easily get away with it. Hopefully it won't be long until the last scammer is thrown into jail."

Recovering from a drive crash

On the subject of restoring your important files from a damaged hard drive, *Wjorkiii* offered his own advice (read the original article at tinyurl.com/9mha6vm). "You can try sealing the drive in waterproof Ziploc bags, then put it in the freezer for a day or two. When you take it out the freezer it will often work long enough for you to copy the files on to a working backup drive. This has worked for me on a number of occasions," he advised. Of course, our advice is to back up your data now, and then you'll never find yourself in this situation.



Windows malware on the rise

Microsoft has admitted that Windows 7's malware infection rate has risen by as much as 182 percent this year (read more at tinyurl.com/8e2qw5u). "Rather than selling PCs with bloatware and trial programs, they should be preloaded with antivirus and anti-malware software," wrote *Sonar Subs*. Of course, with Windows 8 they will be.

Saving the environment

A recent study suggests that the iPhone 5 contains fewer toxic materials than the Samsung Galaxy S III (tinyurl.com/9udgzt2). "The best way to save the environment is to use your current phone for as long as you can," wrote *bbyyjm*.

Flagged: Star letter

Smartphone Advisor

I write in response to last issue's letter from Andrew Pestell about the morphing of *PC Advisor* into a smartphone review mag.

For me, a PC is something big enough to handle with fingers like cows udders, on which you can install software you've found in anticipation of something brilliant. And every so often, it's something to which you apply the Hoover to remove the detritus that accumulated when you stamped your feet in disgust because something didn't work, then turned to PCA for advice on how to fix it.

I don't want to pay for an app that comes with none of the fun of making it work. And

for the price of a smartphone I can get a workable PC and a reasonable mobile phone, and still be better off. **Tony Payne**

Marie Brewis, managing editor, replies: Mobile- and desktop computing are not mutually exclusive, Tony, and many readers use both a laptop or PC and a smartphone or tablet. For many people, a mobile computer will never replace a PC or laptop as their primary machine, but we must acknowledge that phones and tablets are becoming increasingly popular. We'll continue to publish PC news, reviews and advice in every issue.



Our Star letter writer wins a 128GB Crucial m4 SSD with Data Transfer Kit, worth £126. For your chance to win, tell us your thoughts on the latest tech issues:

crucial.com/uk

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pcadvisor.co.uk/polls

Do you plan to get a 4G smartphone?

- **15%**
Yes, as soon as 4G is available.
- **16%**
Yes, when my contract expires.
- **28%**
Maybe, if the price is right.
- **37%**
No, I'm happy with what I've got.
- **5%**
Don't know



Based on 2,357 votes, tinyurl.com/8ocn693

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pcadvisor.co.uk/forums



Get ready for 4G

Many of us are excited about EE's launch of its 4G network, but that doesn't mean we'll all suddenly achieve faster mobile-broadband speeds. Not only do we need a 4G handset or mobile hotspot, we must reside in one of the few locations in which the service is available. Our forum members discuss the topic at tinyurl.com/9t8xbL7.

Bing.alau I don't even know if my phone is 1G, but it does all I ask of it, so that's all I need to know.

bremner There is no point in me getting a 4G-enabled smartphone. I live in an area in which 3G would be nice – forget 4G.

sunnystaines I've recently renewed my contract, so that's another 18 months I'll be locked to a 3G tariff.

Joseph Kerr I have no idea what 4G is. I'm probably not knowledgeable enough to have any right to own a smartphone with 4G capability.

Chegs®™ I planned to upgrade until I read that the UK version of 4G isn't all that wonderful. I expect pricing to be high and the available bandwidth caps to be meagre.

Woolwell 3G isn't available in all depths of the countryside, and it's doubtful that 4G will be. But 4G is such a step up that I will get a compatible handset asap.

Algerian peter My mobile already struggles to send or receive phone calls at home, so that's a no to 4G.

If you, like many of our forum members, aren't entirely sure what 4G mobile broadband is and what it means for you, check out our in-depth guide on page 96 for the answers to all your questions.

facebook.com/pcadvisor



Viva la desktop PC

With the latest tablets and smartphones always in the tech news, we hoped to bring back some love for the humble desktop PC. And it does have some advantages. "You can use only a desktop as a media-centre PC," wrote *Jake Hancke*. *Alan McClean* added that one broken part doesn't mean it's a write-off: "If something goes wrong you can fix it by replacing just that part."

Small hopes for iPad mini

At the time of writing, Apple was alleged to have ordered that 10 million iPad minis be made. The news fell mostly on uninterested ears on our Facebook fan page.

"I am not enamoured with Apple at present. It is milking us with expensive apps that are not available in my country and childish legal action against Samsung," explained *Dorian Phillips*.

"I used to love Apple, but I got fed up with being gouged. I love its products, but enough is enough. If it stops being so greedy, I might reconsider it, but I highly doubt that will ever happen," added *Jillian Lee Adamson*.

"My iPad 2 is really annoying compared with Android. No more iOS devices for me.

Microsoft Surface sounds really interesting, and I'm also looking forward to seeing what materialises from Firefox OS. Having said all that, I love Android and it will take a big leap in functionality to tempt me away," wrote *Daniel Le Dosquet-Bergquist*.

"We already have an iPad mini, it's called the iPod touch," joked *Anuj Kumar*.

"I like the look of the iPad mini. With its 16:9 widescreen, it makes all previous iPads look like the old 4:3 devices of the past," wrote *Wesley A Maloney*.

Keeping up with tech

EE was set to switch on its 4G network as we went to press, and manufacturers are already announcing devices that are compatible with the faster mobile-broadband technology. But should you upgrade your handset? *Claire Jane Turner* thinks not.

"It's hardly worth upgrading these days. The moment you do, your all-singing, all-dancing handset is immediately replaced. Smartphones are usually on a 24-month contract, too, so unless you're rolling in money and can afford to keep buying them, there's no way to keep up with the advances," she wrote. ☒

CHRIS
MARTIN



MICROSOFT LAUNCHES WINDOWS 8

Touch-orientated OS arrives
for PCs, laptops and tablets



On 26 October, Microsoft officially launched Windows 8, its latest operating system for desktop PCs, laptops and tablets.

Windows 8 is one of the most radical overhauls of the OS ever. Microsoft has ditched the familiar Start menu and introduced a Start Screen and tile-based Modern UI (formally known as Metro). This brightly coloured interface has been predominantly designed for touch input, but also works with a keyboard and mouse.

The traditional Windows desktop remains accessible in the standard version of Windows 8 for laptops and PCs, allowing you to run legacy applications. But ARM-powered tablets running Windows RT can access only the Modern UI and apps written specifically for Windows 8.

The Windows Store is new to Windows 8. Akin to Apple's App Store and Google's Play, it lets you download a selection of third-party apps to your device.

Windows 8 will be available in four flavours: Windows 8, Windows 8 Pro, Windows RT and Windows 8 Enterprise. The move dramatically simplifies the range of available Windows options.

Microsoft said: "We have talked about Windows 8 as Windows reimagined, from the chipset to the user experience. This also applies to the editions available. We have worked to make it easier for customers to know which edition will work best for them when they purchase a new Windows 8 PC or upgrade their existing PC."

Windows 8 or RT?

PCs and tablets running on an Intel or AMD x86 processor will be installed with the standard Windows 8 or Windows 8 Pro. The latter is designed for technology enthusiasts and business/technical professionals, and offers features such as encryption, virtualisation, PC management and domain connectivity.

Windows 8 Enterprise is the option targeted at business users, with extras including PC management and deployment, plus advanced security.

Originally named Windows for ARM, Windows RT is tailored to tablets running ARM processors. Touch-optimised

desktop versions of Microsoft Word, Excel, PowerPoint and OneNote are included.

One of the most highly anticipated Windows 8 tablets is Microsoft's own Surface (see opposite page). However, courtesy of Microsoft's many partners, many more Windows tablets will soon be available (see pages 17 and 21).

Upgrading to Windows 8

Upgrading to Windows 8 Pro from Windows 7, Vista and XP costs £25 via download, and £49 for a boxed version. Microsoft has also confirmed that anyone who has bought a Windows 7 PC since 2 June 2012 can upgrade for £14.99 under the Windows Upgrade Offer.

Customers currently using Windows 7 Starter, Home Basic and Home Premium will be able to upgrade to Windows 8 or Windows 8 Pro. However, those running Windows 7 Professional and Ultimate can install only Windows 8 Pro.

WINDOWS PHONE 8 ARRIVES

On 29 October, a few days after the launch of Windows 8, Microsoft introduced Windows Phone 8. The latest version of its mobile operating system is based on Windows 8 and shares the same Start Screen with adjustable live tiles. It also has support for multi-core processors and higher-resolution screens.

The first wave of devices to run Windows Phone 8 includes the Nokia Lumia 920 and 820, the HTC Windows Phone 8X, the HTC Windows Phone 8S and the Samsung Ativ S.

The bad news for existing Windows Phone users is that their software will not be upgraded – the hardware simply won't cope with it. Instead, Windows Phone 7 will be updated to a cut-down version called Windows Phone 7.8.



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APPLE REVEALS PINT-SIZED iPad MINI

Adds to its iPad line-up a 7.9in-screen tablet to rival Google's Nexus 7 and Amazon's Kindle Fire

Apple has introduced a smaller version of its popular iPad. The Californian firm has fitted its iPad mini with a 7.9in screen, placing it in direct competition with Google's Nexus 7, Amazon's Kindle Fire and other small-screen tablets.

Apple's original 9.7in form-factor has enjoyed huge success, but the "iPad mini is every inch an iPad," according to Philip Schiller, senior vice-president at Apple.

The iPad mini costs from £269, with various options including 16-, 32- and 64GB of storage, and either Wi-Fi-only or Wi-Fi + 4G connectivity.

The 7.9in screen uses the same 1024x768-pixel resolution as the original iPad and iPad 2. It's powered by the dual-core A5 processor and uses the smaller Lightning dock connector brought in with the iPhone 5.

The iPad Mini is 7.2mm thick and weighs 308g, making it 23 percent thinner and 50 percent lighter than the fourth-generation iPad. Other specifications include a FaceTime HD webcam, a 5Mp rear iSight camera, 4G LTE connectivity and a claimed 10-hour battery life.



Microsoft Surface now available for £399

Price matches Apple's fourth-gen iPad, with double the storage

Microsoft's Windows 8 Surface tablet is now on sale in the UK.

Microsoft's first own-brand tablet costs from £399, matching Apple's fourth-generation iPad but with double the storage, at 32GB. The Surface runs Windows RT, the tablet version of the OS written for ARM processors.

"Surface delivers the power of amazing software and the feel of premium hardware in one exciting experience," said Microsoft in a press release.

Two other SKUs of the Surface tablet are available: £479 gets you the 32GB

model with a Touch Cover, while for £559 you can get 64GB of storage and a Touch Cover. A Touch Cover can also be bought separately, at £99, in black, white or cyan. A black Type Cover costs £109.

The Intel-powered Surface Pro, which will run a standard version of Windows 8 and allow the use of software written for earlier versions of Windows, is expected to arrive early in 2013.

The Surface RT is preinstalled with Microsoft Office Home and Student 2013 RT Preview edition. The final version will be installed via a free Windows update.

Intel Haswell-powered laptops & PCs coming in first half of 2013

Double-runtime Ultrabooks set to arrive earlier than expected

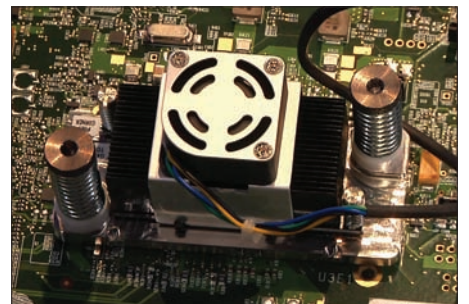
Laptops and desktops running Intel's next-generation Core processor, codenamed Haswell, will be available in the first half of 2013, said Intel CEO Paul Otellini.

The Haswell chip will succeed current Core processors codenamed Ivy Bridge, which became widely available in April. Haswell is expected to deliver twice the performance of Ivy Bridge and, in some cases, will double the battery life of Ultrabooks. These are thin-and-light laptops with a battery life of six- to eight hours.

Haswell chips will be "qualified for sale" in the first half of 2013, said Stacy Smith, chief financial officer at Intel.

Haswell chips draw a minimum 10W of power; by comparison, Ivy Bridge's lowest power draw is 17W. Intel has splintered the chips into two families: 10W CPUs for Ultrabook/tablet hybrids, and 15- and 17W models for other Ultrabooks and laptops.

A new integrated graphics processor will support 4K graphics, allowing a 4096x3072 resolution. Ultrabooks with Haswell chips



inside will also support wireless charging, near-field communication, voice interaction and extra security features.



O2 apologises for service outage

O2 has apologised for a service outage that affected millions of its customers in October. The mobile operator has said sorry after a technical problem with some network nodes left millions of O2 users unable to make calls, send text messages or download data on their smartphones and 3G tablets. According to the firm, around 10 percent of its 23 million customers were affected for three hours. It hasn't offered any compensation.

MORE: tinyurl.com/cox3mz6

WHSmith to offer free Wi-Fi instore

WHSmith has announced it will offer customers free Wi-Fi in its stores. The high-street retailer has partnered with The Cloud to install hotspots in 603 of its UK branches. The service began rolling out in September.

MORE: tinyurl.com/9fjunh4

Virgin broadband boosted to 120Mb

Virgin Media has started rolling out 120 megabits per second (Mbps) broadband to its customers. As part of the firm's 'Double your speeds' programme, 100Mbps subscribers will now receive up to 120Mbps - the fastest broadband available in the UK. Virgin Media said it expects the speed upgrades to complete in mid-2013.

MORE: tinyurl.com/9gu43nx

EE OPENS 4G NETWORK TO THE PUBLIC

Rival operators planning to launch competing networks ahead of schedule

EE, formally Everything Everywhere, has launched its 4G mobile broadband network in the UK.

The UK's first 4G network is available in 10 cities, with six more expected to gain access by the end of the year. Turn to *4G: Next-generation mobile broadband* on page 96 to learn more.

Olaf Swantee, CEO of EE, said: "We are delighted to announce the official launch of our new customer brand, EE, offering the UK's first super-fast mobile 4G and fibre-broadband service."

At the beginning of October EE made available for sale the first raft of 4G-capable smartphones, beyond the iPhone 5, via Orange and T-Mobile. Devices include the Samsung Galaxy S3 LTE, HTC One XL and Huawei Ascend P1 LTE.

The 4G network starts at £36 for 500MB of data, up to a maximum 8GB for £56. All plans include unlimited calls and text messages.

It has also been announced that rival networks will arrive sooner than expected, so EE won't be the UK's only provider of 4G services for long. Ofcom

has made it possible for operators such as O2 and Vodafone to launch their own networks in spring 2013, around five months ahead of schedule.

"This is a significant milestone for the UK, and for the people and businesses of our country who will be able to enjoy the huge advantages of super-fast 4G technology for the first time. We are very proud to be pioneering, innovating and leading our industry in launching 4G for our nation through our new EE brand," said Swantee.



VIRGIN MEDIA IN TALKS WITH EE OVER LAUNCHING 4G SERVICES

Virgin Media has confirmed that it is in talks with EE to launch 4G services that utilise its long-term evolution (LTE) network.

The news comes as the government's 4G peace talks with the UK's other mobile operators are "still in the balance", according to the *Financial Times*.

Ofcom's approval of EE using its existing 1,800MHz spectrum

to bring next-generation 4G services to the UK many months before its competitors has created much turmoil in the telecoms industry.

O2 and Vodafone must wait for Ofcom's 4G spectrum auction to roll out their own 4G services, which is due to begin at the end of this year. Both have been embroiled in legal

disputes regarding the country's competitive landscape once the spectrum has been allocated.

The operators are concerned that EE may attract a significant number of their customers if it is the only operator able to provide a super-fast 4G data connection. With 24-month contracts, it'll be some time before they have the chance to win them back.

Tesco Mobile announces free broadband deal

Year-long unlimited broadband deal available to all Tesco Mobile customers



In a first for mobile networks, Tesco Mobile has revealed that its 3.2 million pay-monthly, pay-as-you-go and SIM-only customers can get free broadband for a year.

"We're always listening to our customers' needs and thinking of new ways to offer great value. This is a tremendous deal and, alongside Clubcard points, enables customers to make significant savings," said Tesco Mobile.

Customers wanting to get in on the deal must pay £13.75 line rental per month, but will save a total £78 on the £6.50 monthly charge for Tesco Broadband.

To sign up, head to tescobroadband.com/mobile and enter your Tesco Mobile phone number and the promotional code sent to you within a text message. The free broadband offer is open until 31 December. ☒

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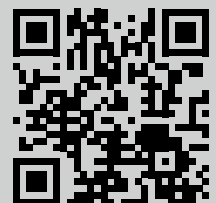
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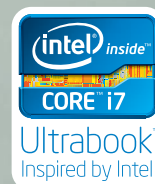
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Watch the full Megan Fox story online - Search 'Aspire S7'

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Growing interest in augmented reality



Following years of hype, augmented reality is finally attracting genuine consumer interest. Mikael Ricknäs reports

Google-owned Motorola's acquisition of Viewdle, a jump in the number of visitors to the insideAR conference, and Nokia's recent launch of the City Lens Windows Phone app all illustrate growing interest in augmented reality (AR).

Interest in the technology waned after it was over-hyped two years ago, but the idea is gaining traction once again. Google's Project Glass, a head-mounted display that started to be tested earlier this year, gave the concept a boost, according to Martin Herdina, CEO at AR vendor Wikitude.

AR allows computer-generated content to be superimposed over a live camera view of the real world.

"This year many big brands have started to invest. The change compared to two years ago is that AR isn't just a technology demo, but has a case for being used in the real world," Herdina said.

The implementation of the technology has also become more stable, he said.

Motorola hasn't commented on how it plans to use Viewdle's computer vision technology, which supports face, object and gesture recognition. But the deal shows that there is a growing interest in the technology, according to Daniel Gelder, vice-president of marketing at AR vendor Metaio, who believes that all smartphones will come with the functionality in two years.

The growing interest was further underlined at Metaio's October insideAR conference in Munich. The event attracted around 500 participants, which is twice as many as in 2011.

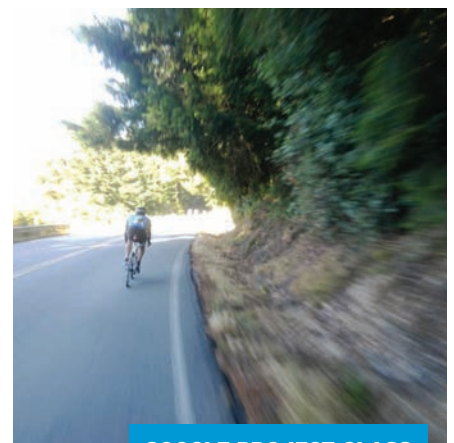
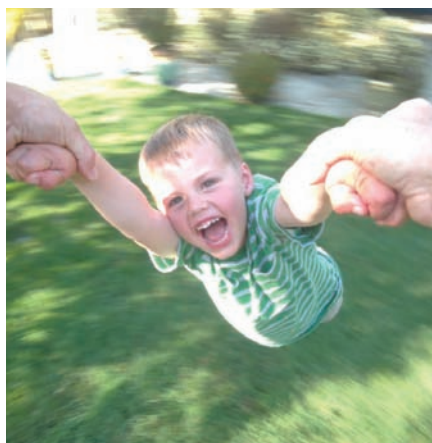
Speakers included Lego and Ikea. The latter has become a poster child for AR. Its 2013 furniture catalogue features additional content that's accessible through an AR app, which was developed using Metaio's SDK.

Although AR has been around for a long time, it's still very much a nascent market.

Chipset makers have and will continue to play an important in the evolution of the sector, as their products become increasingly optimised to help improve AR performance and smartphone battery life when using it, according to Gelder.

"The best way to do AR is to get it as close to the silicon as possible. This way you don't have to do everything at the app level, which uses a lot of battery and horsepower," said CCS Insight's Martin Garner.

If Google is getting credit for giving the AR field a PR boost, Qualcomm should get a nod for investing in companies such as Viewdle and the development of its Vuforia SDK. The company also offers FastCV, which allows developers to access hardware-accelerated functionality on its Snapdragon chips to improve performance.





“The way to engage with consumers is through apps, and brands want to do everything they can to make those apps more compelling”

”

Qualcomm is also seeing an acceleration in the adoption of AR.

“Multiple Vuforia-based applications have passed the one-million-download mark, and that is really significant,” said Jay Wright, who is responsible for developing and driving Qualcomm’s AR commercialisation strategy.

More than 1,800 commercial applications for Android and iOS have been built using Vuforia, a software-development platform that allows developers to build AR apps. The bulk of those apps are being used by large consumer brands to complement physical products and advertising, said Wright.

For example, Vuforia apps can allow consumers to view paper advertisements through smartphones, which then display additional content superimposed on the ads.

“In mobile, traditional display advertising doesn’t work like it did on the desktop,” said Wright. “Brands are realising the way to engage with consumers is through apps, and they want to do everything they can to make those apps more compelling.”

Building AR into the OS

Today, users experience AR by downloading a mix of different apps, but that may change if the functionality is integrated into the OS.

“I think it’s possible that the operating system providers could create their own first-party applications. Google and Apple certainly do that, and it’s foreseeable that one of them or Microsoft adds an AR app and/or APIs to the OS,” Wright said.

Nokia is taking a step in that direction by preinstalling the City Lens AR app on

its forthcoming Windows Phone 8-based smartphones, the Lumia 820 and Lumia 920. It’s already available for existing handsets.

Wright sees Nokia’s City Lens launch as a validation of the AR market. But when OS vendors themselves incorporate AR functions into OSes, third-party developers will become even more confident when writing apps, Garner said.

Herdina and Gelder both think that more large vendors will take on the AR challenge.

“This is just the starting point, and the easiest way for corporations to enter this field is through acquisitions,” said Gelder.

Herdina is a bit more careful: “I think Motorola is very early in this respect, so I don’t think there will be a huge acquisition trend this year. The large companies are still waiting and watching,” he said. ☒





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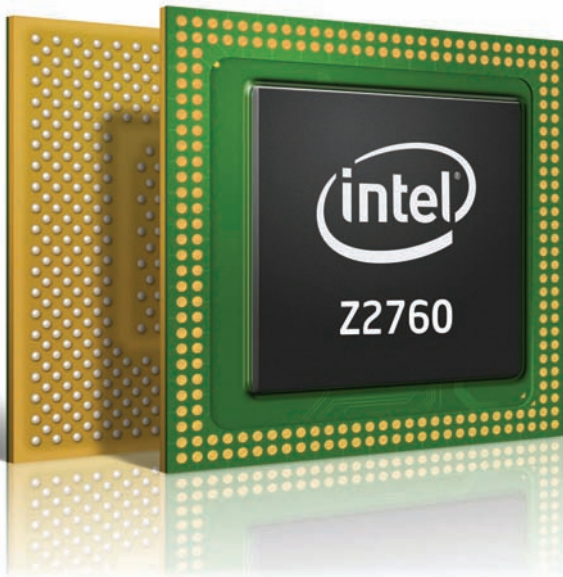
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Can Clover Trail break ARM's hold?

Intel is hoping that its forthcoming Clover Trail processor for Windows 8 tablets will be its ticket to success in the ARM-dominated market. Agam Shah explains

Tablets running Clover Trail, also known as the Intel Atom Z2760 processor, were set to come on to the market as we went to press, in line with the launch of Windows 8. The chip is said to facilitate long battery life and full-HD video.

While Intel dominates the PC processor market, it faces a tough mobile competitor in ARM, whose processors ship in most smartphones and tablets, including Apple's iPad. Intel has high hopes for Windows 8, and has worked with Microsoft to take advantage of OS features to provide fast performance and long battery life in tablets.

The upper hand

Microsoft will release Windows 8 for Intel-based tablets and Windows RT for ARM-based tablets. Only those running standard Windows 8 on Intel chips will be able to support legacy Windows applications and drivers. Users will be able to install existing Windows 7 programs and attach peripherals such as printers and cameras. That could be an issue with tablets running Windows RT, but these devices may have advantages in price and battery life.

Intel has a better chance to succeed in the tablet market with the touch-based Windows 8, said Dean McCarron, principal analyst at Mercury Research. Clover Trail's predecessors were used in tablets running Windows 7, which was a desktop- and not a mobile operating system.

Intel's primary goal with Clover Trail is to reduce power consumption in its tablet processors to allow it to catch up with ARM, whose chips were originally designed for smartphones and are considered to be more power-efficient.

Clover Trail is faster and more power-efficient than the previous Atom tablet chip, codenamed Oak Trail, which appeared in just a handful of Windows 7 tablets in 2011. Clover Trail is made using an advanced, 32-nanometre manufacturing process, which makes the processor smaller in size, while reducing power leakage.

"With each generation the product becomes a better fit," McCarron said. "Intel is doing everything it can."

Clover Trail tablets

Device makers have already shown off forthcoming tablets running Intel's Clover Trail chip. Lenovo announced the ThinkPad Tablet 2 (pictured below), while HP has unveiled its Envy X2, a hybrid laptop/tablet with a detachable keyboard. Asus and Samsung have also announced Windows 8 tablets running Clover Trail. A prominent name missing from this list is Microsoft, which has announced a Surface tablet based on Intel's faster, but more power-hungry, Core chips, and another with Windows RT.

Device makers have indicated the starting prices of Clover Trail tablets could be \$500 or higher - more expensive than the iPad.

The Atom Z2760 is a dual-core processor that runs at 1.8GHz and has 1MB of L2 cache. Depending on the configuration, tablets with the Z2760 can include NFC and LTE capabilities. Some of its image-processing features were drawn from the Intel Atom 'Medfield' smartphone chip, which is currently found in handsets from companies including Lenovo, Motorola, Orange, Megafon, ZTE and Lava International.

Intel is open to making Clover Trail variants for device makers, said Steve Smith, director of tablets at Intel. The initial Clover Trail chips will be tuned to Windows 8, although the company wants to tune the Linux OS to take advantage of its power-saving and graphics features. The company also offers Medfield for Android tablets.

Clover Trail will be succeeded next year by a tablet chip made using a 22-nanometre process, and by a 14-nanometre tablet processor in 2014. ☒





Lenovo is world's #1 PC maker

Lenovo has taken the crown from HP to become the world's top seller of PCs. Agam Shah reports

Lenovo took the top spot during a quarter in which PC shipments dropped due to a weak economy and pressure from mobile devices.

Of the top four PC vendors (Acer, Dell, HP and Lenovo), only Lenovo was able to grow its shipments. Its PC sales increased by almost 10 percent to 13.77 million units, giving it 15.7 percent of the market, according to Gartner.

HP's shipments dropped 16.4 percent to 13.55 million, putting it in second place with 15.5 percent of the market. Dell was in third place after its shipments declined by 13.7 percent, with 10.5 percent of the market.

A similar study by IDC had HP clinging to its top spot, with 13.95 million PCs sold compared to 13.82 million for Lenovo.

HP responded by saying IDC takes a more complete view of the market.

"While there are a variety of PC share reports in the market, some don't measure the market in its entirety. The IDC analysis includes the workstation segment and is

more comprehensive. In that IDC report, HP occupies the number-one position in PCs," said HP spokesman Mike Hockey.

Steps to success

Lenovo benefitted from building up its distribution channel and from "missteps" by its rivals, IDC said. HP is still trying to get its PC business back on track after reversing a plan to sell or spin off the division, and Dell has been moving away from lower-margin PCs and focusing on products that yield bigger profits.

Overall worldwide PC shipments totalled 87.5 million units in the third quarter of 2012, down 8.3 percent compared to the same quarter last year, Gartner said.

The third quarter, which includes the back-to-school season and is usually strong for PC shipments, was hit with weak economies globally and by buyers moving to smartphones and tablets for their computing. In addition, Ultrabooks failed to spark a revival in PC shipments, IDC said.

Strengthening the PC market

Looking ahead, the research firm expects the weak PC market to continue until the release of Windows 8, said David Daoud, a research director at IDC.

The US presidential election in November could also help the PC market, he said, by bringing some clarity to the US' economic plans and thus encouraging vendors to invest in new product development.

Vendors have been trying to clear out their Windows 7 PC inventory, and demand dropped as buyers waited for Windows 8 to arrive, Daoud said. The new OS could help PC sales recover in the fourth quarter.

Beyond Windows 8, a recovery in PC sales will depend on the success of thinner, lighter PCs, including products with tablet-like features such as touchscreens, instant-on functionality and longer battery life.

"Revival of the PC market will be linked to the way people look at the next generation of PCs," Daoud said. Ultrabook prices will also need to come down, he added. ☒

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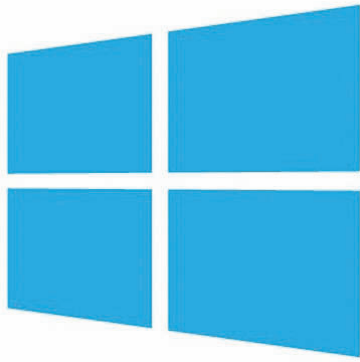
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Windows RT tablets, hybrids coming soon

Microsoft, Asus, Lenovo, Samsung and Dell are launching tablets running Windows RT, says Agam Shah



Microsoft recently opened the floodgates for Windows RT tablets. Its own Surface tablet is now available, with more devices from Asus, Dell, Samsung, Lenovo and Acer coming soon. The tablets are designed for long battery life and will compete with iPad and Android devices on price and features.

Windows RT comes with Microsoft Office Home and Student 2013 RT Preview, which includes the company's Word, PowerPoint, Excel and OneNote applications.

Here are the Windows RT devices that have been announced so far.

Microsoft Surface

The RT tablet getting the most attention is the Microsoft Surface. The tablet represents the first time Microsoft has made its own client hardware, and expectations are high.

The Surface costs £399 with 32GB of storage, and for an additional £99 you can buy a Touch Cover – a magnetic cover that includes a keyboard. A 64GB model costs £559 and is supplied with the Touch Cover.

The 680g, 9.3mm-thick Surface has a 10.6in screen and a quad-core nVidia Tegra 3 processor. Other features include front and rear cameras, Bluetooth 4.0 connectivity, a microSDXC card slot, USB 2.0 ports and 2GB of memory. Microsoft hopes to differentiate the Surface from rival RT tablets with a kickstand, too.

The tablet is initially available in the UK, the US, Canada, Australia, China, France, Germany and Hong Kong.

Asus Vivo Tab RT

Asus was the first to show off a Windows RT device with the Tablet 600, now known as the Vivo Tab RT. Asus has not yet officially

revealed the tablet's price, but US retailer Staples has tagged it at \$599 (translating to anything from £450 to £600 in the UK).

At 520g, the Vivo Tab RT is lighter than Microsoft's Surface, and also thinner at 8.35mm. The tablet has a 10.1in display, an nVidia Tegra 3 processor, 32GB of storage, 2GB of memory, a 2Mp rear camera and an 8Mp front camera. Its display supports a 1280x800 resolution, and there's support for micro-HDMI, microSD, Wi-Fi and Bluetooth.

Samsung Ativ Tab

Samsung is listing a 12-hour battery life for its Ativ Tab when playing movies and, if true, that's longer than anything available today. However, it's unclear whether that battery life will be achieved by using a dock that has a spare battery. The tablet has a 10.1in screen, weighs 570g and is 8.9mm thick.

Pricing for the tablet has yet to be announced, but UK-based online retailer Clove said it will become available in the US in late October for around \$880.

The tablet will run Qualcomm's dual-core Snapdragon S4 CPU, which is configured to deliver connectivity and all-day operation. The Snapdragon chip has integrated 3G/4G capabilities, but currently the tablet does not have mobile broadband features.

Windows RT is being pitched as a consumer OS, but Samsung has highlighted some enterprise features in the Ativ Tab, including Microsoft Exchange and Cisco virtual private network (VPN) support.

The Ativ Tab has both a USB 2.0- and a micro-HDMI port. It also has a software and hardware feature called AllShare, which allows the tablet to share multimedia files with other Samsung devices, such as Android-based Galaxy tablets and

smartphones. Other features include near-field communications (NFC) and Wi-Fi Direct, which allows devices to talk wirelessly without the need for an access point.

Lenovo IdeaPad Yoga 11

Lenovo's IdeaPad Yoga 11 is a hybrid laptop/tablet that runs Windows RT on an ARM processor. The device has an 11.6in screen that flips to turn the device from a laptop into a tablet. But with a starting price of £699, it won't be an easy sell as a tablet – especially as it's slightly heavier and more expensive than similar devices.

The device will run nVidia's Tegra 3 processor, and Lenovo did not say if it would have 3G/4G features. It weighs 1.27kg and offers 13 hours of battery life. Other features include 64GB of storage, 2GB of memory, a HDMI output, a 720p webcam, a USB 2.0 port and a media card reader. The Yoga 11 will go on sale in December.

Dell XPS 10 tablet

Dell is re-entering the consumer tablet market with the XPS 10, which has a 10.1in screen and runs Windows RT. The company is targeting the tablet at the bring-your-own-device (BYOD) phenomena. System administrators can disable the tablet if it's lost or stolen, and deliver software images and updates from afar. The tablet has a Snapdragon S4 processor, but other hardware details are not available. The price and specs will be available at a later date.

Other RT tablets

Acer plans to announce a Windows RT tablet at a later date, while Toshiba has temporarily scrapped plans to launch a device based on the Windows RT OS.

[Continues >>](#)



7 things to look for in a Windows 8 tablet

Windows RT or 8?

Microsoft has engineered Windows RT for touch, internet connectivity and long battery life, and some tablets highlight those features. Windows RT is viewed as more of a tablet operating system in the mould of Apple's iOS, while Windows 8 tablets may appeal to PC users looking for backward application compatibility. The cheapest RT tablet is Microsoft's Surface, which starts at £399. Windows 8 tablets will be competitive on price, however.

Application compatibility

With a few exceptions, existing Windows applications will not work on RT. This is partly because ARM processors haven't previously supported major desktop Windows client OSes. But existing applications will work on Windows 8, as previous Windows OSes over the past few decades were written primarily for Intel or AMD processors. Microsoft has adopted a new application model with Windows RT and 8, and users will be able to download apps through the Windows Store.

Peripherals and accessory compatibility with RT

A lack of drivers may prevent some older peripherals, such as printers or cameras, from working with RT, but that doesn't mean your peripherals won't work. It's worth checking with device makers to see whether they have drivers for RT. Dell and HP have published compatibility lists for their printers.

Memory limit

Windows RT is only 32bit, so tablets running the OS can draw on only up to 4GB of RAM. Windows 8 tablets with Intel's Clover Trail Atom chip will also be only 32bit. However, tablets with Intel's PC-like Core processors run a 64bit version of Windows 8, and can handle more RAM and storage.

Tablets are adequately served with 32bit processors today but, with the usage of demanding applications growing, storage and memory needs will increase in mobile devices. ARM has taken a step ahead by announcing its ARMv8 64bit architecture, with chips likely to appear in 2014. Microsoft has not announced its 64bit plans for Windows RT.

ARM processor options

Windows RT tablets have already been announced with chips from nVidia and Qualcomm, which are based on ARM processors. Microsoft's Surface, Asus' Vivo Tab RT and Lenovo's IdeaPad Yoga 11 hybrid use nVidia's quad-core Tegra 3 processor, which may appeal to gamers and users looking for fast performance. Samsung's Ativ Tab and Dell's XPS 10 run Qualcomm's dual-core Snapdragon S4, which balances performance, battery life and connectivity.

Hardware limits

Windows RT tablets have only USB 2.0 ports. However, backward compatibility allows peripherals such as external storage devices with USB 3.0 ports to connect to RT tablets. The peripherals will work only if compatible with Windows RT, though. USB 3.0 ports are available in Windows 8 tablets running Intel's Core processors.

Enterprise features

Dell and Samsung have highlighted enterprise features in RT tablets. Dell's XPS 10 tablet can be remotely disabled if lost or stolen, and software images and updates can be pushed to tablets. Dell has also included some security features such as TPM, a hardware-based cryptography and authentication technology. Samsung has included Microsoft Exchange and Cisco VPN support in its Ativ Tab. ☒

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9. Toshiba Portégé Z930-11G Ultrabook

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Order: NRQ571944

£849.99 Ex VAT



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MISCO.co.uk

CHRIS
MARTIN**Apple iPad mini >>***Tablet*

Apple has broken tradition and made a smaller version of its iPad. The iPad mini has a 7.9in screen with the same 1024x768 resolution as the iPad 2. It uses the Lightning connector found on the iPhone 5 and supports 4G LTE in the UK.

From £269 inc VAT
apple.com/uk

**13in Apple MacBook Pro with Retina Display <<***Laptop*

Apple's most popular Mac now has a Retina display. The resolution has been doubled in both directions to 2560x1600, totalling more than 4 million pixels. Other features include a dual-core Ivy Bridge chip, up to 768GB of flash storage and two Thunderbolt ports.

From £1,449 inc VAT
apple.com/uk

**Apple iMac >>***All-in-one PC*

The latest iMac design is thinner than ever - tapering down to just 5mm at the edge. Apple has binned the optical drive, but there is an Intel Ivy Bridge processor, a hybrid storage system called Fusion Drive, plus USB 3.0 support. Its available in 21.5- and 27in.

From £1,099 inc VAT
apple.com/uk



Lenovo IdeaPad Yoga 11**Hybrid laptop/tablet**

The IdeaPad Yoga 11 is an nVidia Tegra 3-powered Windows RT tablet. Its 360-degree hinge allows it to morph from laptop to tablet, and anything in between. It's 15.6mm thick and touts a 13-hour battery life.

£699 inc VAT

lenovo.com/uk/en

**Nintendo Wii U****Games console**

The Wii U is the latest console from Nintendo and successor to the Wii. A range of specifications has been upgraded, but the key new feature is the GamePad. This has its own touchscreen and can be used independently of the main console.

£249 inc VAT

nintendo.co.uk



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⬆ **Bowers & Wilkins A5**

Speaker dock

The A5 is a wireless speaker dock compatible with iPhone, iPad, iPod touch and iTunes via AirPlay. Its compact, four-driver design is useful for those who have limited space, but don't want to compromise on sound.

£399 inc VAT
bowers-wilkins.co.uk

⬇ **HTC Windows Phone 8X**

Smartphone

The Windows Phone 8X is HTC's first smartphone to run Microsoft's Windows Phone 8 operating system. It will rival Nokia's Lumia 920 with a 4.3in (720x1280) display, an 8Mp camera, a 1.5GHz dual-core processor and 16GB of internal storage.

Around £400 inc VAT
htc.com/uk



⬅ **Acer Iconia Tab A110**

Tablet

The Iconia Tab A110 is Acer's answer to the Google Nexus 7. Unlike its competitor, it offers a microSD card slot and an HDMI output. It, too, runs Android 4.1 Jelly Bean, but it's a bit chunkier and has a lower resolution screen at 1024x600.

£179 inc VAT
acer.co.uk



⬆ **Logitech K810**

Keyboard

Logitech's latest Bluetooth keyboard is the K810. It's designed for Windows 8, but also compatible with Android and iOS. You can switch between devices and operating systems with a single press of the K810's backlit keys.

£89 inc VAT
logitech.com/en-gb

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Sony Vaio Duo 11 >>

Hybrid Ultrabook/tablet

Sony's Vaio Duo 11 is one of the first hybrid Ultrabooks, also known as a convertible, to run Windows 8. It combines a tablet and a laptop in one device. A sliding mechanism reveals a keyboard hidden behind the screen.

£999 inc VAT
sony.co.uk



<< Barnes & Noble Nook HD

Tablet

Barnes & Noble is hoping to take on Google's Nexus 7 with its Nook HD. It has a 7in screen with a 1440x900 resolution. Android 4.0 Ice Cream Sandwich runs on a 1.3GHz dual-core processor. The 8GB model is the same price as the Google Nexus 7 but, unlike its rival, it includes a microSD card slot.

£159 inc VAT
uk.nook.com



Samsung Galaxy S III Mini >>

Smartphone

As you'd expect, the Galaxy S III Mini is simply a smaller version of the S III - although, with a 4in screen, this handset is far from tiny. Its slightly lower specification includes a 1GHz dual-core processor and a 5Mp camera, but it ships with Android 4.1 Jelly Bean.

Around £300 inc VAT
samsung.co.uk

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Samsung Galaxy Note II **36**



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ANDREW
HARRISON

Ding, Dong, the Wintel witch is dead!

Well, not exactly dead, but possibly approaching her twilight years. That's the duopoly of Microsoft's Windows plus Intel's processors, the partnership that had the personal-computer industry in a stranglehold through most of the past two decades.

Personal computing has evolved from beige boxes on the desk to phones, laptops and tablets we carry everywhere. For the incumbent technology companies, though, adapting to that shift has been glacial – especially so for Microsoft. Both built empires around a predictable cycle of business- and home users refreshing their PCs, most of whom had little idea that better user-focused options were emerging.

Even side-stepping the fact that computing is now a mobile experience, the entrenched desktop/keyboard/mouse computer has little need to be improved upon. There was a time when the PC was begging to be upgraded every two years, to keep it snappy as increasingly weighty software conspired to slow it down. Nothing illustrates that better than the introduction of Vista, a treacherous OS that demanded powerful hardware to run with a semblance of ease.

Vista truly marked the height of Microsoft's hubris, and offered little of benefit over the XP it was replacing. When Vista effectively flopped, Microsoft tried to steer its lumbering carrier back on course with a leaner service pack better known as Windows 7. But in the innovating world of mobile, it offered nothing.

Windows 7 was less important to businesses that needed a functioning desktop, particularly those that were already satisfied with XP. Microsoft looked deeper and finally realised its failure was

in serving the needs of its customers. Of course, Microsoft's customers are not its users, but the PC manufacturers that bulk-buy Windows to preinstall on new machines.

Power to the people

The 21st century has seen the rise of people power. Consumers are less happy sticking with clumsy, insecure systems when attractive, powerful and portable products with clean interfaces are available.

In this real consumer-focused market, Microsoft had to fork its strategy – to somehow keep selling Windows and Office to businesses trapped in a Microsoft monoculture, and to start actually pitching its wares at end users.

Windows 8 sees the move to push on every PC user a new touch-centric interface. Only, in my opinion at least, there's an elephant in the room: it's pretty rubbish. Designed by committee, it has the power to trip up Windows veterans who don't want huge tiles across their screen; and getting daily tasks done on the desktop is confused after switching between interfaces. Meanwhile, touch-based Office apps on tablets still suffer from fat-fingered awkwardness.

The Microsoft ecosystem, hardware and software is unprepared for touchy Windows. Proper touch displays aren't available, software drivers aren't finished. It's telling when even old hands struggle to make sense of a schizoid interface. As we stumble through the century's second decade, it's becoming clear that it's not so much a post-PC era, as maybe just a post-Windows one. ☒

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All prices are RRP's quoted by the manufacturer or distributor and include VAT. Prices are intended as a guide and products are not guaranteed at our quoted price. PC Advisor's recommendations are for guidance only. The publisher takes no responsibility for purchasers' decisions.

£150 inc VAT

Contact

■ viewsoniceurope.com/uk

Read more

■ tinyurl.com/csq2h7p

Specification

23.6in monitor; 1920x1080 resolution; 16:9 aspect ratio; 0.27mm pixel pitch; TN panel; tilting stand; white LED backlight with 40,000 hours rated life; anti-glare, 3H hardness panel coating; 250cd/m² rated brightness; 1,000:1 rated contrast; 170/160-degree (H/V) viewing angles; 5ms response time (typical); 2ms grey-to-grey; VGA; 2x HDMI 1.3; external power adaptor; 3-year warranty; 581x447x194mm; 3.5kg

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



23.6in MONITOR

ViewSonic VX2460H-LED

At 6.8mm thick, the ultra-slim VX2460H-LED offers a sleek alternative to the many chunky, generic-looking displays on the market. It's a 23.6in model that sports a space- and energy-saving LED backlight.

The display is mounted on a small tilting plastic stand, which is more elegantly proportioned than most. The panel itself is thin, but its thick glossy black bezel is unsuitable for gamers wanting a multiscreen setup, for example. A matt panel cuts down on unwanted reflections, making for easier viewing.

To the rear, a standard VGA port is complemented by a pair of HDMI inputs. This will be useful if you want to simultaneously plug in a PC and a Blu-ray player or gaming console. You will need an adaptor if you want to use DVI, though.

The monitor doesn't use display presets for photo, gaming and movie modes, but offers discrete controls for tweaking the response time and enabling the dynamic contrast function, which we were pleased to find is turned off by default. You can still use this to pep up your gaming or movie-watching experience.

There's no Vesa mount for hooking the ViewSonic to a wall, nor any built-in speakers, but a 3.5mm audio jack lets you plug in an external set of speakers, with

the audio fed from either of the HDMI sources.

The display is controlled by a row of touch-sensitive controls. We initially found these difficult to see - it's not immediately obvious where the power switch is, for example, but the screen becomes simple to use once you get the hang of it.

The VX2460H-LED features a standard twisted-nematic (TN)-based panel. This will be fine for most users, although the image quality it can achieve is considerably less impressive than that of the in-plane switching (IPS) panels that are becoming increasingly common in monitors at this price.

The display suffers from the usual reduced viewing angles inherent to TN technology, resulting in colours appearing less consistent across the surface of the screen. This is nothing to worry about for those who just want a display with a little style, but those users who want to edit photos or video would be advised to instead invest in an IPS display.

That said, our tests revealed relatively good performance across the board, making this one of the better TN displays we've seen. Contrast, brightness and colour accuracy are all better than expected. Calibration with a



Datacolor Spyder 4 showed that very little correction is required.

The maximum brightness after calibration was 229cd/m², and the contrast ratio in the checkerboard test reached 710:1. Colour error peaked at 5.87 deltaE, with an average figure of 0.89. The panel could cover 98 percent of the sRGB gamut, and 77 percent of AdobeRGB.

The LED backlight helps to keep power consumption low, with 15W required to operate at 120cd/m².

Verdict

The VX2460H-LED is a slim and stylish monitor that performs well and comes with a trio of useful inputs. Its image quality is bettered by IPS displays, but this model is an improvement over the budget displays often bundled with PCs.

✉ **Paul Monckton**

£399 inc VAT

Contact

■ cambridgeaudio.com

Read more

■ tinyurl.com/bpb5toc

Specification

24bit/96kHz stereo D-A convertor; stereo analogue RCA; coaxial, optical S/PDIF; ethernet; 802.11b/g/n; 2x USB 1.1; 67x270x285mm; 2.1kg

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



NETWORK AUDIO PLAYER

Cambridge Audio Sonata NP30

This compact network audio player is smart enough to sit in the lounge, where it can provide a musical link between a NAS or PC and a stereo system. As well as playing locally stored audio, it can tune into internet radio stations.

Available in black or silver, the NP30's neat fascia has a four-line fluorescent display and a rotary control. You can navigate the menu and settings using the dial and buttons or a remote control. The NP30 can display embedded album art and basic metadata.

Having connected the unit to your network over Wi-Fi, most playback options can be controlled via a free iPhone app, too.

On the rear are stereo analogue outputs, as well as Toslink/coaxial digital. The latter are invaluable for adding an outboard digital-to-analogue (D-A) convertor.

A recent upgrade has added to the NP30 support for Apple Lossless. Updates are flagged onscreen when available, and no PC is needed to install the firmware.

The NP30 is capable of good sound quality. We tested the unit in a system using a Leema Acoustics Tucana II integrated amplifier and Harbeth LS3/5A speakers.

The audio files were hosted on a Synology DS1010+ NAS drive.

With 16bit WAV or lossless files, the NP30 offers a finely etched

sound. It leaned toward illumination of the treble, which gives it a slightly bright overall balance.

Bass is extended, but it's not as rich or articulate as that of a similar CD player. The soundstaging is good but, again, loses out to dedicated separates, with some loss of precision in stereo and image depth.

The sound quality can be quickly upgraded with hardware such as the Arcam rDAC. This outboard D-A convertor opened a smoother sound, particularly in the higher frequencies with low-grade MP3.

Playback from a folder of files is gapless, so there's no perceptible join when playing albums that have segued tracks.

£70 inc VAT**Contact**■ dlink.com**Read more**■ tinyurl.com/9Lgff8y**Specification**

Dual-band wireless router; 802.11a/b/g/n; 2.4GHz and 5GHz concurrent; 4x gigabit LAN; 1x gigabit WAN; USB 2.0; Wi-Fi Protected Access (WPA/WPA2); WPS; IPv6; remote cloud access storage; remote cloud router access control; 111x93x145mm

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

**WIRELESS ROUTER****D-Link Cloud Gigabit Router N600**

The Cloud Gigabit Router N600, also known as the DIR-826L, is one of D-Link's new line of connected wireless routers. It offers not only a link with your home network, but remote access from afar.

Setup is painless. Inside the box is a small card with the essential SSID, password and admin login details, and a wizard guides you through configuration.

The router's cylindrical shape makes a pleasant change from the standard box design of most routers. Ports at the rear include WAN for connection to a cable or ADSL modem, four gigabit ethernet connections, plus a USB 2.0 port for hooking up an external hard drive for access over the web.

It looks very similar to the DIR-636L we reviewed last issue (see tinyurl.com/bogmro9), but the DIR-826L adds a 5GHz radio. This is a significant change, allowing you to simultaneously run both 2.4- and 5GHz wireless networks.

This dual-band setup is better suited to large households that have several devices demanding a simultaneous connection to the web. The 5GHz band experiences less interference from competing devices than the 2.4GHz frequency; it also offers faster data-transfer speeds for streaming and file access at close range.



The router's cloud features work on two levels. First, you can access its web administration interface from a mobile device in a remote location. This makes it possible for parents to monitor their child's internet activity without direct and visible supervision, for example.

The router updates its log of the sites your child has visited in real time, then relay them to your iOS or Android device. This is very simple to set up and can be entirely handled through an online account.

Second is the ability to locally or remotely access the files stored on an external hard drive connected to the router via USB. Note that

the router must be configured in bridge mode to prevent double-NAT from breaking the connection if the D-Link is plugged into a combination modem/router.


The Cloud Gigabit Router also offers remote intrusion detection and Wi-Fi Protected Setup (WPS).

Wireless performance is surprisingly good, given the relatively low price. Using the 5GHz band, we recorded data-transfer rates of 142Mbps with our test PC 1m from the router, and 115Mbps at 7m distant. At this price point that's about as good as you can expect.

With the PC 10m from the router, the D-Link was still able to sustain a 44Mbps data throughput using its 5GHz band.

Performance with the 2.4GHz radio is similar to that of the DIR-636L. We recorded 90Mbps at 1m and 43Mbps at 10m.

Verdict

A reasonable price tag and a strong combination of features makes the D-Link Cloud Gigabit Router N600 a useful option for families. Its ability to operate simultaneously on both the 2.4- and 5GHz frequency bands allows it to provide fast data throughput to all users, while its cloud features allow useful access to media and control over the network from afar.  **John Taylor**



Cambridge Audio promotes its Stream Magic music platform, which unites various sources. Internet radio is simple to browse, as are various podcasts. There's a hook into the Aupeo personal service, which offers interesting content, but ad-free costs £50 per year.

BBC iPlayer streams are also available, and near-CD-quality Radio 3 is available at 320kbps AAC.

High-res audio introduces to the music more body, hinting at the

warmth of analogue-like naturalness when compared to 16bit rips. This can be heard in acoustic instruments such as double bass and strings, which have a richer, life-like tone.

Uninterrupted playback of these high-bitrate files wasn't secure over our 8m wireless link; we'd advise using a wired ethernet connection.


To earn its keep as a trusted music source at home, a player must be simple to use, present music in an easily navigable fashion, and be dependable in operation.

Stability could be improved. We experienced numerous crashes, typically after selecting an album over UPnP. The NP30 would reboot, a process taking a long half-minute.

On restart, we had to drill through the library to find the album, which played fine on the second attempt.

The NP30 can list directories of hundreds of files within seconds. It's also able to show track names with foreign characters, which are lost on some network players.

Verdict

The Cambridge Audio NP30 sounds good with CD-quality material, and great with 24bit audio; its sound can be enhanced with an outboard D-A convertor, too. The addition of ALAC support is a very useful string to the Sonata NP30's already strong bow.  **Andrew Harrison**

£520 inc VAT

Contact

■ samsung.com/uk

Read more

■ tinyurl.com/9zg3kpw

Specification

1.6GHz Exynos 4412
Quad (ARM Cortex-A9
quad-core); ARM
Mali-400MP graphics;
5.5in (1280x720) Super
AMOLED display; Google
Android 4.1.1 Jelly Bean;
3G: HSPA+ 21Mbps (HSDPA
21Mbps/HSUPA 5.76Mbps);
4G LTE: 100Mbps/50Mbps
(HSDPA 42Mbps/HSUPA
5.76Mbps); 2GB RAM;
16GB storage; microSD
slot; micro-SIM; A-GPS,
Glonass; 8Mp rear-facing
camera, 1920x1080 video;
1.9Mp front camera;
3.5mm headset jack;
Micro-USB; 11.78Wh
removable lithium
battery; 151.3x80.6x9.9mm;
184g

Build: ★★★★★☆

Features: ★★★★★★

Performance: ★★★★★☆

Value: ★★★★★☆



SMARTPHONE

Samsung Galaxy Note II

The Galaxy Note II is pegged as a smartphone, but it's easy to mistake this huge 5.5in-screen handset for a tablet. A smartphone this broad and tall falls more naturally into two-handed operation.

We like the user's introduction to the handset: upon thumbing the power switch on the upper right, the lock screen shows an elegant white feather quill on a sky-blue background, evoking images of a creative writing device. And that's the major attraction in this powerful slice of hands-held computing.

The Note II includes a Wacom-licensed pressure-sensitive stylus called the S Pen, which slots away underneath when not required. Pulling out the stylus and bringing it close to the screen (sometimes) lets the Note II know you're about to do some sketching or scribbling. Getting this Air View function to work effectively requires practice, as do many of the Note's other features.

Its recognition of cursive English scrawl is impressive, but we were still frustrated by transcription errors. These took more time to correct than they would using a virtual Qwerty keyboard.

More complexity arrived with the Multi Window feature, which lets you view two apps side by side. This was added via an update, with no explanation of how to use it. An annoying rounded tab is left on the



screen at all times; when dragged across, it reveals all compatible apps. You can, for example, play a video while browsing a web page. It's a neat way to underline a mobile's multitasking capability.

Tablet vs smartphone

There's no denying this is a large device, even by modern mobile standards. It's around 151mm high and 81mm wide, and 9.9mm thick.

Our sample weighed a not insubstantial 214g when fitted with an optional Samsung cover flap that wraps around the front. Without this, the Note is a trimmer 184g.

In use, we found the Note II is really a two-handed device - one to hold, one to tap. Samsung offers an option within Android's Settings titled 'One-handed operation', which places the onscreen keyboard, dialpad and calculator to one side.

Bringing up the dialpad still requires two hands, since its icon is out of the reach of a thumb.

The build is plastic, but good, feeling weighty and all-of-a-piece in the hand. The screen quality is excellent, and it doesn't reveal the same over-ripe colouring of other Samsung Super AMOLED displays.

Picture quality from the 8Mp rear camera is good. High-contrast areas show purple fringing, although the camera is fast in operation.

Recorded HD video is usable, but it suffers from focus-hunting issues even in good light. Shot footage looked smeary on even slow pans.

Internal specifications

The Note II's innards are very similar to those of the Galaxy S III. Inside is a Samsung Exynos 4412 SoC based on a quad-core ARM, but clocked at 1.6- rather than 1.4GHz. This is the

fastest-clocked ARM smartphone we've seen and, combined with Android's latest 4.1 Jelly Bean OS, it bodes well for performance.

Jelly Bean promises smoother graphics, here powered by an ARM Mali-400 MP GPU. It's relatively speedy, and faster than the nVidia Tegra 3, if well short of the fastest available mobile graphics solutions.

In our performance tests, the Note II approached the capability of the iPhone 4S. It managed 17fps in the Egypt HD test, against 19fps for the previous-generation Apple phone. The iPhone 5 played the same benchmark at 38fps.


To gauge processor speed, we use Geekbench 2. Averaged over five runs, the Note II scored 1,958 points, which is the highest score we've seen from this test.

In the SunSpider JavaScript test, the Note managed a very good 1,022ms. By comparison, the S III scored 1,447ms in the same test, and the iPhone 5 903ms (a lower score is better here).

The Note II works with EE's 4G LTE network. This wasn't available at the time of testing, so we measured 3G performance. The Samsung averaged of 11.1Mbps download, and 2.35Mbps upload, versus 15.4- and 2.73Mbps for the iPhone 5.

We found battery life good enough to last two days of sporadic use, in part thanks to a large 11.78Wh removable battery packed inside.

Verdict

Whereas the Galaxy S II and III were Samsung's answer to the iPhone, the Note II's handwriting capabilities are targeted at a different type of user. It's faster and has a bigger screen than the S III, but too big for one-handed use.  **Andrew Harrison**



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■ tinyurl.com/8c7Lyco

Specification

1.8GHz Intel Core i5-3427U; 2.8GHz Turbo; OS X 10.8; 4GB DDR3L 1,600MHz RAM; 256GB SSD; 13.3in (1440x900) glossy LCD with glare-reduction coating; Intel HD Graphics 4000; 802.11a/b/g/n 2x2; Bluetooth 4.0; Thunderbolt; 2x USB 3.0; SDXC slot; FaceTime HD webcam; stereo speakers; mic; headset jack; multitouch trackpad; MagSafe 2 connector; 45W power adaptor; 50Wh lithium-polymer battery (non-removable); iLife; 325x227x4.0-17.5mm; 1.34kg

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



LAPTOP

Apple MacBook Air 13in (Mid-2012)

PC ADVISOR
GOLD



The 15in MacBook Pro with Retina Display grabbed all the limelight when it launched in June. At the same launch event, though, its lightweight compadre the MacBook Air benefitted from a quiet refresh. And a most useful one at that.

Two updates help to keep the Air one of the fastest Ultrabooks around, while another two make it even more comfortable to use.

When Intel released the mobile versions of its third-generation Core-series chips earlier this year - the processors better known by their codename of Ivy Bridge - the MacBooks were among the first to benefit. In the case of the 2012 MacBook Air we again see the low-voltage editions being pressed into service. This time, it's the Intel Core i5-3427U, which headlines at 1.8GHz, but accelerates up to 2.8GHz on demand in Turbo mode.

Aside from the lift in number-crunching performance we usually see with a more efficient processor architecture - here shrunk from 32-nanometre (nm) to 22nm - Intel has sprinkled upon the chip's integrated graphics system even more pixel dust. We've seen how this has paid off in other Ultrabooks, with a healthy boost in graphics and gaming performance.

Performance

Whereas last year's Sandy Bridge models were capable of 17fps in our standard Fear game test at Maximum detail, Ivy Bridge laptops typically get around a 60 percent increase in video framerates. This MacBook Air recorded a playable 29fps, returning to Apple's ultraportable the ability to take

on light gaming duties after the dedicated nVidia chip was removed from the specification last year.

The laptop's memory is soldered to the motherboard and can't be upgraded. Fortunately, Apple has now made 4GB the standard quota for both 11- and 13in machines. The memory is faster, too, moving from 1,333MHz to 1,600MHz. At purchase time you can customise the 13in Air's spec to include 8GB of memory, which adds £80 to the price.

The processor and memory upgrades have provided a measurable boost to performance. We installed Windows 7 to run our benchmarks, and saw this model's WorldBench 6 speed score rise from the 122 points of its predecessor to 132. That's plenty quick for any laptop, let alone an ultraportable.

While running Windows 7 we also used PCMark 7 to measure overall system performance. The Air scored 4,497 points overall, which is faster than all but one of the laptops and some of the desktop PCs in this issue's group test (see page 60).

Breaking down that PCMark 7 score, the 2012 MacBook Air recorded 4,380 points in the Lightweight test, 3,781 in Productivity, 3,392 in Entertainment and 7,572 in Creativity. The Computation score was 11,234.

Geekbench showed an average score of 7,903 points, which is a 34 percent increase over its predecessor's 5,860-point score.

We were pleased to find all this go-faster fun wasn't spoiled by shorter runtimes. In fact, we measured an extension in battery life. The Air has the same 50Wh lithium battery as the two previous models, but it recorded a runtime well over 8 hours (500 minutes) in MobileMark 2007. That's a more useful upgrade than any other.

Features

No changes have been made to the sculpted one-piece aluminium casework, other than a revision to MagSafe 2 for the power connector, and the movement of legends from the left to the right of each port.

MagSafe 2 is electrically (and magnetically) similar to Apple's original safety cable, which holds in place the charging plug via magnets. Mk II is very slightly smaller, designed with even slimmer laptops in mind. The move to the newer design here is probably as much about unifying the revision across the MacBook line-up as it is a pressing need to squeeze into a slimmer sidecheek.

Not so visible is an upgrade to the webcam built into the Air's screen bezel. This is now listed as a FaceTime HD camera, and it allows calls over Skype or Apple's own video-chat system to be made at 1280x720 - subject to your internet pipe being fat enough for the increased bandwidth.

The final tweak we could find on 2012's MacBook Air is to the cooling fan. Just like the Retina MacBook Pro, the Air now has an asymmetric-bladed fan to reduce resonance, and associated whirring noise. In use, we can vouch for the extremely hushed operation of the latest MacBook Air. It's got to be the quietest ultraportable ever made.

Verdict

This revised 13in MacBook Air is a little bit faster in general speed, and a lot faster in graphics speed - if only catching up with 2010's Air. It also has an extra hour of battery life, and an even quieter fan. This is the premier Ultrabook, with quality touches that let it stand out among every Windows Ultrabook we've seen. Andrew Harrison



£799 inc VAT**Contact**■ braebo.com

Read more

■ tinyurl.com/cjc5w5w**Specification**

3.4GHz Intel Core i7-3770; Windows 7 Home Premium 64bit (as tested); MSI H61M-P31; 8GB 1,333MHz DDR3 RAM; 1TB Samsung HD103SJ 7,200rpm SATA HDD; Braebo Pegasus case; 700W Alpine PSU; 21.5in BenQ G2255 monitor; Intel HD Graphics 4000; Logitech LS21 2.1 speakers; DVD writer; 9x USB 2.0; DVI; VGA; 2-year return-to-base warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**DESKTOP PC****Braebo Pegasus**

The Pegasus is a general-purpose family PC, with the surprising inclusion of a high-performance Intel Core i7-3770 processor.

Usually the preserve of enthusiast machines, this 3.4GHz quad-core chip uses Hyperthreading to offer twice as many processing threads as the Core i5-3570 more often seen in family systems.

Family PCs are about more than just raw speed. And although the Pegasus' WorldBench score of 164 points makes it perfectly adequate for home use, it is bettered by PC that use less expensive CPUs.

A 1TB hard disk is included, along with 8GB memory. These are hooked up to an MSI motherboard, which doesn't support USB 3.0. You can add the functionality for around £20.

Given the capable integrated graphics of its processor, the Pegasus wisely omits a dedicated graphics card. Its Intel HD Graphics 4000 is adequate for a family PC and noticeably faster than the integrated graphics of the cheaper

Core i5-3570. This PC can achieve playable framerates, even in a tough game such as Crysis with the detail settings reduced.

BenQ's G2255 monitor is bundled, which is significantly better in both build and image quality than the low-end screens UK systems builders tend to include with their machines. At 21.5in it's a little small for entertainment, though. We usually see 24in screens at this price, on which small text is easier to read. Braebo hasn't included a Blu-ray-compatible drive, so you won't be able to watch Blu-ray films on this full-HD panel without adding an external drive.


The system comes with an underwhelming wired keyboard and mouse, but redeems itself somewhat with a handy built-in memory-card reader and a Microsoft LifeCam HD 3000 webcam. The latter supports



HD capture at 720p resolution and is useful for Skype conversations.

Also included is a copy of Microsoft Office 2010 Home and Student Edition, plus 500GB of LiveDrive online storage for the lifetime of the PC.

Verdict

As a family PC the Braebo Pegasus offers some useful features, including an HD webcam, a card reader and 500GB of online storage. However, budget invested in its costly Core i7 CPU would have been better spent on an SSD, Blu-ray and USB 3.0.  **Paul Monckton**

£827 inc VAT**Contact**■ computerplanet.co.uk

Read more

■ tinyurl.com/c3vrdeh**Specification**

3.4GHz Intel Core i5-3570K; Gigabyte GA-B75M-D3H; 8GB DDR3 RAM; Windows 7 Home Premium 64bit (as tested); 1TB Seagate Barracuda; Cooler Master Elite 343 case; 600W Cooler Master PSU; nVidia GeForce GTX 650 Ti, 2GB VRAM; 2x USB 3.0; 7x USB 2.0; VGA; DVI; HDMI; 10x BD-R/DVD \pm R drive; memory card reader; 3-year warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**DESKTOP PC****Computer Planet Elite 2000**

The Elite 2000 from Computer Planet is targeted at families, but powered by a 3.4GHz Intel Core i5-3570K – the unlocked Ivy Bridge CPU beloved of enthusiasts.

The system's 8GB of Corsair RAM is decent for home applications, while a capacious 1TB Seagate Barracuda hard disk is joined by 2GB of free online backup. The PC scored 168 points in WorldBench 6 running Windows 7, showing ample speed.

The Elite's nVidia GTX 650 Ti graphics card with 2GB of video RAM offers faster gaming framerates than many of the family PCs we've recently tested.

In our benchmarks, Crysis played at 157-, 107- and 85fps in Low-, Medium- and High-quality modes respectively. And in Stalker: Call of Pripyat, it scored 175fps at 720p, Medium detail, tumbling to 91fps at 1080p, Ultra detail.

The system is housed in a dark, compact and relatively plain Cooler Master Elite 343 case. The CPU cooler is a standard model, and

the modest Xigmatek unit at the rear is joined by further cooling toward the front.


The Elite isn't particularly light on power, consuming 108W when idle, and up to 181W during our games testing. It's also rather loud, and added 23dB above ambient noise.

A LG optical drive is fitted, which reads and writes to Blu-ray media. There's also a memory card reader at the front of the case, which supports a string of popular formats.

Two USB 3.0 and four USB 2.0 ports are included at the rear, while another three USB 2.0 are found at the front, alongside audio sockets. A Logitech S220 2.1 speaker set is bundled, as is a one-year Webroot antivirus subscription, CyberLink's Power2Go HD and Microsoft's Office Starter productivity software.

The PC base system is available for £827. If you have £1,013 to spend, you'll also get a 23in Asus VS293H in-plane switching display and a Logitech MK260 wireless keyboard and mouse set.

Verdict

The Computer Planet Elite 2000 offers solid performance in both Windows and games. The £827 price doesn't include peripherals, so if you don't already have these you may find better value in the Arbico i5357 eXcel (see page 133). But there's plenty to work with here, and we could see this proving a satisfactory home computer.  **Robin Morris**



£450 inc VAT

Contact

■ acer.co.uk
Read more
■ tinyurl.com/cqkL4pd

Specification

2.5GHz Intel Core i5-2450M; Windows 7 Home Premium 64bit; 6GB DDR3 RAM; 500GB HDD; 15.6in (1366x768) TN display; Intel HD 3000; gigabit ethernet; 802.11a/b/g/n; Bluetooth; 1x USB 3.0; 2x USB 2.0; HDMI; VGA; 8x DVD ± RW; SD/MS/xD slot; Dolby Stereo System v4 speakers; HD webcam; 48Wh lithium-ion battery; 380x253x33mm; 2.6kg

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



LAPTOP

Acer Aspire V3-571

PC ADVISOR
GOLD

Acer's Aspire V3-571 shows that a budget price doesn't always equate to limited aspirations. The casing is wonderfully slender, and the polished lid suggests a higher price than its mere £450.

The two-button trackpad melts beautifully into the casing. It works effectively, too, both responsive and well-sized, providing enough room to successfully navigate. The wristrest attracts smudges, though.

The Scrabble-tile-style keyboard's properly spaced keys make typing joyful. A few keys are small and difficult to tap, but their light action makes for a high level of accuracy.

The 15.6in screen is a good size, although its 1366x768 resolution is disappointing. The colour palette is adequate, if a touch light, and the Acer makes an excellent job of displaying photos. The viewing angles aren't as poor as they are with many budget laptops, although the picture deteriorates as you move to either side. The glossy panel returns unwanted reflections, too.

General performance is strong, with a 2.5GHz Intel Core i5-2450M processor and 6GB of RAM inside. The Acer scored a very good 123 points in WorldBench 6.

A 500GB 5,400rpm hard disk is fitted, which will prove sufficient storage space for most users.

The graphics processor is integrated into the CPU. The 16fps achieved in Fear at Maximum detail is respectable for the hardware, but you'll need to turn down the settings to actually play games. At Low quality, the laptop recorded 59.5fps in Crysis. The game was still playable at Medium quality (27.2fps), but the 14.7fps recorded at High detail isn't worth bothering with.

Gamers should instead look to the V3-571G, a variation on this model with the addition of dedicated nVidia GT 640M graphics.

The Dolby Sound System is said to provide better audio, but this wasn't evident in our tests.



Ports and connectors are standard, with one USB 3.0 and two USB 2.0 ports, plus VGA, HDMI and a memory card reader. Wi-Fi and Bluetooth 4.0 are supported, and there's an eight-speed DVD drive and an HD webcam.

The Acer recorded a useful 5 hours 18 minutes runtime.

Verdict

The Acer Aspire V3-571 is an example of just how much can be achieved within the constraints of a limited budget. Gamers will need to set their sights higher, and sound is poor. Overall, though, it does a remarkable job. Robin Morris

£130 inc VAT

Contact

■ pnyeuropa.com
Read more
■ tinyurl.com/8z5bdcz

Specification

nVidia GeForce GTX 650 Ti; 1GB GDDR5 RAM; 928MHz core clock; 1,350MHz memory clock (5,400MHz DDR effective); 400MHz Ramdac; 128bit memory interface; 768 stream processors; 64 texture units; 16 ROP units; PCI Express; DirectX 11; 2x DVI; 1x Mini-HDMI; 1x 6-pin PSU connector needed

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



GRAPHICS CARD

PNY XLR8 GeForce GTX 650 Ti

The GTX 650 Ti is the successor to the GTX 550 Ti, and a strong option below £150. It's based on the GK106 architecture, in contrast to the GK104 of the GTX 660 Ti and GK107 of the standard GTX 650.

This is the XLR8 version of PNY's 650 Ti, although not much has been overhauled. One listed change is a tiny increase in core-clock speed, from 925MHz to 928MHz.

Given that they use the same architecture, the 650 Ti and 660 aren't dissimilar, although the 650 Ti is a significantly cut-down version.

The PNY's 928MHz can't match the 660's 980MHz core clock. This difference is widened by the 660's boost clock, which increases its speed by a further 53MHz. The PNY has no such boost.

The memory clock has also been reduced, and the PNY's 1,350MHz (5.4GHz DDR effective) pales in comparison to the 660's 1,502MHz (6,008MHz DDR effective).

Compared with the 660, the number of stream processors and

texture units have both been reduced by a fifth, bringing down the 650 Ti's figures to 768 and 64 respectively.

The number of raster operation units has been slashed, too, with just 16 in comparison to the 660's 24.

The 650 Ti's texture fill rate of 59.4GTps is modest, given that the 660 can achieve 82.64GTps, and Asus' version of the GTX 660 Ti enters triple figures.

Perhaps the 650 Ti's biggest problem is its memory interface: at 128bit, it can't compete with cards in the higher price categories.

Its Crysis 2 performance figures of 32.6- and 25.9fps at 1680x1050 and 1920x1200 are in line with the AMD Radeon HD 7850, but trail the 660 Ti by almost 10fps.

In BattleForge, the 650 Ti trailed the 660 Ti by almost 18fps at lower resolutions, and it fell a couple of frames behind the 7850, too.



Similar results were recorded in Stalker: Call of Pripyat, where the gap between 650 Ti and 660 Ti widened to more than 19fps at 1920x1200. The 7850 also pulled ahead by more than 3fps.

The 650 Ti is reasonably light on power, specified at 110W and requiring just one six-pin power connector. It's also quiet in operation.

Verdict

The AMD Radeon HD 7850 may be this card's biggest competitor, offering slightly better performance, but costing around £20 more. This card, then, offers better value for money. Robin Morris

ASUS recommends Windows 8.



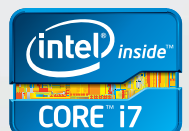
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Specification

800MHz Qualcomm Snapdragon (ARM Cortex-A5 single-core); Adreno 200 graphics; 3.2in (320x480, 180ppi) TFT display; Google Android 4.0.4; 512MB memory; 2.9GB flash storage; microSD card slot; 802.11b/g/n; Bluetooth 2.1; Micro-SIM; 3.2Mp camera; 640x490 video; A-GPS; Micro-USB; 5.6Wh lithium-ion battery; 57x103x13mm; 100g

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



SMARTPHONE

Sony Xperia Tipo

Sony's pebble-shaped Tipo looks more like the HTC Desire C than other models in its recent NXT range. It's smaller, but fatter than the HTC, yet nice and light, at 100g.

We didn't have high expectations for this £129 handset, yet the Tipo is a solid smartphone. The handset is well made, with the screen, chassis and rear cover all fitting flush, even if no premium materials are used.

Unsurprisingly, performance from the 800MHz Qualcomm Snapdragon processor and 512MB of RAM is less impressive. This combination struggled to run Android 4.0, which was reflected in our benchmarks.

The Tipo takes the dubious honour of having garnered the lowest results we've seen in GeekBench; it scored just 262 points. Compare that with the budget Xperia U and its 800 score, and this phone is slow. The results didn't get any better in SunSpider, in which the Sony dawdled in with 5,781ms. In practice, this phone involves a lot of waiting around.

Storage is extremely limited at 2.9GB, although a microSD card slot hides under the cover.

The 3.2in screen is small by today's standards, so gaming and browsing aren't the easiest of tasks to complete. The pixel count of 320x480 is low, but the resulting pixel density of 180ppi is better than the 165- and 125ppi of the HTC Desire C and LG L3. Huawei's £100 G300 trumps the lot with 233ppi.

The Xperia Tipo is far from photographer-friendly. A rear-facing 3.2Mp camera gives predictably poor results with plenty of grain. And forget low-light pictures, especially with no LED flash to help. Video is equally bad, and just 640x480.

Sony's customised interface makes Android 4.0 Ice Cream Sandwich look a lot like 2.3 Gingerbread here. Unlike the older OS, 4.0 supports multi-tasking.

Sony provides plenty of widgets, wallpapers and themes. Various apps are preloaded, but a memory card is essential if you want to add more.



Sony quotes 5 hours talk time, 30 hours music- or 3 hours video playback. We found the Tipo lasted a couple of days with varied use.

Verdict

Although the Sony Xperia Tipo looks and feels nice, it offers poor performance and little in the way of features. Battery life is good, but the Huawei Ascend G300 outclasses it at a cheaper price. **✉ Chris Martin**

£90 inc VAT

Contact

■ lg.com/uk

Read more

■ tinyurl.com/bs8uaff

Specification

Tray-load external Blu-ray drive; USB 2.0; 8MB buffer; Blu-ray speeds: 6x BD-R, 6x BD-R DL, 4x BD-R TL, 2x BD-RE, 6x BD-ROM; DVD speeds: 8x DVD ±R, 6x DVD ±R DL, 6x DVD-RW, 8x DVD+RW, 5x DVD-RAM, 8x DVD-ROM; CD speeds: 24x CD-R, 24x CD-RW, 24x CD-ROM; CyberLink Blu-ray Disc Suite; 2-year warranty

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



BLU-RAY DRIVE

LG BP40NS20

This Blu-ray drive may not match the sizzle of the LG BE12LU38 (see page 141), but it takes some modest specifications and condenses them into a portable and enticingly priced package. Unlike that larger and faster drive, the BP40NS20 is powered from its USB 2.0 connection.

Its base BD-R performance is just six-speed, whereas the more expensive BE12LU38 offers the lure of 12-speed writing. It's something of a chasm on paper, but the real-world difference is small: no media can exploit the full potential of 12-speed, with Blu-ray discs typically topping out at six-speed, and four-speed media the norm.

Copying 22GB of data to a blank disc took 16 minutes 47 seconds in our tests, which is the equivalent to around 21MB per second (MBps). This makes the drive only slightly slower than the BE12LU38, which averaged 22MBps. Thus LG's BP40NS20 is not at a significant disadvantage in the current market.

It claims support for some standards we weren't able to test. Most prominent of these is BD-RL TL, a triple-layer format that advertises up to 100GB of storage. The discs themselves are impossible to obtain. BD-RL TL isn't designed for pace, in any case, and LG's four-speed capabilities are equal to those of the Pioneer BDR-206MBK, which took 100 minutes to fill a disc.

The BP40NS20 supports 3D Blu-ray, and we found playback to be very accurate and smooth.

The LG also supports Millenniata's M-Disc technology. These DVD-compatible discs are said to last much longer than standard DVD media.

Where supplied, the LG's software bundle is standard but nice, with the familiar CyberLink Blu-ray Suite doing the honours. This pleasingly cohesive set of



applications, which includes the Power2Go 6.0 burning program, the PowerProducer 5.0 movie creator, and the ever-reliable PowerDVD 10.0 playback application, among others, continues to find favour with Blu-ray drive manufacturers.

Verdict

If and when Blu-ray media speeds reach the dizzying heights of double-figures, this drive will fall behind its rivals. For the time being, though, it's a visually pleasing and assured drive that offers something for everyone. Search online and you will find this drive for our quoted £90. **✉ Robin Morris**



BLU-RAY DRIVE

Lite-On iHES112-115

A Blu-ray drive can help turn any PC into a multimedia entertainment centre. But if all you want is to watch films, don't waste cash on Blu-ray writing capabilities.

That's where Lite-On's iHES range comes in. The read-only counterpart to Lite-On's IHBS selection of writers, the 112-115 delivers smooth 12-speed Blu-ray video playback.

The iHES112-115 is an internal optical drive, designed to mount into a Windows PC chassis and connect via SATA.


This is a bulk-buy version of the drive, so you don't get any bundled software.

If you don't already have the necessary applications, you could look out for the iHES212, which is supplied with a basic version of CyberLink PowerDVD. Alternatively, you could just buy a boxed copy of CyberLink's Blu-ray playback software.

Being a combo drive, the Lite-On allows you to write to DVD single- and dual-layer discs, and 16-speed DVD \pm R facilities are provided to this end.

The Lite-On iHES112-115 might not be up to the performance of the fastest 22-/24-speed standalone DVD writers, but 16-speed writing will prove more than fast enough for most purposes.

Verdict

The main problem with this drive is that it just isn't very cheap. At £50, it's too much to pay for a BD-ROM drive when you can have a full Blu-ray reader/writer for around £65 to £70. But if you're sure you'll only ever be reading Blu-ray media, then this saves you a few pounds.  **Robin Morris**

£62 inc VAT

■ liteonit.eu ■ [Read more tinyurl.com/8syecmw](http://tinyurl.com/8syecmw)

Specification

SATA; 12x BD-ROM; 8x BD-RE; 6x BD-ROM DL; 16x DVD \pm R; 8x DVD \pm R DL; 6x DVD-RW; 8x DVD+RW; 160ms DVD access time (350ms BD); 2MB buffer

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



WINDOWS 8 KEYBOARD

Microsoft Wedge Keyboard

The Wedge Mobile Keyboard is petite, but built to last. It's a thin, lightweight sliver of silver and black, metal and plastic.

The underside is smooth silvery plastic, broken only by the maker's name and a black plastic wedge-like tube that holds the two AAA batteries. These go in at one end; at the other is the Bluetooth button.

This tube raises the rear of the keyboard, gently tilting the keys and making it comfortable to use for reasonably lengthy typing sessions – although you'll want a full-size model for day-to-day computing.


No space is wasted on the keyboard's front. The tiniest sliver of a bezel surrounds almost full-size keys. In use, the plastic Scrabble-tile keys give a satisfying clunk, but feel sturdy enough to take a hammering.

Typing is by no means as comfortable as using a full-sized keyboard, but it is much more accurate and less cramped than it is with the vast majority of Bluetooth keyboards we've used. You get a good level of feedback from the keys, too.

Special keys represent the Windows 8 Charms, which is a nice touch. The keyboard pairs with your PC, laptop or tablet via Bluetooth, so if you're using a desktop PC you may need to buy a separate dongle.

A solid and rubbery-feeling black cover fits over the front of the keyboard, and in doing so it powers down the device. The cover also folds into a tablet stand.

Verdict

Well built, stylish and practical, this is an ideal travelling companion for Windows 8 tablets.  **Matt Egan**

£79 inc VAT

■ microsoft.com ■ [Read more tinyurl.com/8j34km9](http://tinyurl.com/8j34km9)

Specification

Bluetooth 3.0 keyboard; 2x AAA batteries; 257x101x20.8mm; 236g

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



WINDOWS 8 MOUSE

Microsoft Wedge Touch Mouse

Microsoft's Wedge Touch Mouse eschews a traditional scrollwheel, incorporating a four-way touchpad on its top side. In use, it offers something between touchscreen- and mouse input.

The mouse measures just 61x53x23mm. Its cheese-wedge shape and tiny, lightweight design make it look as though it will be uncomfortable to use. Appearances can be deceptive, however, as this mouse is an immediately satisfying device in use.

With a solid on/off switch, the Wedge Touch Mouse can sit in your pocket all day, just waiting to be paired with a Windows 8 PC. Its composite plastic/metal finish feels like something you want to own and caress. It also feels like you could carry it around for days without it getting damaged.


Nice touches include the way a flick of the battery switch flips open the metallic side to reveal the single AA battery slot.

BlueTrack technology allows the device to be used on any surface, including carpet, a sofa and a train floor in our tests.

In place of using a touchpad or touchscreen, the mouse's top becomes your touch input device. And instead of a scrollwheel, you drag your finger down the groove that bisects the middle of the Wedge Touch Mouse. It works well.

Scrolling horizontally with the Wedge makes sense when using all parts of Windows 8 apart from the Desktop.

Verdict

It's not cheap, or big. But, like Windows 8 itself, we found the Wedge Touch Mouse surprisingly efficient in use.  **Matt Egan**

£69 inc VAT

■ microsoft.com ■ [Read more tinyurl.com/9upmycm](http://tinyurl.com/9upmycm)

Specification

1000dpi Bluetooth mouse; four-way touch-sensitive scroll; BlueTrack; 1x AA battery; 3-year warranty; 61x53x23mm; 65g

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



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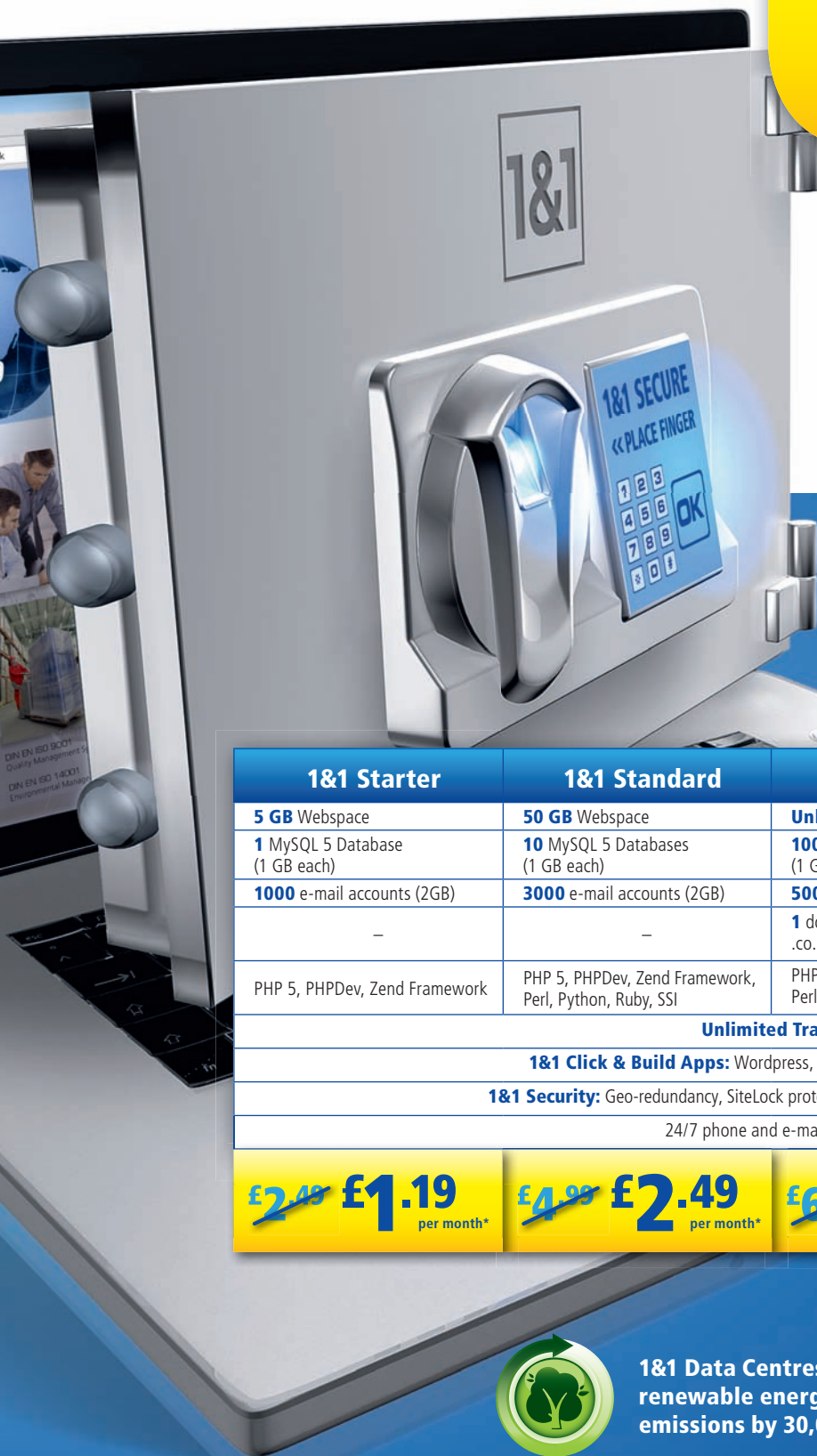


This tool allows you to recover website data that you have accidentally deleted, with a simple click of your mouse. The 1&1 Website Recovery tool is easy to use through the 1&1 Control Panel.



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–	–	1 domain included. Choose from .co.uk, .me.uk or .org.uk	1 domain included. Choose from .co.uk, .me.uk or .org.uk
PHP 5, PHPDev, Zend Framework	PHP 5, PHPDev, Zend Framework, Perl, Python, Ruby, SSI	PHP 5, PHPDev, Zend Framework, Perl, Python, Ruby, SSI	PHP 5, PHPDev, Zend Framework, Perl, Python, Ruby, SSI
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WEB BROWSER

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System requirements

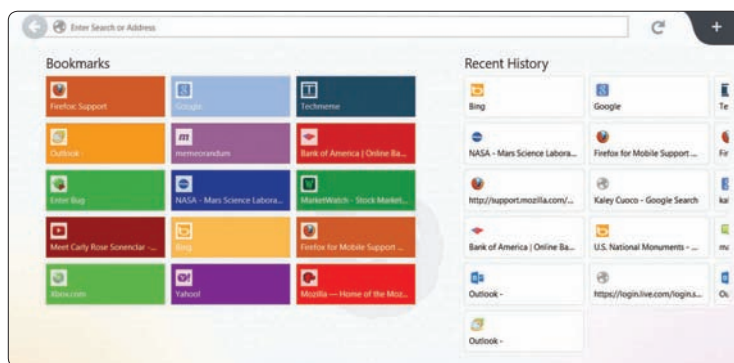
Windows 8

Firefox for Windows 8 is in effect two web browsers: the desktop version that looks and feels much the same as your current Firefox, and a new finger-friendly Modern UI Windows app. They are, of course, the same program, but separated by Windows 8's split personality on desktop PCs and laptops.

In desktop mode Firefox recorded the same scores in the SunSpider JavaScript test as did Firefox 16.0, completing the test in around 200ms. But the Modern UI app didn't fare so well, and recorded 260ms on average. In general browsing we didn't notice the difference.

Firefox for Windows 8 is stable on both a PC and a tablet, and we saw none of the memory-hogging behaviour of which Mozilla's browser is sometimes accused.

There are some interesting UI changes consistent in both modes. New tabs offer a three-column view of your bookmarks, with recent history and downloads presented as tiles in a style similar to Windows 8



itself. On top you'll find a unified bar for URLs and searches.

When you're on a web page, Firefox switches to a full-screen view without the URL bar or any options - it's not dissimilar to Internet Explorer 10.0's approach. You have to right-click to bring up the address bar, and right-click again to show all open tabs. Use a touchscreen and swiping does the same job.

You can configure the browser to show the address bar and all tabs at all times, but it's worth persevering - sites look great without what

Microsoft refers to as the 'chrome' that clutters up modern browsers.

Right-clicking/swiping down also brings up a few other options in a bottom menu bar. You can jump to the downloads list, find a specific word, open a page on the desktop, zoom in or out, create a bookmark, or pin the page to the Start screen.

Verdict

Firefox's new interface features play nicely with Windows 8, but that speed differential worries us.

✗ Matt Egan



PAINTING SOFTWARE

Microsoft Fresh Paint for Windows 8

Free

Contact

■ microsoft.com

Read more

■ tinyurl.com/d35exku

System requirements

Windows 8

Fresh Paint is very simple, and it really requires a touchscreen to be of any use. But it is fun and beautifully built, and it shows off the creative possibilities of the tablet format. If you're looking for the equivalent of Paint, however, this is not it. This is a much more sophisticated creative environment.

Fresh Paint is a painting simulator for Windows 8. It's great for casual use, and sophisticated enough for creating art.

At the top of the painting screen is a range of brushes, crayons, a pencil, a blender and an eraser. The palette is brilliant, with a selection of swatches, a bowl of 'water' and a mixing area with which you can mix up colour for use with the brushes.

Cleaning your brush is fun, as it turns the water the colour of the paint you dumped in it. That's the frivolous fun side of Fresh Paint.

A ribbon at the bottom of the screen allows you to dry or centre your artwork, as well as offering Undo, Redo, New and Save As



options. When you click into the Fresh Paint canvas to paint, the options disappear, but you can recall them by swiping from the top or bottom of the screen.

There's a mixture of fun and serious artistic capabilities about Fresh Paint that appeals. You can just pick up a brush and slap some paint about, or mix and stain exactly the right shades. The ways in which colours interact is very realistic - you'll get a tiny thrill the first time two strokes run into each other and smear together to produce a different shade.

Used by hand Fresh Paint is fun, but a stylus adds precision. Mouse use is possible, but really this is an app for touchscreen devices. The way brush strokes are rendered is very realistic, allowing talented artists to achieve precision in their work, and useless hacks to have fun.

Verdict

If you have a Windows 8 device with a touchscreen, give Fresh Paint a try. It's a fun app with a serious side that can be used to create cool and interesting artwork. And it's free. ✗ Matt Egan



GAME

Rovio Bad Piggies

Free for Android
69p for iOS
£2.99 for Mac
€4.95 for Windows

Contact

■ badpiggies.com
 Read more
 ■ tinyurl.com/bwLgfac

System requirements

Android 2.2 or later,
 34MB storage; iOS 4.0
 or later, 41MB storage;
 Windows XP/Vista/7,
 200MB storage; Mac OS X
 10.6.6 or later, 44MB
 storage; coming soon to
 Windows 8 and Windows
 Phone 8

PC ADVISOR
RECOMMENDED



Bad Piggies is the latest hit mobile game from Rovio, developer of the hugely successful Angry Birds franchise. It's not a carbon copy of Rovio's original blueprint, but we expect it to be every bit as successful. Here's why.

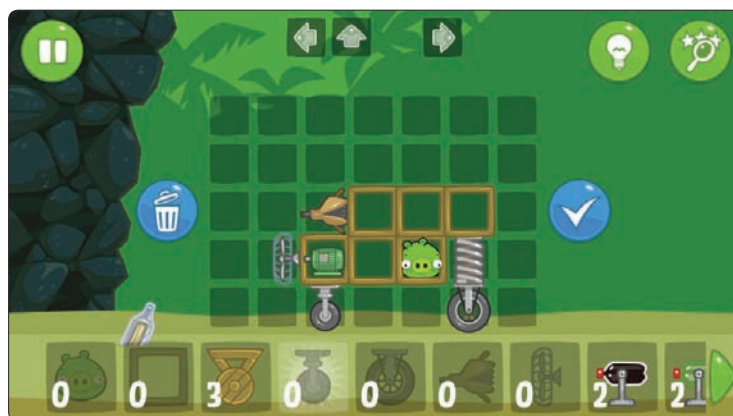
We've all bought into Rovio's loveable characters, from Yellow Bird the dive-bomber to Big Brother Bird who demolishes everything in his way, plus the macaws, bulldogs, toucans, parrots, marmosets and more, introduced in later episodes. But arguably the most important character is the one who features in every level: the egg-stealing Bad Piggy, without whom the Angry Birds would have no purpose; they'd be weapons with no target. It's high time the evil green swines got their own spin-off series.

Unlike Angry Birds, in which you must fire avian missiles to take out Bad Piggies, there is no such violence in this sequel. It appears that having found a map telling them exactly where to find the Angry Birds' eggs, the Bad Piggies have managed to lose said map in Piggy Island. King Pig has ordered his minions to recover the map, and you will collect a single scrap of this vital information with each level you complete.

Make your own pig wagon

Bad Piggies is more of a cross with Fantastic Contraption and Rovio's own Amazing Alex than it is Angry Birds. It's more physics based than you simply using a catapult.

You must build a contraption comprising propellant devices, wheels, springs, TNT, balloons, umbrellas, engines, sand bags, fizzy pop and more. The resulting vehicle should enable you to navigate the level while manoeuvring obstacles,



getting your Bad Piggy to the finishing line and a step closer to victory in Rovio's mobile war.

You are given a grid of varying sizes in which to build your vehicle; each part takes up one square, and the only requirement is that the Bad Piggy sits somewhere within. As you progress through the game the available parts become more plentiful and complex; you must also accommodate the giant King Pig in your travel plans.

There is no single right way to build your cart: several combinations might get you to the end of a level, although not all will allow you to do so with no damage and within a certain amount of time.

The game is made more difficult by your need to not only create a winning vehicle, but to control it throughout the level, toggling on and off the engine, opening an umbrella or popping a balloon with precise timing. Even with the correct combination of parts, it can take several attempts to win all three stars in a level.

Pigs can fly

Bad Piggies operates on the three-star rating system that's become synonymous with Angry Birds, and which has since been incorporated into a plethora of games by developers hoping to build on Rovio's success. There is no baffling scoring system here, though; zoom out of a level to see exactly what is required of you to achieve full marks, whether that's to complete a level within a certain amount of time, collect star boxes placed within the level, build a contraption without using a specific part or get to the finishing line unscathed.

The big difference compared to Angry Birds is that you don't have to achieve all three stars in one attempt, and can build a different contraption for each of a level's objectives. Some levels are easy to complete, since the available parts make it obvious what you need to build; others are significantly more difficult, in which even a small adjustment can reap huge rewards. With you in the driving seat from start to finish, Bad Piggies is more concerned with timing and skill than it is sheer luck.

You can choose to play in either Ground Hog Day or When Pigs Fly chapters, both of which include 36 free levels, plus nine bonus levels. You'll need to complete a level to move on to the next, and a bonus level is accessible only after you score a given number of stars in the four levels preceding it.

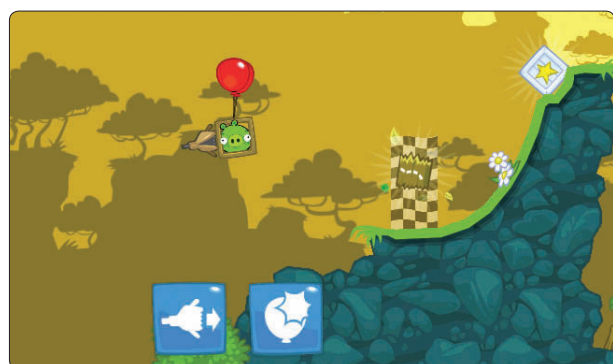
Extremely challenging Sandbox levels can also be unlocked, in essence the equivalent of boss levels, in which you can select any of the tools available throughout the chapter to build a vehicle capable of enduring one mega-challenge and collecting 20 stars.

Collecting 20 silver skulls scattered within the normal levels will unlock a bonus Sandbox, too.

Verdict

Bad Piggies is not just another carbon copy of Angry Birds, and requires far more logical input than simply aim, shoot and cross your fingers. It matters not whether you're Team Red or Team Green, Team Bird or Team Pig, Bad Piggies has the potential to be every bit as successful as Angry Birds.

✉ Marie Brewis



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IMAGE EDITOR

Adobe Photoshop Elements 11.0

£78 inc VAT**Contact**■ adobe.com/uk**Read more**■ tinyurl.com/9p5yxbz**System requirements**

1.6GHz processor;
Windows XP/Vista/7/8/
Mac OS X 10.6 or later;
1GB RAM; 4GB drive
space

**PC ADVISOR
RECOMMENDED**

Usability: ★★★★★

Features: ★★★★★

Value: ★★★★★

**FACE RECOGNITION:**

Elements recognises faces in uploaded images and sorts them in the People tab

GEOTAGGING:

Camera location metadata is integrated with Google Maps

Version 11.0 of Photoshop Elements (PSE) finds Adobe once again splitting the workflow into two parts: there's the Organiser, in which you import, sort and view image files, and the Photo Editor, for manipulating and enhancing images.

A substantial redesign is evident upon launching the Organiser. All the imported files are displayed in single- or grid form in Media view, while an enhanced People tab joins new sections for Places and Events.

PSE will pick up any existing keywords stored in the metadata of imported images, which eases the cataloguing and subsequent sorting of your photo library.

Metadata from cameras and smartphones is also fully exploited by the workflow.

Faces & Places

The People tab is populated only after you've run the Add People facial-recognition exercise. We've seen this facility before, in programs such as Google's Picasa, but the algorithm used here is significantly more powerful. It was able to pick up and associate with the correct person younger versions of faces, different hairstyles and even those distorted in an underwater shot.

The tool isn't always precise, and mistook a patch of mud in one of our festival shots as a face, but it's very impressive on the whole.

Another option prompts you to download or update your Facebook friends list to help PSE name people.

The Places tab picks up and displays geotagged images and location stacks on a Google map. You can also click on photos in the Media pane and manually add places via the Action bar.



GUIDE EFFECT: One of Elements' new Guided edits applies a vignette effect

The Events workflow lets you organise and find images by date; manual routes for applying calendar information are available if required.

Image manipulation

The Photo Fix options available in Organiser, which cover removing red-eye, correcting the levels, sharpening an image and applying a smart fix, have been simplified with large icons and brought to the fore.

You can use these icons to apply an instant fix to the open image; they can also batch-edit your snaps. The results are acceptable.

You get more control over image manipulation in Photo Editor. Here, a streamlined interface offers a Quick edit that covers the most common tasks, along with Guided edit. The latter offers step-by-step adjustments, reclothed in PSE's new icon-driven simplicity.

New Guided options include a High Key effect, which affords a bright, cheery, low-contrast look, plus a Low Key effect, which darkens a photo, adding drama and contrast.

Some of PSE's tasks have been streamlined, too, such as adding a vignette. This previously involved

making selections, creating masks and feathering the edges of photos. In version 11.0 a dedicated Vignette Effect Guided edit walks you through adding and fine-tuning the effect.

There's also a new tilt-shift effect, in which the subjects appear in miniature form. It doesn't replicate the quality that's achievable when manually adjusting the settings, but it's very quick and the effect can be easily edited.

PSE has previously lagged behind the competition in terms of image organisation, but the disparity has disappeared in version 11.0. On both Mac and Windows platforms we found the Organiser quick to respond, while Photo Editor was slick in applying filters, Guided edits and fixes.

Verdict

With professional users taken out of the equation by PSE's bigger brother, Photoshop, Elements has much to offer in the middle-ground. Large, simple icons, smartphone-friendly workflow and social-media integration shows Adobe is gradually shifting the balance toward more casual users. **✗ Michael Burns**

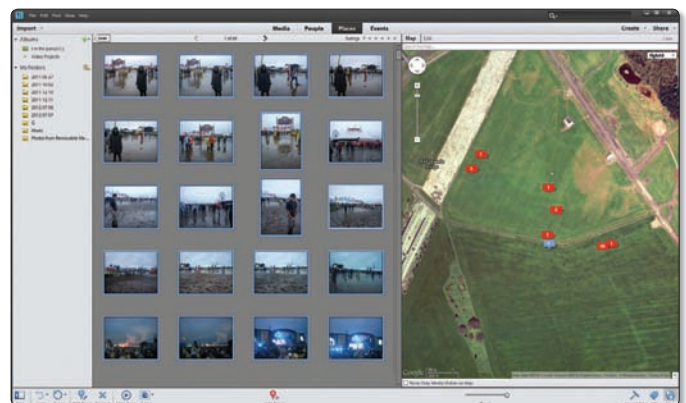


IMAGE EDITOR

CyberLink PhotoDirector Ultra 4.0

£79 inc VAT

Contact

■ cyberlink.com

Read more

■ tinyurl.com/9xdLeft

System requirements

Intel Pentium processor;
Windows XP/Vista/7/8/
Mac OS X 10.6.8 or later;
2GB RAM; 1GB drive
space

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



People are by far the most common subjects for photographs, so it's fitting that two of the new features in PhotoDirector Ultra 4.0 are concerned with facial recognition and portrait manipulation.

PhotoDirector's face-tagging functionality is new to CyberLink, but seen in many other consumer photo editors. You can manually kick off analysis of a particular photo or photos, and PhotoDirector will automatically inspect your snaps during the importation process.

In manual mode, PhotoDirector is more precise than Photoshop Elements in its ability to distinguish real faces from other elements in particularly challenging photos, such as those shot at a muddy music festival. It isn't as good at recognising previously tagged people in new photos, however.

Body bling

Body Shaper, a collection of deformation tools, is one of several sets in PhotoDirector's People Beautifier editing module. Other cosmetic treatments here include Skin Smoother, Wrinkle Removal, Tooth Brush and Eye Blinger.

For the most part Body Shaper simply warps pixels, pushing them or applying pucker and bloat operations, but it also allows a grid to be placed over the image that you can use to reshape objects by dragging its control points.

You can paint over areas of an image to protect them from distortion - but these are tricky tools to use and, as in real life, achieving the 'perfect' body shape is more difficult than you might expect.

In appearance and workflow, PhotoDirector rather resembles



BODY SHAPER: People Beautifier editing tools let you protect areas of a photo

professional photography tool Adobe Lightroom, although it costs just £79 in comparison to Adobe's £103 ticket. PhotoDirector has a similarly dark interface, a focus on image organisation, and support for 16bit colour and RAW file formats. Both tools offer broad and precise image adjustments, metadata editing and the ability to batch-process multiple images.

And, like Adobe's Lightroom, PhotoDirector also stops short of offering pixel-drawing tools, such as Photoshop's pencil and paintbrush utilities. This is not an all-round image-creation and -editing app.

Stylish filters

New to version 4.0 is an HDR effect, which mimics the stylised looks that are achieved by cameras shooting in high dynamic range. The Chromatic Aberration tool offers the more subtle adjustment of reducing colour fringing along object boundaries.

You can also apply a selection of presets, such as High Contrast and Lomo, which include a combination of image adjustments.

You can create your own custom presets, and download those that

have been generated by other users from CyberLink's online Director Zone. You'll want to apply them sparingly and wisely, though - applying PhotoDirector's HDR preset to a portrait won't win you any points with your model, for example.

Content-aware editing, as seen in Photoshop, lets you remove unwanted objects as if by magic, simply by painting over them. It inspects the image's surrounding pixels and uses the information to hazard a guess at how the target area should look. A Line Drawer tool is also available, which makes short work of wire removal.

Verdict

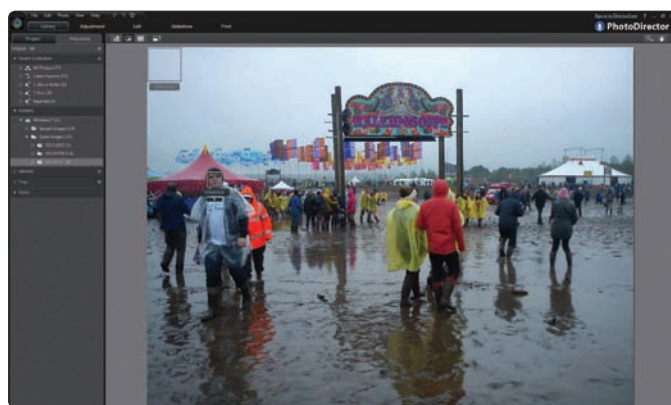
The addition of facial-recognition facilities to PhotoDirector is both welcome and very well implemented, but it's not an earth-shattering innovation. Meanwhile, the program's Body Shaper tools are simply mesh deformers with a celebrity mag-style makeover. Nevertheless, PhotoDirector is a fast and versatile cross-platform tool for working with photos, with just enough adjustment tools to interest professionals. **Michael Burns**

STRANGE VISIONS:

The new HDR effect can add a stylistic look

FACE TAG EDITOR:

Identifies faces in an image for you to tag



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Iolo System Mechanic 11.0

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Contact

■ iolo.com

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System requirements

Windows XP/Vista/7/8;
256MB RAM; 120MB drive
space; web connection

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



System Mechanic, best known for its Windows repair- and optimisation tools, now boasts Accelewrite, Windows 8 integration, more system horsepower and an unlimited home licence, as well as enhancements to many of its other utilities. It also includes SystemShield for basic antivirus and spyware protection.

Accelewrite speeds up file access and reduces the need for periodic housekeeping by tackling fragmentation. The drive heads have fewer places to search for the various bits when asked to load a particular document or application.

System Mechanic 11.0 lets you dig down into its utilities only so far as you feel comfortable. At the top level, TotalCare Fix runs most of the key apps with a single click, analysing and then fixing the problems it detects.

The next level down lets you concentrate on a particular aspect of performance, with sub-sections and automated wizards for PC Accelerator, PC Repair, PC Cleanup and PC Security.

Further down, you can run any of 34 individual utilities, such as Designated Drivers, Program Accelerator and Crudd Remover.

Having applied the TotalCare Fix to our test PC and removed all the suggested programs from the startup list, the Windows shutdown



SYSTEM MECHANIC 11.0 is a comprehensive, good-value optimisation tool

time dropped from 19 seconds to 10 secs, an improvement of around 48 percent. The analysis took 2 minutes 24 secs, while the fixes needed a further 16 mins 57 secs.

The boost to startup time was a little less impressive, and dropped from 1 min 10 secs to 1 min 7 secs. That said, our test machine is pretty clean; other systems may show greater improvement.

SystemShield security is bundled with System Mechanic 11.0. It's not particularly quick, and took 52 mins to scan our usual 50GB basket of test files; it also looked at only a fraction of them - just 8,769. You have to trust that it knows which files to ignore.

The antivirus' footprint is fair. With a scan running in the

background, the time required to copy a 1GB file was increased by around 33 percent.

We usually look at data from independent testing lab AV-Test to judge the efficacy of security software, but none was available. Nevertheless, we expect that the free offerings from AVG or Avast will probably do a better job in protecting your machine.

Verdict

System Mechanic 11.0 is a very comprehensive repair and optimisation suite. Not all of its utilities could be considered state of the art, but there's enough here to justify the expense - particularly given that it can be installed on all your PCs. **Simon Williams**

INTERNET SECURITY SUITE

Symantec Norton Internet Security 2013

£50 inc VAT (3 PCs)

Contact

■ uk.norton.com

Read more

■ tinyurl.com/8u7w6oa

System requirements

300MHz CPU; Windows
XP/Vista/7/8; 256MB RAM;
300MB drive space

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



Probably the best-known Windows internet security suite in the world (although AVG may come close), Symantec's Norton Internet Security 2013 offers antivirus protection, a firewall, parental control and more.

Norton Internet Security 2013 also contains Norton Management, a cloud-based service that lets you add licences without re-entering the product key. It's not a selling point, but it's nice nonetheless.

The suite doesn't include PC tune-up or online backup; for those elements, you need Norton 360.

Norton's interface has had a revamp for 2013, with the addition of large fonts and simple controls. The main screen offers four tiles

for accessing Norton's primary modules: Secure, Scan Now, LiveUpdate and Advanced.

Further options are listed along the top and righthand side.

A Performance option flips the main screen to reveal a pair of live graphs showing CPU and memory usage, as well as details of any recent security events.

Most settings are controlled via simple slide switches, and the program's defaults will be fine for most people. This makes the software particularly easy to set up and, in our testing, it typically worked quietly in the background, without irritating notices alerting you to every action it's completed.

We scanned our usual 50GB basket of test files in 22 minutes 49 seconds. Norton looked at 176,280 files, producing a scan rate of 128 files per second.

This is the third highest throughput we've measured, with Norton offering a quick and thorough scan. It shows a 19 percent improvement over Norton Internet Security 2012, too.

A second scan looked at 37,604 files in 3 minutes 15 seconds, suggesting that Norton fingerprints files to save wasting resources on retracing its steps.

A 1GB file copy took 40 seconds on our test system, but increased to 51 seconds with a Norton scan

DRIVE UTILITY

Paragon Drive Copy 12.0 Professional

£25 inc VAT**Contact**■ paragon-software.com**Read more**■ tinyurl.com/breqybr**System requirements**Windows 2000/XP/
Vista/7/8; 256MB RAM;
1GB drive space

Usability: ★★★★★☆

Features: ★★★★★☆

Value: ★★★★★☆



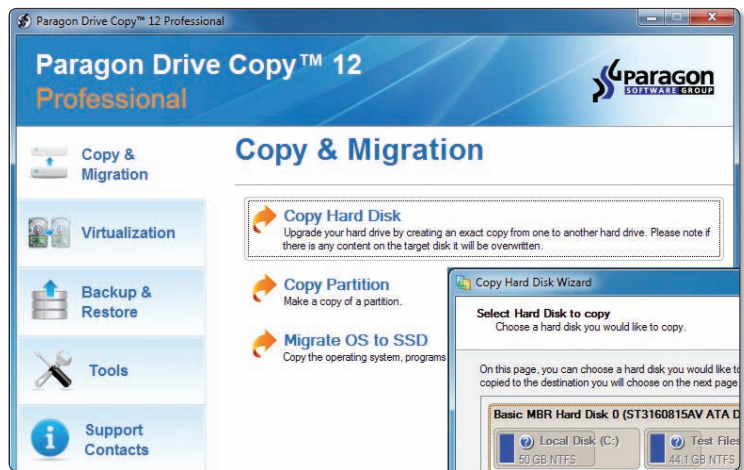
Having set up a Windows PC with all the applications and utilities you need to get your work done, you don't want to have to start afresh should you upgrade your hardware or suffer a drive failure. Drive Copy guards against both events.

The program offers a series of wizards, with five options in the left panel offering Copy & Migration, Virtualisation, Backup & Restore, Tools and Support Contacts.

Copy & Migration lets you copy a hard disk or partition and migrate to an SSD. Virtualisation offers a physical to virtual copy (P2V) and to create an empty virtual disk, while Backup & Restore is self-explanatory. Tools provides utilities for file transfer, the creation of logs to send to Paragon support and the preparation of a startup disc.

Two startup discs can be made: one uses WinPE and the other Linux. They're direct substitutes for each other; you can use whichever you find more convenient. WinPE is likely to be more familiar to Windows users, but you'll have to download and run a separate utility to use it.

Wizards take you through tasks step by step. To create a virtual machine, for example, you're led through screens in which you select the type of virtual machine - VMware, Microsoft and Oracle are supported - and define its size and name.



PARAGON DRIVE COPY makes backing up and restoring your data simple

To copy a physical drive into this virtual machine you select the physical drive, the operating system to use and, again, the size of the virtual machine. You can then set the properties of your virtual disk and Paragon starts the process of creating the virtual machine.


In our test, creating a virtual machine from a partition with 35GB of data took around 20 minutes. Preparation before copying took a while, but Paragon provides a series of encouraging messages to show the work is still progressing.

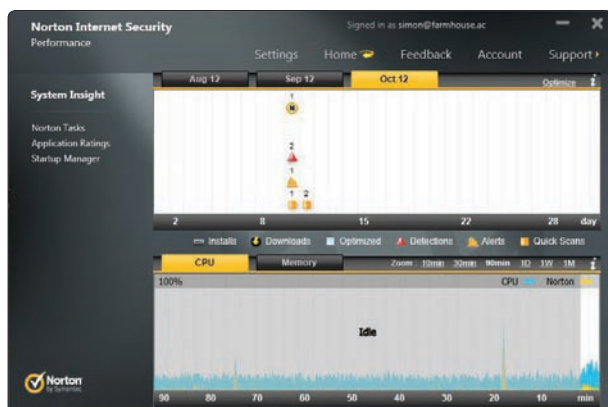
Virtualisation is increasingly used where more than one operating system needs to be run on a PC. It's easy to set up virtual versions of Windows, OS X or Linux. You can now copy these virtual images

to other physical drives or to other virtual drives.

We also backed up to an external drive the 50GB of files used in our antivirus tests. This took just over 35 minutes. Oddly, with standard compression, the program estimated the backup would be 39.8GB, when it was in fact 48.2GB.

Verdict

Paragon Drive Copy 12.0 Professional does as it claims, copying drives and components of drives from one place to another. Changes in version 12.0 include only Windows 8 support and a couple of extra virtualisation options, but it's well-priced, and a worthy tool when upgrading or for protecting your system.  **Simon Williams**



NORTON is one of the best-known security products for good reason: it offers solid, silent protection

running in the background. That's a 28 percent increase in copy time, which is relatively light by the standards of its rival products.

AV-Test has yet to complete its assessment of this suite, so we can't vouch for its efficacy in catching malware. It's even possible it is an

improvement over last year's results, which were pretty impressive.

Norton Internet Security 2012 was awarded 15 out of a possible 18 points under Windows XP, and 15.5 under Windows 7. It lost one point in the Protection category, and 1.5 in Repair, but scored 100 percent against AV-Test's Usability criteria.


The 2012 version was particularly good at spotting zero-day attacks, which is most likely due to its cloud-based Sonar technology. This continually looks for suspicious behaviour while your PC is running.

Its performance was at least 10 percent above the average for its test group, and it detected all widespread malware.

Norton 2012 didn't detect all recent threats, but it performed well in repairing systems damaged by malware - and particularly so in repairing critical system modifications, where it scored 30 percent above the average.

Verdict

As we've come to expect from Symantec, Norton Internet Security is a solid, professional security suite, both thorough and silent in its operation. You might get more features for your money elsewhere, but few products likely do as good a job as Norton at meeting the core requirement: protecting your PC.

 **Simon Williams**

GAME

Guild Wars 2

£33 inc VAT

Contact

■ guildwars2.com

Read more

■ tinyurl.com/99ncrmv

System requirements

2GHz processor;
Windows XP/Vista/7/8;
2GB RAM; 256GB drive
space; nVidia GeForce
7800/AMD X1800/Intel
HD 3000 or better
(256MB of video RAM
and shader model 3.0
or better); broadband
internet connection

PC ADVISOR
GOLD

For years MMOs have desperately hoped to steal a modicum of World of Warcraft's success - always trying to do more, then being caught by the commercial fear of being too different and winding up just the same, with a few extras. Guild Wars 2 cuts straight to the heart of the matter, laser-focused on being better rather than reinventing.

Guild Wars has made plenty of noise about being a whole new approach to MMO games, but the reality is very different. It's boiled down the genre to its core elements of levelling up, player vs player combat, exploration, crafting, self-expression and the need for players to pay, and then worked out how to improve each one. Nothing tried and tested is replaced, as such, but it's constructed in such a way as to allow far more flexibility.

Breaking the mould

Superficially, this might not be evident. While Guild Wars 2 is a terribly pretty game, with its lush, detailed landscapes and its painterly approach to user interfaces, it's still very much a fantasy world... and very much an MMO, with magic, swords, skittering beasts standing in fields waiting for death, dance animations, statistics, collecting coins - the works.

The difference is that it neither nails you down to a fixed path or requests that you soullessly grind away at repetitive actions if you do want to progress.

Run around Guild War's sizeable world of snowy mountains, mystical forests and blasted heaths and you'll naturally run into trouble. You'll find massed fights against powerful monsters, leftfield collection quests, and surviving waves of marauders

COMBAT is flexible, with a choice of inventive skills



It breaks the mould, but **GUILD WARS 2** is still very much a fantasy world

assaulting a snowy inn. Critically, though, your activities happen organically, springing up around you rather than requiring you to fill your questlog with prescribed tasks.

This makes it all too easy to lose vast amounts of time: there's always something going on, it's unlikely to be something you've already done, and you will be rewarded for your participation.

Combat, the bread and butter of most MMOs, is similarly flexible. Whatever class you pick, you'll have a choice of inventive skills rather than be stuck with whatever the game had pre-determined you use.

Equipping new weapons gives you access to different skills (you can swap back and forth at any point), while exploring far-flung corners of the map and surviving brutal boss fights rewards you with skill points to spend on new abilities.

Cobble together the skillset that most appeals to you, and from there work out how to master it rather than simply tap the buttons in a set order. Add in the ability to dye your clothes whatever colour you want and whenever you want, and you've got the holy grail of MMOs - a character that feels unique and personal, not a mere template.

There is an awful lot of numbers to juggle, mind - a raft of different in-game currencies splintered across Player vs Environment, Player vs Player and World vs World modes. There's an auto-balancing system that alters your level to match the zone in which you're playing, plus the traditional experience points and weapon/armour statistics.

Guild Wars 2 has an impressive amount going on at once, and no shortage of things to do, but it could be that much more fearsome to the casual player than the competition.

Helping ease in those players more averse to the frantic but compulsive free-for-all open-world quests is a per-character personal storyline, which reflects choices made during character creation.

As a piece of storytelling, these can be a bit flat, a parade of quickly forgotten characters muttering stiff-limbed exposition, but they do mean a sequence of dramatic fights uninterrupted by other players.


Free play

All this comes at one fixed-entry price, too. Guild Wars 2 is not a subscription game, despite having all the hallmarks of one. You pay for the game and could, in theory, keep playing for free. Most likely, if you're suitably enraptured by the game, you'll buy something from the in-game store - perhaps a pair of decorative sunglasses, or some higher-capacity loot bags, or a key to that magic chest you found.

Much of this can be bought with in-game gold, or you could shortcut by stumping up real cash. It seems as though the balance is spot-on: the base game doesn't feel like a glorified shop-front, but the knowledge that cool new things are available has a strong pull.

However it pans out, the lack of any requirement for a long-term financial commitment, together with a highly polished, highly attractive MMO that's positively brimming with choices and activities, would seem to suggest one thing: this is the first dead-cert MMO smash-hit since World of Warcraft.

Verdict

Great-looking, packed with variety and reinventing rather than cloning, this is the shot in the arm MMOs have been looking for.  **Alec Meer**

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■ toshiba.co.uk
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■ tinyurl.com/cyh2f5h

Specification

2.3GHz Intel Core i3-2350M; Windows 7 Professional; 6GB DDR3 RAM; 750GB HDD; 15.6in (1366x768) matt TN display; Intel HD 3000; 802.11b/g/n; gigabit ethernet; Bluetooth 4.0; 2x USB 3.0, 1x USB 2.0; HDMI; VGA; 8x DVD \pm RW; SD slot; SRS Premium Sound HD speakers; mic input; headphone jack; HD webcam; six-cell 48Wh lithium-ion battery, removable; 380x242x34mm; 2.3kg

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



LAPTOP

Toshiba Satellite Pro L850-11U

Toshiba's Satellite Pro L850-11U is a low-cost business laptop with useful performance and a certain amount of style.

The Satellite Pro's casing is chunky, but its sober and understated colour scheme, and nicely curved casing and polished lid, put it a cut above the typical budget laptop. The rough-hewn two-button Synaptics trackpad is large, but it's neither comfortable to use nor responsive.

Most of the keys are of a good size and properly spaced, with the tiny cursor keys the only exception. There's very little depth to the buttons, though, and we didn't find our typing especially accurate.

The Toshiba has a substantial 15.6in display, but we'd like to see more detail than its 1366x768 panel can provide. The matt surface doesn't pick up reflections, yet the colour palette is lacking in bite and vitality, and viewing angles are dire.

The Toshiba is fitted with a 2.3GHz Intel Core i3-2350M, 6GB of RAM and a capacious 750GB hard drive. We recorded 107 points in WorldBench 6 under Windows 7 Professional, which isn't slow, but other budget laptops are faster.

As a business laptop, the Satellite Pro with its integrated Intel HD 3000

graphics was never intended to play games. We recorded just 15fps in Fear at Maximum detail, and the more intensive Crysis was playable only at its lowest settings. The

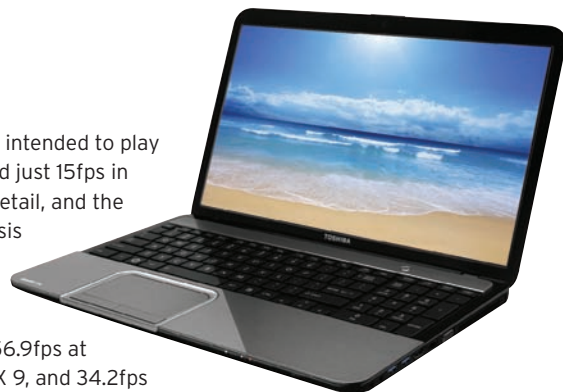
Toshiba managed 56.9fps at Low quality, DirectX 9, and 34.2fps in DirectX 10 mode. At the game's Medium quality levels, it recorded 25.9- and 20.5fps at DirectX 9 and DirectX 10 respectively, and tumbled to just 14- and 12.2fps at High.

The Toshiba offers good battery life, though, and lasted 5 hours 46 minutes in MobileMark 2007.

The speaker system isn't bad. You shouldn't expect sonic fireworks from the Toshiba, but the speakers are bearable when playing music tracks. You'll still resort to the headphone socket when possible, but this is far from the worst budget speaker system we've heard.

The built-in webcam is also nice, offering good resolution (1280x800) and a clear image.

The Toshiba has a decent sprinkling of ports and connectors. Two USB 3.0 and one USB 2.0 are included, along with VGA and HDMI. A memory-card reader caters for various flavours of SD card; gigabit ethernet is also included.



Wireless connectivity runs to single-band 802.11b/g/n, plus Bluetooth 4.0.

The Toshiba also has a Samsung SN-208B DVD \pm R reader/writer, specified for eight-speed.

Windows 7 Professional is preinstalled in 64bit form. The Toshiba comes with a vast array of software titles, including limited version of Microsoft Office and Nero KwikMedia. The many Toshiba utilities carry out a wide range of tasks, from checking the laptop's temperature to conserving power.

Verdict

The Toshiba Satellite Pro lacks the pace of some budget laptops, and costs have been cut on the screen and trackpad quality. But there's a large hard drive and usable speakers, while battery life is usable. For a business on a budget, it will handle the basics. **✉ Robin Morris**

PRINTER

Kyocera Ecosys FS-4300DN

**PC ADVISOR
RECOMMENDED**

The most expensive model in Kyocera's new range of business lasers printers, the FS-4300DN is a strong option that can be expanded to meet the needs of even the most demanding of workloads.

The main unit comes with a deep and substantial 500-sheet input tray. A 100-sheet multipurpose tray folds out, lending the printer versatility when it comes to media.

You can significantly bolster the FS-4300DN's paper handling by adding up to four 500-sheet paper trays (at around £205 each), with a maximum input of 2,600 sheets.

The FS-4300DN's is well built, but its 14.6kg weight is relatively modest for such a printer.

It's still visually pleasing, with a nicely curved front corner that leads up to the circular control panel. The latter is more comprehensive than those of many rival printers, and includes alphanumeric keys for use with the Private Print function.

You can plug in USB drives and bypass the PC for printing, but there's no colour display to aid navigation. An SD card reader is an optional extra.

For the security-conscious, further customisation options allow you to add a 32GB SSD and, using the Data Security Kit, keep the drive clean of fragments of data.

USB 2.0 and gigabit ethernet are included as standard. Whereas most

offices still use wired networking, you can add Wi-Fi as an option.

The printer comes with Kyocera's own controller language, Prescribe II, but can also emulate PCL6 and PostScript 3, among others. Add to this a 500MHz CPU and a healthy 256MB of memory - upgradable to 1,280MB - and this is a printer that should make fast and accurate work of printing documents.

Indeed, Kyocera promises a fast 60 pages per minute (ppm). Our test results couldn't support this claim - with our usual 10-page text document, we saw just 41.2ppm. However, it takes around six seconds to output the first sheet, and turns out prints at great speed thereafter.

£764 ex VAT
£917 inc VAT

Contact

■ tinyurl.com/723c572
Read more
■ tinyurl.com/9y9hht3

Specification

1200dpi A4 laser printer; USB 2.0; gigabit ethernet; up to 2,600 sheet input; 256MB RAM; auto duplex; 380x416x320mm; 14.6kg

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



£708 ex VAT
£850 inc VAT

Contact

■ viewsoniceurope.com/uk
Read more
■ tinyurl.com/9pu6xjs

Specification

DLP projector; 0.65in DMD chip; six-segment colour wheel; 1920x1080 native resolution; 16:9 aspect ratio; 3,000 lumens; 2x HDMI 1.3; composite; S-video; component; VGA; 3.5mm/RCA audio; USB; 1.5x manual zoom; display size: 0.76-7.6m; throw distance: 0.9-10m; throw ratio: 1.4-2.14:1; lamp life: 2,500 hours (normal), 4000 hours (eco); 4,000:1 specified contrast ratio; 30bit colour depth; stereo speakers with 10W amp; 3-year warranty (1 year for lamp); 332x110x264mm; 3.86kg

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



PROJECTOR

ViewSonic Pro8300

ViewSonic's Pro8300 delivers bright, full-HD images and has a host of business-friendly features. It's a great low-cost option for those who need to present HD content in an environment in which it's impractical or undesirable to fully dim the lights.

The ViewSonic offers flexible connectivity options, with a pair of HDMI 1.3 inputs, VGA, composite video, S-video and component video. It also incorporates a pair of stereo speakers, so you can present on the move without relying on tinny laptop speakers. A remote control includes a built-in laser pointer.

As an entry-level projector, it lacks fancy features such as lens shift or motorised zoom and focus, but automatic digital keystone adjustment makes for a quick and easy setup on location. It's also relatively lightweight, at just 3.86kg, and it comes with a carry case.

The large manual focus and zoom controls are precise and easy to use, while the standard-throw zoom lens lets you situate the projector anywhere between 0.9- and 10m from your screen or wall. With a zoom ratio of up to 1.5x, you can project an image with a 100in diagonal from 3.16- to 4.65m away.

Business projectors often sacrifice image quality in favour of

brightness and low cost, but the DLP-based Pro8300 has a quality-boosting six-segment colour wheel that allows it to at least have a stab at reproducing colours worthy of decent HD content. In a typical well-lit room, you'll get a rich, bright and clear picture.

Display modes allow you to adjust the trade-off between colour fidelity and brightness.

When correctly set up, image quality is more than acceptable – although skintones aren't as natural as they are from even a budget home-cinema projector. The Pro8300 isn't built to deliver such movie-friendly subtleties, since it lacks dynamic contrast capabilities.

The richest colours are achieved in the projector's Dark Room mode, in which the ViewSonic more closely matches the performance characteristics of a home-cinema display. The Bright mode significantly enhances the brightness, but also reduces colour saturation and quality.

Even so, the projector's inability to accurately deliver deep blacks becomes all too apparent in an actual dark room. Whereas bright




portions of the image are very bright indeed, shadowy scenes reveal a prevalence of grey.

We measured 77 percent of the sRGB gamut and 60 percent of Adobe RGB. The colour error peaked at 12.46 deltaE, with an average of 4.75. Power consumption at maximum brightness was 280W, dropping to 230W in eco mode.

If you want to present high-resolution stills or video in an environment in which viewers need to be able to see each other and take notes, the Pro8300 will do an impressive job at a low price.

Verdict

This full-HD projector excels in well-lit rooms, where its powerful brightness can make presentations really pop. It's assisted by a large selection of inputs, built-in speakers and a handy laser-pointer. However, the ViewSonic Pro8300 fares considerably worse in colour accuracy in dim home-cinema lighting.  **Paul Monckton**



A 20-page text document was available at 45.4ppm. We don't think you'd manage more than 50ppm even with a large print job, but the Kyocera is certainly a fast printer.

Even in the highest-quality 1200dpi mode, text isn't as dark as

it is from some lasers, although the characters are very nicely defined.


We wouldn't recommend the Kyocera if a lot of in-depth graphical work is required, although you wouldn't usually employ a mono laser for such a purpose in any case. As a text-churner, it's very much up to the job, and we have yet to come across a faster model.

Running costs are exceptionally low, too. Kyocera's drums are extremely durable, so the only regular replacement is likely to be the toner cartridge. These are expensive at around £100 ex VAT, but specified for up to 25,000 pages. That brings costs down to a stunning 0.4p per page.

This is astonishingly economical, and means that the Kyocera will quickly start to repay its significant initial asking price.

The Kyocera is rather low on power consumption, too, although it's not a quiet model. In printing, it exceeded 56dB, making it one of the loudest printers we've tested.

Verdict

For high-volume users, this Kyocera has the performance, features and upgrade options to make it a good choice. Its ultra-low running costs are superb, too. Should you be able to make do with slightly less speed, the FS-4100DN is a cheaper, but still strong, option.  **Robin Morris**

PRINTER

Brother DCP-7055W

Brother's latest three-in-one mono laser printer is the DCP-7055W. As well as printing, it can also scan and copy your documents.

It's not just the initial buying price that's small, it's also relatively compact and lightweight, measuring a trim 405x399x268mm and weighing just 9.8kg.

However, while the main body of the machine feels resolutely sturdy, the cover is flimsy. That's not ideal when you're scanning or copying books or bound documents.

Paper is fed from a 250-sheet standard paper tray in the base, or a single-sheet feeder at the front.



The control panel has been stripped down to the essentials. You get a set of buttons for the three main modes, plus arrow keys to scroll through the setup options on the two-line, 16-character LCD.

The display is difficult to read in low light, but such cutbacks are to be expected when you pay only £150 for a laser printer.

USB and Wi-Fi connectivity, plus an iPrint&Scan app for iOS and Android, ensure the DCP-7055W is compatible with laptops, PCs, tablets and smartphones. There's no ethernet for a wired connection to the office network, though.

Also missing is an auto-duplex facility, although the standard printing speed of 18 pages per minute (not far from Brother's 20ppm claim) is reasonable.

Scanned photos are reproduced with authentic colouring, while printed black text is firm and consistent. But, as with

most Brother mono lasers, copies are considerably darker than the original, with evidence of banding.

The DCP-7055W is clearly intended for low-volume printing, given that the recommended duty cycle is a modest 250 to 1,600 pages per month.

The standard 1,000-page toner cartridge costs £39 (or around 4p per page), which is more expensive than that of its more economical siblings. In fact, you'd be paying almost four times the price per page of a printer more aligned to business use, such as the Brother HL-5380DN (see tinyurl.com/73ukx62).

Verdict

For use with a PC, laptop, tablet or smartphone, Brother's compact DCP-7055W mono laser is a reasonably fast printer, scanner and copier. But its lack of ethernet connectivity, low monthly duty cycle and high running costs mean its suitable only for businesses with low printing needs. Martyn Clayden

£124 ex VAT
£149 inc VAT

Contact

■ brother.co.uk

Read more

■ tinyurl.com/cfn23hd

Specification

Mono laser printer;
32MB standard memory;
2400x600dpi max
print resolution; 20ppm
specified speed;
250-sheet standard
input capacity; 250-1,600
pages per month duty
cycle; Wi-Fi; USB 2.0;
405x399x268mm; 9.8kg

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



DOCUMENT SCANNER

Canon imageFormula DR-M140

Canon has released a trio of document scanners under the imageFormula banner, built for speed and compactness. We've already reviewed the budget C125 (tinyurl.com/9w5ly6b) and flagship M160 (tinyurl.com/82oqLha); here is the third, the mid-range DR-M140.

Unlike its more vertical brothers, the DR-M140 is designed to be laid flat and easily slipped into a desk drawer when not needed. If your desk space is limited, even with the front tray open the Canon is just 288mm deep, and 93mm high.

Weighing 2.6kg, it could also potentially be used as a portable scanner. Although the flip-down extension support looks flimsy, the unit as a whole feels robust.

The DR-M140 has two feeding methods: you can use the U-turn for standard paper, or the straight-through path for thicker media.

The operating panel is relatively simple, with a Double Feed Release button to keep scanning moving after brief hold-ups alongside basic

stop, start and job assignment buttons.

The feeder can take up to 50 A4 sheets, although it seems more comfortable with between 30 and 35, with smooth action and no paper jams.

Canon claims colour scanning speeds of 40ppm/80 images per minute (ipm) at 300dpi, which are close to our own real-world results. We measured 36ppm at 300dpi, and a nippy 52ppm at 200dpi.

We tested the DR-M140's detection powers with mixed document sizes and we found few instances of double- or misfeeds.

Scanned photos are vibrant, with marginally lighter tones but good detail, while duplex documents retain the clarity of the originals.

Most operations will be PC-driven via the bundled software. Together with both ISIS and Twain drivers, Canon's CaptureOn Touch package



will prove useful, with support for up to nine preset job types.

Also supplied on the disc are CapturePerfect 3.1 for advanced image processing, Kofax VRS and eCopy PDF Pro Office.

The price of the DR-M140 sits comfortably between the DR-C125 and DR-M160, making this Canon a logical choice if you need a scanner at this price point.

Verdict

For its portability, small footprint, rapid speeds and smooth operation, the Canon DR-M140 deserves attention. Martyn Clayden

£429 ex VAT
£515 inc VAT

Contact

■ canon.co.uk

Read more

■ tinyurl.com/9fqjgez

Specification

Desktop sheet-fed
scanner; 600dpi max
resolution; 24bit colour;
duplex; 50-sheet feeder;
3m long document mode;
USB 2.0; 6,000-sheet daily
duty scan; Twain/ISIS-
compliant; 313x288x93mm
(open); 313x181x93mm
(closed); 2.6kg

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





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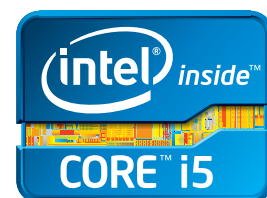
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Windows 8 laptops & PCs



We round up a selection of desktop PCs and laptops running Microsoft's brand-new Windows 8 operating system

Contributors: Kenny Hemphill, Cliff Joseph, Chris Martin, Jim Martin, Paul Monckton

Windows 8 is here, and if you are buying a new computer you will be welcoming into your life Microsoft's ground-breaking operating system. Over the following pages, we put through their paces the first Windows 8 desktop PCs and laptops.

Windows 8 is designed to work across a variety of desktop and mobile computers. As hardware makers get to grips with the OS, they'll have to rise to the challenge Microsoft has set: creating computers with a variety of input mechanisms and screen sizes, all utilised via a single, unified interface.

It's not such a great challenge for users, though. We've been running Windows 8 for months now, and it's fair to say the transition has been one of the smoothest Windows upgrades many of us have experienced.

And an upgrade it is. If you're new to Windows 8 you'll find it very similar to Windows 7 and Vista – just a little faster and a tad more stable. The Start menu has been

replaced with the Modern UI Start Screen, a tiled interface that brings the desktop OS into line with Microsoft's mobile software, and offers access to the Windows Store and apps. But for the regular PC user, the main event will continue to be the classic desktop.

Windows 8 is speedy, good-looking and stable, and it doesn't represent too steep a learning curve. It runs faster and is more stable on the same hardware as Windows 7 and Vista. With Windows 8, fast systems should be available at low price points.

Here, we set out to provide a snapshot of the systems that will be available from 26 October. We set no limits to price or specification, and asked only that vendors submit PCs that will interest our readers.

WorldBench 6, our usual benchmarking tool, is not compatible with Windows 8. We've instead used PCMark 7 (see page 74). Given that the laptops were supplied running Windows 7 (although they will be available

with Windows 8 from 26 October), we also ran WorldBench 6 on these machines prior to upgrading them.

Buying advice

All the desktop PCs in our round-up came with Windows 8 preinstalled, and we upgraded the laptops from Windows 7. The vendors have assured us that versions of each machine will be available with Windows 8 from 26 October.

If you do buy a machine that is still running Windows 7, and envision upgrading the operating system, check for a Windows 8 certification logo. The motherboard, in particular, will need to be Windows 8-compatible, and you can check whether your various peripherals will play nicely with the new OS by comparing them to Microsoft's list at tinyurl.com/99wanpp.



Photography by Dominik Tomaszewski
and Briarley Van Zyl

Few peripherals designed for Windows 8 were available at press time. In particular, Microsoft has recommended that the OS is navigated using a 10-point touchscreen, but monitor makers are waiting to see the level of demand for such screens before starting production. Of the four desktops here that are supplied with screens, three have only two-point multitouch functionality and one is a standard (non-touch) display. You may decide you want to wait a while rather than splash out on a screen that isn't optimised for Windows 8 now.

If you can afford it, get a PC fitted with an SSD - at least 60GB in capacity if you'll be using it as your boot drive. We saw

significantly better performance results in PCMark 7 and noticeably improved system responsiveness from these PCs.

A smaller-capacity SSD can also be utilised to accelerate the hard drive when coupled with Intel's Smart Response Technology. For this you'll need an advanced motherboard, preferably with a Z77 chipset.

Both AMD and nVidia have produced graphics drivers for Windows 8, so your choice of graphics solution should be based on your specific requirements. Non-gamers will get by with integrated GPUs.

For system RAM 4GB is a good starting point. We'd prefer to get 8GB, but not if it means cutbacks have been made elsewhere.

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

ASUS ZENBOOK UX32A

£799 inc VAT • uk.asus.com • tinyurl.com/d54nz7f

Asus' Zenbook range of Ultrabook laptops has a premium feel, but the UX32A is an affordable luxury. The design, reminiscent of Apple's MacBook Air, tapers from back to front. It's not the lightest ultraportable we've seen, but it won't break your back at 1.5kg.

We like the backlit keyboard, with its rounded black plastic keys. Their smooth action makes typing fast and easy, but the Shift and Escape keys are too small for our liking.

Asus has got it right with the trackpad, which is large and responsive to the touch. The integrated mouse buttons work effectively, without sending the cursor flying around the screen.

An aluminium chassis adds durability, and the well-built UX32A feels strong and sturdy. The lid can be opened with one hand, without you having to hold down the keyboard.

Compared with more costlier Ultrabooks, the UX32A packs less of a punch. It's equipped with an Intel Core i5-3317U processor, the least powerful Intel Ivy Bridge Core i5 chip available. There's also just 4GB of DDR3 1,600MHz RAM, although you get both a 500GB hard drive and a 24GB SSD.

We were unable to run our WorldBench 6 processing-speed test in Windows 7, but estimate that this Asus would have scored around 123 points. With Windows 8 installed, the Zenbook UX32A recorded 2,519 in PCMark 7.

The Zenbook relies on the graphics processor integrated to its Core i5 chip for playing video and gaming. We recorded a playable 27fps in Fear at Maximum detail.

The Asus' 13.3in screen has a typical 1366x768 resolution, but with better viewing angles than many of its rivals. The matt panel prevents distracting reflections in direct light.

All three USB ports support the latest 3.0 standard, and there's an HDMI output. A supplied adaptor cable converts a proprietary port to VGA, but the Asus lacks ethernet for wired network connections.

For a thin-and-light laptop designed for a life on the road, battery life is crucial. This Asus chalked up 7 hours 8 minutes in our tests.

VERDICT: Asus' Ultrabook offers a familiar feature set at a good price. It's stylish and well built, but not the fastest in our round-up. **CM**



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

HP ENVY 4-1020EA

£699 inc VAT • hp.com/uk • tinyurl.com/c7eg4ww

HP's Envy 4 is a 14in-screen Ultrabook with a sleek design. The eye-catching red plastic underside and black brushed-aluminium lid and keyboard surround look great, but put on show greasy fingerprints.

The Envy 4 is thin at 19.8mm, but not as light as we'd hoped for an Ultrabook. Still, 1.7kg is light by most laptops' standards.

Build quality is very good, including the HP's very usable keyboard and multitouch trackpad. Both are indented to the chassis, with the key tops level with the laptop's surround.

The trackpad is a good size and responsive to the touch, although we're not keen on the integrated buttons. The natural typing position places your right hand over the trackpad, which can be disabled.

As with the Asus, the muscle is provided by the least powerful Intel Ivy Bridge Core i5 chip you can find, the 1.7GHz dual-core 3317U. There's 6GB of DDR3 1,600MHz RAM and a 500GB hard drive.

With no SSD and a relatively slow Ivy Bridge chip, the Envy 4 didn't break any speed records in our WorldBench 6 test running Windows 7; we recorded 116 points. With Windows 8 installed, it managed 3,517 in PCMark 7.

There's no separate graphics chip, so the Envy 4 uses the Intel HD Graphics 4000 integrated to the CPU. Again following Asus' lead, it recorded a playable 27fps in Fear at Maximum detail.

The Asus takes the lead in the display department, despite it's slightly smaller panel. This HP's 14in screen sports the same 1366x768 resolution, so icons and text will appear slightly larger onscreen, but the viewing angles are narrow and the glossy panel has a distracting mirror-like finish.

A range of ports includes HDMI, two USB 3.0 and ethernet. You also get Wi-Fi, Bluetooth and a built-in webcam.

Beats Audio branding and a 16:9 widescreen may make this Ultrabook appear multimedia-friendly, but there's no optical drive and the audio quality is nothing to write home about.

The Envy 4 passed HP's 8-hour battery life claim with 36 minutes to spare in our MobileMark 2007 tests.

VERDICT: The Envy 4 is a good-looking and well-made laptop with strong battery life, but its performance is uninspiring. **CM**



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

LENOVO IDEAPAD U410

£649 inc VAT • saveonlaptops.co.uk • tinyurl.com/cjl7qn9

Lenovo's U410 budget Ultrabook is no speed demon, but it is a sight for sore eyes. The aluminium lid and underside are colour-coded blue, red or grey, while the keyboard tray is silver with black keys.

It isn't the thinnest or lightest Ultrabook, but it's fine for the occasional traveller. Perhaps more importantly, the specifications are reasonable for the price. A Core i3-3217U processor is backed by 4GB of RAM, a 500GB hard disk and a 24GB SSD.

This combination offers a useful, if not blistering, level of pace. The Lenovo recorded the lowest score here in PCMark 7, with 2,265 points, and in its Windows 7 guise in WorldBench 6, with just 95 points. The lower scores in our benchmarks are primarily due to the Core i3 processor's lack of a Turbo Boost mode. We advise opting for a Core i5 version with Turbo Boost for £50 more.

The GeForce 610M dedicated graphics chip is a bonus, delivering just enough grunt to keep undemanding gamers happy. The Lenovo managed 49fps in our Fear test (Maximum detail).

The combination of a large hard disk and a small SSD means the U410 resumes almost instantly from standby. However, the Lenovo needed 45 seconds to get ready for action from a cold boot.

The 14in LED-backlit screen has a reflective glossy coating. However, it's bright and has good contrast. Unless you really can't avoid bright sunlight or overhead lights, it's not a deal-breaker.

The keyboard is comfortable to type on for extended periods, but you'll have to get used to pressing Fn to use the function keys. Taking another leaf out of Apple's book, the glass multitouch trackpad is large and responsive, and supports Windows 8 gestures.

The U410 has just enough ports to satisfy most users, but the lack of an optical drive will disappoint some. Lenovo's bundled OneKey Recovery program needs updating - it asked us to insert blank DVDs to create a recovery image.

Battery life is reasonable, at 5 hours 35 minutes in our tests, if falling somewhat short of the competition here.

VERDICT: The Lenovo IdeaPad U410 isn't the fastest Ultrabook we've seen, but it's difficult to complain about this laptop, given its designer looks and sensible price. **JM**



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

SAMSUNG SERIES 5 550P7C

£850 inc VAT • samsung.com/uk • tinyurl.com/bpr5f3v

Samsung's 550P7C is a laptop in the broadest sense of the term. Its size and heft mean you're unlikely to want to place it on your lap for too long, nor will you want to sling this 3kg brute in a bag and cart it around everywhere you go.

As a desktop replacement, though, it boasts some impressive credentials, including an Ivy Bridge Core i7 CPU rated at 2.3GHz (3.3GHz in Turbo Boost mode). It also has a matt-finish, LED-backlit 17.3in screen, which crams in 1600x900 pixels. A capable nVidia GeForce GT 650M with 2GB of VRAM drives the graphics show.

For connections with the outside world, the Samsung offers gigabit ethernet, dual-band 802.11a/b/g/n Wi-Fi and Bluetooth 4.0.

There are USB 2.0 and -3.0 ports, an SDXC card reader, and both VGA and HDMI. There's also a Blu-ray/DVD combo drive, a 1TB hard drive (and room for a second), plus a pair of JBL-branded speakers, complete with an extra bass speaker.

Audio from the laptop's speakers is better than average, and Blu-ray movies look great on the Samsung's large display.

So far so good, but this beastly laptop is lacking in build quality. Its admittedly sturdy chassis is built from plastic, and looks much cheaper than its £850 price will attest.

The keyboard is lovely to use, though, with well-spaced keys that have enough travel to make typing satisfying. The trackpad is responsive and supports multitouch gestures such as pinch-to-zoom.

The Samsung did rather well in our benchmarks under Windows 7, although we were unable to run PCMark 7 with Windows 8 installed. A WorldBench score of 136 points is respectable at this price.

In our games tests, the Samsung notched up a decent 122fps in Fear at Maximum detail. In the more challenging Crysis we recorded a still-playable 39fps (1280x720, Medium).

You may not want to lug this laptop around for long, but a decent runtime means you could - if only from room to room. We recorded 7 hours 20 minutes in MobileMark 2007.

VERDICT: There's very little not to like about the Samsung 550P7C. Some build-quality issues aside, this is a very good all-round desktop replacement, with a better feature set than its competition here. **KH**



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

SONY VAIO SVS131N9E

£899 inc VAT • sony.co.uk • tinyurl.com/cfrzse3

The Vaio S-series is one of Sony's top laptop ranges. Despite the price, though, the SVS131N9E is very much an entry-level model.

For your £900, you get a low-end Core i5-3210M processor, 4GB of RAM, a 500GB hard disk, a DVD writer, a bog-standard 13in (1366x768) screen and only integrated graphics.

The budget has instead gone on a fingerprint reader, a backlit keyboard and a magnesium-aluminium chassis. On top of that, there's Bluetooth 4.0, 802.11n Wi-Fi, an HD webcam, two memory card slots (one supports SDXC for up to 64GB cards), and the DVD writer is a neat slot-loading model. Along the right side are HDMI and VGA outputs, a pair of USB 3.0 ports, plus a third USB port that can be used for charging gadgets while the laptop is switched off.

Even with all this kit, the SVS131N9E is relatively light at 1.7kg. Plus, its non-removable battery lasted a shade over 7 hours and you can more than double this by adding a £150 sheet battery.

The screen is disappointing. Viewing angles aren't great, so contrast varies depending on how far back you tilt the screen. It's very bright, though, and the semi-gloss finish isn't too reflective.

The huge touchpad may support gestures, such as scrolling and pinch-to-zoom, but it dispenses with buttons. This means you must get used to tapping in the middle for a left-click, and the bottom-right corner for a right-click.

Another gripe is noise. The Sony's hard disk is audible in a quiet room, and the rear-mounted fan becomes distracting when the laptop's processor is working hard.

Running Windows 7, the Vaio managed a decent 124 points in WorldBench 6 and felt swift in general use. The integrated Intel HD 4000 graphics will also let you play games at lower detail settings. We were unable to run PCMark 7 under Windows 8.

As with all the laptops here, the Vaio should be preloaded with Windows 8, but was previously sold with Windows 7. If you buy a version with Windows 7, you can upgrade to Windows 8 for £14.99.

VERDICT: Not everyone wants an Ultrabook, and the SVS131N9E has the benefit of a built-in DVD drive (upgradable to Blu-ray for £40). The real problems are the mediocre screen and high price. **JM**



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

**PC ADVISOR
RECOMMENDED**

TOSHIBA SATELLITE Z930-10X

£799 inc VAT • toshiba.co.uk • tinyurl.com/c5raqs9

We've already seen the Portégé version of the Z930 (reviewed at tinyurl.com/cL3ac74), and were eager to try the cheaper Satellite model. Aside from a handful of internal components there are few differences between the two, which means you get a fantastically thin and light Ultrabook for just £799.

The Z930-10X has a bright 13.3in screen, and a magnesium-alloy chassis means it weighs just 1.2kg. You can easily pick up the laptop in one hand, and carrying it around is a joy rather than a hindrance.

Despite its lightweight design, the Z930's build is solid in all areas but the lid, which we found rather flexible.

Connectivity is strong, with one USB 3.0 and two USB 2.0 ports, gigabit ethernet, HDMI and VGA. Bluetooth 4.0 and 802.11n are supported, but the svelte design leaves no room for an optical drive.

The speakers aren't particularly powerful, but the sound quality is adequate for listening to the occasional music video on YouTube.

The only real flaw is a rather small backlit keyboard; you'll need nimble fingers if your work involves a lot of typing.

Performance is very good – the best of those tested with Windows 8, and a close second-best with Windows 7. A 1.7GHz Ivy Bridge Core i5 processor is backed with a healthy 6GB of RAM and a speedy 128GB SSD, a combination that spurred on the Toshiba to achieve a respectable WorldBench score of 132, and 5,503 in PCMark 7. The Z930 is more than capable of running Microsoft Office, as well as more demanding tasks such as photo editing.

The Z930 can even turn its hand to some casual gaming. Its integrated Intel HD Graphics 4000 managed a playable 28fps in Fear at Maximum detail, and 74fps at High detail.

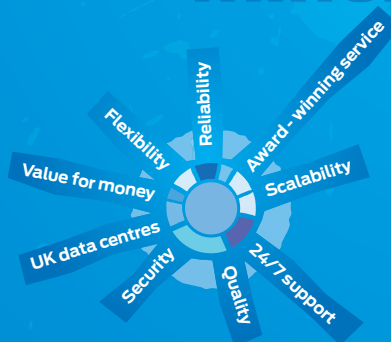
Battery life is crucial in such a portable laptop, and the Toshiba didn't fail to impress. MobileMark 2007 clocked its runtime at 7 hours 7 minutes, and we achieved a full 5 hours between charges when streaming BBC iPlayer video over Wi-Fi. With lighter tasks, such as running Microsoft Office, it should nudge a full working day.

VERDICT: The keyboard is small, but the Satellite Z930 is strong in other key areas. The Toshiba offers good performance, an attractive, lightweight design, and a very competitive price. **CJ**



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How we test

At the time of our testing in early October 2012, Windows 8 laptops were not available to review. So the all-important integration of hardware and software on these laptops remains untested.

All the laptops in this round-up were submitted with Windows 7 Home Premium, and were tested as Windows 7 computers with our outgoing WorldBench 6 real-world benchmark suite. This stopwatch the runtime of scripted actions in popular programs, then compares the results against a baseline score.

We also installed Windows 8 and ran some of these laptops with PCMark 7 - see page 74 for more information on this.

We assess each laptop's graphics capability with the game Fear, set to Maximum detail and 1024x768-pixel resolution.

We test each laptop's battery life using MobileMark 2007 Productivity, a benchmark suite that runs common Windows programs with scripted actions, and takes regular pauses to simulate real-world intermittent use.

Conclusion

These laptops were updated with Windows 8, but were designed to run its predecessor, Windows 7. Expect some manufacturers to launch models with similar specifications but touchscreens and stiffer screen hinges in the coming months.

A number of weird and wonderful designs will also appear on the market, including a range of hybrid Ultrabook/tablets.

None of this means you shouldn't buy one of these laptops. We're not fans of touchscreen laptops in any case, which quickly become uncomfortable to use. And you don't need one to use Windows 8.

Of the models reviewed here, the Toshiba Satellite is a very good Ultrabook, with commendable performance, build quality and looks, and it comes in at a reasonable price.

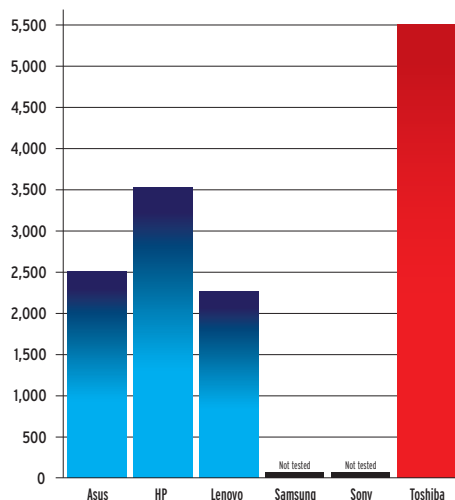
Samsung's Series 5 is barely portable, but its 17.3in screen and dedicated graphics card make it a good choice for gamers.

The cheapest example here, Lenovo's U410, is also the slowest Windows 8 laptop on test. But, forget that: it's gorgeous.

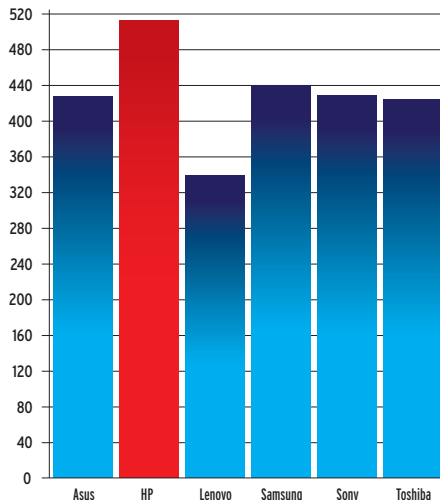
	ASUS £799 inc VAT ★★★★★	HP £699 inc VAT ★★★★★	LENOVO £649 inc VAT ★★★★★	
Model	Zenbook UX32A	Envy 4-1020ea	IdeaPad U410	
Part number ¹	UX32A-R3007V	B3Y15EA#ABU	MAHA5UK	
Processor	1.7GHz Intel Core i5-3317U, dual-core	1.7GHz Intel Core i5-3317U, dual-core	1.8GHz Intel Core i3-3217U, dual-core	
Operating system	Windows 8 64bit	Windows 8 64bit	Windows 8 64bit	
Display size	13.3in (1366x768) matt LCD	14in (1366x768) glossy LCD	14in (1366x768) glossy LCD	
Graphics	Intel HD Graphics 4000	Intel HD Graphics 4000	nVidia GeForce 610M, 1GB VRAM	
Memory	4GB DDR3 1,600MHz	6GB DDR3 1,600MHz	4GB DDR3 1,600MHz	
Storage	500GB HDD + 24GB SSD	500GB HDD	500GB HDD + 24GB SSD	
Ports	3x USB 3.0, HDMI, mini VGA	2x USB 3.0, 1x USB 2.0, HDMI	2x USB 3.0, 2x USB 2.0, HDMI	
Connectivity	802.11a/b/g/n, Bluetooth 4.0	802.11b/g/n, gigabit ethernet, Bluetooth 4.0	802.11b/g/n, fast ethernet	
Optical drive	None	None	None	
Sound	Bang & Olufsen stereo speakers, mic, headphone jack	Stereo speakers with subwoofer, mic, headphone jack	Stereo speakers, Dolby Home Theater v4, mic, headphone jack	
Trackpad	105x71mm, two-button, multitouch	100x63mm, two-button, multitouch	105x70mm, two-button, multitouch	
Card slot	SDXC	SDHC	SDHC	
Other	1280x720 webcam	HD webcam, Kensington lock slot	HD webcam	
Bundled software	Asus utilities	Beats Audio, HP utilities	CyberLink YouCam, VeriFace	
Power adaptor	45W adaptor	65W adaptor	65W adaptor	
Battery	48Wh lithium-ion, non-removable	41Wh lithium-ion, non-removable	48Wh lithium-polymer, non-removable	
Dimensions	325x223x7-18.7mm	340x236x19.8mm	344x235x21mm	
Weight	1.5kg	1.7kg	1.8kg	
Warranty	1-year return-to-base	1-year return-to-base	1-year return-to-base	
WorldBench 6 ²	123	116	95	
PCMark 7 ³	2,519	3,517	2,265	
Battery life	428 mins	516 mins	335 mins	
Fear (Max detail)	27fps	27fps	49fps	

¹Part codes refer to laptops running Windows 7, but they will be available with Windows 8 from 26 October. ²Tested in Windows 7 ³Tested in Windows 8

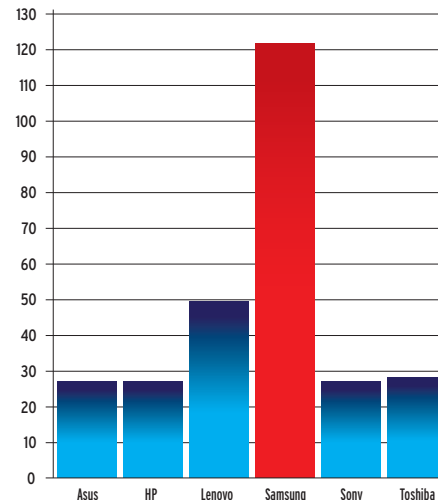
PCMark 7 score



Battery life (mins)

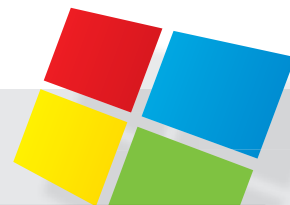


Games score (fps): Fear, Max



SAMSUNG £850 inc VAT ★★★★★		SONY £849 inc VAT ★★★★★		TOSHIBA £799 inc VAT ★★★★★ PC ADVISOR RECOMMENDED	
Series 5 550P7C		S Series		Satellite Z930-10X	
550P7C-S03UK		SVS1311N9E		PT23LE-004007EN	
2.3GHz Intel Core i7-3610QM, quad-core		2.5GHz Intel Core i5-3210M, dual-core		1.7GHz Intel Core i5-3317U, dual-core	
Windows 8 64bit		Windows 8 Pro 64bit		Windows 8 64bit	
17.3in (1600x900) matt LCD		13.3in (1366x768) semi-gloss LCD		13.3in (1366x768) matt LCD	
nVidia GT 650M, 2GB VRAM		Intel HD Graphics 4000		Intel HD Graphics 4000	
8GB DDR3 1,600MHz		4GB DDR3 1,333MHz		6GB DDR3 1,600MHz	
1TB HDD		500GB HDD		128GB SSD	
2x USB 3.0, 2x USB 2.0, HDMI, VGA		2x USB 3.0, 1x USB 2.0, HDMI, VGA		1x USB 3.0, 2x USB 2.0, HDMI, VGA	
802.11a/b/g/n, gigabit ethernet, Bluetooth 4.0		802.11a/b/g/n, gigabit ethernet, Bluetooth 4.0		802.11a/b/g/n, gigabit ethernet, Bluetooth 4.0	
BD-ROM/DVD±RW combo drive		DVD±RW		None	
JBL stereo speakers with subwoofer, mic, headphone jack		Stereo speakers, mic, headphone jack		Stereo speakers, SRS sound, mic, headphone jack	
102x54mm, two-button, multitouch		120x61mm, two-button, multitouch		85x50mm, two-button, multitouch	
SDXC		SDXC, MS Duo		SDXC	
1.3Mp webcam, Kensington lock slot		HD webcam, Kensington lock slot		1.3Mp webcam	
CyberLink Media Suite, Samsung utilities		Sony utilities		Toshiba utilities	
90W adaptor		75W adaptor		45W adaptor	
56Wh lithium-ion, removable		49Wh lithium-polymer, non-removable		47Wh lithium-ion, non-removable	
408x270x29.2-31.9mm		331x225x24mm		316x227x16.9-15.5mm	
3.1kg		1.7kg		1.1kg	
1-year return-to-base		1-year return-to-base		1-year collect-and-return	
136		124		132	
Not tested		Not tested		5,503	
440 mins		430 mins		427 mins	
122fps		27fps		28fps	

Turn over for advice on upgrading to Windows 8 and our Windows 8 desktop PC reviews >>

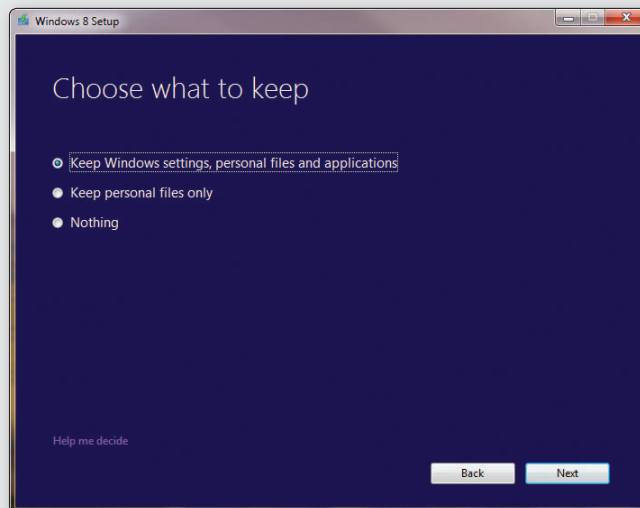
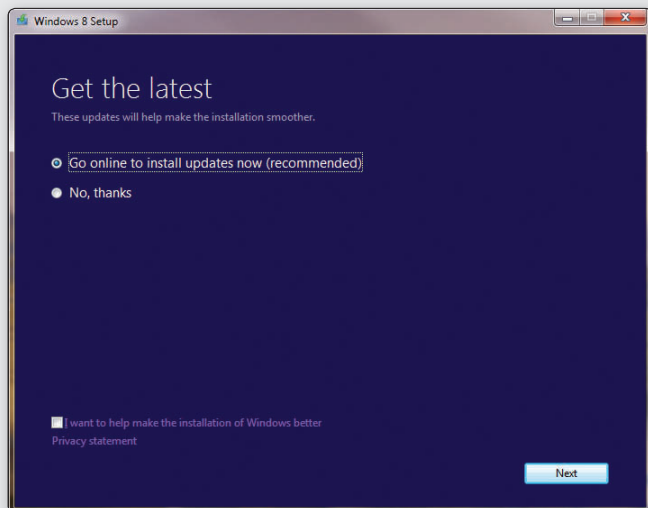


UPGRADE FROM WINDOWS 7 TO WINDOWS 8

Anyone who buys a Windows 7 PC or laptop between June 2012 and 31 January 2013 can upgrade to Windows 8 for £14.99. It's an easy process and, in most cases, the process will keep your Windows settings, personal files and applications intact.

The only caveat is that you can't upgrade from a 32bit version of Windows 7 to 64bit Windows 8.

Having purchased your Windows 8 installation disc and key, follow these steps to install the new OS on your Windows 7 PC.

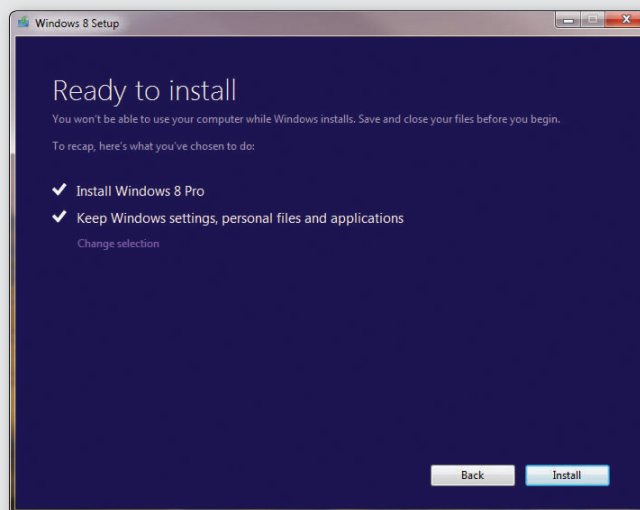
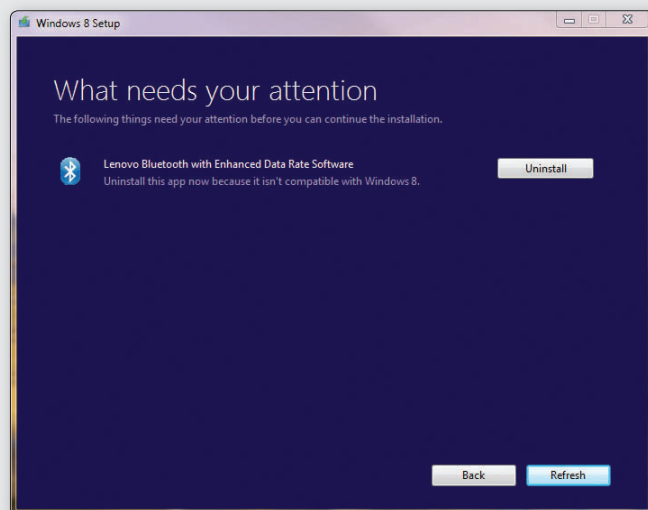


START

Insert the disc and it should autorun. You will see an option to upgrade Windows; click this. On the following screen, tick the option to 'Go online and install updates now'. Click Next to continue.

2

Enter your Windows 8 product key and accept Microsoft's licence terms. Choose what to keep from your previous Windows installation; most people should choose the 'Keep Windows settings, personal files and applications' option.



3

Windows 8 will check your system for any incompatible hardware or software and let you know if it finds anything. We had to uninstall a Bluetooth driver before we could proceed with the Windows 8 installation.

4

You're now ready to install Windows 8. Click the Install button on the recap screen, then sit back while your operating system is upgraded. Note that you won't be able to use the machine until the installation is complete.

Following installation, you'll be walked through configuration. This includes setting up a Microsoft account if you don't already have one (a Windows Live account can be used). You can use an existing email address if you don't want a new Microsoft address.

Finally, you'll be presented with the new Windows 8 Start screen. This is pretty straightforward to use with a touchscreen,

but if you're using a mouse (or touchpad) and keyboard the following shortcuts will come in handy:

- **Windows, D:** switch to the traditional Windows desktop
- **Windows, C:** open the Charms bar
- **Windows, Q:** open the search charm for apps
- **Windows, F:** open the search charm for files



ARBICO QC3578 PRO

£750 inc VAT • arbico.co.uk • tinyurl.com/9zkdz6y

This Arbico is a powerful PC with good features and performance. Housed in a black CIT Jupiter system case, its appearance is sensible enough for work, yet it has that edge required to interest gamers.

Inside, an Intel Core i5-3570 processor runs at 3.4GHz, and can boost to 3.6GHz in Turbo mode. This quad-core chip delivers plenty of power for all but the most demanding of users, but it's not the easily overclocked 'K' version found in some competing systems. Of the machines equipped with an SSD, Arbico's system performed slightly behind the competition in PCMark 7.

While overclocking isn't recommended for most users, this PC is one system that could handle it: the installed MSI Z77A-G45 motherboard comes with built-in automatic overclocking, while a huge third-party CPU cooler has been installed.

The motherboard also has some other useful features, with its Intel Z77 chipset offering fast smartphone charging via USB, USB 3.0 and SATA 6Gbps support.

A 1TB hard disk is included, and there's a 120GB OCZ Vertex 4 SSD as the boot drive, which results in faster startup and shutdown times, and better overall system responsiveness. This SSD has double the capacity of those we typically see bundled with PCs.

The Arbico is fitted with an MSI-branded AMD Radeon HD 7850 graphics card. This can easily cope with most games at reasonably high detail settings, and only the slightly faster-clocked version selected by Eclipse outperformed it in our gaming tests.

Arbico has neatly side-stepped the mess of potential Windows 8 touchscreen problems by opting to supply the system sans screen. This is probably a wise decision: at press time, no reasonably priced touchscreens that offer full support for Windows 8 were available. However, when comparing this PC to the other systems here, remember to factor in the price of a monitor if you don't have one.

Nevertheless, a Blu-ray/DVD combo drive and a healthy 16GB of RAM make the Arbico's £750 price tag competitive.

VERDICT: With up-to-date components and useful features, this PC is well-suited to both everyday computing and gaming. The 120GB SSD is a bonus, although we'd also like to see a Core i5-3570K CPU. **PM**



BRAEBO HERMES 8

£550 inc VAT • braebo.com • tinyurl.com/8f8zpdu

The Hermes 8 is a budget Windows 8 system that makes useful savings by omitting a graphics card and other features, but it will leave enthusiasts underwhelmed.

At just £550 (excluding a monitor), the Hermes 8 is significantly less expensive than any other PC in this round-up, yet its overall performance in PCMark 7 is very good, showing that it can more than hold its own in general-purpose tasks.

If you're not a gamer, you really don't need a graphics card, especially when a PC's Core i5-3570K processor features Intel's best HD 4000 integrated graphics. You'll be able to play most games at their lower detail settings - the Braebo could even handle Crysis.

Perhaps the most noticeable cost-cutting is in the use of an MSI H61M-P31/W8 motherboard, which features Intel's H61-Express chipset. This board lacks support for enthusiast features such as processor overclocking, USB 3.0 and SATA 6Gbps.

The Hermes has limited upgrade potential, too. There's a PCI Express 3 slot for an optional graphics card, but it's the only available expansion slot on the motherboard. If you aren't interested in gaming, consider adding a USB 3.0 card here instead.

As you might expect at this price, the Hermes' system case is less than inspiring. It feels cheaply made and offers no cable management or ease-of-access features inside, causing a large bundle of cables to hang in the middle of the case.

Unlike most of the PCs in our group, the Hermes 8 comes with a DVD drive rather than a Blu-ray/DVD combo unit. A useful 8GB of RAM is complemented by a roomy 2TB hard drive, and we were particularly pleased to find a 60GB Kingston SSD had been included, which gives a significant boost to overall performance. You'll need to manage your files carefully as that 60GB will rapidly fill up, though.

Braebo also includes 500GB of free online storage, valid for the lifetime of the PC. The warranty is less generous - a basic 1-year return-to-base policy that falls short of much of the competition.

VERDICT: Despite its cut-down features and budget components, the Braebo Hermes 8 delivers good overall performance. It'll be difficult to upgrade, and the lack of USB 3.0 support may be a fatal flaw. **PM**



**PC ADVISOR
RECOMMENDED**



CHILLBLAST FUSION GALAXY

£799 inc VAT • chillblast.com • tinyurl.com/bwpsqsv

Chillblast's Fusion Galaxy uses an Asus P8B75-M LX motherboard, which features Intel's business-oriented B75 Express chipset. It doesn't support overclocking, but it does offer USB 3.0, SATA 6Gbps and LucidLogix Virtu support. The latter lets you access both a dedicated graphics card and the graphics integrated to a CPU.

There's 8GB of RAM and a roomy 2TB hard drive, but Chillblast hasn't included an SSD. This has resulted in significantly lower scores in PCMark 7 than the competition. The system will also take longer to boot up or shut down and feel slower in general use.

The VTX-branded AMD Radeon HD 7770 graphics card represents a big step up from the processor's integrated graphics, although it's noticeably slower than the Radeon HD 7850 selected by Arbico and Eclipse. You can certainly play games on this PC, even if it's not designed as an industrial-strength gaming rig.

The Xigmatek Asgard Pro system case has a better finish than most of the budget PC housings we see. It includes a front-facing USB connector, a matt black paint job inside and out, extra fan-mounting points and handy cable management.

The all-inclusive £799 price includes a Blu-ray drive and a Logitech MK260 wireless keyboard, plus a pair of Logitech S220 speakers and a subwoofer. But perhaps the most interesting bundled peripheral is the Dell ST2220T multitouch display.

With a 22in diagonal, it's noticeably smaller than some of the competition, but offers the same 1920x1080 resolution that's necessary for full-HD video playback. It also boasts a high-quality in-plane switching (IPS) panel, which delivers image quality that far outclasses the budget competition. Its hinge allows it to fold back almost flat for a less awkward touchscreen experience.

Like most touchscreen displays, this monitor has a protruding bezel that obstructs the fingers when making gestures that sweep in from off the screen. The optical two-point touch interface should be regarded as a bonus rather than the primary input.

VERDICT: A great-value multimedia system with everything you need included as standard, including speakers and a high-quality display with touch input. Add an SSD if you can afford to. **PM**



**PC ADVISOR
BEST BUY**



CYBERPOWER INFINITY ACHILLES ELITE

£999 inc VAT • cyberpowersystem.co.uk • tinyurl.com/bphy7ow

The Infinity Achilles Elite is one of the more expensive desktops in our round-up, yet it comes with a slightly slower 3.2GHz Intel Core i5-3470 processor than the Core i5-3570K competition. The advantage of this is purely psychological, allowing the system to come in at under £1,000. Enthusiasts: pay more for a 3570K.

CyberPower has instead turned its attention to other system components, with some appealing hardware under the bonnet. A 1TB hard drive is supplemented with a 60GB OCZ Agility 3 SSD. This delivered a measurable performance increase in PCMark 7 - despite its slower CPU, this is one of the fastest PCs on test.

CyberPower has selected a Gigabyte GA-B75M-D3H motherboard, which uses Intel's B75 Express business-oriented chipset. It provides support for USB 3.0 and SATA 6GBps, while omitting the Raid and SSD-caching features found on the pricier Z77 Express boards. It also supports Intel's Rapid Start Technology and Small Business Advantage features, such as after-hours backup.

Smart Connect Technology allows it to monitor your email and social networks while the system is asleep, with everything up to date when you wake the PC in the morning. You can also use the supplied LAN Optimizer program to prioritise different types of network traffic, so big downloads won't slow your web browsing.

It's not all work and no play, however, as the Infinity Achilles Elite comes with a Palit-branded nVidia GeForce GTX 660 graphics card. This enables the CyberPower to play most modern games at reasonable speeds. In fact, it's the fastest graphics card in our round-up; its falling behind those PCs fitted with an AMD Radeon 7850 can be explained only by the slower processor.

Also included is a Blu-ray drive and a decent wired keyboard and mouse set. You'll have to add your own speakers, though.

An Iiyama touchscreen works nicely with Windows 8, but its protruding bezel and limited two-point multitouch system prevent it from delivering a full Windows 8 touch experience.

VERDICT: This PC is a great performer, despite using a slightly slower processor. The Iiyama touchscreen isn't the ideal Windows 8 input device, but it can assist you in getting around the OS. **PM**

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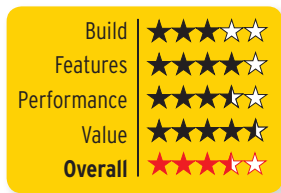
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Monitor specification : e2343Fi, 23" LED backlight monitor, 50,000,000:1 contrast ratio, 5 ms response time

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ECLIPSE EXPLORER TOUCH I5357R785

£999 inc VAT • eclipsecomputers.com • tinyurl.com/d4d8vwg

The Explorer Touch nears the top of the price scale in this group, but it includes a full set of peripherals. Despite offering among the slowest Windows performance here, it's the best choice for gamers.

Inside is the same Core i5-3570K processor as the Arbico, but no SSD. This places the Eclipse at a severe disadvantage both in the real world and in PCMark 7, which is clearly visible in the graphic overleaf. Adding a 60GB OCZ Agility 3 will cost around £50 - a wise upgrade.

Other specifications include a capacious 2TB hard drive, a Blu-ray drive and a set of Logitech stereo speakers and a subwoofer. You also get 16GB of RAM, which is plenty more than you probably need.

Like the Arbico, the Eclipse is fitted with a speedy yet reasonably priced AMD Radeon HD 7850 graphics card. This version is slightly faster clocked, making it the best PC for games in our group. We recorded a very good 159fps in intensive game Crysis at its Low detail setting, and 108fps at Medium detail.

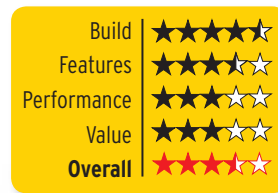
As with CyberPower, the Explorer Touch i5257r785 comes with a 23.6in Iiyama touchscreen display with two-point multitouch. Decent Windows 8-certified displays are not yet available to buy, and this display is seriously compromised in its support for gestures that involve swiping in from the edge of the screen.

However, it's still fun and convenient to be able to select tiles from Windows 8's new Start screen with the touch of a finger. The monitor also offers two HDMI inputs for hooking up a TV, Blu-ray player or games console, plus DVI and VGA.

The system is housed in a budget case simply labelled '902 Series'. It's built on an Asus P8Z77-V LX motherboard, which features the enthusiast-friendly Intel Z77 chipset.

You get USB 3.0 and SATA 6Gbps support as standard, and the motherboard doesn't skimp on slots and connectors either. There's plenty of available room for expansion and upgrades, although the case itself is a little cramped and lacks cable management.

VERDICT: A custom PC at this price really ought to include an SSD - we strongly advise adding one to the specification, even if it means halving the RAM and storage capacity to bring it under budget. If you already have a monitor, the Arbico offers better value. **PM**



QUIET PC ICEPIPE A43 SILENT PC

£1,206 inc VAT • quietpc.com • tinyurl.com/cz6a77p

As usual, our group test entry from Quiet PC shows a radical departure from the norm. At £1,206, it's by far the most expensive PC here, although this amount of money buys you sought after peace and quiet - this fanless PC is utterly silent in operation.

The NoFen CS-60 case looks like military hardware. Its meshed front panel allows good airflow through the case, without assistance from spinning blades. Inside, the usual CPU cooler and fan has been replaced with a huge circular heatsink. Almost all the motherboard components are obscured, including at least one expansion slot.

The 400W NoFen power supply is also a fanless model and, as we've come to expect from Quiet PC, no hard drive has been included as standard - they're just too noisy.

Instead, a 223GB Kingspec Challenger SSD has been fitted. With no moving parts this, too, is silent. It's double the capacity of the next largest here, but the system remains short on storage space.

The only component capable of making a sound in this group test is the DVD drive. Not only does it let the side down in this way, it doesn't support Blu-ray. Fortunately, it's a particularly quiet model.

The use of passive cooling means it's wise not to go too crazy with CPU power, so Quiet PC has selected a Core i5-3450S. The 'S' denotes a power-saving version of the chip, which runs at a lower base speed to the standard edition. The system trundles along at 2.8GHz until full power is required, at which point it rises to 3.5GHz.

This power-saving chip and the lack of a dedicated graphics card enables the system to run with only a 400W power supply - we measured a power consumption of just 24W when idle.

Intel's integrated graphics are good enough for HD multimedia and some light gaming, but it should be noted that the i5-3450S incorporates the slower HD 2500 version of its integrated graphics and falls some way behind the best that Intel has to offer.

Quiet PC has included a 23in Zalman monitor. It includes a pair of HDMI inputs, plus analogue VGA, but it isn't a touchscreen.

VERDICT: Quiet PC's IcePipe A43 is unique among the PCs here in that every component has been selected to make it as quiet as possible. It is expensive, though, and you'll probably need more storage. **PM**

How we test

We test each PC for performance, measuring its speed in everyday computing tasks as well its ability to play games. We asked vendors to submit their systems running Windows 8, but our long-standing benchmark, WorldBench 6, won't work with Windows 8.

For this group test we instead turned to PCMark 7, an industry-recognised test suite that uses 25 different workloads to measure areas such as storage, computation, image- and video manipulation, web browsing and gaming. We understand that results from this benchmark are not absolute, with Intel driver issues in Windows 8 meaning video-transcoding tests can present sub-optimal results. Nevertheless, the results give an idea of the relative performance.

As well as the overall PCMark 7 result, typically a points score between 3,000 and 6,000 with current hardware, we have also published results garnered from some of the suite's sub-routines. These are designed to gauge performance in, for example, creativity and entertainment scenarios. Another test highlights the difference between storage technologies. This is an area that impacts perceived speed more than ever, now that even the slowest modern CPUs are more than fast enough for everyday PC duties.

A major draw for many Windows PC users is playing games. As well looking at the sub-score from the PCMark 7 Entertainment test, we measured each PC's capability in Crysis, a revered first-person

shooter that still stretches the mettle of any potential gaming machine. Most modern dedicated graphics cards now allow fast framerates at HD screen resolutions, while even integrated graphics processors can potentially provide smooth, playable framerates at modest resolutions and detail settings.

Conclusion

Windows 8 is designed to take advantage of touchscreens, but you don't need one to use the OS. The overall system requirements are much the same as they are for Windows 7.

If you're happy with the performance of your current PC, then there's no urgency to upgrade the hardware just to run Windows 8. However, if you are about to buy a new PC, look for a Windows 8-certified motherboard to ensure the best compatibility.

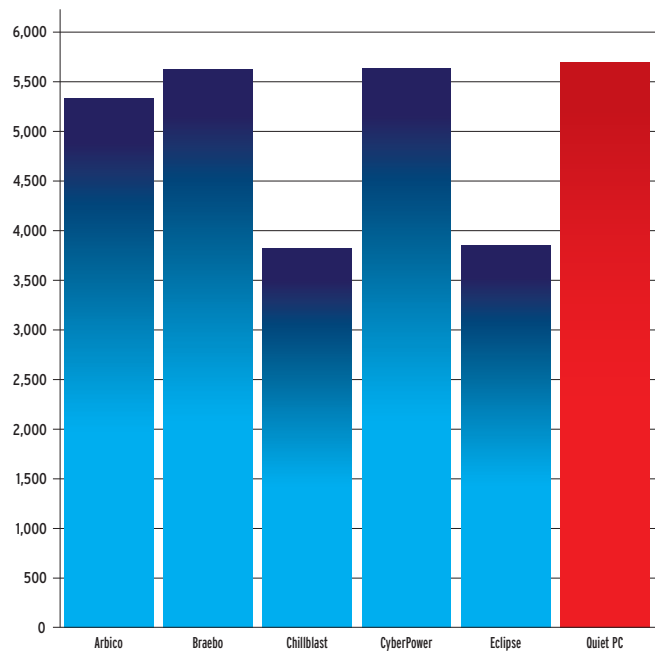
The Modern UI interface may have you itching to try out a touchscreen, and it's tempting to go and buy one now. Be warned, though, that while currently available displays can make the OS more usable, they don't provide the full experience Microsoft has in mind. Some of the gestures required to move around the interface are tricky to perform and, while you may eventually get the hang of it, many gestures eluded us even after persevering.

Today, the best desktop Windows 8 experiences might come from all-in-one PCs that are ahead of the game in touch integration. ☒

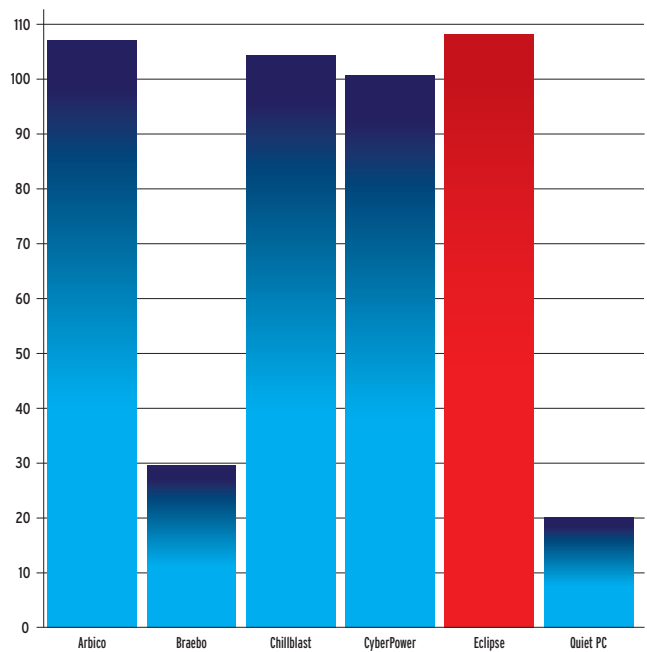
	ARBICO £750 inc VAT ★★★★★	BRAEBO £550 inc VAT ★★★★★	CHILLBLAST £799 inc VAT ★★★★★ PC ADVISOR RECOMMENDED
Model	QC3578 Pro	Hermes 8	Fusion Galaxy
Processor	3.4GHz Intel Core i5-3570	3.4GHz Intel Core i5-3570K	3.4GHz Intel Core i5-3570K
CPU cooler	Artic Cooling Freezer 7	Standard Intel cooler	Standard Intel cooler
Operating system	Windows 8 64bit	Windows 8 64bit	Windows 8 64bit
Motherboard	MSI Z77A-G45	MSI H61M-P31/W8	Asus P8B75-M LX
Memory	16GB DDR3 1,600MHz	8GB DDR3 1,333MHz	8GB DDR3 1,333MHz
Storage	1TB HDD + 128GB OCZ Vertex4 SSD	2TB HDD + 60GB Kingston SSD	2TB HDD
Display	Not supplied	Not supplied	22in Dell ST2220T (1920x1080)
Graphics	MSI AMD Radeon HD 7850, 1GB VRAM	Intel Graphics HD 4000	VTX AMD Radeon HD 7770, 1GB VRAM
USB ports	2x USB 3.0, 8x USB 2.0	6x USB 2.0	3x USB 3.0, 6x USB 2.0
Power supply	500W Xigmatek	600W Alpine	700W Chillblast
Sound, speakers	Onboard, none	Onboard, none	Onboard, Logitech S220 2.1
Optical drive	TSST Blu-ray/DVD combo drive	DVD ± RW drive	LG Blu-ray/DVD combo drive
Case	CIT Jupiter	Braebo Hermes	Xigmatek Asgard Pro
Keyboard & mouse	Not supplied	Not supplied	Logitech MK260 combo (wireless)
Other features	None	500GB online storage	2-point touchscreen
Bundled software	None	None	CyberLink suite, free utilities
Warranty	1-year collect-and-return (parts & labour), 2-year return-to-base (labour only)	1-year return-to-base	2-year collect-and-return
PCMark 7 - Overall	5,363	5,605	3,759
- Creativity	7,068	8,710	5,230
- Entertainment	5,136	4,374	4,070
- Storage	5,108	4,487	2,201
Games score (fps) ¹	153/107	47/29	149/104

¹Tested in Crysis at 1280x720 Low/Medium detail

PCMark 7 score



Games score (fps): Crysis, Medium, 1280x720



CYBERPOWER £999 inc VAT ★★★★★ PC ADVISOR BEST BUY		ECLIPSE £999 inc VAT ★★★★★		QUIET PC £1,206 inc VAT ★★★★★	
Infinity Achilles Elite		Explorer Touch i5357r785		IcePipe A43 Silent PC	
3.2GHz Intel Core i5-3470		3.4GHz Intel Core i5-3570K		2.8GHz Intel Core i5-3450S	
Standard Intel cooler		Standard Intel cooler		Nofen IcePipe CR-95C	
Windows 8 64bit		Windows 8 64bit		Windows 8 64bit	
Gigabyte GA-B75M-D3H		Asus P8Z77-V LX		Gigabyte GA-Z77MX-D3H	
8GB DDR3 1,333MHz		16GB DDR3 1,333MHz		8GB DDR3 1,333MHz	
1TB HDD + 60GB OCZ Agility 3 SSD		2TB HDD		223GB Kingspec Challenger C3000-240 SSD	
23.6in Iiyama PLT2451MTS-B (1920x1080)		23.6in Iiyama PLT2451MTS-B (1920x1080)		23in Zalman TM-230 (1920x1080)	
Palit nVidia GeForce GTX 660, 2GB VRAM		VTX AMD Radeon HD 7850, 1GB VRAM		Intel Graphics HD 2500	
2x USB 3.0, 6x USB 2.0		3x USB 3.0, 5x USB 2.0		3x USB 3.0, 8x USB 2.0	
500W Cooler Master		650W EZCool		400W NoFen (fanless)	
Onboard, none		Onboard, Logitech LS21 2.1		Onboard, none	
Lite-On Blu-ray/DVD combo drive		Lite-On Blu-ray/DVD combo drive		Optiarc DVD drive	
Cooler Master HAF912		902 Series		NoFen CS-60	
Logitech K120 keyboard (wired), Logitech B110 mouse (wired)		Microsoft Comfort Curve Keyboard 3000 (wired), Microsoft Explorer Touch mouse (wireless)		Gigabyte GK-KM6150 combo (wired)	
2-point touchscreen		2-point touchscreen		Silent, fanless design	
None		None		None	
3-year return-to-base (labour only)		1-year return-to-base		2-year collect-and-return	
5,609		3,786		5,675	
8,532		5,317		9,414	
5,379		4,374		3,896	
4,542		2,206		4,902	
137/101		159/108		42/20	

Epson inkjet printers may be the best 'laser' for your business

Matt Egan, Editor, PC Advisor

Despite being historically viewed as a cheaper alternative to laser printers mainly aimed at home users, inkjet printers such as the Epson Workforce Pro range are every bit as capable as their more expensive laser cousins. Indeed, the Epson is perfect for use in a busy office, and a top-of-the-line inkjet printer may be just the thing to improve print quality and save your business money.

Inkjet vs laser printer

Traditionally, inkjet- and laser-printers have been viewed as very different beasts, designed for different jobs. Inkjets were seen as cheap: good for saving money for consumers who have little of it to spend, and low expectations in terms of speed, print quality and reliability. Lasers were for businesses: able to quickly and reliably produce large volumes of high-quality output, over a long lifetime. The down side? They cost a bundle to run and stick a few noughts on your power bill.

But inkjets have improved. A lot. This is great news for both small- and medium-sized businesses, who now expect better print quality and lower running costs. But it is also high-time that businesses looked again at inkjet printers – especially those looking to cut costs in this time of recession.

Faster performance

For one thing, modern inkjet printers such as Epson's Workforce Pro range are quicker than you might expect. Epson's inkjet printers can deliver the first page in less than seven seconds – much faster than the average laser printer. Indeed, when Epson speed-tested its inkjets against 20-page-per-minute lasers, it found that the business inkjets were quicker to print out four pages. And that's often the key metric in a busy office environment.

80% less power consumption

Good, modern inkjet printers are now much less energy-hungry than were their predecessors: according to an independent IDC comparison made against the top 10 A4 colour laser printers and multifunction printers, Epson's Workforce Pro range of printers can consume up to 80 percent less power than the top laser printers. Whereas colour lasers can use up to 1,000W, Epson's Workforce Pro inkjets use only up to a maximum of 26W. And because inkjets are a cold technology that requires no heating, they draw very little power on standby. This will save any business money.

50% lower running costs

Of course, power costs aren't everything. Much more important to your business are the cost per page of toner and paper. In any business environment these will soon rack up. The good news? According to an independent IDC study, Workforce Pro inkjet printers can deliver 50 percent lower costs on every page. And with automatic duplexing, you can slash your paper costs in half, too.

Epson's inkjet printers help businesses to lower ink costs by offering a choice of high-yield cartridges of up to 3,400 pages. But there is no drop in quality to compensate. The Workforce Pro printers offer print resolutions of up to 4800x1200dpi. This is a much higher resolution than that offered by comparative lasers, which in turn leads to clearer text and sharper images.

The difference between inkjet and laser is nothing like it once was, and now there is no reason for any business to avoid inkjet technology. Before you make a selection, take into account speed, print quality and running costs. You may just find that the Epson inkjet is the best deal.





PROFESSIONAL LASER KILLER

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*Top 10 in relevant markets and periods; differs by feature.

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Multifunction printers

Robin Morris looks at six printers that can do it all, from printing your favourite holiday snaps to copying, scanning and faxing your important documents

Gone are the days when you needed to find space for both a printer and a standalone scanner, never mind a fax machine and a photocopier. Today, you're likely to find most or all of these functions built into one svelte device.

All multifunction printers are able to print and scan documents and pictures. They're also capable of acting as a copier. If you want to run off several copies of a document, you'll be able to scan – or sometimes load from a USB flash drive or memory card – and output multiple editions, often without even needing to connect a computer.

Some models add fax facilities. This may be useful, but make sure you're not paying extra for a feature you're not going to use.

Multifunction printers are equipped with either inkjet- or laser printing engines. Inkjets tend to be cheaper and often generate better colour. Lasers are frequently more expensive to buy, are better at printing text than graphics, and offer faster print speeds.

If you're looking for a decent level of quality, it's difficult to find an inkjet that can generate speeds beyond 10 pages per minute (ppm) in text or 5ppm in colour graphics. By contrast, laser models routinely go up to 15ppm and beyond, even in their highest quality modes. If you're a home user, you'll probably be drawn toward the colour-imaging and photo capabilities of inkjet models. Business users are more likely to look for laser models, particularly if they want to generate high volumes of text.

All models can be tethered via USB 2.0. Home models will typically be kitted out with 802.11b/g/n, and Bluetooth is provided on some models. Wireless capabilities can prove invaluable, allowing you to send files to the printer without needing to be in the same room.

And in a family home, where you may have multiple computers, the ability to have each connect to a single printer could be a time-saver.

All printers also have a wired alternative, usually ethernet. This allows the device to effortlessly slot into an office network.

Today's multifunction printers can also use the internet to add extra capabilities, such as printing documents stored in the cloud or on a smartphone or tablet, and for downloading apps.

Many multifunction printers have a graphical display, often with a touchscreen. Touchscreen models tend to cost a little more, but these displays can make using your device much simpler – you simply press the desired menu option or icon, rather than having to operate a tricky set of buttons.

A good graphical interface is important if you want to print directly from a USB drive or memory card, bypassing a computer. A nice colourful screen will let you browse images on an external storage device. Many displays will allow you to retouch, crop or rotate an image before printing it out, and some have more advanced features. Generally, the bigger the size, the more visually impressive the screen will be.

If you'll be scanning documents, don't forget to check the scanner specifications. The higher the optical resolution, the more detail the scanner will be able to reproduce. The scanner won't necessarily be as flexible as a standalone model for scanning large items such as thick books – if this will be important, make sure the scanner lid is adjustable (known as telescoping).



Photography by Dominik Tomaszewski



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

CANON PIXMA MG2250

£50 inc VAT • canon.co.uk • tinyurl.com/9bh4b3u

A multifunction printer that comes with a £50 asking price (and costs only £34 online) has little to sustain the feature-hungry. This Canon isn't the most elegantly styled multifunction printer, and guzzles up a considerable amount of space. It can be positioned on a (rather deep) shelf, with all the relevant parts mounted at the front.

The MG2250 is plastered with buttons, and you don't even get a graphical screen – a text display lets you adjust some settings. There's no memory card reader or PictBridge port, so you can't plug in external devices. You could use a few of the facilities without a PC attached, but we wouldn't recommend the Canon for this purpose.

Just one input feed is built in, although this can hold around 100 sheets – not a bad figure, given the price. A proper output tray is present, too, so prints aren't dumped on to the floor.

You wouldn't expect to get any networking facilities at this price, and USB 2.0 is the only physical interface. However, Canon has tried to make using this model more convenient by bundling copious amounts of software. There's a Print Your Day app for Facebook, while My Image Garden and Creative Park Premium give you more options for organising and manipulating pictures.

The MG2250 is relatively slow, although not fatally so. In Normal text mode we recorded 7.1ppm, which is only 1.4ppm off that possible in its fastest setting. Text is much darker in Normal mode, although the characters remain rather fuzzy. Even the best output lacks clarity, despite its slow 1.9ppm output speed.

The Canon is more successful in printing graphics, although the output time is lacklustre. The fastest 3.2ppm mode is too light, and the middle mode operated at a sluggish 2.1ppm in our tests. The palette is pleasantly balanced, if not showing great detail or accuracy of colour. The Canon was the slowest printer here to produce 4x6in photos, with colour that lacks vibrancy, but the output is adequate.

Running costs are none too expensive for a model this cheap, at 2.8p per page of black, and 4.5p for colour.

In copying, the MG2250 loses detail. It's reasonably fast here, though, and even at 600dpi it needed only 35 seconds to copy our test document. The colours are paler than they should be, with visible imperfections. The lid is a little weak, although it is easily adjustable, allowing you to scan larger items.

VERDICT: The MG2250's running costs are modest, given the low initial price of this model. The Canon produces acceptable output, but spend a little more and you'll get significantly better results.



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

**PC ADVISOR
RECOMMENDED**

CANON PIXMA MX895

£200 inc VAT • canon.co.uk • tinyurl.com/92yq4sf

It's tempting to look at a multifunctional printer that offers fax and ethernet facilities and conclude that it's a business model. The Canon MX895, though, more than almost any other multifunction printer we've seen, caters for all users.

Everyone except the very small, that is, as this machine is something of a giant. Its chunky pyramid design does little to camouflage its bulk, although it does have a nice line in hiding many of its less-sightly features behind compartment doors.

Whereas the likes of HP go to town on touchscreen interfaces, Canon complements its 3in graphical display with a mass of buttons. The cunning interface lights and dims buttons as they become needed. It's a good move that pays dividends on a feature-rich model, making it a cinch to use with or without a PC connected.

And so, on to those features. We could mention the glut of connectivity options – Wi-Fi and ethernet networking (with Bluetooth as an option) jockey for position alongside PictBridge and a fully featured memory card drive that caters for SD, Memory Stick, CompactFlash, xD-Picture Cards and so on. The MX895 can also snatch files from Canon's online cloud services, and mobile devices can make contact, too. And then there's the 35-sheet ADF, which works beautifully for copying and faxing.

This isn't the fastest printer here: its Fast and Normal mono speeds of 11.9- and 8.9ppm are no match for those of the HP 7520, for instance. Neither are the graphics sensationally fast, although in the middle mode it did produce a competitive figure of 3.1ppm. But the Canon's print quality is top-notch.

Colours are gorgeous and characters are sharp and focused. With the addition of dedicated photo paper, the results are beautiful, with the MX895 deftly constructing its images with the deepest shades and the greatest attention to detail.

Running costs aren't at the cheaper end of the scale, at 2.9p for a page of text, and a hefty 12.5p for a full-colour page.

The scanning component works very well, and in good time, adding plenty of colour and incisive detail to documents. The copying facilities are never less than faithful to the source material. An adjustable lid would help, though.

VERDICT: The Canon MX895 isn't the cheapest, nor the fastest, model to run, but its feature set is stunning, and its print quality is unparalleled. For printing results that grab the senses, this Canon is a very capable and highly recommended model.



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

EPSON STYLUS PHOTO PX730WD

£200 inc VAT • epson.co.uk • tinyurl.com/8gbq8c4

Epson's Stylus may be aimed primarily at photographers, but its fierce mix of good features and a reasonable price will make it a very decent addition to many a home. Its low-slung appearance and beautiful dark finish give it a certain brutal charm, although it adopts a modern approach to every aspect.

The interface eschews touchscreen facilities for a hybrid system that combines a colourful 2.5in display with a series of lurid green buttons. It works moderately well, although we miss the punch-and-go feel of touchscreen models. The display itself suffers from poor viewing angles, but the Epson is adequate as a PC-free printer.

The clever design adds to the chunky 120-sheet paper tray with a second dedicated 20-sheet photo holder. And the printer can seamlessly switch from one tray to the other as the situation demands. We found this photo tray easier to use than some, too.

PictBridge is included for USB sticks, and the Epson also plays host to a versatile memory card drive. A Wi-Fi connection allows convenience, but you also get an ethernet port for adding the Epson to an office network. You can even hook up to mobile devices, courtesy of Epson iPrint, and print directly on to compatible discs.

A bumper software bundle includes ABBYY FineReader Sprint for OCR work. Its multiple modes make it accessible to both novice and expert users. For more in-depth scanning that involves extracting different elements from a page, the Epson is a sturdy bet.

Epson traditionally boosts its speed figures with a draft mode that seems drained of all colour. Move beyond the PX730WD's blistering, but almost pointless, 19.4ppm draft mode, and this is a highly capable printer. We recorded 11.5ppm in the middle mode, where output is of good quality, with clear and sharp characters.

Colour graphics are also very good, with the 5.8ppm middle mode combining a swift turn of foot with an appetising palette. However, it's in printing photos that the Epson really shines. Its 80-second speed is decent, but the output explodes off the paper, with the Owl Photographic ink ensuring searing results. Running costs are high, though, at 3.4p for text and 9p for colour.

Copying was fast, and the PX730WD retains its speed advantage even here. Better still, the copies were realistic and faithful to their source material. The scanning lid isn't as robust as we'd like, though.

VERDICT: It's expensive to run, but the Epson's photo results are assured, and its extensive feature set and software bundle also helps soften the blow. A better quality display wouldn't go amiss.



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

HP PHOTOSMART 5520 E-ALL-IN-ONE

£90 inc VAT • hp.com/uk • tinyurl.com/8f47jkc

A considerably pared-down version of HP's 7520 (overleaf), the £90 5520 offers some surprising features. In contrast to the multilayered design of the 7520, the 5520 looks conventional. To a point. It has a rather elegant figure, with a tucked-in waist that gives it a more pleasing look than the typical bulbous multifunction printer. Not that the design is totally successful – it took us some time to find the opening for the scanner lid, for instance.

The 80-sheet input tray isn't the most capacious, but its simple yet sturdy design gave us few feeding issues. Unlike the 7520, there's no additional photo tray, so you'll have to get used to mixing A4 and photo media if you want to use multiple formats. Besides the scanning/copying component, you don't get any extras such as ADFs or fax facilities. There is a memory card slot, cunningly hidden behind a panel, but no PictBridge port. The latter omission is a bit of an annoyance if you're intending to print from USB sticks.

The 2.65in screen is smaller than many we've seen, less than two-thirds the size of the 7520's 4.3in panel. In many respects, though, it's a miniature version of that model's display, right down to the touchscreen capabilities. It's a nice screen to use, with similarly colourful graphics, and a quick response that makes it a joy to navigate. It's not understocked with options, and you can still access HP's apps library. Indeed, the 5520 is remarkably well connected for a seemingly low-end printer. Wi-Fi joins the USB 2.0 interface, and you can also communicate with mobile devices using HP's ePrint.

Given its low price, the 5520's output isn't bad. It can handle text reasonably well and, in the standard 3.1ppm mode, the output grains only when you look closely. Colour graphics look bright and breezy, although the palette lacks subtlety, and depth of detail isn't particularly strong. It holds its own on speed, though, and the 3.1ppm Normal mode is only 0.1ppm down on that of the more expensive 7520. With photo paper, it lacks that ability to astound that distinguishes the best photo printers.

The 5520 benefits from low running costs, costing 2.4p for a page of text, and 4.8p for a page of colour.

The copying facilities are adequate, although our results displayed a few imperfections. The 5520 is one of the slower models in this regard, and its rigid lid lacks the capacity for larger materials.

VERDICT: A nice touchscreen interface and a tempting price helps make the 5520 a contender here; its low running costs won't hurt either. The HP's performance is solid rather than stunning, though.



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

**PC ADVISOR
RECOMMENDED**

HP PHOTOSMART 7520 E-ALL-IN-ONE

£170 inc VAT • hp.com/uk • tinyurl.com/98g9xte

With its peculiar combination of turrets and platforms, the Photosmart 7520's styling is somewhat unconventional. There's plenty to pack in, though, from a sizeable touchscreen display to fax facilities and superb connectivity options.

The default paper feed is a roomy 125-sheet input tray; sitting just above this is a sealed 20-sheet photo tray. The latter's not the easiest unit to slide into place, but it's effective and saves you from having to constantly swap media. Joining these is a 25-sheet ADF.

Besides a USB interface, the 7520 can also be connected to Wi-Fi, which is particularly useful for downloading apps. There isn't a wired ethernet interface, but this device isn't aimed at businesses. HP's ePrint allows you to email your files directly to the printer using your tablet or smartphone, and conveniently situated at the front are connectors for memory cards and USB drives.

The 7520 offers a wonderfully colourful 4.3in screen that allows the control system to work as every good touchscreen should. Punch the Photo menu, for instance, and use your finger to scroll through the photos on your USB drive or memory card. Select the one you want, then access another menu that lets you alter the size, remove red-eye and so on. You don't get an exhaustive selection of retouch options, but the basics are here. You don't need a PC at all.

The 7520 doesn't stint on speed, and its text output is usable in the lowest quality mode, despite hitting an impressive 17.6ppm in our tests. We'd like text to be marginally cleaner and more focused in the middle mode. Results in the highest mode offer superb clarity, but the 1.9ppm speed at which they're available is a turn-off.

The graphics output on standard paper is very good, and almost on a par with that of the MX895. The palette is perhaps just a touch too polite, but the results remain eye-catching. Speeds are very decent, although the 7520 was only slightly faster than the 5520 in our tests. Photos are brilliantly rendered, and alive with colour.

Running costs are reasonable, working out at a wallet-saving 2.4p for a page of text, and 4.8p for colour.

The HP isn't the fastest printer in copying pages, but the results are accurate and little colour is lost in the translation. At 600dpi, the HP turned out results in a mere 34 seconds. The lid is robust, although you can't adjust it to fit in larger items.

VERDICT: The running costs are modest, and the 7520 does an awful lot very well. Its printing speed is mostly good, particularly for photos. Add in the decent interface, and this is quite the all-rounder.



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

KODAK HERO 7.1

£170 inc VAT • kodak.co.uk • tinyurl.com/73txus3

Kodak's Hero 7.1 garnered considerable praise from us last year, winning our award for the Best Printer of 2012. It's certainly far from being best of breed here, but it'll continue to retain a certain charm for as long as stocks remain (Kodak will continue to sell ink and paper, despite having recently pulled out of the printers market.)

The Hero doesn't look particularly alluring, but its feature set impresses. There is a wealth of connectivity options, with both 802.11b/g/n Wi-Fi and ethernet – the latter will be of interest to those looking for a printer they can fit into an office environment. More pertinently, it can use Kodak's Pic Flick to make contact with mobile devices, and it can take advantage of cloud printing.

The Kodak has some convenient paper-feeding facilities, with a capable 100-sheet main tray supplemented by a 40-sheet photo tray. The latter hovers above the main paper feed, and proves rather easier to load than those of many other multifunction printers we've seen. The Hero is also kitted out with USB and memory card slots.

The Hero 7.1 is fitted with a large and breezy 3.5in LCD panel that walks you through the printer's many functions. We found it a very pleasant model to use without a PC attached.

The Kodak isn't the cheapest printer to buy in shops, but you will find it available for considerably less than our quoted £170 RRP (we saw it online for £115 at press time). It's also the cheapest model in our group test in terms of running costs and, over its lifetime, it should save you a pretty packet. Indeed it is the loss of the lower running costs such as those enjoyed by the Hero that make us lament the loss of Kodak as a printer maker. Just 1.7p for a page of black and a miserly 3p for colour is some going.

The Kodak isn't a special performer. It was consistently slower than many recent models in our tests. We recorded 11.4ppm in its fastest mode, and it'll need to drop down to the 9.3ppm mode before you see solid text. Even here, output is legible rather than crisp.

It's a capable performer in graphics, though, producing colourful results in the 2.9ppm middle mode – but again, slower than many of its contemporaries. Photo paper brings out its best side, but the Kodak still lacks the sparkling imagery of the Canon MX895.

The scanning component is a success, with faithful results and good colours. The speeds are adequate.

VERDICT: Like many Kodak printers, the Hero 7.1 has stunning running costs. Overall, though, it's less of a bargain. The all-round features and performance are decent, but no more than that.

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Canon



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How we test

Eight pictures were used to test each printer. Our main speed tests were conducted using a 6.4MB (4000x3000) image. We printed this image on normal paper at the printer's fast-, middle- and best-quality settings, then again on glossy paper at top-quality. We also printed four general photos and three test-card images.

Scanning was assessed with two test pictures at 100dpi (150dpi where this wasn't possible), 300dpi and 600dpi, with the time taken recorded. A Kodak test card was also scanned to assess the colour palette. We also looked at the copying facilities, with the speed at which they were available and the faithfulness of copies noted.

All printers were installed and the setup routines assessed. Where software was provided for optimising print quality, we loaded and ran the programs. However, we didn't use any third-party applications or devices to calibrate the printers.

The user interfaces were extensively analysed. For the purposes of achieving results, the printers were tested using wired USB interfaces, although Wi-Fi connections were also tried to assess effectiveness and the ease of installation.

Conclusion

Which model you plump for may well come down to how often you want to use the device. The Canon MX895 offers the best printing quality, plus a wealth of features. But while light users will adore it, frequent printers will curse its costly consumables.

Epson's Stylus Photo PX730WD has some very nice features, and is slick and easy to use. The software bundle is more versatile than most, and its photos are good but, again, running costs are high.

The two HPs don't suffer from these problems, though, and the Photosmart 7520 combines strong performance with by far the most enjoyable interface we've seen here. While the MX895 offers slightly better quality, the 7520 beats it in overall value for money. If you're not a light user, we'd heartily recommend this model.

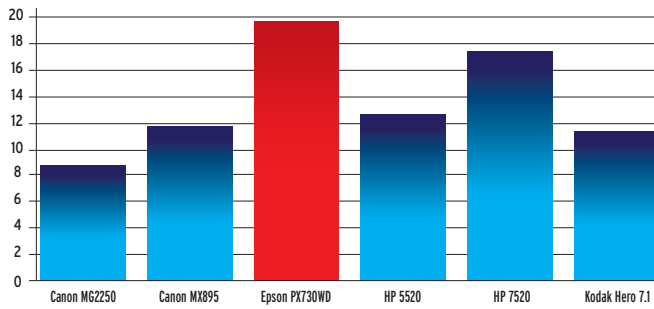
Of the cheaper models, Canon's MG2250 comes in at a rock-bottom price. You don't get great performance, but it's a good deal better than it has any right to be. If you can, though, do spend more.

The HP Photosmart 5520 packs in an awful lot. It doesn't excel in performance, but the interface is nice, and the running costs low. Given its £90 price, it's not such a bad deal. ☒

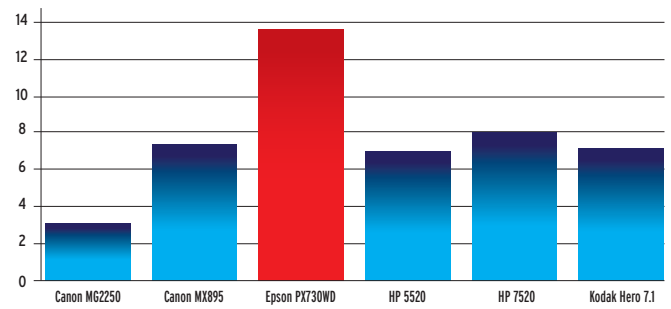
	CANON £50 inc VAT ★★★★★	CANON £200 inc VAT ★★★★★ PC ADVISOR RECOMMENDED	EPSON £200 inc VAT ★★★★★
Model	MG2250	MX895	Stylus Photo PX730WD
Product code	N/A	N/A	N/A
Print engine	4-colour inkjet	5-colour inkjet	6-colour inkjet
Max print resolution	4800x1200dpi	9600x2400dpi	5760x1440dpi
Standard capacity	100 sheets	150 sheets + 35 sheet ADF	120 sheets + 20 sheet photo tray
Input trays	1	1	2
LCD size and type	7-character text display	3in colour touchscreen	2.5in colour display
Max print size (photo)	216x297mm	216x297mm	13x18mm (216x297mm with standard tray)
Max print size (doc)	216x297mm	216x297mm	216x297mm
Scanner type	Flatbed	Flatbed	Flatbed
Scan resolution	1200x2400dpi (optical), 48bit	2400x4800dpi (optical), 48bit	2400x4800dpi (optical), 24bit
Connectivity	USB 2.0	Wi-Fi, ethernet, USB 2.0, SD, MS Pro, CF, xD-Picture, PictBridge	Wi-Fi, ethernet, USB 2.0, SD, MS, CF, xD-Picture, PictBridge, Epson iPrint
Dimensions	449x304x152 mm	491x448x218mm	445x458x150mm
Weight	5.3kg	11.7kg	9.8kg
Warranty	1-year return-to-base	1-year return-to-base	1-year return-to-base
Price of ink tanks	Black: £17, Colour: £18	Black: £10, Colour: £8.33 x3	Black: £16, Colour: £16 x5
Ink tank page yields	Black: 600, Colour: 400	Black: 339, Colour: 200	Black: 470, Colour: 883
Cost per page	Black: 2.8p, Colour: 4.5p	Black: 2.9p, Colour: 12.5p	Black: 3.4p, Colour: 9p
Mono print speed ¹	8.5ppm	11.9ppm	19.4ppm
Colour print speed ¹	3.2ppm	7.3ppm	13.6ppm
Photo print speed ²	84 secs	79 secs	80 secs
A4 scan speed ³	15 secs	12 secs	15 secs

¹Fastest mode ²Top-quality mode ³100- or 150dpi

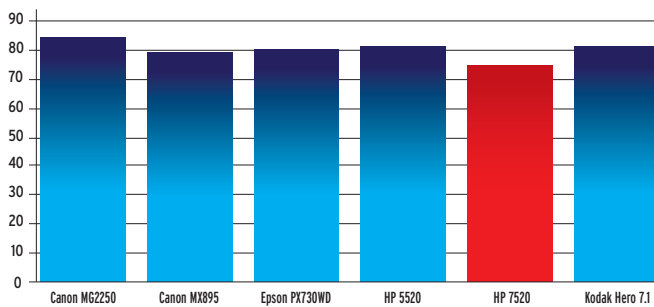
Mono print speed (ppm)



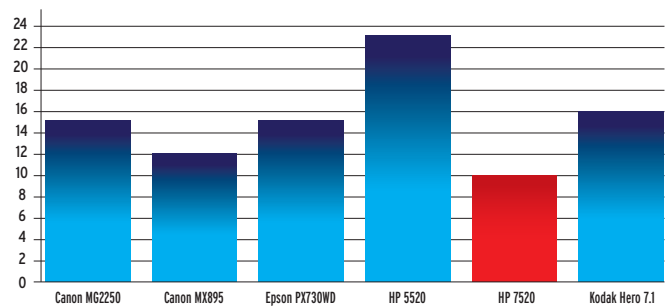
Colour print speed (ppm)



4x6in photo print speed (secs)

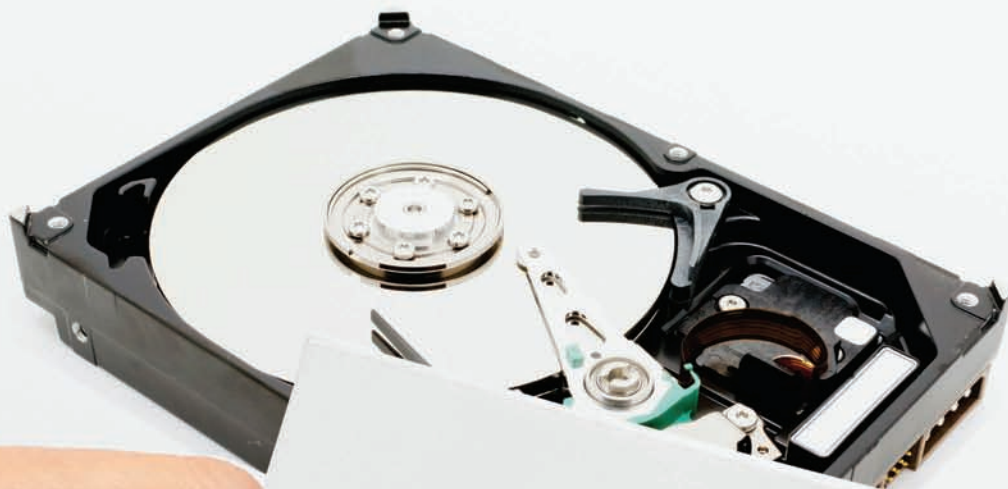


A4 scan speed (secs)



HP £90 inc VAT ★★★★★		HP £170 inc VAT ★★★★★		PC ADVISOR RECOMMENDED		KODAK £170 inc VAT ★★★★★	
Photosmart 5520 e-All-in-One		Photosmart 7520 e-All-in-One				Hero 7.1	
CX042B		CZ045B				N/A	
4-colour inkjet		5-colour inkjet				4-colour inkjet	
4800x1200dpi		9600x2400dpi				9600dpi	
80 sheets		125 sheets + 20 sheet photo tray + 25 sheet ADF				100 sheets + 40 sheet photo tray	
1		2				2	
2.65in colour touchscreen		4.3in colour touchscreen				3.5in colour touchscreen	
216x297mm		13x18mm (216x297mm with standard tray)				10x15mm (216x297mm with standard tray)	
216x297mm		216x297mm				216x297mm	
Flatbed		Flatbed				Flatbed	
1200dpi (optical), 24bit		1200x2400dpi (optical), 48bit				2400dpi (optical), 24bit	
Wi-Fi, USB 2.0, SD, MS, HP ePrint		Wi-Fi, USB 2.0, SD, MS, PictBridge, HP ePrint				Wi-Fi, USB 2.0, SD, MS, PictBridge, HP ePrint	
436x545x146-415mm		454x551x220mm				445x432x190mm	
5.1kg		8.6kg				7.5kg	
1-year return-to-base		1-year return-to-base				1-year return-to-base	
Black: £13, Colour: £12 x3		Black: £13, Colour: £12 x3				Black: £7, Colour: £12	
Black: 550, Colour: 750		Black: 550, Colour: 750				Black: 425, Colour: 400	
Black: 2.4p, Colour: 4.8p		Black: 2.4p, Colour: 4.8p				Black: 1.7p, Colour: 3p	
12.5ppm		17.6ppm				11.4ppm	
6.8ppm		7.9ppm				7.1ppm	
81 secs		75 secs				81 secs	
23 secs		10 secs				16 secs	

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Treat the gadget lovers in your life with this selection of 50 goodies to suit any budget, compiled by Jim Martin

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While some people appreciate Amazon or iTunes vouchers (they're perfectly good presents), buy one of the 50 gifts listed in the following pages and they'll know you've put some thought into the decision.

We've covered a wide range of prices, and include a good few ideas at the lower

end of the price spectrum for these cash-strapped times. If you can't afford a new laptop, why not opt for a present such as Belkin's CushDesk, which will make an existing laptop that much more comfortable to use.

However, if you've got a bit more cash to spend, there are plenty of options including laptops, tablets, digital cameras and gaming PCs. We've done most of the hard work for you: all you need do is choose the wrapping paper.



Under £25



SanDisk Cruzer Fit

sandisk.co.uk

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£15

Griffin Stylus

griffintechology.com

Smartphones and tablets are becoming ubiquitous, so chances are you know someone with at least one touchscreen device. Griffin's basic stylus is great for drawing, sketching or writing on capacitive screens, and it's an ideal gift for anyone obsessed with Draw Something, or keeping fingerprints from their screen. The integrated clip attaches to a pocket. There's no built-in pen, though, so if you want a dual-purpose stylus/pen, try the Incipio Inscribe Dual Ink.



£12

Gelaskins

amazon.co.uk

Personalising your gadgets is easy, thanks to the thousands of available cases for just about every model of smartphone, tablet and e-reader. Gelaskins add to your device scratch-protection and, since they're less than 1mm thick, you can still use a standard case. There's a huge range of designs, plus you can download matching wallpaper for your smartphone or tablet.

£10



Sony USB Portable Power Supply

sony.co.uk

Just about all gadgets charge via a USB cable, so this battery pack is ideal for emergency top-ups. It's small enough to carry in a bag or pocket. All you need is a USB cable, and you can connect the Portable Power Supply to charge a smartphone, tablet or an e-reader on the move. The 2,000mAh battery can charge an iPhone to almost 100 percent.



£15

Belkin CushDesk

belkin.co.uk

Using a laptop on your lap is convenient, but it might not be the best idea for your health. Some laptops become dangerously hot in use, and you can develop neck- or wrist strain from adopting an awkward typing position. The CushDesk goes a long way to solving both problems, with a cushioned base and a hard top on which to rest laptops with screens up to around 16in. It's available in a variety of colours.

£20



£13

E-volve Touchscreen Gloves

theaccessoriescrowd.com

These one-size-fits-all gloves will keep your hands warm this winter, but won't prevent you using your smartphone or tablet's capacitive touchscreen. Thanks to conductive fibres woven into the fingertips, the E-volve gloves allow you to carry on playing Angry Birds without freezing off your digits.



Targus Defcon CL

targus.com/uk

Plenty of tech kit has a Kensington-style lock slot, yet most people don't take advantage of the added security it can provide. The Defcon CL has a combination lock, so there are no keys to lose - you just need to remember the code. Provided that the cable is looped around or through an immovable object that a thief can't simply steal, the Defcon CL is a good deterrent.



£25

Xbox 360 Wireless gaming receiver

amazon.co.uk

Ever wished you could use your Xbox wireless controller to play games on your PC or laptop? Well, now you can, thanks to this USB receiver. Simply plug it in and install the software, then press the connect button to link your controller with your PC. It works with other Xbox 360 wireless accessories, too, including the Racing Wheel, and has a 30ft range. The receiver supports up to four controllers (and headsets) for multiplayer games.



£20

£15

Belkin Micro Car Charger

amazon.co.uk

Most cars don't have a USB charging port, but you can add one by popping an adaptor into your vehicle's 12V socket. Belkin's Micro Car Charger provides 5V at 2.1A, so it will charge almost all USB devices. If you need a second USB port, try Scosche's Revolt C2, which costs around £20.



Aquapac

store.aquapac.net

Electronic gadgets don't play nicely with water, so it's worth protecting your gear if it's in danger of getting wet. Waterproof Aquapacs are available for phones, e-readers, cameras, tablets and MP3 players. Aquapacs allow you to answer your phone or interact with a touchscreen, and even take underwater photos with a standard camera.



£20

Breffo Spiderpodium

play.com

This flexible stand can be bent into all sorts of shapes to hold in place your smartphone, camera or other small gadget. Its eight legs are sufficient for clinging on to both your device and another object. A larger version, the Spiderpodium Tablet, costs around £20 and is suitable for holding a tablet.



£10

USB cup warmer

firebox.com

It's the age-old problem: you've got far more USB ports on your PC than you have peripherals to plug in. What a waste. This USB cup warmer could be the perfect solution, also able to stop your coffee getting cold before you've had a chance to drink it. The gadget makes clever use of USB power to heat a small element to 40°C, so your beverage should be drinkable even an hour after it was made.



£9

Belkin 4-Port Flexible USB Hub

belkin.co.uk

Laptops, especially netbooks and Ultrabooks, tend to be rather short on USB ports. To get more ports you need a hub. Belkin's Flexible hub has three USB 2.0 ports for connecting printers, mice, keyboards, USB disks and other peripherals. The fourth 'port' is a Micro-/Mini-USB connector, which lets you hook up a variety of smartphones and other gadgets. There's enough power to charge most smartphones, but not tablets.



£18

Sculpteo 3DP cases

3dpcase.com

The best gifts are the ones you make yourself. You can create an iPhone case using the free 3DPCase app, which will be printed in 3D and shipped within a few days. There are several basic designs, which you can customise at will. The Free-Hand case, for example, profiles two faces in your photos and cuts them out of the case's rear.



£20

Under £50



Fitbit Zip

£49

fitbit.com

At a time of year when resolutions about eating, drinking and getting fit are made, there's no better gift at this price point than this activity tracker. The Fitbit Zip is a tiny monitor that's worn somewhere on your person (a pocket will do) to track the steps you take, calories you burn and distance you cover. A small display shows your daily progress, and you can check various other stats online.

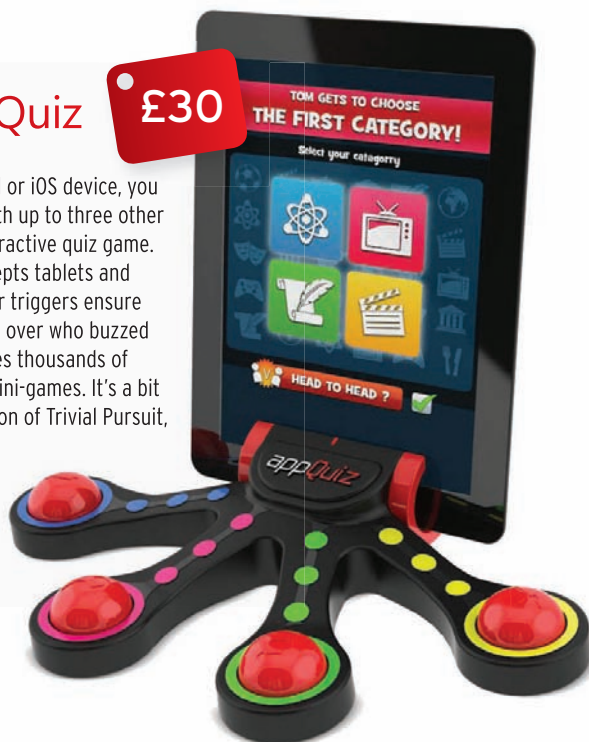


Red5 AppQuiz

£30

red5.co.uk

If you've got an Android or iOS device, you can go head to head with up to three other players in this fully interactive quiz game. The universal dock accepts tablets and smartphones, while four triggers ensure there are no arguments over who buzzed in first. The quiz includes thousands of questions, plus some mini-games. It's a bit like an interactive version of Trivial Pursuit, hosted by virtual quizmaster Chuck Boldheart. Additional content and quiz packs are available.



Kanex MySpot

£49

amazon.co.uk

One for the business traveller, the MySpot is a handy gadget that plugs into a hotel room's ethernet socket and emits a strong Wi-Fi signal for your smartphone or tablet. It's ideal if you don't want to get landed with a room that has a weak or absent Wi-Fi signal from the hotel's own wireless network. The hotspot requires USB power, so you'll need to plug it into a laptop or a USB charger.



TwelveSouth BookBook iPhone 4/4S case

twelvesouth.com

It's hard to stand out of the crowd if you're an iPhone case, but the BookBook does just that. This real leather case looks exactly like a miniature tome, and it's hand-sanded to achieve an authentic 'distressed' look. Flip it open and there's space to store credit cards and a photo.



£49

Plantronics Gamecom 780

amazon.co.uk

When you want to play first-person shooters late at night, without disturbing everyone else in the house, a headset is the answer. The retro-looking Gamecom 780 offers 7.1 virtual surround sound and plugs into your PC or Mac via USB. Controls are mounted on the left ear-piece.



£40

Griffin Helo TC Assault

griffintechnology.com

If you're after something light-hearted, look to this smartphone-controlled helicopter. Just slip your Android or iOS handset into the battery-powered transmitter, plug it into the headphone socket, and download the companion app. The app lets you fly the Helo TC and fire its two missiles at your target.



£49

Bluetooth Ferrari Enzo

£80

sciencemuseumshop.co.uk

Those with a love for fast cars and a lack of cash to splash will enjoy this Bluetooth Ferrari Enzo. The 1:16-scale car has working headlamps, tail, brake, indicator and hazard lights. It even has suspension and sound effects. To control the supercar, you'll need an iDevice and the free dashboard app.

The car has a 10m range and operates via a virtual joystick or gesture control.



£50-£99



Roku LT

£50

roku.com/uk

This tiny media streamer offers excellent value. It plugs into your TV via HDMI, then connects to your router via its built-in Wi-Fi. In essence, it turns a dumb TV into a smart set, providing access to BBC iPlayer, Crackle, Netflix, Facebook, Flickr and other internet services. The LT supports 720p HD video.



Fitbit One

£80

fitbit.com

We like the Fitbit Zip but, if you can stretch to £80, this One is the one to buy. It has a built-in altimeter as well as an accelerometer, which means it can tell you how many stairs you've climbed, and give you a more accurate idea of how many calories you've burned. The Fitbit One can even monitor your quality of sleep.



Blue Microphones Mikey Digital

£59

bluemic.com

Blue Microphones is renowned for producing high-quality mics, and the Mikey Digital is the ideal gift for anyone needing to record great audio on their iPhone or iPad. The pocket-size device plugs in to a 30-pin (not Lightning) connector to record stereo audio. A line-input lets you, for example, record a musical instrument, while a USB passthrough can simultaneously charge your device.



Q2 Wi-Fi Internet Radio

q2radio.co.uk

This nifty little cube is a battery-powered internet radio that lets you listen to your favourite stations just about anywhere, provided that it's in range of your wireless router. You configure the Wi-Fi settings and up to four radio stations by connecting the Q2 to your computer,

then switch between them by turning the cube on its side. The volume can be adjusted by tipping it up or down. There are five designs to choose between.

£90



TwelveSouth BookBook for iPad

twelvesouth.com

You could buy an Apple Smart Case for an iPad but, if you want something a bit different, the BookBook will fit the bill. As with the iPhone version, it's made from real leather and looks like an old book - save for the zip around the edge. A flip-up stand provides a comfortable typing angle.

£69



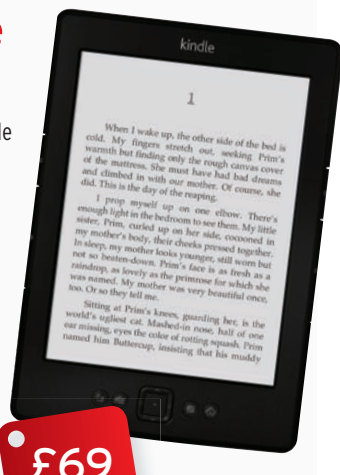
£50-£99



Amazon Kindle

amazon.co.uk

The new Kindle e-reader is hard to beat. It's the most affordable Kindle yet, but slightly faster than its predecessor, with the same long battery life. There's Wi-Fi for near-instant downloads from Amazon's vast book store, and enough memory to store 1,400 titles. If you're after a touchscreen model, the Kindle Touch costs £109, or try Barnes & Noble's £79 Nook Simple Touch.



£69

Panasonic DMP-BDT120

panasonic.co.uk

This entry-level 3D Blu-ray player offers excellent value. It can play DVDs, 2D- and 3D Blu-ray, and convert 2D content to 3D. Panasonic's Viera Connect internet portal includes BBC iPlayer, Netflix and YouTube, among others. A USB port allows you to play video, music and photos from an external drive. The media player supports a variety of popular media formats and DLNA devices.



£99

Kingston Wi-Drive 32GB

kingston.com

Not all portable devices allow you to expand their storage via a memory card (we're looking at you, iPad and iPhone). Kingston's Wi-Drive helps get around this limitation by providing additional storage in an smartphone-sized package. The 32- or 64GB Wi-Drive's Wi-Fi connection that lets you access its contents on the move. It has a four-hour battery life.



£75

Jabra Halo2

jabra.com

This Bluetooth headset works with multiple devices, allowing you to make and take calls from two different phones, or listen to music from A2DP devices. If you prefer a wired connection for music, the Halo2 has a detachable cable that'll come in handy for use with MP3 players that don't have Bluetooth, or for when the batteries run out.



£99

Apple TV

£99

apple.com/uk

The Apple TV connects via HDMI to your TV and offers a slick interface for accessing Netflix, YouTube, Vimeo and, of course, the iTunes Store, from which you can rent or buy films and TV shows. The box will stream content from your iTunes library, while a compatible iDevice can act as a remote control. AirPlay lets you watch videos and photo slideshows from your iDevice on a TV.



Otone Afineo

otone.co.uk

These stereo towers from Otone are rated at 32W RMS, which is loud enough to fill a medium-size room. The sound this pair produces belies their small size, partly thanks to their dual-driver design with a downward-firing bass port. Whether you're listening to music, watching video or gaming, the sound quality won't disappoint at this price. Touch-sensitive controls make for a neat look.



£79



£130

£100-£199



ViewSonic VX2336s-LED

viewsonic-europe.com

This 24in monitor may do away with frills such as an HDMI input, speakers and a USB hub, but its in-plane switching (IPS) panel offers excellent image quality. Its accurate colour reproduction makes it suitable for photo or video work, and it's not bad for gaming either. Viewing angles are inherently good, so colours don't shift as you move around. At this price, you'll struggle to find a monitor with better image quality.

Braven 650

£159

braven.eu

A wireless speaker lets you play music from any Bluetooth-equipped phone, tablet or music player within 10m. The Braven's battery is said to last 20 hours, while a full-size USB port lets you use some of that power to charge mobile devices on the go. The 650 also works as a hands-free speakerphone. Audio quality is great, given the small dimensions.



Atomic Floyd SuperDarts

atomicfloyd.com

These in-ear headphones are primarily made from steel, with a steel remote and yet more metal where the Kevlar-braided left and right wires split. This makes them quite heavy, but audio quality from the dual-driver design is impressive, with thumping bass and crisp (if not brash) treble. You also get a couple of adaptors and a carry case.



£199

£159

Google Nexus 7

play.google.com

The Nexus 7 was the first premium 7in tablet to arrive at this previously unbelievable price. Google and Asus have got just about everything right here, from the Nexus' gorgeous display to its slick Android Jelly Bean operating system. The tablet can also access thousands of apps in the Google Play store, and supports NFC. There's no rear camera, and no way to supplement the 8GB of storage. A new 32GB model costs £199 from Argos.



Orbitsound T9

orbitsound.com

For those who dislike the messy wiring of surround-sound speaker sets, or need something to improve on the puny speakers of your TV, a sound bar is a good alternative. The Orbitsound T9 is remarkably compact, given its room-filling sound. The included subwoofer should be easy to hide away, too. A handy iPhone/iPod dock and a battery of ports make it even more useful.



£199

Sonoro Troy

de-en.sonoro-audio.com

The retro-looking Troy comes from German audio company Sonoro. It's both speaker dock and charging system, with its 3.5mm audio inputs and pair of USB ports covering most devices.

A removable tray hides the ports and wires, and on the underside is a stand that's ideal for a thin tablet. The

sound quality and volume levels are adequate for all bar audiophiles. It's available in red, lime green, grey and black.



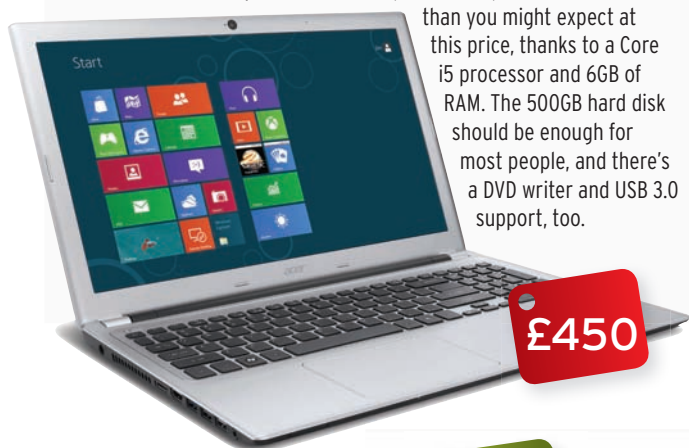
£140

£200-£499 

Acer Aspire V5-571

acer.co.uk

Provided that you're not buying for a hardcore gamer, the Acer V5 is a great-value laptop. It looks more expensive than it is, and has a decent screen, keyboard and touchpad. It also performs better than you might expect at this price, thanks to a Core i5 processor and 6GB of RAM. The 500GB hard disk should be enough for most people, and there's a DVD writer and USB 3.0 support, too.



£450

Apple iPod touch

apple.com/uk

The latest iPod touch is as impressive as its price tag. It borrows a few features from the iPhone 5, notably the 4in screen. It's impossibly thin at 6.1mm and has a 5Mp camera with an LED flash. The touch runs iOS 6, so you get great features such as Flyover maps and, for the first time on a touch, Siri. If you can't afford an iPhone 5, it's the next best thing.



£249

Humax YouView DTR-T1000

humaxdirect.com

Humax makes great PVRs, with easy-to-use interfaces that make it simple to find programmes to watch and record. This box has a 500GB hard disk for around 200 hours of HD recording. Twin Freeview HD tuners allow you to record two shows at once, or watch a different show to the one you're recording. YouView lets you watch on-demand content from the past seven days.



£279

Nikon D5100

nikon.co.uk

A step up from Nikon's entry-level model, the D5100 is easy to use, yet produces stunning photos. It has a 16Mp sensor (the same used in the excellent D7000) and an impressive 11-point autofocus mechanism. On the rear is a 3in articulated LCD screen for reviewing images. The D5100 can also shoot full-HD video at 24- and 30fps, with full-time autofocus, even when using the LCD screen as a viewfinder.



£450

GoPro HD Hero 2

gopro.com

This rugged, waterproof camera is available with a range of mounts, allowing you to attach it to almost anything. We like the vented helmet mount included with the Outdoor Edition, which lets you capture your downhill mountain-biking prowess, then send a clip of where it all went wrong to 'You've Been Framed'.



£299

Apple iPad

apple.com/uk

There are many Android tablets to choose between, but the iPad remains king of the hill. The fourth-gen iPad benefits from a high-resolution Retina display and, with the latest version of Apple's iOS, the iPad gets the Siri voice assistant, too. The choice and quality of apps is second to none. It's also a fantastic playback device for video.



£399



Toshiba Portégé Z930-10X

toshiba.co.uk

The Z930-10X is a great example of a sensibly priced Ultrabook. It doesn't have the best specification, but it's fast and lasts for hours between charges. The Toshiba's waif-like chassis is 17mm thick and weighs just over 1kg. Its matt screen repels distracting reflections, and there are plenty of handy connections, including USB 3.0.

£500 and over



Samsung ES6800

£850+

samsung.com/uk

A couple of rungs down from the range-topping ES8000 is this lower-priced ES6800 TV. It comes in four sizes: 32-, 40-, 46- and 55in. With a slim frame and four-legged stand, it's a showpiece for your living room with picture quality to match. Two pairs of glasses are included for deep and immersive 3D action. Samsung's Smart Hub provides access to iPlayer, ITV Player, Netflix, Lovefilm, Vimeo, Skype and more. Wi-Fi's here, too.



Chillblast Fusion Orb

chillblast.com

If the old family PC is on its last legs, here's a great upgrade. The Fusion Orb is supplied with a 24in IPS monitor, speakers, a Blu-ray drive, a webcam and Wi-Fi. A Core i5-3570K processor and 16GB of fast RAM offer nippy performance, while a 120GB SSD helps to make everything feel more responsive. Even gamers will be pleased, with a Radeon HD 6850 inside. An excellent choice.



Panasonic HC-X900

panasonic.co.uk

Although our phones and tablets can record HD video, the quality isn't even close to that of a dedicated camcorder. The HC-X900 shoots gorgeous full-HD footage, and has an excellent stabilisation system that helps to counteract shaky hands. It supports 3D video via the optional conversion lens, and has a range of manual settings and a rear viewfinder.



£699

Apple MacBook Air 13in

apple.com/uk

The MacBook Air is arguably the ultraportable laptop of choice, and can even run Windows if you're not taken with Apple's slick Mountain Lion OS.

It's expensive, but has an Ivy Bridge processor, an SSD and fast USB 3.0 and Thunderbolt data-transfer connections.

The aluminium shell is durable and beautiful, and the battery lasts up to seven hours. ☑



The Cube

cubify.com

3D printing is quickly gaining popularity and, although printers are still expensive, they're just about within reach of rich enthusiasts. The Cube is a home printer that can print 3D designs up to 5.5in-square. It comes with everything you need to start printing, and includes 25 designs. You can print ornaments, cups, plates, stands and more.



4G

NEXT-GENERATION MOBILE BROADBAND

Chris Martin guides you through the 4G minefield, explaining all there is to know about the latest mobile-broadband technology hitting the UK

You've probably heard of 4G, but what is it? In short, it's the name given to the fourth-generation mobile network, just as the previous generation is known as 3G.

Another piece of jargon, which you'll often see tagged on to the end of 4G, is 'LTE'. This stands for Long Term Evolution, a type of 4G technology. It will be available to around a third of the UK population by Christmas 2012.

4G LTE aims to offer faster, more reliable mobile broadband to devices such as smartphones, tablets and laptops.

In general, 4G is around five times faster than existing 3G networks. It can theoretically provide download speeds of up to 100 megabits per second (Mbps), but you won't see this in real-world use.

Unless you've just bought an iPhone 5, a Samsung Galaxy S III LTE (not a regular S III), or one of several other 4G-capable smartphones now or soon to be available, your existing handset won't natively work with a 4G network. (You will still be able to wirelessly connect to a 4G network via a compatible mobile hotspot, if one is available.)

This is because 4G and 3G networks use different frequencies to transmit data, so a handset must have a modem that supports the new frequencies to be compatible.

Over the following pages, we'll explain everything you need to know about 4G. We'll look at how the technology works, explain where and when you can get it, and tell you which devices are supported.

We were given the opportunity to test EE's 4G network ahead of official switch-on; we reveal our speed-test results later in this feature.



Although 4G is new to the UK and us Brits like to think we're running the latest technology, it's actually been around for many years. Two forms of 4G are in use today: WiMAX and LTE.

You may have heard of WiMAX before, since it was trialled in the UK in 2009. But WiMAX began three years previous to that, with the first network launched by South Korean firm KT in 2006.

The first LTE network was deployed in Scandinavia in 2009. However, it was debatable whether the speeds on offer back then were worthy of the 4G tag.

Across the Atlantic in the US, mobile network operator Sprint has been using WiMAX since 2008, while MetroPCS was the first operator to offer an LTE service in 2010. Verizon and AT&T also offer LTE.

Only the LTE version of 4G will be accessible in the UK. You may have already seen several smartphones appearing on the market with an LTE suffix appended to their product name. The Samsung Galaxy S III LTE is a notable example, and not to be confused with the standard Samsung Galaxy S III.

Us Brits are more accustomed to 3G connectivity, where available. Hutchison Telecommunications unveiled the UK's first 3G network under the simple brand name '3', often seen as 'Three'.

Wideband Code Division Multiple Access (WCDMA) was the first technical standard used for 3G. It's now more commonly known as Universal Mobile Telecommunications System (UMTS). More modern forms of 3G are High Speed Packet Access (HSPA) and HSPA+. The latter allows for download speeds up to 42Mbps, which is twice that of which HSPA is capable. Common spectrum used for 3G connectivity includes 850MHz, 900MHz, 1,900MHz and 2,100MHz.

4G COVERAGE - HERE'S THE PLAN

SELECT A LAUNCH CITY*

BIRMINGHAM	LEEDS
BRISTOL	LIVERPOOL
CARDIFF	LONDON
EDINBURGH	MANCHESTER
GLASGOW	SHEFFIELD

*Plus Belfast, Derby, Hull, Nottingham, Newcastle, Southampton are planned to have coverage by the end of the year.

OR CHECK YOUR POSTCODE

CHECK >

EE will launch its 4G NETWORK in 10 UK cities

4G's headline download speed is 100Mbps, and a blistering 50Mbps for uploads. This means 4G offers more than double the speed of the latest 3G technology, and is many times faster than previous versions.

Of course, these speeds are theoretical, and won't be achievable in the real world. Regardless, 4G offers significantly faster connection speeds than 3G, in downloads but even more so in uploads, as we reveal in our test results on page 100.

In practice, web pages are quicker to load, and there's no lag involved in streaming video and podcasts. You'll be able to quickly download large email attachments and pull down other content stored in the cloud. Apps that depend on online data, such as mapping programs, will run more smoothly, especially when zooming in or out. The speed difference should be akin to switching from 3G to Wi-Fi.

How easily you are able to stream video is a good measure of the strength of your internet connection. The BBC recommends a minimum 3.5Mbps to watch HD content online. Although 3G is theoretically capable of this, the average achieved in the UK is 3Mbps.

For all those tasks for which you would normally toggle on a Wi-Fi connection to achieve smooth performance, 4G will more than suffice. It should allow you to feel as though you're taking your home broadband connection on the move. In fact, EE predicts an average connection speed of between 8- and 12Mbps, which is faster than the 5.9Mbps average for ADSL home broadband.

Faster upload speeds will also be a boon. If you hate waiting for pictures to upload to Facebook or Twitter, for example, you'll find it a much quicker process over 4G.

Technology

The main reason 4G is faster than 3G is Orthogonal Frequency-Division Multiplexing (OFDM). It sounds complicated, but it's the same technology used in Wi-Fi, ADSL broadband, digital TV and radio.

OFDM allows more data to be squeezed on to a given amount of radio frequency. It also reduces latency and interference. Data is split up and sent via small chunks of frequency in parallel, therefore increasing the capacity of the network.



Multiple-input, multiple-output, or MIMO, is another reason 4G is able to provide faster speeds. This is simply the use of multiple antennae on both the transmitter and receiver to improve communication performance.

MIMO allows more data to be transferred, without requiring additional bandwidth or power. The most common configuration is 2x2 MIMO, found in many smartphones and some tablets. A 4x4 setup is also possible, and promises even faster speeds, but it's still a little way off from making its way on to devices. However, since different setups are possible, one handset could potentially provide faster 4G speeds than another.

With 3G networks, most of us take roaming for granted. We expect to pick up emails and browse the web from whichever country we're in. Things are different with 4G.

Although 4G networks are accessible in many countries, a UK 4G smartphone may not be compatible. It's not a given that 4G will operate on the same frequency in each country you visit; in these cases you'll instead need to use 3G. Even if the frequencies in use are a match, your network operator will also need to have in place a roaming agreement, and offer data at a reasonable price.

4G coverage in the UK

EE says it will provide 4G in 10 UK cities at launch, with 16 switched on by Christmas. Some 20 million users will be able to access the faster network before the year is over, it claims. The lucky 10 include Birmingham, Bristol, Cardiff, Edinburgh, Glasgow, Leeds, Liverpool, London, Manchester and Sheffield; Belfast, Derby, Hull, Nottingham, Newcastle and Southampton will also get 4G this year.

Twelve of the 16 cities will benefit from wide-ranging coverage. London 4G's signal will stretch beyond the M25, for example.

UK frequency bands

Technology	Frequency spectrum (UK)
3G	850MHz, 900MHz, 1,900MHz, 2,100MHz
4G	800MHz, 1,800MHz, 2,600MHz
Wi-Fi	2,400MHz, 5,000MHz
Bluetooth	2,400MHz

It has yet to be confirmed which four of the 16 cities will get only city-centre coverage.

Don't make the mistake of assuming that if you have decent 3G coverage now you will also get good 4G coverage when the network launches in your area.

Independent regulator Ofcom has set a requirement that 98 percent of the UK must have 4G coverage by the end of 2017. However, EE has promised the fastest ever rollout of a mobile network in the UK, claiming it will reach 70 percent coverage by the end of 2013. It also says 98 percent of the UK will be able to access 4G by the end of 2014, three years ahead of Ofcom's goal.

You can check 4G coverage in your area on EE's website: ee.co.uk/coverage.

4G tariffs

There has been, and remains, a lot of aggro between the UK's mobile operators and Ofcom over 4G. EE was the first operator to launch its 4G network as we went to press. Until other operators are allowed to roll out their own 4G networks, EE will have a monopoly on the market.

The process of setting up a 4G network is complicated and involves plenty of red tape, so it will be a while before there's a choice of 4G operators.

Ofcom is auctioning off 800MHz and 2,600MHz spectrums to be used for 4G:

O2 and Vodafone will be the main bidders. Once this process is complete, the networks are expected to roll out from spring 2013.

Ofcom allowed EE to launch a 4G network ahead of its competitors because it already owned 1,800MHz spectrum that it could use for 4G services. Ofcom also wanted 4G to be available in the UK as soon as possible.

Three has made an agreement with EE to use parts of the 1,800MHz spectrum for 4G, but it won't be able to do so until the latter part of 2013 when it gains approval.

Virgin Media is negotiating with EE to launch 4G tariffs by the end of this year. Since Virgin is a 'virtual' operator, and already uses EE's network for 3G, it hopes to simply piggyback on EE's 4G network.

Orange and T-Mobile are owned by EE and won't be going anywhere. All three operators will use the EE network, and users will begin to see 'EE' displayed on their devices. However, this doesn't mean you're getting 4G.

Existing Orange and T-Mobile customers must switch to EE to gain 4G services - a process EE has said it will make straightforward for customers. It will be free to move, but users will need to sign an 18- or 24-month contract of the same or higher value than their current tariff. A 4G SIM will be provided free.

EE's 4G tariff starts at £36 per month for 500MB of data, rising to a maximum 8GB for



£56. Unlimited calls and text messages are included with all plans.

Which phones support 4G?

Only a handful of 4G-capable smartphones had been announced as we went to press, but we're certain that plenty more will arrive next year. The Apple iPhone 5, HTC One XL, Huawei Ascend P1 LTE, Samsung Galaxy Note II and S III LTE are available now, while the Nokia Lumia 820 LTE and 920 LTE are expected to launch in November.

Don't forget that you'll need a 4G SIM and you must be in a 4G area to see that all-important 4G symbol on your phone's status bar. Not all postcodes will be enabled on launch day so, again, check EE's website to learn when 4G will be available in your area.

It's worth bearing in mind that you don't need a 4G smartphone to access a 4G network - all is not lost if you've recently signed a 24-month contract for a non-4G Samsung Galaxy S III, for example.

An alternative is to buy a 4G mobile hotspot, such as the Huawei E589 Mobile Wi-Fi or Huawei E392 MBB Stick. You can insert a 4G SIM, then wirelessly share its faster connection with a smartphone, tablet, laptop or PC. A drawback of this approach is you'll need to sign up for a second tariff.

If you're about to buy a new smartphone, it's critical that you check with which 4G networks it is compatible. Some handsets might claim to be '4G-ready', yet not be compatible with UK 4G networks.

If you're buying your new handset direct from an operator, you can be fairly sure that it will work with that operator's own 4G network - but it isn't always a given.

In the case of the Apple iPhone 5, only certain 4G spectrums are supported. It will happily operate on 850MHz, 1,800MHz and 2,100MHz, of which 1,800MHz is covered by EE and Three, but not on the 800MHz and 2,600MHz that will be offered by Vodafone and O2. You can still buy an iPhone 5 from O2 or Vodafone, but it will be limited to 3G.



It's possible that other handsets will be limited in the same way, so check the supported frequencies before parting with any of your hard-earned cash.

4G and tablets

If you've bought a Wi-Fi + 4G version of Apple's third-generation iPad, you'd be forgiven for thinking you could simply pop in an EE 4G SIM and get online. This isn't the case: EE uses the 1,800MHz spectrum; the iPad works on 700MHz and 2,100MHz.

Barring any radical changes, the iPad won't be compatible with any other 4G networks in the UK either. Apple has been forced to remove the 4G element from the iPad's branding, and we're sure rival manufacturers will be rushing to become the first to release a 4G tablet in the UK.

Asus has just announced its Padfone 2, a hybrid tablet and smartphone that will work on the 4G network here.

Testing

Theoretically, 4G can offer download speeds up to 100Mbps and upload speeds of 50Mbps. We were able to test EE's 4G network in central London prior to its official switch-on.

The fastest download speed we achieved on an iPhone 5, according to SpeedTest.net, was 41Mbps. The fastest upload was 14.3Mbps.

Both figures are seriously impressive, but we saw wildly different results as we repeated the test with different smartphones.

We were able to run tests on a Samsung Galaxy S3 LTE, Huawei Ascend P1 LTE and HTC One XL. The average speeds achieved across nearly 20 tests were 26.4Mbps download and 14.2Mbps upload.

In our side-by-side test with 3G, the 4G network was more than three times faster for downloads and 10 times faster for uploads.

Our results show a best-case scenario, with few devices competing for bandwidth and an optimum location. ☒

Download speeds and population coverage

Technology	Typical av. speed	Typical max speed ¹	Peak speed ²	Headline speed ³	UK population coverage
4G LTE	8-12Mbps	40Mbps	64Mbps	100Mbps	34% by end of 2012
3G (DC-HSPA+)	3Mbps	6-8Mbps	26Mbps	42Mbps	40% by end of 2012
3G (HSPA+)	3Mbps	6-8Mbps	26Mbps	42Mbps	95% by end of 2012
3G	3Mbps	6-8Mbps	26Mbps	42Mbps	98%
2G	Voice & text	Voice & text	Voice & text	Voice & text	99%
Fibre broadband	58.5Mbps	76Mbps	80Mbps	80Mbps	11.4m homes & offices by end of 2012
Broadband (ADSL)	5.9Mbps	14Mbps	24Mbps	24Mbps	95%

¹Ofcom measures that at least 10 percent of base can achieve ²Technical speed that could be reached in non-commercial environment ³Theoretical speed for which technology allows

JIM
MARTIN**Tech
Help**

Storage solutions

One of the problems with many of today's tablets, smartphones and other mobile devices is that you can't expand their storage capacity with removable memory cards. We look at several ways to beat these storage limits in *Troubleshooter* (page 102).

Digital cameras allow us to take as many photos as we like, but not all are keepers. On page 110 we explain how to correct nine common photography problems, from removing red-eye to improving the exposure.

Portable apps are programs that can run directly from a USB drive without needing to be installed on the PC itself. Turn to page 114 to find out where to find some great free programs to install on your USB flash drive.

Less and less software is being bought on disc, with internet downloads becoming the norm. You can get the latest games for your PC or laptop via Steam; we offer step-by-step advice on how to use it to buy games and play them with friends on page 120.

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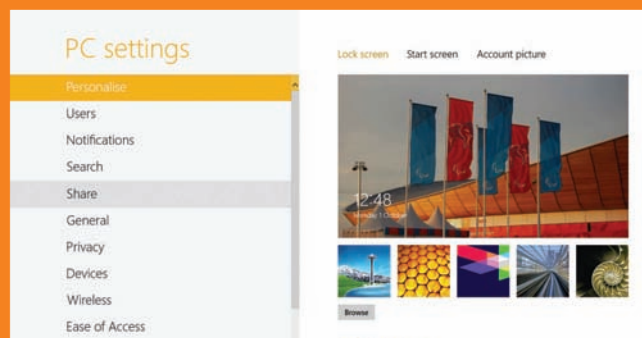


QUICK TIP: CUSTOMISE THE WINDOWS 8 LOCK SCREEN

Windows 8's Modern UI can be customised, but you can no longer use your own photos as a desktop wallpaper. A way to get around this is by customising the Lock screen, causing Windows to display your chosen photo each time it boots up.

Press Windows, I to open the Settings Charm, then click 'Change PC settings'. The current Lock screen image will be displayed, with some alternatives for selection shown below. Click the Browse button and navigate to the photo you want to use. Click the image to select it, then click the Choose photo button to set it as the Lock screen image.

It's also possible to personalise Windows 8's Start screen and Account picture from within the Settings Charm. ☒



Beat gadget storage limits

Rosemary Hattersley explains how to get more storage space on tablets and smartphones

Gadgets were once regarded as inessential luxuries; these days, they're indispensable. The circa-£500 cost of the latest and greatest smartphone or tablet may place it within the luxury-gadget category, but mobile devices now work hard to earn their keep.

Both tablets and smartphones have become useful companion devices, and we routinely use them to store hundreds – if not thousands – of photos, video and digital audio files, plus documents, apps, books, newspapers and magazines.

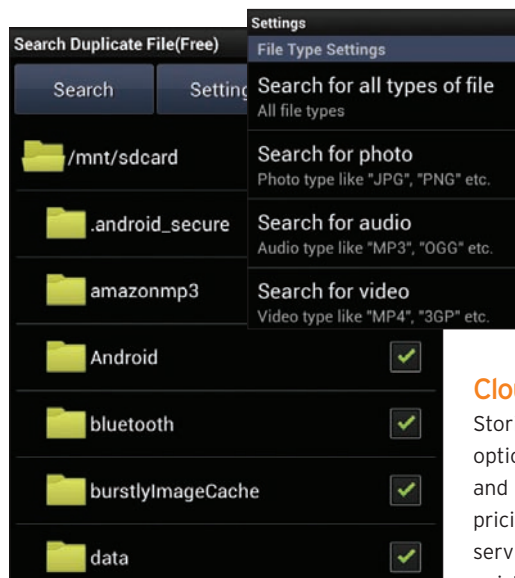
Most are equipped with sensors and lenses of sufficiently good quality that we can now leave our camera at home, but snapping away and capturing HD video with our smartphone creates yet more content that needs to be stored.

An obvious drawback of smartphones and tablets is their limited storage capacity in relation to a PC or laptop – something that becomes a greater problem if your chosen device lacks a removable memory card slot.

Here, we look at ways to manage your media, trim down your collection so you can claw back space, and how to add storage to your tablet or smartphone.

More storage; fewer locations

We all have a different approach to our media. Some of us like to store it all on our MP3 player, regardless of how infrequently it's played. Others take a scattergun approach, with photos, music,



video and supposedly important documents strewn across several PCs, laptops, USB drives, SD cards and media players.

Storing all your media in one place and deleting the duplicates and duds is a good first step. You can then populate your device with the content you want. File Duplicate Finder (tinyurl.com/9g44Ld2) can excise multiple copies of files in Windows, while the free Search Duplicate File app is a good choice for Android.

Local sharing options

If you've got a home network you can stream content to any Wi-Fi-enabled device. A NAS drive or other form of router-connected storage, perhaps one that has its own iTunes server, can provide ready access to your complete photo and music library.

The HomeGroup feature in Windows 7 and Windows 8 pushes media content to PCs, laptops and Windows smartphones and tablets. If you've got devices of every stripe, look for DLNA-compliance when choosing your streaming hardware.

There are apps to control content streaming on iOS and Android devices, too. Home Sharing in iTunes allows you to make your entire media collection available wirelessly, without syncing anything.

Try DoubleTwist from doubletwist.com (and the associated Twonky server)

to stream to and from almost any portable device. Windows users can hook up their iPhone or iPad using Air Stream (tinyurl.com/6omzcv3) and enjoy music and video over Wi-Fi.

These are all options that work within your Wi-Fi network. For external access, you'll need to make that central media server accessible via the web – or use the web itself.

Cloud storage

Storing media files in the cloud is a great option. Some services can stream your music and photos over Wi-Fi, too. Online storage pricing and limits vary wildly, so check the service is adequate for your needs and won't quickly jump up in price.

For iPhone and iPad users, the obvious choice is Apple's own iCloud. The service lets you store and synchronise 5GB for free, after which you'll need to buy into a storage plan. Apple has recently added 3G support to iCloud, so you aren't restricted to using it only in a Wi-Fi hotspot, but you will need to watch how much data it consumes to avoid going over your monthly allowance.

SkyDrive is a similar free service with a 7GB storage limit for Windows users. There's a SkyDrive app for Windows Phone, Android and iOS, through which you can view and delete your photos and other files.

For serious amounts of online storage, try Box.net, Dropbox or Mozy. You can earn extra storage by installing these on several devices – there are Android and iOS apps for each – and by sharing folders with friends. We got 30GB of free storage this way.

Dropbox on Android and iOS can be used to auto-archive your photos. You can also use these services with OpenPhoto (tinyurl.com/9ohuk3u), which lets you view and manage your photos online.

Don't forget Flickr. You can upload up to 300MB of photos for free per month, while a \$25 annual subscription offers unlimited photo and video uploads (with some file-size restrictions). You can then view and stream them via the web or through an Android, iOS, Windows Phone or BlackBerry app.

Amazon and Google allow you to store in their online repositories several gigabytes of



photos and other files. Signing up to Google Drive gets you 5GB of free space.

Stream what you own

Amazon has just launched its Cloud Player service in the UK. This lets you store and play all the tracks you've bought from the AmazonMP3 store, plus up to 250 others you bought elsewhere (250,000 with the Premium service). Hopefully, Google will soon announce a UK launch for its Music by Google Play. Since November 2011, US residents have been able to stream up to 20,000 tracks and purchase more for playback on their Android devices.

iTunes Match is Apple's music-streaming service. It lets you stream whatever you've bought through iTunes to your device. It's a useful storage-limit-buster for those with extensive music collections. You have to pay £25 per year to stream tracks you didn't buy through iTunes, but it automatically replaces them with top-quality DRM-free versions.

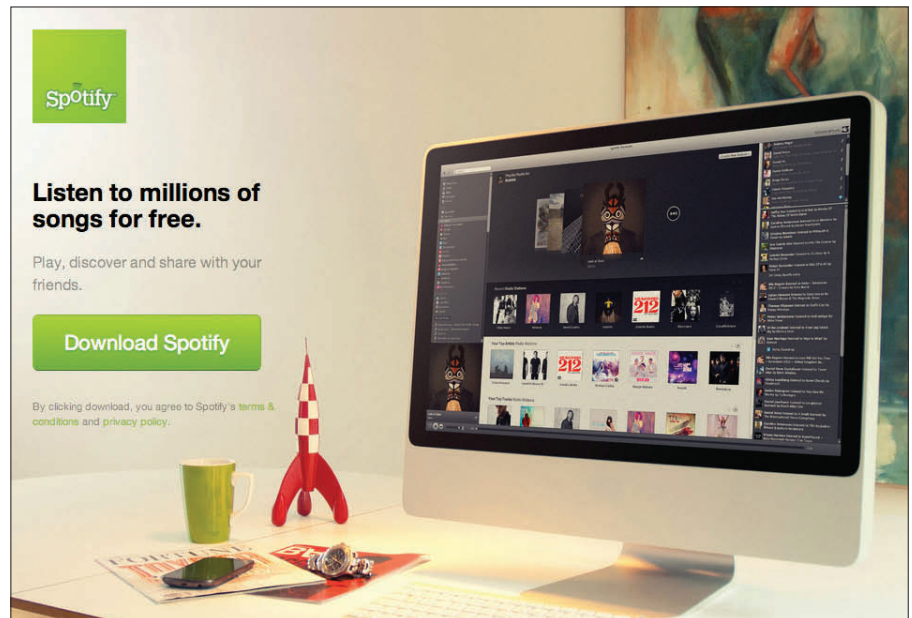
Rent, not rip

Music- and video-rental services take the pressure off your gadget's already cramped storage, and they can work out cheaper than buying albums digitally.

Spotify and Napster's music subscription services start at £5 per month for unlimited streaming over Wi-Fi, and £10 if you want to enjoy offline listening and download tracks to your mobile device.

Smartphone users need to buy the Premium (£10 per month) version of Napster to enjoy the app anyway, while Spotify is ad-free on a PC for £5 but it also requires the Premium app to serve up its streaming library on Android, iPhone, BlackBerry, Windows or Symbian phones.

You can import your own music collection to Spotify, but the only real benefit is the



convenience of having one program to manage all your music.

Portable Wi-Fi drives

Several hard-drive manufacturers have hit upon the cunning ploy of adding Wi-Fi connectivity and battery power to their hardware, allowing their contents to be streamed to a smartphone or tablet. These drives connect directly to your gadgets and are controlled via an associated app, so you can use them on the move.

Products such as the 32GB Kingston Wi-Drive add significant amounts of storage space, yet are small enough to take out and about with you. The Wi-Drive works with iOS and Android, and it has a three-device limit for simultaneous streaming.

Seagate's GoFlex Satellite is similar. It has an eight-device limit and also works with Windows laptops and Android tablets.

Shrink-to-fit

Archiving items to save space makes sense on a PC. On a tablet or smartphone you instead need to shrink or compress the files so they take up less storage space. Smaller versions should load faster, too.

No tablet or smartphone can display an image larger than 3Mp without scaling it to fit the screen. Storing

8Mp images, therefore, is a waste of space if you merely want to view them onscreen.

Use an image editor such as Photoshop Elements to batch-convert photos, reducing their resolution to match your device's screen (or lower if you don't mind a drop in quality). You can choose a medium amount of compression without noticing any degradation in quality. Each photo should end up smaller than 1MB.

Make sure you save the originals to your backup drive and the low-resolution copies to your laptop or tablet.

Repeat the process for photos you've taken on your smartphone or tablet as well, making sure you don't lose the originals.

Sound reduction

Shrink your music files by re-encoding them at a lower bitrate. Advances in encoding software mean that albums you ripped years ago may now be ripped again using the latest tools, with no discernible audio loss but significantly smaller files. Find out more at tinyurl.com/79tbf8.

Similar principles apply to video. Use a free video encoder such as Any Video Converter, Freemake or HandBrake and export your video files for the device on which you wish to view it. Note that this is a time-consuming exercise on most computers, however. ☒



PAUL
MONCKTON



YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

UNDELETE EMAIL

Q I've inadvertently deleted my latest emails. I cleared out Mozilla Thunderbird's Archives folder, without realising this would also delete the same messages in my inbox. Is it possible to recover the deleted messages?

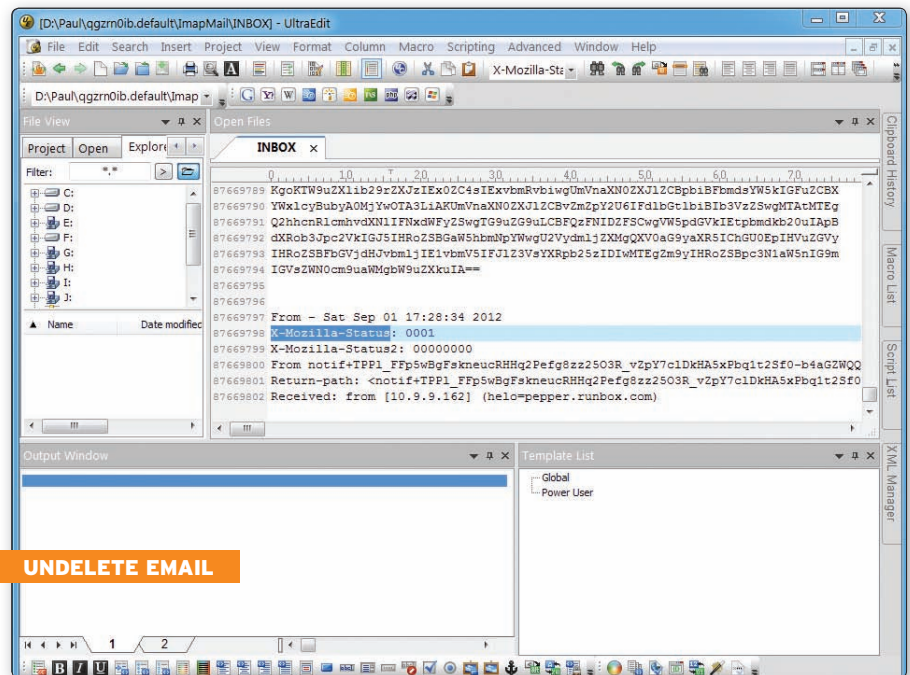
It's usually possible to retrieve messages after an accidental deletion such as this.

First, check the Deleted folder. This functions much like Windows' Recycle Bin in that you can retrieve any accidentally deleted items simply by dragging them to your inbox. You may have more than one Deleted folder, depending on how your email is set up. You could have one residing on your local hard drive and another on your email server. Check both.

If you've already emptied the Deleted folder(s), you may still be able to retrieve some or all of your messages, provided that you haven't compacted your mail database. Although Thunderbird automatically compacts the database under some circumstances, it's worth checking.

Before you do so, note that the service provider may have a backup of your messages if your email is hosted on a server; check with the support team. If no backup is available, you'll have to perform some data recovery yourself.

Open Account Settings and select the account from which the messages were deleted. Now choose Server Settings and find the Local directory at the bottom right.



The folder here should contain your messages. If no folder is visible, open a Windows Explorer dialog, press Alt to bring up the menu, then choose Tools, Folder Options and select the View tab. Enable 'Show hidden files, folders and drives'.

With the folder now visible, search its contents for an Inbox file. You may also see a file labelled Inbox.msf, but we want the file simply called Inbox. Windows may be configured to hide file extensions, causing these files to look the same.

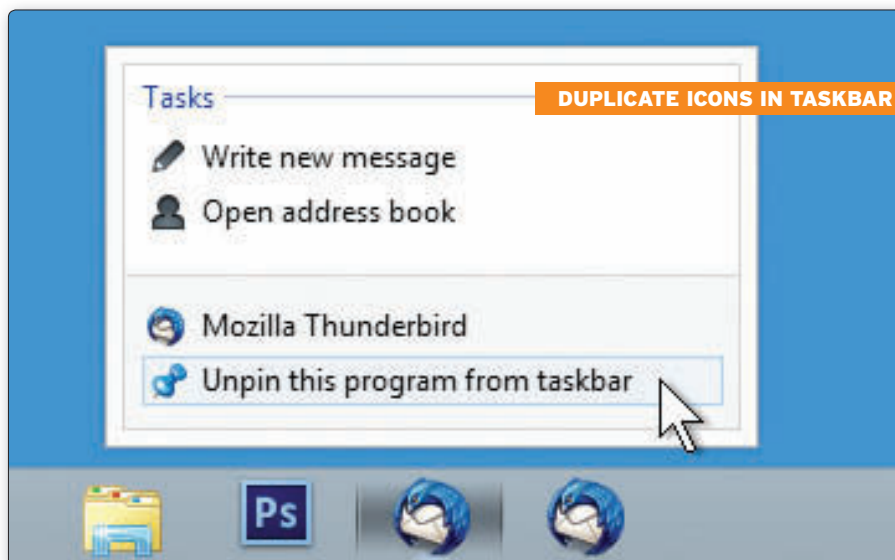
You can find the correct file by right-clicking each and selecting Properties; the one that has File rather than MSF File in the 'Type of file' field is the correct file.

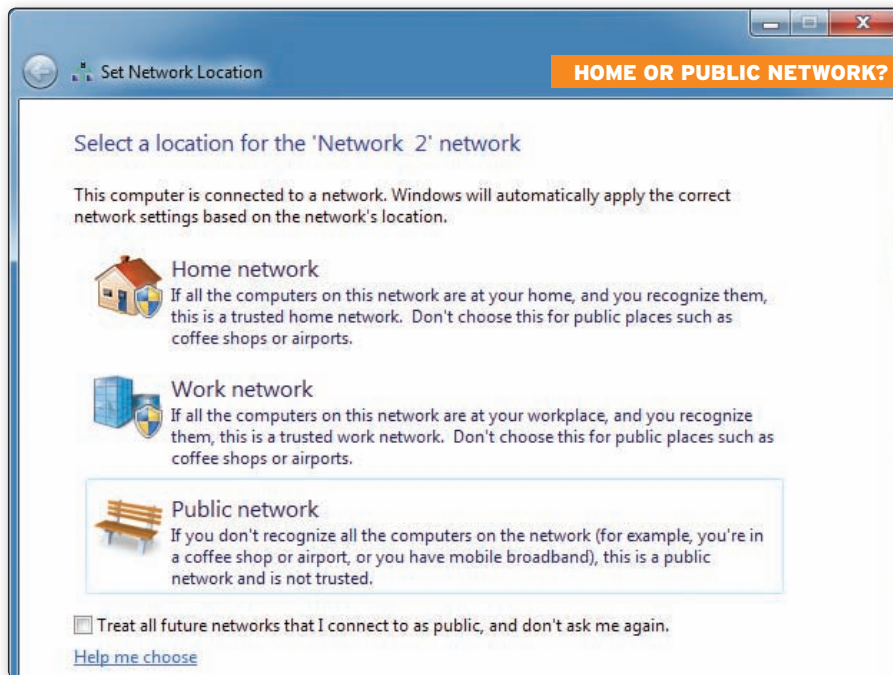
Close Thunderbird and make a backup copy of your Inbox file. This is important: you will need to edit the file to restore your messages, which increases the risk of data corruption. If you make a mistake you'll also need to restore the original file.

Next, open the Inbox file in a text editor. Windows' Notepad utility will almost certainly be unable to cope with a file as large as your inbox; instead, you could try the 30-day trial of UltraEdit, available from ultraedit.com. Whichever text editor you use, note that the sheer amount of data inside means it may take a while to open.

Search for one of your missing messages using the text editor's 'Find and replace' function. This will be easier if you know the message sender. The email header will begin 'X-Mozilla:Status:', followed by some numbers. Edit these numbers to read 0000, save your Inbox file, and the message will appear marked as unread the next time Thunderbird launches. Follow this step for each message you want to restore.

If you make a mistake or the data becomes corrupt, you can simply write over the Inbox file with the backup copy you saved earlier and start again.





was recently updated. Windows isn't treating them as the same program, which is why you have two Thunderbird icons.

Launch Thunderbird using the original taskbar icon. Right-click the second icon that appears and choose 'Pin this program to taskbar'. Next, right-click the original Thunderbird icon and select 'Unpin this program from taskbar'. You should find only one Thunderbird icon is visible the next time you launch the email client.

HOME OR PUBLIC NETWORK?

Q My Windows network is configured as a home network, which I assumed would be more secure than a public network. I thought my network would be hidden, yet I can see other networks alongside mine. Is this dangerous?

We can see why you might think a public network setting would be less secure than a home network, but it's actually the other way around. The different network types are designed to match the locations in which you're using your PC; rather than opening your network to all around, a public network will offer greater protection than a home network when you're out and about. In fact, it's the safest Windows network setting that you can use.

Continues >>

DUPLICATE ICONS IN TASKBAR

Q A Mozilla Thunderbird icon is pinned to my Windows 7 Home Premium taskbar for easy access. Following a recent update, clicking this icon results in a second Thunderbird icon appearing alongside it, which disappears when I

close the program. I've tried removing and re-adding the icon, but still two appear. How can I make things tidy?

This is simple to fix. The original version of Thunderbird installed on your machine has a different name to the version with which it

QUICK TIP: PROTECT USB DRIVES WITH BITLOCKER TO GO

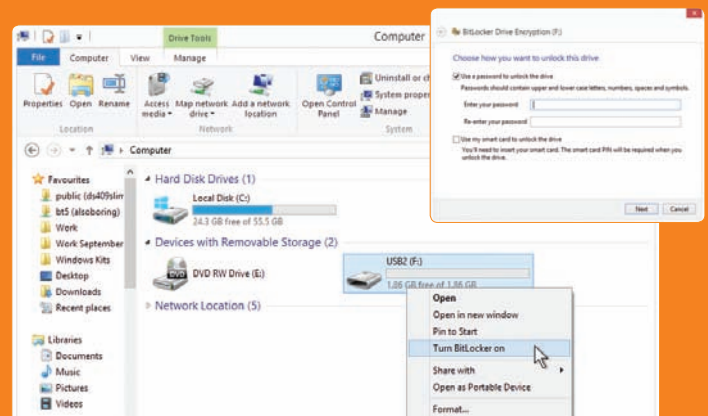
Losing a USB flash drive can be the stuff of nightmares if it contains sensitive or valuable information. Windows 7 and Windows 8 include an encryption system called BitLocker To Go, which will safely encrypt the data stored on your external drives and lock them down with a password.

Corporate users may instead elect to use a hardware-based encryption system, using a smart card and reader attached to the PC, which can provide additional protection.

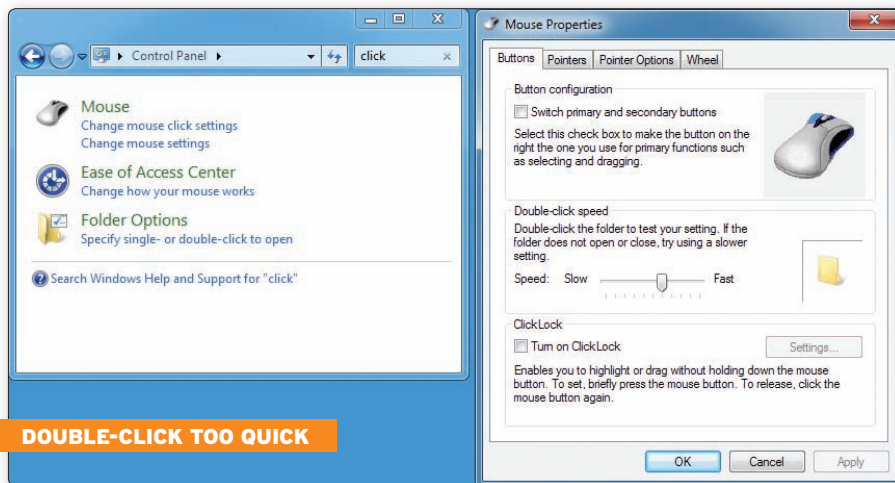
BitLocker To Go is very straightforward to use. Simply insert the USB drive you wish to protect and locate it in the Computer folder in Windows Explorer.

Next right-click the drive and select 'Turn on BitLocker'. Enable the setting 'Use a password to unlock the drive', enter and then confirm your password and click Next. Some advice on creating a strong password can be found at tinyurl.com/8z3kh2h.

Windows will now prompt you to print or save a recovery key to a file. You can use this key to regain access to the USB drive if you forget your password, so be sure to keep it in a safe place away from the encrypted drive.



Using the BitLocker To Go Reader, which is automatically installed on your USB drive, you will be able to read, but not write to the contents of the encrypted drive on a PC running Windows XP or Vista. This utility will allow you copy files off the drive and on to your PC for editing.



The Home network setting is for use only when your computer is in the relative safety of your own home and you want to communicate and share with other PCs as well as the internet.

Don't worry about the Work network option. This is similar to the Home setting, but it's designed for corporate domains.

If you're at home and unrecognised computers are showing up on your network, ensure that WPA (or preferably WPA2) encryption is enabled on your router. As an extra precaution you could also change the password.

It's more likely that the other 'computers' you're seeing are in fact nearby wireless networks. It's normal for several to be in range, especially in densely populated areas. These pose no security threat to you.

DOUBLE-CLICK TOO QUICK

Q How can I make folders open with a single click? I must be too slow to double-click, because I find it rarely has the desired effect.

To configure Windows to accept single-click instructions, open a folder on the desktop and click Organize at the top left. Now choose 'Folder and search options'.

In Windows 8 you'll need to click the View tab, then select 'Change folder and search options' from the Options menu.

Open the General tab and find the central section labelled 'Click items as follows'. Select the top option, 'Single-click to open an item (point to select)', and click Ok.

This solution will be useful only when working in Windows Explorer. If you're having real difficulty with double-clicking within other applications, a better fix is to

alter the speed at which double-clicks are recognised by your computer.

Open the Control Panel and type **click** in the Search box. Find and select 'Change mouse click settings', which will bring up the Mouse Properties dialog. Select the Buttons tab and you'll find a slider that lets you adjust the double-click speed.

Next to the slider is a folder icon that lets you test your settings. Move the slider to the left, then see if you can open the folder icon with a double-click. This should make it easier for you to double-click folders, but you'll now need to be extra careful not to move the mouse between clicks.

HOMEPLUG PROBLEMS

Q I've recently built an extension on my kitchen and a home office at the bottom of the garden. My Wi-Fi signal doesn't reach the garden office, even with a wireless extender. I tried using HomePlug, but it seems that the office is on a different mains circuit to my router. Can you help me get an internet connection to my office with the minimum expense? I don't want to have to dig up the garden to run cables.

If there's no cost-effective way of running an additional cable between the house and the garden office, you may have to resort to using outdoor antennae. You will also

need to buy a wireless router that supports interchangeable antennae.

Before going down this route, check that there aren't any other plug sockets in the house that operate on the same circuit as your office. A socket in your new extension would be the most likely candidate.

Leave your HomePlug adaptor set up in the garden office, then try the other adaptor in various sockets in your house. If the connection changes from red to green, signifying communication between the two devices, you will have found an alternative location in your house from which your network connection can be shared.

The next step is to get the connection from your broadband router over to the socket you've just located. It may be a simple matter of moving the router from its current location or running an ethernet cable between the router and adaptor.

If you'd rather avoid setting up your router in your new kitchen, you can create a wireless connection between the two using a wireless extender. The Edimax model pictured below is available from tinyurl.com/yj3vgjx, for example. A wireless extender will convert the HomePlug adaptor's wired ethernet port to a wireless one, allowing it to communicate with your router and send the signal to the office.

HOMEPLUG PROBLEMS



BROADBAND NOT WORKING

Q I'm unable to connect to the internet unless I pick up my phone. I haven't changed any settings. I've tried restarting everything and have checked that it's all correctly plugged in. I also note that my phoneline is crackly, but BT wants £100 to come and check it for me. Can you help?

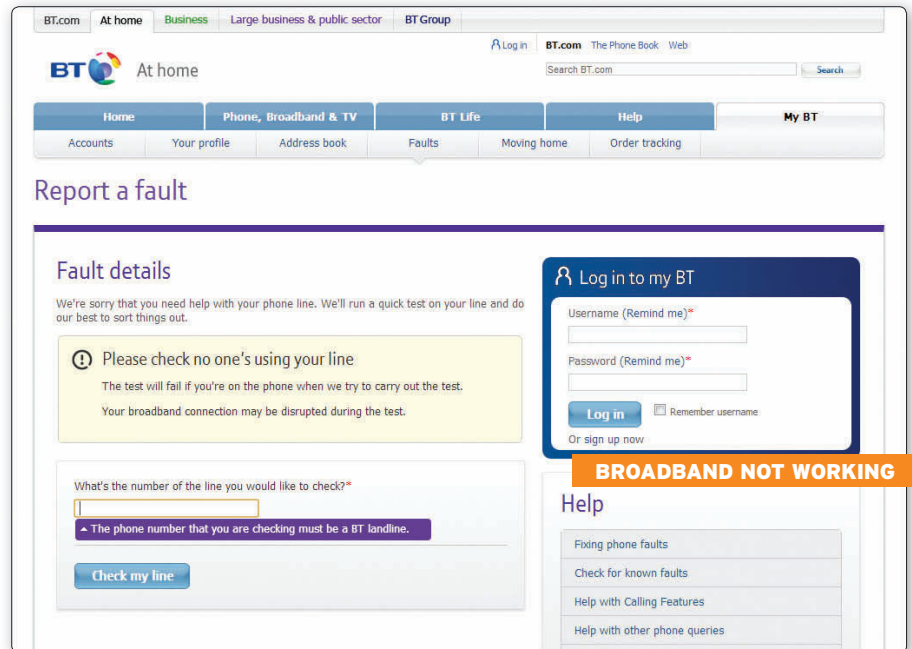
First, rest assured that you won't receive a large repair bill. BT charges customers only if one of its engineers has to waste their time coming to your home, only to find no genuine fault. Since your problem can be easily demonstrated, this will not happen.

If your broadband is working fine only when your phone is off the hook, it could be a problem with your ADSL filter, or this could have been inadvertently removed. Also, if you've added a second phone anywhere else in the house, it will need its own ADSL filter to prevent interference with the internet.

Try unplugging all the landline phones in the house. If the problem goes away, it's either a faulty phone or the lack of an ADSL filter that's causing the problem.

The video at tinyurl.com/9798wwk shows you how to check your wiring by accessing the test socket in your master socket.

If your broadband connection is reliable enough, also try BT's free line test service at tinyurl.com/8eh464w. This will automatically



test the line, and an engineer will be despatched if a fault is found.

MY PICTURES ARE TOO SMALL

Q I've scanned some photos and want to enlarge them for printing. I can make them bigger onscreen, but they still print at the same size. I'm running Windows 7, with no other editing software installed. Please help.

Windows 7 offers some flexibility in printing photos. Select and right-click one or a number of photos in Windows Explorer, then choose Print to bring up the Print Pictures dialog. This lets you specify the paper size and type, the image quality, and various formatting options.

If you want each image to fill an entire sheet of paper, select 'Full page photo' from the selection of formats on the right. You

Continues >>

TECH JARGON BUSTER

LTE 4G: The fourth-generation mobile communication standard is known as 4G. Currently supported in the UK by service provider EE, it allows for much faster data-transfer speeds, in excess of many home-broadband services. You'll need a compatible phone or 4G mobile hotspot to take advantage.

Near Field Communication (NFC):

A wireless system that allows suitably equipped devices to transfer data over very short distances – usually of just a few centimetres – or by coming into physical contact with each other. NFC can be used for contactless payments or function as an electronic key.

NFC-enabled Android smartphones can use Android Beam to transfer files.

This uses an initial NFC connection to set up a Bluetooth file transfer.

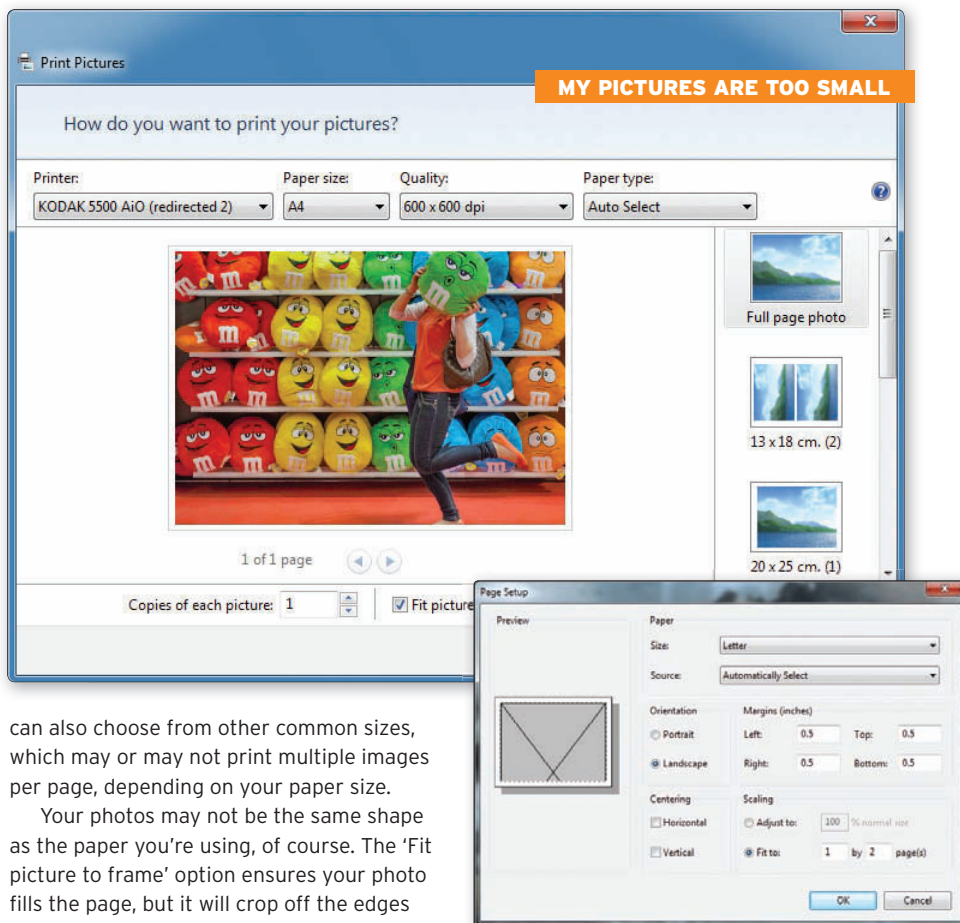
ADSL filter: A small box that's connected between a telephone wall socket and a DSL modem, a telephone or both. The filter's function is to separate the broadband and voice signals so they don't interfere with each other.

Wireless extender: A device that can extend the range of your wireless router by receiving and re-transmitting its Wi-Fi signal.

Apple Maps: A new Apple-created mapping app that's available in iOS 6.0. Apple designed Maps to replace the rival Google Maps on its mobile devices.

Lightning connector: Introduced with the iPhone 5, iPod nano and iPod touch, Lightning is the name given to Apple's new smaller connector that replaces the 30-pin port found on earlier models. An adaptor is available to connect to most, but not all, previously compatible accessories. The initial adaptors available from Apple don't support video output.

Cloud storage: A form of online storage where individuals or companies can store data that can then be remotely accessed from any PC with an active internet connection. The data may be physically stored on multiple servers and separated geographically, but it will appear in a single storage location to the user. Examples include Dropbox and Mozy.



can also choose from other common sizes, which may or may not print multiple images per page, depending on your paper size.

Your photos may not be the same shape as the paper you're using, of course. The 'Fit picture to frame' option ensures your photo fills the page, but it will crop off the edges where necessary to make it fit. Leave this option disabled if you'd rather print the entire image and trim off the excess paper.

Windows will automatically apply some sharpening to the image when printing. If you'd prefer this not to happen, click the Options link at the bottom of the dialog box and then disable sharpening in the Print Settings box that pops up.

For more control over the print size, right-click your photo and select Edit to open Windows Paint or another installed image editor. In Paint choose Print, Page Setup, then adjust the margin size and select a percentage magnification of the original image. You can preview how it will look using the Print Preview option. ☒

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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.

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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
pcadvisor.co.uk/helproom



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Synology® DiskStation DS213air is a one stop solution for wireless sharing, web applications and centralised storage. Specifically designed for home users and small offices

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- Support up to 8TB personal storage
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- Energy Efficient & Noise-Free Design
- Hassle-free System Installation with Mobile Devices
- Mobile Apps available at App Store, Google Play & Market Place



Can be purchased at

amazon.co.uk

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ebuyer.com

OVERCLOCKERSUK

Quick, easy photo fixes



Mike Bedford explains how to quickly and easily correct nine common photo flaws, from removing red-eye and unwanted objects to digital noise



Digital photography should make dodgy snaps a thing of the past. We're not restricted by the number of shots we can take, and the ability to immediately preview our handiwork ought to spur us on to retake any that fall below expectations. Unfortunately, it doesn't work like that.

Seeing small blemishes on a camera's LCD is very difficult on a bright, sunny day and, unless you zoom in, camera shake and poor focus will go undetected.

Some shots must be taken at exactly the right moment. Get it wrong and there's no opportunity for a second stab.

And finally, even when you know what the problem with a photo is, you may not know how to fix it. We'll deal with that issue here, allowing you to correct those photos that should have been great but, ultimately, disappointed.

We're using the free PhotoScape image editor, available from photoscape.org, but the principles we discuss apply to all photo editors.

In each of our nine mini-walkthroughs, we'll assume

you've selected Editor from the opening screen and opened the offending photo. Always save your corrected image with a new name to avoid overwriting the original.

With all the tricks of the most advanced image editor up your sleeve, there's still no excuse to taking a relaxed attitude to photo composition. While you can improve your image, it will never be as good a result as had you correctly composed it in the first place.

If your photo is slightly out of focus, it'll have a characteristic soft look and be missing detail. A photo editor can sharpen the image, but it can't add detail. It's the same with over- or underexposed shots: you can correct the exposure, but you can't add the fine graduations in light and shading will be lost.

With some errors, such as serious camera shake, there's little you can do in the way of recovery. The golden rule is to make every effort to take a good photograph at the outset. We'll make some recommendations on this over the following pages.

CORRECT COMMON PHOTOGRAPHIC FLAWS

Reframe your shot

The best way to make sure your photo is correctly composed is to discipline yourself to first have a really good look in the viewfinder. Zoom in and out and be prepared to move your position until you like what you see. It's all too easy to make a mistake, though, especially if you're in a rush, and for some scenes it just isn't possible to achieve perfect framing. Fortunately, editing can help.

Select the Crop tab at the bottom of the editing screen. Although you don't have to preserve the original aspect ratio, you'll often want to do so to give a group of photos a common look and feel.

Select 'Crop by Original Photo Ratio' from the drop-down menu, then click and drag in the photo to select the area you want to preserve. You can then move the selection or click just outside it to start again. You can also stretch the selection using the handles, but this will change the aspect ratio.

When you're happy with the selection, use the 'Save Cropped Area' rather than Save option. Cropping isn't useful only for fixing errors, it can also be used for artistic effect. If you're not bothered about your image fitting in with a slideshow, you could try cropping with a more extreme aspect ratio.



Correct white balance

To record natural colours, a camera needs to know what type of light is used for the illumination. If the camera assumes daylight, but you're using artificial light, the scene will have a yellowish cast. Under the opposite conditions, your photo will look overly blue.

To prevent this it's necessary to correct the white balance. The camera's automatic setting will normally do the trick, but you should understand how to configure it when it trips up.

It's best to keep your camera set to auto white balance: leave it on the wrong setting, such as fluorescent light when you're shooting in daylight, the end result will be way off the mark.

To fix this, select the Home tab and choose Color Curves from the Bright, Color menu. In the Curves dialog box, ensure that only the colour or colours you want to adjust are selected at the bottom. To correct a blue cast you'll need to reduce blue and perhaps increase the red and green; for a yellowish cast, you should reduce the red and green and increase the blue. With the appropriate colours selected, drag the curve until you get the desired effect.



Image sharpening

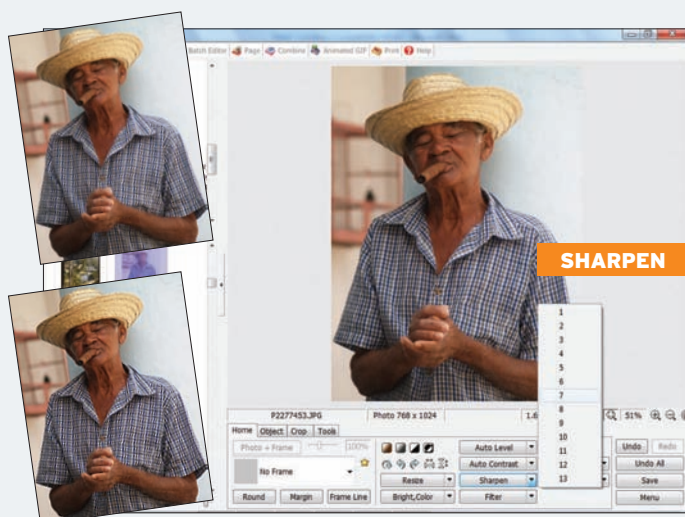
Blurred photos can result either from camera shake or poor focusing. To prevent camera shake when taking a photo, hold your camera firmly in two hands, take a steady stance and select a fast shutter speed in a shutter-priority exposure mode.

For composition use the optical viewfinder (if present) rather than the LCD. Your camera ought to automatically get the focus right, but the autofocus can sometimes be slow. Don't stab at the shutter release; half-press the shutter and wait for the camera to focus (this may be indicated by a beep) before fully pressing it.

A blurred photo can't be edited to look as good as it would if it were taken without camera shake and with proper focusing. Although you won't be able to recover the detail that's lost, it's easy to reduce the softness to make your photo appear sharper.

Select PhotoScape's Home tab and then choose a number between one and 13 (increasing degrees of sharpening) from the drop-down Sharpen menu. If you think you've overdone it, don't select a smaller number: this will sharpen it further. Instead, use the Undo option and then select a lesser degree of sharpening.

If your chosen image editor has an Unsharp Mask tool, use this rather than the basic Sharpen tool.



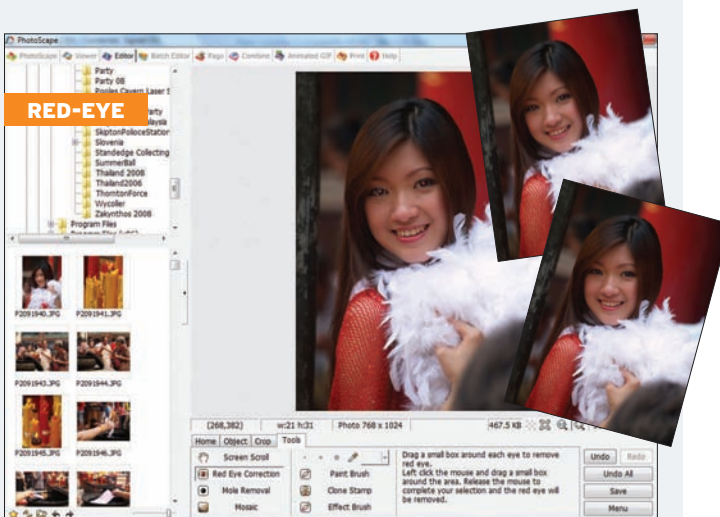
Remove red-eye

The all-too-familiar red-eye effect is caused by bright light from a camera's flash reflecting on a person's retinas. You can prevent it by using the bounce-flash technique (reflecting the light from the flash off the ceiling), or select your camera's anti-red-eye mode.

You could also try turning off the camera's flash and using the available light instead, although this might result in camera shake due to a slower shutter speed. Fortunately, correcting red-eye in your photos is easy and effective.

Zoom in so the eyes appear very large on the screen. Select 'Red Eye Correction', which you'll find on the Tools tab, and drag a box around the offending portion of each eye. PhotoScape tends to err on the side of caution, and you may find it doesn't remove all the redness, leaving a halo effect around the eye. If this happens, you'll have to remove the remaining redness yourself.

There are several ways you could do this, but one of the easiest and most effective is to use the clone stamp tool. We'll look at how to use this powerful tool when we explain how to remove unwanted objects (see page 113).



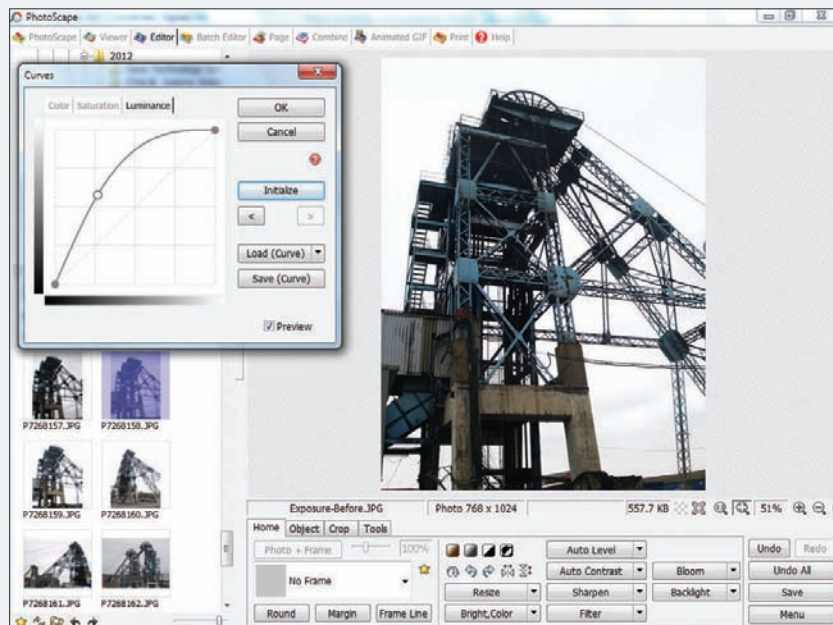
Correct poor exposure

With automatic exposure, poorly exposed photos ought to be a thing of the past - but things aren't that simple. For a start, the camera assumes that a scene has a mid-level level of reflectivity. If you shoot in a highly reflective environment such as snow, the camera will underexpose the image; in a scene with several dark objects it will tend to overexpose the shot.

To compensate for this you should tell the camera to deliberately over- or underexpose the shot. Very bright skies can also result in everything else being underexposed; a solution here is to lock the exposure to the element of the scene you're most concerned about.

If you do end up with a poorly exposed photo, modest correction can be made. You can use the same techniques to create a deliberately over- or underexposed shot for dramatic effect. Underexposing an evening landscape, for example, could give a spectacular sky against a silhouetted skyline.

For maximum flexibility use the Luminance Curve in the Color, Brightness menu, which works in the same way as Color Curves. An easier solution is to use Brighten or Darken.



Remove digital noise

To improve performance in low-light conditions without the flash a camera will amplify the signal from the sensor before it's digitised and written to memory. This occurs automatically, up to a point, but with some cameras you can adjust the 'ISO' sensitivity, which is a measure of this amplification.

Use too high an ISO value and you can end up with digital noise marring your shot, which makes the image look grainy, usually with pink and green dots. Similarly, long exposures can result in odd bright dots, called hot pixels. This can distract attention when it occurs in particularly dark areas of a scene.

To remove digital noise use the 'Noise Reduction (Clear Skin)' option in the Filter menu. Use it sparingly, since this technique could also make your photo take on a soft appearance.

The filter probably won't have any effect on hot pixels, though, even on its High setting, so you'll have to use a largely manual solution. There are several methods you could use, including the

red-eye removal tool for red pixels, provided that you don't try it on a red object. However, you'll probably have to resort to the clone stamp for other colours.

Improve contrast

A high-contrast photo is one that has a whole range of intensity levels, from the dark shadows all the way to bright highlights. If an image has poor contrast it will lack impact.

To some degree contrast is affected by the quality of the camera's lens and the CCD and, inevitably, you get what you pay for. However, very poor contrast can also be caused by particular lighting conditions, and in that case there's little you can do to improve things when you take the shot.

However, you can always improve the contrast after the event, and you can even enhance the contrast of perfectly acceptable shots for impact - just beware of overdoing it.

For a quick-and-easy fix try selecting either Low, Middle or High from the Auto Contrast menu on the Home tab. For more control, though, you should turn to the Luminance Curve that we used earlier to correct poor exposure.

A curve that represents an improvement in contrast will be below the diagonal at the

lefthand-side and above the diagonal at the righthand-side. If you want to reduce the contrast (a less common requirement) the curve would have the opposite overall shape. You could also try the Saturation Curve for more vibrant colours.





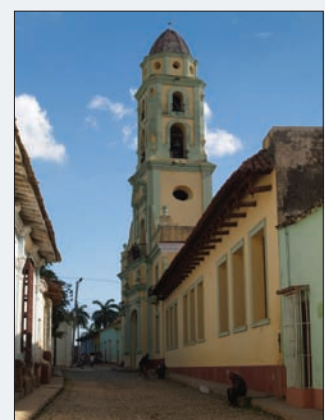
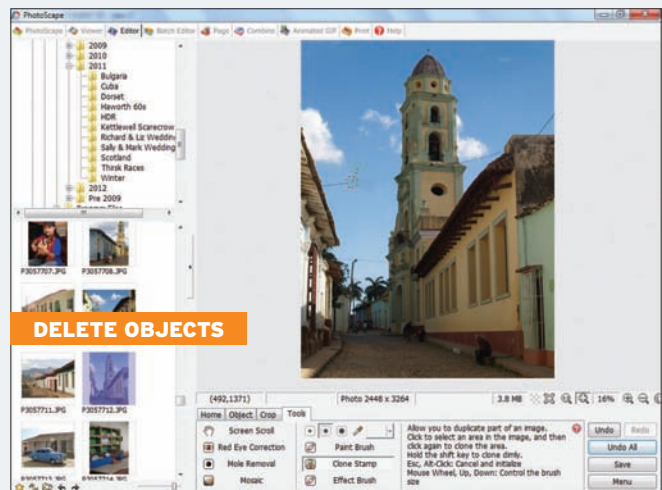
Reduce depth of field

How much of a scene is in focus is determined by the depth of field. A large depth of field will ensure that everything is in focus, from the foreground to the far distance. For this you'll need to either use your camera's landscape mode setting or switch to aperture-priority mode and select a small aperture (large f-number).

If you accidentally end up with too small a depth of field then it's impossible to correct later. However, sometimes you specifically want a small depth of field. A classic example is when you want to photograph something or someone in the foreground, while rendering the background blurred so that it won't distract. You can achieve this effect by zooming in on your subject as much as possible, or by selecting a large aperture (small f-number).

Alternatively, you can blur the background in an image editor such as PhotoScape. Click on Effects Brush in PhotoScape's Tools tab and select the Blur option. Now paint over the parts of the photograph you want to blur (this will most likely be the background), while holding down the left mouse button. Note that there are three brush sizes to choose from.

The effect is subtle in PhotoScape, but not necessarily so with other software. You may find that you have to repeat your steps several times to achieve the exact level of blur you're looking for.



Delete unwanted objects

As we've seen, cropping is useful for removing unwanted objects on the periphery of a scene. However, if unwanted objects are in the centre of your photo, such as the power lines in our example above, a different approach is called for.

The best method of removing such objects is to paint over them. Needless to say, do so with a single colour and it'll stick out like a sore thumb, even if the background is largely a single colour.

Instead, you need to copy a similar area of the photo and paste it over the unwanted object. This is possible with the clone stamp tool.

Click Clone Stamp on the Tools tab and select a brush size. In all probability you'll need to do this in several stages, perhaps using all three brush sizes. Click the part of the photo you want to copy from, followed by the part of the scene containing the unwanted object. Keep clicking until you've painted over the object. Practice makes perfect but beware the tell-tale repetitive pattern you'll get unless



you periodically restart by clicking again on 'Clone Stamp'.

If you have a version of Adobe Photoshop Elements, you can use the healing brush tool to automatically close out unwanted objects. Simply select it, draw over the object, and watch it disappear. ☒

Take your own apps wherever you go



Portable apps can be installed on a USB flash drive and taken wherever you go, allowing you to use them on any PC. Sandra Vogel explains how it works



If you find yourself regularly using different computers, not having the files you need and programs to which you've become accustomed can make you far less efficient.

Even if your preferred applications are installed on an 'alien' machine, your user preferences won't be. Configuring programs to fit your needs can be time-consuming, and forgetting to restore them later is unfair on the owner of the machine.

There's an easy solution: take your own apps with you. Free portable applications can be run directly from a USB flash drive or memory card, which you can plug into any machine you need to use.

Configure your personal preferences in your portable apps and you'll need to do so only once; the programs will always look and work the way in which you expect them to. Portable apps can also retain data - for example, a browser can remember your bookmarks, and a word processor can carry your favourite fonts.

Portable applications can be run from a dedicated menu that launches when

you plug in the device to a host PC. This makes it easy to quickly locate the apps, and means you won't have to dedicate your external drive to portable apps only. Just like any other storage medium, it can have folders storing whatever else you need to take with you, from documents to video, music and presentations.

Granted, portable versions of all the programs you use may not be available, such as those for Microsoft Office or Adobe Photoshop, but you may be surprised at just how many are; head to portableapps.com to see what we mean. From Google Chrome to Dropbox, 7-Zip and OpenOffice, most bases are covered.

Another advantage of using portable apps is that they leave no footprint on the host computer. You won't need to worry about having accidentally left an important document on someone else's machine.

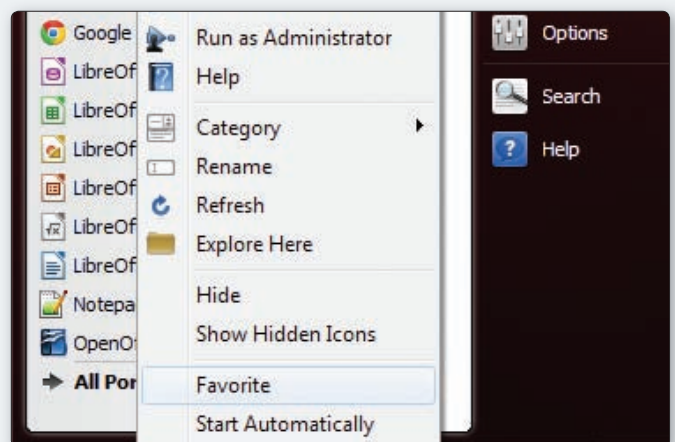
In the following workshop, we'll explain how to download, install and configure portable versions of your most frequently used programs.

GET STARTED WITH PORTABLE APPS



START

Head to portableapps.com. This is a great source of free apps, complete with a dedicated and customisable launcher app. The launcher contains a download manager and can automatically update your apps to their latest versions.



4

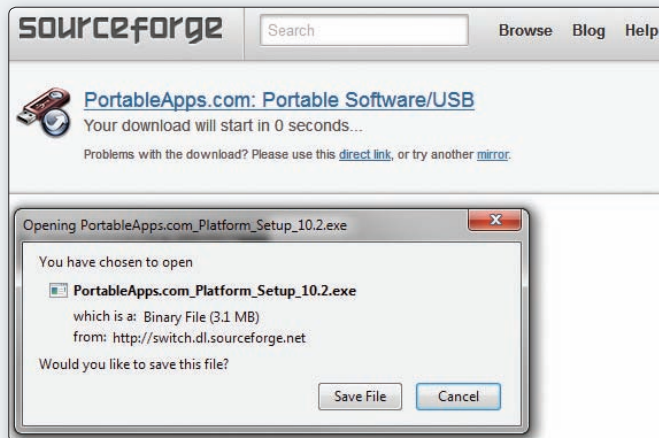
Installed apps are listed on the left side of the launcher, with folders and options on the right. The last open app will appear at the top of the list, although it's possible to set favourites to keep specific apps readily accessible. Right-click to favourite an app.

PORTABLE APPS TWEAKS

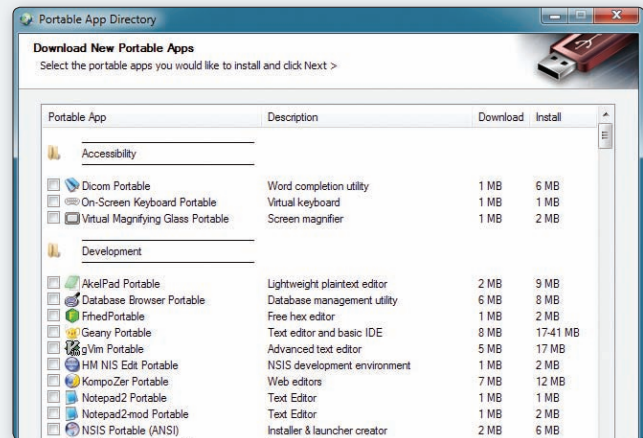
Portable Apps is simply an app launcher that provides easy access to a range of portable software. It isn't the only launcher, nor is it the only source of portable apps available. Some other sources you can try include portablefreeware.com and liberkey.com, while a PStart launcher is available from pegtop.net.

While you're working with Portable Apps as a launcher, consider the following tweaks to help you get the most from it:

Use large fonts. If you find the default font too small to read, choose Options, select the General tab and enable 'Use Large Fonts'.



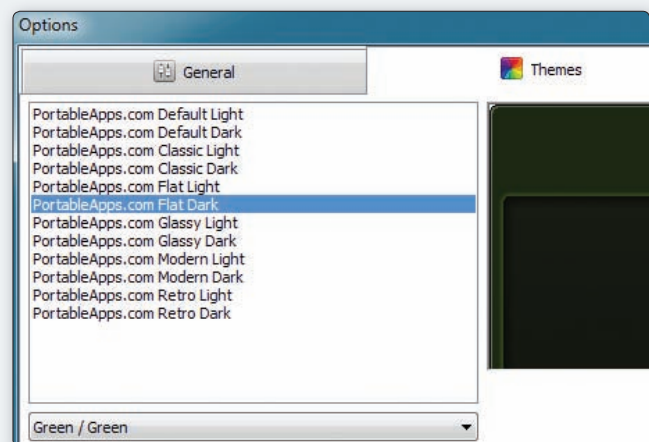
2 Click Download Now, then follow the link to the Sourceforge website; at this point the download should automatically begin. Run the downloaded file, selecting your USB drive or memory card as the destination folder.



3 You can now launch portable apps from your USB drive. Plug it into a PC and the App Directory will open for you to select apps. Find a few programs that take your fancy, then click Next. The selected downloads will be installed on your drive.



5 If you've got lots of apps then storing them in folders (known as categories) can help organisation. Right-click to assign an app to a category. Click 'All Portable Apps' to bring up the categories list, to which you can add your own if none is suitable.

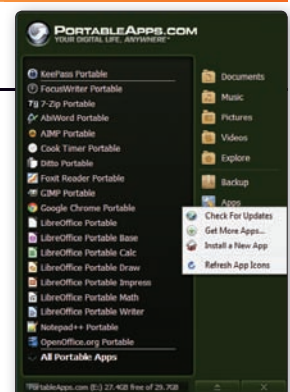


6 You can personalise the Portable Apps launcher with a theme. Click Options, Themes to select a colour scheme. You can also alter the window transparency and the ordering of apps under the General tab. ☒

Keep Portable Apps up to date. Click Apps in Portable Apps' righthand pane to access an option to check for updates. Portable Apps will simultaneously check and update all your apps.

Monitor disc space. At the bottom of the Portable Apps window is a small information bar that reveals how much storage space is in use and how much remains. If you need to use a drive with a larger storage capacity, it's possible to simply copy the contents of your existing drive to a folder on your PC, then transfer the folder to your new USB drive.

Keep an eye on what's new. New portable apps are appearing all the time. If you want to keep an eye on what's new in the Portable Apps world, pay regular visits to portableapps.com.



Pay for goods and services with PayPal



PayPal is a safe and popular way to pay for goods and services online. James Fell explains how it works and how to set up a free account



UK shoppers spent around £70bn online last year. Using the web to procure goods and services from the comfort of your own home is quickly becoming the norm.

Rather than having to enter your payment details for each purchase, many sites now offer a PayPal checkout in addition to or in place of their own payment system. Having already signed up for an account, you simply enter your email address and password and click Pay now.

PayPal is a convenient middle-man, allowing you to transfer money without the recipient being privy to your account details. It has around 100 million active users.

As well as processing payments for goods and services, PayPal allows you to gift money to friends and family – all you need is their email address. It's far safer than sticking a tenner in a birthday- or Christmas card.

If you use eBay, chances are you already hold a PayPal account. The payments service is owned by the online auction site, and many listings require

e-transfers via PayPal. With 95 percent of all eBay auction payments processed by PayPal, your goods will almost certainly be more attractive to buyers if they can simply click a button rather than write a cheque and trundle off to the Post Office.

PayPal doesn't charge you to send money, although a fee (3.4 percent) is levied on the recipient when you purchase goods and services.

PayPal's Buyer Protection means its support team will help you resolve any disputes, such as when you don't receive an item for which you've paid.

All you need to set up a PayPal account is an email address and a valid debit- or credit card. For most people a standard Premier account will suffice, although a Business account is also available.

A balance held in your PayPal account can be used to pay for goods online or transferred to your bank account (this usually takes two-to-three working days).

Here, we'll show you how to get started with PayPal and use it to pay for goods online.

SET UP A PAYPAL ACCOUNT

PayPal

Enter your information

Please fill in all fields:

Email address
You will use this to log in to PayPal

Choose a password

START Head to [PayPal.com/uk](https://www.paypal.com/uk) and hit Sign Up. Specify your region and click Get Started under 'PayPal for your personal use'. Enter your details, consent to the User Agreement and Privacy Policy, then click 'Agree and Create Account'.

Hotmail

Inbox

Activate your PayPal account by confirming your email address

service@paypal.co.uk Add to contacts
To Mark Fell

PayPal

Activate your PayPal account by confirming your email address

Dear Mark Fell,

To complete your PayPal account, you must click the link below and enter your password on the following page to confirm your email address.

[Click here to activate your account](#)

You can also confirm your email address by logging in to your

PayPal. Safer. Simpler. Smarter.

- Use your debit or credit card without revealing your details to retailers.
- Speed through checkout without the need to enter your card number or postal address.
- Send money to family and friends for free.

4 PayPal will send a confirmation message to the email address you specified at registration. Open the message and hit the 'Click here to activate your account' link. You can now sign into PayPal using your email address and password.

Send Money

Secure Transaction

Review your payment and send

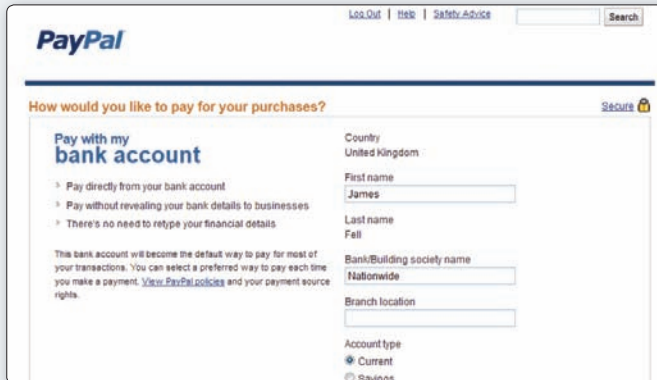
Please check the following information before continuing. Fees may apply in case of currency conversion and/or cross-border transactions. [Learn more](#)

Description	Amount
Payment To: soandso@hotmail.com With the details you have submitted we are unable to confirm that the recipient has registered with us. PayPal will send an email to the recipient explaining how to complete your transaction.	£23.00 GBP Change amount
Apply coupon/gift voucher	
Your total charge:	£23.00 GBP

[Send Money](#)

7 PayPal will ask you from where it should take the funds. An Instant Bank Transfer takes the money from your bank account (minus any funds stored in your PayPal account), or you can pay by credit- or debit card. Enter a message and click Send Money.

Tech Help



PayPal

How would you like to pay for your purchases?

Pay with my bank account

- Pay directly from your bank account
- Pay without revealing your bank details to businesses
- There's no need to retype your financial details

This bank account will become the default way to pay for most of your transactions. You can select a preferred way to pay each time you make a payment. [View PayPal policies](#) and your payment source rights.

Country: United Kingdom

First name: James

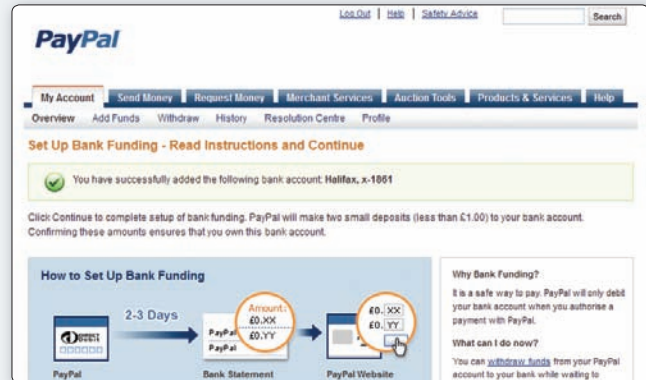
Last name: Fall

Bank/Building society name: Nationwide

Branch location:

Account type: ☒ Current ☐ Savings

2 The following page will prompt you to enter your bank account details. These are held in your account to save you re-entering them each time. You can add only one bank account for now, but 'verified' accounts can have up to eight (see Step 5). Click Continue.



PayPal

Set Up Bank Funding - Read Instructions and Continue

You have successfully added the following bank account: Halifax, x-1001

Click Continue to complete setup of bank funding. PayPal will make two small deposits (less than £1.00) to your bank account. Confirming these amounts ensures that you own this bank account.

How to Set Up Bank Funding

2-3 Days

PayPal

Bank Statement

PayPal Website

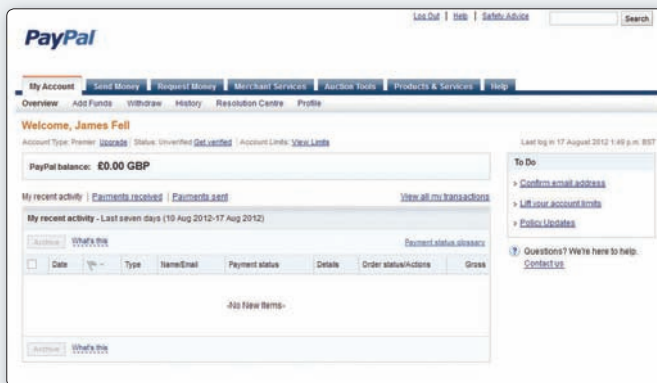
Why Bank Funding?

It is a safe way to pay. PayPal will only debit your bank account when you authorise a payment with PayPal.

What can I do now?

You can [withdraw funds](#) from your PayPal account to your bank while waiting for

3 To verify that you have correctly entered your bank details, PayPal will make two small deposits (each less than £1). Click Unconfirmed next to your account in the Bank Accounts section and follow the instructions.



PayPal

Welcome, James Fall

Account Type: Premier | Status: Unverified | [Get verified](#) | Account Limits: [View Limits](#)

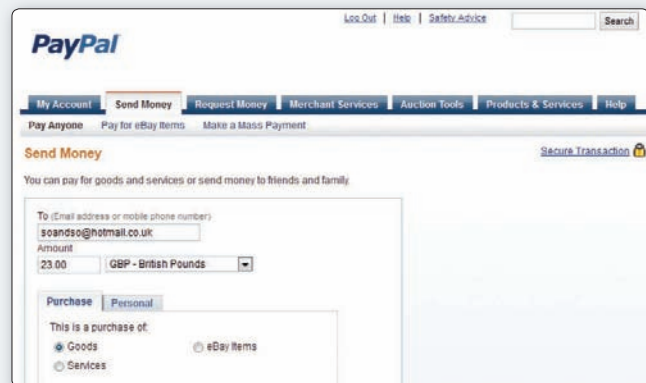
PayPal balance: £0.00 GBP

My recent activity: [Payments received](#) | [Payments sent](#) | [View all my transactions](#)

My recent activity - Last seven days (10 Aug 2012-17 Aug 2012)

[Add New Items](#)

5 It isn't essential to verify your account, although doing so will free you from restrictions on how much money you can send and receive. Open the My Account Overview and click 'Get verified'. Enter the amounts of the two deposits to your bank account.



PayPal

Send Money

You can pay for goods and services or send money to friends and family.

To (Email address or mobile phone number): soandso@hotmail.co.uk

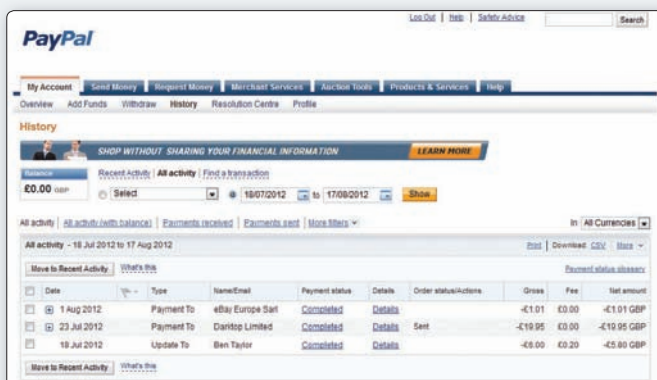
Amount: 23.00 GBP - British Pounds

Purchase | **Personal**

This is a purchase of:

☒ Goods ☐ Services ☐ eBay Items

6 Making a payment via PayPal is usually processed via a checkout screen on an e-commerce site. It's also possible to send money through PayPal's own site. Click the Send Money tab, specify the payment type and enter the relevant details.



PayPal

History

SHOP WITHOUT SHARING YOUR FINANCIAL INFORMATION [LEARN MORE](#)

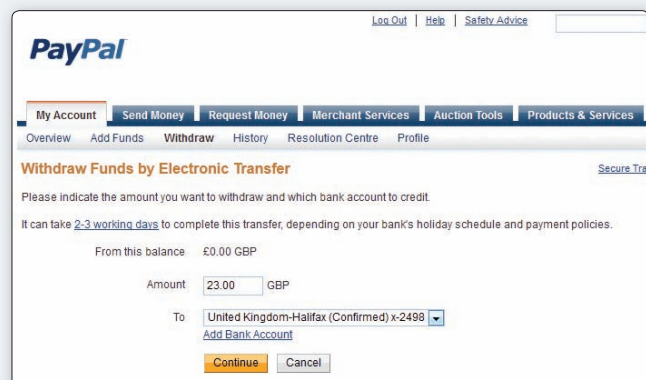
Recent activity: [All activity](#) | [Find a transaction](#)

£0.00 GBP

All activity - 18 Jul 2012 to 17 Aug 2012

Date	Type	Name/Email	Payment status	Details	Order status/actions	Gross	Fee	Net amount
1 Aug 2012	Payment To	eBay Europe Ltd	Completed	Details		-£1.01	£0.00	-£1.01 GBP
23 Jul 2012	Payment To	Danip Limited	Completed	Details	Sent	-£19.95	£0.00	-£19.95 GBP
18 Jul 2012	Update To	Ben Taylor	Completed	Details		-£5.00	£0.20	-£5.80 GBP

8 You can view a log of all payments sent and received via the History tab in My Account. For payments received you'll be able to see the gross amount, PayPal fee, and net total. You can check the details of transactions, and see where refunds have been made.



PayPal

Withdraw Funds by Electronic Transfer

Please indicate the amount you want to withdraw and which bank account to credit.

It can take 2-3 working days to complete this transfer, depending on your bank's holiday schedule and payment policies.

From this balance: £0.00 GBP

Amount: 23.00 GBP

To: United Kingdom-Halifax (Confirmed) x-2498

[Add Bank Account](#)

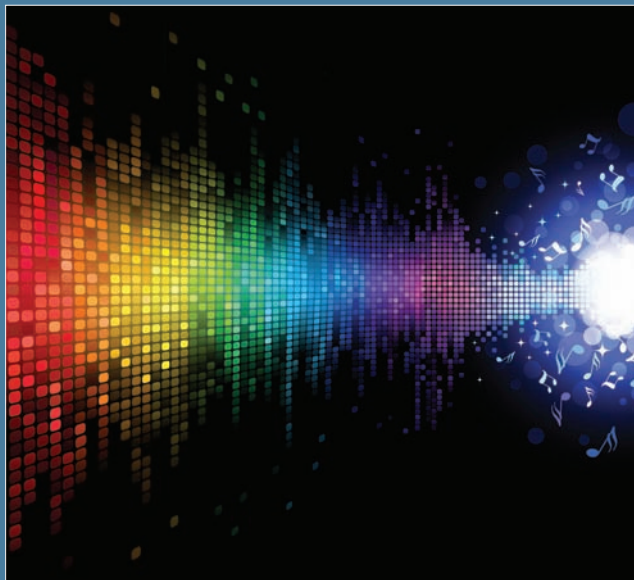
[Continue](#) [Cancel](#)

9 Payments received will be added to your PayPal balance. This can be offset against the future payment of goods and services, or transferred to your bank account. For the latter, open the Withdraw tab and choose 'Transfer to Bank Account'. ☐

Record audio on your Windows PC or laptop



It's easy to record audio playing from your PC or laptop's speakers. Roland Waddilove shows how to make digital recordings for later listening



Recording audio in Windows is a simple matter of plugging in a microphone and selecting some software to record the input. But you may not have known that it's just as easy to record digital audio playing through your PC's speakers.

There are several scenarios in which this might be useful. Perhaps you want to record an interview or conversation conducted over a VoIP service such as Skype, for example. You must remember to ask all parties' permission before doing so, of course.

Live webcasts and internet radio broadcasts can also be recorded for later listening. In the same way that you might use a catch-up TV service to watch programmes after they were broadcast, recording audio from the web lets you keep up to date with other content you may have missed.

A variety of online radio stations stream every music genre you can imagine; just check out shoutcast.com,

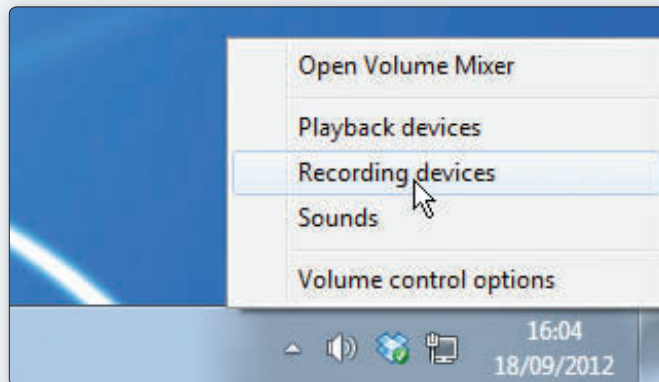
live365.com and sky.fm for starters. You don't need to adhere to their programming schedules to enjoy their music broadcasts: just record them.

Recording internet radio for later listening isn't illegal; it's only when you start burning those recordings to disc and selling them on that you will fall foul of the law.

In the following workshop we provide step-by-step advice on how to enable a hidden Windows setting that will allow you to record the audio playing through your PC's speakers. We're using the free Audacity audio editor to record the output, although alternatives are available.

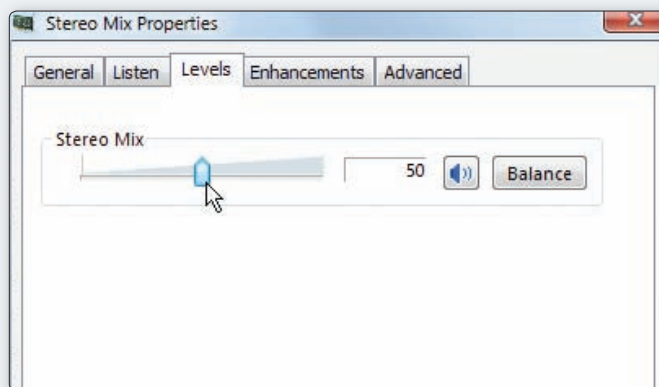
To follow our workshop you'll need a PC running Windows Vista, 7 or 8, with a sound card that supports recording (the Realtek onboard audio chips selected by many PCs and laptops may suffice). Turn up the volume and unplug any standalone speakers for optimum audio quality.

RECORD AUDIO WITH AUDACITY

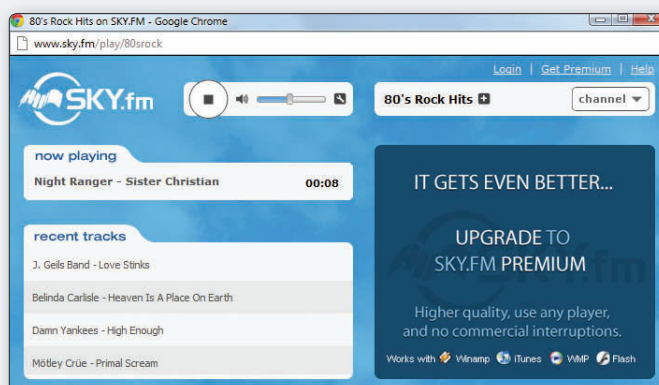


START

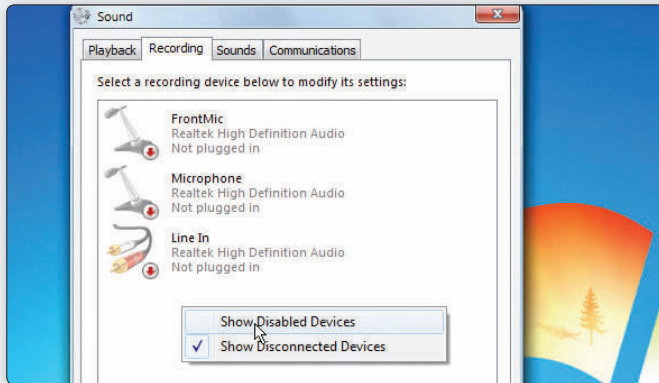
To begin recording audio played through your computer's speakers you'll first need to tweak the audio configuration in Windows. Right-click the speaker icon in the taskbar and choose Recording devices in the pop-up menu.



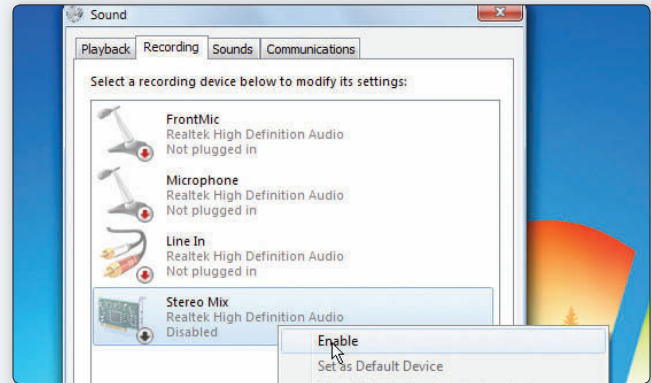
4 Select the Stereo Mix device and click the Properties button. The default settings should be adequate, but it's worth checking that the volume on the Levels tab is set to 50, and the quality on the Advanced tab is 'CD quality'.



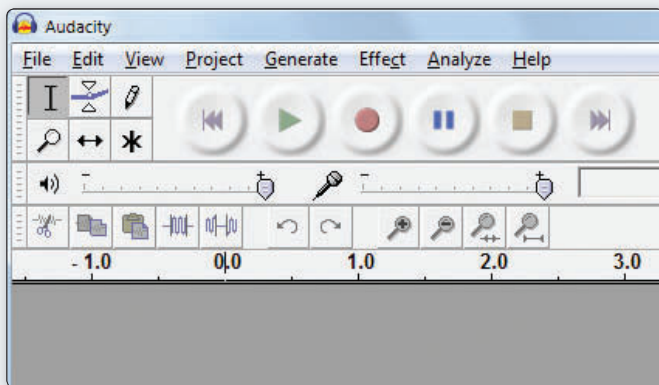
7 You're now ready to start recording, so let's find something to listen to. Launch your web browser and head to sky.fm or another internet station of your choice. Select a radio station and click the button to begin playback.



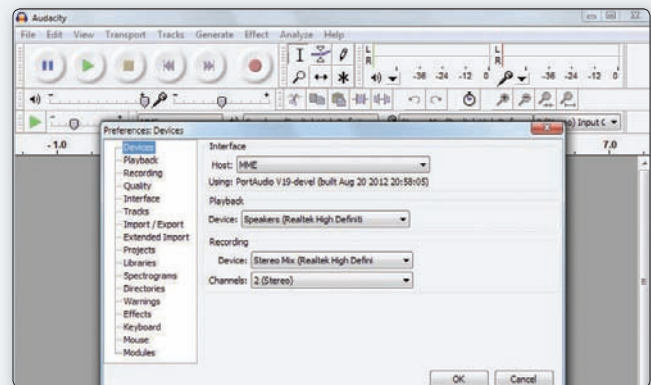
2 Select the recording tab in the Sound dialog that appears onscreen. The list of recording devices installed on your computer that's returned may not be definitive; right-click in the white space and select 'Show Disabled Devices'.



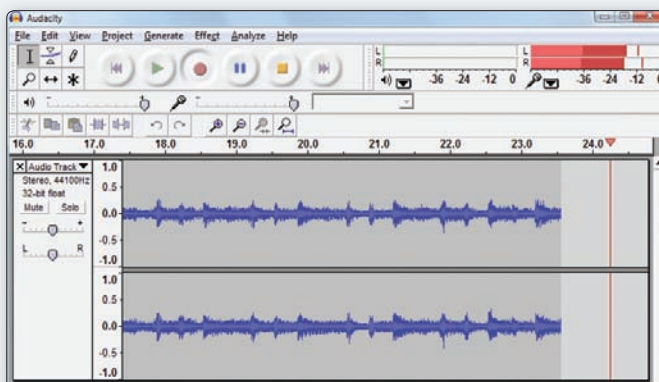
3 You should be able to see Stereo Mix in the list, although it may be disabled. You can enable Stereo Mix by right-clicking the entry and choosing Enable. Right-click Stereo Mix again and choose 'Set as Default Device'.



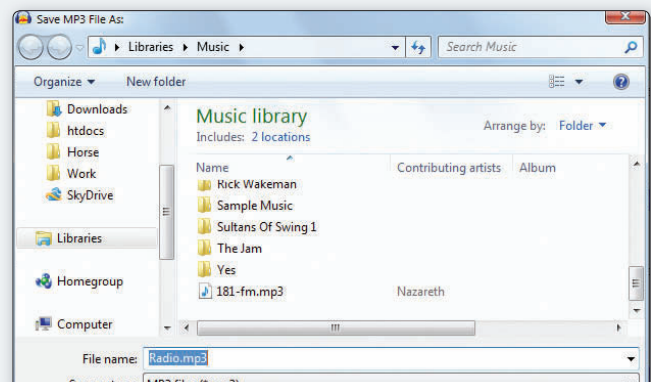
5 Next, you'll need some audio-recording software. If you don't already have some installed on your machine, download the free Audacity from our website at tinyurl.com/9349vmn. The Lame MP3 Encoder is required to output to MP3.



6 Click the setup file and follow the instructions to install and then launch Audacity. The settings must be configured to use the correct input source. Select Edit Preferences and, under Devices, set the recording device to Stereo Mix.



8 Back in Audacity click the record button. Your speakers don't need to be plugged in or switched on, but you will need to turn up the volume for the best recording quality. You can quickly ramp it up using the speaker icon in the taskbar.



9 Click the Stop button when the broadcast ends. Click the File menu and choose to export the file as an MP3 or WAV (you'll need the Lame MP3 Encoder for MP3). The saved file will be compatible with Windows Media Player and other music players. ☒

Get your game on



Steam is the most popular way to download games to your Windows PC or laptop. Martyn Casserly explains how to get started



Although consoles may have stolen its thunder in recent years, the PC has always offered one of the best gaming experiences available. The PC's main problem was that it lacked a central location where players could safely buy, download and play games, and interact with others. It's something Xbox 360 has got down to an art with its Live Gold service.

Valve software, the vendor behind Half Life, Counter Strike, Left for Dead and Portal, has since offered a solution in the form of Steam. Its service is now one of the most popular PC gaming and retail sites on the web.

Steam is straightforward to use. You simply head to store.steampowered.com and download and install a game. You can then buy more games, participate in online tournaments and multiplayer games, download the latest content, interact with friends, and even gift games.

With more than 2,000 titles, including most big releases and lots of casual games, Steam offers plenty of fun. And with weekly deals

and seasonal sales it's not difficult to build an impressive library of games for a modest outlay. It certainly beats spending £60 on one Call of Duty Game for the Xbox 360.

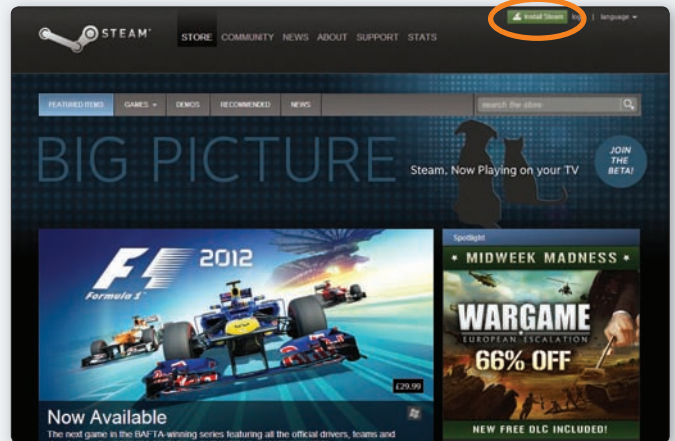
To encourage publishers to sell their games through Steam, Valve uses a form of DRM to protect against piracy. In essence this prevents you from copying the game and selling or passing it on; neither can you play the game without being logged in.

DRM remains a hot topic with user groups and other commentators who see it as restrictive and heavy-handed. However, of all the DRM we've come across, Valve's is the fairest and least disruptive.

Purchases are linked to your account and you can download the games on as many computers as you like, although you'll be able to play them on only one at a time.

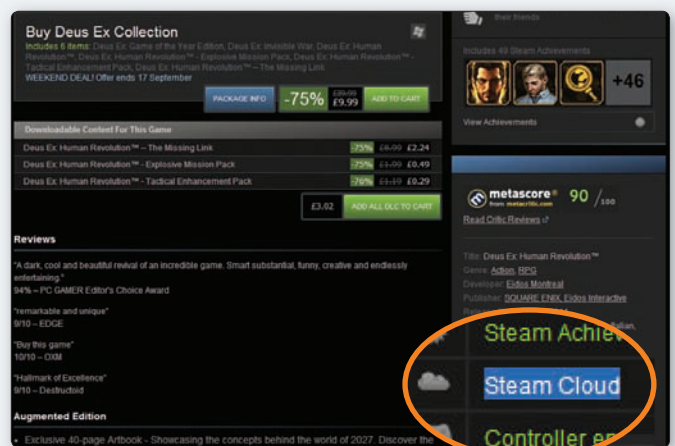
So, with cheap games, a vibrant community, online play, no fees, and a soon-to-be-released interface for your TV called the Big Picture (see tinyurl.com/9kvrs4e), there's never been a better time to be a PC gamer.

BUY, DOWNLOAD AND PLAY GAMES FROM STEAM



START

You can access the Store and interact with the community via a browser, but for the full Steam experience you'll need to install the client. Head to store.steampowered.com, click Install Steam, then double-click the .msi file to install the program.



4

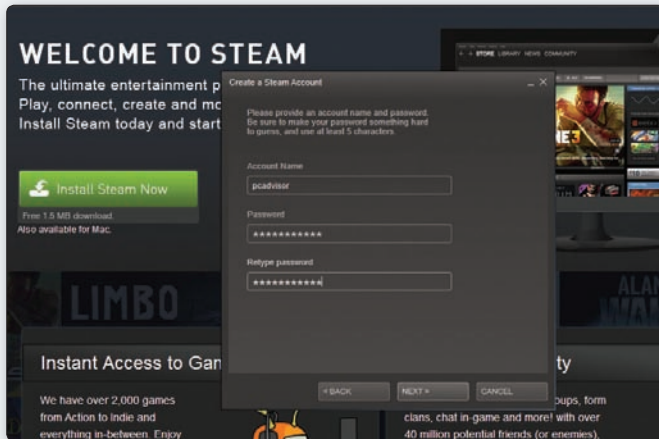
Downloaded games are stored in the Library. Steam keeps a record of any games with 'Steam Cloud' functionality (scroll down to the bottom of their description in the Store to check), allowing you to delete them and later redownload them.

MULTIPLAYER AND OTHER FEATURES

One of Steam's best features is its multiplayer mode. If you and a friend want to go head to head in a particular game, provided that game has a multiplayer mode (you can check in its Store description), all you need to do is ensure you both have a copy of the game installed on your computer.

Multiplayer options vary from game to game. Generally speaking, one of you will need to select multiplayer, then choose to create or host a game. The second player can then select multiplayer, opt to join a game and look for your username in the list of servers.

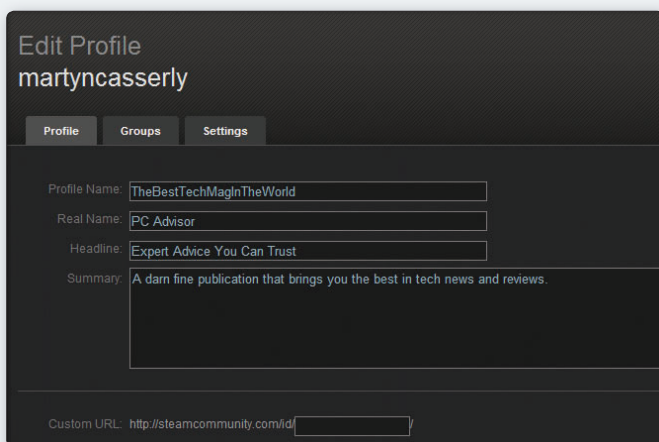
Tech Help



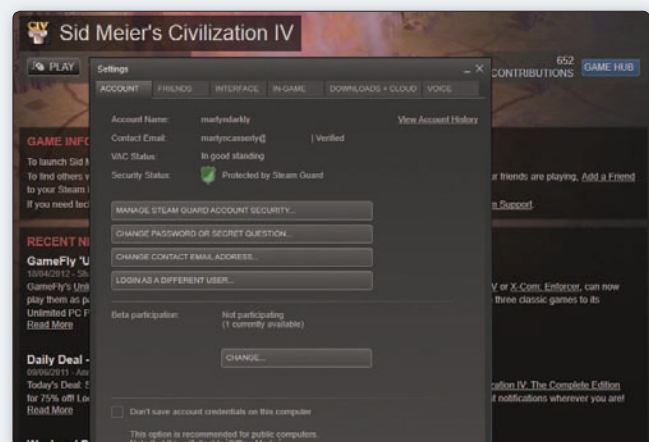
2 You'll be prompted to create a new account. Enter your details, accept the terms and conditions, create your account details, verify your email address, then head over to the games Store and find something that takes your fancy.



3 Steam defaults to the Store screen. You'll find new releases centrestage, with any discounts prominently displayed. Use the search bar to find a particular game, or click on a game to get more information, download a demo or make a purchase.



5 To access online chat, join tournaments and be recognisable to your friends, you'll need to create a profile. Choose the Community tab and select Profile, 'Edit my profile'. You can also link your Steam account to Facebook if you wish.



6 You can play games in Offline mode if you will be away from an internet connection for a while. Click Steam, Settings and deselect 'Don't save account credentials on this computer'. Now go to Steam, Go offline, Restart in Offline mode. ☒

There's also the Steam Community Overlay, which is displayed by pressing Shift, Tab. If this doesn't work, make sure the option is enabled both in Steam's settings and in the individual game (right-click the game in your Steam Library and choose Properties).

Games can consume many gigabytes of storage. If you start running low on drive space, some titles can be uninstalled (see Step 4). To save you having to download them again, Steam Mover (traynier.com/software/steammover) allows you to copy a game on to an external drive and then return it to your PC later.



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LETITIA AUSTIN



Bitdefender Total Security 2013

FULL PROGRAM

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 210\ Bitdefender Total Security 2013 and open the install file

Online registration required: follow the links during installation

System requirements

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

Welcome to the next generation of the #1 ranked antivirus technology. For 2013, Bitdefender Total Security takes privacy and security to new levels with Bitdefender Safepay - an exclusive, hacker-proof browser that automatically engages to shield all your online banking and e-transactions from cybercriminals. All the while, Autopilot's Silent Security makes the optimal security-related decisions for you.

Additional features include antivirus, antispyware, antispam, ID theft protection, firewall, parental controls and online sync.

Award-winning antivirus

Bitdefender's antivirus technology ranks high in major independent testing labs (AV-Comparatives, AV-Test, VB100), beating competitors including Norton, Kaspersky, McAfee and Microsoft.

Bank, shop with confidence

Never worry about hackers stealing your account information again! Bitdefender Total Security 2013 keeps hackers at bay by automatically opening all your e-banking and -shopping pages in a separate iron-clad, secure browser.

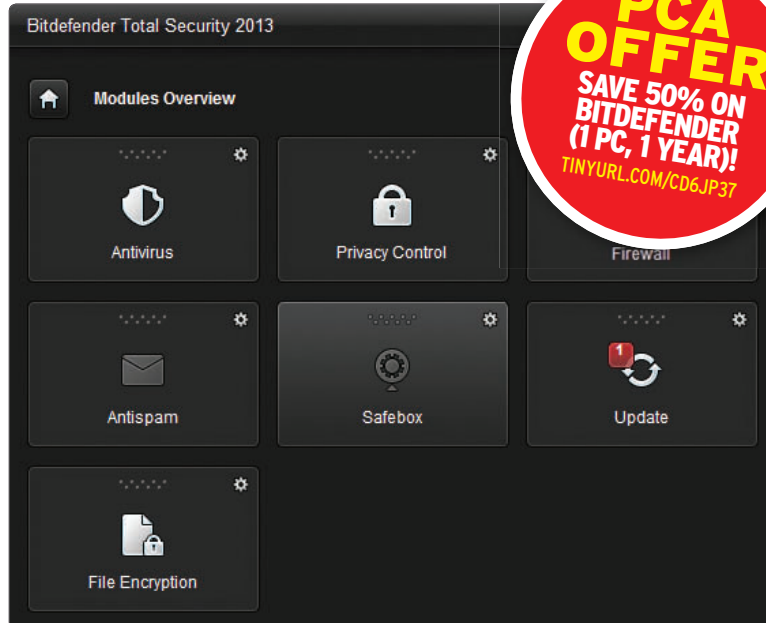
Whenever you're using the internet through public, insecure wireless connections, Bitdefender Safepay creates an unbreachable connection between you and the online bank/shop to which you're sending your data.

Silent security

How effective can an antivirus be if you have to be a rocket scientist to properly use it? Bitdefender Autopilot allows you to play, watch movies, or simply enjoy your PC, without interruptions or slowdowns.



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Control lost/stolen devices

How would you like your antivirus to protect you from more than just online threats? Bitdefender Anti-Theft gives you a head start in locking, locating or wiping your missing laptops or netbooks.

Windows 8-compatible

The latest security technologies for the latest Windows operating system: Bitdefender Total Security 2013 is compatible with laptops, desktop computers and tablets running Windows 8. ☒

Visit our website for more software special offers: pcadvisor.co.uk/special-offers

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TuneUp Utilities 2013

FULL PROGRAM (THREE MONTHS OF UPDATES)

**ONLINE
REGISTRATION
REQUIRED**

Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select Files 210\TuneUp Utilities 2013 and open the install file

Online registration required: follow the links during installation.

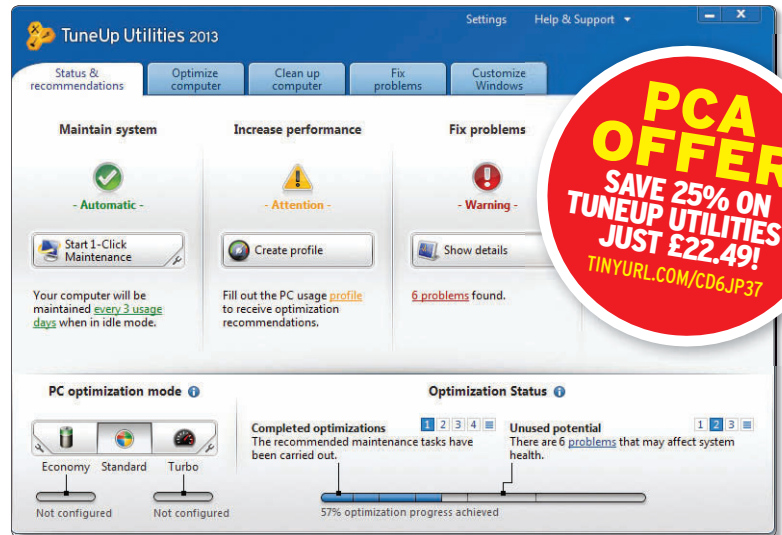
System requirements

300MHz processor; Windows/XP/Vista/7/8; 256MB RAM; 80MB drive space; Internet Explorer 6.0 or later

TuneUp Utilities sets the standard for PC tune-up and optimisation, particularly when it comes to removing traces of your browser history and other residue. Version 2013 'cleans' some 250 popular PC programs, Windows functions and browser residue, and introduces Live Optimization 2.0, a feature designed to recognise and remedy the most resource-hungry applications on your PC, laptop or tablet.

Features

- One-click maintenance
- Erases browser traces
- Fixes a number of PC problems
- Improves system reliability
- Performs Windows maintenance
- Recovers wasted disk space
- Offers a fresh-looking interface



You'll have complete, safe control over your PC, and tweaking will become a breeze. ☒

Abelssoft CryptBox 2012 SE

FULL PROGRAM

**ONLINE
REGISTRATION
REQUIRED**

Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select Files 210\Abelssoft CryptBox 2012 SE and open the install file

Online registration required: follow the links during installation.

System requirements

Windows XP/Vista/7/8; .Net Framework 2.0; web connection

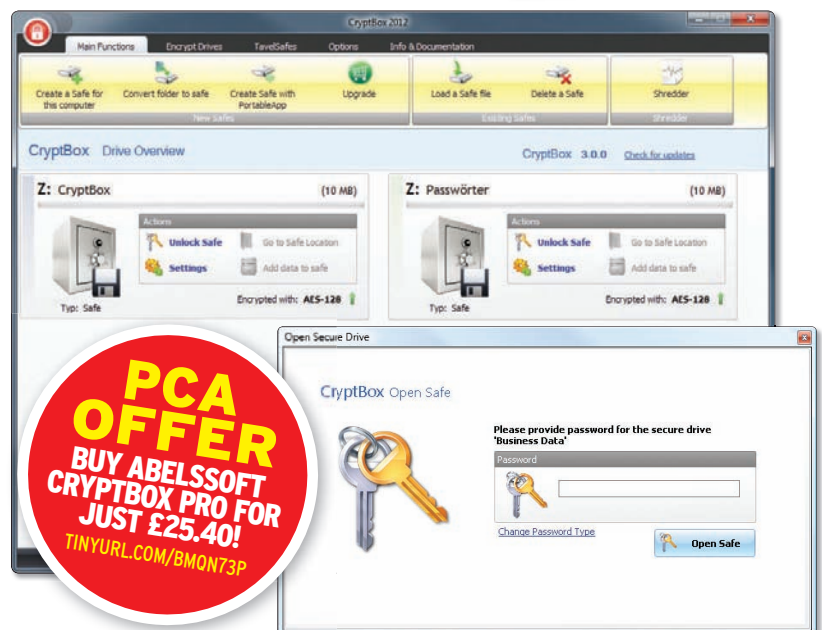
More and more unencrypted personal data is stored on PCs, and even those files that have already been deleted remain visible to all who have access to the machine - including hackers.

CryptBox allows you to securely store your data. CryptBox creates virtual Safes, which look like normal drives, into which you can place any data you like.

Encryption wizards: Take you through creating a Safe and specifying a storage capacity, encryption algorithm and password.

Portable Apps: Install portable apps inside your Safe, enabling you to access your data in a protected environment on any PC.

TravelSafe: CryptBox allows you to create a TravelSafe, which can be exported to a USB flash drive or CD.



iPhone/iPod as key for your Safe: Plug your device into the PC and the Safe will automatically open.

File shredder: CryptBox allows you to securely delete sensitive files from your machine. ☒

Conduv Undelete 10.0 Home

FULL PROGRAM (THREE-MONTH LICENCE)

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select Files 210\ Conduv Undelete 10 Home and open the install file

Online registration

required: follow the links during installation.

System requirements

Windows XP/Vista/7;
140MB drive space

From financial records, work- and school reports to digital photos you'll never be able to re-take again, there's a load of valuable information stored on your PC. How would you feel if you lost those files and couldn't get them back?

Fortunately, Undelete protects your data from accidental deletions, overwrites and other catastrophes.

Undelete includes Emergency Undelete, which can recover files deleted before the program was installed, and SecureDelete to completely erase confidential files.

Set-it-and-forget-it features and InvisiTasking technology ensure the security of your data. ☒

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BUY UNDELETE
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OC Shield DataGuard VPN + AV Mobile Security

ANDROID APP

ONLINE
REGISTRATION
REQUIRED

Installation details

Download the app on to your smartphone from tinyurl.com/7j64esx

Registration required:

Go to Android Play on your smartphone, search for DataGuard VPN + AV, download and install app. Open app and click 'Try for Free'.

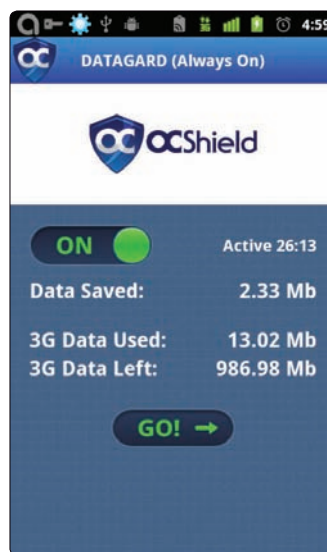
System requirements

Android 2.2 or later;
1.7MB storage

DataGuard is the only smartphone internet security app that fully secures Wi-Fi hotspots to prevent phishing/malicious app attacks. DataGuard could also help you save money by reducing your reliance on 3G by as much as 25 percent of your data plan. The display shows your 3G Saved, 3G Used and 3G Left and, since Wi-Fi is secure, DataGuard helps you to increase your Wi-Fi usage and save money.

Features

- Secure Wi-Fi, anti-phishing, antivirus, all-in-one malware defence
- 25 percent automatic data plan savings
- 50 percent faster browsing and downloading
- View Netflix and BBC iPlayer from abroad ☒



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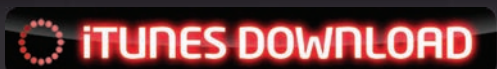
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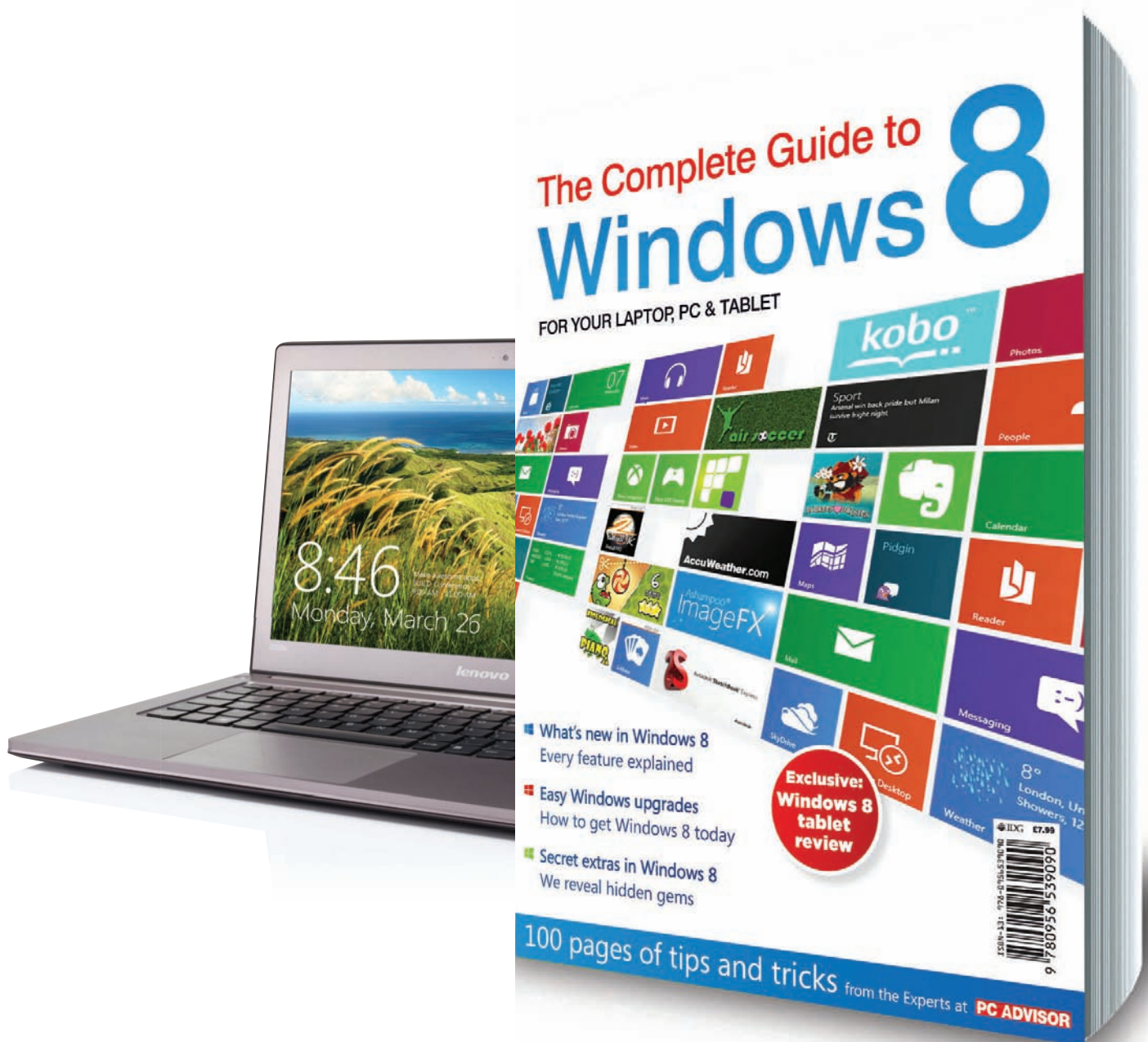
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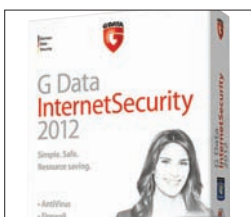
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	Apple MacBook Air 11in	Samsung 900X4C	Toshiba Portege Z930-108	Acer Aspire S5-391	HP Envy Ultrabook 6-1010ea
Price	£849 inc VAT	£1,000 inc VAT	£1,479 inc VAT	£1,125 inc VAT	£699 inc VAT
Website	Apple.com/uk	Samsung.com/uk	Toshiba.co.uk	Acer.co.uk	Hp.com/uk
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	1.7GHz Intel Core i5-3317U	1.7GHz Intel Core i5-3317U	2GHz Intel Core i7-3667U	1.7GHz Intel Core i5-3317U	1.7GHz Intel Core i5-3317U
RAM	4GB DDR3	8GB DDR3	8GB DDR3	4GB DDR3	4GB DDR3
Storage	64GB SSD	128GB SSD	128GB SSD	256GB SSD	500GB hard drive
Screen size	11.6in	15in	13.3in	13.3in	15.6in
Screen resolution	1366x768 pixels	1600x900	1366x768 pixels	1366x768 pixels	1366x768 pixels
Graphics	Intel HD Graphics 4000	Intel HD Graphics 4000	Intel HD Graphics 4000	Intel HD Graphics 4000	Intel HD Graphics 4000
Video memory	N/A	N/A	N/A	N/A	N/A
Wireless	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11a/g/n	802.11a/b/g/n
Ethernet	100Mbps with USB adaptor	Gigabit	Gigabit	N/A	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0	2x USB 3.0	2x USB 3.0, 1x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	✓	x	x	✓	x
DisplayPort	✓	x	x	x	x
HDMI	x	✓ (Micro HDMI)	✓	✓	✓
DVI	x	x	x	x	x
VGA	x	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	Speakers, headphone jack
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	HD webcam, multitouch trackpad, backlit keyboard	Webcam	Webcam, fingerprint scanner, Kensington lock slot	Webcam	Webcam, Kensington lock slot
Operating system	Mac OS X 10.7 Lion	Windows 7 Home Prem 64bit	Windows 7 Pro 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Bundled software	iLife 11	Samsung Recovery Solution	None	MS Office Starter	None
Fear (Max detail)	28fps	28	29fps	28fps	20fps
Battery	35Wh lithium-ion	62Wh lithium-ion	46Wh lithium-ion	35Wh lithium-ion	59Wh lithium-ion
Battery life	6 hrs 10 mins	8 hrs 3 mins	8 hrs 14 mins	6 hrs 3 mins	7 hrs 6 mins
WorldBench 6 score	129	125	136	136	112
Dimensions	300x192x3-17mm	375x237x15mm	315x226x15.5-16.9mm	322x226x15.5-23.5mm	374x253x20.5mm
Weight	1.07kg	1.67kg	1.1kg	1.2kg	2.07kg
Warranty	1-year return-to-base	1-year return-to-base	1-year international	1-year collect-and-return	1-year return-to-base
Verdict	<ul style="list-style-type: none"> Reasonable price tag Very light and compact Strong performance for size Good graphics Great build quality 	<ul style="list-style-type: none"> Sleek and stylish Good matt screen Comparatively fast Great battery life Lots of memory 	<ul style="list-style-type: none"> Lighter than MacBook Air Good Windows performance Not cheap Strong build quality Plenty of battery life 	<ul style="list-style-type: none"> Just 18mm thick Thunderbolt connectivity Low-grade screen Specifications adequate rather than exciting 	<ul style="list-style-type: none"> Good-looking laptop Decent sound quality Slow processor Poor gaming option Reflective screen
FULL REVIEW	TINYURL.COM/CCPOANM	TINYURL.COM/6VZ5TOG	TINYURL.COM/CL3AC74	TINYURL.COM/CXGCVYT	TINYURL.COM/8JF3YJG

>> Buying advice



Ultraportable laptops

Apple's MacBook Air sets the standard for thin-and-light laptops, which are usually referred to as Ultrabooks or ultraportable laptops.

Most run fast and silent SSDs for storage, which can partly explain their higher retail price, but some manufacturers are now fitting slim 7mm hard disks.

All Ultrabooks run Intel CPUs (AMD variants are known as Sleekbooks), often a low-power version identifiable by its U suffix. The 1.7GHz Intel Core i5-3317U is a popular example.

Beware of cheap glossy panels with poor contrast and colour gamut and, if possible, judge in person the screen quality and viewing angles before you buy.

Ports are limited due to space constraints, but look for built-in ethernet or dongles that allow full-size ports to be connected.

A smaller chassis also means a smaller, often non-removable battery. Expect five hours of life.

There's no room for an optical drive, but you can always connect an external USB version.

READ MORE: TINYURL.COM/CEAHEZK

Sub-£500 laptops	1	2	3	4	5
	Acer Aspire V3-571	Toshiba Satellite Pro L850	Samsung RV511	Lenovo IdeaPad S205-1038	Acer V5-571
Price	£450 inc VAT	£500 inc VAT	£500 inc VAT	£370 inc VAT	£480 inc VAT
Website	Acer.co.uk	Toshiba.co.uk	Samsung.com/uk	Lenovo.com/uk	Acer.co.uk
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★★	★★★★☆
Processor	2.5GHz Intel Core i5-2450M	2.3GHz Intel Core i3-2350M	2.53GHz Intel Core i3-380M	1.6GHz AMD E450	1.4GHz Intel Core i3-2367M
RAM	6GB DDR3	6GB DDR3	6GB DDR3	4GB DDR3	8GB DDR3
Storage	500GB hard drive	750GB hard drive	640GB hard drive	500GB hard drive	500GB hard drive
Screen size	15.6in	15.6in	15.6in	11.6in	15.6in
Screen resolution	1366x768	1366x768	1366x768 pixels	1366x768 pixels	1366x768
Graphics	Intel HD Graphics 3000	Intel HD Graphics 3000	nVidia GeForce 315M	AMD Radeon HD 6310M	Intel HD Graphics 3000
Video memory	N/A	N/A	1GB	N/A	N/A
Wireless	802.11a/b/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	1x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x 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	Speakers, headphone jack
Optical drive	8x DVD±R	8x DVD±R	8x DVD±R, 4x DVD±RW, 8x DVD-ROM	N/A	8x DVD±R
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Windows 7 Home Prem 64bit	Windows 7 Pro 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Bundled software	Microsoft Office Starter	Microsoft Office Starter	None	None	Microsoft Office Starter
Fear (Max detail)	16fps	15fps	33fps	18fps	16fps
Battery	48Wh lithium-ion	48Wh lithium-ion	48Wh lithium-ion	48Wh lithium-ion	37Wh lithium-ion
Battery life	5 hrs 18 mins	5 hrs 46 mins	5 hrs 15 mins	5 hrs 38 mins	5 hrs 2 mins
WorldBench 6 score	123	107	105	53	84
Dimensions	380x253x33mm	380x242x34mm	382x256x34mm	290x168x29mm	382x253x21-23mm
Weight	2.6kg	2.3kg	2.4kg	1.5kg	2.3kg
Warranty	1-year collect-and-return	1-year carry-in	1-year return-to-base	1-year return-to-base	1-year collect-and-return
Verdict	<ul style="list-style-type: none"> • Strong general performance • Not much gaming potential • Excellent trackpad, keyboard • Reflective screen • Decent battery life 	<ul style="list-style-type: none"> • i3 processor isn't the fastest • Anti-glare matt screen • Capacious hard drive • Keys lack depth • Windows 7 Professional 	<ul style="list-style-type: none"> • Solid performance for an i3 CPU in WorldBench 6 • Good hard-drive capacity • Light gaming potential • Reflective screen 	<ul style="list-style-type: none"> • Extremely portable • More powerful than a netbook • Glossy screen • Rather slow 	<ul style="list-style-type: none"> • Slower Core i3 chip • 8GB of RAM • No ethernet • Onboard graphics • Decent battery life
FULL REVIEW	TINYURL.COM/CQKL4PD	TINYURL.COM/CYH2F5H	TINYURL.COM/5TVT8AE	TINYURL.COM/6G5EKQK	TINYURL.COM/CABX8Z

>> Buying advice



Sub-£500 laptops

Budget laptops are quick enough for most people, but economies are often made in build quality.

At the top end of the category you should find a highly capable Intel Core i-series processor. This will probably be a second-gen Sandy Bridge chip (ix-2xxx part number), but look out for a newer Ivy Bridge model (ix-3xxx).

Windows 7 and 8 run on 2GB of RAM, but 4GB or more is useful.

Hard disks are the norm at this price, with 250GB enough for most people. If you're a video hoarder look for 500GB or more.

Wi-Fi is standard, but Bluetooth is not a given at the price.






The bodywork and display are the main areas in which costs are cut. Expect creaky plastic bodies,

bendy frames and faux-metal paint jobs. Keyboards and trackpads are also likely to feel cheap and erratic.

Gloss screens hide inferior image quality. Colours are vivid, but the contrast may be poor. Check the visibility at an angle.

Some laptop manufacturers scrimp on the battery. Look for a rating of 48Wh or more.

READ MORE: TINYURL.COM/CA9EXZ6

£1,001+ laptops	1  PC ADVISOR GOLD	2  PC ADVISOR RECOMMENDED	3  PC ADVISOR RECOMMENDED	4 	5 
	Apple MacBook Pro Retina	Alienware M14x	Rock Xtreme X685-i5-2540M	Dell Latitude E6420 ATG	Toshiba Qosmio X870-11Q
Price	£1,799 inc VAT	£1,350 inc VAT	£1,229 inc VAT	£1,350 inc VAT	£1,699 inc VAT
Website	Apple.com/uk	Alienware.co.uk	Rockdirect.com	Dell.co.uk	Toshiba.co.uk
Build rating	★★★★★	★★★★★	★★★★☆	★★★★★	★★★★☆
Features rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★★	★★★★★	★★★★★	★★★★☆	★★★★★
Value rating	★★★★★	★★★★★	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.3GHz Intel Core i7-3615QM	2.66GHz Intel Core i7-3720QM	2.6GHz Intel Core i5-2540M	2.8GHz Intel Core i7-2640M	2.3GHz Intel Core i7-3610QM
RAM	8GB DDR3L	8GB DDR3	6GB DDR3	4GB DDR3	16GB DDR3
Storage	128GB SSD	64GB SSD, 500GB HDD	500GB hard drive	128GB SSD	128GB SSD, 1TB hard drive
Screen size	15.4in	14.1in	15.6in	14in	17.3in
Screen resolution	2880x1800	1600x900	1920x1080 pixels	1366x768 pixels	1920x1080 pixels
Graphics	nVidia 650M, Intel HD 4000	nVidia GeForce GT 650M	AMD Radeon HD 6990	Intel HD Graphics 3000	nVidia GeForce GTX 670M
Video memory	1GB	1GB	2GB	N/A	3GB
Wireless	802.11a/b/g/n	802.11b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n
Ethernet	x	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0, 2x USB 2.0	3x USB 2.0	4x USB 3.0
FireWire	x	x	x	x	x
Thunderbolt	✓ (2)	x	x	x	x
DisplayPort	✓	✓	x	x	x
HDMI	✓	✓	✓	✓	✓
DVI	x	x	✓	x	x
VGA	x	✓	x	✓	✓
eSATA	x	x	✓	✓	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, Toslink out	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	2x Harman Kardon speakers
Optical drive	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	8x DVD ±R, 2.4x DVD-RW, 4x DVD+RW, 8x DVD-ROM	BD-RE/DVD ±RW DL
Extras	HD webcam, multitouch trackpad, backlit keyboard	N/A	Webcam, fingerprint reader	Webcam, fingerprint reader	Webcam, Kensington lock
Operating system	Mac OS X 10.7.4 Lion	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Pro 32bit	Windows 7 Home Prem 64bit
Bundled software	iLife 11	None	None	None	Toshiba Blu-ray Disc Player
Fear (Max detail)	N/A	84fps	275fps	17fps	205fps
Battery	99Wh lithium-polymer	63Wh lithium-ion	76Wh lithium-ion	60Wh lithium-ion	47Wh lithium-ion
Battery life	N/A	5 hrs 7 mins	2 hrs 30 mins	6 hrs 24 mins	2 hrs 18 mins
WorldBench 6 score	N/A	168	124	155	170
Dimensions	359x247x18mm	337x258x38mm	376x256x43mm	352x241x35mm	417x272x43.7mm
Weight	2.02kg	2.9kg	3.1kg	2.7kg	3.45kg
Warranty	1 year return-to-base	1 year in-home support	3 years onsite	3 years onsite	1 year carry-in
Verdict	<ul style="list-style-type: none"> • Gorgeous super-resolution Retina display • Outstanding build quality • Wonderfully light and slim • Effortless to use 	<ul style="list-style-type: none"> • Great gaming system • Stunning WorldBench score • Cool looks • Glossy screen can be difficult to read 	<ul style="list-style-type: none"> • Great performance • 2GB AMD Radeon graphics • Incredible gaming machine • Very poor battery life • Wonderful glare-free screen 	<ul style="list-style-type: none"> • Rugged build quality • Fantastic general speed • Lacklustre for gaming • Long battery life, given the performance 	<ul style="list-style-type: none"> • Desktop-replacement model • Huge 16GB of RAM • Plasticity build quality • Active-shutter 3D tech • Good for gaming
FULL REVIEW	TINYURL.COM/7YGC3KJ	TINYURL.COM/CLGSCMV	TINYURL.COM/BTZSQ97	TINYURL.COM/CBA725B	TINYURL.COM/C3F8XP2

>> Buying advice



£1,001+ laptops

Invest £1,000 or more in a laptop, and you can be reasonably sure of getting a high-quality PC.

Sometimes that money will be spent on getting a thin-and-light laptop, with good performance to boot. Alternatively, you may prefer a rugged laptop that's able to withstand wear and tear on the road, or a performance-first

high-powered workstation.

Whatever your need, accept no compromises in build quality.

The best laptops should offer very good screens. Beware of glossy shiny panels that allow distracting reflections in certain lighting conditions.

Ultraportables may have 256GB or more of solid-state storage, but won't have an optical drive or GPU.

Workstation laptops will have faster – often quad-core – CPUs and a mobile graphics processor.

Rugged laptops are engineered for strength, at the expense of light weight and sleek design. Look out for milspec standard ratings, such as MIL-STD-810G.

You'll find a wide range of ports, high-grade components and extras.

READ MORE: TINYURL.COM/CC3KBMM

Family PCs					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	Chillblast Fusion Orb	CyberPower Ultra Scylla SE	Arbico i5357 eXcel	CCL Elite Raven	Eclipse Matrix i5357T777
Price	£799 inc VAT	£699 inc VAT	£799 inc VAT	£669 inc VAT	£779 inc VAT
Website	Chillblast.com	Cyberpowersystem.co.uk	Arbico.co.uk	Cclonline.com	Eclipsecomputers.com
Build rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Features rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Performance rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Value rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-3570K	4.2GHz AMD FX-4170	3.4GHz Intel Core i5-3570	3.1GHz Intel Core i5-3450	3.4GHz Intel Core i5-3570K
RAM	16GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Storage capacity	1TB HDD + 120GB SSD	1TB HDD	1TB HDD + 120GB SSD	1TB HDD	1TB HDD
Motherboard	Asus P8B75-M LX	Asus M5A78L-M	Asus P8B75-M LX	Gigabyte GA-H61MA-D2V	Asus P8Z77-V LX
CPU cooler	Standard Intel cooler	Standard AMD cooler	Standard Intel cooler	Standard Intel cooler	Standard Intel cooler
Power supply	700W Chillblast	500W Cooler Master	400W Xigmatek	450W XFX	Not specified
Screen	23.6in Iiyama	23.6in Edge 10	23.6in AOC	23.6in Acer	23.6in HKC
Screen resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics card	XFX AMD Radeon HD 6850	MSI AMD Radeon HD 7770	AMD Radeon HD 7770	AMD Radeon HD 7770	VTX AMD Radeon HD 7770
Video memory	1GB	1GB	1GB	1GB	1GB
Wireless	802.11b/g/n	802.11b/g/n	N/A	N/A	N/A
USB	3x USB 3.0, 8x USB 2.0	2x USB 3.0, 4x USB 2.0	4x USB 3.0, 8x USB 2.0	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0
Media card slot	✓	✓	✗	✗	✗
Sound card	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	Logitech S220 2.1	Logitech S220 2.1	Logitech S120 2.0	N/A	Logitech S220 2.1
Case	Chillblast Vantage	Cooler Master Elite 430	CIT Templar	Not specified	EZ Cool HA900B
Keyboard	Logitech Cordless MK260	Logitech Cordless MK230	Logitech Cordless MK260	Logitech Cordless MK120	Microsoft Optical Desktop 400 wireless
Optical drive	Samsung Blu-ray/DVD combo drive	Lite-On Blu-ray/DVD combo drive	Sony Blu-ray/DVD combo drive	Lite-On Blu-ray/DVD combo drive	Lite-On Blu-ray/DVD combo 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	CyberLink software	Microsoft Office SE	None	MS Office SE, free game	None
Crysis (Low/Medium)	157/109fps	114/76fps	153/112fps	147/102fps	152/109fps
WorldBench 6 score	193	132 (estimated)	176	161	174
Warranty	2-year collect-and-return	1-year parts, 3-year labour	1-year parts, 2-year labour	2-year return-to-base	1-year return-to-base
Verdict	<ul style="list-style-type: none"> • Great performance • 16GB of RAM • Superb 24in Iiyama in-plane switching screen • Wi-Fi and card reader • Not the cheapest system 	<ul style="list-style-type: none"> • Low price • Uses an AMD processor • Performance not amazing • Wi-Fi and card reader 	<ul style="list-style-type: none"> • Good turn of speed • Virtu function makes it strong on video conversion • Nice 24in screen • Not many peripherals 	<ul style="list-style-type: none"> • Lowest price in the chart • Includes 24in screen and Blu-ray drive • Not the most powerful system here • Compact case saves space 	<ul style="list-style-type: none"> • Slow for the money • Few peripherals and features • Windows 8-certified motherboard • Intel Z77 Express chipset good for overclockers
FULL REVIEW	TINYURL.COM/8D6N6FU	TINYURL.COM/C7JUV7R	TINYURL.COM/9545C4U	TINYURL.COM/9007AZ9	TINYURL.COM/CHW3TMZ

>> 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.

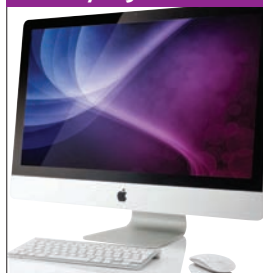
Screen quality is crucial, with the best displays using IPS tech. A Blu-ray drive will help make the most of a 23.6in full-HD monitor.

For Skyping, 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 BEST BUY	3  PC ADVISOR RECOMMENDED	4  PC ADVISOR RECOMMENDED	5 
	Apple iMac 27in 2.7GHz	Lenovo IdeaCentre A720	HP Z1 (WM429EA)	Asus ET2411NTI	PC Spec PowerGlide Extreme
Price	£1399 inc VAT	£1,299 inc VAT	£2,500 inc VAT	£999 inc VAT	£899 inc VAT
Website	Apple.com/uk	Lenovo.com/uk	Hp.com/uk	Uk.asus.com	Pcspecialist.co.uk
Build rating	★★★★★	★★★★☆	★★★★★	★★★★☆	★★★★☆
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.7GHz Intel Core i5-2500S	2.3-3.3GHz Intel Core i7-3610QM	3.5-3.9GHz Intel Xeon E3-1280	3.1-3.5GHz Intel Core i5-3450	3.4-3.8GHz Intel Core i5-3570K
RAM	4GB DDR3	8GB DDR3	8GB DDR3	6GB DDR3	8GB DDR3
Storage capacity	1TB hard drive	750GB hard drive	1TB hard drive	1TB hard drive	2TB hard drive
Screen	27in IPS glossy	27in MVA 10-point touchscreen	27in IPS	23.6in TN 2-point touchscreen	24in TN 2-point touchscreen
Screen resolution	2560x1440	1920x1080	2560x1400	1920x1080	1920x1080
Graphics card	AMD Radeon HD 6770M	nVidia GeForce GT 630M	nVidia Quadro 1000M	nVidia GeForce GT 630M	nVidia GeForce GT 640
Video memory	512MB	2GB	2GB	1GB	1GB
Wireless	802.11a/b/g/n	802.11b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	✓	✓	✓	✓	✓
Bluetooth	✓	✗	✗	✗	✗
USB	4x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 3.0, 4x USB 2.0	2x USB 3.0, 3x USB 2.0	2x USB 3.0, 5x USB 2.0
FireWire	✓	✓	✓	✗	✗
Thunderbolt	✓	✗	✗	✗	✗
HDMI	✗	✓	✗	✓	✓
Media card slot	✓	✓	✓	✓	✓
Max disc speeds	8x DVD±R, 4x DVD±R DL, 8x DVD-ROM	BD-ROM/DVD±RW	DVD±R	BD-ROM/DVD±RW	BD-ROM/DVD+RW
Extras	Webcam, wireless keyboard	720p webcam, tuner, remote, wireless keyboard and mouse	2Mp webcam, wired keyboard and mouse	1.3Mp webcam, woofer, wireless keyboard and mouse	2Mp webcam, SATA dock
Operating system	Mac OS X 10.7 Lion	Windows 7 Home Premium 64bit	Windows 7 Professional 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
Power consumption	67W (idle), 180W (under load)	45W (idle), 111W (under load)	82W (idle), 210W (under load)	34W (idle), 93W (under load)	54W (idle), 132W (under load)
Crysis (720p)	133fps	111fps	109fps	104fps	111fps
Crysis (1080p)	12fps	8fps	7fps	7fps	8fps
WorldBench 6 score	147	140	172	163	169
Dimensions	650x517x207mm	650x220x480mm	660x419x59mm	590x461x230mm	571x128x464mm
Weight	13.8kg	11.6kg	21kg	10.8kg	10.5kg
Warranty	1-year return-to-base	1-year return-to-base	3-year onsite	1-year return-to-base	1-year collect-and-return
Verdict	<ul style="list-style-type: none"> Peerless design and build quality Fantastic high-quality 27in screen Excellent gaming speed WorldBench score not as high as some OS X operating system 	<ul style="list-style-type: none"> Sleek and stylish 10-point touchscreen Strong software and multimedia features Relatively low WorldBench performance score 	<ul style="list-style-type: none"> Excellent display Not a touch interface Superb all-round performance No Blu-ray support Many ports and connectors are hard to access 	<ul style="list-style-type: none"> Strong build quality Screen has decent colour, but poor contrast and viewing angles Only two touch points Speaker system well above average Doesn't offer the best value 	<ul style="list-style-type: none"> Good gaming performance Uninspiring plastic looks Quad-core Intel i5-3570K packs lots of power Fans are too noisy No preinstalled software
FULL REVIEW	TINYURL.COM/7THNXU8	TINYURL.COM/93EUU4F	TINYURL.COM/CJ8MCMA	TINYURL.COM/CHJDOMU	TINYURL.COM/9K8WGS0

>> 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)

Gaming PCs		 1	2	 3	 4	5
		Yoyotech Warbird 3570XTA	Eclipse Vengeance i5357r795 OC	Arbico Elite 5357 OCX	Dino PC Maxosaurus 3570K	CyberPower Fang III Rattler
Price		£1,149 inc VAT	£1,200 inc VAT	£1,200 inc VAT	£1,399 inc VAT	£1,399 inc VAT
Website		Yoyotech.co.uk	Eclipse-computers.co.uk	Arbico.co.uk	Dinopc.com	Cyberpowersystem.co.uk
Build rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating		★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating		★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor		3.4GHz (4.5GHz) Intel Core i5-3570K	3.4GHz (4.7GHz) Intel Core i5-3570K	3.4GHz (4.4GHz) Intel Core i5-3570K	3.4GHz (4.4GHz) Intel Core i5-3570K	3.4GHz (4.5GHz) Intel Core i5-3570K
CPU cooler		Arctic Freezer cooler	Zalman cooler	Xigmatek Gaia	Xigmatek Prime SD1484	Advanced water cooling
Memory		8GB DDR3	16GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3
Storage		120GB SSD + 2TB 3.5in HDD	128GB SSD + 1TB 3.5in HDD	120GB SSD + 2TB 3.5in HDD	60GB SSD + 1TB 3.5in HDD	128GB SSD + 1TB 3.5in HDD
Power supply		550W OCZ	550W XFX	580W Xilence	700W Xigmatek	650W Cooler Master GX650W
Motherboard		Asus P8Z77-V LX	Asus P8Z77-V LX	Asus P8Z77-V LX	Asus P8Z77-V	Asus P8Z77-V Pro
USB		3x USB 3.0, 5x USB 2.0	6x USB 3.0, 4x USB 2.0	4x USB 3.0, 12x USB 2.0	6x USB 3.0, 2x USB 2.0	6x USB 3.0, 3x USB 2.0
Screen		23.6in Asus VS247H (1920x1080)	24in BenQ GL2450 (1920x1080)	Not supplied	23.6in Asus VS247H (1920x1080)	Not supplied
Graphics		2GB PNY GeForce GTX 670	3GB XFX Radeon HD 7950	2GB Palit GeForce GTX 680	2GB Zotac GeForce GTX 670	2GB Palit GeForce GTX 670
Sound		Onboard	Onboard	Onboard	Asus Xonar DGX PCIe	Onboard
Connectivity		Gigabit ethernet	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet, 802.11b/g/n	Gigabit ethernet, 802.11b/g/n
VGA		x	x	x	x	x
DVI		✓ (2)	✓	✓ (2)	✓ (2)	✓ (2)
HDMI		✓	✓	✓	✓	✓
DisplayPort		✓	✓	✓	✓	✓
FireWire		x	x	x	x	x
eSATA		x	x	✓	x	x
Case		Gigabyte Luxo X10	X11 X-Station	CIT Jupiter	Corsair Carbide 300R	Azza Fusion 3000
Keyboard & mouse		Microsoft Wired Desktop 400	Microsoft Wireless Desktop 800	Not supplied	Razer Arctosa, Gigabyte M8000X	Not supplied
Optical drive		BD-ROM/DVD±RW	22x DVD±RW	BD-ROM/DVD±RW	BD-ROM/DVD±RW	BD-ROM/DVD±RW
Operating system		Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit	Windows 7 Home Prem 64bit
Extras		None	None	None	None	Microsoft Office 2010 Starter
WorldBench 6 score		209	218	214	213	205
Gaming performance ¹		106/68/53/111fps	112/69/62/141fps	110/75/57/118fps	102/67/52/110fps	105/66/51/109fps
MediaEspresso time		4 mins 3 secs	Not tested	4 mins 1 sec	4 mins 13 secs	Not tested
Power Consumption ²		89W/185W	111W/239W	63W/192W	83W/194W	98W/160W
Warranty		3-year RTB (labour)	1 year return-to-base	2-year RTB (labour)	3-year RTB (2yr parts, labour)	3-year RTB (labour)
Verdict		<ul style="list-style-type: none"> • Low price • Very good performance • GTX 670 graphics card isn't the fastest on offer • Only 8GB of RAM 	<ul style="list-style-type: none"> • Excellent WorldBench 6 performance score • 7950 isn't a new graphics card, but it is fast • Interesting white case, but it can be cramped • Good value with a screen 	<ul style="list-style-type: none"> • High WorldBench score • GTX 680 ensures excellent games speed • Limited motherboard • Strong storage capacity 	<ul style="list-style-type: none"> • Strong general performance • Keyboard and mouse are proper gaming models • Graphics card only an nVidia GTX 670 • Sound card a cut above onboard solutions 	<ul style="list-style-type: none"> • Water-cooled system • Premium motherboard • Easy-swap drive bays • Performance could be better, given the water-cooling capabilities
FULL REVIEW		TINYURL.COM/7KPQCY6	TINYURL.COM/8D522BW	TINYURL.COM/7CL6865	TINYURL.COM/6RSJEY2	TINYURL.COM/BSC6RB2

¹Tested in Crysis at 1080p, High (no AA)/V High (no AA)/V High (16x AA)/Stalker: Call of Pripyat at 1080p, Ultra ²Tested when idle and in Crysis

>> Buying advice



Gaming 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.

Gaming PCs put performance and upgradability before subtlety and quiet operation. Many run overclocked CPUs to eke out every bit of available speed.

Intel's Core i5-2500K is a popular choice of CPU, but will require a decent cooler and beefy PSU. The HyperThreaded i7-2600K is slightly faster, but dearer.

Cooling is essential for stability. Liquid-cooling systems, dust filters, fan-speed controls and good cable-management can aid airflow.

Most important of all is the graphics card; vendors will often

skimp on storage, networking and other features and throw all their budget at the graphics card.

AMD's Radeon HD 7970 delivers unparalleled performance – but at a price. Cheaper solutions include the nVidia GeForce GTX 560 Ti.

Look for wired peripherals and a headset. Good warranty terms are crucial for overclocked PCs.

READ MORE: TINYURL.COM/CZXH443

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"> Packs the latest Ivy Bridge processor Strong components and performance Superior 22in flat-panel HD 4000 a cut above the usual onboard graphics 	<ul style="list-style-type: none"> Beautifully compact Good performance No DVD drive Very low power consumption Quiet and elegant Versatile OS X operating system 	<ul style="list-style-type: none"> Small-form-factor PC takes up little desk space Very low power consumption Performance is adequate, but not stunning Graphics card only an onboard HD 2000 	<ul style="list-style-type: none"> Dual-screen system Neither of the screens are of great quality CPU isn't very powerful Windows 7 Home Premium not aimed at office users 	<ul style="list-style-type: none"> Sound-damping materials keep noise to a minimum Low price for a system with Windows 7 Professional Performance some way behind the fastest here No monitor included
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.

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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"> Generally noiseless operation Cute looks and great build quality SSD is fast, but more storage is needed Xebec keyboard replaces a remote control 	<ul style="list-style-type: none"> Beautifully compact Great for graphics Good performance No DVD drive Very low power consumption Quiet and elegant 	<ul style="list-style-type: none"> Generally noiseless operation Great performance SSD is fast, but more storage is needed Price tag is high 	<ul style="list-style-type: none"> High-quality looks No Blu-ray or TV support External storage needed Not great performance 	<ul style="list-style-type: none"> Blu-ray drive included Silent, fanless operation Best multimedia playback of group Dual digital TV tuners Stylish Zalman case Expensive
FULL REVIEW	TINYURL.COM/BQM62QH	TINYURL.COM/88GUG5H	TINYURL.COM/D9GP87X	TINYURL.COM/C4NPQ5F	TINYURL.COM/7S2ZWXD

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.


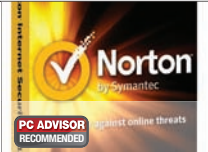



Fanless systems can be built using large passive heat sinks or heat pipes, although you can find ultra-quiet tweakable fans if fitting one is unavoidable.

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.

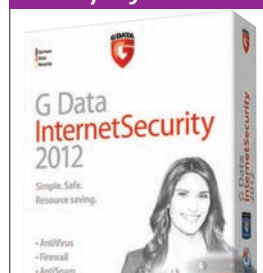
READ MORE: TINYURL.COM/CGFOD2K

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"> Excellent detection rates Good value Low impact on resources Confusing interface 	<ul style="list-style-type: none"> Good all-rounder Fast scan times Clean interface Flagged some false-positives 	<ul style="list-style-type: none"> Impacts system resources Very strong malware blocking and removal Intuitive interface 	<ul style="list-style-type: none"> Strong block rate Above-average scan times Can affect PC performance Interface needs tweaking 	<ul style="list-style-type: none"> Set-it-and-forget-it security Flagged some false-positives Reasonable scan speeds Ideal for novice users
FULL REVIEW	TINYURL.COM/7CZT5XB	TINYURL.COM/CVVDWUR	TINYURL.COM/75H3WUK	TINYURL.COM/6UEHPMW	TINYURL.COM/7QTBA6

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"> Smooth user interface Large 'Fix Now' button Moderate impact on system performance 	<ul style="list-style-type: none"> Very good performance for malware removal Average scan speeds Three interface tiers 	<ul style="list-style-type: none"> Strong malware detection, blocking and removal Good user interface, but poorly translated 	<ul style="list-style-type: none"> Well-designed interface Easy to use On-demand single-file scans Impacts PC performance 	<ul style="list-style-type: none"> Set-it-and-forget-it security Cloud-based protection Requires web connection Good performance
FULL REVIEW	TINYURL.COM/4P5YCXF	TINYURL.COM/66SK77U	TINYURL.COM/6BFXWCS	TINYURL.COM/6HQA2WB	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)

Tablets	1	2	3	4	5
	PC ADVISOR GOLD	PC ADVISOR GOLD	PC ADVISOR GOLD	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Apple iPad (3rd gen)	Google Nexus 7	Apple iPad 2	Asus Eee Pad Transformer Prime	Samsung Galaxy Tab 2 7in
Price	£399 inc VAT	£159 inc VAT	£329 inc VAT	£510 inc VAT	£250 inc VAT
Website	Apple.com/uk	Play.google.com	Apple.com/uk	Uk.asus.com	Samsung.com/uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 5.1	Google Android 4.1 Jelly Bean	Apple iOS 5.0	Google Android 3.0 Honeycomb ²	Google Android 4.0 ICS
Screen size/resolution	9.7in/2048x1536	7in/1280x800	9.7in/1024x768	10.1in/1280x800	7in/1024x600
Storage/media card slot	16GB/none	8GB/none	16GB/none	32GB/microSD	32GB/microSD
Connectivity	802.11a/b/g/n, Bluetooth ¹	802.11a/b/g/n, Bluetooth	802.11a/b/g/n, Bluetooth ¹	802.11b/g/n, Bluetooth	802.11b/g/n, Bluetooth
Processor	1GHz Apple A5X	1.3GHz nVidia Tegra 3	1GHz Apple A5	1.4GHz nVidia Tegra 3	1GHz dual-core
RAM	1GB	1GB	512MB	1GB	1GB
Claimed battery life	10 hrs	10 hrs	10 hrs	12 hrs	Not specified
Cameras (front/rear)	0.3/5Mp	1.2Mp/none	0.3/0.7Mp	1.2/8Mp	3Mp/0.3Mp
Dimensions	241x186x9.5mm	120x199x11mm	241x186x8.8mm	263x181x8.8mm	194x122x10.5mm
Weight	652g	336g	597g	596g	345g
Warranty	1 year	1 year	1 year	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Breathtaking display • Searing performance • 32GB version recommended • Supports 4G where available 	<ul style="list-style-type: none"> • Best budget tablet • Strong build quality • Nice screen • Impressive battery life 	<ul style="list-style-type: none"> • Exceptional touchscreen • Beautiful design and build • Best selection of apps • 10-hour battery life 	<ul style="list-style-type: none"> • Fast quad-core processor • Excellent Super IPS panel • Stunning battery life • High-end Android tablet 	<ul style="list-style-type: none"> • Excellent budget choice • Easily pocketable size • Decent performance • Generous warranty
FULL REVIEW	TINYURL.COM/6MTG9OW	TINYURL.COM/CGBA439	TINYURL.COM/4XV7Q4K	TINYURL.COM/7U67UBN	TINYURL.COM/7TFKU8Y

¹3G available at additional cost ²Android 4.0 available

Smartphones	1	2	3	4	5
	PC ADVISOR GOLD	PC ADVISOR BEST BUY	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Apple iPhone 5	Samsung Galaxy S III	Motorola RAZR i	HTC One S	Huawei Ascend G 300
Price	£529 inc VAT	£500 inc VAT	£345 inc VAT	£449 inc VAT	£110 inc VAT
Website	Apple.com/uk	Samsung.com/uk	Motorola.com	Htc.com	Vodafone.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Platform	Apple iOS 6.0	Android 4.0 ICS	Android 4.0 ICS	Android 4.0 ICS	Android 2.3 Gingerbread
Processor	1GHz Apple A6	1.4GHz Exynos 4212 Quad	2GHz Intel Atom Z2480	1.5GHz Qualcomm Snapdragon	1GHz Qualcomm MSM7227A
Storage/media card	16GB/none	16GB/microSDXC	8GB/microSD	16GB/none	2.5GB/microSD
Screen size/resolution	4in/640x1136	4.3in/800x480	4.3in/540x960	4.3in/960x540	4in/480x800
Input method	Capacitive multitouch	Capacitive touchscreen	Capacitive touchscreen	Capacitive multitouch	capacitive touchscreen
Connectivity	HSPA+, Bluetooth, Wi-Fi	HSPA+, GSM, Bluetooth, Wi-Fi	HSPA+, Bluetooth, Wi-Fi	HSDPA, Bluetooth, Wi-Fi	HSDPA, GSM, Bluetooth, Wi-Fi
Battery life (talk/standby)	8 hrs/225 hrs	11 hrs/750 hrs	20hrs in average use	Not specified	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	59x124x8mm, 115g	70x137x9mm, 133g	61x123x8.9mm, 126g	65x130.9x7.8mm, 119.5g	63x123x11mm, 130g
Warranty	1 year	2 years	1 year	1 year	1 year
Verdict	<ul style="list-style-type: none"> • Very fast performance • Superb 4in screen • Beautifully balanced weight • Siri voice-recognition 	<ul style="list-style-type: none"> • Best choice for Android • Superb 4.8in screen • Strong build • Difficult to use one-handed 	<ul style="list-style-type: none"> • Fast single-core Intel CPU • Edge-to-edge 4.3in display • Very robust build • Very good battery life 	<ul style="list-style-type: none"> • Very good for multimedia • Excellent build quality • Good performance • Sense interface 	<ul style="list-style-type: none"> • Excellent price tag • Screen can be unresponsive • Good battery life • Camera captures VGA video
FULL REVIEW	TINYURL.COM/CTRJEJD	TINYURL.COM/CQ4FM7X	TINYURL.COM/D2XQ94V	TINYURL.COM/BSXFL6G	TINYURL.COM/D50Q55X

>> Buying advice



Smartphones

The smartphone you choose to use is a very personal choice - while some prefer a small device that slips into a pocket, others prefer a large-screen handset that's better suited to watching video and typing on an onscreen keyboard.

The screen's resolution is just as important as its size. More pixels mean text and photos look

sharper, and more information can be shown onscreen at once.

Unlike Android, iOS doesn't support Flash. However, HTML 5 is slowly replacing the standard, and Adobe has discontinued development of Flash Player for mobile devices in any case. Mobile apps can also allow you to view sites that still use Flash.

Look for a fast processor and decent graphics if you want to play games or watch video.

It's common to see mobile operators offer expensive handsets free with 24-month contracts. It'll usually work out cheaper to buy the handset outright, however, and it won't be locked to a network.

READ MORE: TINYURL.COM/7SK2AS3

Blu-ray drives	    				
	1	2	3	4	5
	LG BH10LS38	Lite-On iHBS212	LG BP40NS20	Lite-On iHES112-115	Buffalo BR3D-12U3
Price	£65 inc VAT	£90 inc VAT	£90 inc VAT	£50 inc VAT	£199 inc VAT
Website	Uk.lge.com	Liteonit.eu	Uk.lge.com	Liteonit.eu	Buffalotech.com
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★★
Blu-ray speeds	10x -R, 8x -R DL, 2x -RE, 10x -ROM	12x -R, 8x -R DL, 2x -RE, 8x -ROM	6x -R, 6x -R DL, 2x -RE, 6x -ROM	12x -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	8x ±R, 8x ±R DL, 6x -RW, 8x +RW, 8x -ROM	16x ±R, 8x ±R DL, 6x -RW, 8x +RW, 5x -RAM, 8x -ROM
Max storage	50GB	50GB	100GB	8.5GB	50GB
Interface type	SATA (internal)	SATA (internal)	USB 2.0 (external)	SATA (internal)	USB 3.0 (external)
Label technology	LightScribe	LightScribe	None	None	None
Software	(OEM - add £5 for software)	CyberLink Blu-ray Suite	PowerDVD, PowerProducer	None	PowerDVD, PowerProducer
Dimensions	146x170x41mm	146x170x41mm	160x153x22mm	158x145x22mm	160x220x50mm
Weight	749g	650g	380g	700g	1.1kg
Warranty	1 year	2 years	1 year	2 years	2 years
Verdict	<ul style="list-style-type: none"> • 10-speed internal writer • Attractive front panel • Reliable performance • Very good value 	<ul style="list-style-type: none"> • 12-speed internal writer • Issues during testing • Noisy during operation • Average with 4x media 	<ul style="list-style-type: none"> • Attractive external model • Maxes out at 6x BD-R (most media is only 6x) • Supports triple-layer BD-R 	<ul style="list-style-type: none"> • Playback only • No software included with many bundles • Low price 	<ul style="list-style-type: none"> • 12-speed external writer • Power supply required • Bulky design • Expensive
FULL REVIEW	TINYURL.COM/8YTUJEF	TINYURL.COM/65PXHUJ	TINYURL.COM/BS8UAFF	TINYURL.COM/BSYECMW	TINYURL.COM/453BX7L

Wireless routers	    				
	1	2	3	4	5
	Cisco Linksys E4200	Apple AirPort Express	AVM FritzBox Fon 7390	D-Link DIR-636L	D-Link DIR-857
Price	£115 inc VAT	£79 inc VAT	£190 inc VAT	£46 inc VAT	£150 inc VAT
Website	Linksysbycisco.com	Apple.com/uk	Fritzbox.eu	Dlink.co.uk	Dlink.co.uk
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Standards supported	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11a/b/g/n
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz	2.4GHz/5GHz (concurrent)
WEP/WPA/WPA2	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
USB port/Network port	✓✓	✓✓	✓✓	✓✓	✓✓
Firewall	NAT/SPI	NAT/SPI	NAT/SPI	N/A	NAT/SPI
Eco mode	x	x	x	x	x
Ethernet ports	Gigabit WAN, 4x gigabit LAN	10/100 LAN, 10/100 WAN	4x gigabit LAN	4x gigabit LAN, 1x gigabit WAN	4x gigabit LAN, 1x gigabit WAN
Throughput (near/far)	226/92Mbps	94Mbps/not tested	92/38Mbps	92/43Mbps	125/37Mbps
Dimensions	225x160x25mm	98x98x23mm	226x160x48mm	111x93x145mm	212x160x34mm
Weight	335g	240g	not specified	330g	342g
Warranty	1 year	1 year	5 years	1 year	1 year
Verdict	<ul style="list-style-type: none"> • Excellent performance • Dual-band Wi-Fi • Guest login feature • In short supply 	<ul style="list-style-type: none"> • Sleek, flat and square look • Concurrent 2.4/5GHz • Extremely easy setup • Digital audio output 	<ul style="list-style-type: none"> • Supports landline and internet telephony • Dual-band Wi-Fi • USB port 	<ul style="list-style-type: none"> • Parental controls • Remote access functionality • Attractive price • Interesting design 	<ul style="list-style-type: none"> • Parental controls • Media-sharing options • 3x3 Mimo antenna for speed • Strong performance
FULL REVIEW	TINYURL.COM/6Z7BDKM	TINYURL.COM/C4ZAYEM	TINYURL.COM/3QUJZBX	TINYURL.COM/BOGMRO9	TINYURL.COM/82KWLJO

>> 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	2	3	4	5
	PC ADVISOR BEST BUY	PC ADVISOR RECOMMENDED	PC ADVISOR GOLD		PC ADVISOR BEST BUY
	Seagate FreeAgent GoFlex	iStorage diskAshur DT 3TB	G-Tech G-Raid Thunderbolt	WD My Book Thunderbolt Duo	WD My Passport Studio
Price	£180 inc VAT	£295 inc VAT	£750 inc VAT	£375 inc VAT	£120 inc VAT
Website	Seagate.com	Istorage-uk.com	G-technology.com	Wdc.com	Wdc.com/en
Overall rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★★
Capacity tested	3TB	3TB	8TB	4TB	1TB
Capacity range	1TB to 3TB	1TB to 3TB	4TB to 8TB	4TB to 6TB	500GB to 1TB
Disk size	3.5in	3.5in	3.5in	3.5in	2.5in
Spin speed	7,200rpm	5,400rpm	7,200rpm	7,200rpm	5,400rpm
Transfer speed	94MBps (USB 3.0)	155MBps (USB 3.0)	329MBps	223MBps	76MBps (FireWire 800)
Encryption	192bit	256bit	None	None	256bit
Other interfaces	Optional FireWire 800	None	None	None	FireWire 800, USB 2.0
Software	Memo Backup	None	None	WD Drive Utilities	WD utilities
Dimensions	158x124x44mm	183x112x40mm	235x130x85mm	165x157x99mm	126x84x22mm
Weight	1kg	1.2kg	2.3kg	2.2kg	334g
Warranty	2 years	3 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> Great speed for USB 3.0 Great value for capacity Separate storage drive and USB 3.0 dock 	<ul style="list-style-type: none"> Hardware encryption is difficult to break and requires no software Superb performance 	<ul style="list-style-type: none"> Fast Thunderbolt interface Real-world speed can exceed 200MBps Pricy, but huge capacity 	<ul style="list-style-type: none"> Thunderbolt interface Not as fast as some Thunderbolt Raid drives Quiet and cool operation 	<ul style="list-style-type: none"> Superbly built FireWire 800 and USB 2.0 interfaces AES encryption
FULL REVIEW	TINYURL.COM/BN2Z92F	TINYURL.COM/BMGKSVY	TINYURL.COM/CXEF6MH	TINYURL.COM/C6TADAH	TINYURL.COM/6FAWBNE

NAS drives	1	2	3	4	5
	PC ADVISOR BEST BUY	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED		
	Synology DS412+	Zyxel NSA325	Qnap TS-419P II	Netgear ReadyNAS Pro 6	Iomega StorCenter px6-300d
Price	£510 inc VAT (diskless)	£100 inc VAT (diskless)	£460 inc VAT (diskless)	£853 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"> Superb read/write performance Powerful options Attractive and intuitive 	<ul style="list-style-type: none"> Cheapest drive here Decent performance and features for the money Complex interface 	<ul style="list-style-type: none"> Well priced Robust cabinet construction Solid performance Old but effective interface 	<ul style="list-style-type: none"> Most expensive NAS here Mostly strong performance Internal power supply Complex admin interface 	<ul style="list-style-type: none"> High-quality construction Features suitable for home and business use Decent performance
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 connected to a network via a 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	    				
	InFocus ScreenPlay SP8600	Vivitek Qumi Q2	Dell M110	NEC NP43	ViewSonic PJ07383i
Price	£655 inc VAT	£400 inc VAT	£390 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 ¹ , 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"> • Smooth video playback • Full-HD resolution • Great contrast levels • Bright, colourful image 	<ul style="list-style-type: none"> • Now fantastic value • Lightest model here • DLP-Link enables 3D display • Exceptional lamp life rating 	<ul style="list-style-type: none"> • Ultra-small and -light • Good colour • Long-life LED lamp • Remote control costs extra 	<ul style="list-style-type: none"> • Portable business model • Strong Auto Focus • Customisable settings • Decent image quality 	<ul style="list-style-type: none"> • Ultra-short throw • Gets very warm in operation • Lacks HDMI and DVI • Creston RoomView software
FULL REVIEW	TINYURL.COM/3HQANPV	TINYURL.COM/3TXMWPK	TINYURL.COM/77S8D6D	TINYURL.COM/62W3796	TINYURL.COM/3BW7ZZW

¹Ansi lumens GLOSSARY: • CM: component • CP: composite • SV: S-Video

Compact system cameras	    				
	Panasonic DMC-G3 (14-42mm)	Nikon D5100 (18-55mm)	Sony Alpha NEX-5 (18-55mm)	Canon EOS 600D (18-55mm)	Olympus E-PM1 (14-42mm)
Price	£400 inc VAT	£530 inc VAT	£510 inc VAT	£590 inc VAT	£390 inc VAT
Website	Panasonic.co.uk	Nikon.co.uk	Sony.co.uk	Canon.co.uk	Olympus.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Megapixel rating	16Mp	16.2Mp	14.6Mp	18Mp	12.3Mp
Maximum resolution	4592x3448 pixels	4923x3264 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/270 shots	1x lithium-ion/660 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	115x84x47mm	124x97x79mm	111x59x38mm	133x100x80mm	110x64x34mm
Weight	336g	510g	229g	570g	217g
Warranty	3 years	3 years	1 year	1 year	2 years
Verdict	<ul style="list-style-type: none"> • Great dSLR alternative • Rotating touchscreen • Strong video-capture mode • Very fast autofocus 	<ul style="list-style-type: none"> • Excellent stills and video • Suitable for novice and intermediate photographers • Plenty of lenses available 	<ul style="list-style-type: none"> • Compact • Great performance • Great colour fidelity • Takes clean, sharp shots 	<ul style="list-style-type: none"> • Top-notch photo results • Fully auto/manual modes • Articulated LCD screen • Strong video capture 	<ul style="list-style-type: none"> • Compact camera • Likable art filter modes • High ISO suffers noise • No built-in flash or EVF
FULL REVIEW	TINYURL.COM/7JCXJCR	TINYURL.COM/6UTE9KK	TINYURL.COM/37XOZX5	TINYURL.COM/72STE88	TINYURL.COM/BLMYMJW

>> 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)

Sub-£150 graphics cards	    				
	1	2	3	4	5
	Sapphire HD 7770 OC	Sapphire Radeon HD 7750	Asus Radeon HD 6670	PowerColor Radeon HD 6790	Gigabyte GeForce GT 640 OC
Price	£105 inc VAT	£85 inc VAT	£60 inc VAT	£105 inc VAT	£96 inc VAT
Website	Sapphiretech.com	Sapphiretech.com	Uk.asus.com	Powercolor.com	Uk.gigabyte.com
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Graphics processor	AMD Radeon HD 7770	AMD Radeon HD 7750	AMD Radeon HD 6670	AMD Radeon HD 6790	nVidia GeForce GT 640
Installed RAM	1GB GDDR5	1GB GDDR5	1GB DDR3	1GB GDDR5	2GB DDR3
Memory interface	128bit	128bit	128bit	256bit	128bit
Core/memory clock	1GHz/1,150MHz	800MHz/1,125MHz	800MHz/900MHz	840MHz/1,050MHz	1,050MHz/1,800MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	640	512	480	800	384
Power connectors	1x 6-pin	None	None	2x 6-pin	None
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.1	11.0	11.0	11.0	11.0
Digital interface	DVI, HDMI, Mini-DisplayPort	DVI, HDMI, DisplayPort	DVI, HDMI	2x DVI, HDMI, DisplayPort	2x DVI, HDMI
Warranty	3 years	2 years	3 years	2 years	3 years
Verdict	<ul style="list-style-type: none"> • Faster than 7750 • Good value at just £20 more • Only 128bit memory • Low sound levels 	<ul style="list-style-type: none"> • Offers better overall value than the GT 640 OC • Some way behind the 7770 • Light on power 	<ul style="list-style-type: none"> • Great-value video card • 800MHz core clock memory • 128bit memory limits appeal • Lacks power for some games 	<ul style="list-style-type: none"> • Few 6790 cards left • Not as good value at £100+ • Good memory bandwidth • 256bit memory interface 	<ul style="list-style-type: none"> • Costs more than 7750 • Falls far behind 7770 • The best version of this card • Three digital connectors
FULL REVIEW	TINYURL.COM/BWJ7BL9	TINYURL.COM/7ZB5OE3	TINYURL.COM/3LM8HGE	TINYURL.COM/6P9B7KZ	TINYURL.COM/9OSWMK2

£151+ graphics cards	    				
	1	2	3	4	5
	MSI GeForce GTX 670	Zotac GeForce GTX 680	Asus GTX 660 Ti	Asus HD 7870 DirectCU II	XFX 7970 3GB GDDR5
Price	£295 inc VAT	£410 inc VAT	£250 inc VAT	£240 inc VAT	£330 inc VAT
Website	Uk.msi.com	Zotac.com	Uk.asus.com	Uk.asus.com	Xfxforce.com
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Graphics processor	nVidia GeForce GTX 670	nVidia GeForce GTX 680	nVidia GeForce GTX 660 Ti	AMD Radeon HD 7870	AMD Radeon HD 7970
Installed RAM	2GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5	3GB GDDR5
Memory interface	256bit	256bit	192bit	256bit	284bit
Core/memory clock	915MHz/1,502MHz	1,006MHz/1,502MHz	967MHz/6,008MHz	1,010MHz/1,210MHz	925MHz/1,375MHz
Ramdac	400MHz	400MHz	400MHz	400MHz	400MHz
Stream processors	1,344	1,536	1,344	1,280	2,048
Power connectors	2x 6-pin	2x 6-pin	2x 6-pin	2x 6-pin	1x 6-pin, 1x 8-pin
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
DirectX	11.0	11.0	11.0	11.1	11.1
Digital interface	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DP	DVI, HDMI, 2x Mini-DisplayPort
Warranty	2 years	5 years	2 years	2 years	2 years
Verdict	<ul style="list-style-type: none"> • Almost on a par with 7970 • Low power consumption • Same memory bandwidth as GTX 680 	<ul style="list-style-type: none"> • Fastest single-GPU card • Low power consumption • Price drop to 7970 weakens this card's value for money 	<ul style="list-style-type: none"> • Faster than 7870 • Nicely priced • Can boost clock to 1,058MHz • Compares well to GTX 670 	<ul style="list-style-type: none"> • GTX 660 Ti is better value • Cheaper than GTX 670, but behind on framerates • Modest power consumption 	<ul style="list-style-type: none"> • Good performance • Not as powerful or as efficient as GTX 680 • Close to 7870 on value
FULL REVIEW	TINYURL.COM/CRDW78J	TINYURL.COM/C6C37QO	TINYURL.COM/D5BV2NG	TINYURL.COM/BUFMAFF	TINYURL.COM/6UZRVXC

>> 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


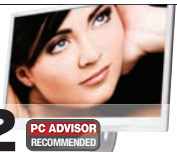





clock speed should produce the best performance.

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	£130 inc VAT	£132 inc VAT	£145 inc VAT	£108 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 ²	258cd/m ²	225cd/m ²	247cd/m ²	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"> Currently difficult to obtain Excellent value IPS panel Strong image quality Slow response rate 	<ul style="list-style-type: none"> Good value IPS panel Accurate colours Plain styling Few extras 	<ul style="list-style-type: none"> Wide viewing angles Excellent colours Attractive, slimline design No DVI connection 	<ul style="list-style-type: none"> Extremely low price Pleasing image quality Low power consumption Only a TN panel 	<ul style="list-style-type: none"> Wonderful 24bit colour reproduction Viewing angles not great Height-adjustable stand
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	NEC MultiSync EA232WMI	ViewSonic VP2765-LED	Philips Brilliance 248X3LFHSH
Price	£190 inc VAT	£230 inc VAT	£270 inc VAT	£360 inc VAT	£205 inc VAT
Website	Viewsoniceurope.com/uk	Philips.co.uk	Nec-display-solutions.co.uk	Viewsoniceurope.com/uk	Philips.co.uk
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Screen size	23in	24in	23in	27in	23.6in
Panel type	In-plane switching	Advanced MVA	In-plane switching	Advanced MVA	Twisted nematic
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel pitch	0.27mm	0.28mm	0.27mm	0.31mm	0.27mm
Brightness	238cd/m ²	299cd/m ²	Not measured	1,200cd/m ²	326cd/m ²
Static contrast ratio	681:1	1,691:1	Not measured	378:1	800:1
Response time	6ms	12s	14ms	25ms	2ms
Digital connector	DVI	DVI, DisplayPort	DVI, DisplayPort	DVI, DisplayPort	2x HDMI
Dimensions	548x433x250mm	565x220x395-518mm	550x220x379mm	642x365x474-608mm	578x443x194mm
Weight	5.4kg	5.9kg	5.8kg	8.5kg	5.1kg
Warranty	3 years	3 years	3 years	3 years	3 years
Verdict	<ul style="list-style-type: none"> Premium IPS panel Superb colour reproduction Wide viewing angles DVI port only 	<ul style="list-style-type: none"> Very strong image quality Excellent viewing angles Rotate, height adjustability Four-port USB hub 	<ul style="list-style-type: none"> High-calibre IPS screen Impressive colour depth Poor 14ms response rate Height/tilt-adjustable stand 	<ul style="list-style-type: none"> Large 27in display Low resolution for size Poor viewing angles Slow response for games 	<ul style="list-style-type: none"> Graceful design Illuminated Lightframe bezel reduces eye fatigue Twisted nematic panel
FULL REVIEW	TINYURL.COM/5WMJLR9	TINYURL.COM/6VVODAP	TINYURL.COM/4CQGNVW	TINYURL.COM/86T3PFM	TINYURL.COM/6MJA2NS

>> 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/6RMBVR6

JIM
MARTIN



Windows 8: don't write it off just yet

Windows 7 is dead; long live Windows 8! That's not true, of course, as Windows 7 will live on for several years yet, but walk into your local electronics store and all the laptops and PCs you'll find on the shelves will be running Microsoft's latest operating system.

As you've no doubt read a thousand times before, it's an operating system of two halves. The fancy new Modern UI is designed with touchscreens in mind, but it's in essence a glorified Start menu that most PC or laptop owners will see only when launching desktop apps.



I can say this with confidence, as we've been running Windows 8 in the office for several months, and we all use it just the same as its predecessor. We spend the vast majority of the working day using traditional desktop apps and call up the new Start screen only to search for files, apps or settings.

That isn't the end of the story, though. It's early days for Windows 8 and, unlike Windows 7 and Vista before it, hardware will play just as big a part as software. We've already seen some wacky designs, from giant 20in battery-powered touchscreens (Sony's Tap 20) to dual-screen laptops (Asus' Taichi has a screen on both sides of its lid) and plenty of convertible tablets that try to be both an Ultrabook and a tablet (think Lenovo's Yoga and Toshiba's U940T).

When these products go onsale, along with Microsoft's own Surface tablet, there will be an almost bewildering choice of devices that will suit pretty much everyone's needs.

On the shelves now, however, is a rather more mundane selection of laptops that are pretty much unchanged from their Windows 7 incarnations. Some have been given a touchscreen but, as we saw in our group test (page 62), the only real update is the OS.

That's a good enough reason to buy one, though. Windows 8 is both faster and more stable than Windows 7 on the same hardware, although there will be a much wider choice of hardware in six months' time. ☒

Next issue

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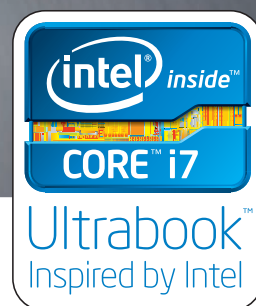


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