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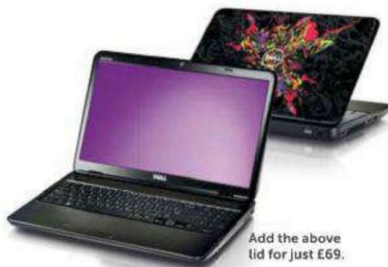● IDG ISSUE 201 **APR 2012**

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It ain't what you do, it's the way you do it

Music-download and -streaming services have shown how copyright and user choice can co-exist; it's finally happening for video, too

Recently we saw the madness and hype of CES in full flow. Its impact on the world of tech – and the publications that write about it – is hard to overestimate. Any tradeshow that's influential enough to have the mainstream press and a gaggle of high-profile pop stars and celebrity wrestlers attend is important enough to have us muscling in on the action and ensuring we bring you as much coverage as we can.

But this year, the big story isn't about a single impactful product launch. The keynote was Microsoft boss Steve Ballmer's CES swan song, as he said Microsoft won't be attending next year. It isn't interested in specific tech products, Ballmer said, save for a few PC peripherals and the Xbox Kinect, which famously wasn't unveiled in an HD version at this year's CES. Its next product launch, Windows 8, will be all about a shiny new interface and new ways of getting and using content to play on it. The gadgets are good enough already and Microsoft doesn't make those anyway.

> **For me, the big announcement at CES was that Netflix was now available in the UK**

For once, Microsoft could be on the money. It's what you're running that counts, not what you run on.

For me, the big announcement at CES wasn't a globally impactful one. Rather, it was that the Netflix video-on-demand service was now available to us content-hungry Brits. Along with many other tech journalists, I didn't need telling twice. Netflix is a proven platform with a solid catalogue of content, much of which is aimed at a British audience, priced such that I can afford to use it, and there's a slick interface to boot. The list of positives keeps on coming: the ability to simultaneously log into my account on a laptop, smartphone or tablet, and have my user preferences acknowledged, scores another hit.

Now Netflix is here, the video-on-demand market is ready for the prime time. The same old films and freebies across several competing but expensive services are no longer enough. We don't want to dip our toes into the murky waters of video-on-demand; we want a clearly, fairly priced service, perhaps eventually to use as our primary method of acquiring digital video.

With comprehensive video libraries delivered over a secure platform, there should soon be no need for dodgy P2P file-sharing sites that lure us in with movie freebies and infest our PCs with malware as their price.

Of course, it's far from being that straightforward. Were DRM and music-download services the satisfactory solutions to piracy their proponents assume, we wouldn't still be writing of the heavy-handed policing of ISPs and regulatory bodies. The US has been enjoying Netflix for the past five years, yet even now Stop Online Piracy Act privacy campaigners find themselves having to fight against the might of the House of Representatives rather than working with the movie industry to find better, mutually acceptable means of distributing content.

Napster went from bad guy to vanguard of the music-streaming subscription model, while Spotify has transitioned seamlessly from ad-supported freebie to sensibly priced save, share and download service. It's great to welcome Netflix and its movie-on-demand services to the fold. Now let's get realistic about allowing everyone to enjoy it. ⊠

Reader letters

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

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Windows XP, anyone?

Reports suggest users have deserted Microsoft's once-loved Windows XP OS in near-record numbers in the past few months, and it seems our Facebook fans are very much in accord. While **Likezo Tembo Azariah** thought it amazing that he was still using Vista – the OS that appeared a long five years after XP and still made its predecessor look good – **Courage Mic Gandamina Kosana** couldn't even remember the last time he'd used Windows XP.

How many have you had?

Ella Goodall was intrigued by our revelation that Brits are drunk in 76 percent of the photos they're tagged in on Facebook. "I tend not to post too many pictures of myself – mainly baby pics, and they don't drink! But I see lots of party pics from younger people, so I guess they've had a drink," she wrote.

pcadvisor.co.uk/news

Linux is still the nerds' preserve

Thomas Kings found fault with our 10 reasons to switch to Linux in 2012 (see tinyurl.com/7rbsk9z). In another 10 to 20 years it might become a usable OS for most punters, he advised, but for now it's simply an "interesting nerds' hobbyist OS". He points to a plethora of devices preloaded with Linux that are currently gathering dust on store shelves as his proof.

Where's my hologram TV?

Many gadgets on display at the annual CES tradeshow are based on sound technology, but products often fail to see the light of day or appear late and in a different format. We remembered some of the most anticipated gadgets at tinyurl.com/6qq3ufe. *Jimboweb* reckons we should add 3D TV to our list. In his opinion, "Nobody is going to sit in their home wearing [3D] glasses to watch TV." The poor lad's still waiting for the hologram TV he was promised 20 years ago.

New Mac to play with

Master gestures, chat with a friend using FaceTime, record a song with GarageBand... these are all activities you could be enjoying on your new toy if you were lucky enough to get a Mac for Christmas. But *Mick Hucknall*'s suggestion escaped our recommendations, available at tinyurl.com/7gd2gfj. "I don't see the option of selling it at a car boot and putting the cash towards a PC," he joked.

Flatout disappointment

We were less than impressed when we reviewed Flatout 3: Chaos & Destruction, awarding it just 1.5 stars out of a possible five (tinyurl.com/7bmgyo7). Not as unimpressed as a reader masquerading as *Christmas*, however. "I'm upset to hear that this game is so terrible. It's like all your birthdays and Christmas' coming at once, and then being told you're not getting anything," he wrote.

Flagged: Star letter

Fire, wheels, guns and smartphones

Your article about patents in the February issue (page 18) was interesting, although, probably for the sake of brevity, you neglected to consider two points. The first is the importance of smartphones. For many people, the choice of which handset they own is arguably as important as which religion they practise. And why? Smartphones are simply hybrid computer/mobile phones. Their invention was not as important to mankind as that of fire, the wheel, agriculture, the gun, and so on.

The second point is the absurdity of the patent system. Few rational people would begrudge firms that wish to protect the devices they've spent millions of pounds in developing, but it's ridiculous to think you can protect an idea or a gesture.
Mike Bennett

Matt Egan, editor, replies: I think you're right, Mike. Patents should be used only to defend the rights of those that are being taken advantage of. Unfortunately, lots of big corporations appear to be using them as political tools to give them a competitive advantage, and the person that loses out in that situation is the consumer.

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To what media do you back up your important data?

- **5%** In the cloud
- **69%** External hard drive
- **7%** CD/DVD
- **6%** Other
- **13%** I don't back up data

tinyurl.com/738tbhd
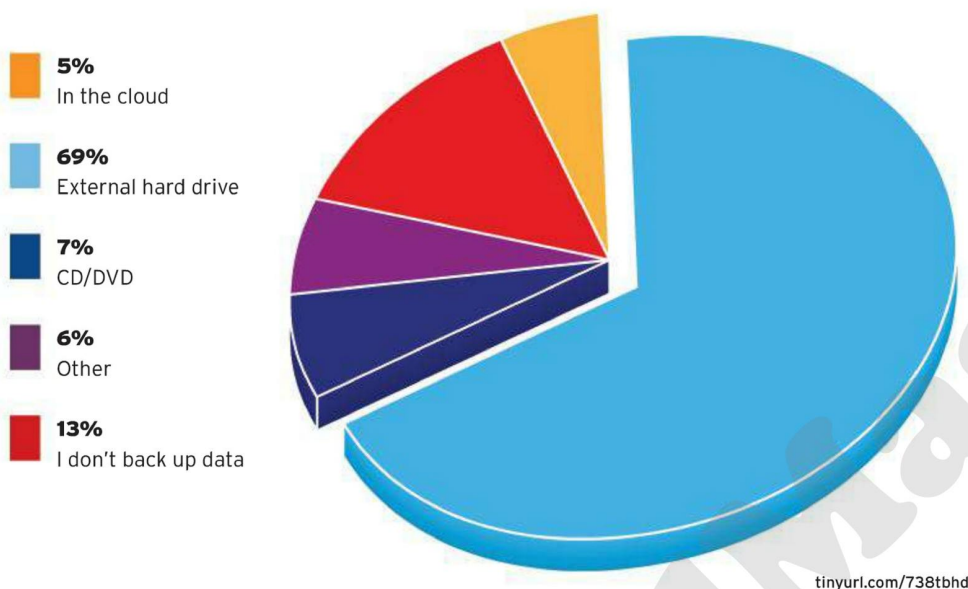
A win for online shoppers

Billions of pounds are spent online every day, but the impersonal nature of e-commerce means that, in most cases, cash payments simply aren't possible. Forced to instead use a debit or credit card, many a consumer has complained about the "unfair" surcharge that can be levied upon them as a result.

It should come as good news, then, that the government has stated its intention to introduce legislation by the end of 2012 that will put an end to any such excessive surcharges. But is it? Visitors to Speakers Corner remain sceptical (tinyurl.com/6rhtxsd).

"Companies will still be able to recover their costs for transactions, and I foresee EasyJet and Ryanair finding some interesting new ways to add administration charges to their bills," said **alan14**.

"This move was discussed several years ago, and it still hasn't been resolved to the public's liking," added **spuds**.

"The credit-card companies will increase their annual charges to the retailers, who will pass on the costs to their customers. Rip-off Britain exists because there are too many greedy people," wrote **OTT_B**.

fourm member concurred, but turned that argument on its head. "Many of those 'greedy people' are the ones who thought they could really get a flight from London to Dublin for 50p," he suggested.

Interestingly, it isn't the price that **oresome** takes most issue with. "Provided that we have a competitive market, I've got no problem with a supplier pricing their product as they see fit. But that pricing needs to be transparent."

letters@pcadvisor.co.uk

Is budget best?

I recently visited my local PC World to buy one of the printers listed in your Top 5 charts. It was out of stock, so I came home with an Advent model (PC World's own brand). I figured it was worth a try at just £29. I was very impressed with its speed and print quality, even for photos. Given that it's actually a rebadged Kodak model that includes Wi-Fi, a scan facility and an LCD display, I don't see how PC World can make any profit on it. How is this printer not in your Top 5? *John Soden*

Andrew Harrison, reviews editor, replies: Thanks for your letter, John, which raises an important point everyone should consider when shopping for a printer: if something looks too good to be true, it probably is. A printer manufacturer might not make a profit on the original hardware sale, but the cost of its inks are carefully calculated to ensure it claws back that bottom line.

In the case of your Advent, printing costs work out around 6p for a page of text, and 14p for colour. Its use of tri-colour cartridges also means that if one colour runs down quicker than the rest you'll need to replace *the lot. We wouldn't recommend a printer whose total cost of ownership can easily prove so high after even average home use.*

Happy birthday, PC Advisor!

I'm a long-term subscriber to *PC Advisor*, having read every issue from cover to cover since your launch in 1995. I very much enjoyed the coverage in your 200th issue, and can well remember many of the products and predictions you reminisced over. So, happy birthday, PCA, and here's to the next big milestone! *Maureen Thomas*

Apps everywhere

I read in the previous issue that Microsoft has confirmed that Windows 8 will have its own app store. Is there any platform that doesn't have an app store these days? I'm sure there are a handful of apps that are useful to folks – Skype, Dropbox and, of course, *PC Advisor*, for example – but the majority seem to be free or extremely cheap pieces of software that, more often than not, are uninstalled within a few hours of their installation. If these programs came preinstalled on our PCs then we'd refer to them as bloatware. *James Taylor* ⊠

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ULTRABOOKS TO GET TOUCHSCREENS & VOICE RECOGNITION

Intel hopes its smart laptops will turn the heads of consumers in 2012
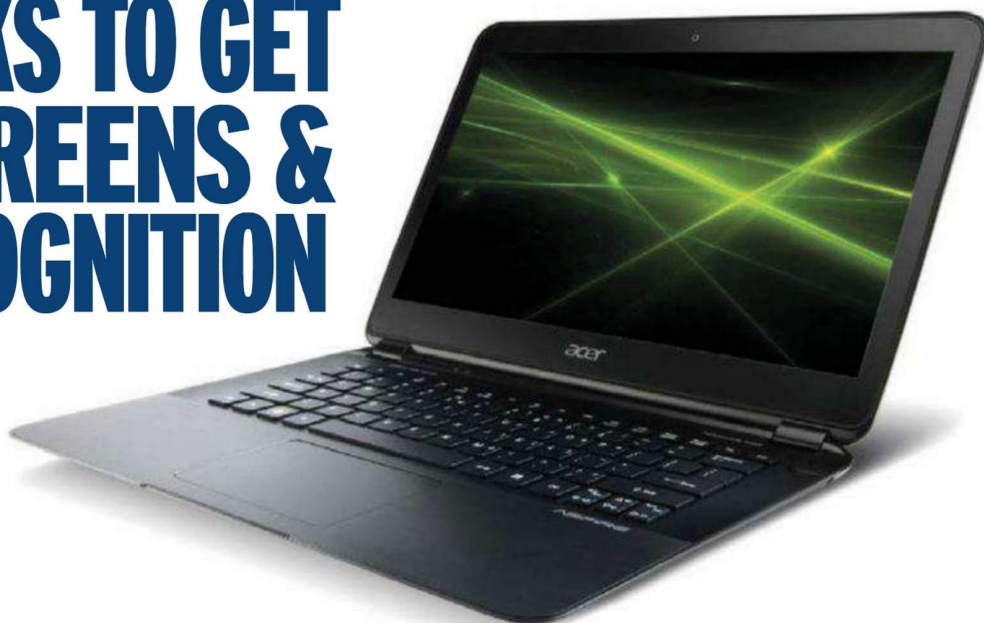
Future Ultrabooks, a new category of thin-and-light laptops, will not only be priced more attractively, but benefit from touchscreens, voice-recognition technology and longer battery life, according to Mooly Eden, Intel's general manager of the PC client group.

Touchscreens skipped Ultrabooks and were instead dedicated to smartphones and tablets, said Eden, but no longer. With users reluctant to give up laptop keyboards, touchscreens will instead provide complementary functionality for gestures, zooming, cropping and scrolling.

Intel has also announced a partnership with Nuance to bring speech-recognition technology to Ultrabooks later this year.

A new concept

The processor giant said Ultrabooks will come in hybrid designs with screens that can be flipped down to look more like tablets. It's already demoed a concept Windows 8 laptop called Nikiski, which has a small screen at its bottom. When the laptop is shut, this screen can be used to access basic data. A second concept laptop is able to recognise hand gestures to control games – much like Microsoft's Xbox console, with Kinect.

Ultrabooks, launched by Intel in 2011, are a new category of thin-and-light laptops. The company defines such laptops as less than 20mm thick, and designed to "marry the performance and capabilities of today's laptops with tablet-like features".

Until recently, only a handful of manufacturers, including Asus and Toshiba,

had unveiled Ultrabooks. This is set to change: more than 75 Ultrabooks are in the pipeline for 2012. HP, Acer and Dell were among those that unveiled Ultrabooks at January's CES tradeshow in Las Vegas.

Eden has high hopes that Ultrabooks will become a hit with consumers this year, as tablets did in 2011. "People like to create in order to express themselves," he said. They are not "consumption cows", he added, taking a shot at tablets, which are often viewed as tools for accessing rather than creating content.

Intel initially pitched the price of Ultrabooks at around $1,000 (£645). Current market prices are around $800 (£522), and Intel hopes to bring this down even further to less than $699 (£390) by the end of the year. It's working with PC manufacturers to "pull it down collectively", said Eden.

Introducing Ivy Bridge

Ultrabooks slated to launch this year will be based on the 'Ivy Bridge' microprocessor, the successor to Intel's second-generation 'Sandy Bridge' family of Core chips.

The Acer Aspire S5 (pictured above) is one such laptop, and benefits from more than a 20 percent CPU performance- and 30 percent graphics improvement.

Ultrabooks will consume just 17W on average, said Eden. Performance can be

scaled up to 35W – that of standard laptops – to boost performance based on application demands, however.

Beyond 2012

Ivy Bridge will be followed by processors currently code-named 'Haswell'. These chips are expected to provide a 20-fold improvement in idle time on laptops.

Charles King, principal analyst at Pund-IT, believes that future Ultrabooks won't just be recycled laptops.

> ## Intel is resetting the bar of what people expect from their laptops

"As the new features come to the line, probably beginning in autumn – the hand gestures, touchscreen features, speech recognition – you are looking at Intel resetting the bar of what people expect from their laptops," King said.

Research firm IHS iSuppli has predicted that Ultrabook shipments will hit 136.5 million in 2015, which is a huge increase from the fewer than one million expected to ship this year.

INTEL ENTERS SMARTPHONE MARKET

Partnership with Lenovo and Motorola sees Atom Z2460 chip used in Android phones and tablets

Intel has joined forces with Lenovo and Motorola to make its first entrance into the smartphones market.

The Lenovo K800 handset runs Google's Android operating system and is powered by the Intel Atom Z2460 processor. Previously dubbed 'Medfield', this chip runs at 1.6GHz. According to Intel, it was specifically designed for use in smartphones and tablet PCs to deliver "leading performance with competitive energy-efficiency".

The Z2460 also features in the Lenovo IdeaTab K2110 tablet, which runs Google Android 4.0 'Ice Cream Sandwich'. It's expected to ship later this year.

The Lenovo K800 has a 4.5in touchscreen that can display 720p video. It will be made available in China this spring, with launches in the UK, Europe and the US to follow shortly afterwards.

"The best of Intel computing is coming to smartphones," said Intel President and CEO Paul Otellini.

Intel has also teamed up with Motorola Mobility, having entered into a multi-year, multi-strategy relationship that will see Motorola's Android phones and tablets running Intel's processors. Devices are expected to ship in the second half of 2012.

"Although there are five billion mobile subscribers in the world, less than 800 million are using a smartphone today. With Android as the leading smartphone OS globally, and advancements in computing technology, we see tremendous opportunity for the converged devices market," said Sanjay Jha, Motorola's chairman and CEO.

Mike Bell, vice-president and general manager of Intel's mobile wireless group, said the Intel chip will be competitive on power and excel in performance. Handsets running the Z2460 chip will provide up to 8 hours of talk time (3G), 6 hrs of HD video playback, 5 hrs of web browsing, and a standby time of 14 hrs.

The Atom chip can deliver a burst in performance when needed, which could burn more power, but also reduce power consumption when the performance isn't required, said Bell.

Virgin Media network upgrade will 'double broadband speeds'

Four million customers to benefit from increased download speeds, with up to 120Mbps possible

Virgin Media has announced plans to double the connection speed received by four million of its customers, free of charge.

The upgrade program, which began in January and is expected to complete by mid-2012, will see 10 megabits per second (Mbps) packages upgraded to 20Mbps, 20Mbps and 30Mbps to 60Mbps, and 50Mbps to 100Mbps. Those currently receiving the up to 100Mbps service will also get a speed bump to 120Mbps. According to the ISP, this will enable the download of an entire music album in 4.4 seconds, and an HD movie within 5 minutes.

"The internet has become an integral part of our social, work and family lives, so we think our customers are going to love this," said Virgin Media's CEO, Neil Berkett.

"As people are doing more online, and connecting to the internet with lots of different devices, having a fast, reliable broadband service shouldn't be a luxury.

We want to make sure that consumers have access to the best-value broadband service, and that means a super-fast connection."

Virgin Media also revealed it hopes the speed increase will go some way to helping achieve the government's plan to ensure the UK has the best super-fast broadband network in Europe by 2015.

Prime minister David Cameron said: "I welcome this announcement from Virgin Media; it will provide a great boost for the economy and change the way many households, consumers and businesses use the internet".

"Rolling out super-fast broadband across the country is a critical part of our plan to upgrade the UK's infrastructure and build a new and smarter economy."

Virgin Media added: "Faster broadband gives users greater bandwidth to cope with the demands of increasing numbers of internet-connected devices."
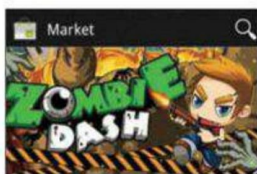
Android Market has 400,000 apps

Google's official Android Market has more than 400,000 apps available for download. Research firm Distimo said the number of apps in Google's catalogue has surged since April 2011, when it had 'just' 200,000 programs available.

The Android Market launched in October 2008, meaning it took 38 months for it to reach the 400,000 mark. Apple achieved the same milestone with its App Store in just 36 months, however.
MORE: tinyurl.com/7nujv4z

O2 brings free Wi-Fi to London

Millions of residents and visitors to London will be able to access free wireless internet after O2 signed a deal with Westminster City Council and the Royal Borough of Kensington and Chelsea to create a free wireless network in the area. Networking equipment will be installed on lamp posts and other street furniture. O2 said the network will run at no cost to the councils or to the taxpayer.
MORE: tinyurl.com/763m9ab

MICROSOFT SUES COMET FOR PIRATING WINDOWS

Comet believes it was within its rights to offer £15 XP and Vista recovery discs

Microsoft has launched legal action against UK high-street store Comet, claiming its practice of creating and selling Windows recovery CDs constitutes piracy.

The tech giant says Comet sold 94,000 counterfeit recovery discs with XP and Vista systems in 2008 and 2009. Microsoft claims the discs were created at a factory in Hampshire, then sold in various stores across the country.

"Comet produced and sold thousands of counterfeit Windows CDs to unsuspecting customers in the UK," said David Finn, Microsoft's associate general counsel, worldwide anti-piracy and anti-counterfeiting.

Despite the necessary software being preinstalled on each PC's hard drive, Finn said that Comet approached the PC owners to offer the £14.99 recovery discs.

"Not only was the recovery software already provided on the hard drive by the computer manufacturer but, if the customer so desired, a recovery disc could have been obtained from the PC manufacturer for free or a minimal amount," he said.
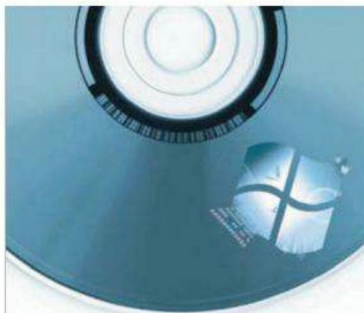
"Comet's actions were unfair to customers. We expect better from retailers of Microsoft products – and our customers deserve better."

It was once normal for recovery discs to be bundled with Windows PCs. In recent years, however, these discs have begun to disappear as computer makers cut costs. Instead, manufacturers typically partition the hard drive and place a recovery utility and the necessary operating system startup files in one portion. Alternately, Windows 7 and Vista users can create their own recovery disc using built-in tools.

However, Comet, which is currently owned by French retail company Kesa Electricals Plc and operates 250 stores across the country, believes it was well within its rights.

"Comet firmly believes that it acted in the very best interests of its customers," the company said.

"It believes its customers had been adversely affected by the decision to stop supplying recovery discs with each new Microsoft operating system-based computer. Accordingly, Comet is satisfied that it has a good defence to the claim and will defend its position vigorously."

Consumers finally dropping XP in favour of Windows 7

10-year-old OS hits all-time low with just 46.5 percent of the Windows PC market

PC users are at last ditching XP in favour of Windows 7.

According to data collected by web-metrics firm Net Applications, just 46.5 percent of all the world's Windows PCs were running the 10-year-old XP operating system in December. This is 2.4 percent less than the previous month, and a new all-time low. Furthermore, between September and December last year, the number of Windows XP users fell by nearly 6 percent from 50.5 percent. And in the past 12 months, the operating system has lost 12.4 percent of all its users.

Windows 7 has been the beneficiary of XP's decline, gaining the same percentage of users as XP lost in December. Microsoft's most recent OS now accounts for 37 percent of the world's Windows PCs.

In both 2009 and 2010, XP's share fell 40 to 48 percent more in January than it did in the previous month – most likely due to purchases of new PCs running Windows 7 in the post-Christmas sales. With that in mind, XP's share could have plummeted by as much as 3.5 percent in January this year; it will be a while before these figures are released.

The acceleration of XP's decline suggests that users have heard Microsoft's message that the OS should be retired. In July last year, Microsoft told customers it was "time to move on" from XP, reminding everyone that support would end in April 2014. Before that, the Internet Explorer team had dismissed XP as the "lowest common denominator" when they explained why it wouldn't run version 9.0 of the browser.

Projections based on Net Applications' data indicate that Windows 7 will become the most widely used Windows OS in April this year, which is several months earlier than previous estimates. By the time Windows 8 debuts, with October seeming the most likely onsale date, Windows 7 will have captured between 50 and 52 percent of the OS market.

Android Market under threat from 'RuFraud'

Some experts criticise Google for allowing untested apps to enter its Android Market. But, as Tony Bradley & Gregg Keizer explain, the real threat to users is their own behaviour

The Android market was recently hit by a spate of malicious apps, designed to trick users into sending expensive text messages. Google again faced criticism for failing to scan apps before they are uploaded to its primary distribution channel.

In fact, in 2011 Google had to remove more than 100 malicious apps from its Android Market. At the beginning of this year, San Francisco-based Lookout Security said that it and other vendors had notified Google of several recent waves of malicious apps – 22 apps altogether – that reached the Android Market. Google quickly pulled those programs from its catalogue, said Lookout.

The company dubbed the malware bundled with the recently spotted fake apps 'RuFraud', and said that the code sent spurious text messages to premium numbers, racking up revenues for the criminals.

SAFETY IN NUMBERS:
Stick to the most popular apps

As well as the UK, Android users in France, Germany, Italy, Poland, Russia and several other eastern European and central Asian countries were affected.

What's RuFraud?

As in previous malicious app campaigns, the RuFraud apps borrowed elements of legitimate apps – but they didn't simply snatch complete apps, then re-package them with malicious code, said Lookout.

"They borrowed aspects of other apps, including terminology and in some cases identical text," said Tim Wyatt, a principal engineer at Lookout.

The RuFraud operations began with horoscope apps, then moved on to Android phone wallpapers – including one for the *Twilight* series of movies – and downloaders posing as accessories to bestselling games such as Angry Birds and Cut the Rope, then finished with a round of fake games, Lookout's researchers said.

That last run accounted for the majority of downloads before Google pulled the apps. Lookout estimated that about 14,000 copies of the fake games were downloaded by users.

"A couple of instances of the apps really drove that number in a single weekend," added Derek Halliday, a Lookout senior security product manager. "The others didn't affect very many people as far as we know."

Ongoing security concerns

Google has had trouble keeping malware out of the Android Market.

In July 2011, Lookout found four apps that were infected with a variant of the 'DroidDream Light' malware. This was the third instance of DroidDream-infected apps making it into Google's Android Market,

The **ANDROID MARKET** is under threat from rogue apps
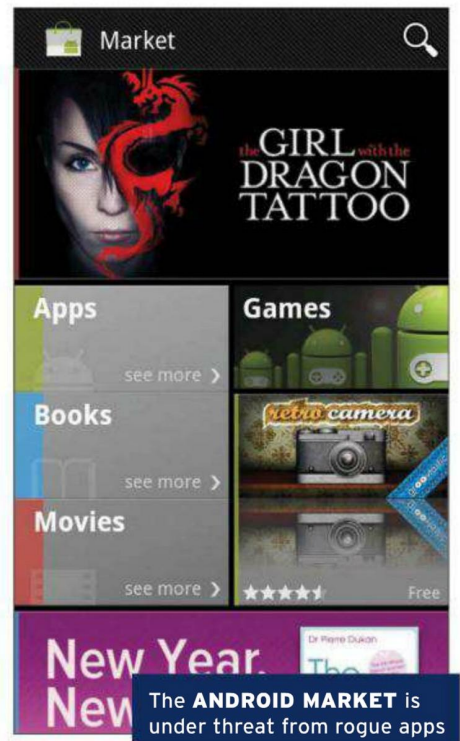
following an initial campaign in March and a second in early June. Those two waves forced Google to pull more than 80 poisoned apps from its store.

Lookout uses its own malware-detection technology to uncover malicious mobile apps. According to Halliday, Lookout detects rogue apps "as soon as they're published".

"Google is very responsive," said Wyatt, referring to the Android maker's moves when it's told that tainted apps are in its marketplace. "From notification to pulling the apps is generally on the order of minutes," Wyatt added.

Another knock for Google

Security experts regularly knock Google for not proactively scanning apps submitted to the Android Market, and are repeating that criticism in the wake of RuFraud.

"We have already stated several times that the requirements for becoming an Android developer that can publish apps to the Android market are far too relaxed," said Vanja Svajcer, a principal virus researcher with antivirus vendor Sophos, in a blog. "The attacks on Android Market will continue as long as the developer requirements stay too relaxed."

Even **ANGRY BIRDS** has found itself cloned and used to spread malware
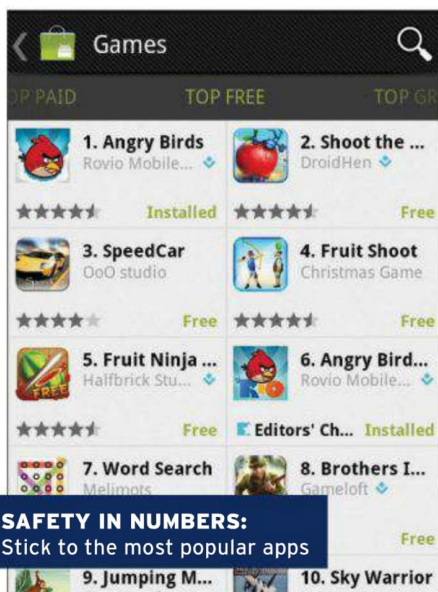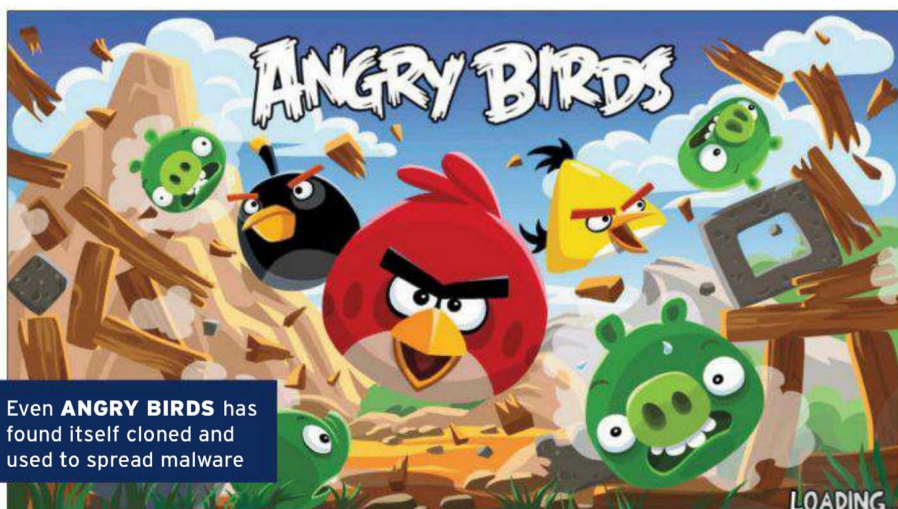
Svajcer identified some of the fake games used to spread RuFraud – a list that included Angry Birds, Assassin's Creed Revelations, Cut the Rope and Need for Speed.

Unlike Google, other app store operators vet submissions and scan apps for possible malware. Microsoft, for example, has promised to review for security issues apps submitted to its PC- and tablet-oriented Windows Store; Microsoft's market is slated for opening in late February alongside the release of the first Windows 8 public beta.

When asked if Lookout had offered Google the former's technology for scanning apps submitted to the Android Market, Halliday declined to comment.

User error

While it may be easier to distribute a shady app without an app store gatekeeper, fraud is not unique to Android and doesn't even need an app. Fraud is one of the oldest crimes in existence, and relies more on duping people than on circumventing technology.

There are instances of SMS phishing scams that can trick people regardless of mobile platform. The victim receives a spam text message with a link. Inevitably, some users will click the link, and most likely end up approving some sort of charge – the RuFraud apps work in a similar way. Getting users to click on a link is a social-engineering tactic that transcends the operating system of the target mobile device.

Symantec recently reported on a completely different kind of fraud related to smartphones. Fraudsters marketed a software application called SMS Privato Spy that promises to enable you to "view the phone screen live, activate and listen on the microphone, view call logs and perform GPS tracking at all times" on a target smartphone, all for just $50.

No such app exists. If you fall for the marketing and buy SMS Privato Spy, the fraudsters will take your money and run.

The weak spot when it comes to fraud isn't Android, iOS or any mobile platform or desktop operating system. The Achilles' heel for fraud is the naive, gullible user who falls for the bait and unwittingly approves transactions or volunteers to pay for things that don't exist.

The bottom line in the case of the fraudulent Android apps is that the apps do disclose what they intend to do, and the user is approving that activity by accepting the agreement. The terms are intentionally buried. Most people won't read the terms of service or end-user licence agreement, but there are still some simple tricks you can use to avoid being a victim of this type of fraud.

For starters, let the community be your police. Stick with apps that are more heavily downloaded and reviewed. If you do download a more obscure app that has been rarely downloaded, or has only a handful of reviews, be more vigilant about the permissions the app is requesting. Does a game such as Angry Birds really need access to send SMS text messages on your behalf?

Users need to be better educated about mobile security in general, and more aware of emerging scams so they can recognise and avoid them. Most importantly, though, people need to exercise some common sense and maintain a healthy dose of scepticism to steer clear of these kinds of threats. ⊠

Check out **REVIEWS** by other users

Always check the **PERMISSIONS** before downloading an app

Mobile payments to make slow progress this year

Commercial mobile payment services will become more common this year, but mass market acceptance will take longer, according to Mikael Ricknäs

Operator partnerships and small-scale mobile payment trials will start to bear fruit this year, and some analysts think Apple will also make a play for our wallets. But mass-market acceptance is likely to continue to elude the sector.

In some ways, 2011 was a disappointing year for mobile payments and Near Field Communications (NFC).

"There has been progress, but not as much as people had hoped for. We now have a number of handsets with NFC, albeit a small number," said John Devlin, group director at ABI Research.

Last year also saw the launch of Google Wallet in the US, which the market research firm expects to prove popular with consumers by the end of 2012.

The slow progress mainly stems from operators that have had to rethink their business model for mobile payments.

"I spoke to a number of operators in the May-June time frame who were convinced that companies would pay them to carry their cards – they thought that if Visa wouldn't pay them, MasterCard would. That was a blinkered strategy," said Devlin.

But Google changed the game with the introduction of Wallet, spurring operators in a number of countries, including the UK, to join forces and form a single platform.

Operators launching commercial services have set the stage for a battle between Google and operator joint ventures. That US firm Verizon asked Google not to put its Wallet app on the operator's version of the Galaxy Nexus highlights the brewing battle.

"It's about being first to market right now, and the likes of Verizon will be wary that if consumers start using Google Wallet it's going to be very difficult to change them from that in the future," said Devlin.

Payment wars

While there is the realisation that in order to be successful in the long term with NFC, payments and mobile wallets need to be ubiquitous, transferable and interchangeable, no-one is willing to give any ground, according to ABI. Eventually, they will find a happy medium, which will suit Google, the operators and the consumers, Devlin said.

Google hasn't made any announcements about launching Wallet in other countries,

but it's expected to go live in the UK sometime this year. Google's service is likely to make more progress as the operators struggle with the demands of a consensus approach and regulatory scrutiny.

But the competition with Google isn't all bad. As more large companies enter the space consumers will begin to see it as a legitimate market, according to Jaymee Johnson, head of marketing at Isis.

By the middle of 2012, Isis will launch services in Salt Lake City and Austin, Texas, and then build from there.

In those two cities, consumers will be able to walk into a carrier retail store and choose between multiple smartphones, load their choice of mobile payment card on to the phone, and then use the mobile payment system at both national chains and local stores, according to Johnson. Eventually, Isis will have nationwide coverage in the US, but real scale won't come until 2013 and 2014.

The number of phones that ship with NFC will grow from an estimated 34 million in 2011 to 80 million this year, which doesn't equate to mass-market acceptance. But by 2016, that number will have grown to 552 million, according to ABI.

NFC successes will at first be found outside payment systems, and operator efforts will not achieve much success before 2015, according to CCS Insight.

Even if NFC continues to get attention, it isn't the only technology that will be used to enable mobile payments. PayPal will soon start using barcodes, for example.

As always, one of the big questions for NFC is what Apple will do, and if the company still has the power to change the telecom sector in the post-Jobs era. Some analysts think Apple will launch a service and grab market share from operators.

"Apple will launch a mobile wallet product in 2012," said Mark Beccue, senior analyst at ABI. And CCS Insight also expects that Apple will integrate NFC into the iPhone 5, and link it to its iTunes payment infrastructure. ⊠

GOOGLE WALLET can be used (currently in the US only) to pay for goods and services instore or online

Websites & apps at DoS risk

Hackers armed with a single PC and a minimal broadband connection can cripple web servers, putting a huge number of websites and apps at risk. Gregg Keizer explains

Security researchers recently revealed a vulnerability in the handling of hash tables by programming languages that puts sites and apps at risk of a denial of service (DoS) attack. Microsoft, whose ASP .Net programming language is one of several affected, quickly shipped an out-of-band update, designated 'MS11-100'.

The problem exists in many of the web's most popular app- and site-programming languages, including ASP .Net, PHP, Ruby, Java and V8 JavaScript, according to researchers Alex Klink and Julian Walde.

Klink and Walde traced the flaw to the handling of hash tables, a programming structure used to store and retrieve data.

Unless a language randomises hash functions or takes into account 'hash collisions' (when multiple data generates the same hash), attackers can calculate the data that will trigger large numbers of collisions, then send that data as a simple http request. Because each collision chews up processing cycles on the targeted server, a hacker using relatively small attack packets could consume all the processing power of even well-equipped servers.

Microsoft confirmed that a single 100K http request sent to a server running ASP .Net could consume 100 percent of a CPU core for 90-110 seconds.

"An attacker could potentially repeatedly issue such requests, causing performance to degrade significantly enough to cause a DoS condition for even multi-core servers or clusters of servers," company engineers Suha Can and Jonathan Ness said in a blog.

Klink and Walde estimated that packets as small as 6K would keep a single-core processor busy on a Java server.

The implications are significant for web apps and sites that run on those servers.

Small-scale attacks with huge impact

"An attacker with little resources can effectively take out a site fairly easily," said Andrew Storms, director of security operations at nCircle Security. "No botnet is required to create havoc here."

Microsoft's rush to patch the flaw in ASP .Net hinted at the seriousness of the bug. Can and Ness said the firm "anticipates the imminent public release of exploit code", and urged customers to apply the patch.

Other programming language developers have already offered fixes for their software. Ruby, for instance, has issued an update that includes a new randomised hash function, while PHP has shipped a release candidate for version 5.4.0.

Some, however, will take their time implementing a fix, said Klink and Walde.

Oracle told them there wasn't anything to patch in Java itself, but said it would update the GlassFish Java server software with a future fix.

Klink and Walde credited another pair of researchers – Scott Crosby and Dan Wallach – for outlining the attack vector in 2003, and applauded the Perl programming language for patching its flaw then. Meanwhile, they chastised other vendors for not tackling the problem years ago.

"I'd have to agree that we all expected vendors to have fixed this by now," said Storms. "On the other hand, there's a lot of research out there and it's not always possible to be on top of everything. It's not as though this kind of attack has been ongoing in the wild since 2003 and everyone refused to fix it."

Klink and Walde reported their research to the Open Source Computer Security Incident Response Team in September. The organisation contacted the various vendors responsible for the affected languages.

The patch from Microsoft was its only out-of-band update in 2011 and Storms, who had only recently praised the company for not having to go out of band, noted that he had at the time issued a caveat. "I did say at the December Patch Tuesday that it had a few weeks to go before the year was over," he said in an instant message.

Microsoft delivered MS11-100 via its usual Windows Update and Windows Server Update Service (WSUS) channels. ⊠

More speed and less power consumption from processors

Nate Ralph explains what to expect from processors over the next year or so

As the brains of almost every modern computing gadget, the CPU is an indispensable part of every desktop, laptop, phone or tablet. The processor crunches the numbers and assigns the tasks, and it's one of the chief pieces of hardware that determine how thick your laptop is or how long your phone's battery will last.

Every year, these slabs of silicon get smaller, stronger and more energy-efficient. That's good news for gadget fans, as devices become faster, lighter and generally more impressive as a result. Here, we look at what's expected from Intel, AMD and nVidia. It's a bit too soon to tell how things will shake out in 2012, although you can expect big announcements from the CES tradeshow that kicked off as we went to press. Keep an eye on pcadvisor.co.uk/articles/ces for details.

Crossing the Sandy Bridge

There are two major players in the desktop and laptop markets: Intel and AMD. Intel gained more traction in 2011, bringing a

Intel's **SANDY BRIDGE** chips will be followed in 2012 by Ivy Bridge CPUs

number of powerful, popular components to market – with the promise of much more to come this year.

Intel operates on what it calls a 'tick-tock' cycle. With every tick, Intel introduces a new manufacturing process. In 2010, Intel's Clarkdale desktop processors reduced the company's Nehalem microarchitecture to 32 nanometres (nm), delivering improved performance and energy savings.

> ❝ **You'll see laptops that provide better battery life without sacrificing speed** ❞

With every tock, Intel introduces a new microarchitecture. Last year brought Sandy Bridge CPUs, which deliver superior performance to their Clarkdale predecessors while cutting power costs and improving the integrated graphics performance.

We'll see the next tick this year, when Intel shrinks the Sandy Bridge microarchitecture to the 22nm process. The resulting CPUs, codenamed Ivy Bridge, promise even better power savings and performance, much as the most recent two processor generations did.

Smaller Is better

Most of the information we have about Ivy Bridge comes from the 2011 Intel Developer's Forum, plus the occasional leaked PowerPoint presentation. Of primary importance is Intel's die shrink, which moves from the 32nm process to 22nm. Switching to a smaller die size allows CPU manufacturers to create chips that draw less energy.

Last year Intel unveiled the 3D tri-gate transistor technology that has enabled this

transition to 22nm. The new transistors are smaller, faster and more power-efficient, and will be key to the performance gains that Intel claims we'll see with Ivy Bridge.

But what does all of that mean for you? An Ivy Bridge CPU will supply performance similar to that of a Sandy Bridge chip while consuming less power, and it will offer greater performance while consuming the same amount of power. That means you'll see laptops that provide better battery life without sacrificing speed, as well as faster desktops that are easier on your budget.

Under the bonnet

Intel hasn't confirmed what the Ivy Bridge line-up will look like, but leaked reports obtained by Xbit Labs give some information on its naming conventions and CPU frequencies. Ivy Bridge will purportedly follow the standard naming convention for Intel's Core processors, falling into the 3000 series (Sandy Bridge was the 2000 series).

Traditionally, Intel divides the Core platform into three segments: Core i3 is low-end, Core i5 is mid-range, and Core i7 is high-end. Following that designation is a model number. You may also see a suffix at the end of the model number: K for unlocked processors, S for performance-optimised processors, and T for power-optimised processors. The S and T variants are generally for OEM use only – expect to see them in desktops and laptops on retail shelves. An unlocked, higher-end Ivy Bridge CPU might thus be named the Core i7-3770K.

We also know that Ivy Bridge will be compatible with the LGA 1155 socket. This is great news for Sandy Bridge owners, who may not need to buy an entirely new motherboard to upgrade. And if you just splashed out on Intel's Sandy Bridge Extreme Edition processor, don't worry: when we met
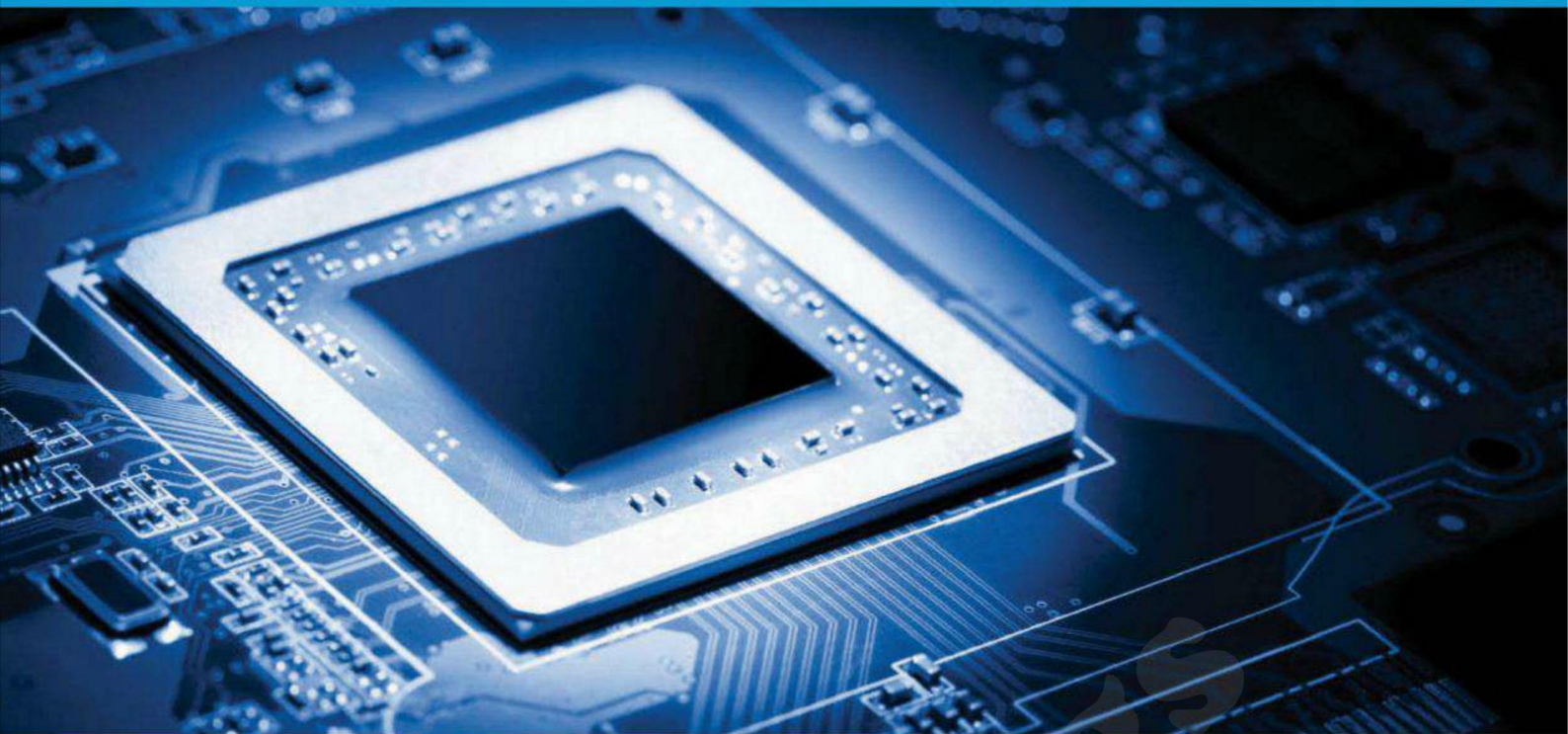
with Intel representatives, they told us that the Ivy Bridge Extreme Edition will use the LGA 2011 socket, so you too have a clear upgrade path.

Other notable enhancements include an upgraded graphics core built into the CPU, allowing DirectX 11.0 support with Intel's integrated graphics. We don't have many concrete details yet, but with every microarchitecture iteration we've seen, Intel's integrated graphics improve. Ivy Bridge CPUs will also bring native support for USB 3.0 and Thunderbolt, which we hope will mean greater adoption of those connectivity technologies across desktops and laptops of all makes and models.

We've heard no word on when Ivy Bridge CPUs and products equipped with them will arrive, but you can expect to see them sometime around the second quarter of 2012. We'll know more in the next couple of months.

Beyond Bulldozer

Now, what about AMD? The budget-minded processor manufacturer is focused on its Fusion Accelerated Processing Units (APUs), which combine CPUs and GPUs on to a single piece of silicon. AMD has its work cut out for it over the next year, however.

In October, AMD pulled back the curtain on its long-awaited Bulldozer architecture.

AMD BULLDOZER chips have thus far failed to outpace Intel's offerings
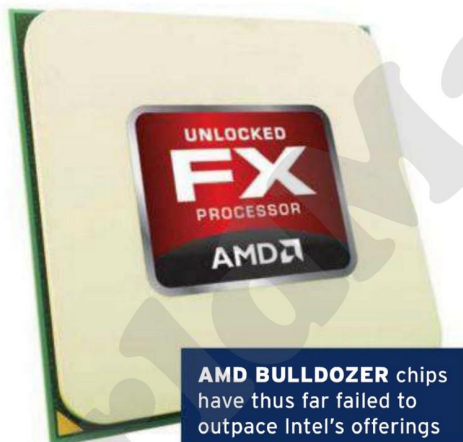
Unfortunately, Bulldozer had a rather disappointing launch, and our lab testing showed that the best chip technology that AMD could muster failed to outdo Intel's mid-range offerings.

The company will follow up the Bulldozer microarchitecture with Piledriver, an enhanced variant of the Bulldozer core. Actual details are slim, and codenames for individual desktop and laptop lines abound, but we do know that AMD will be looking to boost the performance per Watt and will be baking in stronger GPU cores. Piledriver is still expected to be a 32nm architecture, which puts AMD at something of a disadvantage in light of Intel's 22nm Ivy Bridge.

We aren't expecting to see Piledriver until sometime around the middle of 2012. Bulldozer arrived only a few months ago, after all. Expect more news from the AMD camp at CES in the next issue or online.

Bite-size CPUs

We'd be remiss to discuss processors without touching on the mobile market. Tablets and smartphones are the gadgets du jour and,

although consumers might be a bit more concerned about aesthetics and apps than about their portable bauble's innards, quite a bit of power is at play inside.

It seems like only yesterday we were wondering what to do with more than two cores in our mobile phones. In 2012, quad-core processors will rule the day, with chip manufacturers such as nVidia and Qualcomm leading the charge.

nVidia's Tegra 3 is one of the first quad-core mobile CPUs to come to market, and the latest in nVidia's Tegra system-on-a-chip line. The system consists of an ARM Cortex A9 CPU with an integrated 12-core GeForce GPU to power the graphics. Expect a deluge of Android tablets to use these chips, as device manufacturers pile on the features in a tablet-spec arms race.

Qualcomm will be introducing quad-core Snapdragon S4 chips by the end of the year. These chips will support tablets running Windows 8. The S4 will be built on the 28nm process, down from the 45nm process that Qualcomm used on the current-generation S3 chips. Expect improved performance and reduced power consumption. ⊠

The **TEGRA 3** is one of the first quad-core mobile CPUs to market
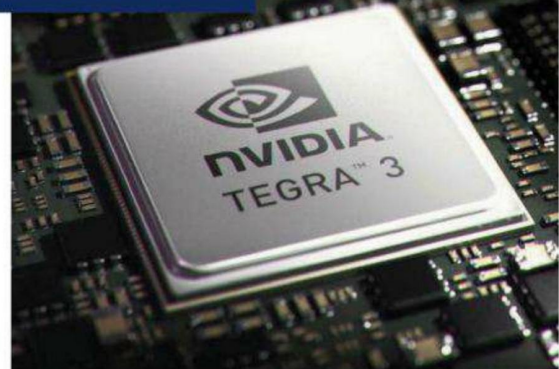
IVY BRIDGE, unveiled at IDF 2011, uses a 22nm manufacturing process

Set up your gestures

Draw three gestures on your picture.
You can use any combination of circles,
straight lines, and taps.

Remember, the size, position, and
direction of your gestures -- and the
order in which you make them --
become part of your picture password.

1 2 3

Windows 8 gets picture passwords

In a bid to improve security and speed up logins, Microsoft is to give Windows 8
picture passwords. Tim Greene and Carrie-Ann Skinner find out more

Window 8, which is expected to launch in public beta imminently, will allow PC users to log in using picture passwords. You'll be able to select any image from your gallery, then specify a gesture to authenticate secure login. In our image, for example, login requires the user to tap the mother's nose, circle anticlockwise around the father's head, then draw a line from one sister's nose to the other.

"When we started the process of designing picture passwords, we knew that we wanted a sign-in method that was fast, fluid and personal to each and every user, but still had a robust security promise," said Zach Pace, a Windows program manager.

"You get to decide the content of the picture, and you can choose a picture that is important to you, just like many people do on their phone lock screen."

Traditional login authentication causes security issues as many users choose easy-to-remember – and, therefore, guess – passwords. Alphanumeric passwords are stronger, but vulnerable to keylogging, where malware records and reproduces a user's keystrokes. Microsoft hopes its picture passwords will alleviate this security concern.

A one-tap login is relatively insecure, given that the grid overlay has only 270 possible touch points, but using eight taps increases the number of possible combinations to more than 13 quadrillion. Circles are even more complex, with seven circles providing one quintillion options.

"Someone trying to reproduce your picture password needs to know not only the parts of the image you highlighted and the order in which you did it, but also the direction and start and end points of the circles and lines that you drew," said Pace.

Microsoft claims that its picture passwords will also speed up logins. With three gestures, a picture password takes less than four seconds to enter but can still provide more than one trillion combinations, compared with 81,120 for character-based, and 1,000 for numeric passwords.

"We believe we've hit on a method of signing in that's secure but also a lot of fun to use. We love picture password and the additional personal flavour it brings to Windows 8," said Pace.

Not everyone is enthused, however. According to the inventor of RSA's SecurID token, Kenneth Weiss, picture passwords are "cute", but don't offer serious security.

Weiss said the major down side of picture passwords is that drawing a pattern across a photo is easy to record from a distance, and therefore relatively easy to compromise. Alphanumeric passwords get around this problem by starring out the characters onscreen as you type. That Microsoft will also allow a traditional password login for Windows 8 is perhaps an acknowledgement of this shortcoming, he said.

Other problems include backing up the touch pattern that is the login. "To put down a description of the sequence is possible, but

that's a lot of writing," Weiss said. "It's more like a Fisher-Price toy than a serious choice for secure computer access."

Still, it's better than nothing, admitted Weiss, and will raise login security awareness.

What to expect

Described as a "reimagining of Windows from the chipset to the experience", Microsoft's forthcoming OS boasts a dual interface that's suitable for both keyboard/mouse and touchscreen input. The traditional Windows desktop is joined by the new Metro interface, which borrows heavily from Windows Phone 7 with a series of tiles that link to apps or can contain live data. You can switch between the two using the Start button.

For the first time, Windows will also include an integrated app store, known as the Windows Store, where Metro apps and traditional desktop software can be purchased. Microsoft has confirmed that Windows 8 will run on ARM-powered devices, and its Metro-based apps will also be compatible. The desktop programs will not work on these devices, however.

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

"We took everything that was really great about Windows 7 and we made it even better in Windows 8," said Steven Sinofsky, president of the Windows division. ⊠

3D TV takes a back seat

Manufacturers will turn their backs on 3D TVs over the coming year. So is 3D just another fad technology? Patrick Miller investigates

3D has lost its spark. Few people were interested in the technology at this year's CES IT tradeshow, which took place in January. It's as if last year's CES, where 3D TVs were all the rage, never happened. So how can it go from darling to dud in one short year?

The answer is a combination of things, such as a lack of content, a technology that hasn't evolved fast enough, and the growth of more-compelling HDTV tech.

LG, Panasonic, Samsung, Sony and Visio will tout new Oled technology over the coming months. They will promote new content-delivery services, TV-based apps and voice commands, but no 3D TVs.

But 3D isn't dead; it's just gone into hibernation. You can expect to see little progress for the technology over the next year or two, but then it'll come back with a vengeance. Here, we'll explain the reasons behind its vanishing act.

The 3D dilemma

For the past two years, 3D technology has been rammed down our throats with varying degrees of success by HDTV makers. For manufacturers, 3D has been a compelling feature on multiple grounds. First, it gave consumers a reason to upgrade their TVs; and second, once TV makers had developed the 3D technology, they were able to add it to their sets at little cost to them – and great expense to us. More importantly, major consumer electronics brands were able to use their 3D TVs to push sales of 3D cameras, smartphones and tablets.

But 3D image quality hasn't improved in that timeframe, hovering around a generally good, but not amazing, level. This makes it hard to sell to new and existing 3D HDTV customers, who have to dig deep into their recession-hit pockets.

Unlike with other tech niches, where the chips get faster and the laptops get thinner, in 3D the technology hasn't evolved fast enough to keep consumers interested. If you were one of many who loathed TV makers pushing

3D TVs still require you to wear SPECIAL GLASSES

3D on you, there was no breakthrough content or technology to make you a convert.

What do you want to watch?

In short, 3D hasn't been an easy sell to consumers, with relatively few buyers proving to be overly enthusiastic about the technology. Consumers ask two questions: 'Do I want to watch this show?' and 'Do I want to watch this show in 3D?' To which the answers are "Yes" and "I'm not bothered".

Practically no-one is excited enough about 3D that they'd watch something they wouldn't normally watch just to get the 3D experience. And not all of us are going to be interested in *A Very Harold and Kumar Christmas 3D* or the *Ultimate Fighting Championship 3D*.

Still, if you do want to watch what limited 3D programming there is available, then we come to the third question: "Do I like the 3D effect enough to put up with active-shutter or passive 3D glasses?"

Goofy glasses

Both active-shutter and passive 3D glasses technology have stabilised. Passive 3D was big news at CES 2011, and active-shutter the year before that. But it seems as though we'll see mostly incremental updates for the next year or so – lighter glasses, minor advances

in image-processing features, and so on. There's much talk of glasses-free 3D displays, but that technology is still best suited for small-screen devices such as the Nintendo 3DS and phones such as the HTC Evo 3D.

The road to progress for 3D is sluggish, and HDTV buyers won't hold off a purchase in order to wait for the next big thing in 3D.

Content conundrum

Content is also holding back the technology. If the TV industry wants to sell more 3D sets, glasses and Blu-ray players, the lack of available content must first be addressed.

Companies such as Samsung, LG and Vizio can't do much to fix this problem – they are tech manufacturers, not entertainment producers. Instead, these companies are focusing on their forthcoming Oled technologies, apps and services.

Sony and Panasonic, however, dip their toes in both entertainment and tech. Sony has the PlayStation 3, which supports 3D gaming. Sony also has a massive presence in the film and music industries. Panasonic is deeply entrenched in Hollywood and provides many of the professional-grade cameras used to make 3D films and sports broadcasts. It can drive more 3D content production to expand its audience.

Sony and Panasonic aren't giving up on 3D over the coming year, but they are less concerned by the technology inside the TVs

themselves. In other words, you can expect to see more 3D films at your local cinema.

Smart TVs in demand

If you look back, you might have thought internet-connected smart TVs would have been the big thing in HDTV over the past two years. Instead, HDTV enthusiasts were saturated with 3D features, whether consumers liked them or not.

In 2012, the buzz is expected to surround smart TVs that stream content and have apps. Samsung and LG are promoting smart TVs that run gaming apps and connect to movie-streaming services such as Netflix. Lenovo has an Android 4.0-based TV with

natural language processing and speech-recognition technology.

The pool of potential 3D TV buyers will increase at a slow but steady rate as more 3D content makes its way on to Blu-ray discs, streaming video channels and live broadcasts. For now, though, we're keeping tabs on Oled screens and Sony's Crystal LED technology. Both will improve an HDTV's ability to display 3D, while glasses-free 3D tech will continue to improve as we find ways to solve the viewable-angle problem.

We wouldn't be surprised to see a satisfactory glasses-free 3D prototype in 2013, a ridiculously expensive one in 2014, and a reasonably priced one in 2015. ⊠

NEWPRODUCTS

This year's CES had few 'wow' products, but Ultrabooks and clever cameras were well represented. Rosemary Hattersley and Carrie-Ann Skinner are your show guides

Nikon D4 »
Digital SLR

Nikon has announced the D4, a full-frame 16.Mp camera with a £4,799 body-only price tag. This pro camera improves on the speed and accuracy of its predecessors, with better image quality and low-light capability. Full-HD recording and a multitude of new features have been added to the mix.

Accordingly, it's clad in magnesium alloy to keep the elements at bay. The camera has slots for both CompactFlash and the ultra-fast XQD memory format, and can back up between the two. Wireless modules, an extended ISO range, plus a 51-point autofocus all feature.
£4,799 inc VAT (body only)
nikon.co.uk

HP Spectre ⌄
Ultrabook

Ultrabooks were popular at CES, but HP was the only manufacturer to launch a seethrough model. This glass-clad ultraportable has a 14in display, besting the 13in screens of most other Ultrabooks we've seen. It also sports near-field communications. HP has managed to squeeze this screen into a chassis that would normally accommodate only a 13.3in display. There's also a multitouch trackpad, a choice of 4GB or 8GB of RAM, a 128GB or 256GB SSD and Intel Core i5 or i7 ultra-low-voltage processors. A mini DisplayPort and a USB 3.0 port feature, as do 802.11n Wi-Fi and Bluetooth 2.1. HP says users can expect a battery life of nine hours between charges.
$1,399 (around £904)
hp.com/uk
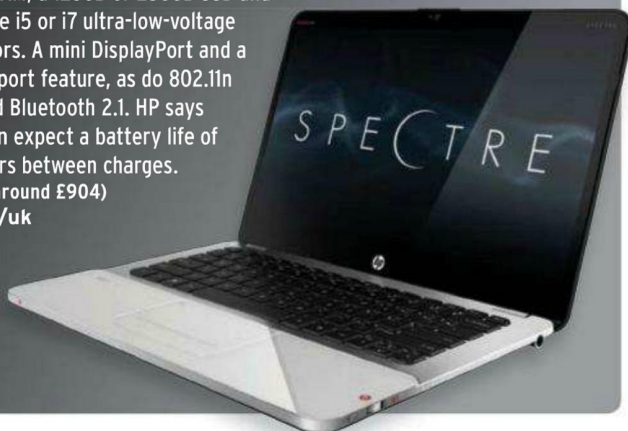
⌄ Sony NSZ-GS9 & NSZ-GS7
Google TV accessories

The Sony NSZ-GS7 is a network media player that hooks into the Google TV ecosystem, while the NSZ-GS9 is a Blu-ray player that also works with Google TV. A separate Media Remote can be used to call up such content via a Bravia TV, Sony Tablet S or P. Together, these products allow you to seamlessly watch TV broadcasts, browse the web and enjoy apps – around 150 of those found in the Android Market are optimised for TV.
Price TBC
sony.co.uk

Canon PowerShot G1 X ⌄
Digital camera

Canon's G1 X is a 14.3Mp compact camera with a 28mm wide-angle lens. The aperture ranges from f2.8 to f16, while a huge 18.7x14mm CMOS sensor dwarfs that of APS-C and Micro Four Thirds models. It also allows for faster continuous shooting and full-HD video capture.

The ability to continuously autofocus while shooting video, plus 14bit RAW image support, distinguish the PowerShot from its rivals.
£699 inc VAT
canon.co.uk

Kodak EasyShare M215 ⌄
Digital camera

This 14Mp credit-card-size camera weighs just 105g, but it packs in a lot of technology. It sports a 26mm wide-angle lens with a 5x optical zoom, and comes with Kodak EasyShare software onboard.

A self-portrait mode is included, and there's a tiny mirror on the camera's front so you can fix your hair. Smart capture and face-recognition technology are included.

The Kodak supports 720p video, and can convert this into still images. A 2.5in LCD aids composition and playback.
$99 (around £63)
kodak.co.uk

›› Orange Tahiti
Tablet

Mobile operator Orange is introducing a 3G Android tablet. Its 7in-screen Tahiti will cost £25 a month for two years, following an initial payment of £69. The contract includes 1GB of peak and 1GB of off-peak 3G web access per month. A £41-a-month contract that bundles an Orange San Francisco Android smartphone is also posited. The Tahiti tablet runs Android Honeycomb from a 1.2GHz dual-core Qualcomm 8260 processor and 512MB of RAM. It has 8GB of onboard storage, a 5Mp camera, a capacitive touchscreen and an a-GPS compass.
From £69 on a £25/month contract
orange.co.uk

Toshiba Camileo Z100 ⌄
Digital camcorder

Toshiba's latest Camileo video camera offers full-HD video capture at 30fps. A pair of 5Mp CMOS sensors enable it to shoot 3D footage, where an 8x zoom is available. The 2.8in touchscreen offers glasses-free previews.

The Z100 has a 120x digital zoom in 2D mode, with which it can capture 16Mp stills. Electronic image stabilisation is built in.

The user interface has been rethought for this latest model, and a Pause button added for use during recording. Toshiba Camileo Upload software is onboard.
Price TBC
toshiba.co.uk

Dell XPS 13 ⌄
Ultrabook

Dell's first Ultrabook is a 13.3in-screen model that pays more than a passing resemblance to Apple's MacBook Air (hardly a criticism, mind). Aimed at business users, the laptop is 6mm thick, offers an eight-hour battery life and weighs 1.35kg. Dell says the 13in laptop is effectively the same overall size as an 11in laptop, and offers as much processing power as a standard laptop, despite its slim dimensions.

Smart Connect technology built into the motherboard allows software updates to proceed in standby mode. Intel Core i3, i5 and i7 CPUs, 4GB of DDR3 RAM and SSD configurations of up to 256GB are cited by Dell.
$999 (around £647)
dell.co.uk
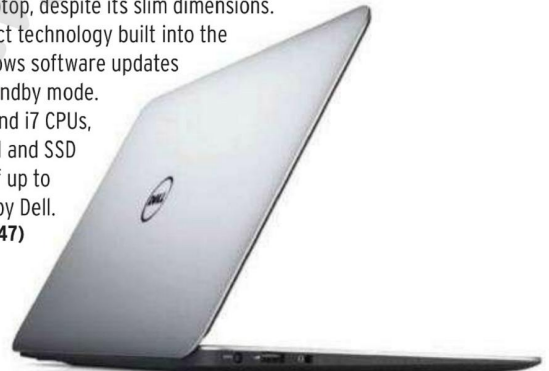
Sony Xperia Ion ⌄
Smartphone

Sony used CES to unveil the first smartphone to escape its Sony Ericsson branding. The Xperia Ion is a 12Mp cameraphone that can shoot 1080i video. The Android 2.3 phone has a 4.6in touchscreen and sports a 720p secondary camera. Designed as an entertainment device, the phone has a 1.5GHz dual-core processor, an HDMI port, and offers Bluetooth, Wi-Fi and 3G connectivity.
Price TBC
sony.co.uk

⌄ Bang & Olufsen Beolit 12
Wireless speaker

The Beolit 12 is the first product in Bang & Olufsen's recently announced Beoplay range of audio products that mere mortals may be able to afford. Reminiscent of an old Apple Mac G5, the imposing aluminium Beolit 12 houses a pair of 2in tweeters and a 4in woofer. The Apple styling is far from coincidental, as the Beolit is AirPlay-compatible, meaning iTunes music can be played wirelessly from a Mac, iPhone, iPod or iPad. The speaker can be either mains or battery-powered. Expect to be able to enjoy your audio favourites for up to eight hours before you need to recharge the battery. Ethernet and USB ports are included as alternative means of porting audio.
$800 (around £518)
beoplay.com

ION iCade Mobile >>
iPhone accessory

Following the success of its iCade retro games arcade for iPad, ION has unveiled a portable retro gaming product known as the iCade Mobile. Rather than housing a 9.7in-screen iPad, the iCade Mobile works with an iPod touch or iPhone, synched via Bluetooth. Its four-way navipad and four front-facing buttons are designed to withstand the rigours of some serious button mashing.
Price TBC
ionaudio.com

⌄ Canon Legria HF-R series
Digital camcorders

Several camera makers have added wireless connectivity to their compacts, and Canon has now extended that trend to its Legria camcorders. Models in its HF-R range are able to quickly send footage to a storage drive or iOS device over Wi-Fi. Key features of the Legria HF-R36 include Mpeg4 support, optical image stabilisation, a 51x digital zoom, cinematic filters and face detection. The camcorder offers 38 scene modes and comes with Story Creator software for easy storyboarding of your resulting footage.
Price TBC
canon.co.uk

Scosche myTrek Wireless Pulse Monitor
Pulse monitor

If improving your fitness is one of your goals, there's plenty of gadgetry out there to help you set out on the right track. The Scosche myTrek logs your physical progress by measuring your pulse and heart rate, distance covered, training duration and calories burned.

The device syncs with an iPhone or iPod via Bluetooth, and makes use of its GPS. Five myTrek training programs are offered.
£109 inc VAT
scosche.com

⌄ Pure Sensia 200D Connect
DAB radio

The 200D Connect is Pure's latest Sensia DAB radio. Its 5.7in touchscreen acts as a control console for access to internet, FM and DAB digital radio stations, as well as to the Pure Music streaming and downloading service the company launched last year. The Sensia's screen has a resolution of 640x480 pixels, while the hardware concealed by the screen includes a 30W RMS class D amplifier, twin speakers, a DAB digital radio tuner, a Wi-Fi chip and a processor.
£250 inc VAT
pure.com

iLuv iSM524 ArtStation Pro
Docking station

iLuv has created a docking station for Samsung Galaxy Tab Android tablets. The ArtStation Pro turns the hugely popular tablet range from slate to complete home-entertainment setup, adding a sturdy stand that allows the tablet to be rotated to either landscape or portrait mode. The device uses via Samsung's proprietary 30-pin docking connection, has an acoustically tuned two-way speaker, a 3.5mm headphone/auxiliary input and a magnetic infrared remote control that clings to one side when not in use. The speaker dock is mains-powered, measures 300x295x200mm and weighs a hefty 2.28kg.
£149 inc VAT
iluv.co.uk

Doxie Go Smart >>
Document scanner

The Doxie Go Smart is a document scanner capable of reproducing files in Jpeg, PDF or PNG format at up to 600dpi. Its optical character recognition software recognises written information and turns it into editable, searchable text.

Around 100 documents can be scanned before this 4kg device needs a recharge via USB. The Doxie can store up to 600 pages or 2,400 photos to its internal memory. These can then be viewed on a PC, Mac, iPhone or iPad.

£169 inc VAT
firebox.com

Kingston Hyper-X LoVo
PC memory

Kingston's revamped low-voltage PC memory is now more 'green' than ever, and better suited to use in a compact chassis or fanless media PC. A heat spreader allows the memory to run cooler and consume less energy. The HyperX LoVo RAM modules run at either 1.6GHz at 1.35v or 1,333MHz at 1.25v. Kingston says the memory is perfect for Intel's mini-ITX 'Apple Glen' motherboards.

From £35 inc VAT (4GB)
kingston.com

Netgear WNDR4700
Wireless router/NAS combo drive

Netgear's WNDR4700 is a combined wireless router and network storage drive that allows you to get at and share your digital photos, music and video on any web-connected device. Unusually, this Netgear router works with both Apple Time Machine and Windows-based backups. A pair of USB 3.0 ports, a 2TB hard drive (user upgradable) and dual-band 802.11n Wi-Fi all feature. Netgear reasons that the USB ports can be used to add networking capabilities to standard USB drives, thereby cheaply adding to the amount of networked storage space available.

Price TBC
netgear.co.uk

Quaduro QuadPad 3G Plus
Tablet

Quaduro's 12in-screen Quadro should appeal to business users who demand the convenience of a familiar Windows interface and the ability to access all their Windows programs and documents on a highly portable device. Specifications include a 1280x800-pixel capacitive touchscreen, a 1.66GHz Intel Mobile D510 CPU, 250GB of storage, two USB 2.0 ports and 802.11b/g/n Wi-Fi. Bluetooth is an optional extra, but Quaduro provides for 3G and WLAN.

From £500 inc VAT
quaduro.com/en
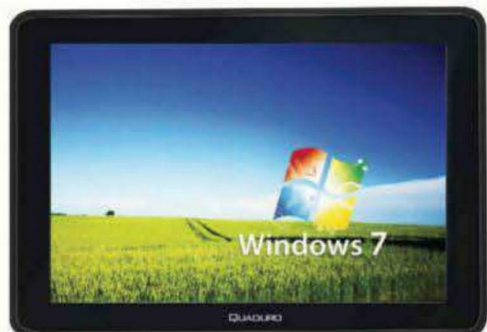
ioSafe Solo G3
USB 3.0 hard drive

ioSafe has established a reputation for bullet- and bombproof storage, and its Solo G3 external hard drive continues that trend.

ioSafe describes this USB 3.0 drive as a black box for data. It can withstand a ferocious fire for up to 30 minutes, and cope with being submerged in 10ft of water for three days. Genie Timeline Pro backup software provides continuous data backups at up to 5Gbps, while TrueCrypt protects it from hackers. Drive contents can be accessed by a registered iPhone, iPod touch or BlackBerry. A Kensington lock security slot allows the drive to be fastened in place, preventing theft.

Price TBC
iosafe.com ⊠

Asus UX21E Zenbook **38**

45

59
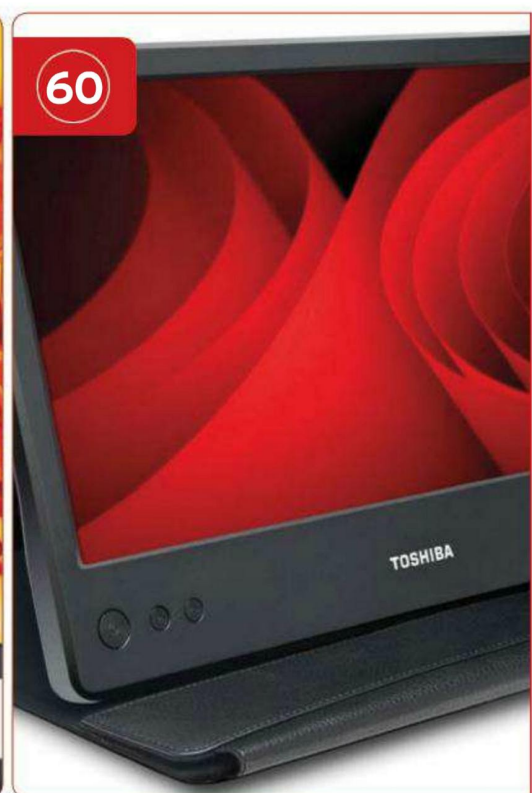
60

Blu screen thinking

Floods in the far east triggered a minor famine in storage across the world. Prices of hard drives are finally beginning to settle down, with 2TB of spinning storage costing closer to £100 than the £200 mark it was a few months ago.

But like Wikipedia disappearing for a day, you don't always realise how much you need something until it's not there. And if you're looking to keep all your data securely squirrelled in an online repository, you'll need an array of still-pricey hard disks, nesting in one neat NAS chassis. For major storage requirements, look to a six-bay professional unit like the Qnap on page 58.

Those inflated hard-disk prices started to make even flash storage look cheap. We've standardised on testing 256GB SSDs, since that capacity is enough to keep the essentials in one place. But remember a few years ago when 80GB was a decent size for a PC drive? You might still get by with just 64GB, and SSDs of this capacity can really rocket your PC experience. Turn to page 46 for two options.

Optical storage offers more permanent security for your precious data, and the Blu-ray Disc is a good option for archiving multiple gigabytes. But the medium was built for HD video. Windows users have had that option for years; Mac users weren't so well catered for.

"Blu-ray is a bag of hurt," said the late Steve Jobs when asked why no Blu-ray hardware or software was provided by Apple. "I don't mean from the consumer point of view... the licensing is so complex. We're waiting until Blu-ray takes off before we burden our customers with the cost of licensing and the drives."

And Blu-ray Disc drives certainly have been expensive since Sony spearheaded the format 10 years ago. Even now, a Blu-ray writer is still around three times the price of a full-featured dual-layer DVD±RW mechanism. You'll find several affordable examples in our Blu-ray writers group test, however – see page 62.

And a large hole in the otherwise comprehensive multimedia capabilities of a modern Macintosh has also been filled, in part at least, by Mac Blu-ray Player, reviewed on page 52. ⊠

> " **Blu-ray is a good option for archiving, but the medium was built for HD video** "

ANDREW HARRISON

Scoring and pricing explained

PC ADVISOR TEST CENTRE

How we rate hardware
We look at how well a product is made, judge its specs and features by current standards, and consider its value for money.

How we rate software
How easy software is to install and use, what it offers in features and its price are considered.

Gold award
PC ADVISOR GOLD The *PC Advisor* Gold award honours product excellence.

Recommended award
PC ADVISOR RECOMMENDED Recommended awards are given to high-quality products that don't quite merit a Gold award.

Prices
All prices are RRPs 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.

LAPTOP

Asus UX21e Zenbook

PC ADVISOR RECOMMENDED

Build: ★★★★½
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★★☆

★★★★☆

Do you believe in love at first sight? That's the question Asus poses in its marketing for the Zenbook, an ultraportable very much in the mold that Intel promotes as Ultrabook.

In turn, that means this is a Windows clone of Apple's MacBook Air. We're starting to see plenty of these tributes now, yet the Asus Zenbook is the best so far.

That's not because of any innovation here, mind. The similarity to the award-winning 11in MacBook Air is uncanny, from the all-metal high-grade clamshell construction, to the almost identical dimensions, to the battery, processor and the decent screen resolution.

Even the trackpad, an area where most Windows laptop makers cut some serious corners, is a healthy size at 104x63mm. And precision isn't bad either, with enough multitouch recognition to enable two-finger scrolling and pinch-to-zoom gestures. Asus has even added a three-finger gesture that elicits not OS X's Mission Control, but Windows' Aero Peek.

It may have exceedingly short-travel keys, but the keyboard is eminently usable. It's been simplified to follow the Mac style, removing some key clutter, and has the same shortcuts for Page Down and Up, and Home and End, by using the cursor keys with the Fn button.

As you scrutinise the chassis, you find superb levels of fit-and-finish, the deeply brushed aluminium fitting together like few other laptops. A deep bronzey tint lends an almost old-fashioned charm to this example of computing modernity.

Performance is unsurprisingly at the same level as the 11in Air, and the Asus scored 116 points in WorldBench 6. It, too, lasts a little short of 6 hours in MobileMark (347 minutes). And gameplay is just possible at lower detail: we measured 17fps in Fear (Max detail).

Asus has skimped on the screen somewhat. The resolution is 1366x768 pixels, a wise compromise for an 11in widescreen, but the gloss panel lacks the anti-reflective coating that makes Apple's ultraportable tolerable to view under common lighting conditions.

Integration with the installed Windows 7 OS is good, with the standby mode allowing the laptop to enter sleep mode by closing the lid. We also tried Ubuntu 11.10 on the Zenbook, and performance really took off in the Linux environment with its Unity interface. All the laptop's components worked out of the box here, although some terminal tweaks are required to optimise power saving, standby modes and trackpad.

At a price of £850 with this specification, the Zenbook offers plenty of memory and storage; to get the same RAM and SSD quota costs £999 on Apple's original. The latter is still the better system overall, thanks to the more powerful OS and its integration, but Asus has closed the gap like no other Microsoft OEM to date.

Verdict

We're inclined to affirm that we do believe in love at first sight. But since that initial look was of the laptop that launched this clone, our heart does stay with the MacBook Air. Make no mistake, though, the Zenbook is the best copy of any Apple portable we've seen, with a fantastic all-metal build and signs of the kind of attention to detail that's rarely seen outside the Mac maker's design labs. ⊠ Andrew Harrison

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LAPTOP

Acer Aspire Ethos 5951G

Build: ★★★½☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★½☆

★★★½☆

If you're in the market for a multimedia-focused laptop that's good for use both at home and on the road, you could do worse than Acer's Aspire 5951G.

Also known as the Ethos, the 5951G does a good job when it comes to sound, and has Dolby Home Theater surround software.

The 15.6in screen is a let-down, though. In terms of colour depth, it does a fine job, but we were disappointed to find a resolution of just 1366x768 pixels, which doesn't support 1080p HD video without downscaling.

This laptop's optical drive is a CD/DVD-only model in any case; look elsewhere if you need Blu-ray.

The screen also has a glossy finish, meaning it's compromised by any natural or artificial lighting behind you.

But there's plenty else here to make the Ethos a useful laptop for both work and play. The Acer Aspire's keyboard is very easy to get along with, and a numeric keypad to the right is ideal for quick and easy data input. We found the Arrow keys a little too small, as is the left Shift key.

Performance-wise, the 2.3GHz Intel Core i5-2410M processor does a good job. It pushed the Ethos to a respectable score of 122 points in our WorldBench 6 test suite. There's also a generous 8GB of DDR3 RAM, and a decent-capacity hard disk with 750GB of storage for your applications, media and files.

A non-removable lithium-ion battery allowed the Ethos to endure more than 8.5 hours (508 mins) in MobileMark 2007. This is longer than many rival laptop batteries.

While the long battery life lends itself to a life on the road, the Ethos is very heavy at 3.3kg. We wouldn't want to lug it around any more than is absolutely necessary.

If you play games you'll appreciate the GeForce GT 540M graphics. The Acer managed 53fps in Fear at Maximum detail settings, which is a vast improvement over integrated graphics solutions.

LAPTOP

Acer TravelMate 8481T

PC ADVISOR RECOMMENDED

Arriving just too late for our group test of business portables (page 70), the Acer TravelMate 8481T is a solidly built model that weighs just 1.7kg. It's a tough little cookie in its dark metal finish, but there are plenty of other reasons why the Acer is well-suited to life on the road.

It's very comfortable to use. The keyboard has large, well-spaced keys, and the Return, Backspace, right Shift keys and the Spacebar are all huge. The result is a very decent typing experience, even over an extensive period of time.

Battery life is incredibly long. We saw the Acer survive 11 hours (661 mins) in MobileMark 2007. This is achieved by a low-power processor and a huge eight-cell lithium-ion battery that clips to the laptop's underside.

Because of the battery's unusual shape, it props up the TravelMate, tilting it slightly toward you. This can make it feel as though you're typing on a desktop-style keyboard.

There is a down side to the battery's odd shape, though: it juts out enough to make quickly slipping the Acer into a bag or laptop sleeve difficult. It also makes it bulkier than the 1.7kg frame and 14in screen would suggest.

That 1366x768-pixel display has a matt finish, providing excellent readability, although its colours are slightly duller and the definition less crisp than with high-gloss screens. The panel neatly fills the available space within the Asus' attractive bezel. A thin rubber strip buffers the display when the lid is closed.

A WorldBench 6 score of 100 points isn't particularly impressive for a laptop these days, but partly explained by the lowly 3GB of DDR3 memory and the absence of a dedicated graphics processor. Integrated Intel graphics are slower than usual here, enough to propel Fear only to 6fps at Maximum detail. For everyday office tasks, however, the TravelMate will do a fine job.

Network connectivity stretches to the usual 802.11b/g/n wireless standards and gigabit ethernet; there's also a selection of choices for connecting desktop peripherals. USB 3.0, combined eSATA/USB 2.0, VGA and HDMI are all catered for. Note, however, that Acer has left out an optical drive to keep down the laptop's cost and weight.

A fingerprint reader that allows for secure logins has been embedded to the body, discreetly sited between the two touchpad buttons. The touchpad itself is pleasingly large for a laptop of this size, and has a slightly textured finish. It helps your fingers find their way in dark conditions, or when you don't want to take your eyes off the screen.
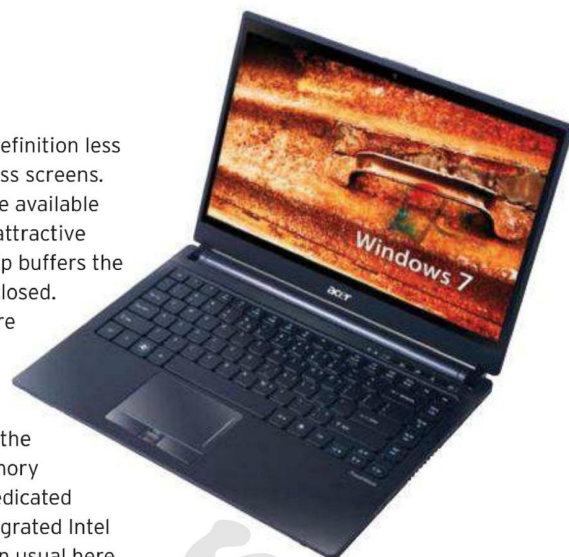
Verdict

The Acer TravelMate 8481T is a good choice for frequently travelling office workers, but somewhat inconvenient to carry, given its protruding, odd-shaped battery. It's not going to weigh you down too much at 1.7kg, though, and the 11-hour runtime will be a godsend for unplugged productivity. This Acer isn't the fastest laptop we've seen, but neither is it slow. Its screen is usable in a variety of lighting conditions. You'd be pushed to find a better business-focused portable with a matching specification at £769. ⊠ **Ben Camm-Jones**
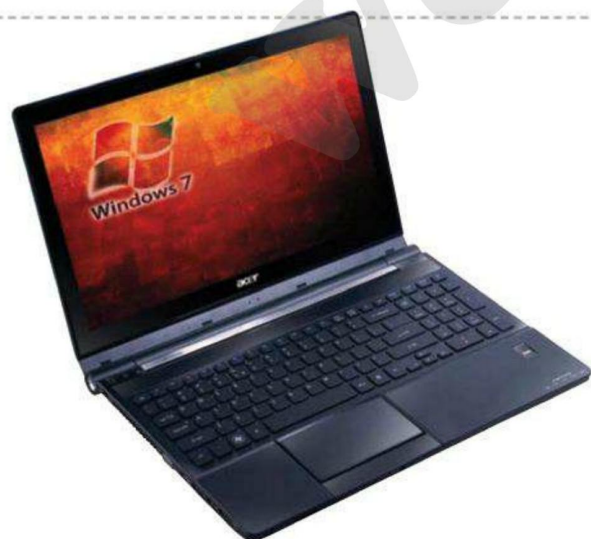
We aren't overly enthused by the Ethos' built-in remote control. Its day job is the Acer's touchpad, but a sliding button at the front of the laptop allows this to pop up and reveal the remote. It can then be removed from its hidey-hole, and later slid back into place.

The remote control itself is perfectly usable, and lets you watch films on the Acer without having to get up and fiddle with the laptop to control playback. But you're unable to move the mouse cursor or use other touchpad functions simultaneously. Mislay this remote, and you're in big trouble. Controlling a laptop using only its keyboard is difficult, to say the least.

The Acer Aspire has strong connectivity options. There's one USB 3.0 port, allowing you to connect a compatible hard drive for faster data transfers. You also get two USB 2.0 ports and a combo eSATA/USB 2.0. There's a choice of VGA and HDMI, and you'll also find a four-pin FireWire 400 port.

Verdict

Acer's Aspire Ethos 5951G has some impressive specifications that suit a home office and living room equally well. It's battery life is also good, although it's not a particularly portable laptop at more than 3kg. An easy-to-use – and lose – remote control is bundled, but we'd rather have a high-resolution screen and a Blu-ray drive for watching films. Overall, though, this £850 laptop offers relatively good value. ⊠ **Ben Camm-Jones**

LAPTOP

Apple MacBook Pro 15in (Late 2011)

Outwardly identical to the MacBook Pro released in February 2011, Apple has bumped up the processor speed a smidgeon for this latest revision.

That first Sandy Bridge-equipped model had a choice of two CPUs, with the higher-end version taking a quad-core Intel Core i7-2620QM, clocked at 2.2GHz (3.3GHz with Turbo Boost engaged). This upgrade runs a 2.4GHz i7-2760QM, with 3.5GHz possible under Turbo Boost.

The only other change is to the graphics, where a discrete AMD Radeon HD 6770M now replaces the previous model's HD 6750M.

It's a same-generation graphics card – slightly faster at 750MHz, in comparison to the 6750M's 600MHz, but Apple has underclocked it to 675MHz. The new card also has 480 stream processors.

In our WorldBench 6 speed test, this 15in Pro scored 133 points – a sterling result, which until recently was the preserve of high-end desktop PCs. In context, however, it scored only one point more than its predecessor.

A larger performance gain was recorded in our gaming tests. Apple's move to AMD graphics in the previous model showed a clear advantage over the nVidia chips it was using previously. And we saw some measurable gains again here.

Playing Fear at Maximum detail, this MacBook Pro averaged 98fps, against the 92fps of its predecessor.

DirectX 11.0 game, Stalker: Call of Pripyat, showed a similar delta, from 53 to 58fps, when set to our

low-spec test of 1280x720 pixels and Medium detail. At native screen resolution and Ultra detail (plus tessellation and contact hardening shadows on), the MacBook Pro revealed a boost from 35 to 39fps.

Our low-spec Crysis test (1024x768 pixels, High detail, DirectX 9) played at 44fps.

Battery life – as measured in Windows 7 Home Premium with MobileMark 2007 – was shorter, but only slightly. This model lasted 5 hours 11 minutes; the previous version was capable of 5 hrs 19 mins.

Verdict

Last autumn's MacBook Pro has received a gentle speed bump, but it was already a pretty fast laptop. We're still holding out for a complete revision to the design, though – to improve on the poor glass-fronted screen, in a slimmer, lighter chassis, perhaps in line with the vogue for ultraportable computing that Apple helped engender with the MacBook Air. ⊠ **Andrew Harrison**

£1,849 inc VAT

Contact
- apple.com/uk

Read more
- tinyurl.com/6Lrtacr

Specification
2.4GHz Intel Core i7-2760QM; OS X 10.7 Lion; 4GB DDR3 RAM; 750GB SATA; 15.4in (1440x900) glossy screen; AMD HD 6770M/Intel HD 3000; 802.11a/b/g/n; gigabit ethernet; Bluetooth; 8x DVD± RW DL; HD webcam; Thunderbolt; FW800; 2x USB 2.0; SD/SDXC; 77.5Wh battery; iLife; 364x249x24mm; 2.55kg
WorldBench 6 score: 133
Battery life: 311 mins

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★½
Value: ★★★½☆

★★★★☆

PRINTER

Canon i-Sensys LBP-7010C

£115 inc VAT

Contact
- canon.co.uk

Read more
- tinyurl.com/7tLxcbk

Specification
Colour laser printer; 2400x600dpi print resolution; quoted print speed: B=16ppm, C=4ppm; actual print speed: B=13ppm, C=3.3ppm; USB 2.0; 150-sheet input tray; 16MB memory; toner costs: B=£45, C=£46 x 3; print yield (pages): B=1,200, C=1,000 x 3; 2-year warranty; 400x398x223mm; 12.3kg

Build: ★★★½☆
Features: ★★★½☆
Performance: ★★★½☆
Value: ★★★☆☆

★★★½☆

This £115 colour laser sits at the budget end of Canon's i-Sensys line-up, but offers strong image quality for those prepared to wait.

While the printer has a small footprint, the 150-sheet paper tray must be slotted into the front, swallowing up more desk space. The top output tray holds just 50 sheets, and doesn't do a great job of preventing prints falling to the floor.

The specifications are limited. Just 16MB of memory is included, and there are no wired- or wireless networking options.

As you might expect of a budget printer, speed is not the Canon's main concern. Even text was generated at just 13 pages per minute (ppm). Nevertheless, such speed casts a shade over most inkjets in good-quality mode. The Oki C110 is only slightly faster, at 15.8ppm, and the Canon comfortably beats the 9.6ppm of the more expensive HP LaserJet Pro CP1525n. It takes just 15 seconds for the printer to turn out its first sheet.

The text quality is good. It lacks the crispness of more expensive models, but characters are cleanly defined at reading distance and only slightly fuzzy at the smallest font sizes.

The Canon produces colour documents at 3.3ppm. This isn't fast, but it beats the Oki's 2.5ppm. The HP is faster, at 5.6ppm, but the Canon offers better colour print quality, with more natural shades. Skin tones are handled better by rival models, but digital photos look great when printed on to premium paper.

Some models allow you to open up a front-mounted compartment and simply slot in new cartridges, but the Canon falls short in such user-friendly features.

Neither is it economical to run. The toner cartridges are only just becoming available, and prices may yet come down. They'll have to drop considerably to offer good value, however, with a page of mono

currently costing 3.8p, and a colour print running to a staggering 13.8p.

In design, the Canon is plain but functional. The cream and dark-grey colour combo doesn't make for the slickest of appearances. There's no text display, and just one button on top of the minimalist control panel.

Verdict

The Canon i-Sensys LBP-7010C looks basic and doesn't offer many features. Its print quality is impressive, though, and the initial price tag is low. Only the high running costs prevent us from recommending this budget printer. ⊠ **Robin Morris**

See page 140 for our printer charts ▶

TABLET

Asus Eee Pad Slider SL101

£400 inc VAT

Contact
■ uk.asus.com

Read more
■ tinyurl.com/7ckrscq

System requirements
10.1in Android 3.2 Honeycomb tablet; 1GHz nVidia Tegra 2; 1GB RAM; 16GB or 32GB internal flash storage; 1280x800 IPS capacitive touchscreen; Gorilla Glass; qwerty keyboard; Bluetooth 2.1 + EDR; 802.11b/g/n; MicroSD slot; mini-HDMI; 1x USB 2.0; headphone socket; rear speaker; GPS, G-Sensor; 1.2Mp rear camera, 5Mp rear camera; 25Whr lithium battery; 273x180x17mm; 960g

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

★★★★☆

The Asus Eee Pad Slider is a tablet with integrated slide-out keyboard, a relation of the Asus Transformer that proved one of the better Google tablets of 2011.

The Slider is attractive when viewed front on, with a gently bowed edging delineated with a smart silver bezel. It's chunky, though, to accommodate a keyboard under the screen.

The display is a 10.1in (1280x1920) multitouch in-plane switching panel. We found the screen responsive and colours well reproduced.

Setting up the Slider involves logging into or creating a new Google account. We slid out the physical keyboard to enter our details, but the device didn't recognise its orientation for a moment.

Software

Asus offers a couple of features beyond the standard Honeycomb interface. The first is MyCloud, a web-based storage and backup system that claims to synchronise your tablet's content with a Windows PC or Mac. Asus is overselling its product, though: there's no compatibility with OS X.

The document-synching aspect works by scanning for available Windows PCs or other devices through the Splashtop Remote app. This initiates a remote access pairing, allowing you to get at music, photos and documents stored within Wi-Fi range.

Create an Asus @vibe email account and, once connected, you can tune into the likes of Radio Caroline via the web radio, or your music. Audio is plenty loud enough for personal listening, and the output from the small speakers sited midway up on the back is good, if lacking mid depth and a little thin. The sound becomes more muffled when the keyboard is docked under the screen.

A narrow volume rocker on the left edge of the tablet sits close to the power button. More than once, we accidentally initiated a power off when tweaking the volume. Thankfully, we found our text documents and emails had autosaved.

The email app offers no advantage over any other webmail service, in contrast to the Sony Tablet P with its infinite scroll, or HTC's dual-pane message displays.

The preinstalled Polaris Office and a Supernote app allow for document creation and editing. A spellchecker for the latter would have been welcome.
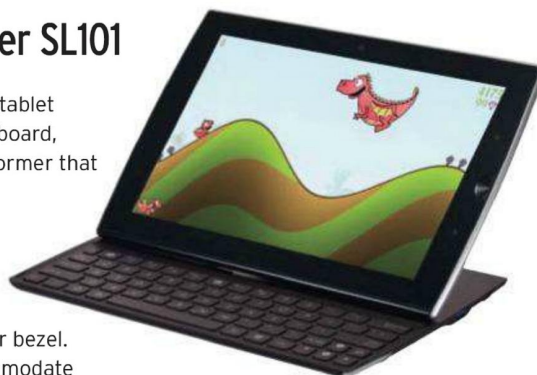
Typing using the Slider's physical keyboard is much faster than the software equivalent. It came as a surprise that the keyboard isn't revealed by a push-to-slide mechanism but by prising the screen apart on the farthest edge. The sliding action is smooth and a clever hinge keeps the screen upright.

We've used worse keyboards on netbooks, but tapping out a review on the Slider left us thoroughly frustrated. Yet the fact we even contemplated such work on a tablet proves one point: a keyboard is a useful addition.

At £400 for the 16GB model, the Slider is priced in line with its rivals. And at less than 1kg and 19mm thick, it makes for a modestly proportioned travelling companion.

In general use, it ticks the boxes for performance, battery life and web browsing that we'd expect from an nVidia Tegra 2 tablet. But not everything is well executed. Asus doesn't appear to make a UK version of the Slider, for instance, and offers only a US keyboard.

Photos can be taken with the Slider closed. It doesn't feel natural to hold up the tablet to take a shot, but the image stabiliser does a decent job and we weren't too disappointed with the close-up photos we took, given the absence of a flash and the slow operation of the camera.

We can't see ourselves using this tablet for taking photos, but they display relatively well on the Slider's colourful IPS screen. There's no option for recording video, however.

Verdict

The Asus Eee Pad Slider SL101 is a likable Android Honeycomb tablet that deftly manages to be both tablet and proper laptop without compromising too much in the process. The bulk is easily forgiven, given the advantages that a hardware keyboard brings, and doesn't detract from its smart styling or above-Android-average operation.

⊠ **Rosemary Hattersley**

£160 inc VAT

Contact
■ viewsoniceurope.com
Read more
■ tinyurl.com/7ch8foy

System requirements
24in LCD monitor;
1920x1080 resolution;
16:9 aspect ratio;
TN panel; matt
anti-glare 3H hard
coating; LED backlight;
tilt adjustment; mercury-
free construction; 5ms
response time (typical),
2ms (GtG); rated
brightness 300cd/m^2;
rated contrast 1000:1
(typical), 20,000,000:1
(dynamic); HDMI; DVI-D;
VGA; 3.5mm audio jack;
2x 2.5W amplifier; stereo
speakers; external power
supply; 582x440x210mm;
4.23kg

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

★★★★☆

24in MONITOR

ViewSonic VX2451mhp-LED

The pearl-white finish of the VX2451mhp-LED immediately sets it apart from the multitude of grey and piano-black monitors on the market.

It will look great in a home environment, where its bright exterior makes it appear smaller. A black version is also available.

This 24in full-HD display offers VGA, DVI-D and HDMI inputs. A pair of speakers are built into the bezel, making it suitable for light multimedia use.

The ViewSonic's specification isn't anything to get too excited about. It produces a punchy, colourful picture, with an impressive amount of contrast, but suffers from the usual pitfalls associated with budget twisted-nematic panels. A matt 3H hard coating means it diffuses reflections well, however.

Narrow viewing angles mean the picture won't appear consistently bright across the entire screen, and head movements create small shifts in brightness and colour. There's also a noticeable backlight bleed along the top and bottom edges.

ViewSonic is rightly proud of the VX2451mhp-LED's 'green' credentials. The display has a mercury-free construction, with zero electromagnetic radiation, and boasts a power-saving LED backlight.

The LED backlight also contributes to the panel's slender

proportions, which are further enhanced by the use of an external power supply.

The display's control buttons are grouped together at the middle below the screen. They form a silver 'V' shape around a large white power button, which is optionally illuminated by a blue LED.

After many years, ViewSonic has finally updated its onscreen menu system. It's now easier on the eye, but the same button '1' and '2' control interface is used to access it.

In this case, the buttons are also very small. When placed this close together, menu operation can become rather fiddly.

Advanced menu options include the ability to turn on dynamic contrast (it's off by default), and adjust the response time. We found the three levels available made no apparent difference, however.

Lab results

Our Spyder3 calibration tests revealed the VX2451mhp-LED to have solid but unremarkable performance. It's mostly in line with other twisted-nematic panels, but gave better contrast results.

We measured 71 percent of the Adobe RGB and 91 percent of the sRGB colour gamut. The maximum recorded brightness was 258cd/m^2

uncalibrated, while contrast ratio was a strong 801:1.

As we were hoping, the power consumption figures were impressive. At maximum brightness we measured a power draw of just 19W, which fell to 13W at 120cd/m^2. ViewSonic has also included three Eco settings. Selecting the most frugal 'Conserve' mode shaved off an additional 1W, but also dimmed the screen to just 89.77cd/m^2. We still found this setting comfortable for reading text.

Verdict

The unusual white finish may be your main reason for buying the ViewSonic VX245mhp-LED. Unless you need a display primarily for photos and video, you're unlikely to be disappointed with its strong image quality. If you're concerned about power consumption and the environment, it has excellent green credentials. ⊠ **Paul Monckton**

£99 inc VAT

Contact
■ devolo.co.uk
Read more
■ tinyurl.com/6wchprt

Specification
'500Mbps' AVplus
powerline adaptors;
2x dLAN 500 adaptors;
gigabit ethernet; push-
button security; 3-year
warranty; 65x45x125mm

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

★★★★☆

POWERLINE KIT

Devolo dLAN 500 AVplus Starter Kit

PC ADVISOR RECOMMENDED

The dLAN 500 AVplus HomePlug Starter Kit is a twin pack of powerline networking adaptors that promise transmission rates of up to 500 megabits per second (Mbps) using the HomePlug AV standard. This is an improvement over older HomePlug AV equipment, said to be capable of 200Mbps.

As with Wi-Fi router speeds, these performance claims should be taken with a pinch of salt. Routers rarely produce their advertised speeds, as interference and walls drastically reduce their range and throughput.

Powerline networking isn't affected by these obstacles, but it still gives very mixed results. The quality of wiring in your home and

the electrical noise emitted by other mains-connected devices can have a detrimental effect on performance. Sometimes, just plugging an adaptor into a different wall socket can make all the difference.

There are some installation issues, too. The size, shape and orientation of the adaptor restricts where it can be used, since it might not fit into a low-mounted socket. Adaptors are best plugged directly into the wall, but many people have only a single socket and an extension lead for their PC and all its peripherals.

Devolo solves this problem by providing a passthrough electrical socket in each dLAN 500 adaptor.

You can plug other devices directly into it, including extension cables. We also applaud Devolo's inclusion of a standby mode in which just 0.5W is consumed when not in use.

For the best performance, the dLAN 500 should be used with a gigabit ethernet network. If any device in the chain is capable of only 100Mbps ethernet, including the PCs at either end, then the dLAN 500 is also limited to that speed.

We tested the adaptors with one plugged into a wall socket next to the router, and the other upstairs next to a PC. We used a NAS connected to the router as an FTP server, transferring a 10GB file to and from the device. We've seen transfer

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

★★★★☆

3G SIGNAL BOOSTER
Nextivity Cel-Fi RS2

Those who live in good 3G reception areas are the lucky ones. They can browse the web on their phones, download apps and do all the other things that high-speed internet connections allow.

The rest of us are less fortunate. If you live in an area of only passable signal strength, you may have to consider radical measures to get your mobile online.

Setup is theoretically simple. The larger of the two devices, the 'Window Unit', sits on a window sill in a room where you have a usable signal; the 'Coverage Unit' should be sited in a room which receives a weaker signal. Both have simple mains power blocks and require no other connection, talking to each other through a 5GHz wireless link.

These units work only with 3G – they won't improve a regular 2G, GPRS signal, so won't help you with simple voice calls. (You may be wondering about 3, which doesn't own a 2G GSM network in the UK and has a roaming agreement set up with Orange and T-Mobile to support 2G calls outside its 3G-only coverage area. The Cel-Fi works only with Orange/T-Mobile and O2).

If you can get some 3G signal within a building, though, the Cel-Fi units should be able to boost it from a single bar to five bars, by retransmitting it.

There are one or two problems with the setup and use of the kit. The front panel of the Window Unit has a power LED and five more denoting signal strength, but these aren't particularly bright. Placed in a window with light pouring in, their visibility will likely be poor.

The Coverage unit is likely to be further into the building, so the LED intensity won't be a problem. Here, though, it's the single seven-segment display that we found awkward to use, with its range of arcane status and error codes, only some of which are explained in the setup guide.

In many respects, this guide is exemplary, but it didn't mention the E5 error we experienced during setup. Fortunately, the problem appeared to resolve itself.

We tried the Cel-Fi unit in a cottage on Dartmoor, where one-bar 3G service is the best on offer; and even then only from one point, on one upstairs window sill.

After placing the Window Unit here and the Coverage unit downstairs in the hall, we received full-strength coverage in most rooms – even though some of the walls are several feet thick.

Benefits include faster web access and downloads and longer battery life, since the phone needn't constantly strain itself to connect.

The Cel-Fi RS2 does what it sets out to, but at a price. The units cost £450 a pair, which is a huge amount for a small business and even more for a home installation.

Before purchase, you'll want to be sure there's no other solution just round the corner – a new mobile mast may be planned for your area in the near future, for example.

Verdict
This is a very simple, plug-and-play solution to getting 3G coverage throughout a building that has sketchy signal strength. It's pretty easy to use, although the display LEDs could be brighter. The main problem is the price: £450 is a great deal to spend on mobile coverage – using conventional broadband with a wireless router is likely to be a lot cheaper. ⊠ **Simon Williams**

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speeds in excess of 600Mbps from this NAS over a gigabit ethernet connection, so were satisfied it wouldn't restrict performance.

Our first test results were disappointing. We measured read speeds of 104Mbps and writes of 120Mbps, making this device far slower than its maker claims. The house used to test the adaptors was built in the 1930s and, despite the electrics being given a clean bill of health, a modern building may allow for better performance.

We tried the same test in a new build flat. As expected, the results improved. We measured 192Mbps when reading a file from the NAS, and 184Mbps when writing to it.

This may be an excellent real-world result for powerline networking kit, but it's significantly below Devolo's claimed speeds. It seems the maker is simply following the industry trend in advertising powerline performance that simply isn't possible in the real world.

For non-Windows computers, note that Devolo doesn't provide firmware upgrades for this product.

Verdict
Our tests show how temperamental powerline technology can be, giving different results in each building in which we tested it. The dLAN 500 is HomePlug AV-compatible, so you can use other-brand powerline kit to extend your network. This starter kit justifies its relatively high £99 price tag with decent performance under some conditions, particularly when compared to other adaptors we've tried. ⊠ **Orestis Bastounis**

GRAPHICS CARD

PNY XLR8 GTX 580 Liquid Cooled

£475 inc VAT

Contact
- pnyeurope.com

Read more
- tinyurl.com/7jsgkwa

Specification
nVidia GeForce GTX 580; 1,536MB GDDR5 RAM; 857MHz core clock; 1,053MHz memory clock (4,212MHz DDR effective); 400MHz Ramdac; 384bit memory interface; 512 CUDA cores; 64 texture units; 48 ROP units; PCI Express; 1x 6-pin and 1x 8-pin power connector; DirectX 11.0; 2x DVI; Mini-HDMI; 5-year warranty

Build: ★★★★½
Features: ★★★★½
Performance: ★★★★½
Value: ★★★★☆

★★★★☆

PNY's luxury XLR8 comes with closed-loop liquid cooling from Asetek. These self-contained systems require less setup – the XLR8 wasn't much more difficult to install than a standard card.

But the difference it makes to the card's specifications are immense. This enhanced GTX 580 (already a powerful card) goes far beyond the remit of the unenhanced.

The original core clock of 772MHz has been pushed up to 857MHz. And the 1,536MB of GDDR5 memory also gets a speed nudge, from 1,002MHz (4,008MHz DDR effective) to 1,053MHz (4,212MHz DDR effective). Aided by the 384bit interface, memory bandwidth is thus increased from 192.4GB per second (GBps) to 202.2GBps.

Performance is very good. The PNY edged ahead of the standard GTX 590 in our tests, although AMD's HD 6990 is even faster.

In Crysis, it scored 56- and 48.2fps at 1680x1050- and 1920x1200-pixel resolutions, compared to the 58.3-

and 49.5fps of the 6990. The GTX 590 here slipped behind with 55.2 and 47.1fps.

In the Heaven engine, this PNY was also slightly ahead of the standard 590, and scored 62.4- and 57.7fps to its 60.9- and 57.3fps. The 6990 was faster still, and notched up 63.9- and 58fps.

In BattleForge, the PNY established itself as the fastest card, and its 95.6fps at 1920x1200 decimated the 91- and 87.7fps of the 590 and 6990 respectively.

In Stalker, the 580's figure of 83.2fps at 1920x1200 was identical to that of the 6990, but some way ahead of the GTX 590's 75.6fps.

The liquid-cooling system doesn't enable this card to run totally cool. It does a good job of protecting the GPU, but parts of the board became hot to the touch during testing. The card remained stable, though, and

even an overclocking test wasn't able to trip it up.

PNY promises a 30 percent reduction in operational noise over the reference design. Whereas the standard 580 produced 43dB in our tests, the XLR8 recorded 39dB. We still found it loud in operation.

You'll need to find room in your system case for the radiator, plus two spare power-supply connectors.

Verdict

The flagship GTX 590 remains unfeasibly expensive, making this super-fast PNY excellent value at £475. Its cooling system works well to protect the GPU. ⊠ **Robin Morris**

SCREEN HUB

Sapphire Vid-2x

£140 inc VAT

Contact
- sapphiretech.com

Read more
- tinyurl.com/83acth5

Specification
Driverless multi-display box; requires DVI or DisplayPort connector; 2x single-link DVI outputs (compatible with HDMI); Mini-USB power; stretch mode maximum of 3840x1200/3840x1080 @50Hz; 114x107x32mm; 110g

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

★★★★☆

Sapphire's Vid-2x is a small box that sits on your desk and allows you to quickly plug in two screens to create a multi-monitor setup within seconds.

It's available in two versions: DVI and DisplayPort. The latter is designed for Macs and recent Windows PCs such as ultrabooks.

In both cases, the monitor outputs are on two DVI connectors; you may need extra adaptors if your monitors feature only an HDMI connection, for example.

You'll also need to connect a power source to the Vid-2x. It takes its power from a USB port, either from a computer or an included USB mains adaptor.

Once connected, a small display tells you about the signal, resolution and view mode.

Although our two screens fired up in seconds, we still had to go into Windows' Control Panel and adjust the resolution settings. Rather than set resolutions for each monitor, you instead choose

a combined resolution (up to 3840x1200 pixels) to cover the entire space.

This works well, although if you're not used to multiscreen systems you may be slightly bewildered by the process – Sapphire could have made setup more user-friendly.

You can alter several options on the box by flicking DIP switches. The first controls whether you use it in spanning or mirror mode, for presentations where you want to see what's onscreen without looking directly at it. Laptop users may already be familiar with this.

Other switches on the box let you experiment with the more technical aspects of screens, such as the monitor blanking time and bezel correction. The latter lets the image look as though it carries on behind the display frame. Not everybody will be happy to be faced with a battery of old-fashioned DIP switches, though.
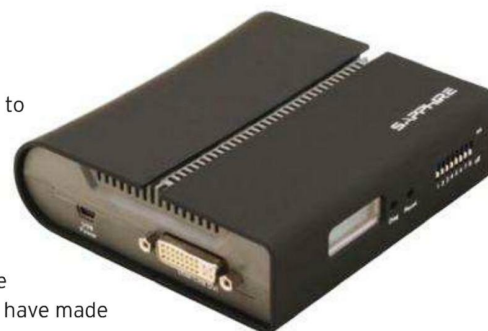
With the Sapphire Vid-2x you're expecting your PC to work with a larger combined-resolution display, so gaming will require you to have some powerful hardware to match.

Verdict

The Vid-2x is a dinky device, and it has some advantages over existing multi-display options. It's slightly faster to set up, the image reproduction is very smooth, and the box doesn't need any drivers, so works on any PC platform. It's not as easy to use as we'd like, and many of its features are replicated on existing multiscreen systems. ⊠ **Robin Morris**

See page 144 for our graphics card charts ▶

SSD

Samsung 830 Series 256GB

Samsung's 830 Series SSD uses a fast 6 gigabits per second (Gbps) interface. Its three-core ARM9 controller, 256MB DRAM buffer and Nand flash have all been produced in-house. The cache is only DDR2-class, but its flash chips are the latest 20-nanometre toggle type, which are said to double throughput by reading data on both rising and falling edges of a fast clock pulse.

Samsung hasn't skimped on the chassis either. An anodised case in brushed aluminium has polished edge accents and an orange flash in one corner to indicate the capacity. We tested the 256GB version; the 830 Series is also available in 64GB, 128GB and 512GB capacities.

In contrast to most 2.5in SATA drives, the 830 Series takes a 7mm form. This makes it easier to squeeze into the razor-thin space of the latest ultraportable laptops than standard 9.5mm types.

Performance

It's not uncommon for today's SSDs to hit 500MBps read speeds, and the 830 was no exception in our lab tests. Samsung cites reads and writes up to 520 and 400MBps respectively, and the venerable ATTO benchmark raced past these numbers with 549 and 409MBps.

Our first run with HD Tune Pro wasn't so successful. While the read test plotted a straight line across the capacity of the drive, the write trace quickly deteriorated into a vicious squiggle that oscillated between 140 and 389MBps. As our sample was a used example, we suspected it was suffering from some ageing and needed resetting.

Samsung thoughtfully supplies a utility for inspecting and servicing its SSD, Magician, which works only with Windows. We used its Secure Erase function to reset the drive, which took only a few seconds – this usually takes hours.

Following our reset, the 830 Series maintained an even 389MBps write across the drive. HD Tune Pro's read speed was 505MBps.

CrystalDiskMark gave similar results, whether using random or compressible data sets. So, Samsung hasn't resorted to real-time compression to accelerate transfers.

Looking at small file transfers, Samsung looks to have optimised the drive for read rather than write performance. In the 4k QD32 test, the 830 could muster only 147MBps writes, whereas the Crucial M4 and Corsair Performance Pro hit around

244 and 276MBps respectively. But read speeds were much higher, at 314MBps vs 167 and 285MBps for Crucial and Corsair.

In the AS SSD test, the 830 Series gave a nominal score of 740 points, which compares well to Crucial's 749-point score. The Corsair recorded 871 points.

AS SSD broadly concurred on sequential transfers, reporting 508 and 390MBps for reads and writes. The read-centric tuning was evident here, with 4k-64Thrd results amounting to 289MBps reads, but just 93MBps writes. In the IOPS test, the Samsung maxed out at 74k for read operations and 24k for writes.

Verdict

This SSD doesn't top the league tables for overall performance, but it's fast nonetheless. Samsung's controller favours read speeds, suggesting it may have the edge in, for example, PC boot times.
⊠ **Andrew Harrison**

SSD

A Data S599 64GB

The benefits of solid-state storage are plain to see, but it's not the cheapest medium for storing data. Hard-disk prices are currently high, however, closing the difference a little. If you look around you can find smaller-capacity SSDs below £100.

The 64GB A Data S599 is one such drive. Its SATA 3Gbps interface allows for up to 280MBps.

The S599 uses a SandForce SF-1222 controller, and thus garners wildly optimistic benchmark results in certain tests, including ATTO. In this benchmark, it reached peak sequential read speeds of 286MBps, and writes of 271MBps.

But the cache-less design of SandForce-based SSDs has one benefit that becomes apparent with smaller drives such as this 64GB

example: performance remains consistent across capacity choices, unlike other drives that tend to perform best in larger capacities.

CrystalDiskMark (CDM) wasn't so kind to the S599, giving top sequential reads and writes of 200 and 101MBps respectively. Using the test's default 0s or 1s data sets, these figures rose to 267MBps reads and 259MBps sequential writes.

Low-level file juggling is handled well, though, with the random-data test giving 100MBps for reads and writes in the 4k QD32 test.

AS SSD awarded a relatively decent 390 points, with the S599's sequential reads/writes recorded at 200/95MBps. But its multithreaded test, using 64 against CDM's 32, gave 108MBps read and 91MBps write.

Peak IOPS from the AS SSD test were 28k reads and 23k writes.

Verdict

The A Data S599 has enough capacity to be used as a Windows PC's boot drive, or to speed up and quieten down a laptop. But its price needs to fall by £30 to be competitive. ⊠ **Andrew Harrison**

DIGITAL CAMERA

Samsung MV800

The Samsung MV800 is a 16Mp compact that can also capture 720p video at 30fps. Its key selling point is a flip-up 3in touchscreen, which aids your ability to control settings and take self-portraits.

Footage and photos are recorded to MicroSD – a pricier alternative to SD, but useful if you want a very compact camera. The MV800 is just 18mm thick and weighs 124g.

Portraits come out well. Autocrop tied into face recognition results in a tighter, more impactful shot. The zoom rocker is effective and smooth, but this camera isn't great at capturing small objects at close proximity. For proper close-ups, you need to delve into the Program menu and choose the macro mode.

Our macro test photos had bold colours that accurately represented the object in shot. We used the same small doll to try out the camera's 3D mode but, aside from distortion to its forehead, results differed little from standard macro mode.

Standard scene modes for landscape, sunset, dawn and so on add colour casts to photos. Backlight compensation is the most effective.

The flip-out photography mode is intended for self-portraits or easier group photos, but there's no Wi-Fi to enable direct web uploads. Using the camera this way takes some getting used to, thanks to the awkward shutter button location.

Photos came out better than we'd hoped, given the unnatural nature of pointing the lens at yourself. Barrelling due to proximity was minimal.

But if you want to add a barrel distortion, you can find fisheye effects in the Smart Filters section. The 'fun' effects are best avoided.

White balance is handled automatically, and the indoor photos we took under artificial light weren't bad. The touchscreen means it's easy to specify a focal point for a photo and to make settings adjustments via an onscreen slider.

The most successful feature turned out to be panorama mode. The Samsung recognised and spliced together footage of the crescent we panned around. The composite image was uniformly in focus, colours balanced and images seamlessly stitched together.

Verdict

Samsung has made video and photography across a range of modes extremely easy. Lack of Wi-Fi and an awkward self-portrait shutter release notwithstanding, this is well-executed point and shoot.
☒ **Rosemary Hattersley**

£199 inc VAT

Contact
- samsungcamera.co.uk

Read more
- tinyurl.com/83ssnqx

Specification
16Mp compact digital camera; flip-up 3in LCD; 4608x3456 stills; 720p video; ISO 100-1,600; dual image stabilisation; 10MB internal memory; supports microSD; 3D photo capture; face detection; panorama mode; 92x56x18.3mm; 124g

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

REMOTE CONTROL

Griffin Beacon for iOS

Griffin's Beacon addresses the age-old problem of a living room cluttered with too many remote controls. A modest setup may consist of a TV, satellite or cable set-top box, DVD or Blu-ray player and a stereo amplifier, each of which can have its own separate remote control.

Until recently, the best solution was using a universal remote to control all your devices. These work by learning the correct infrared codes from each remote control.

The Griffin Beacon is a more modern approach for the smartphone generation. Instead of replacing the existing controls with yet another remote, an iOS app sends commands via Bluetooth to an IR receiver, which then forwards the IR signal on to the device.

Its a black plastic, roughly square box, with a large round plastic button on the top. Press the button to sync a remote with the Beacon. A blue LED flashes when its ready to learn commands.

Macros can be set up. To watch a sport programme, for example, the Beacon might turn on the TV, choose the correct cable channel and set the hi-fi to a preferred volume, all with a single button press.

Multifunction remotes can be a pain to set up, due to the large number of devices they may have to control. With perseverance most will work, but it can take a lot of fiddling to find the correct settings.

The Beacon suffers from this problem, too. Our test comprised a Philips TV, a Sony Blu-ray player, a Virgin Media set-top box and a Cambridge Audio amplifier. Once the Beacon's IR receiver is switched on and the app downloaded to your phone, it runs through a wizard to set up each device. However, we couldn't get a single device to work this way.

It was only when randomly choosing from a long list of possible IR codes for Philips TVs that the Griffin was able to control it. And the set-top box and amp required us to point the original remote at the Beacon to learn its commands, which took many attempts to get right.

The buttons on the Dijit app roughly resemble those on a physical remote control, but without looking at the screen your finger easily misses the correct controls. The Beacon supports gesture controls to alleviate this.

Verdict

Controlling your home appliances with a smartphone may be the future, but some issues need ironing out first. The Griffin Beacon isn't cheap and took some effort to configure. ☒ **Orestis Bastounis**

£55 inc VAT

Contact
- griffintechnology.com

Read more
- tinyurl.com/6t8t9r8

Specification
Bluetooth-to-IR remote adaptor; Bluetooth; infrared transmitter; support for approx 200,000 devices; 180-degree IR line of sight; 30ft range; requires 4x AA batteries; 90x90x40mm

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

Productivity software

Bento for iPad

PC ADVISOR RECOMMENDED

£2.99 inc VAT

Contact
- filemaker.co.uk

Read more
- tinyurl.com/8y5v2qb

System requirements
iPad running iOS 4.2 or later; 21MB available memory

★★★★☆

Database program Bento has been a firm favourite with Mac users for several years. It's now available for iPhone and iPod touch, as well as finding a more obvious home on the iPad. Bento presents information in a visual form – displaying thumbnail images of your products rather than just listing them. Using Bento to create digital recipe books is one suggested use.

Dummy project pages pre-populate the Bento app when you first use it, to give you a flavour of how it works and the sort of items you can enter in each field. You can overwrite these or create new items. We decided to use Bento to log details of craft projects.

Much of the appeal for Mac users is Bento's seamless synchronisation with the desktop version of the software. However, even without this, we found plenty to admire. You don't need more than the iPad version to use the notetaking, costing and reminder features, or
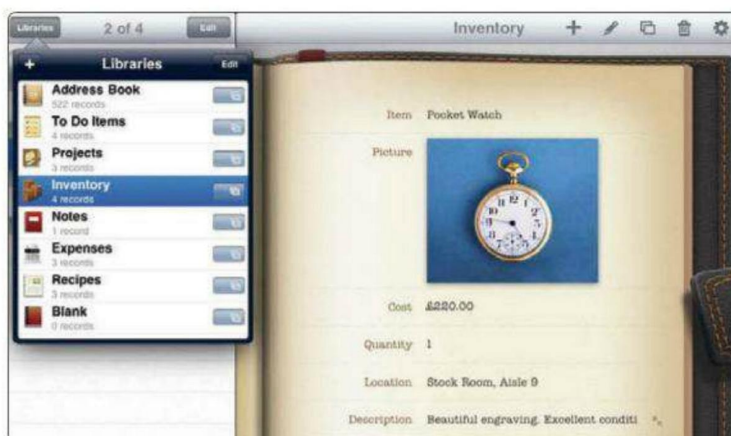
to create projects. The fact that we could associate notes, pricing and prompts with our project library meant we felt more in control of those projects and their status.

Bento for iPad automatically presented costed items we entered in sterling, and offered links to resources such as images and our own web store. Adding elements such as an inventory, expenses list or address book involves no more than clicking on the drop-down library items list. As well as photos

and notes, you can record memos and embed them in your projects.

Bento doesn't just allow you to file away items and then quickly retrieve them along with a cache of associated information; it can also be used as a real-time cataloguing tool. Backup is handled by iCloud.

Verdict

For micro businesses that need to keep tabs on stock, this simple database tool is worth the £2.99 investment. ⊠ **Rosemary Hattersley**

Numbers 1.5 for iPad

£6.99 inc VAT

Contact
- apple.com/uk

Read more
- tinyurl.com/7j4kzb5

System requirements
iPad running iOS 5.0 or later; 109MB available memory

★★★☆☆

Numbers for iPad is a good alternative to Excel for Mac users not keen on Microsoft Office. However, it's a less successful app for Windows users who routinely use Excel. Support for the more advanced features of Microsoft's spreadsheet tool is not fully realised.

An issue with previous versions of Numbers was that it generated its own spreadsheet format, rather than being able to export as .xls or .xlsx. Version 1.5 fixes this, and adds iCloud synchronisation and the ability to create folders.

Numbers has some way to go before it can replicate the full desktop spreadsheet-charting and formulae-crunching experience, though. Hiding and unhiding cells isn't supported, for example; neither is cell or row merge.

Taking these limitations into account, we stuck to creating original spreadsheets on our iPad. On the tablet's generous 9.7in screen, we were able to enjoy

fullscreen documents and data set overviews, and switch between landscape and portrait modes at will. These features don't work on the iPhone 3GS and iPhone 4/4S versions of Numbers. You can see everything, but as very small text, or only a handful of cells at once.

More importantly, editing and entering data is frustrating using the iPad's touchscreen; less of a problem if you're using a Bluetooth keyboard.

Another minor but potentially annoying feature in Numbers on the

iPhone and iPod touch is that you can only undo and redo changes by shaking the device; the iPad app has a dedicated toolbar button.

Verdict

Mac OS X users will get more from Numbers than iPad-owning Windows users. For simple spreadsheet creation on the go, it's not a bad £6.99 app, but don't expect to enjoy the full sophistication of Microsoft's Excel software. ⊠ **Rob Griffiths & Rosemary Hattersley**

Evernote

Evernote is one of the more established productivity apps for smartphones and tablets. Much like the elephant that symbolises this app, Evernote aims to ensure you never forget an appointment, a half-remembered message or task, or lose track of a web page containing important information. It's like a clipping service for your brain, and has the immense advantage of being free to use across multiple devices.

Create an account on your PC and you'll then be able to log into it from any web-connected device. We had problems with account creation on an iPad; important messages stating that our account name format was invalid didn't appear. We used an Android tablet instead, and didn't even need to wait for a confirmation email.

Evernote is a doddle to use. Click the page icon to create a new note; tap the pushpin to log your current location; take a photo; and install the optional Web Clipper widget to start collating web pages. Location data can also be stored with your notes.

You can tag items and add them to private or selectively sharable notebooks. For family-tree, business or scholarly research, these soon become invaluable.

Verdict
Backups to the Evernote server are automatic, providing peace of mind. This app is equally useful to a student, a mobile worker, a small-business owner and a busy mum. ⊠ Rosemary Hattersley

Free

■ evernote.com ■ **Read more** tinyurl.com/86yxn59

System requirements
iOS/Android/BB/WP7;
6.1MB available memory

★★★★☆

Wave Accounting

Wave Accounting began as a web-based financial tool. It caught our eye because it's one of few such services that works with Sterling rather than defaulting to US dollars. There's now a free plug-in for Chrome.

Setup involves little more than creating an account and adding items to your sales and expenses lists. You can save contact details for companies and individuals with whom you've dealt, automatically generate invoices, and see a balance sheet and payment pending information. Various taxes can be added, and payment terms amended. What we couldn't work out was how to add discounts for bulk purchases of materials, or shipping costs where applicable.

You can associate your Wave account with your online bank account, and approve or hold in abeyance particular payments depending on the healthiness of your balance. As well as small-business accounts, Wave maintains a separate tab in which you can enter personal expenses. A monthly overview, with a pie chart showing where the lion's share of your salary is disappearing, offers a useful visual means of understanding your outgoings.

Wave also sends you weekly updates of the transactions that have taken place.

Verdict
Few accounting tools are as straightforward and undaunting to use as Wave. The fact that it's free is another important plus point. ⊠ Rosemary Hattersley

Free

■ tinyurl.com/7mtk8ty ■ **Read more** tinyurl.com/88bgk8d

System requirements
Google Chrome

★★★★☆

Dataviz Docs To Go

Docs To Go will be familiar to BlackBerry and some Android users as the office suite found on smartphones. It's the closest thing we've found to a complete productivity package.

On the Android version you log into your Google Docs account and can then view and edit items stored there or in your email. These are listed alphabetically by default, but it's a single click to view recently edited files.

The spreadsheet we tried opened fine, with all the formatting preserved. Clicking on a cell, followed by the Options menu, brought up options for insert function, rows, autosum or a cell comment.

New documents can be composed, but the options are limited and you can save existing files only in Office 2004 format.

It's easy enough to select a specific cell to enter data in Sheet To Go, but you need to bring up the menu list and choose an option before the onscreen keyboard appears.

Viewing text documents is a plain vanilla experience, with text filling the full width of the screen and displayed rather small by default. You can pinch to zoom in, but the copy doesn't reflow.

You can open documents stored on an SD Card. Documents are saved either to this or Google Docs.

Verdict
Docs To Go is simple to use and covers basic tasks without complaint, but it's rather unsophisticated, given its price, and not without faults. ⊠ Rosemary Hattersley

£9.99 inc VAT

■ dataviz.com ■ **Read more** tinyurl.com/6tgz96w

System requirements
Android; iOS; BB;
57kb available memory

★★★½☆

SOFTWARE

AVG Internet Security 2012

£40 inc VAT (1 PC, 1 year)

Contact
- avg.com/gb-en

Read more
- tinyurl.com/7mxc3g8

System requirements
1.5GHz processor; Windows XP/Vista/7; 512MB RAM; 1GB hard-disk space

Usability: ★★★★☆
Features: ★★★⯪☆
Value: ★★★☆☆

★★★⯪☆

AVG offers robust protection for your PC with its free and paid-for packages

Back in 1992 when it was first released, free AVG security software was used by millions of people to protect their PCs. Even today there are 98 million AVG users worldwide. But it's worth paying out for a full subscription, which adds to the antivirus package the assessment of dangerous websites, spam and phishing detection, identity protection and a two-way firewall. AVG 2012 can also scan specifically for low-level infiltration by rootkits.

The suite is lacking parental controls and file backup, although a separate LiveKive application is provided for the latter.

AVG's antivirus engine uses four detection techniques: signature, polymorphic, heuristic and behavioural. The last two are similar, both looking at software behaviour to determine whether it's malicious.

The key revisions in this 2012 upgrade are Advisor and Accelerator. Advisor suggests the best course of action in the face of potential problems. Accelerator is designed to speed up downloads, although we noticed no difference.

The main control screen is rather basic in its design. A set of small icons on the Overview pane take you to more detailed status screens for various parameters.

The suite can be easily tweaked, making it simple to tailor AVG 2012 to your particular needs.

AV-Test awarded AVG 2012 a score of 15/18, beaten by only three products in the most recent 25 suites on which it's reported.

The scores break down to 5/6 in the sub-categories of Protection, Repair and Usability. AVG scored highly in spotting new malware (99 percent) and running malware, including rootkits (100 percent).

Our own tests assess a product's impact on system resources. It took 44 seconds to copy a 1GB file with AVG running in the background, which is very good. However, it needed 1 min 47 secs to complete the same task during a scan.

AVG took more than 47 mins to scan our 50GB basket of assorted files, but claimed to have scanned more files than any other suite we've tested. Its average scan rate of 63.21 files per second thus sits in the middle of the group.

Verdict

The scanning engine in both AVG Internet Security 2012 and AVG Free is robust, effective and has a comparatively light footprint. AVG Internet Security 2012 includes worthwhile extensions into spam and identity protection. The single- and three-PC licences aren't cheap, though, particularly when compared with rivals such as Norton Internet Security 2012. ⊠ **Simon Williams**

Stellar Phoenix Data Recovery Professional

£82 inc VAT

Contact
- stellarinfo.com

Read more
- tinyurl.com/7fyehL9

System requirements
Windows 98/XP/Vista/7; 256MB RAM; 40MB hard-disk space

Usability: ★★★★⯪
Features: ★★★★☆
Value: ★★★☆☆

★★★★☆

If you lose valuable data stored on your PC, you have two main concerns: whether you have a working backup and, if not, how you can recover the data.

Data-recovery applications are often a last resort, but they can also be used to correct simple mistakes, such as deleting files you later find you need – even after emptying the Recycle Bin. Stellar Phoenix Data Recovery does that and more.

In the box are two CDs: one containing the Windows installer, the other a boot CD for when things go bad and Windows refuses to load.

The Windows application offers four main options: Quick Recovery, Deleted File Recovery, Formatted/Lost File and Folder Recovery, and Search Lost Volume.

Quick Recovery is designed to recover files from a volume that's become corrupted. Deleted File Recovery is for when you've emptied the Recycle Bin; Formatted/Lost File and Folder Recovery is used to restore files and folders from partitions or drives you've reformatted; and Search Lost Volume looks for a deleted volume.

After running any of the first three of these tools, the program scans the selected drive, partition or folders, then presents a tree display showing what it has found.

Scans can take anything from a few minutes to an hour or more, depending on the depth of the scan, the capacity of your hard drive or partition and the number of files it locates.

Stellar Phoenix can be targeted at removable drives, too, including memory cards, so you can recover files from smartphones and tablets, provided that they're not kept on the device's internal storage.

Once you've selected the files and folders you want to recover, you specify where you want them to be stored – the software sensibly forces you to save them on a different drive, then recovers them.

When trying to recover partial files, or those with no intact file type, Stellar Phoenix Data Recovery can use built-in 'signatures', specific to different types of file, to determine what they're most likely to be.

We tried the program on a partition where software is regularly installed and then removed. We

PC MAINTENANCE UTILITY

Avanquest Fix-It Utilities 12.0

£31 inc VAT (5 PCs)

Contact
- avanquest.com/uk

Read more
- tinyurl.com/7f3spzk

System requirements
Windows XP/Vista/7; 256MB RAM; 40MB hard-disk space

Usability: ★★★★☆
Features: ★★★☆☆
Value: ★★★★½

★★★½☆

Fix-It Utilities is a venerable suite of maintenance tools for Windows. Over the years it's grown more sophisticated at pre-empting the problems that are most likely to slow down a Windows PC. Many of its functions offer one-click fixes.

During the installation procedure, Fix-It Utilities looks for existing antivirus programs and asks whether you want to continue using them or use its own antivirus engine, licensed from Sunbelt Software.

Utilities are grouped under three main headings: Optimise, Security and Fix, and Maintain. Optimise offers a Registry Fixer, Memory Optimiser and a fast Disk Defrag, among others. It's designed to make your PC start up and run faster. Security controls how the antimalware programs work, offering various scan types and letting you configure Allowed and Blocked lists. Fix and Maintain handles file and Registry cleaning, with tools for System Recovery, File Restore and a Scheduler.

Avanquest cites four new or improved features in version 12.0. There's a PC Analyser, which lets you tailor what runs on your PC, a four-fold increase in the speed of Registry repair, a Program Optimiser, which accelerates application launch

FIX-IT UTILITIES 12.0 is a useful suite of maintenance tools for Windows

times and responsiveness, and a 35 percent speed increase in antivirus scanning.

Fix-It Utilities took an hour to scan the same 50GB bundle of files we use to test regular internet security suites. This is none too quick, and Fix-It Utilities doesn't log the number of files it's scanned. We were therefore unable to calculate the scan rate.

A One-Click Fix button lets you run all the necessary utilities on your computer without manually ploughing through them. This took around an hour on our test PC, but it found a lot of redundant files, processes and Registry entries. The system then started up and ran noticeably quicker.

At one point a message popped up stating that not all the temporary files could be deleted and our attention was required. That's fine, except that it didn't say which files couldn't be deleted, so we couldn't take matters into our own hands.

Running the Temporary Files Cleaner separately appeared to delete them all, but the message popped up again next time we ran a One-Click Fix.

Verdict

To a large extent, Fix-It Utilities 12.0 handles all the key housekeeping tasks needed to keep your PC running well. We experienced some problems, but they may be unique to our test PC. ⊠ **Simon Williams**
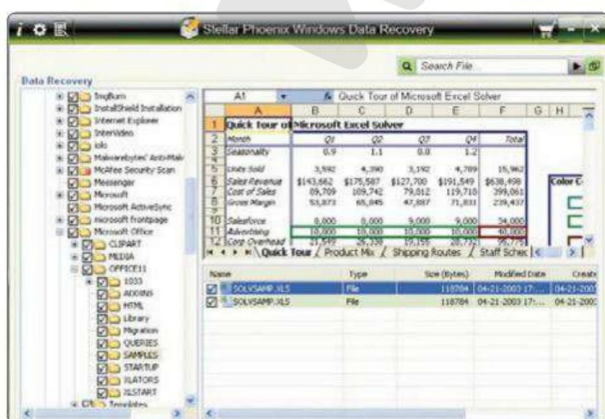
STELLAR PHOENIX is an effective recovery tool for deleted files

noted the names of several files of different types and deliberately deleted them and emptied the Recycle Bin. Running the application to undelete them, there was little problem in resurrecting them all.

We then tried recovering files from a partition that had been reformatted and still managed to find and reinstate most of them. Success is dependent on you not having copied fresh data to the drive, of course. Even then, files from the original, recorded in areas not covered by the reinstallation, may still be accessible.

Other facilities in the package include the ability to image a hard drive or volume, so you can transfer it to another computer and work to recover files there. A similar technique can also be used to clone one hard drive to another, to make a backup of a working system in case of problems later.

The boot CD loads a copy of Windows preinstall environment

(PE), so the same software is available in Rescue mode. This saves you having to learn two different interfaces, making it easier to concentrate on the file recovery.

Verdict

This is an effective package for recovering documents, photos, video clips and audio tracks that you've accidentally deleted. It can be used for individual files, through to folders and partitions, right up to complete volumes. The supplied boot disk, which uses a slimmed-down Windows operating system, makes it very easy to use. The cut-down Home version, which costs £32, lacks the filtering and imaging capabilities of the Professional edition. ⊠ **Simon Williams**

VIDEO SOFTWARE

Macgo Mac Blu-ray Player

$60 (£38)

Contact
■ macblurayplayer.com
Read more
■ tinyurl.com/86uq87v

System requirements
Intel Mac; BD-ROM drive; 2.4GHz Intel Core 2 Duo processor or better; OS X 10.5; internet connection to update DRM keys

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

★★★☆☆

Full-screen mode provides an overlay on the picture for essential contols

Apple was an early signee to Blu-ray Disc Association membership, yet it never did pursue the playback of Blu-ray films on its computers – at least, not as far as releasing any hard- or software for the task.

The technical means to play HD video from an optical disc is relatively easy to accommodate. You just need an optical ROM drive built to read the finer blue-wavelength tracks off a disc, and a fast enough processor to decode the Mpeg4 video and its soundtrack in real time.

The AACS encryption, along with HDCP and BD+ virtual-machine copy protection – and all the patents and licences to use them – are what prevent the simple process of playing Mpeg4 from blue-laser disc.

While open-source projects have been refining the playback of all manner of commercial video and audio codecs, Macgo's app is the first to combine all the essential libraries with the decryption keys and tools to unlock the HD content.

Mac Blu-ray Player is a simple program, with few aids to usability. While it makes a good fist at playing every disc we tried, it's a far from slick experience.

Installation and features

You'll need a recent Mac to play Blu-ray films. For example, the 2.4GHz Intel Core 2 Duo in our MacBook was too slow; but the 2.5GHz Core i5 in a Mac mini is just fine. From the latter, we saw CPU load average around 65 percent from one processor core.

The core functionality of this media player has been extracted from VLC, and anyone familiar with its top menu will recognise many of the control and transport options.

The interface has been polished compared to the French player, starting with an inviting bubbly
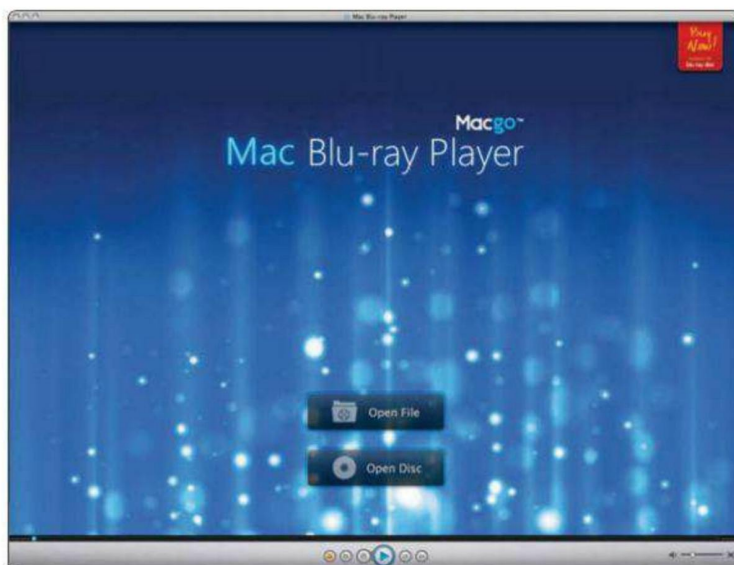
MAC BLU-RAY PLAYER is a working, if basic, solution for Blu-ray on Mac

blue backdrop before any disc is loaded. Pop a Blu-ray film into your drive, and Mac Blu-ray Player automatically loads the disc. This is where the experience differs from that seen by commercial Blu-ray players and Windows software.

Instead of being greeted by the disc's fancy menu screen that normally enables you to navigate straight to the main feature or select a chapter or bonus content, you're presented with a simple text-based interface. The app selects the first title, usually the main film feature, but searching on a chapter basis is a tortuous task.

As is simply finding half the disc content you're looking for. Often the main film is repeated several times in the Titles listing, with just the timing information shown for you to ponder on the content.

In windowed mode, a silver tray along the bottom of the picture gives basic playback controls. There's play/pause, stop, and a pair of buttons for track skip.

Missing are any fast-forward/rewind controls, although you can jump back and forth in increments – 30 secs is default, adjustable in the app's preferences. There is no slo-mo or frame advance control. Sometimes the track skip buttons would fail to work after a few presses.

Audio

Selecting audio tracks is a game of suck-it-and-see. There may be several audio tracks included with any Blu-ray film, such as DTS-HD Master Audio, Dolby TrueHD, DTS 5.1, Dolby

Digital and PCM. Assuming all are in the primary language, these will helpfully be labelled English, English, English, English and English. And then there's commentary, or audio description tracks, to fathom out.

None of the metadata about video or audio tracks is available to see. By contrast, VLC can sometimes relay such information from the playing media.

Volume control can be activated by the scroll function of a mouse. In the case of the Apple Magic Mouse, we found this could be set off all too easily by a casual brush of the hand. And curiously, the volume works upside down, so that stroking down the mouse increases the volume.

Stability could be improved. The program would quit unexpectedly on occasion, or lock up when asked to play a track it didn't like.

There's no escaping the quality of the picture, though, when everything is playing smoothly.

Verdict

You can get a similar setup, at no cost, by ripping the BD first and playing it with VLC. But without buying into the AACS-LA licence, Macgo is working with reverse-engineered tools, devised by the open-source community, and thus far cannot give the full Blu-ray film menu experience. If your aim is to play Blu-ray Discs on your Mac, Macgo's Mac Blu-ray Player will do the job. It's the first commercial solution for playing full-HD video on a Mac, for which it should be applauded. ⊠ Andrew Harrison

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WORLD N°1

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GAME

Star Wars Old Republic

£36 inc VAT

Contact
- swtor.com

Read more
- tinyurl.com/86tLu6g

System requirements
2Ghz processor; Windows XP/Vista/7; 1.5GB RAM (2GB for Vista or Windows 7); 256MB video memory; Shader 3.0 support

OVERALL
★★★★☆

A few years ago in a galaxy not very far away, World of Warcraft was hugely successful. This is the big-budget sci-fi riposte

Years in the making and costing nearly unfathomable amounts of money to create, the second Star Wars MMO is a brute-force attempt to be an online hit. It's a sci-fi alternative to the tall shadow cast by World of Warcraft, and has many features in common with this stalwart of the massively multiplayer online roleplay genre. However, Old Republic redeems itself by being heavily story-based, and with a layer that tries to lend purpose to your adventures and monster-bashing. It can be enjoyed in single-player mode, too.

As with Bioware, Mass Effect and Knights of the Old Republic, the storytelling is excellent. You'll find hours of dialogue and cut scenes that together create meaty, epic stories for each of the game's player classes. Each has branching chat and consequences based on your moral choices. You can be a quasi-evil Jedi or a noble Sith-contracted Bounty Hunter, or anything in between.

Pick a character

Since this is an MMO, there are big statistical bonuses to be had from min-maxing your morality, but straightforward roleplay is also an option. As a Bounty Hunter, we proved disturbingly willing to execute adults in cold blood. Gameplay is hardly deep and nuanced but, in contrast to the vast majority of MMOs, Old Republic makes a point of emotional connection to your character and their actions, rather than caring solely about stats and armour sets.

The entertainment value of the classes differs a little. We found the nominally Light-side Smuggler rather bland, but the

STAR WARS OLD REPUBLIC: Lightsaber first, and ask questions later

murderous derring-do and bloody competitiveness of the Bounty Hunter proved entertaining, sinister and packed with sharp dialogue and performances. The quests rarely escape the traditional kill X of X or collect X of X or courier X to X format – but because they're book-ended by a quick, fully voice-acted chat with someone, a sense of context beyond 'reward' is often able to creep in.

Sometimes you want to help another character or have a negative reaction to that hissing, paranoid weirdo and decide not to pitch in. This is most effective when you're about to fight a named or boss character and have a quick argument first. It often includes a shoot-first-ask-questions-later approach, but in some cases there's an attempt to talk them out of whatever skullduggery they're up to.

Other players

Old Republic offers stronger stuff than most MMOs – it's a lavish world away from the scrolling text boxes and frozen-faced non-playing characters (NPCs) of its rivals. At the same time, we rather wish it was a fully fledged single-player RPG with a wider choice of actions and encounters that don't always boil down to clicking a series of icons (or pressing number keys) to win another identi-fight.

We also found the presence of other players, shouting, moaning and talking to NPCs, who were, only moments ago, claiming you were their only hope, Obi Wan Kenobi, can disrupt the fantasy. If this is supposed to be your amazing adventure, what are all these other guys doing?

In happy contrast to that is that the other players can boost the sense of this being a living, breathing place. Of course, a space station would be full of other people all pursuing their own self-interests. Not everyone in the Old Republic is here waiting in a neat line to sell you new trousers and offer up quests. If you can deal with the noise of people's neediness, Old Republic can be a thrilling place to be.

However, it's hard to escape the fact that, a few key features aside – companion NPCs and, come the end game, owning your own spaceship, being the most notable – Old Republic adheres very closely to the World of Warcraft model. Quests, crafting, postboxes, flightpoints, skill trainers and PVP arenas are all found here, too. We'd much prefer to feel more surprised by the Old Republic and for it to be a voyage of discovery and wonder, rather than of the same loot-crazed hamster wheel we've all spent so much time on already. That said, making laser guns and lightsabers fit that model so naturally is a respectable achievement, given that sci-fi MMOs have struggled in the past.

There isn't much the game gets wrong, but if it matched the lavish world design with something more than workmanlike it could have been the giant-killer it wants to be.

Verdict

Massively ambitious (if uneven) in its attempts to bring single-player storytelling into a persistent online world, but massively average in the MMO that lies underneath, Old Republic's success is far more modest than its budget promised.
⊠ **Alec Meer**

GAMING PLATFORM

OnLive

Free

Contact
- onlive.co.uk

Read more
- tinyurl.com/82emdts

System requirements
Windows Vista/7/Mac OS X 10.5.8 or later; 1024x768-pixel screen resolution; 2Mbps internet connection

OVERALL
★★★★☆

ONLIVE's MarketPlace has a range of popular games, old and new

OnLive streams video games from a remote server to your computer, so you can play the game in a light client application. This opens up a whole new world of gaming possibilities: suddenly you don't need to own a computer that's packed with memory or has the latest high-end graphics card or processor to run even the most high-end games.

In fact, the system specs for OnLive are simply a 2Mbps connection (although 5Mbps is recommended), Windows 7 or Vista (or Mac OS X 10.5.8), and a screen resolution of 1024x768. It can run on just about any modern machine.

It's a great idea, but it's viable only if the experience is as good as gaming on a fast-paced local PC. Any hint of slow response times or tardy framerates will render OnLive interesting, but not fit for purpose.

Get gaming

There is a good, albeit small, collection of new releases, with big-ticket items such as Deus Ex: Human Revolution and Batman: Arkham City; and lots of lower-key titles such as Borderlands, Braid and BioShock.

Pricing is on par with purchasing a game on Steam or picking up a physical copy (Deux Ex and Arkham City are both £34), and you can purchase a three- or five-day pass for some games for £3.99 or £5.99 respectively.

We're happy to report that the service is responsive, for the most part, and games are perfectly playable. There are instances when the display starts to break up; the video is fairly low in resolution, and sometimes the quality decreases,

Instead of buying a subscription service, try OnLive's online offering

but by and large we found it perfectly possible to play the latest games on everything from a MacBook Air to a two-year old Windows computer.

How well it works for you will depend on your internet connection speed. We tried OnLive in various locations, and the results were mixed. In our office and a hotel room, reaction times were exemplary, although the display occasionally became sporadic. And every now and then we saw a 'Network quality too low' error on the screen, and had to wait.

The worst performing environment was in a home setting using Virgin Media's up to 50Mbps service. This reported several lost connections, and failed to work roughly half the time. This is because raw download speed isn't the most important factor when using online gaming services; rather, ping, jitter and packet loss are what matter.

So before you purchase games for OnLive, test your service using Pingtest.net, or try the service using one of the trial games available.

Technically, OnLive is a remarkable achievement. The video feed is split into 16 parts, with each of them compressed using the H.264 codec. The audio is also split up, and the video and audio are then reassembled into the display while your controls are sent in the other direction.

Games are slightly converted to work remotely, and all game saves are made instantly to your online account. There's no installation process, and games can be played

the instant you purchase them. One nice touch is that you can watch other gamers before making a purchase to get a real feel for what a game is like.

We have a lot of faith in OnLive's future. It has a number of tricks up its sleeve. Aside from the desktop versions, an OnLive Game System enables you to play the latest games on a TV with an Xbox-style controller. And, at just £69, it's a lot cheaper than buying an Xbox or PlayStation 3.

Then there's the promise of tablet versions in development. At press time, the iPad version was undergoing approval by Apple. The thought of playing full-scale computer games on an iPad is beyond appealing.

And it's scalable. As games get better, and internet service improves, OnLive will always be able to run the latest games at the highest level of quality. And when it comes to forking out for a new graphics card, more memory, or a whole new system to play the latest game, the idea of just streaming it here and now for the same price will become increasingly appealing.

Verdict

We found OnLive to be a great way to play the latest titles. When it works, it takes your breath away. But there is a price to be paid. Unlike installing on a desktop, we found consistency of service to be an issue. Sometimes it performs better than others, and we'd still be tempted to pick up a physical copy or full digital download if our PC was capable of playing it. ⊠ **Mark Hattersley**

NAS DRIVE

Qnap TS-659 Pro II

£1,000 inc VAT

Contact
■ qnap.com

Read more
■ tinyurl.com/7mx6oz7

System requirements
Six-bay NAS; 1.8GHz Intel Atom D525; 1GB DDR3 RAM (expandable to 3GB); Qnap DiskStation 3.2; 6x SATA 6Gbps lockable drive bays; two-line backlit LCD panel; 2x USB 3.0; 4x USB 2.0; 2x eSATA; 2x 90mm cooling fans; internal power supply; 175x257x235mm

Build: ★★★★☆
Features: ★★★★½
Performance: ★★★★☆
Value: ★★★½☆

★★★★☆

Qnap has upgraded its professional range of multi-bay NAS drives, adding USB 3.0 and SATA 6Gbps. For anyone that needs several terabytes of secure always-on storage, the six-bay TS-659 Pro II is a versatile, highly capable choice.

A recent addition to Qnap's Linux-based OS is Raid 10, where an even number of disks are striped for performance like Raid 0, and mirrored like Raid 1 for security.

It's when adding this extra level of performance, or data security, that a six-bay NAS becomes invaluable, still allowing for huge reserves of storage. Current 3TB disks can here equal 18TB of combined storage. But even with 2TB disks, you can create around 10TB of secure storage.

The chassis is a solid all-metal housing with key-lockable drive bays. Two 90mm fans are rear-mounted to draw air over the disks. It's inevitably more noisy than a single-fan setup, although not uncomfortably so.

Driving the NAS is a dual-core 1.8GHz Intel Atom and 1GB RAM, expandable to 3GB. There are two USB 3.0 ports, four USB 2.0, two eSATA and two gigabit ethernet.

We tried the Qnap with a variety of disk and Raid configurations in OS X and Windows, using AFP, NFS and SMB/CIFS network protocols.

The best large-file performance hit 112MBps for sequential reads, with 100MBps available at the 512kB file level. This was using a pair of 2TB Seagate Barracuda Green disks in a Raid 0 configuration, connected over AFP. The Qnap's write performance reached around 70MBps, although at the 1MB file level this dropped to just 15MBps.

A quartet of 2TB Hitachi Deskstar disks in a Raid 5 array gave better throughput, with writes of 74MBps. The single gigabit interface was the limiting factor in large-file sequential reads. Our tests saw transfers reach 116MBps, translating to 928Mbps.

We noticed poor small-file transfer characteristics over AFP, as low as 0.06MBps for 4kB files. Using Windows' SMB sharing, we saw much healthier small-file speeds – 3.5MBps for 4kB writes – at the expense of lower top speed of around 70MBps.

A NAS drive should be easy to administer and maintain, and here Qnap has some of the best tools in the business. As well as supporting all the important networking protocols and user/group/folder share requirements, it also adds useful features such as remote replication, iSCSI targets and volume encryption. For enterprise applications, VMware vSphere and Citrix XenServer are also supported.

All configuration options are handled by a rich Ajax web interface. It's not as approachable as Synology's DSM, but it offers more features. Our only niggle is the inability to enable power down external disks after a preset idle time.

Verdict

The Qnap TS-659 Pro II is pro network storage hardware, with bay capacity, processing power and memory expandability to accommodate your requirements. USB 3.0 ports aid its integration with modern external storage. The £775 Pro+ version is still in production, but this £1,000 TS-659 Pro II offers extra bells and future proofing.
⊠ **Andrew Harrison**

WIRELESS ACCESS POINT

Zyxel WAP3205

£50 inc VAT

Contact
■ zyxel.co.uk

Read more
■ tinyurl.com/7gdcgx4

Specification
2.4GHz 802.11n; 2x 10/100 LAN port; WPS/QOS/WDS; 2x 2dBi external detachable antennae; 12V DC power adaptor; 162x115x33mm; 245g

Build: ★★★★☆
Features: ★★★★½
Performance: ★★★☆☆
Value: ★★★☆☆

★★★½☆

In small homes and buildings, most wireless routers provide a strong enough signal for a reliable connection in every room. But a single antenna won't guarantee total coverage in larger buildings.

This can be overcome with a second router, but it's hasslesome to maintain two networks. A wireless access point, such as this Zyxel, offers a solution. Configured in repeater mode, it extends the signal from the router, with the same security and routing rules, subnet and IP allocation. The entire network is configured via the web interface.

It connects to the router via one of two LAN ports on its rear. The other port is useful for connecting a wired device or another extender to further increase the network's range. The number of extenders you connect is limited only by how many the router can handle. Zyxel recommends a maximum of three.

Features

The WAP3205 has a white plastic chassis, and its front is adorned with several green LEDs. It's a bland-looking device, but will look at home next to a Zyxel router. There are the two aforementioned LAN ports, plus a Wireless Protected Setup (WPS) button, but there's little else to it.

Setup wasn't as easy as we'd hoped. The WAP3205 can operate as an Access Point, Universal Repeater or a Client. We plugged in the device, connected it to a PC and successfully obtained an IP address from the router. Currently set to Access Point instead of Universal Repeater mode, however, it created a second SSID rather than extend our network. This is still preferable to using a second router, since it uses the same routing rules and IP address allocation from the router.

Logging into the onboard software to adjust this setting was tricky. The manual advises setting a static IP address, without explaining how to do so.

Once we'd run through the setup wizard, which prompts you to choose your network's SSID and enter its

Specification
24in LCD monitor; 1920x1200 resolution; 16:10 aspect ratio; IPS panel; matt anti-glare 3H hard coating; LED backlight; 8ms response time; tilt/swivel/pivot/ height adjustments; arsenic-, mercury-free panel; 2,000,000:1 DCR; 178-degree (H/V) viewing angles; DVI-D; DisplayPort; VGA; 1x USB 2.0 upstream; 4x USB 2.0 downstream; DC power connector for Dell Soundbar; 514x556x180mm; 7.49kg

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

★★★★☆

24in MONITOR
Dell UltraSharp U2412M

PC ADVISOR RECOMMENDED

Something of a rarity these days, Dell's U2412M is a 24in monitor with a 1920x1080-pixel resolution in the classic 16:10 widescreen ratio.

The Dell has been designed for the very best image quality and premium ergonomics. Its subtle design and smart, business-like appearance will look professional and tidy on any desktop.

The stand incorporates height, tilt, swivel and pivot adjustments. VGA, DVI and DisplayPort inputs are provided, as is a four-port USB hub.

The Dell delivers a consistently excellent image, due to an in-plane switching (IPS) panel. Wide viewing angles keep colours and brightness uniform across the entire surface, making the display just as easy to use in portrait mode as in landscape.

Adjusting the display settings is effortless. The four small buttons that control the display menus are unmarked, but their onscreen legends are easier to read in a dark environment than printed labels.

The Dell's 16:10 format and lack of speakers or an HDMI port mean this is far from an ideal multimedia display, but Dell's optional AY511 SoundBar can be fitted to the bottom of the screen. This allows audio playback with virtual-surround capability.

The display's dynamic contrast mode with a claimed ratio of 2,000,000:1 can also give film playback some extra punch. This is disabled in standard and text modes by default to ensure predictable, consistent output while working on documents.

Dell's pixel-defect policy entitles you to a replacement monitor if any bright pixel is found during the three-year warranty period. This can be extended to four or five years at additional cost.

Lab results
Our Spyder calibration tests confirmed what our eyes had already told us: the U2412M delivers exactly the accurate colour response we would expect from an IPS display.

We recorded colour reproduction that encompassed 76.9 percent of the NTSC gamut, and 108.6 percent of sRGB. This means images should be roughly similar to the sRGB standard, even without calibration.

During calibration, we measured a maximum brightness of 250cd/m^2, with black level down to 0.37cd/m^2. In our checkerboard contrast test we managed to achieve a maximum contrast ratio of 672:1.

The panel's matt finish keeps reflections to a minimum.

Of the many vivid colours this monitor can handle, Dell's favourite is most certainly green. It's selected 'environmentally responsible' materials, including halogen-free laminates in the circuit boards. It also features some impressively low power-consumption figures.

At maximum brightness the monitor drew only 30W of power; at 120cd/m^2 we measured just 17W.

Verdict
The Dell UltraSharp U2412M delivers very good value for money at £280, and will appeal to anyone who needs to spend a lot of time in front of their monitor. It's not a multimedia display, but its excellent image quality and premium ergonomics make it great for design work, long-term office use and even gaming. It's an absolute pleasure to use. ⊠ **Paul Monckton**

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security key, the WAP3205 rebooted and the second SSID disappeared.

We connected the Zyxel to our network, then used an ethernet cable to connect an FTP server to the router. We disabled the router's wireless to ensure only the signal

of the WAP3205 was at play, then measured performance by recording how long it took for a file to transfer wirelessly from the FTP.

At short range we measured 7.6MB per second, which dropped to 3.8MB per second at long range. These speeds are reasonable, but there are other reasons why you might want to use this Zyxel.

Indeed, the WAP3205 could be of use to small businesses with a reasonably large number of wireless devices, that want to extend a single wireless network without complicating their setup.

And for home use, its support for 802.11n enables the WAP3205 to boost the speed of 802.11g routers.

You may find it cheaper to simply upgrade your router, of course.

If you already have an 802.11n network but need more range, this is a useful solution.

Verdict
While its performance is reasonable, the Zyxel WAP3205 isn't the fastest wireless access point we've seen – of course, speed isn't the main reason you might want this device. It does an effective job of extending a wireless network or giving an older router a speed bump. Once configured, the software is relatively easy to use, but we found setup required perseverance and prior knowledge. ⊠ **Orestis Bastounis**

PRINTER

Brother HL-5380DN

£336 inc VAT

Contact
- brother.co.uk

Read more
- tinyurl.com/73ukx62

Specification

Mono laser printer; 1200x1200dpi print resolution; 30ppm quoted print speed; 23.1ppm actual print speed; USB 2.0; ethernet; 250-sheet input tray + 50 multipurpose; 32MB memory; toner costs £99; 8,000-page print yield; 393x384x259mm; 9.5kg

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

★★★★☆

The Brother HL-5380DN is a luxury mono printer that advertises high speeds and strong upgrade options.

Navigation is standard but effective. The green LCD display is rather basic, even if the options offered within are plentiful. When problems occur, this screen changes to a lurid orange.

A PIN can be used to prevent a sensitive document printing until you're free to collect it, which can be useful in busy offices.

There's no Wi-Fi, just ethernet and USB. The Brother's 32MB memory allocation can be bolstered to a substantial 544MB if needed.

The rugged input tray supports 250 sheets, while a further 50 can be added via the flimsy multipurpose tray. Two more 250-sheet trays can be fitted to the bottom; these cost around £85 each.

An Anti-Curl switch helps to stop thin paper becoming too furled.

Since the printer doesn't have a great deal of depth, it's not possible to build in a full-size output tray.

The paper support flaps are only partially successful at catching the paper, too.

In the fastest 300/600dpi modes, the Brother achieved a strong speed of 23.1 pages per minute (ppm).

The high-quality 1200DQ mode adds extra clarity at a still excellent speed of 21.4ppm, and only the highest 1200dpi mode sees the performance splutter to a mere 12ppm. Even in the highest mode, however, the output isn't amazingly dark. Characters are of good definition, but they are a touch too light.

Auto-duplex mode is adequate. The 600dpi setting sees the speed drop from 23.1 to 12ppm. This is close to a 50 percent fall in performance, but it's fast enough to remain usable.

The Brother handles graphics well, and showed considerable depth in our monochrome tests.

The £336 price tag is high, but volume users will benefit from low running costs. At just over 1.2p per page, the Brother is a very cheap printer to run. The toner is reasonably easy to replace, too.
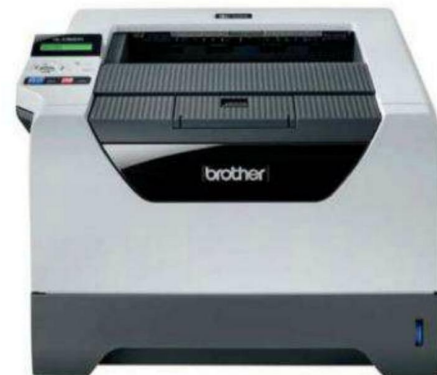
The Brother is well built, although the light/dark grey livery will be a matter of personal taste. The control panel is oddly bulbous, protruding from the side as though it was squeezed in at a later date.

Verdict

The Brother is a serious-minded printer for those who like plenty of options. It's not pretty, and its output is a little on the light side, but running costs are inexpensive.
⊠ **Robin Morris**

EXTERNAL LAPTOP DISPLAY

Toshiba PA3923E-2LC3

Although smart in appearance, this portable LCD screen from Toshiba offers a muted experience. It's billed as a second screen for laptops, for either business or entertainment use, enabling easy desktop presentations to several people.

From a distance, the unit's matt black casing gives the illusion of weight and rigidity, but on closer inspection we found it rather plasticky. At 754g, it's light enough to carry around with you, but the plastic quality feels as though it would not withstand many bumps.
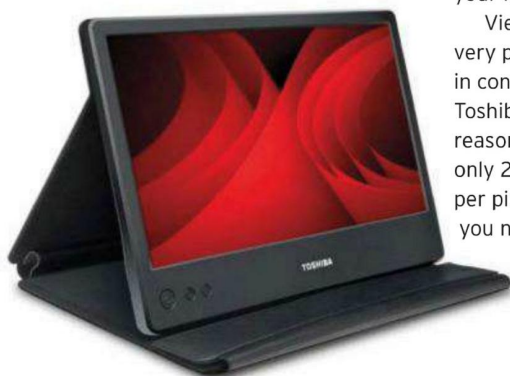
Thankfully, the unit comes complete with a leather-effect cover, which also folds into a stand.

When we attempted to separate the screen from the case for the first time, the unit's glued-on Velcro backing almost tore straight off. It's hardly the impression you'd want to leave at a business meeting.

The 14in, 1366x768-pixel matt LCD is bright and clear enough for the purposes of business and leisure.

The screen connects via USB 2.0, using DisplayLink technology, so requires a driver to be installed on your PC before it will work.

Viewing video soon revealed a very poor colour gamut, resulting in conspicuous colour banding. Toshiba's specifications betray the reason here – this screen can display only 256,000 colours, or just 6bit per pixel. To get decent colours, you need 8bit per pixel, to create 24 million colours.

This low image fidelity gets worse – much worse – as you view the screen

off-axis. That loss of clarity will noticeably dampen the experience for peripheral viewers.

The unit is Mini USB-powered, with an auxiliary DC power socket for underpowered USB ports. Three buttons are found on the unit's front, for brightness up/down and power.

We tried playing HD video and were surprised to see relatively smooth motion – USB DisplayLink technology screens once had rather low framerate capability for showing motion video. You could even get away with using this screen for gaming, but its quality shortcomings make it less attractive for serious entertainment use.

Verdict

This Toshiba portable screen's unflattering plastic casing feels too fragile for on-the-road use, and the viewing experience is far from exceptional. At around £150, we'd hope for an in-plane switching screen with decent image quality and viewing angles. ⊠ **Aaron Lee**

£150 inc VAT

Contact
- toshiba.co.uk

Read more
- tinyurl.com/7j3sywq

Specification

14in portable screen; 1366x768; 16:9 aspect ratio; TN panel; 400:1 contrast ratio; Mini-USB 2.0 port; 5V DC input; brightness controls; 342x240x16mm; 754g (1.3kg with case)

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

★★★☆☆

ACCOUNTING SOFTWARE

Business Accountz Basic 2012

Business Accountz finance software comes in three versions: Basic, Professional and Enterprise. They're aimed at small, medium and large businesses respectively. We've reviewed the Basic edition.

An advanced mode is available via the Rapid Data Entry option, while clicking a new Eazy button takes beginners to a simplified interface. This addition makes Business Accountz the most straightforward tool available for managing your money.

The Eazy mode contains a 16x16 grid, with seven headings at the top: Buy/Pay, Sell, Bank, Report, Set Up, Tax and Tax/Year End. Each heading has a number of options that perform specific functions in relation to your accounts.

On the Buy/Pay page, for example, you can add or remove a supplier, log a company vehicle purchase, and more. It's extremely easy to use, moving the focus away from baffling terminology and toward getting things done,

allowing you faster access to information about your money.

New features in the Enterprise version of Business Accountz are Supplier Tracking, Purchase Orders and Automated Entries.

It's still reliant on third-party support for Payroll, but the tight integration of the package focused around the Eazy button should leave you time to deal with that.

Accountz is multi-platform, although you'll need to install Java. Support is free and reports are produced in a format your accountant will understand.

Verdict

Business Accountz's Eazy button simplifies the accounting process for the uninitiated, without reducing the functionality. ⌧ **David Bradforth**

BUSINESS ACCOUNTZ 2012 is a useful tool for managing your money

Blu-ray writers

Blu-ray writers and blank recordable discs are coming down in price, making them a more viable long-term storage medium for consumers. Orestis Bastounis tests the latest models

Blu-ray drives offer more than the ability to store and play HD and 3D films. Their large capacity makes them ideal for storing vast quantities of data, too. In fact, Blu-ray may soon take over from standard 4.7GB DVDs in this manner.

Blu-ray didn't have an easy start. An early format war with rival HD-DVD slowed its initial adoption, while HD video can be enjoyed via alternative means. Despite this, Blu-ray has become hugely popular.

An enormous library of Blu-ray films is available and standalone players can now be bought for less than £50. Alternative ways to access HD films, such as online streaming services, require a fast internet connection – something that isn't available to everyone in the UK. The simplest way to enjoy HD video is via Blu-ray, and most new films are released on DVD and Blu-ray simultaneously.

Recordable Blu-ray has had an even rougher ride with consumers. The first writers were hideously expensive, as was recordable media. Prices have gradually fallen, and a rise in hard-disk costs due to recent flooding in Thailand has coincided nicely for the technology. Now might be the time to reconsider your backup medium.

A recordable Blu-ray disc (BD-R) can hold 25GB per layer, with dual-layer discs holding 50GB. BDXL discs that can hold 100GB of data are on the way. With due care, and kept free from scratches, a BD-R should last a lifetime. Hard disks are far more likely to fail, making recordable Blu-ray a strong primary or even secondary alternative.

The read and write speeds of CD, DVD and Blu-ray discs are written as multiples of a base transfer rate (such as 1x, 2x, 4x and so on). That rate is different for each optical format, reflecting the amount of data a blank disc can hold. At single-speed, a Blu-ray writer copies data at 4.5MB per second. Writing 25GB of data to a BD-R at this speed takes around an hour and a half.

Faster drives and media are available, but external drives that connect to a PC's USB 2.0 port are limited to eight-speed (equivalent to 36MBps). To go beyond this, a connector that supports higher transfer rates, such as USB 3.0, must be used.

There are three options for adding recordable Blu-ray drive to your PC: an internal model is suited to desktop PCs, while external drives are available in slim USB 2.0 chassis capable of six-speed.

Faster SATA or USB 3.0 versions are limited only by the speed of the recordable media (itself currently maxing out at six-speed). Many ultraportable laptops don't come with an optical drive, so an external Blu-ray writer that connects to a spare USB port is an excellent addition.

Internal Blu-ray readers aren't that much more expensive than DVD writers, and may soon become a standard feature in desktop PCs – we already see combo DVD/Blu-ray drives in many of the PCs we review. Internal Blu-ray writers and recordable media are more expensive, but their price has dropped considerably.

Backing up data to a BD-R is as easy as burning a CD or DVD. Companies such as Nero, Roxio and CyberLink provide the necessary burning software, while packet-writing tools let you add and remove files to and from a BD-RE disc, allowing it to be reused.

Here, we look at a selection of internal and external Blu-ray writers. Verbatim and TDK have provided us with a selection of media with which to test each drive, including both single and dual-layer BD-Rs, and rewritable BD-RE discs.

Build	★★★★⯪
Features	★★★★☆
Performance	★★★★☆
Value	★★★★⯪
Overall	★★★★⯪

PC ADVISOR RECOMMENDED

ASUS SBW-06C1S-U SLIM

£111 inc VAT

• uk.asus.com • tinyurl.com/7s3wpv6

Asus' SBW-06C1S-U is a slim external Blu-ray writer that's almost small enough to fit into a coat pocket. It's powered entirely from the USB bus, with no need for an external mains adaptor. It weighs only 380g, so could be a good choice of portable backup drive.

A Y-cable plugs into two USB 2.0 ports on the computer to draw enough power for a reliable burn. If you're using a laptop, ensure it has enough ports and is fully charged.

Asus has added a few lights to try to make the drive look more appealing than the usual black box. It's covered in glossy black plastic and, rather than use a standard LED status indicator, a criss-cross of transparent lines glow blue when the drive is in use. This looks far better than the LEDs at the front of most optical drives we've seen.

At four-speed, our 21GB image burned to disc in 30 minutes and 18 seconds. Using six-speed media the Asus managed 22 mins 7 secs. Both results were the slowest in our group test. Unlike other slim external Blu-ray writers, the drive was quiet when the disc was spinning.

VERDICT: The Asus is a good external Blu-ray writer, provided you have enough USB ports on your laptop to power it. Its performance in our tests with both four- and six-speed media was slow, but reliable. This drive is also quiet, portable and affordable.

Build	★★★★☆
Features	★★★★⯪
Performance	★★★★★
Value	★★⯪☆☆
Overall	★★★★⯪

BUFFALO MEDIASTATION BR3D-12U3

£200 inc VAT

• buffalotech.com • tinyurl.com/453bx7L

Buffalo's high-end external Blu-ray writer has a maximum write speed of 12-speed, which should be enough to burn a single-layer disc in 8 mins when connected to a PC via USB 3.0. The problem, for now, is that we're limited to six-speed media – using which, its 10 mins 48 secs performance was the fastest result among all the drives here.

The Buffalo also put in a good showing with four-speed media, and wrote 21GB to disc in 16 mins 4 secs in our tests.

It's expensive and rather bulky, roughly the same size as a standard internal optical drive, and it needs its own power supply. When a disc is spinning, the drive was only slightly louder than our PC's whirring fans.

Despite the speed limitations of our blank media, Nero allowed us to write to disc at eight- and 12-speed. Performance here was strong, and the resulting discs were readable in a standalone DVD player.

When we tried the drive with a different disc-burning suite, using both TDK and Verbatim media, we found the speed came close to the claimed 12-speed write figure as the burn reached the edge of the disc.

VERDICT: Excellent performance can be had from this Buffalo external Blu-ray writer, and this may improve should 12-speed media become available. However, it's pricey, bulky, and requires its own power supply.

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

BUFFALO MEDIASTATION BR-X816U2

£129 inc VAT

• buffalotech.com • tinyurl.com/6qxqcxu

This BR-X816U2 is the older and significantly cheaper sibling of the BR3D-12U3, but identical in appearance. It also requires an external power supply, and is similarly quiet during operation. Unlike its brother it lacks support for USB 3.0, however, and is limited to eight-speed writing.

We had some interesting results when we plugged this drive into our PC. First, Windows thought it was a USB 3.0 model, and suggested plugging it into the faster port for better performance.

As with the BR3D-12U3, Nero allowed us to select eight-speed burning for our four-speed TDK media, and 10-speed for our six-speed discs. Our test results didn't tally with the write times that should have been possible at those speeds, suggesting only part of the process is conducted at the faster speeds. However, our results were rather impressive for a USB 2.0 Blu-ray burner.

Using four-speed media, we wrote 21GB of data to disc in 20 mins 46 secs, and the same file to eight-speed media in 13 mins 35 secs. Both resulting discs were accessible by a standalone Blu-ray player.

VERDICT: This well-priced external drive makes its presence known with a bulky power adaptor. The Buffalo is by no means portable, but offers very good performance with today's recordable Blu-ray media.

PC ADVISOR TEST CENTRE

Build	★★★★★
Features	★★★★☆
Performance	★★★★★
Value	★★★★⯪
Overall	★★★★★

PC ADVISOR BEST BUY

LG BE12LU38.AUAE10B

£126 inc VAT

- uk.lge.com • tinyurl.com/8yvfLfp

The white casing and enormous size of LG's external Blu-ray writer means it dwarfs even Buffalo's offerings. This 1.6kg burner is not at all portable and requires its own power supply. It is somewhat quieter than its Buffalo rivals, however.

The drive can be mounted on its side if needed. Its metallic eject button responds to the lightest touch, at which point the broad faceplate springs forth, spitting out the disc.

Its maximum single-layer write specification is 12-speed. The LG has both a USB 2.0 and eSATA connector at the rear (an eSATA bracket is bundled for desktop PCs).

As with both Buffalo drives, Nero allowed us to choose faster speeds than the media was rated. Write times were longer than we would expect at those speeds, however, suggesting the performance boost wasn't possible across the entire burn. Using four-speed TDK media we recorded 21GB of data in a very fast 15 mins 48 secs; the same test took longer to complete using six-speed Verbatim media, at 18 mins 54 secs. Both discs played fine on our standalone player.

VERDICT: Given its good pricing, quiet operation, interesting design and strong performance, we're enamoured with this LG. On the down side, it's big, heavy and lacks USB 3.0 support – although an eSATA port and bracket are usefully supplied.

Build	★★★★⯪
Features	★★★☆☆
Performance	★★★★⯪
Value	★★★★★
Overall	★★★★⯪

PC ADVISOR RECOMMENDED

LG BH10LS38.AUAU10B

£60 inc VAT

- uk.lge.com • tinyurl.com/8ytujef

LG is a well-known name in optical-drive circles, and was one of the only companies to sit on the fence by producing a Blu-ray/HD-DVD combo drive before the disc format war drew to a close. Its internal Blu-ray-only BH10LS38 is significantly better-looking than some cheap, run-of-the-mill DVD drives, with an attractive glossy front panel.

It's a reliable drive, and not as noisy as the Lite-On during operation, but there's little more here to grab our attention.

With write performance maxing out at 10-speed, this drive is technically slower than its more expensive Lite-On rival. However, since we remain limited to using six-speed media, this drive put in the faster performance in our tests.

Unlike its external brother, the BE12LU38, the LG was limited to the speed rating of the blank media in our tests, and recorded 21GB of data to a four-speed disc in 29 mins 32 secs. This wasn't the slowest result on test, but toward the back of the pack. In our six-speed test, the LG managed 20 mins 7 secs, a middling performance. Both discs played fine on our standalone Blu-ray player.

VERDICT: The best thing about the LG is its price, which has potential to open up the recordable Blu-ray format to many more consumers. Its performance isn't the best on test, but it's good-looking and fairly quiet.

Build	★★★★★
Features	★★★☆☆
Performance	★★★★★
Value	★★★★⯪
Overall	★★★★☆

LITE-ON iHBS212

£94 inc VAT

- liteon.com • tinyurl.com/65pxhuj

Lite-On's internal Blu-ray drive has an excellent specification, able to write to single-layer BD-Rs at 12-speed and dual-layer media at eight-speed. Dual-layer discs hold twice as much data, but accept it at a slower rate. The fastest media we could find was rated at four-speed – it should take around 46 mins to entirely fill this disc.

We experienced a few issues with the iHBS212 during testing. It was unable to erase the content of a recordable Blu-ray disc written by another drive, and an update to Nero led it to recognise the Lite-On as a CD writer. We place the blame for this with the software rather than the drive itself, but had to resort to Imgburn for completing our performance tests.

Using four-speed media, it recorded 21GB of data in 30 mins 2 secs, making it the second-slowest on test. Our six-speed testing clocked the drive at 21 mins 58 secs.

This drive not only costs more than the LG BH10LS38, it's noisier too. But its 12-speed write performance could make the Lite-On the better drive if compatible media ever becomes available.

VERDICT: Since most Blu-ray writers are limited by the speed rating of available media, it makes less sense to pay extra for a 12- rather than 10-speed drive. For now, the LG is the better option.

PLEXTOR PX-LB950SA

£90 inc VAT • plextor.be • tinyurl.com/7whr2kb

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★½☆
Overall	★★★½☆

External Blu-ray burners come in all shapes and sizes, but internal drives have no such freedom – they're constrained by the physical dimensions of a 5.25in drive bay, and all buttons and LEDs must face forward. Such drives are usually differentiated only by their price, performance and audible output.

Plexor's PX-LB950SA has a similar specification to its rivals. It can write to standard 25GB BD-R discs at 12-speed, to 50GB BD-R DL discs at eight-speed, and BD-RE discs at two-speed.

The Plextor's blisteringly fast 12-speed write potential is a moot point, since the fastest media available is rated at six-speed. In our testing with TDK media, however, we found the write speed rose steadily as the burn progressed.

Using four-speed TDK media, the Plextor recorded our 21GB of data in a very good 19 mins 50 secs; its result using six-speed Verbatim media was slower, at 22 mins 1 sec.

VERDICT: Plextor's PX-LB950SA is by far the fastest internal drive on test when using four-speed TDK media, but its lead over its rivals narrows with six-speed Verbatim discs. It's not especially noisy either, but we were less impressed with its relatively low price tag.

How we tested

When using any backup medium, reliability is the number-one concern. If a BD-R disc recorded by a particular drive is unable to be read by another Blu-ray burner or playback device, it's useless.

We used Nero Video to create a 21GB encryption-free Blu-ray video (BDMV) disc image, made up of several smaller files.

We then used Nero Burning ROM to copy this disc image to four-speed TDK and six-speed Verbatim discs. For each drive, we recorded how long it took to complete this test. If the BDMV then played in a standalone player, it was recorded as a successful burn.

We also paid attention to how noisy the drive was in operation, and the write speeds offered by the Nero software. It's possible to exceed the disc speed rating with some drives.

Most important is whether a disc can be successfully burned at the top speed that both the media and drive support. Today's media tops out at six-speed, and it's essential that a Blu-ray drive can provide a sustained data rate to match – particularly when using cheap media.

We also used the free ImgBurn utility to measure performance. We didn't test the drives' CD and DVD performance.

	ASUS £111 inc VAT ★★★★★ PC ADVISOR RECOMMENDED	BUFFALO £200 inc VAT ★★★★★	BUFFALO £129 inc VAT ★★★★★	LG £126 inc VAT ★★★★★ PC ADVISOR BEST BUY	
Product name	SBW-06C1S-U	BR3D-12U3	BR-X816	BE12LU38.AUAE10B	
Drive type	external	external	external	external	
Connector	USB 2.0	USB 3.0	USB 2.0	USB 2.0/eSATA	
BD-ROM (read)	6x	8x	7.2x	10x	
BD-R 25GB (write)	6x	12x	8x	12x	
BD-RE (write)	2x	2x	2x	2x	
BD-R DL 50GB (write)	4x	12x	8x	12x	
Lightscribe	yes	yes	yes	yes	
DVD-R (read)	8x	16x	16x	16x	
DVD-R (write)	8x	16x	16x	16x	
DVD-R DL (write)	4x	8x	4x	8x	
DVD-RAM (write)	5x	5x	5x	12x	
CD-R (write)	24x	40x	32x	48x	
CD-RW (write)	16x	24x	24x	24x	
CD-R (read)	24x	40x	32x	48x	
Burn time (4x media)	30 mins 18 secs	16 mins 4 secs	20 mins 46 secs	15 mins 48 secs	
Burn time (6x media)	22 mins 7 secs	10 mins 48 secs	13 mins 35 secs	18 mins 54 secs	
Warranty	2 years	2 years	2 years	1 year	
Dimensions	157x142x21mm	160x220x50mm	160x220x50mm	163x260x50mm	
Weight	364g	1.13kg	1.11kg	1.38kg	
Powered by	dual USB connectors	external power brick	external power brick	external power brick	

PC ADVISOR TEST CENTRE

TDK TB150U

£115 inc VAT • tdk.com • tinyurl.com/6w6ytuc

TDK's TB150U is a slim USB 2.0 Blu-ray writer that, like Asus' offering, is incredibly portable. A two-pronged USB cable is used for power, meaning you don't need to lug about an external brick.

The TB150U lacks the visual niceties of the Asus, taking the form of a slim, matt black plastic box. An activity LED flashes at the front. It's noticeably louder than that drive, too.

Maximum writes are limited to six-speed, which looks very slow in the face of most external models in our round-up. And unlike those drives, while its performance is sufficient for today's standards, the TDK won't be able to offer faster performance as higher-rated media becomes available.

Perhaps not surprisingly, this TDK drive put in third-slowest performance with its own-brand four-speed media, at 29 mins 58 secs. Using Verbatim six-speed media, the TDK drive recorded our 21GB test file to disc in 21 mins 45 secs.

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★☆☆
Overall	★★★⯪☆

VERDICT: Louder than the Asus and without the lower price tag and pleasing design to make up for it, we're unlikely to recommend this TDK as the better drive. Its more than up to the job and, indeed, faster than its rival, but you can do better for your money.

Conclusion

Our four- and six-speed tests with each Blu-ray drive didn't result in a single coaster, with every disc able to play in a standalone Blu-ray player. That's a good sign for the Blu-ray format, and something that's not necessarily a given with CD and DVDs.

All the drives were able to burn the recordable discs at their maximum speed rating, although our tests with BD-RE media found them capable of only two-speed.

At £60, LG's BH10LS38 offers brilliant value for money, and is worth considering for anyone building a new desktop PC. For something more portable, Asus' BW-06C1S-U is a slim external model that's powered by two USB 2.0 ports.

Our favourite in this group is LG's BE12LU38. The white casing and chunky finish make it feel robust. It was quiet in our tests and supports faster media, too.

Our most interesting finding during testing is that some drives are capable of writing to media faster than the discs are said to support. Verbatim told us that a disc's speed rating simply reflects the best guaranteed performance, and faster write speeds may be possible using some drives. We can't guarantee you'll get the same results as us, however, particularly when using different brands of media. ⊠

LG £60 inc VAT ★★★★⯪ PC ADVISOR RECOMMENDED	LITE-ON £94 inc VAT ★★★★☆	PLEXTOR £90 inc VAT ★★★⯪☆	TDK £115 inc VAT ★★★⯪☆
BH10LS38.AUAU10B	iHBS212	PX-LB950SA	TB150U
internal	Internal	internal	external
SATA	SATA	SATA	USB 2.0
10x	ripped at 7x	8x	6x
10x	12x	12x	6x
2x	2x	2x	2x
10x	8x	8x	6x
yes	yes	yes	yes
16x	16x	16x	8x
16x	16x	16x	8x
8x	8x	8x	6x
12x	12x	12x	5x
48x	48x	48x	24x
24x	24x	24x	24x
40x	48x	48x	24x
29 mins 32 secs	30 mins 2 secs	19 mins 50 secs	29 mins 58 secs
20 mins 7 secs	21 mins 58 secs	22 mins 1 sec	21 mins 45 secs
1 year	2 years	2 years	2 years
146x170x41mm	146x170x41mm	146x170x41mm	157x142x21mm
749g	650g	670g	324g
internal PSU	internal PSU	internal PSU	dual USB connectors

Business laptops

Getting the right laptop for the task at hand is just as important in a business setting as it is in a home environment. Ben Camm-Jones guides you through your possible options with a selection of office and industrial-use laptops

The options facing business users when choosing a laptop can be overwhelming if you don't know where to start. No two businesses are the same, and every professional user will have different requirements. Getting the right laptop for you will very much depend on identifying your usage patterns and the type of programs you're going to be using regularly.

Some business users are frequently on the road, but that doesn't necessarily equate to them needing a small-and-light laptop, possibly with slimmed-down functionality. Rather, if the system is going to spend most of its life in the car boot and come out only when you're sitting at a desk with access to mains power, a desktop-replacement model may be the better option. Of course, if the laptop will be on your lap on flights and train journeys, its dimensions, weight – and also battery life – will need to be carefully considered.

The screen is very important – after all, it's the component that you'll spend most of your time looking at. Glossy panels tend to offer richer colours and a sharper image, but they're less easily readable indoors and out. A matt-finish or anti-glare panel is more suited to such conditions. For spreadsheet use, you'll also want a large display.

The keyboard is important if your work involves a lot of typing up documents and email. Look for a model with full-size letter keys and Return, Backspace, Spacebar and Shift keys of decent proportions. For spreadsheet use, a numeric keypad may be important.

Some business users will require a rugged design for outdoor use. We've reviewed one such laptop, the Dell Latitude XFR, which takes this ruggedisation to the limit with its military-spec build quality.

Security is an important aspect for business laptops, and many machines include fingerprint or smart card readers. Encrypted hard disks and trusted platform module (TPM) chips will ensure that lost or stolen laptops don't quickly reveal their secrets to unauthorised personnel.

Build	★★★★⯪
Features	★★★★☆
Performance	★★★★☆
Value	★★★⯪☆
Overall	★★★★☆

PC ADVISOR BEST BUY

APPLE MACBOOK PRO 13IN (LATE 2011)

£1,299 inc VAT • apple.com/uk • tinyurl.com/88oee2u

If appearances matter in your line of work, then arming yourself with a MacBook Pro is a smart choice. But Apple's 13.3in-screen laptop is more than just a pretty face. The construction isn't only handsome, it's sturdy. Everything about the MacBook just oozes quality.

Some top-notch components are found inside. Intel's dual-core i7-2640M is one of the youngest CPUs in the Sandy Bridge family, and a WorldBench score of 132 points (in Windows) is testament to its performance. This is not the fastest laptop on test, but it's no slouch.

Other specifications include 4GB of RAM and a 750GB hard disk; an SSD option is available for £80 more.

The keyboard is a dream to use. The keys provide just the right amount of feedback, and aren't too noisy even when typing frantically. The Return key is on the small side, but well-positioned on the keyboard's outer edge. The touchpad is more generously proportioned, although the mouse button area is rather small.

The 13.3in screen is great to look at, even if its gloss finish makes it reflective under normal lighting conditions. The colours are deep and rich, and the lines sharp and accurate.

For the ultimate in portability, Apple offers the MacBook Air. But this Pro model won't weigh you down either, at a touch over 2kg.

Battery life is decent, lasting just over six hours in our tests. It's a non-removable type, but lithium-polymer rather than lithium-ion. As with most models here, graphics handling is an afterthought.

The MacBook Pro offers two USB 2.0 ports, but no USB 3.0. There is, however, a Thunderbolt port, which offers incredibly speedy data transfers to compatible peripheral devices. This also doubles up as a Mini DisplayPort, and there's a FireWire 800 connection, too.

Dual-band Wi-Fi covers all angles, specified for 2.4GHz and 5GHz operation with 802.11a through to 802.11n networks.

VERDICT: The MacBook Pro looks great and offers strong performance and long battery life. Boot Camp lets you install Windows 7 alongside OS X if needed (OEM licences cost from £75). All this comes at a price, though, and Apple's Pro is costly in the face of the Lenovo.
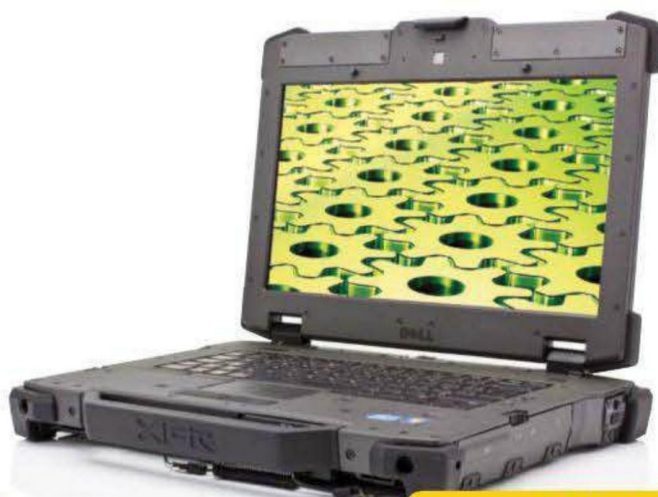
Build	★★★★⯪
Features	★★★★☆
Performance	★★★★⯪
Value	★★☆☆☆
Overall	★★★⯪☆

DELL LATITUDE E6420 XFR

£4,500 inc VAT • dell.co.uk • tinyurl.com/7wjrxon

The Dell Latitude E6420 XFR is a fully ruggedised laptop that's ideal for outdoors and industrial workers. It's tough enough to withstand a natural disaster, should one occur.

It looks more like a toolbox than a laptop, complete with a carrying handle. A sturdy clip locks down the lid, and fingerprint and smart card readers control secure access.

The 14in display has a matt finish that'll prove readable in all lighting conditions, and also works as a stylus- or finger-operated touchscreen. The stylus is attached to the laptop by a plastic coil, which is the least rugged thing here; it looks as though it might rather easily get snagged on a passing branch.

We weren't impressed with the calibration of the screen, which seemed to register touches more than an inch away from where we were actually making contact with the screen.

All the ports and inner workings of the Dell are protected by its outer shell. You must open catches to access such things as the USB ports (2.0 only), the SD Card slot, the DVD±RW drive and even the battery. There are so many little nooks and crannies that it can take a while to find the port you're looking for.

Component-wise, a powerful Intel Core i7 processor and small but speedy 128GB SSD are found inside. These helped the Dell Latitude to a very good score of 143 points in our WorldBench 6 benchmarking suite, second only to the Toshiba Portégé. The CPU takes its toll on battery life, however, and the Dell lasted 5 hours 30 mins in our tests.

Gaming isn't the most important job of a business laptop, but it's good to know that the nVidia NVS 4200M graphics card with 512MB of video memory is capable of light gameplay during a spot of down time. Its 46fps score in Fear (Maximum detail) also suggests this laptop will be capable of handling graphics-intensive applications.

VERDICT: The Dell Latitude E6420 XFR is a laptop well-suited to the outdoors. Potential owners must have deep pockets, however, with this laptop costing a staggering £4,500. Performance is good, but we were disappointed with the touchscreen's calibration.

PC ADVISOR TEST CENTRE

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Build	★★★★½
Features	★★★★½
Performance	★★★★☆
Value	★★★½☆
Overall	★★★★☆

HP ELITEBOOK 8740W XT914UA

£3,500 inc VAT • hp.com/uk • tinyurl.com/89vb3y5

HP's EliteBook 8740w is billed as a mobile workstation, but mobile certainly isn't the first word that springs to mind. It's enormous, with a 17.3in display – though with a 16:10 aspect ratio rather than 16:9. Despite HP's claims that it weighs only 3.57kg, we suspect that figure to be a rather conservative estimate with all its components in place. Very poor battery life means you won't lug it far in any case.

The price tag is similarly huge, at £3,500. But the HP's build quality and specification are in line with its intended use.

Its Intel Core i7-740QM processor is an older model running at 1.73GHz. Its 112-point result in our WorldBench 6 test is somewhat disappointing, but we can expect this quad-core processor to perform better with multithreaded applications and in general multitasking with high-end software.

The EliteBook stands out for its graphics capabilities. Its nVidia Quadro 5000M graphics card scored 174fps in Fear at Maximum detail, making it significantly better suited to graphics-intensive applications than any other laptop here – an area where its large screen will also prove useful.

As a workstation designed for professionals, the HP has a screen to match. The DreamColor panel is a matt anti-glare type, with superb visibility from all angles, thanks to IPS technology. More than that, it works at 10bit/pixel quality, with the Quadro card accommodating 1 billion colours.

The keyboard is a full-size backlit model with a numeric keypad to the right. We weren't so happy with the small Return key, though.

Just about every conceivable kind of port can be found on the HP. HDMI is notably absent; instead, there's a less widely supported DisplayPort connection. The USB provisions are generous, and there are smart card and fingerprint readers for secure logins.

VERDICT: The sheer size of the HP EliteBook 8740w means you won't want to carry it too far, and its sub-two-hour battery life is evident of the fact it's intended as a desktop replacement. It's a great choice for anyone with the need for high-end graphics performance, but pricey.

Build	★★★★☆
Features	★★★☆☆
Performance	★★½☆☆
Value	★★★★☆
Overall	★★★½☆

LENOVO THINKPAD X121E 3045

£529 inc VAT • lenovo.com/uk • tinyurl.com/7r5woar

As the smallest and cheapest model in our business laptops round-up, Lenovo's ThinkPad X121e will appeal as a take-anywhere laptop to the budget-conscious. Such users may need to rethink their feature and performance expectations at £529, however.

The 11.6in screen is excellent, with a matt finish that doesn't reflect light. Shiny panels give richer colours and sharper images, but anti-glare screens are more practical – especially if you're working in an environment where you can't control the lighting.

It's lightweight and has a small footprint, so it'll easily fit on to the drop-down table of an aeroplane seat. There's also a good selection of wired and wireless connectivity options. An optical drive has been omitted to keep down the size and weight.

Battery life is decent, lasting 6 hrs 15 mins in our tests, and the lithium-ion battery is easily removed should you want to carry a spare for extra unplugged mileage.

The modest 1.3GHz Core i3 processor does a fair job, but the ThinkPad is unsuitable for graphics-intensive applications – it scored just 13fps in Fear at Maximum detail. For everyday tasks, its 72-point WorldBench score suggests it'll do just fine.

Our biggest bugbear with the Lenovo is its keyboard. Although the letter keys are of a good size, everything else is a bit cramped and can make for an uncomfortable typing experience. The left and right Arrow keys are directly next to the Page Up and Page Down keys, for example, so you'll need to type carefully when navigating a document using the keyboard – there's a good chance that your cursor will end up in completely the wrong place.

The touchpad is also on the small side, but long-term Lenovo/IBM users will appreciate the trackpoint in the middle of the keyboard, which may prove to be the easier way of steering your cursor.

VERDICT: The Lenovo ThinkPad X121e is a well-priced, easily portable laptop that has a lot to offer business users on the move. The keyboard and touchpad are sources of frustration, and an optical drive is missing. Its value for money is undeniable, however.

Build	★★★★☆
Features	★★★★⯪
Performance	★★★★⯪
Value	★★★☆☆
Overall	★★★★☆

PC ADVISOR RECOMMENDED

TOSHIBA PORTÉGÉ R830-1DZ

£1,615 inc VAT • toshiba.co.uk • tinyurl.com/7ow49xo

If you need a laptop that blends performance with portability, Toshiba's Portégé is a worthy contender. It boasts an Intel Core i7-2640M dual-core processor running at 2.8GHz. Coupled with 8GB of RAM – and, crucially, an SSD for storage – it stormed through our WorldBench 6 real-world speed test with a score of 153, putting it 10 points clear of the nearest competition here.

All this speed is crammed into a diminutive frame weighing just 1.4kg, making the Portégé a very good option for those who need to take their laptop on the road. In such instances the very good battery life – also the best on test – will prove to be a real lifesaver. We recorded 7 hrs 33 mins in MobileMark 2007.

The keyboard is very pleasant to use. Despite being rather small, we didn't feel as though any of the keys had been slimmed down a step too far. It lends itself well to accurate typing.

The design is smart and sober, although the Toshiba doesn't have the build or class of the MacBook Pro. Our review model's solid-state storage means everything seems to run faster, and the drive itself is more robust – if rather low in capacity. It stands a better chance of brushing off the shakes and rattles of everyday use.

Despite having no spinning disk, the Toshiba is noisy with an audible whirring fan. This does a good job of keeping things cool, and this laptop is one of few that can actually be operated from your lap.

The 13.3in screen is a matt, non-reflective type, driven by Intel's integrated graphics processor. This scored a lowly 18fps in our Fear gaming test at Maximum detail settings.

Provision for both wired and wireless connectivity is good, and there is a range of ports at your disposal, including USB 3.0. The Portégé also includes an optical drive that can read, write and re-write single- and dual-layer DVDs – a welcome touch.

VERDICT: Graphics aside, the Toshiba Portégé offers performance that's head and shoulders above the competition in this group test. High-quality components and a variety of connectivity options in a compact shell mean this Portégé comes highly recommended.

Build	★★★⯪☆
Features	★★★⯪☆
Performance	★★★⯪☆
Value	★★★★☆
Overall	★★★⯪☆

TOSHIBA TECRA R850-10R

£999 inc VAT • toshiba.co.uk • tinyurl.com/876zpdn

Toshiba's Tecra is neither the fastest, the cheapest, nor the most full-featured of the laptops in our group test. But it's a good all-rounder for desk-bound workers with the occasional need to travel offsite. It also offers decent performance, with an Intel Core i5-2520M dual-core processor helping to power the Tecra to a solid WorldBench score of 128 points in our tests.

There's little in the Toshiba's specification to set it apart from the competition. The Tecra's 4GB of RAM is standard, while the 320GB hard-drive capacity seems a little stingy. This disk is a fast 7,200rpm type, though, and offers improved performance over 5,400rpm units.

There's a DVD±DL drive and a decent selection of ports, including one USB 3.0, an eSATA/USB 2.0 combo, two USB 2.0 ports and a DisplayPort. Toshiba also includes VGA for hookup to older monitors.

Battery life is particularly impressive, with the Tecra able to survive 7 hrs 8 mins in our MobileMark 2007 tests. And usability is rather good – the keyboard buttons are well-spaced, and there's a numeric keypad to the right. All the most frequently used keys are of a good size, as are the Arrow buttons.

The touchpad is easy to use; should you favour a trackpoint, there's one here too. You can turn off the touchpad easily enough with a dedicated button found just below the Spacebar.

The 15.6in screen is a cracker. Although its colour depth and sharpness are compromised somewhat by the anti-glare coating, the Tecra's display is eminently usable and won't reflect ambient light into your eyes. The Toshiba's overall design is plain and unfussy, which is perfect for a work-focused laptop.

The catch is in the integrated graphics, with which the Tecra scored just 12fps in Fear at Maximum detail. It's no good for graphics-intensive applications, such as design or 3D modelling programs.

VERDICT: Toshiba's Tecra is just a bit too big for someone who needs to take their laptop on the road, but it's well-suited as a desktop replacement. Build quality isn't as robust as some others in this category, although its Windows performance is good.

Conclusion

The Toshiba Portégé and MacBook Pro are fairly evenly matched, so it'll come down to personal preference whether you choose the lighter and faster but pricier Windows-based Toshiba or the sturdier Mac. You could even opt for a 128GB SSD for the MacBook for just £80 – still less than the R830's asking price.

When deciding on our Best Buy, we favoured the design and versatility of Apple's Pro with its Thunderbolt connection over the USB 3.0-touting Toshiba.

Both 13.3in-screen laptops are on the small side for prolonged use, however. If your laptop will more often find itself in an office environment than on a train or plane, Toshiba's Tecra is a strong offering. It has a commendable keyboard with a numeric keypad, a good-size 15.6in screen and useful battery life, yet it's not overly weighted.

A less-expensive, more portable option is the Lenovo ThinkPad. This well-priced laptop offers decent performance, but it isn't suited to high-end or graphics-heavy applications. For everyday office tasks it'll do just fine.

With a bigger budget, and a call for workstation-class computing, HP's EliteBook is a great choice. It's a beast, though, at almost 4kg plus 1kg for the charger.

If you work outdoors or in an industrial environment, Dell's military-spec Latitude is an easy – if expensive – choice. It'll be able to withstand just about any natural disaster and offers searing performance, too. ⊠

	APPLE £1,299 inc VAT ★★★★☆ PC ADVISOR BEST BUY	**DELL** £4,500 inc VAT ★★★★☆	**HP** £3,500 inc VAT ★★★★☆
Model name	MacBook Pro 13in (Late 2011)	Latitude E6420 XFR	EliteBook 8740w XT914UA
Processor	2.8GHz Intel Core i7-2640M dual-core	2.7GHz Intel Core i7-2620M dual-core	1.73GHz Intel Core i7-740QM quad-core
Screen size and type	13.3in glossy LED-backlit	14in matt LED-backlit touchscreen	17.3in matt LED-backlit
Resolution (pixels)	1280x800	1366x768	1920x1200
Operating system	Mac OS X 10.7 Lion	Windows 7 Professional 64bit	Windows 7 Professional 64bit
RAM	4GB DDR3-1333MHz	4GB DDR3-1333MHz	8GB DDR3-133MHz
Storage	750GB 5,400rpm SATA 3Gbps HDD	128GB SATA 3Gbps SSD	500GB 7,200rpm SATA 3Gbps HDD
Graphics	Intel HD Graphics 3000	nVidia NVS 4200M with 512MB RAM	nVidia Quadro 5000M with 2GB RAM
Video out	Thunderbolt	HDMI, VGA	DisplayPort, VGA
Audio	stereo speakers, headphone jack, mic	headphone jack	stereo speakers, headphone jack, mic
USB	2x USB 2.0	2x USB 2.0	2x USB 3.0; 2x USB 2.0
FireWire/eSATA	1x FireWire 800	1x eSATA	1x eSATA, 1x FireWire 400
Optical drive	DVD±RW DL	DVD±RW	DVD±RW DL
Wireless	802.11a/b/g/n; Bluetooth 2.1 + EDR	802.11a/b/g/n; Bluetooth 3.0	802.11a/b/g/n; Bluetooth 2.1
Ethernet	gigabit	gigabit	gigabit
Card slot	SDXC	SD	SD/MS Pro/xD-Picture
Other features	HD webcam, iLife software	ruggedised design, stylus, webcam, fingerprint reader, smart card reader, ExpressCard 54	webcam, fingerprint reader, smart card reader, ExpressCard 54
Battery	63.5Wh lithium-polymer non-removable	60Wh lithium-ion removable	73Wh lithium-ion removable battery
Battery life[1]	6 hrs 8 mins	5 hrs 30 mins	1 hr 44 mins
WorldBench 6 score	132	143	112
Games score (fps)[3]	18	46	174
Dimensions	325x241x23mm	389x308x67mm	398x286x37mm
Weight	2.05kg	3.99kg	3.57kg

[1] Tested in MobileMark 2007 Productivity [2] Failed to run AutoDesk 3ds Max 8.0 SP3 (Rendering) test [3] Tested in Fear (Maximum detail)

How we test

PC ADVISOR TEST CENTRE

We test every laptop's battery life, graphics performance and overall real-world speed in our lab. All Windows laptops are tested with their default operating system.

Battery life is recorded using the industry-standard benchmark, BAPCo MobileMark 2007. We use the Productivity test, which loops a series of intensive everyday applications until the battery is empty. Pauses are added between short runs to simulate the way laptops are used in real life.

Each laptop's graphics capability is measured using the game Fear and its built-in framerate-measurement tool. Here we have tested at 'Maximum' detail settings.

We use WorldBench 6 to measure performance. This stopwatches a PC as it completes a series of scripted operations, using 10 real-world programs. The results are compared to a reference 2.2GHz Intel Core 2 Duo PC with 2GB of RAM and Raid hard drives, which sets a 100-point baseline score.

LENOVO	TOSHIBA	TOSHIBA
£529 inc VAT	£1,615 inc VAT	£999 inc VAT
★★★★☆	★★★★☆ PC ADVISOR RECOMMENDED	★★★★☆
ThinkPad X121e 3045	**Portégé R830-1DZ**	**Tecra R850-10R**
1.3GHz Intel Core i3-2357M dual-core	2.8GHz Intel Core i7-2640M dual-core	2.5GHz Intel Core i5-2520M dual-core
11.6in matt LED-backlit	13.3in matt LED-backlit	15.6in matt LED-backlit
1366x768	1366x768	1366x768
Windows 7 Professional 64bit	Windows 7 Professional 64bit	Windows 7 Professional 64bit
4GB DDR3-133MHz	8GB DDR3-1333MHz	4GB DDR3-1333MHz
320GB 7,200rpm SATA 3Gbps HDD	128GB SATA 3Gbps SSD	320GB 7,200rpm SATA HDD
Intel HD Graphics 3000	Intel HD Graphics 3000	Intel HD Graphics 3000
HDMI, VGA	HDMI, VGA	DisplayPort, VGA
stereo speakers, headphone jack/mic	stereo speakers, headphone jack, mic	stereo speakers, headphone jack/mic
1x USB 3.0, 2x USB 2.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0
n/a	1x eSATA/USB 2.0 combo	1x eSATA/USB 2.0 combo
n/a	DVD±RW DL	DVD±RW DL
802.11b/g/n, Bluetooth 3.0	802.11a/b/g/n; Bluetooth 3.0	802.11a/b/g/n; Bluetooth 3.0
gigabit	gigabit	gigabit
SD/MS Pro	SD/MS Pro/xD-Picture	SD/MS Pro/xD-Picture
webcam	webcam, fingerprint reader	webcam, fingerprint reader
54Wh lithium-ion removable	66Wh lithium-ion removable	66Wh lithium-ion removable
6 hrs 15 mins	7 hrs 33 mins	7 hrs 8 mins
72[2]	153	128
13	18	12
289x208x24mm	316x227x18mm	379x252x25mm
1.57kg	1.4kg	2.44kg

MEDIA centre PCs

Paul Monckton tests six ultra-quiet machines designed to sit unobtrusively in your living room, where they'll dish up all manner of audiovisual entertainment

A suitably configured PC can form a formidable multimedia hub, capable of recording, storing and playing back all your media. Hook it up to a TV or projector and you can enjoy all manner of audiovisual entertainment from the comfort of your living room.

A Windows- or Mac-based media-centre PC is usable for running standard desktop applications and, given a decent graphics card, large-screen gaming. A media system can also be built around a PC running Linux. Along with OS X systems, overall security is higher with little need for annoying antivirus.

Windows Media Center, which comes built into some versions of Windows 7, offers an interface that's easy to operate via remote control. Many of the PCs we review here are supplied with a dedicated remote, and some can also be controlled using a smartphone or tablet app.

Media-centre PCs can require more technical knowledge and time to set up than standard desktops. For more complex systems, we recommend checking what level of support is offered. A home installation may be a better option still.

Almost any PC could be used as a media centre, but the noisy fans and spinning disks of tower systems can ruin your viewing or listening pleasure – and will look out of place in the living room. A quiet, compact PC is advisable and, since media PCs are designed to be powered on for long periods, most should consume less power and generate less heat.

With this in mind, don't look for the fastest processor you can afford. You'll want to strike a delicate balance between power requirements and performance.

If the PC is to be used only for media, a low-power CPU is ample. AMD's E-350 is one such chip, and is capable of processing DirectX 11.0 graphics and HD video content. The Asus E35M1-I Deluxe motherboard comes pre-stuffed with the E-350, and makes a strong basis for a low-power PC.

Cooling is an important consideration. You want to listen to music and video, not your PC, so minimise the number of fans and moving parts. Fanless systems can be built using large passive heat sinks, often aided by multiple heat pipes designed to draw heat away from core components to an external radiator. The Zeno NT-TX2000,

for example, has a custom-built fanless CPU block, linked to large aluminium heat sinks on the outside of the case.

Where cooling fans are your only option, ultra-quiet fans have intelligent spin speeds to balance cooling with noise.

Graphics cards and hard drives can also be the source of noise, with whirring fans and spinning platters respectively. For a little extra cost you can plump for a quiet graphics card and SSD storage.

For components that can't be silenced, sound-proofing material and enclosures can provide an effective solution.

Internal PCI or external USB TV tuners allow you to watch and record live TV. Dual or twin tuner cards let you watch and record different channels simultaneously. A premium model, such as Black Gold's BGT3600, lets you watch Freeview and Freesat in both standard definition and HD.

Blu-ray playback is standard on many media PCs. Expect to find a BD-ROM/DVD combo.

Photography by Dominik Tomaszewski

APPLE MAC MINI

£896 inc VAT • apple.com/uk • tinyurl.com/88gug5h

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

PC ADVISOR RECOMMENDED

It's not designed as a media PC, but the Mac mini's tiny proportions, elegant chassis, excellent performance and low power consumption make it a formidable piece of hardware for the living room.

Based on laptop-spec components, the Mac mini is impressively small and draws a tiny amount of power. We measured only 10W when idle, which is around one third of the juice required to maintain any of the competition in our group test.

Our review model is fitted with a 2.53GHz Intel Core i5-2520M processor and discrete AMD Radeon HD 6630M graphics. We installed Windows 7 to run our benchmark software. The mini's 123-point WorldBench 6 score is lower than some rivals, but represents surplus power for our purposes. Gaming performance was among the best of the group, losing out only to the Chillblast.

Since the demise of Apple's Front Row, no media-centre interface ships with the mini. Plenty of free options are available and support the Apple Remote (£15, supplied separately), including XBMC, Plex and Boxee. Alternatively, it's easy to navigate media with OS X Finder.

We added Apple's compact Bluetooth keyboard (£57), Magic Trackpad (£59) and Remote to this £699 device, enabling us to control the mini from a desk or sofa, and using multitouch gestures not available elsewhere.

The mini is missing an optical drive, so you'll need to hook up an external drive to play CDs or DVDs. We added the Macbook Air SuperDrive (£66). There's no native Blu-ray support within OS X,

but you can use third-party apps such as Mac Blu-ray Player, or remove DRM while ripping the disc, then play films with ULC.

If you prefer to run Windows rather than the native OS X, as we have done for benchmarking purposes, factor in the cost of a licence. But note that you'll be losing out on the benefits of stable Unix-based operation, a multitouch interface and a virus-free environment.

VERDICT: This ultra-compact PC has ultra-low power consumption and is quiet in use. The Apple Mac mini makes a compelling media PC when matched with the right peripherals and software.

ARBICO ZIPPY X35 HD MEDIA CENTRE

£549 inc VAT • arbico.co.uk • tinyurl.com/82xd4fq

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

Arbico's Zippy packs plenty into its compact case. An Asus E35M1-I Deluxe motherboard is preinstalled with an AMD E-350 processor, and fitted with a huge heat sink that removes the need for a large fan to keep core components cool.

This Mini ITX motherboard is suited to the Arbico, which is the only PC in the group designed to stand vertically. Its Blu-ray drive is also mounted upright, making it fiddly to use.

As a media PC, the Arbico performs adequately; for any other computing task, this system is slow. We recorded just 57 points in WorldBench 6, which is less than half the score of its closest rival.

The system idles at around 27W, and is considerably less power-hungry than all but Apple's Mac mini. Graphics processing is integrated within the E-350 processor, providing Direct X 11.0 capabilities and accelerated playback of HD content.

A Compro E750 dual-tuner DVB-T card provides recording and playback facilities on two Freeview channels simultaneously. The Zippy is also supplied with an infrared remote control, enabling you to operate Windows Media Center from the sofa.

Equally sofa-friendly is the included Logitech K400 Wireless Touch Keyboard. Its diminutive proportions find room for a built-in touchpad and mouse buttons, which can be easily operated with a thumb while holding the keyboard in mid-air.

Despite the motherboard's entirely silent cooling solution, small fast-spinning fans are built into the Zippy's system case that

add enough noise to make the PC significantly louder in use than Chillblast's powerful Fusion Avatar Media PC.

VERDICT: The Zippy X35 HD Media Centre is noticeably slower than any other PC in this group test, but it also costs less. It provides enough power for fulfilling multimedia duties and accelerated Blu-ray playback, but is weak for gameplay. Its fanless CPU cooler is wasted in a case that employs noisy fans.

PC ADVISOR TEST CENTRE

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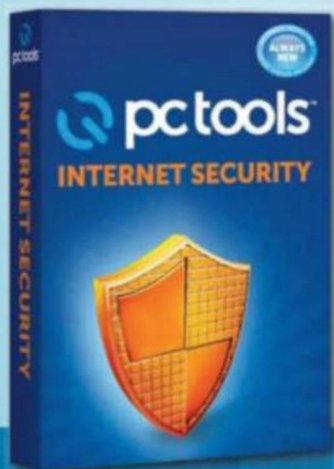
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CHILLBLAST FUSION AVATAR MEDIA PC

£799 inc VAT • chillblast.com • tinyurl.com/8843u87

Inside the slim case of the Chillblast Fusion Avatar lurks a beast of a media-centre machine. Featuring an overclockable Intel Core i5-2500K processor it is by far the fastest computer in our group test, with the potential for yet more speed. Its WorldBench 6 score of 172 points puts it in the same league as a standard high-end tower desktop PC, with the Chillblast providing plenty of power if you want a single machine for general computing and entertainment.

The system case, while considerably larger than the Apple, Arbico or Quiet PC offerings, is a slim landscape affair with plenty of vents to assist airflow. Inside, we find mostly standard-size PC components, including a Samsung Blu-ray/DVD combo drive and a hushed BeQuiet-branded power supply.

It's the only system other than the Apple Mac mini to include a dedicated graphics processor – in this case an AMD Radeon HD 6570. With this card installed, the Chillblast is capable of very creditable gaming framerates, making it a powerful all-rounder.

While the graphics card is cooled without the need for a fan, the CPU is not. However, Chillblast has selected quiet components, including a low-profile Arctic Cooling Freezer CPU cooler, to help minimise disturbance. A 60GB SSD is the Windows boot drive, while a huge 2TB hard drive can store your films, music and games.

Chillblast has selected a Peak dual-channel DVB-T tuner, enabling you to watch one channel while recording another. It doesn't support Freeview HD or Freesat HD, however.

Build	★★★½☆
Features	★★★★☆
Performance	★★★★★
Value	★★★★☆
Overall	★★★★½

PC ADVISOR BEST BUY

The supplied Logitech Wireless Combo MK260 keyboard is a compact model that incorporates media-control functions but no touchpad. Instead, you must wrangle with a standard desktop mouse. A basic remote control is also included.

VERDICT: Delivering the best overall performance, the Chillblast Fusion Avatar Media PC still relies on audible fans to keep itself cool. CyberLink Blu-ray playback software is supplied in addition to the standard Windows Media Center.

CRYO PC ALTO

£1,038 inc VAT • cryopc.co.uk • tinyurl.com/3ophwhd

Cryo PC's virtually silent Alto system is a great example of a PC designed from the ground up as a media centre.

Much like Quiet PC's Zeno, the Alto contains no cooling fans. The processor, graphics card and power supply are all passively cooled, thereby running silent. A 2TB Seagate Barracuda hard drive is the only noise-generating component, but combined with a 60GB Corsair Force SSD using Intel Smart Response Technology. When this cache is in full effect, it not only speeds up the PC but can also enable the hard drive to power down, cutting down on noise. All the spare drive bays are also vibration-damped.

These silent components are situated within Zalman's huge HD503 Home Theatre PC case, which is styled much like a home-cinema receiver amp and should blend in nicely with similar-looking equipment.

It features a large rotary volume control alongside two rows of control buttons. A built-in LCD panel uses the supplied iMon software to display various media-related information, so you may not need to keep your TV switched on to use the system for audio.

The Alto is powered by an Intel Core i3-2100T, with the 'T' denoting a low-power processor. Cryo PC has undervolted this chip to reduce power consumption and heat generation further. It's the slowest Intel chip in our round-up, coming in just behind Apple's Mac mini in WorldBench 6, but delivers enough power for multimedia applications, such as the included Total Media Theatre.

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

The nVidia GT430 graphics card adds DirectX 11.0 support and the ability to play some games if you stick to lower resolutions. Also included is a Black Gold quad-tuner TV card, which supports both DVB-T (terrestrial) and DVB-S (satellite) standards. You can plump for a dual-tuner card supporting Freeview HD at no extra cost.

VERDICT: Although it's very large, the Alto looks and sounds the part. There's plenty of room for internal expansion, too.

ECLIPSE DMS PRO TOUCH i321Z68

£699 inc VAT • eclipse-computers.com • tinyurl.com/7wszoj4

Build	★★★⯪☆
Features	★★★★☆
Performance	★★★☆☆
Value	★★★☆☆
Overall	★★⯪☆☆

When this PC arrived in the Test Centre, we were somewhat taken aback. Housed in EZCool's huge HT 960 Touch Media Centre case, the Eclipse could easily swallow up four Quiet PC Zeno systems.

A flap at the front of its aluminium fascia conceals a Samsung Blu-ray/DVD combo drive and several ports. Above this are two rows of media-control buttons. Most striking, though, is the 4.3in touchscreen, which functions as a second Windows display and means you shouldn't need to turn on the PC to listen to music.

In addition to the standard Windows Media Center software, Eclipse supplies Soundgraph's HD Frame application. This offers a tile-based interface, which runs on your TV or the touchscreen.

The system features a powerful dual-core 3.1GHz Intel Core i3-2105 processor. It's slower than the 3.3GHz version favoured by Quiet PC, but the combination of an Asus P8Z68-V LX motherboard and a fast 1TB hard disk enables the Eclipse to match that PC's performance in WorldBench 6. It's rather noisy in operation, however.

An ultra-compact Trust Thinity wireless keyboard is included, which comes with a handy recharging dock and a built-in touchpad.

The system was supplied with two remote controls, and this marked the beginning of our confusion. One is for the Compro TV

tuner, and we believe the other is designed to work with the IR receiver built into the case – we were unable to get it to work.

The HD Frame software also had us foxed, and first-time users should steer clear. This PC certainly warrants a home installation.

VERDICT: This is a physically imposing PC, and incredibly complex. It's fast enough, but generates too much fan noise.

Model name	**APPLE** £896 inc VAT ★★★★⯪ PC ADVISOR RECOMMENDED	**ARBICO** £549 inc VAT ★★★★★	**CHILLBLAST** £799 inc VAT ★★★★⯪ PC ADVISOR BEST BUY	
Model name	Mac mini	Zippy X35 HD Media Centre	Fusion Avatar Media PC	
Processor	2.53GHz Intel Core i5-2520M	1.6GHz AMD E-350	3.4GHz Intel Core i5-2500K	
RAM	4GB DDR3-1333	4GB Mushkin DDR3-1333	8GB DDR3	
Storage	500GB 5,400rpm 2.5in SATA HDD	1TB 3.5in SATA HDD	60GB SSD + 2TB 3.5in SATA HDD	
Power supply	85W Delta Electronics	150W integrated	BeQuiet	
Motherboard	Apple Mac mini board	Asus E35M1-I Deluxe	Asus P8H67-M Pro	
CPU cooler	custom active cooler	integrated fanless cooler	AC Freezer 7 LP	
USB	4x USB 2.0	2x USB 3.0, 6x USB 2.0	2x USB 3.0, 6x USB 2.0	
TV tuner	none	Compro E750	Peak Dual Tuner Freeview card	
Graphics card	AMD Radeon HD 6630M, 256MB VRAM	AMD Radeon HD 6310	HIS AMD Radeon HD 6570, 1GB VRAM	
Media-centre software	none	WMC	WMC, CyberLink PowerDVD	
Sound	onboard	onboard	onboard	
Connectivity	dual-band 802.11n, gigabit ethernet, Bluetooth	gigabit ethernet	802.11n, gigabit ethernet	
Optical drive	MacBook Air SuperDrive DVD±RW	Samsung BD-ROM/DVD±RW	Samsung BD-ROM/DVD±RW	
Operating system	OS X 10.7 Lion	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	
Ports	S/PDIF, Thunderbolt, HDMI, FW800	S/PDIF, HDMI, DVI	S/PDIF, HDMI, DVI, VGA	
Case	Apple Mac mini unibody	Arbico Zippy Black Case	Silverstone SST-ML03B Milo	
Keyboard & mouse	Bluetooth keyboard & Magic Trackpad	Logitech K400	Logitech MK260	
Extra features	SDXC slot, iLife software, remote control	none	remote contol	
WorldBench 6 score	123	57	172	
Gaming performance (fps)[1]	77/48	24/12	118/62	
MediaEspresso time	8 mins 33 secs (no hardware encode)	37 mins 7 secs (no hardware de/encode)	7 mins 43 secs (no hardware encode)	
Idle power consumption	10W	27W	39W	
Warranty	1-year collect-and-return	2-year labour only	2-year collect-and-return	

[1]Tested in Crysis at 720p, Low/Medium settings

PC ADVISOR TEST CENTRE

QUIET PC ZENO NT-H67 FANLESS MEDIA PC

£1,444 inc VAT • quietpc.com • tinyurl.com/7s2zwxd

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

PC ADVISOR RECOMMENDED

Housed in a Zalman Zeno NT-TX200 system case, Quiet PC's Zeno is perhaps the most stylish here, albeit in a different way to Apple's meticulously designed Mac mini, which lacks an internal optical drive.

The compact Zeno NT-TX200 is designed with the living room in mind. Its brushed black aluminium chassis presents a minimalist appearance, and features a small power button and a slot to house a slim-line Blu-ray/DVD combo drive. A remote control is supplied.

It's fitted with its own heatpipe-based CPU cooler, which connects to two banks of large metal fins that flank both sides of the case. In this way, the case itself is a giant cooler, and no fans are required.

The only sound you'll hear is the Blu-ray drive spinning, or an occasional low-level rattle from the 2.5in hard disk.

Despite its fanless design, the Quiet PC sports a powerful Intel Core i3-2125 processor. This provides ample processing power for general-purpose computing tasks, as well as multimedia playback. In our transcoding tests, the Quiet PC outperformed all others.

A superb Black Gold TV tuner card offers dual DVB-T and dual DVB-S tuners, allowing four channels to be received at once. Both the terrestrial and satellite modes support HD broadcasts, making this the only media PC here capable of handling HD TV as standard.

The only component not obviously tuned for media-centre use is the Microsoft wireless keyboard and mouse. While the keyboard is of a high quality with dedicated media buttons, it's a standard desktop model rather than one you can use comfortably on your lap.

VERDICT: Compact, quiet and powerful, the Quiet PC Zeno incorporates the best TV capabilities and is almost everything a media PC should be. It's also by far the most expensive PC here, however.

CRYO PC £1,038 inc VAT ★★★★☆	**ECLIPSE** £699 inc VAT ★★★☆☆	**QUIET PC** £1,444 inc VAT ★★★★☆ PC ADVISOR RECOMMENDED
Alto	DMS Pro Touch i321Z68	Zeno NT-H67 Fanless Media PC
2.5GHz Intel Core i3-2100T	3.1GHz Intel Core i3-2105	3.3GHz Intel Core i3-2125
4GB Corsair DDR3-1600	8GB DDR3	8GB DDR3
60GB Corsair Force SSD + 2TB 3.5in SATA HDD	1TB 3.5in SATA HDD	1TB 2.5in SATA HDD
460W Seasonic fanless	650W EZCool	1000W Zeno
Gigabyte GA-Z8MA-D2H-B3	Asus P8Z68-V LX	Gigabyte GA-H67N-USB3-B3
passive	standard Intel cooler	Zeno heatpipe cooling
4x USB 3.0, 6x USB 2.0	2x USB 3.0, 7x USB 2.0	2x USB 3.0, 4x USB 2.0
Black Gold BGT3595	Compro E750	Black Gold BGT3600
Zotac nVidia GeForce GT 430 passive-cooled	Intel Graphics HD 3000	Intel Graphics HD 3000
WMC, ArcSoft TotalMedia Theatre	WMC	WMC, ArcSoft TotalMedia Theatre
onboard	onboard	onboard
gigabit ethernet	802.11n, gigabit ethernet	gigabit ethernet
LG BD-ROM/DVD±RW	Samsung BD-ROM/DVD±RW	LG BD-ROM/DVD±RW
Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
S/PDIF, HDMI, DVI, eSATA	S/PDIF, HDMI, DVI, VGA	S/PDIF, HDMI, VGA
Zalman HD503	EZCool HT 960 Touch	Zeno NT-TX2000
none	Thrust Thinity Wireless Media Keyboard	Microsoft Wireless Desktop 3000
none	touchscreen LCD	remote control
120	141	141
not tested	31/16	45/20
not tested	3 mins 24 secs	3 mins 14 secs
50W	47W	36W
3-year return-to-base	1-year return-to-base	2-year collect-and-return (open case policy)

>> How we test and our conclusion

PC ADVISOR TEST CENTRE

Conclusion

Media-centre PCs are available to suit most needs and budgets. A low-end system should set you back around £500, provide a dual-channel TV tuner and cope perfectly well with recording and playing back all sorts of multimedia content, including HD video and Blu-ray. Arbico's Zippy X35 HD Media Centre is a good example of such a budget system, providing just enough power to play media, while keeping down costs.

Spending a little more will afford you extras such as support for HD TV and improved build quality. If you don't want an eyesore of a PC sitting in your living room, then you may wish to invest in the system case, too. A PC that looks more at home in the hi-fi rather than IT world can set you back rather a lot, however: Quiet PC's stunning Zeno NT-H67 costs £1,444, and more than £200 of that has been spent on the passively cooled, fanless Zeno NT-TX2000 system case.

Extra processing power is useful for other computing tasks, but also bumps up the price tag – and that's before you consider quietly stepping up the cooling to counteract the increased amount of heat generated. The aforementioned NT-TX2000 can cope with any CPU rated with a thermal design power of 65W or less. If you don't have the budget to spend on such a case, opt for quiet fans instead.

For more flexibility, a custom system such as Eclipse's DMS Pro Touch will deliver plenty of computing power, as well as a handy colour touchscreen – but beware the fiendish complexity.

The Mac mini is an excellent and quiet alternative, but factor in the cost of a TV tuner, DVD drive and other peripherals if required. Freeview and satellite tuners from Elgato neatly finish the package.

How we test

Application performance

Core system performance is measured using WorldBench 6. This customised test suite runs several desktop Windows applications with real-world workloads, mimicking how PCs are used on a daily basis.

These workloads include tasks such as editing documents and images, compressing files, browsing the web and encoding video. Some tasks are then run simultaneously to form an additional test of the PC's multitasking capabilities.

In total, eight applications are used: Adobe Photoshop Creative Suite 2.0, AutoDesk 3ds Max 8.0, Firefox 2.0, Microsoft Office 2003, Microsoft Windows Media Encoder 9.0, Nero 7.0 Ultra Edition, Roxio ViewWave Movie Creator 1.5 and WinZip Computing WinZip 10.0.

Results from 10 individual tests are combined and weighted to produce a numerical score relative to a baseline PC.

Our baseline configuration runs a 2.4GHz Core 2 Duo E6600 processor, 2GB of DDR2 RAM, an nVidia GeForce 7900 GS graphics card, twin Western Digital Caviar WD3200KS hard drives in a striped Raid array, and Windows Vista Home Premium 32bit. This PC scored 100 points in WorldBench 6.

Transcoding performance

Because you'll often be working with more than one video file format, we set each PC the task of converting a batch of 1080p Mpeg4 video clips for use on the iPad 2 and recorded how long it took to complete. We used CyberLink's MediaEspresso software.

This software is able to make use of hardware-accelerated decoding and encoding built into graphic cards and CPUs with integrated graphics-processing capabilities. These techniques can often shorten conversion times by a factor of 10. Multiple CPU threads are also fully exploited, allowing quad-core CPUs to shine when compared to dual-core versions.

Gaming performance

As entertainment centres plugged into your TV, media PCs might be used to play games. Power and noise requirements usually prohibit the use of the best graphics cards, so we tested each PC running Crysis at 720p, 'Low' and 'Medium' quality settings.

Overclocking

We allow overclocked systems to be submitted only for our dedicated gaming PC reviews. All other components are run at stock speeds, with the exception of factory-overclocked graphics cards designed and sold at boosted speeds. We do, however, allow underclocking for the purposes of reducing power consumption.

Subjective assessment

We also pay close attention to the physical characteristics of each PC, its noise output and its build quality, delving inside the case and taking note of the quality of components used, cabling and airflow.

Good-quality peripherals are also important, and where they are supplied we note the ergonomics of the keyboard and mouse. A media PC also needs a remote control and, preferably, a keyboard that can be operated from the sofa.

Support

Differences in warranty terms can impact our scoring. Long warranties are sought after, but we also look at the terms and conditions – specifically, whether faulty systems must be returned to the vendor at your own cost and if both parts and labour are included. Ensure the vendor offers full software support and preferably a home installation for more complex systems. ⊠

PC ADVISOR TEST CENTRE

Get a faster, safer PC

One of the simplest ways to get more from your home computer is to return it to the uncluttered state in which you found it. Rosemary Hattersley suggests ways to make your PC – and its owner – more productive and efficient

Much like the humans who operate them, PCs benefit from a periodic detox. The accumulation of stray files, downloads scattered across various folders, and programs that start up as soon as Windows boots do nothing for a PC's efficiency. And with the best will in the world, that vast hard drive inside your PC does actually have a limit – the more you store, the less space is available for important Windows tasks such as virtual memory and system rollbacks. These not only help your PC seem slicker; System Restore is one of the best ports of call if your computer begins to act strangely.

It's not just your PC itself that could do with taking in hand, though. Getting into better habits about how you organise and arrange your PC's contents is also a productivity must. If you've no particular system for how and where you store files, and you pay scant regard for how photos and videos are named, it's likely you'll eventually end up wasting precious time tracking them down when you need them.

Over the following pages we look at how to give your computer some more pep and strip it back, clean it out, reorganise its innards and give it some much-needed TLC.

Contributors: Rick Broida, Jason Cross, Jon Jacobi, Anne McDonald, Nick Mediati, Justin Phelps, Nate Ralph, Wes Simons, Lincoln Spector

Get going faster

Get a flying start to your working day by ensuring your PC is ready for action as soon as you are. An instant boot is yet to be realised on PCs, although Windows 8 promises much faster startups from cold. Resuming from standby or sleep is already possible. Rather than setting your PC to shut down each day, change the Shut down option by clicking the Start button and choosing Sleep or Log Off.

Clear out the system tray

Have you ever wanted to remove icons, specifically those for unused programs, from the lower-right corner of the screen?

Those icons in the System Tray or notification area aren't just icons; they're running programs that use RAM and clock cycles. Each one is slowing down your PC. They might also be conflicting with other software, making Windows less stable.

Some of these programs are worth such potential problems. For instance, you need an antivirus program's real-time malware protection to keep your PC safe.

To remove icons for programs you don't use, however, your best bet is to uninstall the unwanted software itself. If you can't remember its name, point your mouse at its icon and that information will be revealed.

Once you know the name, click Start, select Control Panel and, in XP, click 'Add or Remove Programs'. In Windows 7 or Vista,
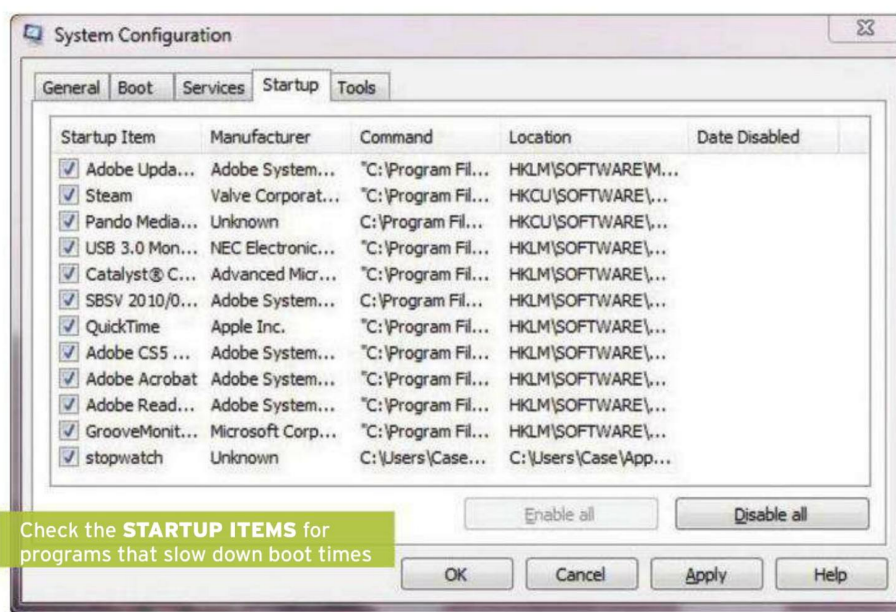
Check the **STARTUP ITEMS** for programs that slow down boot times

choose 'Uninstall a program'. Select the program and click Remove or Uninstall.

If uninstalling doesn't remove the icon, click Start (in XP, Start, Run), type **msconfig** and press Enter. Click the Startup tab to see a list of programs that load automatically when you boot. Once you find the culprits, deselect them from the startup items list. This is also what you should do if you prefer to keep a program installed, but don't want it running at all times.

UNINSTALL any unwanted software

Remove crapware

It's a familiar problem: you boot up a new Windows PC, only to find it's already littered with trial versions of software, commonly referred to as 'crapware'. Although the unwanted software won't harm your computer, it will hog memory and often create annoying pop-ups asking you to update your membership. Ditching crapware is like uninstalling any other program, but these steps will make the process easier.

To manually clean up your PC, click Start and head to the Control Panel. Double-click the 'Programs and Features' button if you're in Classic View, or click the 'Uninstall a program' text under the Programs heading if you're using the new Control Panel. Select the program to remove and click the Uninstall/Change text near the top of the screen. Make sure you remove all components if prompted.

Another cleanup option is to use PC Decrapifier (tinyurl.com/84dkx8f). It's a small program that's easy to delete after you've flushed your system. Run the application file and read through the first few screens until you reach the one titled 'Select Items'. You can then begin to sort through the software that it's identified as possible junk.

Be careful: PC Decrapifier has trouble distinguishing between paid-for and trial

software. If you've upgraded or manually installed any of the applications it lists, deselect those programs so that PC Decrapifier doesn't eliminate them.

A slicker setup

Both you and your computer can become instantly more efficient simply by dint of some reorganisation. Read on for some handy tips.

Partition your hard drive. Disk partitioning can fix many PC-related headaches, and Windows 7's Disk Management tool does the job for free.

Back up your data. The partitioning process shouldn't delete any data, but it's not worth taking that chance.

Select Control Panel, Administrative Tools, Computer Management to open the Disk Management tool. Beneath the Storage heading on the left, click Disk Management. You should see a list of your existing drives and partitions (if applicable). To create a new partition, choose a disk that has free storage space, right-click it, and select Shrink Volume. You can safely shrink only basic disks; if you try to shrink dynamic disks (such as Raid arrays) formatted with the NTFS file system, you may lose data.

In the available field, enter the amount of space you want to shrink the disk by, based
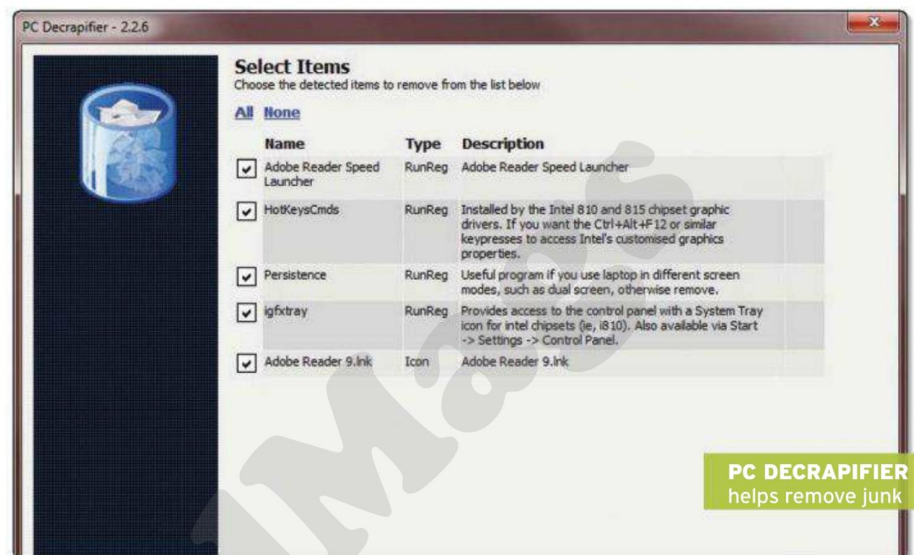
on what you wish to use the other partition for. If you plan to dual-boot another version of Windows, for example, you'll want a lot of space; but if you're creating an emergency recovery partition, you'll need far less space. If you'll be installing an operating system in this partition, its installer will probably insist on creating the partition itself during the installation process.

Once you've cleared the necessary space, it should show up in the Disk Management

window as Unallocated Space. Right-click this entry, select 'New Simple Volume', and let the wizard guide you through the remaining steps of the process. In all probability, you'll want to format the new partition as NTFS; and unless you're using the partition for archiving, you won't need to enable file and folder compression for the whole drive.

Now you have a clean hard-drive partition you can use to dual-boot Windows 7 or keep your data safe.

PC DECRAPIFIER
helps remove junk

Clean your laptop or PC screen properly

When it comes to cleaning an LCD screen, there's a right and a wrong way. Let's focus on the right way. For starters, turn off your monitor. To eliminate the risk of shock or electrical damage, also unplug it. This cleaning will involve some moisture and the last thing you want is for liquid to contact anything powered.

Dampen a clean, soft cloth (a paper towel will do, but it isn't the best choice) with water. Don't soak it – just moisten it. And don't use anything other than water. Ammonia- and alcohol-based cleaners can ruin

an LCD. If plain water doesn't do the job, make a 50/50 solution of distilled water and white vinegar.

If you decide to use a spray bottle, don't aim it directly at the screen. Instead, spray the water or solution on to the cloth, then wipe the screen. A circular motion is best for eliminating streaks. Apply only light pressure.

Finally, let the screen air dry for a few minutes, or gently wipe it dry with a fresh cloth. Only when you're absolutely certain that it's 100 percent dry, plug in the display and turn it on.

The big clean up

A cleaner PC is a better PC. Not only is it easier to find items you need, but it will run faster if its processors can breathe and its fans work efficiently. Using your computer will also be an altogether more pleasant experience if the screen and keyboard are clean of smears and crumbs.

Clean a PC and keyboard

PC: Unplug everything, and open the case. Remove large clumps of dust or hair by hand; then use short blasts of compressed air (from the inside out) to blow dust and debris off fans, wires and other components. You can then wipe surfaces with a moist, clean cloth. Don't get anything noticeably wet, and give the PC time to dry before plugging it in.

Keyboard: Turn off the PC and use a can of compressed air to blast dust and debris from beneath the keys. Use a cloth moistened with a mild cleaning solution, such as an alcohol-and-water mix, to wipe surfaces. If the keyboard is filthy, gently pry off the keys, clean them, and snap them back in place – don't try this on a laptop keyboard.

Prevent PC hacks

Ensure that your software is up to date and install any Windows Updates as soon as possible. Most major commercial software products have automatic updating options.

Distrust unexpected email attachments. Remain wary even if they come from someone you know. Also beware of shortened URLs on social networks. Cybercriminals hide links to malicious websites or downloads behind shortened URLs, and they may route poisoned links through messages from people you know and otherwise trust.

Install a link-checker plug-in. AVG LinkScanner (linkscanner.avg.com), McAfee SiteAdvisor (siteadvisor.com) and Norton Safe Web Lite (tinyurl.com/6ueb4my) are free tools that can identify any malicious

THREATFIRE offers your PC an extra layer of protection
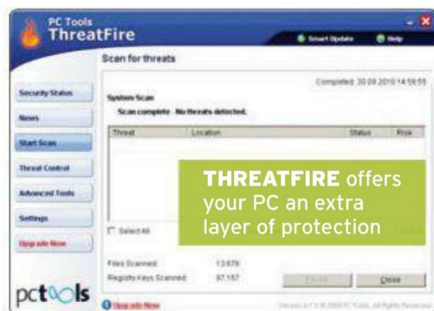
links in search results and when you're browsing the web.

Use up-to-date antivirus software. Malware evolves quickly, and an antivirus product without the latest updates may not block the latest threats effectively. If you haven't updated your antivirus software, do it now.

Defend your PC against attacks

An infected PC may be sluggish or crash-prone. The malware plaguing it may flood your screen with pop-ups, even if your browser isn't running. If you navigate to one website, the rogue app might redirect you to another. And malware may prevent you from updating your security software.

Consult Microsoft's three-step guide to removing malware at tinyurl.com/3onskcv. If your system has a stubborn infection, try the free Norton Power Eraser (tinyurl.com/3ce5sgd). It can identify and remove malware.

PC Tools' free Threatfire (threatfire.com) is worth downloading, too: it gives your system an extra layer of protection.

Load secure sites faster

We've found certain sites slow to load in Google Chrome and Firefox. When we looked into the cause, we found a McAfee SiteAdvisor extension we hadn't purposely installed. Disabling this resulted in faster page loads. There's nothing wrong with SiteAdvisor, but

excessive security software does more harm than good, so use a minimal set of tools. A good alternative is WOT (mywot.com).

Power down and save

Wasting electricity is bad for your bank account and the planet – and it's probably bad for the PC. But shutting down and booting up takes an age.

While some people argue that shutting down a PC and then starting it up from cold causes more wear and tear than leaving it on for 12 hours, we aren't convinced. All PCs are at risk of suffering from heat problems, and one that never gets a chance to cool down will be under more heat stress.

Besides, a computer that's turned off is a computer that can't catch a malware infection (or if it's already been infected, it can't behave under orders sent from afar).

As we said earlier, if you don't like to start your PC fresh each day, you can hibernate it rather than shutting it down. From the

SHUT DOWN the PC at least once a week
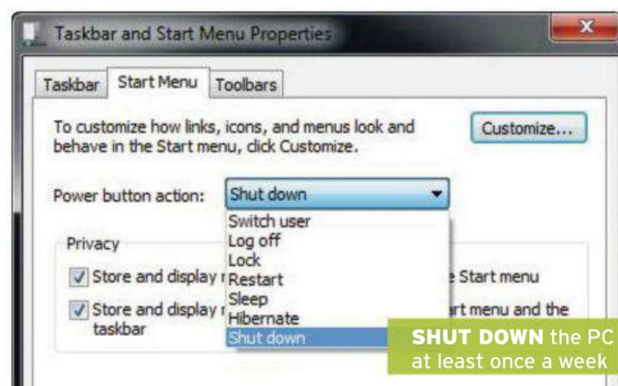
hardware and power-consumption points of view, there's no difference between shutting down a PC and hibernating it. But a shut-down system will give Windows a fresh start, clear of any digital cobwebs it may have acquired since its last boot. A hibernated PC will wake up where you left it, with the same programs, files and windows open.

An alternative to hibernate mode is sleep mode, a short-term power-saving option that saves power but, unlike hibernation, doesn't turn it off. The best solution is to shut down at least once a week to clear those cobwebs.

Power down with the power button

It is intuitive to use the power button to switch off your PC, but it's not the way Microsoft configures Windows. Right-click the Start menu to bring up the Properties dialog, and you can then specify that when you press the power button your PC should power down.

NORTON SAFEWEB can prevent you clicking on malicious links

Manage cables

1

Declutter cables

Start fixing your cable disaster area by completely powering down everything and then disconnecting all the cables at each end. Slowly remove each wire, untangling as you go, and lay out each cable neatly next to the device to which it belongs.

2

Label cables

Attach a label to each cord or cable describing the device or peripheral it connects to. Legibility is essential. Use a label maker if you can. Colour-coding is also a good idea. Alternatively, write labels on pieces of paper and attach them with tape. Ensure the labels are easy to read and won't get snagged.
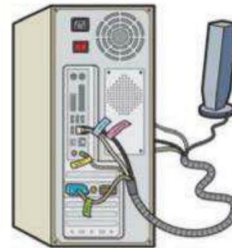
3

Reconnect cables

Take your freshly labelled cables and reconnect everything, keeping the cables tidy by tying them together. Many cable-management products are available. For those who don't want to spend money on special bundling products, simple cable ties offer a simple and cost-effective alternative.
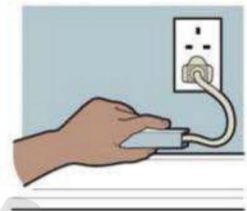
4

Apply finishing touches

To conclude your project and give your office, game room or home-entertainment setup maximum visual appeal, you can use products designed to hide your newly organised cables along skirting boards, the edge of your desk and so on.

Improve your own efficiency

Email alert

Returning to work after a break usually means dealing with an email mountain. It's best to stay on top of things by routinely checking and deleting messages. If you're routinely swamped, however, a colour-coding and filing system many help. Start from the newest emails and work back, skim-reading subject lines and glancing at the sender name. Any from your boss need to be addressed; any from your mates will have to wait; anything else with a firm deadline then needs to be sifted through. False bank messages and PayPal notifications should be flagged as phishing spam. Raising your security filter is advisable if you have many such emails.

Ignore anything that doesn't fit into any of the above categories and that hasn't got a self-explanatory subject line. Why waste time opening a message just to find it's yet another sales pitch?

Use filters to categorise and organise anything you need to keep or file. If you're still deluged, change the frequency settings to check for new mail less frequently. To change the settings in Outlook click File,

SCHEDULE your email client to look for new mail at longer intervals
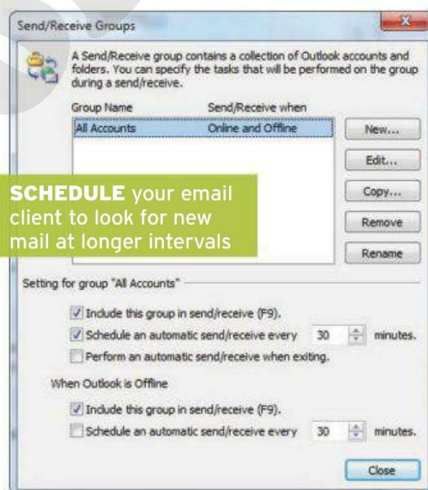
Options, Advanced and scroll down the 'Send and receive' options.

Unsocialise for a while

Email used to be the single most distracting and time-consuming aspect of the working day. Twitter and Facebook are other notable timekillers. If you just can't afford to spend time responding to messages, log out of both.

Make text easier to read

It's easy to fix your Windows and monitor settings to make documents, spreadsheets and photo-editing programs more readable.

One simple way to make onscreen content larger in all versions of Windows is to reduce the monitor's resolution. Although images, text and icons on the display will be sharper at the recommended resolution, they'll be larger at a slightly lower resolution. Experiment with the available resolutions (you can find them via the Control Panel or by right-clicking your system's desktop).

Windows 7 offers additional handy options to make your display more readable. First, you can change the size of everything onscreen from 100 to 125 or 150 percent by adjusting the display settings. Right-click your screen, choose Personalization, Display, and then go big, bigger or biggest. Windows 7 also lets you establish a custom size for text in these settings, while the ClearType Text Tuner can make text on LCDs sharper.

Another feature that promotes easy reading in Windows 7 is the Magnifier tool (you can reach it through a link in the text describing the Display options under

Personalization). Although having this tool on all the time can be somewhat annoying, the Magnifier is useful when you need to see just one thing a little larger. You may want to rely on it occasionally instead of enlarging all your text or your entire screen.

Disable a laptop touchpad

Whether you love touchpads or just tolerate them, they get in the way at times. If your laptop lacks a physical switch or keyboard shortcut to turn off the touchpad, you may be able to disable the feature through software.

Look for a touchpad icon in the notification area; double-click or right-click that icon to view the options and disable the touchpad if possible.

If no icon is present, click Start, Control Panel, 'Hardware and Sound'. Click Mouse under 'Devices and Printers' (in Vista, click Start, Control Panel, 'Hardware and Sound', Mouse). Mouse Properties might have a tab where you can disable the touchpad.

Still no luck? Look for a touchpad software entry in the Start menu.

One other option is to click Start, type **device manager** in the Search box, and click the Device Manager result. Expand 'Mice and other pointing devices', then right-click the touchpad's entry. In the pop-up menu, click Disable. Confirm your choice.

Finally, if you have touchpad software on your laptop, you may be able to adjust the touchpad's behaviour without disabling it. For example, you might change its sensitivity.

Make a bigger point

Still in the Mouse menu, you'll see a variety of options to enable faster scrolling and pointer customisation. Perhaps the most useful is the option in the Scheme drop-down menu to change from the default large pointer option to 'extra large'. This nearly doubles the onscreen pointer size.

There's a wealth of pointer and input customisation options within the Mouse driver menus to change colour schemes, responsiveness and behaviour.

Tag it to find it

Tagging photos and files that are stored locally on your own computer can make them much easier to find. Being able to

Change the **POINTER SIZE** in Mouse Properties
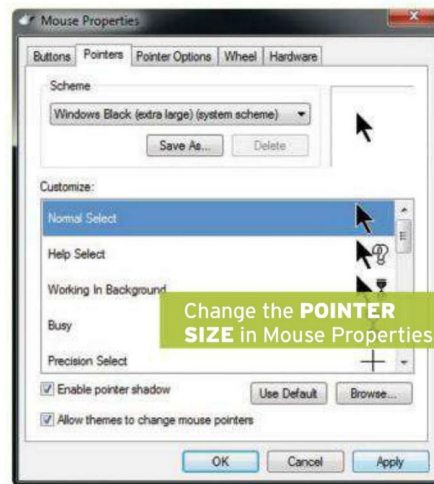
search by subject, location or quality rating speeds things up.

Ensure all the photos from a set are in the correct folder. The menu at the top right allows you to select large thumbnails so you can more easily view your images. When you're ready to tag your photos, right-click on one of the images and choose Properties. Click the appropriate number of stars to rate it. Now click in the blank space next to the Tag label. Type in keywords

TAG FILES to make them easier to find
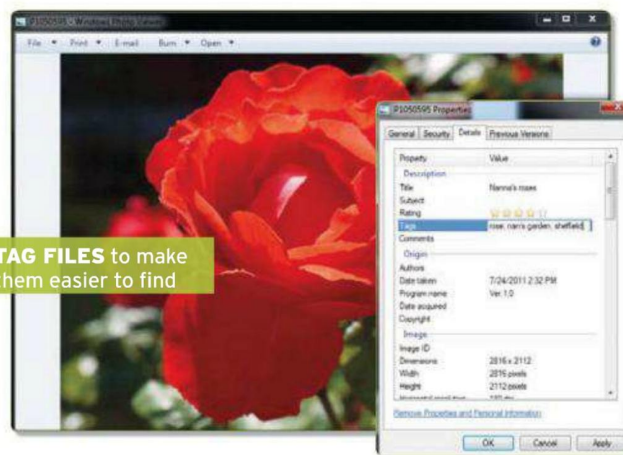
as identifying tags. Click Apply to save your changes.

To add the same tags to all the photos in the folder, click on the tag text, press Ctrl, A to select all the words, then Ctrl, C to copy it. Now click the Up or Back button to view the whole photo folder. Select All, right-click as before and choose Properties. Now paste the tags into the field and click Apply. All the photos will now be tagged.

The same technique applies to Word and Excel documents as well as other sorts of file.

Quick locator

Windows Search is now pretty sophisticated (at least by comparison with that found in XP). You can refine searches easily without the distracting digidog assistant and see at a glance where the located items have been found. We also like the option to open a file's location from the search results.

Preview your work

Still in the Explorer menu, there's a very nifty little icon just to the right of the thumbnail size menu that lets you toggle on and off the Preview for documents. It's useful if you need to quickly see what a document contains or to view its contents without interfering with what you're typing into Word.

Make use of news feeds

Should you need to keep abreast of developments about a particular subject, setting up a news alert can help a lot. Try tools such as iCurrent and Summly. For the latest tech news, of course, you can always turn to the PC Advisor website.

Preserve browser tabs

If, like us, you often leave browser tabs open so you can come back and read them later, you'll probably appreciate a way of keeping these tabs 'live' without having to make bookmarks for them all. Chrome and Firefox each offer an easy way to keep tabs open from one session to the next, without the need for plug-ins or extensions.

To enable the option in Chrome, click the spanner icon in the upper-right corner. Select Option then, in the Basics section, enable 'Reopen the pages that were open last'.

The process is very similar in Firefox. Click the orange Firefox button, hold the mouse over Options, then click Options. (If your version of Firefox doesn't have the orange button, click Tools, Options.) In the General tab, click the drop-down menu next to 'When Firefox starts' and choose 'Show my windows and tabs from last time'. Click Ok.

In both browsers, the change goes into effect immediately, meaning that when you close the browser whatever tabs you have open will reappear when you run it again.

Stick it in the calendar

A calendar is no longer just a glorified poster with a series of photos of pretty landscapes or the latest pop star pin-ups. It's a proper reminder mechanism, intended to help you keep track of appointments and appear more organised than you may actually be. Email and onscreen alerts – as well as ones that can pop up on your smartphone – are the saviour of the routinely flustered office worker.

Take a break

You'll be more efficient and won't tire so easily if you take regular breaks from your PC. Your eyes will appreciate it, too. If you find it hard to regulate your breaks, use an onscreen prompt such as Screen Break to remind you to do so. Opticians recommend that every 20 to 30 minutes you turn away from the screen and instead focus elsewhere in the room, preferably somewhere distant.

Set your clock ahead

It's a well-known fact that tasks expand to fill whatever time slot you give them (and often overspill beyond it). Set your watch and PC clock a few minutes fast and you'll buy yourself a bit of time. This psychological trick works well. Note, though, that Windows has a habit of losing a few minutes all by itself, so check first that you're not already behind the times. Click on the time in the notification area to bring up the options to adjust the current time. ⊠

Check that Windows' CLOCK is telling you the true time

Ergonomic outlook

Maintain a good posture
Keep your back straight – no slouching! Your head should be balanced above your neck and arms resting at your sides comfortably

Place keyboard and mouse
Keep them close to each other on the same level, with the home row of keys easy to reach with your elbows positioned at 90 degrees. As you type, your wrists should be straight

Position monitor
Raise or lower the screen so you can clearly see the whole screen without tiling your neck

Adjust the seat
Position your hips a bit higher than your knees, with your feet on the floor/footrest and your lower back supported

Rest regularly
Every 20 minutes or so, take a short 30-second break. Take a few longer breaks during the day

WINNER 2012

PC ADVISOR AWARDS NOMINEES

As we head toward a new year, we are proud to present our roll-call of honour: the best of the past year's technology, and our guide to the brands you can trust and the sites from which to buy

WIN £250!
IN AMAZON VOUCHERS
PCADVISOR.CO.UK/AWARDS

The votes are still coming in and the arguments raging, but the nominees for the *PC Advisor* Awards have been decided for another year. As with last year's awards, there are nearly two-dozen prizes. Many of our award categories have been wrangled over by our team of reviewers and writers, while the rest will be decided by *PC Advisor* readers before the winners are announced in early 2012.

The purpose of the *PC Advisor* Awards is to showcase excellence across the diaspora of products and services we cover online, in

digital magazines and apps, and right here in the *PC Advisor* print magazine. Nominees and winners have been chosen from a year's worth of reviews, so each represents the best of the best in its particular category.

For the hardware awards, we've split up the categories along similar lines to the Top 5 charts we update every month, while we've divided the software section by program type.

In each case, products in contention had to have been reviewed by *PC Advisor* editors during 2011. Those reviews could have been online or in print - or most often both.

In addition, there are five *PC Advisor* Reader Awards. We will be running an online survey, inviting UK consumers to have their say on the best laptop and desktop PC brands, the best online retailers, and the gadget of the year. From the votes we receive we'll be able to deduce valuable feedback about the brands you favour and how well they live up to expectations. So don't forget to have your say! Head to pcadvisor.co.uk/awards.

HARDWARE

WINNER
2012
PC ADVISOR
AWARDS

Best Desktop PC Brand

- Arbico
- Chillblast
- CyberPower
- Dino PC
- Eclipse

Best Budget Laptop

- HP Pavilion dv6-6103sa
- Kogan Agora Pro
- Lenovo IdeaPad G570
- Lenovo ThinkPad Edge 11
- Packard Bell EasyNote TS11HR039

Best Power Laptop

- Apple MacBook Air 11in (Mid 2011)
- HP EliteBook 8540w
- Rock Xtreme X 685-I5-2540M
- Samsung NP900X3A
- Toshiba Satellite R830-143

Best Tablet

- Acer Iconia Tab A100
- Apple iPad 2
- Asus Eee Pad Transformer TF101
- Samsung Galaxy Tab 10.1
- Sony Tablet S

Best Printer

- Brother HL 2130
- Canon iSensys LBP7750Cdn
- Epson Workforce Pro WP-4535DWF
- Kodak Hero 7.1
- Kyocera Mita FS 1320D

Best Portable Entertainment Device

- £89 Amazon Kindle
- Apple iPod touch (2011)
- Kodak PlaySport Zx5
- Pure Move DAB 2500
- Sony Ericsson Xperia Play

Best Monitor

- Iiyama ProLite XB2472HD
- LG IPS236V
- NEC MultiSync EX231W
- Philips 273E3LH
- ViewSonic VP2365-LED

Best Graphics Card

- Asus GTX 560 Ti
- HIS ATi Radeon HD 6950
- HIS Radeon 6970 IceQ 2GB
- PNY GeForce GTX 570
- Sapphire Radeon HD 6770

Best Smartphone

- Apple iPhone 4S
- HTC Sensation
- RIM BlackBerry Bold 9900
- Samsung Galaxy S II
- Samsung Omnia 7

Best Compact Camera

- Canon Ixus HS 230
- Fujifilm FinePix HS20
- Nikon Coolpix S9100
- Panasonic Lumix DMC-TZ20
- Sony Cyber-shot DSC-HX9V

Best Digital Camera

- Canon EOS 600D
- Nikon D5100
- Olympus PEN E-P3
- Panasonic DMC-G3
- Sony Alpha A55

Best Portable Storage Device

- Apricorn Aegis Pro SSD
- Buffalo MiniStation Extreme
- Hitachi Touro Mobile Pro
- WD My Passport Studio 1TB
- Seagate FreeAgent GoFlex UltraPortable

Best Storage Device

- Corsair Performance Pro 256GB
- Crucial M4 256GB
- Promise Pegasus R6
- Qnap TS-419P+
- Synology DS211

Best Audio Product

- ADL GT40
- Arcam rCube
- Etymotic Research hf3
- Naim Audio UnitiQute
- Orbitsound T12v3

Best Digital Home Device

- Apple TV
- Cryo PC Alto
- Elgato Netstream
- InFocus ScreenPlay SP8600
- WD My Book Live

Best Wireless Networking Product

- AVM FritzBox Fon WLAN 7390
- Cisco Linksys E4200
- D-Link W307AV
- Netgear N600 DGND3700
- TP-Link TL-WR1043ND
- Zyxel NBG4615

SOFTWARE

★ Best Security Software

- Bitdefender Internet
  Security 2011
- Kaspersky Small Office Security
- Panda Internet Security
- Symantec Norton Internet
  Security 2011

★ Best Photo or Video Software

- Adobe Photoshop Elements 9.0
- Adobe Premiere Elements 10.0
- Corel Painter 12.0
- Sony Vegas Movie Studio
  HD Platinum 10.0
- Xara Photo & Graphic Designer 6.0

★ Best Game

- Assassin's Creed: Brotherhood
- Dead Space 2
- DiRT 3
- Need for Speed: Hot Pursuit
- Super Street Fighter IV 3D

★ Best App

- Camera+
- ESPN Goals
- Facebook for iPad
- The Guardian for iPad
- Napster

- Sky Go
- Skype 3
- Spotify for iPhone
- TripAdvisor
- WhatsApp

READER AWARDS

★ **Best Desktop PC Brand**

★ **Best Laptop Brand**

★ **Gadget Of The Year**

★ **Best Online Retailer**

★ **Specialist IT Retailer Online**

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HTC Flyer 7 inch 16GB Android 3.20 Tablet PC with WiFi

Serious gaming wherever you go--a powerful processor and gorgeous graphics lets the HTC flyer handle rich, immersive games with ease. It's not just the visuals that are impressive. HTC Flyer comes with dual speakers for a much richer listening and entertainment experience. Enjoy high fidelity sound with SRS WOW HD™ virtual surround sound.

Fly through the web with your friends, wherever you are. Conveniently compact and light enough for you to travel around, yet amazingly powerful, the HTC Flyer tablet with a 7-inch display and a super speedy 1.5 GHz processor is perfect for web browsing at home, in the car or on a business trip. To make it just that little bit better, it even comes equipped with Adobe Flash support, multi-window browsing with pinch to zoom capability, and a clever quick look-up that allows you tap into Wikipedia, Youtube and other web resources as you wish.

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- 1GB RAM
- 5 megapixel color camera with auto focus

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Stock Code: LT-000-HC

Ultima 9100a Annihilator AMD Bulldozer 4.20GHz DDR3 8 Core System

Featuring an AMD FX-8 8120 overclocked and guaranteed to a stable 4.20GHz. With eight processing cores and dual channel DDR3 memory the "Ultima 9100a Annihilator" powers through applications and games with equal ease. Designed for gaming on the edge, the "Ultima 9100a Annihilator" delivers blistering performance and amazing DX11 visuals from a choice of DX11 graphics cards.

- 4.20GHz performance for the price of 3.10GHz
- 8 Core processing and DX11 performance
- 8GB DDR3 1600MHz
- 500GB HDD + optional SSD upgrade available

£831.59
Stock Code: FS-204-0E

Search: PCADAPRIL

Titan Techno Intel Core i5 2500K 3.30GHz DDR3 Complete System

The perfect complete gaming system comes in microATX form featuing the fantastic Intel Core i5 2500K CPU combined with a Intel H61 motherboard. With 8GB of RAM you can launch the most demanding of applications with ease and have plenty of space to store all of your files thanks to the massive 1TB hard drive. Outstanding performance and value.

- Complete system including wireless keyboard & mouse, speakers & 24" widescreen monitor
- Intel Core i5 2500K 3.30GHz Sandybridge CPU
- 8GB DDR3 1333MHz Dual Channel Kit
- 1TB HDD + optional SSD upgrade available

£684.78
Stock Code: FS-205-0E

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Titan 8000i Xenomorph Intel 3.10GHz Dual Core System

Featuring a blisteringly fast overclock, powerful graphics, immersive 5.1 audio and ultra cool styling. With DX11 cinematic graphics from the Nvidia 400 & 500 Series of graphics cards. With a massive 500GB hard drive as standard you have more than enough space to store all your films, games and music making the "Titan 8000i Xenomorph" a competant media player when you aren't owning the competition.

- Nvidia 400/500 Series DX11 compatible graphics cards, various options available
- Intel Core i3 2100 3.10GHz Clarkdale
- 4GB DDR3 1600MHz Dual Channel Kit
- 500GB HDD + optional SSD upgrade available

£461.57
Stock Code: FS-237-0K

Search: PCADAPRIL

ROSEMARY
HATTERSLEY

Tech Help

Getting sticky with it

'Sticky content' is elements that add interest and character to your website and are likely to ensure site visitors hang around longer than they might otherwise do. Add a poll, some photos, video clips and so on, and you'll entice them to stay a while. We look at several options for adding video to your website on page 114.

Another way of getting visitors to your site is to place QR codes in your marketing materials. These digital barcodes allow you to add video or audio to a static image such as an advertising poster, or direct those interested in a product or event to your website for further details. They're also used as electronic tickets for concerts and flights. We show you how to create and embed QR codes on page 110, along with more ideas for what they can be used for.

If you're more of a traditionalist, our look at the rebirth of analogue photography (page 118) and how it can be incorporated into digital workflows may be your style. We love lomo photography and the way it forces us to think about what's in the frame rather than firing off a series of shots and hoping for the best. ⊠

102 Troubleshooter

110 Mobile

114 Web

118 Photo
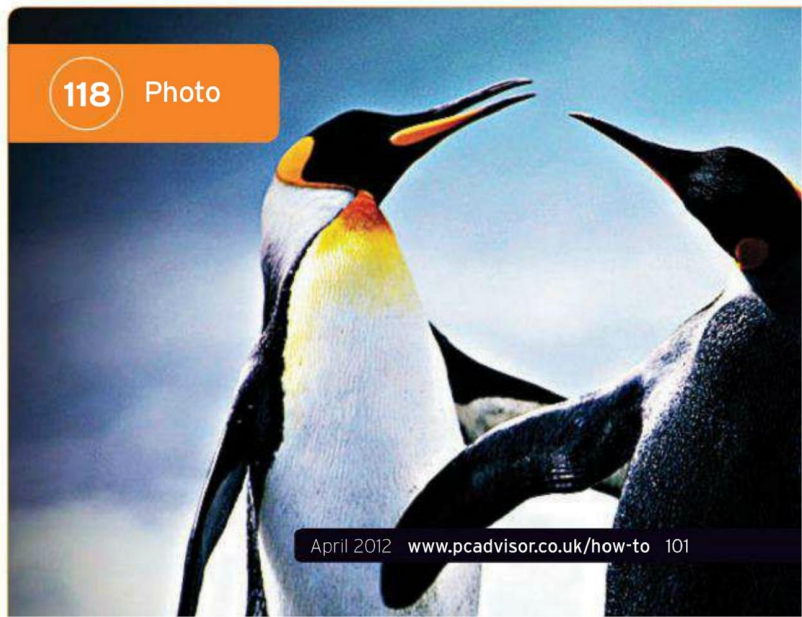
How to uninstall Windows drivers

**If your computer is acting up, hardware drivers may be to blame.
Michael King explains how rolling back drivers can help**

Installing drivers can be a hair-raising adventure, even on the latest operating systems. These finicky pieces of code act as the middleman between your PC hardware and its OS. Although drivers install with ease, they integrate deeply into the OS, sinking their teeth into areas most other software doesn't go near.

Most of the time the driver installation process is simple, seamless and transparent to you, as it should be. But when things go wrong, they can go really wrong. A poor driver can even crash your PC.

For example, when Microsoft launched Windows Vista in 2007, critics lambasted it for being slow and prone to crashing; Microsoft investigated and found that a majority of computer crashes were due to driver issues.

Should you encounter a problematic driver, a couple of tricks can help. Microsoft has introduced an easy way to roll back to a previous, hopefully more stable, version of the driver, or remove it from the system altogether, giving you a clean slate to try again or install a different version.

Roll back to a previous driver

Click Start, type **Device Manager**, then press Enter. Find and double-click the category of device causing the issue (for instance, the graphics card is listed under Display Adapters).

Double-click the problematic device to bring up the Properties window. Click the Driver tab. Click the 'Roll Back Driver' button. Click Yes to confirm your choice.

Windows will automatically remove the current driver for the device and reinstall the previous driver. You may receive a notification that the system settings have changed, and be prompted by Windows to reboot. In this case, restart your PC as soon as possible.

You can use the Device Manager to uninstall troublesome driver software
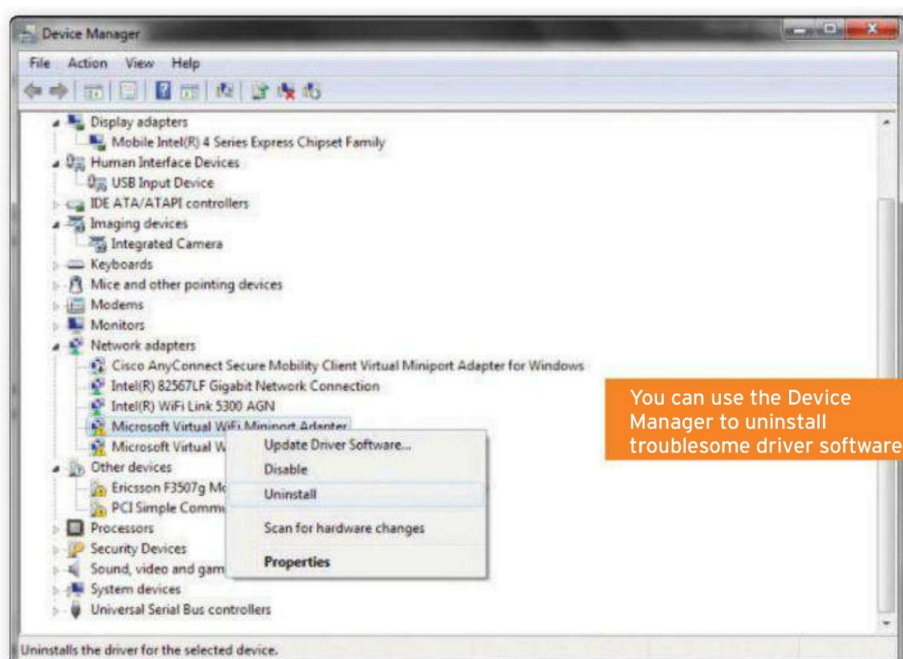
Uninstall a driver

The best and safest method of uninstalling a driver completely is to use the device's uninstaller program – if it has one. If you used an installer to set up the device (as is the case with most graphics card and sound card drivers, for example), you can

Use the Properties menu to uninstall your driver software or roll back to a previous version

uninstall it just as you would any other program on your PC.

Click Start, type **Uninstall Program** and press Enter. In the Uninstall window that appears, go through the list and find your device or drivers. Double-click the entry to begin the uninstallation process.

Sometimes a device won't have an uninstaller or it doesn't appear. You can use the Device Manager to remove such drivers. Click Start, type **Device Manager** and press Enter. Find and double-click the category of device whose driver you wish to uninstall.

Right-click the device and click Uninstall. Windows will prompt you to confirm the device's removal. Click Ok to remove the driver then reboot as soon as possible.

After you roll back or uninstall a problematic driver, you can try downloading and installing the latest version from the manufacturer's website, or try a specific version that previously worked to get your computer back on its feet. ⊠

With APC Back-UPS, your digital life goes on...
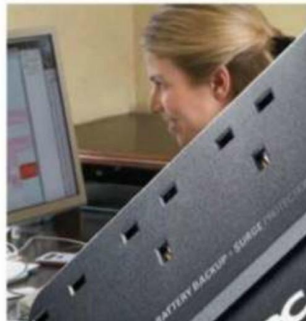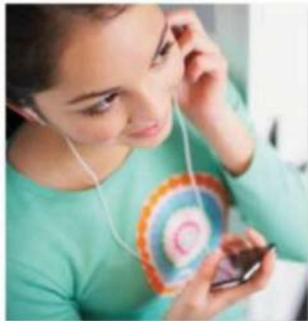
even when the power goes off

Preserve what's most important to you

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YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

LEGACY APPS IN WINDOWS 7

Q I'm considering buying a Windows 7 PC, but I know the 64bit version doesn't support Clipper or Quicken 2000 Deluxe. Is the 32bit edition compatible?
Bob Cowell

You're correct, Bob. Clipper is a 16bit MS-DOS program, as are the programs it creates, and these are not supported in a Windows 7 64bit environment. There's no such restriction in the 32bit edition, but be aware that your PC will be limited to around 3.5GB of usable RAM if you go down this route.

Regarding Quicken 2000 Deluxe, the Windows 7 Compatibility Center notes that an upgrade is recommended for use with the OS (see tinyurl.com/d5qucek).

The update can be downloaded from quicken.intuit.com/support. An upgrade is also available to make the application work in Windows 7 64bit.

If you opt for Windows 7 Professional, Ultimate or Enterprise editions, you'll be able to run legacy apps in Windows XP Mode. This is a virtualised XP installation, and any programs that work in that OS will continue to do so here – including Clipper.

VIDEO-EDITING REQUIREMENTS

Q What upgrades should I make to my Dell Inspiron 530 PC so I can edit and burn HD videos captured on a Panasonic HDC-HD90 camcorder? My PC runs Vista and has a 2.66GHz Intel Core 2 Duo E6750 CPU, 4GB of

LEGACY APPS IN WINDOWS 7

DDR2 RAM, an nVidia GeForce 8600 GT graphics card with 256MB of video RAM, and twin 320GB hard drives. I also have separate DVD±RW and DVD-ROM drives and a 19in Dell monitor. *Barry Adams*

Perhaps more than any other type of consumer PC application, HD video editing places huge demands on your hardware, often resulting in very long rendering times.

You don't say which editing software you will be using. Below are the minimum system requirements for the most popular suites.

Pinnacle Studio: 2.66GHz Intel Core 2 Quad or Core i7 processor.

Adobe Premiere Elements 10.0: 2GHz or faster dual-core CPU with SSE2 support.

AVS4YOU: 3GHz single-core/1.8GHz dual-core processor.

CyberLink PowerDirector 10.0: AVCHD and Blu-ray burning profiles require a Pentium Core 2 Duo E6400 or AMD Phenom II X2 processor; full-HD H.264 and Mpeg2 profiles require an Intel Core i5/7 or AMD Phenom II X4 processor.

Your choice of editing software can have a measurable impact on performance, and your PC's current specification is at the low end of what is practical for the task.

Hard-drive capacity is likely to be an issue, but external storage is relatively inexpensive and simple to use. A Blu-ray burner would be useful if you intend to archive a lot of HD footage (see page 62).

Your Dell monitor has a native display resolution of 1440x900 pixels, and won't be able to display full-HD video without scaling. We recommend upgrading to a 1920x1080-pixel display (see page 145).

The latest video editors use the power of your graphics card to significantly boost rendering performance. Upgrading your graphics card may be helpful here.

You don't say whether you've already attempted to edit HD video on your PC. Give it a try before you get out your wallet; if it struggles, then you can start to consider upgrades. And if this is the case, you may be better off buying a new PC with a faster processor, which your current motherboard doesn't support. Look for a PC running a second-generation Intel Core i5 or i7 chip for the best performance; their multiple cores are well-suited to HD video editing.

And if you haven't yet chosen your video editor, install free trials to see which works best with your current setup.

VIDEO-EDITING REQUIREMENTS

Plug-ins ✕ ➕

← → C 🔵 chrome://plugins

Flash (2 files) - Version: 11,1,102,55
Shockwave Flash 11.1 r102

Name: Shockwave Flash
Description: Shockwave Flash 11.1 r102
Version: 11,1,102,55
Location: C:\Users\paul\AppData\Local\Google\Chrome\Application\16.0.912.63\gcswf32.dll
 Disable
MIME types:

MIME type	Description	File extensions
application/x-shockwave-flash	Adobe Flash movie	.swf
application/futuresplash	FutureSplash movie	.spl

Name: Shockwave Flash
Description: Shockwave Flash 11.1 r102
Version: 11,1,102,55

SHOCKWAVE ERRORS IN CHROME

DATA RECOVERY

Q My husband recently passed away and I'm keen to retrieve what I can from his PC, but it refuses to start up. I get the message: 'Auto Detecting SATA Port2. Atapi Cdrom Data port1: st3750528AS CC44 Ultra DMA Mode-6 S.M.A.R.T. capable and status BAD Data POrT2: HL-DT-ST DVDRAM GH41N MN01 Ultra DMA Mode-5 Hard master hard disk: S.M.A.R.T. Status BAD, Backup, and replace. Press F1 To resume'. Pressing F1 takes me to a black screen. Please help. *Amy28john32*

We're sorry to learn of your bereavement. We'll do our best to help you get the computer working again.

The message you're seeing suggests there is a problem with the hard drive. Do not attempt to boot this PC again.

Attempting to reinstall Windows on a hard drive failing in this way can cause permanent data loss, so this is also a no-no.

To prevent any further damage to your precious files, data recovery will need to be performed – and, in this case, when it's so important that you get back those files, it would be best done by an experienced professional. Be sure to make it very clear that you require data recovery and not a simple repair with a new hard drive.

SHOCKWAVE ERRORS IN CHROME

Q Can you help resolve the regular crashing of Shockwave Flash in Google Chrome? *zsolutions4u*

Google Chrome, unlike other browsers, has its own version of Adobe Flash Player built in. If you're also running another web browser that requires a downloaded version of Adobe Flash player to be installed, the two versions of the software are likely to be causing a conflict.

To check Google Chrome's configuration, type **about:plugins** into the address bar and press Enter. This will bring up a page of information about all the plug-ins currently configured within Google Chrome.

Look for the Flash section. If it states that you're using two or more files, you have more than one Flash plug-in installed.

At the top right of the page you'll see the word 'Details'. Click the plus sign next to this to reveal more information.

The filename of each plug-in will be listed next to Location. Look at this information, and you'll see that one is stored under [Your User Folder]AppData\Local\Google\Chrome. This is Chrome's integrated plug-in. The other will be under 'C:\Windows\…'.

The path names used will vary depending on your version of Windows, but one will be stored with Chrome's application data and the other in a Windows system folder.

If both these files offer a Disable link, both are active and likely to be the cause of your browser crashes.

You can now choose which player you want to retain, by clicking Disable on the other one. Chrome will now use whichever version is enabled on your PC.

If you decide to use the installable plug-in rather than the integrated one, it's advisable to make sure you have the latest version installed. Head to tinyurl.com/Lzqp4 to get the latest version.

If the crashing behaviour continues, try going back to about:plugins and selecting to use the other Flash player.

TAKE TASKHOST.EXE TO TASK

Taskhost.exe is usually a small background application. Occasionally, however, Taskhost can become a huge CPU hog. One reader reported a Taskhost CPU usage of 50 percent. Taskhost.exe can become pretty much whatever any dynamic link library (.dll) file wants it to be. Libraries can only run through an .exe program file, for example, and Taskhost provides that service. This is why you'll often see multiple instances of Taskhost running at the same time.

But this also means that if Taskhost appears to be hogging resources, some other file is really to blame. The hard part is tracking down and identifying which .dll is the culprit. To see what Taskhost is doing, right-click the Taskbar and select Task Manager or 'Start Task Manager'. Click the Processes tab. Click the Image Name column header to alphabetise the processes so you can easily find all the taskhost.exe processes that are running.
Lincoln Spector
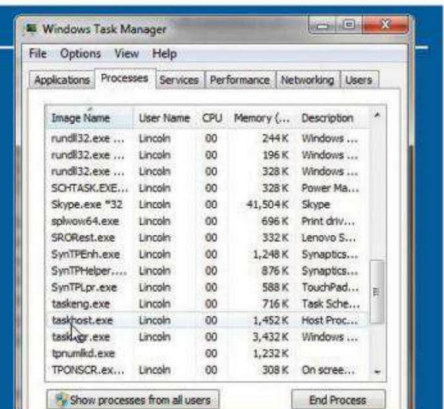
UNWANTED BOOTING

Q I built my own PC inside a barebones chassis, then installed Windows 7. After shutting down, any movement of the wireless mouse starts up the machine. How can I prevent it being used as a remote control? *AroundAgain*

Many recent motherboards include a feature that allows USB devices to turn on your PC. Fortunately, you can turn off this function.

Head to the Control Panel, Device Manager and expand the 'Mice and other pointing devices' section.

Find and right-click your mouse, then select the Power Management tab. Clear the box next to 'Allow this device to wake up the computer'.

If your mouse still wakes up the PC, you may need to change a similar setting in the system Bios.

Restart the PC and enter the Bios. You are usually instructed on how to do so with a splashscreen; otherwise, try pressing F2 or Del before the Windows login appears.

Inside the Bios, look for a Power Management setting, and then for a sub-menu called 'Wake up Event Setup' or something similar. This should display a list of devices that can be configured to wake up the PC. You may also find an option to specify whether such settings are managed by the Bios or the OS.

Look for an entry marked USB Devices and make sure the option is disabled. Now save your Bios settings and restart the PC.

PC CAN'T READ MEMORY CARD

Q My digital camera's 8GB SD Card does nothing when I plug it into my PC to transfer photos. All is fine with 1GB and 2GB cards, but not 4GB and 8GB capacities. The PC is five years old, so I assume this problem is due to some limitation in the hardware. Is there anything I can do? *Blott*

SD cards are not all alike. The original design allowed for capacities up to 2GB, although some 4GB versions were made. To go beyond this capacity, High-Capacity (SDHC) cards were introduced. SDHC cards support a maximum capacity of 32GB and are the type most commonly in use today. Capacities between 32GB and 2TB are available with Extended Capacity (SDXC) cards.

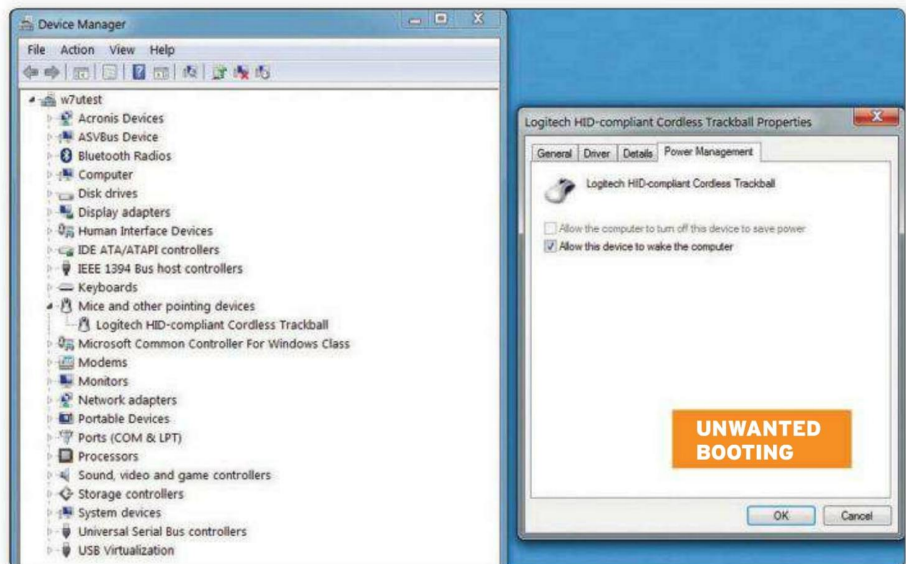Card readers designed for the higher-capacity formats are backwards-compatible, but older card readers can't read the more recent high-capacity formats.

Your 8GB card must be an SDHC Card, while your PC's card reader is limited to standard-capacity (SD) cards.

Card readers are relatively cheap (around £10-£15). A good example is the Akasa AK-ICR-07. How easy they are to fit depends on whether your existing reader is integrated to the case or is a removable module that fits into a drive bay, however.

If you don't want to delve inside your PC, consider using an external USB card reader. A quick search for 'card reader' on Amazon turns up SDHC Card readers from £1.99.

For more information on the various types of SD card, take a look at the SD Association website: tinyurl.com/7jmmoLh.

FAULTY LAPTOP DISPLAY

Q The screen on my niece's XP laptop went blank and is now showing coloured vertical lines. When I plug in an external monitor the correct image is displayed onscreen. What can I do? *denis93*

It sounds as though the laptop has developed a hardware fault with the graphics adaptor, the screen itself or the ribbon cable connecting the two together.

Since you're seeing a normal screen on an external monitor, the graphics card is the least likely culprit.

Assuming the laptop is out of warranty, your niece will need to cost up whether to replace the screen or find an inexpensive external monitor, I'm afraid. It's possible to buy a replacement laptop screen and fit it yourself, but these are often very expensive and such a repair can be uneconomical if the laptop is old. You can find replacement screens available for purchase on eBay. Prices vary considerably depending on the size and model of the screen but, as an example, 15.6in panels were selling for around £35-£65 at press time.

You should be able to find a secondhand monitor available for less – perhaps for free if you ask around and look on Freecycle.

\\DS409SLIM\public\Win 7\en_windows_7_ultimate_with_sp1_x64_dvd_618240\setup.exe

The version of this file is not compatible with the version of Windows you're running. Check your computer's system information to see whether you need an x86 (32-bit) or x64 (64-bit) version of the program, and then contact the software publisher.

64BIT UPGRADE NOT SO SIMPLE

OK
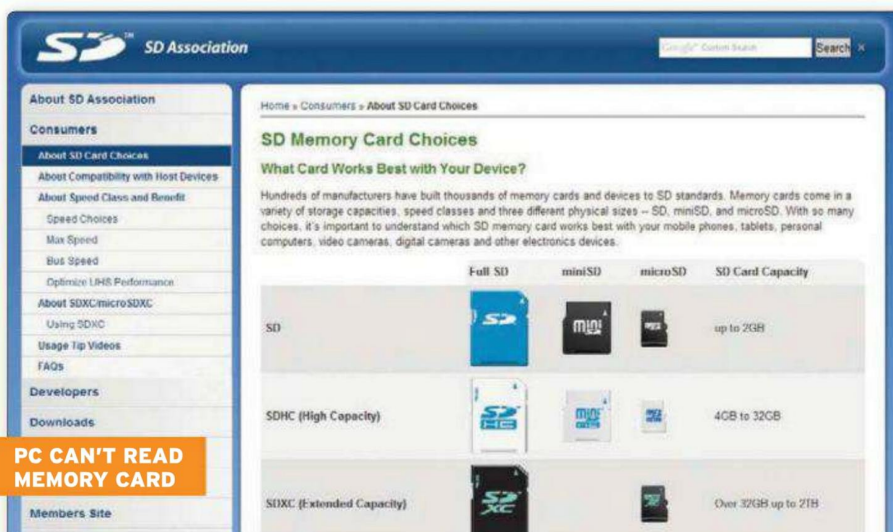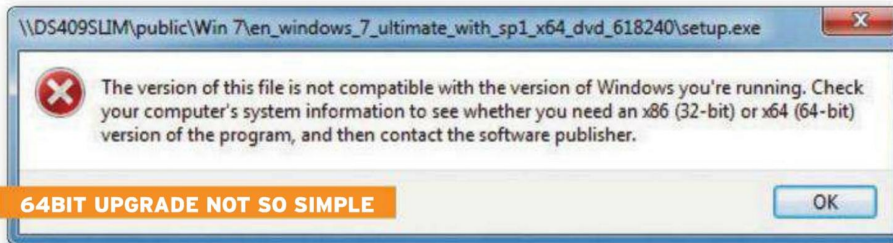
To diagnose your problem properly, you'll need to show the screen to a technician. For other readers suffering similar problems, please attach a photograph of the faulty display to your query so we can try to give you more specific information.

Laptoprepair101.com has a page collating various laptop screen faults along with a diagnosis. Browse through the examples given at tinyurl.com/38jqhh and you may find a diagnosis for a fault that looks the same as yours. The site also offers tips on replacing the screen and checking to see whether you have a faulty connecting cable.

BLUE SCREEN ERRORS

Q My Dell Inspiron 1525 laptop runs Windows 7. Every so often I get a Blue Screen with the message 'data dump'. The PC restarts so quickly that I can't read any more of the information displayed. Any idea what's going on? *Hilary91*

You can change your system settings to stop the laptop from restarting after a blue screen. This will give you more time to read the information and determine what has caused the crash. It should at least give you something you can search for online.

From the Start menu, right-click on Computer and select Properties. Click 'Advanced system settings'. In the section marked 'Startup and Recovery', click the Settings button.

Clear the box next to 'Automatically restart' in the section labelled System failure. Click Ok.

The next time a blue screen occurs, it should remain onscreen long enough for you to write down any useful information or take a photograph.

The message you're seeing regarding a 'data dump' is telling you that Windows is creating a file containing debugging information. There are tools that can help you debug this information to find out what is causing the crash.

One such tool is NirSoft BlueScreenView (tinyurl.com/7uxygmo). It can analyse the contents of the data dump to discover the cause of the crash.
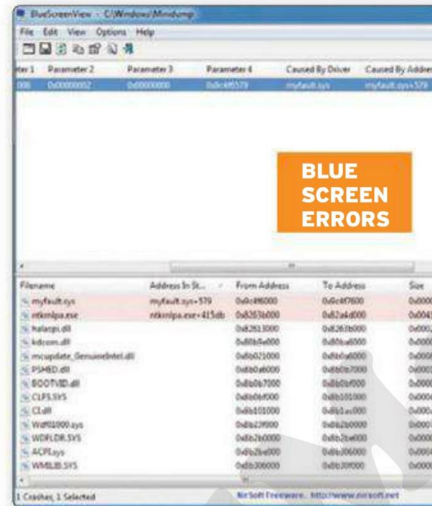

BLUE SCREEN ERRORS

In our screenshot (above), we caused a crash using a utility called 'NotMyFault'. We can see that myfault.sys is the cause of the crash. Your dump file will contain different information, but the details provided should enable you to hunt down the culprit.

64BIT UPGRADE NOT SO SIMPLE

Q Robert K asked a question concerning upgrading from Vista 32bit to Windows 7 64bit in your February issue (page 106). Your answer covers transferring pictures and so on, but doesn't mention the most important issue: you can't upgrade from X86 to X64. You have to complete a clean install, which I think is what Robert was asking. *Tarmo Kappa*

You are, of course, correct, Tarmo. Upgrading from the 32bit version of Windows 7 to the 64bit version requires a 'custom' installation. You can't simply perform an upgrade installation and keep your files and settings and programs intact.

Microsoft provides instructions on how to perform the upgrade on its website. Head to tinyurl.com/y9b2Lp7.

DRAFT MODE PLEASE

Q I use Microsoft Word 2010, but my documents aren't designed to be printed. How can I make Word default to the Draft view mode? I currently have to manually switch to Draft view each time I open a document. *Kiki Abdi*

As you've discovered, Microsoft Word 2010 doesn't like to open documents in Draft view by default. However, there are a few steps you can take to enable all documents saved in Draft view to re-open in Draft view, and to enable all new Word 2010 documents to start in Draft view.

Open Word 2010 and go to the File Menu. Under Help, click on Options. Now click on Advanced and scroll all the way down to General, near the bottom of the page. Here, tick the box marked 'Allow opening a document in Draft view', then click Ok.

Now, if you save your document while in Draft view, it will re-open in Draft view the next time you load it.

To make new documents open in Draft View you need to edit Word's Normal.dotm template file, which holds the default settings for new documents.

To locate your Normal.dotm template file, type %appdata%\Microsoft\Templates in the Word's File, Open dialog.

Open Normal.dotm, change the view mode to Draft view and re-save it. Now, when you start a new document, it should start in Draft view.

DRAFT MODE PLEASE
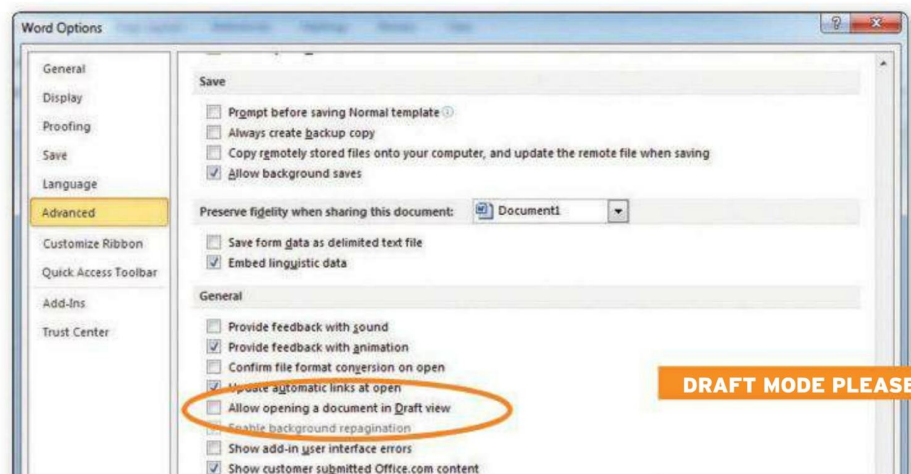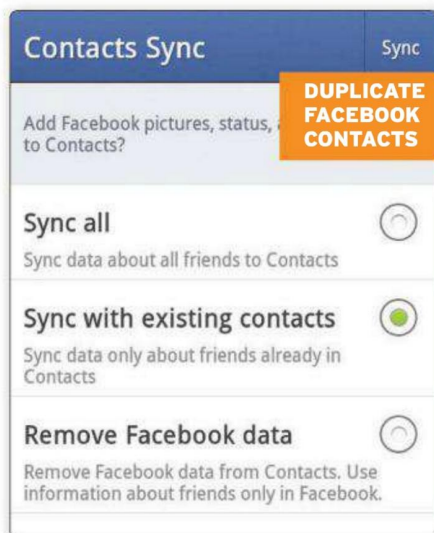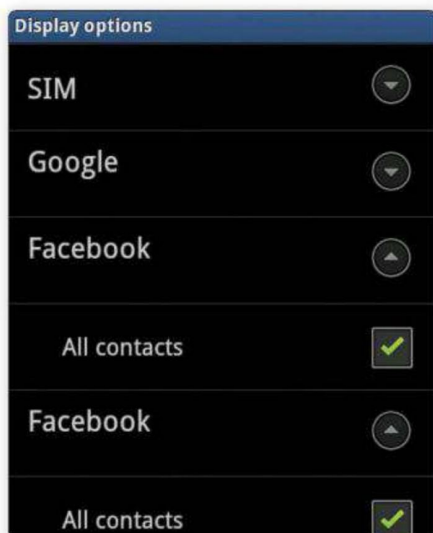
DUPLICATE FACEBOOK CONTACTS

Q All my Facebook friends appear twice in my Samsung Galaxy S II smartphone's Contacts list. How can I remove the duplicates? *Chrissy*

This is probably due to a recent update to the Android Facebook app. You may have two sets of Facebook contacts being synched.

Open up your Contacts list on your phone. Under Display Options, look for the section marked 'Select contacts to display'. If you have two Facebook entries in this section, then this is the root of your problem. Samsung's built-in Social hub is already synching your contacts, and so is the updated Facebook App.

You could simply clear the box next to one of the Facebook accounts to hide them. However, the duplicate contacts will still be stored on your phone.

Start up the Facebook app and go to Settings. Select Sync Contacts in the Other settings section at the bottom. From here you can select the option 'Remove Facebook data'. Click Done and the duplicate Facebook contacts will be removed. Your Facebook contacts will now be synched by Samsung's built-in Social Hub software rather than the Facebook application.

While we're discussing such duplications, you may like to clean up any duplicates in your Google contacts. This is most easily done from your PC using your browser. Sign into Gmail and click on the word Mail at the top left. Select Contacts from the drop-down menu. Now move across to the right and click on the button marked More. Select 'Find & merge duplicates' from the drop-down menu. If you're clear of duplicates you will receive a cheerful "Yay! No duplicates" message. ⊠

SEARCH THE *PC ADVISOR* FREE ONLINE HELPROOM

The *PC Advisor* online Helproom contains an indispensable database of answers to common questions regarding all aspects of PC problems. This ranges from general Windows issues to problems with specific apps, and covers all types of PC hardware and software, including system components and peripherals.

Alternatively, you can ask for help from the experts on our online forums. Sign up to be a registered user – which is free – and then browse to one of the discussion forums. In the Helproom your first stop should be the searchable database of frequently asked and previously answered queries. With more than 1.5 million forum posts, you'll almost certainly find your answer in this archive of queries – just enter a few keywords.

If our online database can't solve your problem, try posting a question in the Helproom forum, where more than 200 queries are answered every day. The forum is manned by our team of Helproom Angels, who are ready and willing to lend a hand with anything from system crashes to virus alerts.

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Email your Helproom questions to helproom@pcadvisor.co.uk. Please use 'Helproom' as the subject header and give your full name, the operating system you're using and other product details. We will let you know by email if your query has been selected for inclusion in these pages. If your query is urgent, you may find it useful to visit our forum at pcadvisor.co.uk/helproom.

Helproom aims to give you the best assistance possible. But, given the limitations of this type of advice, we can't guarantee what we say will work and we can't accept responsibility for any damage arising as a result.

Always back up your system before you make any changes, including software installations.

Please note that we are unable to respond to letters or telephone requests, but we will endeavour to answer queries submitted by email or via our Helproom forum.

Use QR codes in your documents

Mike Bedford provides practical advice on how to generate QR codes that send smartphone browsers to your website, then include them in your documents

The Quick Response (QR) code revolution has gone from relative obscurity to widespread use in what seems like no time at all. QR codes came into being in 1994, but only now are these black and white patterns are cropping up on anything and everything, from posters to magazine ads and product packaging. They make it far more convenient for consumers to follow web links in printed documents.

You simply launch a reader app on your smartphone, then snap a QR code with its camera. The relevant website will appear onscreen.

In a sense, the QR code is the modern-day barcode. A barcode contains enough numerical data to identify a product at a checkout, but no more; a QR code's alphanumeric data can define a web URL. It achieves this by adding a dimension.

The data held in a simple one-dimensional barcode is encoded in one direction only, but a greater amount of information can be contained in a two-dimensional 2D barcode, which looks like a chequerboard.

You may have snapped QR codes on your smartphone before, but have you considered incorporating them into your own business materials? They'll be at home in your product brochures and advertisements, in club newsletters, or even on your business card. And because they can contain phone numbers as well as internet addresses, you could even add them to the Contacts section of your website.

QR code generators are widely available online and easy to use, but there are various pitfalls into which the unwary could all too easily stumble. Here, we provide practical guidance on how to generate QR codes and embed them in a Word file or other document. We focus on using a QR code to direct someone to a website, but most of our instructions also apply if you want to encode a phone number or other element.

DIRECT TRAFFIC TO YOUR WEBSITE WITH QR CODES

START Your QR code is likely to be read by a handheld device with a much smaller screen than a desktop or laptop PC, so it's a good idea to direct followers to a page that's optimised for mobile devices. Compare our mobile.pcadvisor.co.uk mobile site with our full pcadvisor.co.uk desktop site to see what we mean.

4 Click Options and experiment with the various Error Correction Code levels. Note how your QR code grows larger at the higher levels. In some instances you might want to select a higher level to make your code more resistant to damage but, for now, revert to the default 'L' setting to generate a small QR code.

ANATOMY OF A QR CODE

A QR code may look like a matrix of black and white squares that represent binary ones and zeros but, as usual, things aren't that simple. In addition to ordinary data, other elements must be present in order for your smartphone's reader to be able to make sense of a code. It's not essential that you understand this part of the workshop in order to implement QR codes in your business materials, but you may find the anatomy of a QR code interesting.

To illustrate, we've used a diagram of a QR code that has areas shaded in various colours. Of course, this colouring isn't present in a

2 A QR code should be as small as possible. To limit the amount of data encoded in it, use a URL-shortening service such as tinyurl.com or bit.ly. This will cut down the length of the web address you want to direct people to. Some QR code generators include such a service, in which case you can skip this step.

3 We're using the QR code generator at goqr.me, although plenty of others are available and some offer extra features. Click the URL tab and enter the internet address (ideally a shortened version of it) after the 'http://'. The QR code corresponding to the URL will appear onscreen as you type.

5 Select a value of 4 against 'Margin around QR code (module)': This is the minimum recommended value. Click Options if the value isn't visible. You can stick with the default resolution of 250x250 pixels or choose a higher resolution using the 'Size' slider. Click Download to save your code as a PNG file.
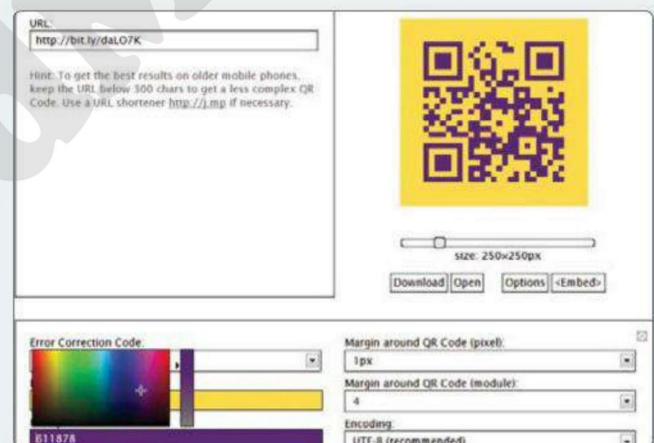
6 QR codes don't have to be black and white. You can alter the background colour and data pixel colour by selecting the relevant options (click Options to see these). This can make a QR code fit in better with a document's colour scheme, but nothing is as easily readable as black and white.

standard QR code and is used here for identification purposes only. That's not to say it doesn't work, however, and if you scan your QR reader over the code pictured right then you'll see it directs you to http://abcdefg.com.

The square targets in three of the four corners (pink) are finder patterns. These are used by the software to recognise a QR code and determine the orientation at which it's been photographed. The smaller target (blue), of which there is one in this Level 2 code but more in some higher-level codes, is an alignment pattern. It's used by the software to correct any distortions caused, for example, by the paper being crumpled. The two lines of alternate black and white squares (yellow) are timer patterns, and define the positions of each row and column of squares.

To double-check your QR code contains what you think it does, or to check the content of one someone has sent you, use the online decoder at onlinebarcodereader.com. Click Browse, find and select your file – it will need to be in Jpeg or PNG format – then press 'Send file'. The contents of the QR code will be shown onscreen.

Add your QR code to a document as you would any other image. However, it's crucial that the square containing the code is big enough. For a Version 1 (21x21 block) code it should be at least 1in square; this rises in proportion to the number of blocks so, for example, a Version 5 (37x37 block) code must be 37/21 = 1.8in.

You can also add QR codes to web pages. This might allow a phone number to be dialled or contact details to be downloaded to a phone's address book. Details will vary depending on what software you use for web authoring, but the guidance on minimum size and the quiet zone still apply.

QR codes are functional, but they don't have to be boring. There are many instances of them being used within artwork (see tinyurl.com/7wwhrfm). Generate your code at a high resolution and with a high error correction level, since customisation will destroy some data. Now get to work in a graphics package.

The latest news, reviews and tutorials available on the go on iPhone & Android

9 A space of four blocks around the QR code was specified in Step 5. It's important not to encroach on that white space in designing your document. Although you can position content immediately adjacent to your QR code, which includes this so-called quiet zone, don't allow anything to overlap it.

10 You might have tested your QR code in Step 7, but now it's in a document you need to test it works with a smartphone or tablet. Print the page at full size and check that the code takes you to the correct website. If you don't have a QR code reader on your handset, download one from i-nigma.mobi.

13 Exactly how you customise your QR code is limited only by your imagination. A good tip is to blank out any area you're thinking of replacing with an image and make sure that the code remains readable. This way, you won't waste time on customising a creation that has no use.

14 Having gone to the trouble of creating your QR code, why hide it away on a brochure or business card? QR code T-shirts have become rather fashionable (in a geeky way). You can order one with a standard QR code from goqr.me, or head to Zazzle (tinyurl.com/qgcsb3) to include your custom version. ⊠

levels: L, M, Q and H. These permit data to be read if 7 percent, 15 percent, 25 percent or 30 percent of the code is damaged, respectively. Which level you choose depends on where you intend to use the code and how likely it is to be damaged. However, for a given version, the amount of data you can store decreases as error correction level increases.

Add HTML 5 video to your website

James Morris explains how to add HTML 5 video to your website, and the exciting possibilities this holds

The web has been through two distinct phases, usually referred to as Web 1.0 and 2.0. We're now considering how the third phase will shape up. One technology that will be central is HTML 5, the latest generation of markup code that forms the backbone of every web page. The HTML 5 standard makes some radical changes to the way pages are structured, so that element tags refer to their roles in the page in a more fundamental and meaningful way.

An important part of this process is that audiovisual content has finally been brought into the fold.

For as long as the internet has existed, text has been rendered directly by every browser. Shortly afterwards, Mosaic popularised web graphics – again, rendered by the browser. But audio and video have always required plug-ins. This has made interaction between the streaming content and the other elements of the page problematic, and universal browser and platform compatibility impossible.

With HTML 5, however, both audio and video can be rendered directly by compatible browsers, in all platforms. Mobile web browsers will eventually be included, too.

This has enormous implications for video on your website. It simplifies the process, so you no longer need a proprietary streaming server and can host the files within your own web space. It also allows audiovisual elements to function in broadly the same way as text and images. Such content is more easily addressed by interactive scripting elements, letting your video drive other actions within the web page.

In this tutorial, we show you how easy it is to add HTML 5 video to your website. Some complications remain (see *Web video format issues*, page 116), and backwards compatibility is still important, given that older browsers don't support HTML 5 content. We'll show you how to take advantage of HTML 5 and ensure your site continues to be accessible.

GETTING STARTED WITH HTML 5
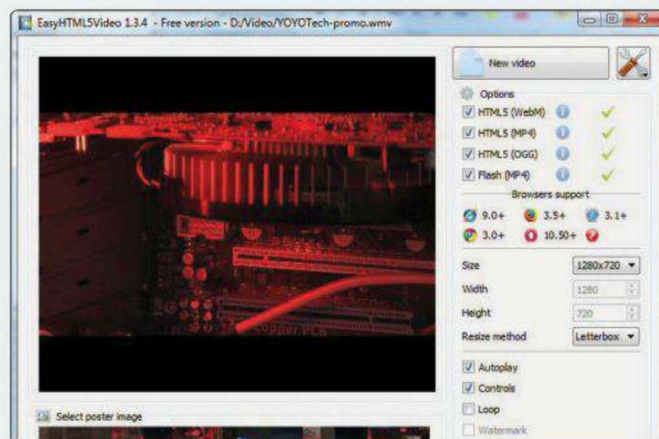
START Your first task is to create your video files. You'll need to create at least two versions to ensure your video is compatible with every browser. EasyHTML5Video (easyhtml5video.com) will encode everything for you, and even creates the associated HTML files. It's free for non-commercial use.
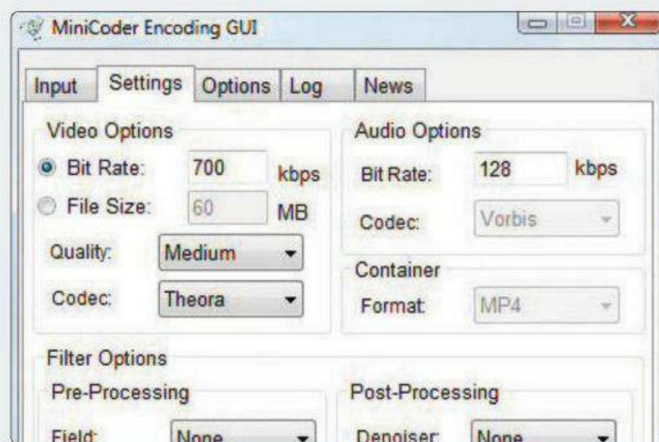
4 Follow a similar process to create an Ogg Theora version. Selecting Theora greys out most of the Audio Options and Container option, but you can still choose bitrates for both video and audio, and resize settings. Again, we recommend saving your settings as a preset using the Save button at the bottom.

PUSHING THE BOUNDARIES OF HTML 5

Having video as another HTML element has opened up a world of creative possibilities, particularly when allied with other experimental HTML 5-oriented technologies such as WebGL. The latter brings 3D acceleration within the browser, most famously allowing a Google developer to port over the game Quake 2 (see tinyurl.com/yhczcLm for more details). But there are a number of extremely impressive examples of the capabilities of HTML 5 video, when combined with WebGL or other technologies.

The innovative independent band OK Go, habitually at the forefront of web video, produced a promo using HTML 5 video and scripting, for
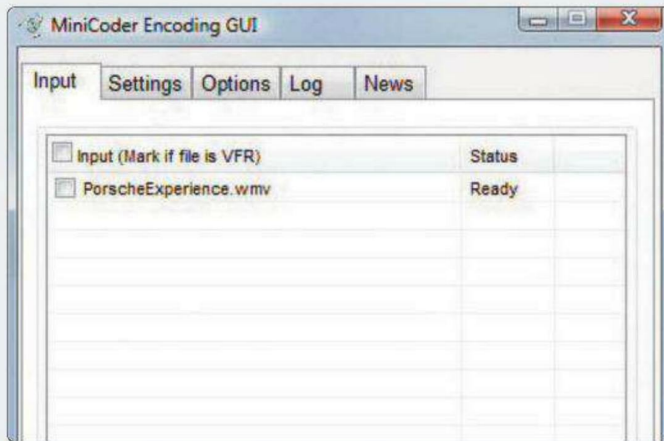
2 For better configuration options we recommend MiniCoder (videohelp.com). Install the software and run the updater to download the necessary encoder files. Load the files you want to encode into the list. You can encode multiple files simultaneously, but only one encoding template can be used at a time.
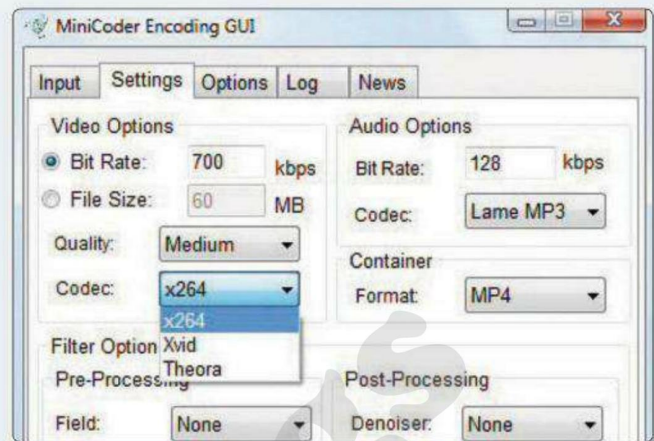
3 First, we're going to create an Mpeg4 file with MP3 audio. Choose x264 for the Codec, and MP4 for the Format. Set the audio codec to Lame MP3. Specify the video bitrate to 700kbps and the audio to 128kbps. You can also resize in the Filter Options. Save your settings as a preset for later use.

5 Now you're ready to create a raw HTML file. Whereas previous HTML standards required a long and confusing <!DOCTYPE> tag, HTML 5 merely needs <!DOCTYPE html>, plus a tag indicating the language used. Non-HTML 5 browsers will fall back to a default state, which should be fine for the compatibility elements we'll add later.

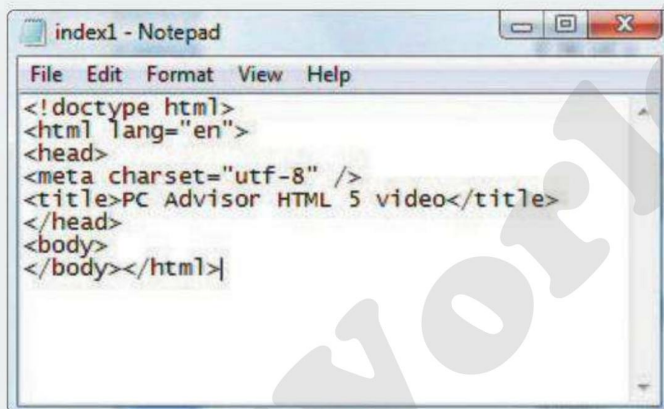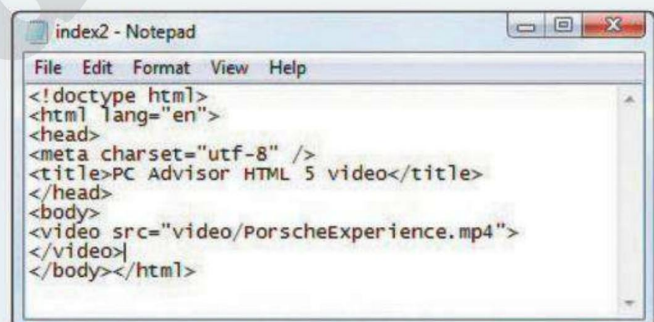**6** Place your HTML index file and videos in a well organised folder structure, such as the index in the root and videos in a subfolder called 'video'. You can now add a basic <video> tag. We've also added the 'src' (source) parameter to tell the browser where to find the video and closed the section with a </video> tag.

the track 'All Is Not Lost' (allisnotlo.st). It's a great example of the raw capabilities of HTML 5, and wouldn't be possible with video plug-ins. Chris Milk's video for 3 Dreams of Black by Rome (ro.me), the collaboration between producer Danger Mouse and composer Daniele Luppi, allows you to pan the scene with your mouse. Most elaborate of all is the One Millionth Tower project (highrise.nfb.ca/onemillionthtower), which blends numerous interactive elements to explore the collapsing high-rises found in every city, and re-imagine them.

Many of these examples were created with Chrome in mind, but will work in other HTML 5-capable browsers, particularly Firefox. Mozilla is backing the Popcorn.js framework (popcornjs.org) and Popcorn Maker (mozillapopcorn.org), an online tool for creating interactive HTML 5 projects.
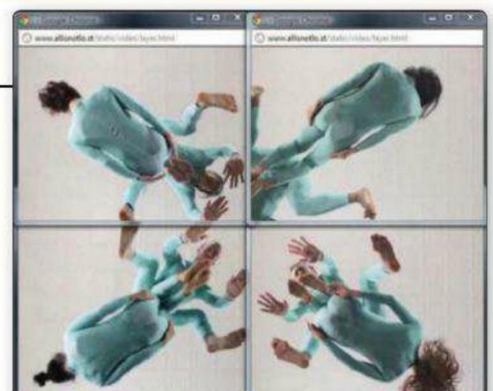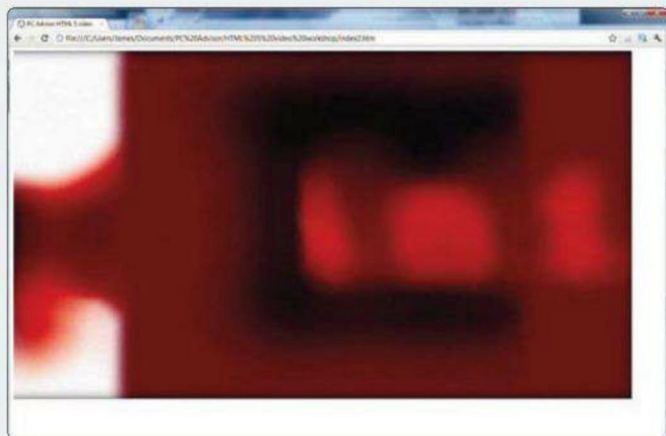
7 In an Mpeg4-compatible browser, you'll see something like this. The first frame of the video will be loaded, but nothing else. The video won't autoplay and you can't click on it to play. So the next stage is to add some more parameters to our <video> tag to provide controls and add other features (see *HTML 5 video tags*, opposite).
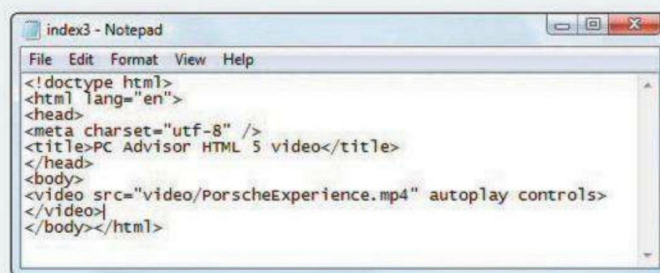
8 We've now added the parameters 'autoplay' and 'controls'. The first will set the video playing as soon as enough has been loaded over the web connection for the browser to be confident of getting to the end without rebuffering. The 'controls' tag adds the default playback controls for your browser.

11 The video will now play in any HTML 5-compatible browser. After loading the HTML file, a browser will go through the list of possible video files until it finds one it can play. Put the Mpeg4 <source> first because some versions of iOS require this. Next, we need to add instructions for legacy non-HTML 5 browsers.
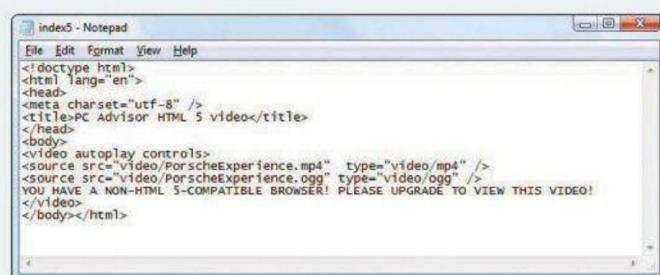

12 You can add text telling visitors to upgrade their browser, or you can provide a fallback option for legacy browsers that support Flash. Use JW Player (tinyurl.com/5an8yw) to create a Flash-based player for your video. Place the <object> code you create within your <video> and </video> tags, after the <source> tags.

WEB VIDEO FORMAT ISSUES

There are clear discrepancies in the implementation of HTML 5. Although different browsers display and react to the tags we've discussed in various ways, there's a more fundamental variation in the video formats that the different browsers will handle using the HTML 5 <video> tag.

The reasons for this are too complicated to go into here. But suffice to say that there is no single video format you can use to address every web browser. If you want to create a site that contains video everyone will be able to watch, you'll need to create multiple versions in different formats.

Three basic video formats are supported by HTML 5: Mpeg4, Ogg Theora and WebM. Google Chrome supports all three, but Firefox and Opera support only Ogg Theora and WebM, while Safari and Internet Explorer support only Mpeg4. You'll therefore need to create at least two versions of your video files; we recommend Mpeg4 and Ogg Theora.
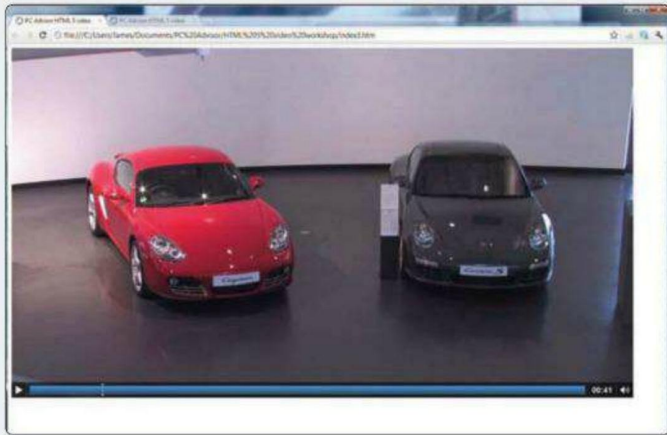
9 The video now looks like this in Chrome, but in a non-Mpeg4-compatible browser such as Firefox you won't see the video at all. You'll see only a non-functioning player with an incorrect video frame size. The browser won't have been able to parse this from the video file header, since it can't read the file. Fortunately, there is a fix.
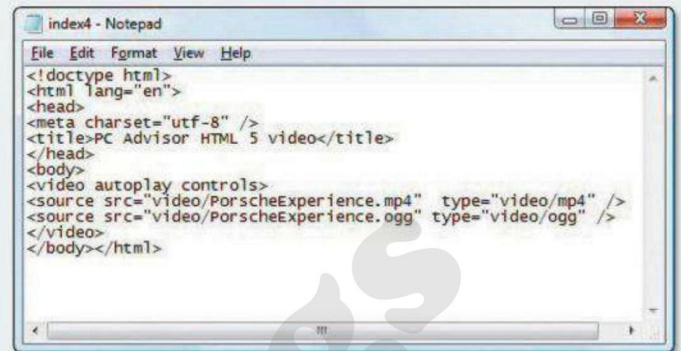
10 We've taken out the 'src' parameter from the ‹video› tag and added it to an extra ‹source› tag. We've also added a second ‹source› pointing to the Ogg Theora file. Finally, we've added 'type' parameters – 'video/mp4' for Mpeg4 and 'video/ogg' for Ogg Theora. These ‹source› tags must come between ‹video› and ‹/video›.
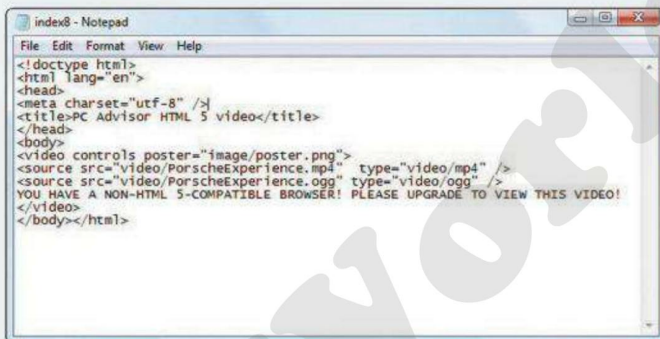
13 Another useful ‹video› parameter is 'poster'. This allows you to define an image to use as the initial thumbnail (else the first frame will be displayed). Grab a frame of your choice, save it as a Jpeg or PNG, then add the parameter to your ‹video› tag as shown. This picture will be used for every browser which supports it.

14 Here is the video, showing a still frame prior to playback, in Firefox, Chrome and Internet Explorer. Note that the latter doesn't display the poster frame, evidence of the fact that there's still some way to go before HTML 5 video can be used with total confidence that it will work as hoped in every browser. ⊠

HTML 5 VIDEO TAGS

These HTML 5 video attributes can be used within the main ‹video› tag. The final three attributes in our list can be included by placing a ‹source› tag between ‹video› and ‹/video›.

| Attribute	Values	Description
autoplay	autoplay	Specifies that the video will start to play when it's ready
controls	controls	Specifies that video controls should be displayed
height	pixel value	Sets the height of the video player
loop	loop	Specifies that the video will restart each time it finishes
muted	muted	Specifies that the video's audio output should be muted
poster	source image URL	Specifies an image to be shown while the video is downloading, or until the user hits the play button

preload	auto	Specifies if and how the author thinks the video should be loaded when the page loads
src	metadata	Specifies the URL of the video file
width	none	Sets the width of the video player

media	media_query	Specifies the type of media resource
src	video file URL	Specifies the URL of the video file
type	MIME_type	Specifies the MIME type of the media resource

Lo-fi photography

Digital cameras are better and more easily affordable than ever, yet analogue photography is increasing in popularity. Michael Burns explains

Digital cameras are becoming ever more powerful, with clever algorithms making it easy to take great-looking photos. Megapixel counts are well into double figures, even on budget models. So the rise in popularity of analogue photography is interesting. Aficionados of such 'lo-fi' photography use basic pinhole cameras, but also seek out cheap single-body models such as the Diana, Holga, Lubitel and Lomo.

The original versions of some of these cameras were very poorly manufactured, and prone to a whole host of problems. Poor focus, misaligned or double-exposed film and aberrations caused by cheap lens materials were common, as was light leakage when the camera casing offered inadequate protection to the light-sensitive film within. These faults are now used creatively by lo-fi artists.

Another attribute associated with this style of photography is vignetting. This darkening along the edges of an image is caused by an incorrect or misaligned lens, but it's become a much prized look. Lo-fi enthusiasts also use cross-processing to achieve a distinctive look with saturated colours. Probably discovered via an interesting mistake, cross-processing is where colour slide film is developed using a 35mm colour film process.

While it isn't strictly lo-fi, another look that's becoming increasingly popular is that of giving life-sized objects in pictures the appearance of brightly painted miniatures. This can be a side effect of the tilt-shift or perspective control lenses, often used to avoid the convergence of parallel lines, such as when photographing a tall building.

We don't need expensive tilt-shift lenses or poorly constructed cameras to achieve lo-fi effects, however. For replication in the digital realm, we have two choices: using dedicated one-shot filters in image-editing software, or building up the effect manually, which allows for greater control.

CREATE TINY TERRORS

START Tilt-shift lenses offer unique depth-of-field capabilities, and can give real-world objects the appearance of models. In Photoshop Elements, it's possible to replicate this with any photo. Choose a scene shot from a high angle, with some middle-ground detail. Select Layer, Duplicate Layer to create a new layer.

PRICELESS MEMORIES
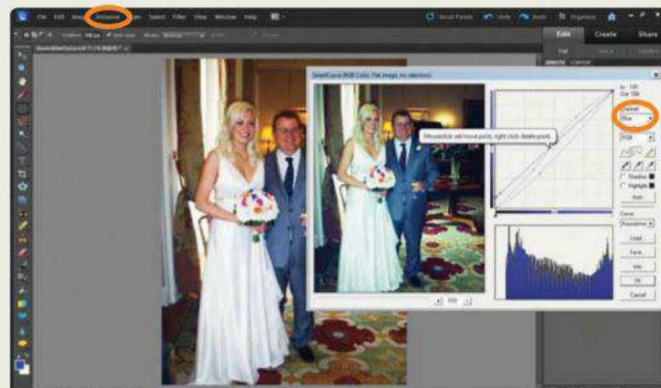
START Photoshop Elements has a Vintage Photo filter, but we can also manually create the aged print look. Choose Enhance, Adjust Color, then increase the saturation and contrast from the Color Curves sub-menu. Select Filters, easy.Filter, Smart Curves to adjust the red, green and blue curves separately. (See page 120).

ALTERNATIVE TOOLS

We've used Adobe Photoshop Elements 10.0 in our workshop, but a good free alternative is The Gimp (tinyurl.com/3pLezh4). It lets you use filters to achieve special effects, manipulate colours, experiment with using layers to blend effects, play with colour-selection tools and 'ruin' images with the clone and heal tools.

Photoscape (photoscape.org), another useful free tool, offers batch editing and can remove red-eye. Photoscape also offers some unique features, such as the ability to combine several photos into one by merging them in a filmstrip fashion, as well as providing a

Tech Help
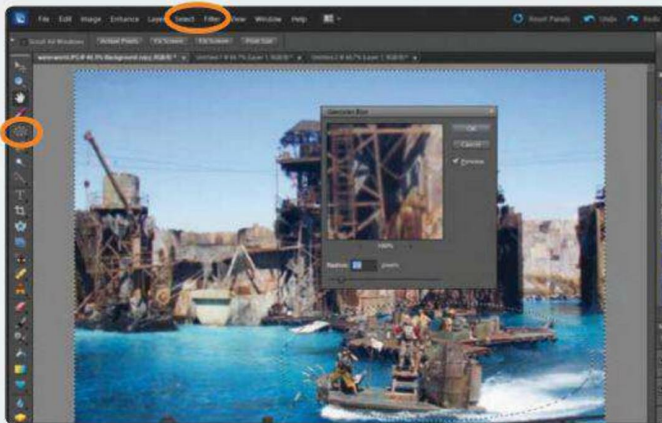
2 Select the Elliptical Marquee Tool and draw a sphere around the area of focus in the middle of the shot. Select Feather and choose 100 as the value to give the selection a rough edge. Choose Select, Inverse, then apply a Gaussian Blur from Filter, Blur, Gaussian Blur. Set the radius value to 2 pixels.

3 We've also increased the colour saturation. Invert the selection by choosing Select, Inverse, then choose Enhance, Adjust Color, 'Adjust Hue/Saturation'. We chose a value of 50+. Finally, increase the contrast via Enhance, Adjust Color, 'Adjust Color Curves'. We chose the standard Increase Contrast setting. ☒

2 Create a duplicate layer and add a vignette (see overleaf), with an opacity of 75 percent. Duplicate the layer again and, in the Hue/Saturation dialog, select the Colorize option. Drag the Hue slider to the left to apply a sepia tone, then adjust the layer opacity to 50 percent. We then added a low-opacity pink fill layer.
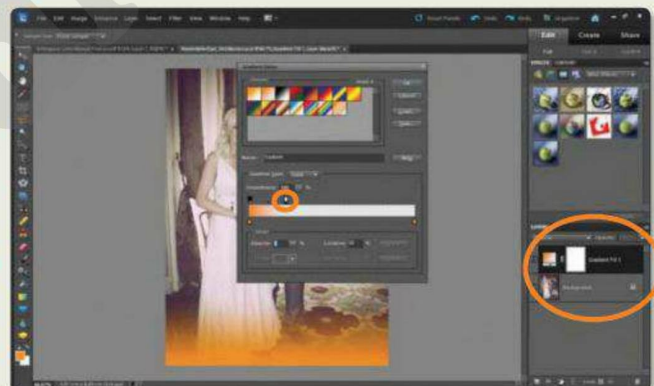

3 Merge the existing layers, then add a new orange layer. Add an adjustment layer and select Gradient from the Layers panel. Select Foreground in the gradient colour box, change it to Transparent and drag the white slider to the left. Choose 0 as the gradient angle, and the blending mode to Color Dodge. ☒

splitter tool to divide a photo into multiple parts, which may be useful as building blocks for special-effect images.

Dedicated lomo cameras

A number of software-based options let you add 'lomo' effects to your photos, but you could instead buy a camera designed specifically for the purpose. The best-known cameras of this type are probably the plastic Diana (pictured) and Holga cameras sold by Lomography.com. These accept standard 35mm film, but quirky

effects can be created with Lomo's cross-processing film. If you simply crave the immediacy of an instant film snapper, Polaroid cameras cost around £70 (see tinyurl.com/3an4f7e for details of the PIC-300).

Finally, you could stick with digital photography but choose a camera that has some lomo effects built-in. Some Olympus compacts and its PEN line-up of Micro Four Thirds cameras offer such options.

CREATE LOMOGRAPHIC PHOTOS
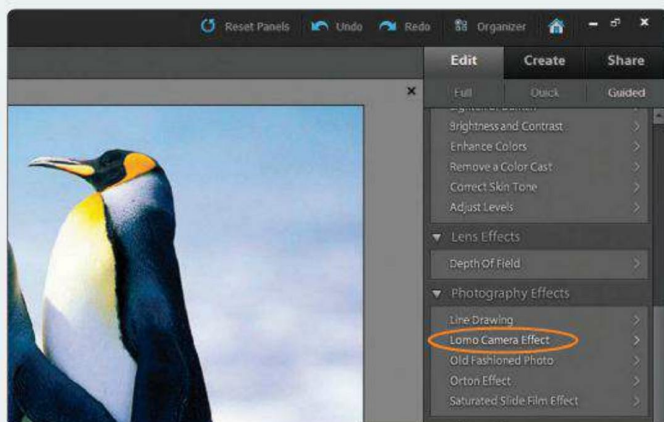
START Photoshop Elements 9.0 and later includes a Guided Effect dedicated to achieving a lomo look. We've loaded an image from Windows 7's Sample Pictures folder. Choose the Edit panel and select the Guided tab. Scroll down to find Photography Effects, then select 'Lomo Camera Effect'.
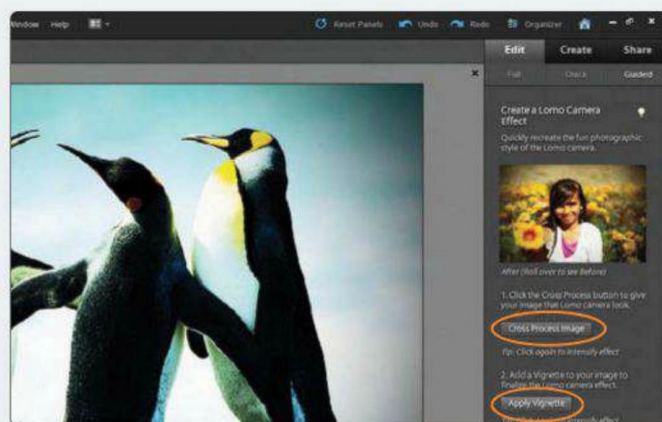
2 Click the 'Cross Process Image' button and Elements will ramp up the saturation. Choose Apply Vignette to darken the edges of the image, replicating the aberration caused by the lomo lens. Each time you click these buttons, Elements intensifies the last applied effect. Clicking Reset will remove all the applied effects.

5 In the Layers panel, add an oversaturated effect by switching the Blending mode to Overlay. We can replicate this manually by adjusting Curves. Switch the duplicate layer to Normal and choose Enhance, Adjust Color, 'Adjust Color Curves'. Click the Increase Contrast option, then adjust the Midtone Contrast slider.

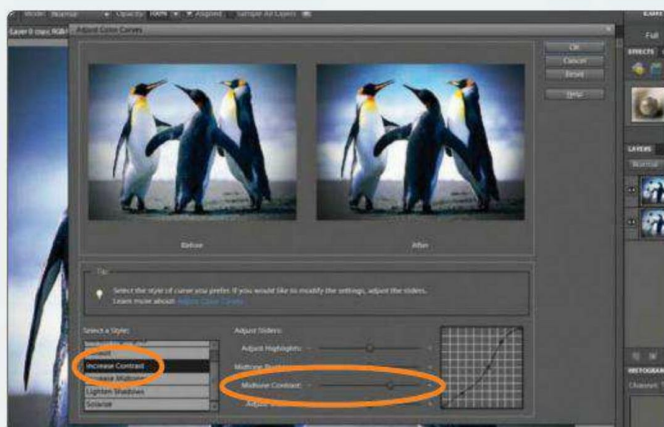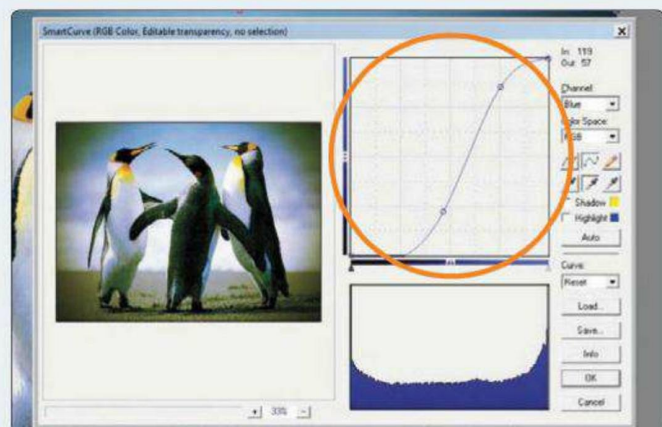**6** We're now going to manipulate the Curves settings using the plug-in from easy.Filter (see below). We've returned to our vignetted penguin image and duplicated the layer. Click Filters, easy.Filter, Smart Curves. Click on the curve to add anchor points – we've created a slanted S shape to increase the contrast.

GET TO GRIPS WITH CURVES

Photoshop Elements offers a Colour Curves enhancement, but it doesn't offer the full Curves feature found in its professional sibling, Photoshop CS5. This is one of the most useful tools for manual image manipulation, as it allows an image's tonal attributes to be adjusted on a fine level.

Help is at hand with a free plug-in called Smart Curve from easy.Filter. Available from tinyurl.com/mm6go, it can also be used by other graphics packages that support Photoshop plug-ins. Once installed in Elements, it's accessible from the Filters menu.

A graph shows the main colour channel (RGB) and separate channels for red, green and blue. At first the graph will show a straight diagonal line. The horizontal axis represents input levels
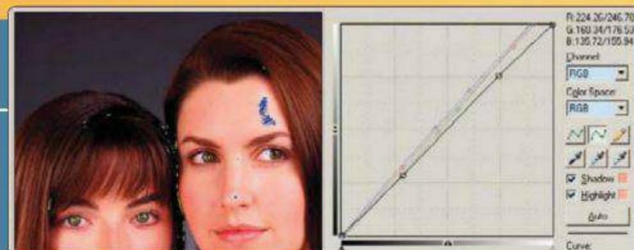
and the vertical axis represents output levels, with the curve charting the relationship between the two.

To manipulate the tonal qualities of the image, select a channel and click in the graph to add points to the curve. A point can be dragged with a mouse click, and deleted with a right-click. Drag the points to manipulate the curve and adjust the image. The preview window shows the transformation.

3 We can adjust the lomo effect by switching to the Full tab in the Edit panel. This gives access to the Layers panel, where there are two layers marked Lomo Effect. Click on the top layer and adjust the opacity slider. Try sliding it from around 50 to 70 percent and see how the strength of the effect varies.
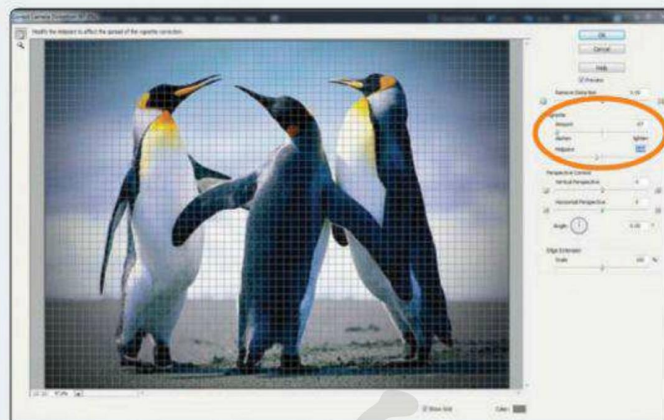
4 To manually apply a vignette, we'll apply the 'Correct Camera Distortion' filter. In this case we'll use the filter in reverse. Select the Preview box, drag the Vignette Amount slider to the left and use the Vignette Midpoint slider to reposition the effect. Return to the image, right-click the layer and choose Duplicate.
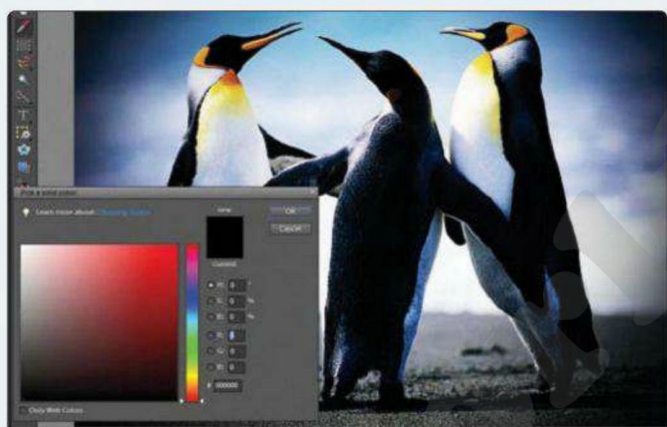
7 To add a darker hue, set the foreground colour to black and select Layer, Add Fill Layer, Solid Color. The blending mode in the Layers panel is changed to Hue and the opacity adjusted to give the image a dark cast, but the saturation remains intact. Change the hue by double-clicking the Solid Color icon and selecting a new colour.

8 Select all the layers, then right-click and choose Merge Layers. The final step is to sharpen the image, by selecting the Unsharp Mask command in the Enhance menu. We set the amount of sharpening to 50 percent and the radius of the effect to 10, while leaving the threshold at 0. ⌧

COVERDVD

iolo System Mechanic 10.7
FULL PROGRAM (SIX-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 201\ iolo System Mechanic 10 and open the install file

Online registration required: head to tinyurl.com/7fpeftr

System requirements
400MHz processor; Windows XP/Vista/7; 256MB RAM; 30MB hard-disk space; Internet Explorer 6.0

While all Windows PC users realise their once-fast computers slow down over time, few understand the reasons for mysterious crashes, system errors and long boot times. With a quick tune-up, your PC could work like new again.

Computer components do not inherently slow down with time. iolo Labs' research indicates that 98 percent of all slowdowns are caused by Windows becoming clogged with faulty settings, system clutter, and data fragmentation that results from everyday use.

These performance-draining problems are specifically what System Mechanic is designed to deal with. With more than 50 advanced tools and a range of options to satisfy both novice and expert users, System Mechanic is engineered to breathe new life into old PCs by releasing misused processor cycles, sweeping away useless hard-drive clutter and recovering wasted memory.

Features

- Designated Drivers: Auto installs critical updates that keep PC components running problem-free

- Program Accelerator: Re-aligns applications for faster responsiveness with breakthrough patent-pending technology

- Crudd Remover: Finds and removes redundant programs that affect performance and stability

- SSD Accelerator: Prolongs the life of SSDs and keeps them running at ultra-high speeds

- Internet Connection Repair: Detects and repairs bad connections to get you online with the fastest, most reliable connection possible ⊠
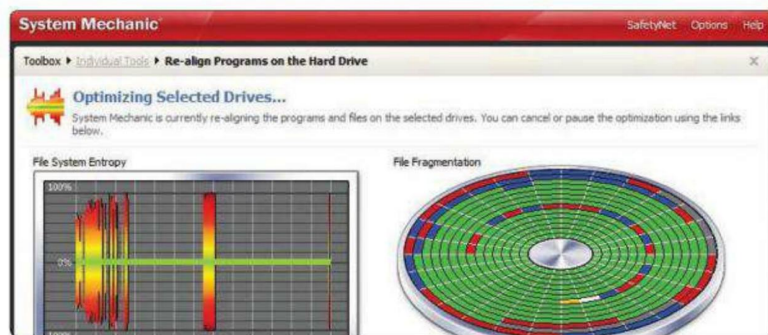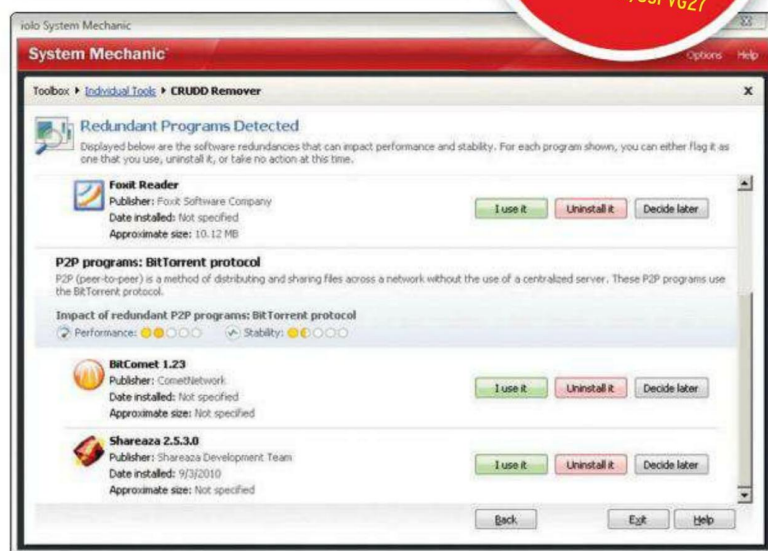
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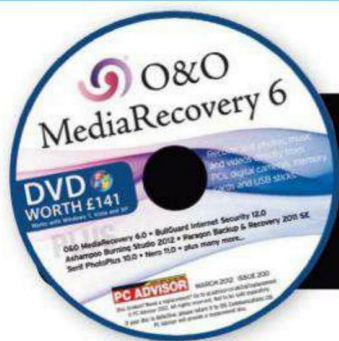
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Installation details
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Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7; 512MB RAM (1GB for Vista and Windows 7)

There are more than 3 million pieces of malware circulating on the internet. A new threat is launched into cyberspace every 12 seconds. Being cautious about what you do online just doesn't cut it anymore: actively protecting your computer and identity has become a must.

G Data InternetSecurity 2012 offers comprehensive protection for your PC and data. In addition to its award-winning virus-detection rates, InternetSecurity's new IdleScan feature scans the system when not in use, utilising your system's uptime efficiently. Cloud-based analysis of suspicious files and a silent firewall give your system an effective all-round defence against viruses,

worms, spam and hacking, without loss of performance and nagging pop-ups windows.

BankSafe blocks Trojans, helping to secure your online banking. Parental controls are also included. ⊠

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Abelssoft Backup 2012 SE
FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details
Go to My Computer. Right-click the DVD icon and open the disc. Select Files 201\ Abelssoft Backup 2012 and open the install file

Online registration required: follow the links during installation

System requirements
Windows 2000/XP/ Vista/7

Your computer is replaceable; the data stored on it is not. It's important to back up your files regularly – a task that Abelssoft Backup 2012 simplifies.

Abelssoft Backup 2012 can back up entire hard disks and selected directories, including any protected and blocked files stored within. It lets you create an emergency backup for the entire hard disk, or you can choose which file types to protect. You could, for instance, choose to back up all your photos, without having to search through your various files and folders to select images for backup.

- Automatic backup of external hard disks upon connection
- Password-protect backups
- Specify file types for backup
- Scheduled backups
- Fast restore feature ⊠
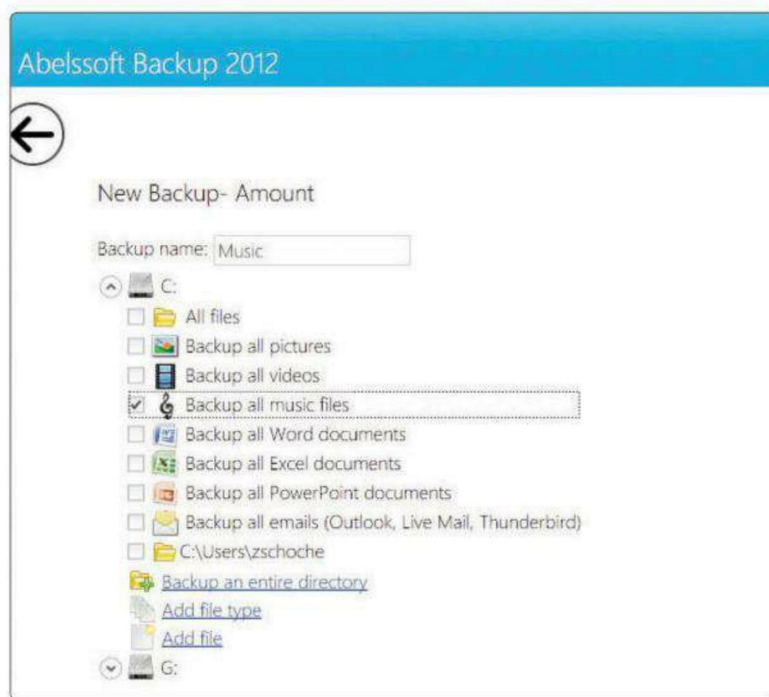
TeamViewer 7.0
FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details
Go to My Computer. Right-click the DVD icon and open the disc. Select Files 201\ TeamViewer 7.0 and open the install file

Online registration required: follow the links during installation

System requirements
Windows 2000/XP/ Vista/7; web connection

TeamViewer is a popular remote control and online meeting solution, which lets you establish a connection with another PC anywhere in the world in a matter of seconds. With TeamViewer, remotely controlling a PC is easy – you can even reboot, log off, transfer files and participate in audio/video calls.

TeamViewer supports Windows, Mac and Linux. Further flexibility is provided by iOS and Android apps that let you remotely control a computer or join meetings from a mobile device.

TeamViewer is a fully functional collaboration tool, providing you and your colleagues with video, chat and a whiteboard – just as if you were all sitting in the same room. All communication via TeamViewer is fully encrypted, based on 1,024bit RSA private/public key exchange and 256bit AES session encoding, widely considered completely secure by today's standards.

Whether it's for home or office use, remote support for family, friends and business partners or for online meetings, training and collaboration, TeamViewer lets you share your desktop with up to 25 people. ⊠

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Ashampoo Office 2010
FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 201\ Ashampoo Office 2010 and open the install file

Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7; 230MB RAM; 64MB hard-disk space; Internet Explorer 6.0

Ashampoo Office 2010 is a powerful and efficient office suite for home or business users. Create documents fast and with ease, streamline and enhance your spreadsheets with meaningful charts, and grab your audience's attention with multimedia-based presentations.

Ashampoo Office comprises word processor TextMaker, spreadsheets app PlanMaker, and the presentation software Presentations. It offers compatibility with Microsoft Office and OpenOffice, reading and writing Word, Excel and PowerPoint files with the highest accuracy.

Install it on a USB stick and never leave home without your office. ⊠
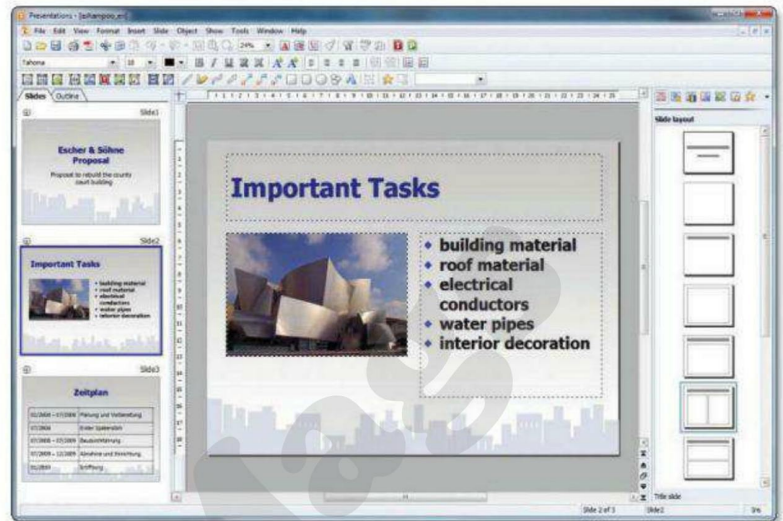
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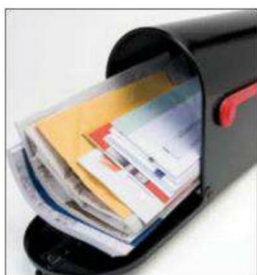As an added bonus, we've cut a deal with Pearson, enabling you to choose one of its great Windows 7 or Microsoft Office 2010 books for free, along with your PC Advisor subscription.

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Brilliant Windows 7

Find out all you need to know about Microsoft's Windows 7 operating system!

This *Brilliant* guide helps you find all the information you need. It takes a highly visual, step-by-step approach, and provides exactly what you need to know, when you need to know it.

WORTH £15.99!

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This *Brilliant* guide helps you quickly find information on Office 2010, leaving you with more time to spend getting the most from your PC.

With a step-by-step approach to beginner- and intermediate-level office tasks, it will visually guide you through all your productivity needs.

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STRAIGHT TO YOUR DOOR • BE THE FIRST TO READ PC ADVISOR

Letter from the Editor

PC Advisor hit the news stand in 1995. Not every family had a PC, and if they did it was a noisy beige box used for spreadsheets, newsletters and the occasional game. Surfing the net mostly meant using dialup: snarling up the

> **There's no better way to get expert advice**

phoneline to find atrocious-looking websites. Such days are gone.

In the past 16 years, we've covered the inexorable rise of the internet, an exponential increase in computing performance, and the birth of the mobile- and cloud-computing eras.

Along the way we've seen false starts and spats, technology successes and failures, and malware that refused to die. We've watched as Microsoft slowly got to grips with PC security, Google swallowed the world whole, and Apple defied those who believe that substance always beats style (it doesn't).

Join us

Now we can all access everything, at any time, from everywhere, PC Advisor is bigger and better than ever. Our unrivalled team of experts continues to bring you news of the latest PC hardware and software, as well as independent, lab-tested reviews of the world's best technology products.

Each month we review hundreds of computer products, cover thousands of news stories, and write yet more features and expert guides. And to the latest issue of the magazine we bring only the most interesting and important of each.

If you're an expert in computing, an interested hobbyist, or a total beginner, there's no better way to get expert advice you can trust than with a subscription to PC Advisor. Join the PC Advisor team and enjoy the next 16 years of computing in the best company possible.

Matt Egan, Editor,
PC Advisor
matt_egan@pcadvisor.co.uk

CONTACT PC ADVISOR

We're always interested in hearing from our readers. You can send us an email at letters@pcadvisor.co.uk, post a message in the PC Advisor forums at PCAdvisor.co.uk/forums, or find us on any of these social networks:

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PC ADVISOR TEST CENTRE

PC Advisor's charts rank and rate the best products every month. If you're looking for the latest Best Buys and Recommended kit, look no further than our 100-plus reviews

Top-ranking chart entrants are eligible for either Best Buy or Recommended awards. A Best Buy takes the top spot, thanks to a winning combination of features, performance and value for money, while Recommended products are excellent alternatives. Almost as good, they offer great value, quality and performance. Chart placings are based on a calculation of features and performance compared to price, so the highest-scoring products usually also represent the best value for money.

USB DRIVES

Costs are fluctuating at the moment, but that's no reason not to back up your most important documents. We recommend five external USB hard drives on page 141.

PC ADVISOR BEST BUY   **PC ADVISOR** RECOMMENDED

All-in-one PCs	Family PCs
Netbooks	Sub-£600 laptops
£601-£1,000 laptops	£1,001+ laptops
Security software	Tablets
Projectors	Printers
USB drives	NAS drives
Digital camcorders	Digital cameras
Graphics cards	Flat-panel displays
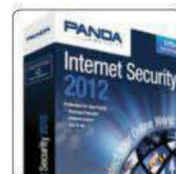
Prices

Laptops
Laptops up to £600
£601 to £1,000
£1,001 and over

Printers
Printers under £150
£151 and over

Graphics cards
Graphics cards under £150
£151 and over

Flat-panels
Flat-panels under £200
£201 and over

Prices listed are those quoted by the distributor or manufacturer and include VAT. They are intended only as a guide and you may see products on sale for less or more than our quoted price.

If you're interested in purchasing one of the products reviewed here then please contact the manufacturer or supplier directly, mentioning both *PC Advisor* and the issue in which you saw the product. If it won't supply the product as reviewed, contact us at letters@pcadvisor.co.uk.

Manufacturers are under no obligation to feature reviewed products on their websites. *PC Advisor's* recommendations are for guidance only. The publisher takes no responsibility for purchasers' decisions.

Read reviews of 10,200-plus products, extended analysis and price comparisons, then buy direct online: **pcadvisor.co.uk/reviews**

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Top 5 All-in-one PCs

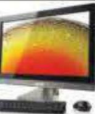|			Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
1 **PC ADVISOR BEST BUY**	Apple iMac 21.5in	• £999 inc VAT • £999 (RRP) • 1-year RTB warranty	2.5GHz Intel Core i5-2500	4GB DDR3 500GB HDD	4x USB 2.0, FireWire 800, Thunderbolt	802.11a/b/g/n, Bluetooth, gigabit ethernet	21.5in IPS glossy LED-backlit 1920x1080
	apple.com/uk tinyurl.com/6276q4s Last month 1			>> WorldBench 6 — **139**			
2 **PC ADVISOR RECOMMENDED**	Sony Vaio VPC-L22Z1e	• £1,600 inc VAT • £1,600 (RRP) • 2-year RTB warranty	2.2GHz Intel Core i7-2670QM	8GB DDR3 1TB HDD	2x USB 3.0, 3x USB 2.0, HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	24in glossy 3D touchscreen 1920x1080
	sony.co.uk tinyurl.com/3r9ppg6 Last month 2			>> WorldBench 6 — n/a[1]			
3	Asus ET2400XVT	• £1,277 inc VAT • £1,277 (RRP) • 1-year RTB warranty	1.73GHz Intel Core i7-740QM	6GB DDR3 1TB HDD	2x USB 3.0, 4x USB 2.0	802.11b/g/n, Bluetooth, gigabit ethernet	23.6in glossy 3D touchscreen 1920x1080
	uk.asus.com tinyurl.com/6Lxtsn4 Last month 3			>> WorldBench 6 — n/a[1]			
4	HP TouchSmart Pro 610-1130UK	• £1,200 inc VAT • £1,200 (RRP) • 1-year RTB warranty	3.2GHz Intel Core i5-650	6GB DDR3 1.5TB HDD	2x USB 3.0, 4x USB 2.0, 2x HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	23in glossy touchscreen 1920x1080
	hp.com/uk tinyurl.com/69tvukz Last month 4			>> WorldBench 6 — **122**			
5	Sony Vaio VPC-J21L8E	• £850 inc VAT • £899 (RRP) • 2-year RTB warranty	2.3GHz Intel Core i5-2410M	4GB DDR3 1TB HDD	2x USB 3.0, 2x USB 2.0, HDMI	802.11b/g/n, Bluetooth, gigabit ethernet	21.5in glossy touchscreen 1920x1080
	sony.co.uk tinyurl.com/42ykrru Last month 5			>> WorldBench 6 — **84**			

Top 5 Family PCs

			Processor	RAM Hard-disk capacity	Ports & connectors	Wireless connectivity	Screen Resolution (pixels)
1 **PC ADVISOR BEST BUY**	Chillblast Fusion Hotrod	• £799 inc VAT • £799 (RRP) • 2-year collect-and-return warranty	3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (3Gbps)	2x USB 3.0, 7x USB 2.0	none	23.6in Asus VS247H 1920x1080
	chillblast.com tinyurl.com/7q3p93n Last month 1			>> WorldBench 6 — **172**			
2 **PC ADVISOR RECOMMENDED**	Braebo Ares	• £611 inc VAT • £611 (RRP) • 1-year RTB warranty	2.9GHz AMD Fusion A8-3850	8GB DDR3 1TB SATA (3Gbps)	4x USB 3.0, 2x USB 2.0	none	21.5in AOC F22+ 1920x1080
	braebo.com tinyurl.com/6wm2drq Last month 2			>> WorldBench 6 — **115**			
3	Arbico eXcel i5256 VX	• £699 inc VAT • £699 (RRP) • 2-year RTB warranty	3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (6Gbps)	2x USB 3.0, 4x USB 2.0	802.11b/g/n	23.6in AOC 2436Vwa 1920x1080
	arbico.co.uk tinyurl.com/7ssrknr Last month 3			>> WorldBench 6 — **172**			
4	Eclipse Solar i525n560Ti	• £849 inc VAT • £849 (RRP) • 1-year RTB warranty	3.3GHz Intel Core i5-2500K	8GB DDR3 1TB SATA (6Gbps)	2x USB 3.0, 6x USB 2.0	none	23.6in HKC 2412 1920x1080
	eclipse-computers.com tinyurl.com/d6qodth Last month 4			>> WorldBench 6 — **169**			
5	CyberPower Ultra 6 Core Silent Edition	• £999 inc VAT • £999 (RRP) • 3-year RTB warranty	2.8GHz AMD Phenom II X6 1055T	8GB DDR3 2TB SATA (3Gbps)	2x USB 3.0, 4x USB 2.0	802.11b/g/n	23.6in HKC 2412 1920x1080
	cyberpowersystem.co.uk tinyurl.com/88799nw Last month 5			>> WorldBench 6 — **123**			

[1] Not tested

>> Buying advice

Family PCs

Desktop PC prices were correct at press time for issue 200 and include delivery. Vendors often honour the price of PCs longer than our onsale date. However, changes in exchange rates and component supply issues mean that not all the PCs listed here will be available as specified. These charts are intended only as a guide.

Processor: Intel's Core i5-2500K is a popular CPU, offering excellent performance at a good price. Its 'K' suffix means the chip can be easily overclocked in the EFI, provided that you're also using a motherboard with a Z68 chipset. It also includes integrated graphics, which are adequate for most users. AMD also sells CPUs with graphics built-in – its Fusion chips are faster for gaming than their Intel counterparts, but the trade-off is found in application performance. We like the A8-3850, a quad-core CPU running at 2.9GHz.

Graphics card Maximum memory Fear (Max)	Dimensions Weight Power consumption	Max disc speeds	Operating system, software and extras	**VERDICT**
AMD Radon HD 6750M 512MB 100fps	528x189x451mm 9.3kg not tested	8x DVD ± R/ 4x ± R DL/ 8x -ROM	Mac OS X 10.7 Lion, FaceTime HD webcam, Magic Mouse, wireless keyboard	The iMac is preloaded with OS X 10.7 Lion. It excelled in our benchmarks, with its 139-point WorldBench score beating all others, while the AMD Radeon HD 6750M delivered strong games performance. You won't find a Blu-ray player or USB 3.0 support here, but you will find the faster Thunderbolt connection. Neither do you get a touchscreen, although the supplied Magic Mouse features a touch-sensitive body for scrolling. The 21.5in IPS panel is small, but it offers unparalleled image quality.
nVidia GeForce GT540M 1GB 116fps	608x168x429mm 12kg 87W (idle), 135W (under load)	6x BD-ROM/4x -R 8x DVD ± R/ 6x ± R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, wireless keyboard	The Vaio has some of the best specs in our chart, including both 3D and Blu-ray support. The Core i7-2670QM quad-core processor usually runs at 2.2GHz, but climbs to 3.1GHz with Turbo Boost enabled. The Sony decimated its rivals in our gaming tests; we weren't able to run WorldBench, but it should be plenty fast for most tasks. The large 24in glossy display offers strong blacks, bright vivid colours and crisp text. This dream entertainment all-in-one computer carries a hefty price tag, though.
nVidia GeForce GT460M 1.5GB 40fps	582x50x495mm 13kg 40W (idle), 78W (under load)	4x BD-ROM 8x DVD ± R/ 6x ± R DL/ 8x -ROM	Windows 7 Home Premium 32bit, webcam, 3D glasses, wireless keyboard	The ET2400XVT's strong specs include a 23.6in touchscreen, support for nVidia's 3D Vision technology (active-shutter glasses are supplied), and a slew of USB 3.0 and 2.0 ports. The i7-740QM quad-core CPU supports Turbo Boost, allowing the 1.73GHz processor to run at 2.93GHz when the PC is under load. However, it's significantly slower than the second-gen processors seen elsewhere in the chart. The 23.6in screen isn't the most accurate we've seen, displaying a slight oversaturation of some colours.
AMD Radeon HD 5570M 1GB 72fps	584x103x450mm 11.8kg 67W (idle), 112W (under load)	4x BD-ROM 8x DVD ± R/ 6x ± R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, TV tuner, Beats Audio, wireless keyboard, remote	This chunky all-in-one offers great potential for entertainment and office productivity. Although the 23in screen is no larger than that of the competition, its chassis is much thicker, at 103mm. Input is via a wireless keyboard, mouse or remote control. The Beats Audio-branded speakers deliver crisp highs and mids, and excellent bass for their size. Blu-ray is also thrown in. Application performance is good, but the graphics card isn't particularly powerful. The TouchSmart's tilting stand is a nice touch.
Intel HD 3000 n/a 17fps	525x185x398mm 9.8kg 41W (idle), 72W (under load)	8x DVD ± R/ 8x ± R DL/ 8x -ROM	Windows 7 Home Premium 64bit, webcam, wireless keyboard	Sony has copied the square edges and styling of its Bravia TVs with astonishing accuracy. This all-in-one is extremely compact, with a small 21.5in display. The specs are decent, although the WorldBench score of 84 is unimpressive. The touchscreen display is capable of two-point multitouch, but it's overly sensitive. We were surprised to find no Blu-ray drive. This PC also lacks a dedicated graphics card. The wireless keyboard is comfortable to type on, and the selection of USB ports is decent.

Graphics card Maximum memory Crysis (Low/Medium)	Case Motherboard Power supply	Max disc speeds	Operating system, software and extras	**VERDICT**
Sapphire AMD Radeon HD 6870 1GB 161/100fps	EZCool A200D Rev 2 Asus P8Z68-V LE 650W	12x BD-ROM 16x DVD ± R/ 8x ± R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, CyberLink PowerDVD, Logitech Cordless MK260 keyboard	Chillblast's Fusion Hotrod can turn its hand to almost any task in a home environment. Based on a 3.3GHz Intel Core i5-2500K processor, this PC offers very good application speed. Graphics are also impressive, with the AMD graphics card able to produce 100fps in Crysis. The 23.6in full-HD flat-panel is a good partner for the Blu-ray drive, while Chillblast bundles a set of Sweex speakers and a wireless keyboard and mouse. At £799 the Hotrod may be on the pricey side for a family desktop PC, however.
AMD Radeon HD 6550D n/a 62/36fps	Inwin Dragon Slayer ASRock A75M-HVS 500W	12x BD-ROM 16x DVD ± R/ 8x ± R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter, Nero, Microsoft WD3000 keyboard	This budget desktop makes its presence felt like a Sherman tank crashing through your living room. With its striking looks, military colours and blue illuminated logo, it certainly looks ready to kill something. And that something was our benchmark, for the Braebo put in a very reasonable score of 115 points in WorldBench 6. Graphics performance from the integrated solution is less impressive, but playable nonetheless. A 21.5in screen is paired with a Blu-ray drive, external speakers and the best wireless peripherals here.
Intel HD Graphics 3000 n/a 46/21fps	Gigabyte GZ-X6 Black Asus P8Z68-V LX RTL 500W	22x DVD ± R/ 12x +R DL/16x -R DL/ 22x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Nero, BullGuard Internet Security	Arbico's eXcel is a powerful yet practical home PC. Despite costing less than many PCs in this chart, it performs just as well. We recorded a staggering 172 points in WorldBench 6, but the Arbico delivered just 21fps in Crysis – gamers should look elsewhere. A Z68 chipset enables you to unlock an extra speed boost through the EFI, and the Asus motherboard also supports USB 3.0. It looks smart, and comes with a large 23.6in monitor but, unlike the competition, the Arbico omits a Blu-ray drive.
nVidia GeForce GTX 560 Ti 1GB 162/110fps	Cooler Master Elite RC-430 Asus P8Z68-V LE 650W	10x BD-ROM 12x DVD ± R/ 8x ± R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit	Eclipse's £849 Solar offers more performance than most home users will ever need, while gamers will be in their element: it delivers faster framerates in Crysis than any other PC in this chart. This gaming performance comes at the cost of user-friendly features, though, such as wireless connectivity and a card reader. The keyboard and mouse are also disappointing, given this system's price. A 23.6in full-HD monitor is paired with a Blu-ray drive and a set of Logitech speakers that includes a subwoofer.
PowerColor AMD Radeon HD 6750 1GB 96/58fps	Cooler Master Silent RC-551-KKN1 Asus M5A97 500W	12x BD-ROM 16x DVD ± R/ 8x ± R DL/ 16x -ROM/12x -RAM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter, Logitech MK320 keyboard	This expensive PC features superb build quality, decent peripherals, quiet operation, a built-in card reader and Wi-Fi. But did we mention that it's expensive? We had trouble getting the CyberPower to complete our benchmarks, and were even less impressed by its performance in Windows. Still, speed isn't a priority for everyone, and the Ultra 6 Core has much to offer – including a superior system case and cooling, a 23.6in display, a Blu-ray drive and an external speaker set that includes a subwoofer.

Prices are intended only as a guide and are correct at press time

Graphics: If you later find integrated graphics aren't fast enough for your needs, it's possible to boost your setup. An AMD Radeon HD 6870 or nVidia GeForce GTX 560 Ti graphics card can provide ample performance without breaking the bank.
Memory and storage: Consider 4GB of RAM and a 500GB hard drive as the minimum required. If you plan to upgrade the storage later, keep in mind that recent flooding in Taiwan has pushed up prices. Things should settle down within a few months, however.

Display: Screen quality is crucial. Look for in-plane switching (IPS) panels where available, which offer better colour fidelity than budget twisted-nematic (TN) monitors.

Consider a full-HD 24in monitor rather than a get-you-by 21.5in model, especially if you'll be using the PC to watch video.
Multimedia: If you want a PC for watching films and video, listening to music and chatting with friends, a set of speakers is essential. For larger rooms or simply a bigger sound, a 2.1 stereo set that incorporates a

separate bass speaker or subwoofer will perform better than a cheap 5.1 setup.

A Blu-ray drive is becoming a more affordable option, but watching films isn't helped by a noisy PC. Quiet, sound-dampened cases can drastically cut down on the noise produced by fans and drives. Good-quality CPU coolers can also help.
Software: Beginners may find the automated setup process of systems from larger manufacturers useful, but a lot of unwanted preinstalled software can slow down your PC.

Top 5 Netbooks

	Processor	USB 2.0 ports FireWire ports	RAM Hard-disk capacity	Dimensions (wxdxh) Weight	Wireless connectivity
1 PC ADVISOR BEST BUY **HP Mini 210-3002sa** hp.com/uk tinyurl.com/4yfd5ho Last month 1 • £269 inc VAT • £269 (RRP) • 1-year collect-and-return warranty	1.66GHz Intel Atom N570	3 0	1GB DDR3 250GB	268x191x32mm 1.4kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **38**					
2 PC ADVISOR RECOMMENDED **Samsung NC110** samsung.com/uk tinyurl.com/7qzapkm Last month 2 • £250 inc VAT • £250 (RRP) • 1-year RTB warranty	1.5GHz Intel Atom N550	3 0	1GB DDR2 250GB	259x180x28mm 1.2kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **36**					
3 **Kogan Arora Pro** kogan.co.uk tinyurl.com/43mn2ob Last month 3 • £280 inc VAT • £289 (RRP) • 1-year collect-and-return warranty	1.3GHz Intel Pentium SU2700	3 0	2GB DDR2 500GB	290x195x26mm 1.3kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **n/a[1]**					
4 **Samsung NS310** samsung.com/uk tinyurl.com/444sktx Last month 4 • £330 inc VAT • £330 (RRP) • 1-year RTB warranty	1.5GHz Intel Atom N550	3 0	1GB DDR3 250GB	275x188x31mm 1.1kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **37**					
5 **Dell Latitude 2120 Advanced** dell.co.uk tinyurl.com/7wnff7t Last month 5 • £598 inc VAT • £598 (RRP) • 1-year collect-and-return warranty	1.5GHz Intel Atom N550	3 0	2GB DDR3 320GB	265x187x23mm 1.3kg	802.11a/b/g/n
>> WorldBench 6 **33**					

Top 5 Sub-£600 laptops

	Processor	USB ports FireWire Memory card reader	RAM Hard-disk capacity	Dimensions (wxdxh) Weight	Wireless connectivity
1 PC ADVISOR BEST BUY **Samsung RV511** samsung.com/uk tinyurl.com/5tvt8ae Last month 1 • £530 inc VAT • £530 (RRP) • 1-year RTB warranty	2.53GHz Intel Core i3-380M	3 0 yes	6GB DDR3 640GB	382x256x34mm 2.4kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **105**					
2 PC ADVISOR RECOMMENDED **Lenovo IdeaPad S205-1038** lenovo.com/uk tinyurl.com/6g5ekqk Last month 2 • £340 inc VAT • £350 (RRP) • 1-year RTB warranty	1.6GHz AMD E350	3 0 yes	4GB DDR3 500GB	290x168x29mm 1.5kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **53**					
3 **Lenovo G570** lenovo.com/uk tinyurl.com/6fzz4xe Last month 3 • £500 inc VAT • £500 (RRP) • 1-year RTB warranty	2.1GHz Intel Core i3-2310M	4 0 yes	6GB DDR3 640GB	377x250x35mm 2.6kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **96**					
4 **Dell Inspiron 17R** dell.co.uk tinyurl.com/64nqqk8 Last month 4 • £599 inc VAT • £599 (RRP) • 1-year RTB warranty	2.4GHz Intel Core i5-2430M	3 0 yes	4GB DDR3 500GB	423x287x30mm 3kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **114**					
5 **MSI CR650** uk.msi.com tinyurl.com/5trk7f4 Last month 5 • £500 inc VAT • £511 (RRP) • 1-year RTB warranty	1.6GHz AMD E350	3 0 yes	4GB DDR3 500GB	383x250x38mm 2.3kg	802.11b/g/n, Bluetooth
>> WorldBench 6 **54**					

[1] Not tested Note: WorldBench 6 works only in Windows [2] Not tested using MobileMark 2007

>> Buying advice

Netbooks

A light, compact chassis is a mini laptop's main asset. Portability, lengthy battery life and a low price tag are these modest machines' main selling points.
Processor: Intel's Atom N450 is a popular chip. It consumes little power and gets the job done. Just don't expect massive processing muscle.

Storage: Netbooks usually come with either 160GB or 250GB hard-disk drives. Some have solid-state drives instead. Smaller, less fragile and quieter, these are also expensive and you'll have to settle for far less capacity.
Memory: Most netbooks come with 1GB of RAM, but you can upgrade to 2GB for around £20 (see tinyurl.com/yerjwpc). A smaller complement than found in more capable machines, this is sufficient for basic tasks.
Wireless: 802.11b/g was standard on netbooks, sometimes with Bluetooth, but

PC ADVISOR TEST CENTRE

Screen size Native resolution (pixels)	Graphics card Maximum memory	Flash memory drive	Max disc speeds	Operating system, software and extras	VERDICT
10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	Offering a very good mix of performance and battery life, the brightly coloured HP comfortably holds on to the top spot. It may not suit the boardroom, however – we reviewed the grey version; the pink version is more garish. With a WorldBench 6 score of 38, the HP is fast for a netbook, while the keyboard is 93 percent of a full-size version. This enables almost error-free typing. The speakers are good as well, and the 10.1in screen with an anti-glare coating offers a nice image. Battery life is very good.
›› Battery life				7:54	
10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	After initial problems, etailers now have good supplies of the NC110. That's good: this netbook is one of the better models on the market. The 1.5GHz CPU isn't as fast as the HP's, but 36 points is a good showing for a netbook. The 1GB of RAM is standard, but it's only DDR2. Battery life is excellent, with the Samsung lasting for almost 8 hours. The matt screen offers good quality, and won't suffer from distracting reflections. A small, light chassis and good battery life make the Samsung a road warrior.
›› Battery life				7:52	
11.6in 1366x768	Intel GS40 n/a	yes	n/a	Ubuntu Linux 11.04 Natty Narwhal	Fitted with an 11.6in screen, the Agora Pro just about qualifies as a netbook (Kogan bills it as an ultraportable laptop). The single-core SU2700 Pentium is joined by a useful 2GB of RAM and a large 500GB hard disk. The matt screen works well in daylight, and its 1366x768 resolution is welcome. Buttons on the full-size keyboard are a little wobbly, but quick typing is easy. The Kogan Agora Pro was noisy in our tests, and battery life is poor. But its Ubuntu OS allows the Pro to run with ease.
›› Battery life				2:22[2]	
10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	The NS310 is a brand-new netbook, yet appears to be stuck in a time warp. Rather than break free from the shackles of Microsoft, Samsung has chosen to trot out another Wintel notebook. The electric blue finish is interesting, but there's little else here that wasn't available three years ago, with the exception of Bluetooth 3.0. The low weight is pleasing, although a small battery reduces the runtime considerably. It's barely faster than its predecessors, while the low-resolution screen is glossy.
›› Battery life				3:41	
10.1in 1366x768	Intel GMA 3150 n/a	yes	n/a	Windows 7 Professional 32bit, Microsoft Office Starter 2010	You can get cheaper versions of this netbook from Dell, and that's probably just as well – even given the ruggedised casing, the £598 price tag is exorbitant. The specs are good, with 2GB of DDR3 memory, a fast 320GB hard drive, and Windows 7 Professional rather than Starter. Nonetheless, performance is nothing to write home about, and even the battery life lacks endurance compared to some models here. The keys are almost full-size, but the touchpad is rather small. You can find better value.
›› Battery life				6:24	

Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear)[1]	Max disc speeds	Operating system, software and extras	VERDICT
15.6in 1366x768	nVidia GeForce 315M 1GB	33	8x DVD ± R/4x ± RW/8x -ROM	Windows 7 Home Premium 64bit	The 6GB version of this laptop can be tricky to find – Laptopsdirect had good supplies at press time, albeit at the slightly inflated price of £530. It's worth hunting down, though, since it offers superb performance, with a sizzling WorldBench 6 score of 105 points. A 3GB version is available at lower cost, but performance won't be so great. Battery life isn't vast, but it compares reasonably with its rivals. The 15.6in display is reflective, with its shine concealing washed-out images. This is a very capable model.
›› Battery life				5:15	
11.6in 1366x768	AMD Radeon HD 6310M n/a	18	n/a	Windows 7 Home Premium 64bit	This 11.6in-screen Lenovo IdeaPad is extremely portable, but has far more in the way of power and specifications than a similar-sized netbook. The screen is criminally glossy, but offers a sharp, well-defined image. The 1.6GHz AMD E350 processor shows its age, and a WorldBench score of 53 isn't great. Nor are the graphics capable of doing any justice to games. But the 500GB hard drive is capacious, and typing is very comfortable. Battery life is also very good. This Lenovo is an ideal travel companion.
›› Battery life				5:38	
15.6in 1366x768	AMD Radeon HD 6370M 1GB	32	2x BD-ROM 8x DVD ± R/4x ± RW/8x -ROM	Windows 7 Home Premium 64bit	This is exactly the sort of functional laptop you might expect from Lenovo, and it doesn't fare badly in the looks department either. Our sample developed a row of dead pixels, but otherwise impressed. Its score of 96 points in WorldBench 6 is adequate at this the price, and the HD 6370M graphics controller makes this one of the few low-priced laptops that can handle games. The 640GB hard drive is capacious and this model can even handle Blu-ray playback. It's a little heavy at 2.6kg, however.
›› Battery life				5:01	
17.3in 1366x768	Intel GMA HD n/a	n/a	8x DVD ± R/4x ± RW/8x -ROM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter	A study in clean, simple design, the Inspiron 17R is highly configurable and supports many of the latest technologies, including USB 3.0 and Intel's Wireless Display (WiDi). Perhaps most startling at this price, though, is the giant 17.3in display. A Scrabble-tile-style keyboard is recessed into the desk, with the cursor arrows and numeric keypad delineated from the main keys. The 114 points notched up in WorldBench 6 is impressive. Battery life isn't great, but the Dell makes an ideal desktop replacement.
›› Battery life				3:30	
15.6in 1366x768	AMD Radeon HD 6310M n/a	19	8x DVD ± R/4x ± RW/8x -ROM	Windows 7 Home Premium 64bit	Creeping in at the bottom of the chart, the MSI is hamstrung by a high price and a weak processor. The latter is a dual-core 1.6GHz AMD E350, a chip that Lenovo also places in its IdeaPad. But while that laptop is designed primarily to be portable, the CR650 is intended as a primary PC. Gaming performance isn't fantastic either, while the 15.6in screen doesn't send out the sharpest picture. The sound quality is good and the keyboard fine. A better price is needed to make this a tempting purchase.
›› Battery life				5:42	

Prices are intended only as a guide and are correct at press time

newer models support faster 802.11n, too. As they are designed to be used on the move, the faster Wi-Fi technology comes in handy when copying large files. All the models currently in our chart support 802.11n.

Operating system: Windows 7 Starter Edition is now standard, with slightly reduced performance compared to Windows XP. Some earlier netbooks instead ship with a Linux operating system. All those we've tested have struggled with Vista, but Windows 7 will run on an Atom processor.

Display: Netbooks' small screens and lowly resolutions, plus the lack of dedicated graphics, mean they don't lend themselves to video playback or gameplay. However, most netbook screens are adequate for sending emails, web browsing and word processing.

Keyboard: Cramped keyboards go with the territory, and it's useful to try out typing on a netbook before you buy it. The keyboards on netbooks with smaller than 9in screens will make touch typing impossible. Watch out for non-standard layouts; mini laptops sometimes sacrifice dedicated function keys, for example.

Extras: To keep cost and weight down, mini-laptop manufacturers compromise heavily on extras – don't expect to get a CD/DVD drive, a FireWire port or an ExpressCard slot, for example. You'll find three USB ports, but they may be crammed together tightly, which can make plugging in two devices side by side tricky unless you use a USB hub or an extension cable.

Top 5 £601-£1,000 laptops

			Processor	USB ports FireWire Memory card reader	RAM Hard-disk capacity	Dimensions (wxdxh) Weight	Wireless connectivity
BEST BUY	1	**Toshiba Satellite P750** toshiba.co.uk tinyurl.com/buhw64s Last month 1	• £999 inc VAT • £999 (RRP) • 1-year carry-in warranty	4 0 yes	8GB DDR3 750GB	381x254x36mm 2.6kg	802.11b/g/n, Bluetooth
		>> WorldBench 6				131	
RECOMMENDED	2	**Toshiba Satellite R830** toshiba.co.uk tinyurl.com/6xwtk99 Last month 3	• £700 inc VAT • £749 (RRP) • 3-year RTB warranty	2 0 yes	6GB DDR3 640GB	316x227x27mm 1.5kg	802.11b/g/n, Bluetooth
		>> WorldBench 6				122	
	3	**Asus U46SV-WX044X** uk.asus.com tinyurl.com/c845t5y Last month 2	• £699 inc VAT • £699 (RRP) • 2-year RTB warranty	3 0 yes	4GB DDR3 640GB	333x245x27mm 2.1kg	802.11b/g/n, Bluetooth
		>> WorldBench 6				114	
	4	**Apple MacBook Pro** apple.com/uk tinyurl.com/5td25pq Last month 4	• £999 inc VAT • £999 (RRP) • 1-year RTB warranty	2 1 yes	4GB DDR3 500GB	325x241x23mm 2.1kg	802.11 a/b/g/n, Bluetooth
		>> WorldBench 6				117	
	5	**Medion Erazer X6811** medionshop.co.uk tinyurl.com/4mqooc8 Last month 5	• £800 inc VAT • £979 (RRP) • 2-year RTB warranty	2 0 yes	4GB DDR3 640GB	390x265x46mm 3.2kg	802.11b/g/n
		>> WorldBench 6				113	

Top 5 £1,001+ laptops

			Processor	USB ports FireWire Memory card reader	RAM Hard-disk capacity	Dimensions (wxdxh) Weight	Wireless connectivity
BEST BUY	1	**Apple MacBook Air 13.3in 2011** apple.com/uk tinyurl.com/3gy2Lae Last month 1	• £1,349 inc VAT • £1,349 (RRP) • 1-year RTB warranty	2 0 yes	4GB DDR3 256GB SSD	325x227x17mm 1.3kg	802.11 a/b/g/n, Bluetooth
		>> WorldBench 6				122	
RECOMMENDED	2	**Rock Xtreme X685-i5-2540M** rockdirect.com tinyurl.com/btzsq97 Last month 2	• £1,229 inc VAT • £1,249 (RRP) • 3-year onsite warranty	4 0 yes	6GB DDR3 500GB HDD	376x256x43mm 3.1kg	802.11 a/b/g/n
		>> WorldBench 6				124	
	3	**Toshiba Qosmio X770-107** toshiba.co.uk tinyurl.com/cLq5e99 Last month 3	• £1,399 inc VAT • £1,399 (RRP) • 1-year carry-in warranty	4 0 yes	8GB DDR3 2x 500GB HDD	412x270x58mm 3.4g	802.11b/g/n, Bluetooth
		>> WorldBench 6				132	
	4	**Apple MacBook Pro 15in Core i7 2.2GHz** apple.com/uk tinyurl.com/4bd9Ljv Last month 4	• £1,549 inc VAT • £1,849 (RRP) • 1-year RTB warranty	2 1 yes	4GB DDR3 750GB HDD	364x249x24mm 2.5kg	802.11 a/b/g/n, Bluetooth
		>> WorldBench 6				132	
	5	**Dell XPS 15z** dell.co.uk tinyurl.com/5wtg6wp **New**	• £1,199 inc VAT • £1,199 (RRP) • 1-year RTB warranty	3 0 yes	8GB DDR3 750GB HDD	385x260x25mm 2.6g	802.11b/g/n, Bluetooth
		>> WorldBench 6				135	

GLOSSARY • RTB: return to base • SSD: solid-state drive   [1]Gaming framerate scores in fps, at 1024x768-pixel resolution and 'Maximum Quality' settings [2]Not tested Note: Windows is not preinstalled on

>> Buying advice

Laptops

Processor: Intel chips remain the dominant force. The Intel Core 2 Duo CPUs offer strong battery life, but if you want the best performance then you'll have to look to the Intel Core i5 and i7 chips. The latter, in particular, are incredibly fast.

The Core i5-M520 and i7-620M are currently extremely popular choices in £1,001-plus laptops, offering a good mix of speed and battery life.

Processors in Intel's Core i3, i5 and i7 families include performance features such as Turbo Boost, for short-term overclocking, and Hyper Threading, which enables dual-core CPUs to function like quad-core processors.

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Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear)[1]	Max disc speeds	Operating system, software and extras	VERDICT
15.6in 1366x768	nVidia GeForce GT 540M 2GB	54	6x BD-ROM 8x DVD ± R/6x-RW/8x+RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	Boasting a quad-core i7-2670QM processor, the Toshiba Satellite scored 131 points in WorldBench 6. The Satellite comes with a generous 8GB of RAM and a capacious 750GB hard drive. Gaming performance is lower than some, but offers playable framerates. The screen is decent, but the shiny bezel and glossy panel add glare. The Blu-ray drive is useful for HD film playback, although the resolution maxes out at just 1366x768 pixels. The battery life is poor at around 3.5 hours.
›› Battery life 3:23					
13.3in 1366x768	Intel HD Graphics 3000 n/a	18	8x DVD ± R/4x ± RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	Now with an even better CPU and greater availability, the Toshiba takes second place. General speed is good, if the integrated graphics are underpowered for gaming. The Toshiba looks smart. Its keyboard has small keys, but is easy to use for prolonged periods. Battery life is excellent, and only the Asus lasted longer. The 13.3in screen has a matt finish and is usable in a variety of lighting conditions, even if the colour depth suffers slightly. Lighter than the Asus, this laptop will be a great road warrior.
›› Battery life 7:32					
14.1in 1366x768	nVidia GeForce GT 540M 1GB	78	8x DVD ± R/4x ± RW/ 5x -RAM/8x -ROM	Windows 7 Professional 64bit	The Asus is the cheapest laptop in this chart, yet its 10-hour battery life is remarkable. Combined with some relatively compact dimensions, this laptop will suit a life on the road. It looks smart too, and the 14.1in 1366x768-pixel screen does a good job. It is glossy, but the image is sharp and the colours resonant. The slim frame finds room for an optical drive, and you get plenty of ports. The Core i5-2410M processor is capable rather than brilliant, but graphics performance is rather good.
›› Battery life 10:01					
13.3in 1280x800	Intel HD Graphics 3000 n/a	18	8x DVD ± R/4x ± RW/ 5x -RAM/8x -ROM	Mac OS X 10.6 Snow Leopard	Its £999 price tag means the MacBook Pro only narrowly makes it into our chart, but this doesn't stop it from offering very good value. Capable of dual-booting into Windows (although you will need to factor in the cost of the operating system), it produced a solid WorldBench 6 speed score of 117. It doesn't have a dedicated graphics card, and its gaming scores are poor. However, battery life is good, and the keyboard is comfortable to use. The Pro is attractive and superbly built.
›› Battery life 6:29					
15.6in 1366x768	nVidia GeForce GTX 460M 1.5GB	158	8x DVD ± R/4x ± RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	The Medion Erazer X6811 is built for business: gaming business. The nVidia GeForce GTX 460M is a meaty graphics processor. Combined with its 1.5GB of GDDR5 memory, it takes gaming at healthy resolutions in its stride. It's a hefty slab of a laptop, but the Core i5 CPU is efficient and the Medion lasted for longer than 4 hours in our tests. The keyboard is plasticky in feel, and the trackpad is a little small. The Medion's screen isn't glossy, but the low-grade image suffers from limited viewing angles.
›› Battery life 4:02					

Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear)[1]	Max disc speeds	Operating system, software and extras	VERDICT
13.3in 1440x900	Intel HD Graphics 3000 n/a	17	n/a	Mac OS X 10.7 Lion, iLife 09, multitouch trackpad, backlit keyboard	When Apple launched the original MacBook Air in 2008, some dismissed it as an overpriced toy. Now in its fifth generation, the Air cis the leading ultraportable. The construction has changed little since the previous revamp, and the aluminium body is still highly desirable and ultra-thin. The backlit keyboard is back, and the video port has been replaced with a Thunderbolt connector. The screen is a glossy version, but with an anti-reflective coating. Application performance is strong.
›› Battery life 6:35					
15.6in 1920x1080	AMD Radeon HD 6990 2GB	275	6x BD-ROM 8x DVD ± R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Home Premium 64bit	The Rock focuses on gaming, and its HD 6990 blows much of the competition away with a blistering 275fps in Fear. The 15.6in screen is also a corker, with a full-HD resolution and an effective anti-glare coating. The model we reviewed didn't have a Blu-ray drive; this version does. Application performance is good, and the Core i5-2540M CPU and 6GB of RAM produced a respectable 124 points in WorldBench. A fingerprint reader adds security. Battery life isn't great, and the Rock is hefty.
›› Battery life 2:30					
17.3in 1920x1080	nVidia GeForce GT 560M 1.5GB	166	6x BD-ROM/4x -R/2x -RE 8x DVD ± R/6x -RW/ 8x +RW/8x -ROM	Windows 7 Home Premium 64bit	A beefy laptop with an equally impressive feature set, the Toshiba's beating heart is an Intel Core i7-2630QM processor (along with 8GB of RAM) that propels it to a score of 132 WorldBench points. The ample frame houses two Seagate 7,200rpm hard disks, and one is a solid-state hybrid. Gaming framerates are fast, too. The 17.3in screen is very good, offering a full-HD resolution. Its finish is glossy, but the anti-glare coating works a treat and 3D capabilities add to the allure. Battery life is poor, however.
›› Battery life 2:04					
15.4in 1440x900	Intel HD 3000/ Radeon HD 6750M 1GB	92	8x DVD ± R/2.4x -RW/ 4x +RW/8x -ROM	Mac OS X 10.6 Snow Leopard, iLife 09, multitouch trackpad, backlit keyboard	Such is the quality of the models ahead of it, even a sizeable pay cut doesn't push the MacBook Pro further up the table. In fairness, the new price comes at the cost of reduced storage capacity – to 500GB. But the MacBook still offers Intel's hyper-fast Thunderbolt connection, and the Sandy Bridge CPU remains a step up in performance. The AMD is a good graphics chip, too. The Pro's performance is very good. If you need workstation power in an inch-thick slab, don't look anywhere else.
›› Battery life 5:18					
15.6in 1920x1080	nVidia GeForce GT 525M 2GB	51	8x BD-ROM 8x DVD ± R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Home Premium 64bit	Dell has set out to mimic the MacBook Pro with its XPS 15z, but it's not quite up to Apple's standards. The strange-looking keyboard is squashed in between the large speaker grills (the latter offering decent audio). Typing is easy enough, but the touchpad struggles with more ambitious pinch-to-zoom functions. The screen offers impressively bright colours, although the finish is far too glossy. Performance is strong, thanks to the capable i7 CPU and 8GB of RAM. Battery life is strong, too.
›› Battery life 6:49					

Apple Mac PCs, which are tested under Windows and Boot Camp for comparison only   *Prices are intended only as a guide and are correct at press time*

Memory: The minimum offering if you're paying more than £600 should be 2GB. Most offer more. The more memory you have, the smoother your laptop will run.

Hard drive: It's difficult to upgrade a laptop's hard drive, so get as much storage space as you can. For best performance and increased reliability, look out for a solid-state drive. Expect less capacity than with a hard drive.

Screen: If you're after a desktop-replacement machine, go for at least 15in. For film playback, 17in widescreen models are even better. For ultraportables, 13in or under is best.

Graphics card: When shopping for a more expensive laptop, the best cards include the two highest entries in the GeForce family, the 330M and 320M. The ATI Mobility Radeon HD 5650 graphics chip is also fast and

supports DirectX 11.0. Look for at least 256MB of graphics memory.

Integrated graphics in Intel Core i-series CPUs are now usable with some games too. Older Intel GMA 4500M graphics are sufficient only for games played at low resolutions.

Some laptops feature switchable graphics, using the integrated chip to maintain battery life and the discrete card for maximum performance.

Top 5 Internet security suites

|			Signature-based malware detection	Malware blocking		Successful cleanup of active malware	Scan speed (secs)		Interface design	Extra features
				Fully blocked	Partially blocked		On-demand	On-access		
1 PC ADVISOR BEST BUY	**Panda Internet Security 2012** pandasecurity.com/uk tinyurl.com/63sbhfn Last month 1	• 3 PCs, 1 year: £35 inc VAT	99.96%	85.4%	n/a	100%	n/a	n/a	Very good	USB vaccine, virtual keyboard, safe browser, parental controls
	Panda Internet Security 2012's interface is well-designed and easy to use, while the product itself offers very good protection and doesn't clobber your PC's performance. Panda led the way in cloud-based protection; while this is less significant now that Panda's competitors have followed suit, it's a commendable approach to online security. New signatures are automatically pushed to your PC.									
2 PC ADVISOR RECOMMENDED	**Symantec Norton Internet Security 2012** norton.com tinyurl.com/cvvdwur **New**	• 3 PCs, 1 year: £50 inc VAT	98.4%	96.7%	n/a	83.3%	n/a	n/a	Good	rootkit/ID/network protection, parental controls, Safe Web
	Norton continues to move with the times, and the 2012 incarnation includes parental controls and system rescue, plus ID protection. A two-way firewall and spam and phishing prevention complete the tools. The interface is straightforward to use, and the useful performance display shows you CPU and memory usage by Norton and other processes. It's fast, and the software isn't too intrusive.									
3	**Kaspersky Small Office Security 2012** kaspersky.co.uk tinyurl.com/3cn9k8s Last month 2	• 5 PCs and 1 server, 1 year: £159 inc VAT	99.4%	94.6%	n/a	94.4%	n/a	n/a	Good	staff access limits, encrypted backups, file shredder
	If you run a small business with several PCs to protect, Kaspersky Small Office Security 2012 is a sensible purchase. It protects up to five PCs and a server. If you use a network server to share data and applications, it's a simple matter to share your security provision too. Small Office Security offers very good value, with centralised security and similar ease of use to the company's consumer product.									
4	**Kaspersky Internet Security 2011** kaspersky.co.uk tinyurl.com/4us5hzq Last month 4	• 3 PCs, 1 year: £49 inc VAT • 1 PC, 1 year: £39 inc VAT	95.7%	92%	0%	80%	109	315	Good	anti-phishing, virtual keyboard, parental controls, SafeSurf
	Known for being a power user's anti-malware tool, Kaspersky has quietly developed its 2011 internet security suite into a somewhat kinder, gentler application. This excellent security suite will at last appeal to the masses. Some useful extras are included, but the installation is a headache. Kaspersky Internet Security 2011 provides solid defence against malware and has a friendly interface.									
5	**Bitdefender Internet Security 2011** bitdefender.co.uk tinyurl.com/69wtdep Last month 5	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	97.5%	68%	20%	80%	131	305	Very good	online fraud and ID theft protection
	Bitdefender Internet Security 2011's overall protection levels are very good, but short of the topmost tier of security software products in this chart. Bitdefender's multiple-mode interface is complicated, but this fully featured suite blocks malware effectively. This is something of a budget option, and, while it has its issues, Bitdefender Internet Security is still a good fit for almost any class of user.									

Top 5 Antivirus software

			Signature-based malware detection	Malware blocking		Successful cleanup of active malware	Scan speed (secs)		Interface design	Extra features
				Fully blocked	Partially blocked		On-demand	On-access		
1 PC ADVISOR BEST BUY	**Symantec Norton AntiVirus 2011** norton.com tinyurl.com/4p5ycxp Last month 1	• 3 PCs, 1 year: £39 inc VAT	98.7%	96%	0%	80%	121	272	Very good	Pulse updates, Sonar 3 behavioural protection, Insight
	Symantec Norton AntiVirus 2011 does a very good job of detecting and removing malware, and it has a smooth user interface. We particularly like the way it alerts you to potential problems with a red warning message and large 'Fix now' button. Norton has a moderate impact on system resources compared with rival antivirus products, and earned solid scores in our system-speed tests.									
2 PC ADVISOR RECOMMENDED	**Bitdefender Antivirus Pro 2011** bitdefender.co.uk tinyurl.com/66sk77u Last month 2	• 3 PCs, 1 year: £24 inc VAT • 1 PC, 1 year: £14 inc VAT	97.5%	68%	20%	80%	126	327	Very good	gaming mode
	Bitdefender Antivirus Pro 2011 does a good job at detecting malware, and was the top performer in this chart at removing infections from our test machine, but it has some trouble blocking live malware attacks. Three interface tiers are available: Basic, Intermediate and Expert; the last of these is a convoluted mass of tabs but offers plenty of features for advanced users. Scan speeds are average.									
3	**G Data AntiVirus 2011** gdatasoftware.com tinyurl.com/6bfxwcs Last month 3	• 3 PCs, 1 year: £34 inc VAT • 1 PC, 1 year: £24 inc VAT	99.4%	84%	4%	80%	111	336	Very good	cloud security
	G Data AntiVirus 2011 has muscle where it counts most, offering strong malware detection, blocking and removal capabilities, which it couples with a good user interface. However, it isn't as good as the other products in this chart at showing security status at a glance, and some of the text is poorly translated from German. Pleasingly, G Data AntiVirus 2011 flagged no false positives in our tests.									
4	**Kaspersky Anti-Virus 2011** kaspersky.co.uk tinyurl.com/6hqa2wb Last month 4	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	95.7%	88%	4%	80%	103	310	Very good	Rescue CD, desktop gadget
	Once known as the power user's security tool, Kaspersky's Anti-Virus 2011 software offers a well-designed interface and is easy to use. We particularly like Kaspersky's 'hot spot', which lets you drag individual files to it for on-demand scanning. Kaspersky Anti-Virus 2011 is very good at blocking malware – particularly brand-new threats – but it noticeably slowed down other activities on our test computer.									
5	**Trend Micro Titanium Antivirus Plus 2011** uk.trendmicro.com tinyurl.com/4huorv3 Last month 5	• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	98.4%	88%	8%	80%	187	249	Very good	cloud security
	Trend Micro Titanium Antivirus Plus 2011 is a set-it-and-forget-it security product that does a good job of blocking malware. The program is cloud-based, and dependent on an active internet connection. The upside is there's no need to worry about manual updates. Infections are consistently staved off and active malware is almost always removed. Advanced users may crave more control.									

Prices are intended only as a guide and are correct at press time

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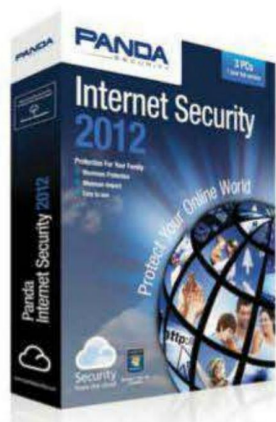
>> Buying advice

Security software

We work with world-renowned independent security testing lab AV-Test.org to evaluate the effectiveness of internet security and antivirus software. While many products offer similar results in terms of malware detection and disinfection, other factors such as their ease of setup, scan speeds, interface design and ability to deal with brand-new threats set them apart.

The best products will offer features that go beyond the traditional antivirus, antispyware, antispam and firewall concoction of internet security suites – you might see parental controls, 'cloud' protection, anti-phishing, anti-rootkit, virtual web browsers and keyboards, link and file scanners, gaming modes, online backup and more included.

With many households now owning more than one computer, the best value is usually offered by a one-year, three-user licence. However, you can save some cash with a single-user licence if you have only one computer.

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Top 5 Tablet PCs

	Platform	Screen size/res (pixels)	Storage Media card slot	Connectivity[1]	Processor RAM	Claimed battery life (in use)	Other	Dimensions (wxdxh) Weight
1 PC ADVISOR BEST BUY — **Apple iPad 2** apple.com/uk tinyurl.com/4xv7q4k Last month 1 • £399 inc VAT • £399 (RRP) • 1-year warranty	Apple iOS	9.7in 1024x768	16GB none	802.11a/b/g/n, BT	1GHz Apple A5 512MB	10 hrs	0.3/0.7Mp cameras	241x186x9mm 597g

The iPad 2 may not be hugely different to the original – although it is slimmer and faster – but the first iPad was stunning. Brilliant as a web-connected device that fits in the space between smartphone and PC, the iPad 2 works well as an e-book reader or video player. Two cameras are useful for video chat with FaceTime or Skype. The iPad 2 can also come with 3G, and up to 64GB of storage.

	Platform	Screen size/res (pixels)	Storage Media card slot	Connectivity	Processor RAM	Battery	Other	Dimensions Weight
2 PC ADVISOR RECOMMENDED — **Samsung Galaxy Tab 10.1** samsung.com/uk tinyurl.com/3Lh239c Last month 2 • £399 inc VAT • £399 (RRP) • 1-year warranty	Android HC 3.1	10.1in 1280x800	16GB none	802.11b/g/n, BT	1GHz Tegra T20 1GB	9 hrs	3/2Mp cameras	257x173x9mm 559g

This is the tablet Apple wants to stop you buying, given its similarities to the iPad. The Tab 10.1 is ultra-slim and the best Android tablet we've seen yet. In essence a landscape device (the iPad excels in portrait mode as well), its display is almost as gorgeous. The battery life is good, although charging (by mains only) is slow. The screen needs a little more pressure to work, and web browsing is slower.

3 — Sony Tablet S sony.co.uk tinyurl.com/3tsqkp4 Last month 3 • £369 inc VAT • £399 (RRP) • 2-year warranty	Android HC 3.1	9.4in 1280x800	16GB SD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	8 hrs	0.3/5Mp cameras	241x174x20-7.6mm 598g

Hats off to Sony for its original design and for reskinning the Android Honeycomb interface. The plastic Sony Tablet S is just lighter than the iPad 2, with a page curl effect along one edge. This makes it easy to grip the tablet in one hand, and raises the display in landscape mode for convenient viewing and text entry. The lack of HDMI is less impressive, but offset by Sony Entertainment features.

4 — Acer Iconia Tab A100 acer.co.uk tinyurl.com/3t2bjqL Last month 4 • £280 inc VAT • £280 (RRP) • 1-year warranty	Android HC 3.0	7in 1024x600	8GB microSD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	5-8 hrs	2/5Mp cameras	241x186x9mm 612g

The 7in Acer is light but solidly built, and manages to look rather chunky. You get the full complement of connection options, while the screen is dark, bordering on brooding. Vertical viewing angles aren't great. We had no issues with accurately inputting text. The 5Mp camera and GPS module work well. Battery life is good too, and the Acer makes a good case for Android on a 7in-screen tablet.

5 — Packard Bell Liberty Tab packardbell.co.uk tinyurl.com/5w55ec6 Last month 5 • £299 inc VAT • £299 (RRP) • 1-year warranty	Android HC 3.2	10.1in 1280x800	16GB microSD	802.11b/g/n, BT	1GHz nVidia Tegra 2 1GB	10 hrs	2/5Mp cameras	177x260x13mm 760g

The Liberty Tab may be an imposing slab, but it's very well connected with slots for an SD Card, HDMI and docking. It looks smart, and Packard Bell has done a good job of disguising the Acer Iconia tablet that lies within. The interface is clean and uncluttered, and the admittedly rather reflective screen has good viewing angles. The tablet is muted during gameplay, although GPS is spot-on.

GLOSSARY • BT: Bluetooth • HC: Honeycomb [1]3G available at additional cost

Top 5 Projectors

	Projection technology Resolution	Brightness (Ansi lumens) Contrast	Supported aspect ratios	Noise levels (dB) Battery	Connections	Lamp Lamp life	Dimensions (wxdxh) Weight
1 PC ADVISOR BEST BUY — **InFocus ScreenPlay SP8600** infocus.com tinyurl.com/3hqanpv Last month 1 • £770 inc VAT • £799 (RRP) • 5-year warranty	DLP 1920x1080	1,800 5,000:1	16:10, 16:9, 4:3	30 (26 eco) no	VGA, HDMI, component, S-Video, composite, USB	230W 4,000 hrs	326x254x104mm 3.4kg

The ScreenPlay SP8600 may lack some of the pleasing design touches of more expensive InFocus models, but it's still a fantastic projector. Building on the Vivitek H1080FD, it adds several important upgrades, including a DarkChip 3 DMD engine. The zoom range is narrow, but the performance is impressive, with crisp images and clear motion. This is an excellent projector for smooth HD.

2 PC ADVISOR RECOMMENDED — **Vivitek Qumi Q2** vivitek.co.uk tinyurl.com/3txmwpk Last month 2 • £520 inc VAT • £670 (RRP) • 3-year warranty	DLP 1280x800	300 2,500:1	16:10, 16:9, 4:3	32 (28 eco) no	VGA, HDMI, USB	LED 30,000 hrs	162x102x32mm 635g

Although a full-size model like the InFocus offers greater power and quality, the Qumi is excellent for those on the move. It packs in better specs than many pico models. Compact and smooth, but offering a generous 1280x800 native resolution and 300 Ansi lumens, the Q2 can project an image in a reasonably well-lit room. It offers 3D facilities when plugged into a DLP-Link source.

3 — BenQ W1000+ benq.co.uk tinyurl.com/6kfuemf Last month 3 • £830 inc VAT • £840 (RRP) • 1-year warranty	DLP 1920x1080	2,000 3,500:1	16:10, 16:9, 4:3	28 (26 eco) no	VGA, HDMI, component, S-Video, composite, USB	180W 4,000 hrs	325x254x95mm 3.4kg

Now beaten as a home-cinema model by the InFocus, and behind the Vivitek as an overall deal, this full-HD projector is still a decent and well-connected model. The BenQ also packs some strong specs, including a 3,500:1 contrast ratio and a brightness rating of 2,000 Ansi lumens that ensures you don't need to watch movies in a darkened room. Pictures aren't crystal clear, but the image is pleasing.

4 — NEC NP43 nec-display-solutions.co.uk tinyurl.com/62w3796 Last month 4 • £610 inc VAT • £622 (RRP) • 2-year warranty	DLP 1024x768	2,300 1,600:1	16:9, 4:3	37 (32 eco) no	VGA, S-Video, USB	200W 1,000 hrs	246x72x177mm 1.7kg

With its crisp white casing, the NP43 looks attractive. Tipping the scales at just 1.7kg, it's highly portable, and its rating of 2,300 Ansi lumens gives it an impressive brightness to weight ratio. Its best feature is the Auto Focus, which kicks in every time you resize the screen. Add the highly customisable settings and decent image quality, and this is a great choice for businesses on the move.

5 — ViewSonic PJD7383i viewsoniceurope.com/uk tinyurl.com/3bw7zzw Last month 5 • £1,129 inc VAT • £1,129 (RRP) • 3-year warranty	DLP 1024x768	3,000 3,000:1	4:3	32 (27 eco) no	VGA, composite, S-Video, USB	210W 4,000 hrs	290x126x254mm 3.5kg

Perfect for schools and businesses, combining networking with an innovative controller and an ultra-short lens, this is an extremely good projector – if not a cheap one. It's not small, but networking facilities let you manage it from a single location. A slightly darkened room is needed for the best results, and the palette lacks intensity when projecting dark images (particularly with films).

Prices are intended only as a guide and are correct at press time

>> Buying advice

Tablet PCs

Tablet PCs bridge the gap between what PCs and mobile phones do. They couple the mobility and connectivity of a smartphone with elements of a laptop – in particular, larger screens and more powerful processors.

A tablet is a thin slab, dominated by its screen. Instead of struggling to run Windows, they run a lightweight, touchscreen-focused mobile platform. The most developed and optimised is Apple iOS, with Google Android and OSes from HP and RIM following. Some tablets offer 3G connectivity, and are available on subsidised data contracts.

Tablets are ideal for web browsing, email, reading e-books, playing games and watching video. However, you won't be tempted to write long essays or reports on a tablet's onscreen keyboard.

Top 5 Sub-£150 printers

#	Printer	Price	Technology / Max printer resolution	Actual print speed (ppm)	Optical scanner resolution / Fax capabilities	Supported interfaces	Cost per page	Memory-card slot / Auto-duplex / Input capacity	Dimensions (wxdxh) / Weight
1 **PC ADVISOR BEST BUY**	**Oki C110** oki.co.uk tinyurl.com/yLno5rv Last month 1	• £135 inc VAT • £152 (RRP) • 3-year standard warranty	Colour laser 1200x600dpi	B=15.8 C=2.5	no scanner no fax	USB	B=3.6p C=5p	no/no 100	396x380x275mm 14.4kg
			A laser printer for £135 is a good deal; one that also offers colour is almost impossible to find. But the Oki C110 manages it. This version has no ethernet or auto duplexing options, but it's a very usable colour laser printer that produces cleanly defined text at 15.8ppm. Colour is realistic, but rather faint. The Oki C110 is slow in laser terms, but fast compared to inkjets working in high-quality modes.						
2 **PC ADVISOR RECOMMENDED**	**Brother HL-2130** brother.co.uk tinyurl.com/4yrrdjm Last month 2	• £65 inc VAT • £90 (RRP) • 1-year standard warranty	Mono laser 2400x600dpi	B=20 C=n/a	no scanner no fax	USB	B=3p C=n/a	no/no 250 sheets	368x360x183mm 6.7kg
			Looking like a compact version of Brother's standard-sized printers, the HL-2130 lacks the Samsung's chic design. But it's robust, and very straightforward to service. The 250-sheet input tray is substantial, and noise levels are pleasingly low. There are no advanced features, but it prints text very well, producing 600dpi output that's clean and crisp – and at 15.8ppm. Graphics are less successful.						
3	**Kodak Hero 5.1** kodak.co.uk tinyurl.com/6s5bw3b Last month 3	• £90 inc VAT • £100 (RRP) • 1-year standard warranty	Colour inkjet 9600dpi	B=12.2 C=6.8	1200dpi no fax	USB, cloud, 802.11b/g/n	B=1.8p C=3.3p	yes/yes 100 sheets	422x399x183mm 6.3kg
			The Kodak isn't the slickest or most stylish printer we've seen, but its running costs are exceptional. There are compromises, and the Kodak's printing speed is slightly uninspiring in places. Neither is it the most eyecatching of models, with a slightly clunky interface and understated looks. But it's very reliable and comes with a multitude of connectivity options. Print quality is generally good.						
4	**Canon Pixma MG6250** canon.co.uk tinyurl.com/3koof7a Last month 4	• £138 inc VAT • £150 (RRP) • 1-year standard warranty	Colour inkjet 9600x2440dpi	B=12.4 C=5.2	4800x4800dpi no fax	USB, cloud, 802.11b/g/n	B=2.9p C=6.7p	yes/yes 2 x 150 sheets	470x367x173mm 9.2kg
			In terms of quality and features, the MG6250 is the best inkjet here. Indeed, it comes with almost every feature you might want – from dual paper trays and direct-disc printing to Wi-Fi and cloud computing via Canon's Image Gateway. Add to that the great print results, particularly on photographic paper, and this is a very good model. Scanning is good, too. However, the Kodak is cheaper to buy and run.						
5	**Epson Stylus SX525WD** epson.co.uk tinyurl.com/3scrzpc Last month 5	• £74 inc VAT • £149 (RRP) • 1-year standard warranty	Colour inkjet 5760x1440dpi	B=15 C=4	2400x2400dpi no fax	USB, 802.11b/g/n	B=2.4p C=8.2p	yes/yes 150 sheets	455x359x164mm 6.2kg
			It's not as strong on photographic results (although the text is very good) as the MG6250. Nor is the Epson as fully featured. However, it costs around half the price, and improves on the cheaper SX425W with auto-duplex, enhanced speed and quieter operation. It's not the prettiest printer, but you can scan and copy documents, and the Epson can be shared over a network. The running costs are competitive.						

Top 5 £151+ printers

#	Printer	Price	Technology / Max printer resolution	Actual print speed (ppm)	Optical scanner resolution / Fax capabilities	Supported interfaces	Cost per page	Memory-card slot / Auto-duplex / Input capacity	Dimensions (wxdxh) / Weight
1 **PC ADVISOR BEST BUY**	**Kyocera Mita FS-1320D** kyoceramita.co.uk tinyurl.com/6gg9ukv Last month 1	• £160 inc VAT • £200 (RRP) • 2-year warranty	Mono laser 1200x1200dpi	B=26.1 C=n/a	no scanner no fax	USB	B=1.4p C=n/a	yes/yes 250	375x393x250mm 12kg
			The Kyocera Mita isn't the most heavily featured of laser printers here but, for a mix of capable print quality and strong pricing, the FS-1320D is the perfect choice for text-hungry businesses. Paper handling is decent, although you'll need its sibling, the FS-1370DN model, if you want ethernet connectivity. Text quality is strong and performance very high. Running costs are lower than average.						
2 **PC ADVISOR RECOMMENDED**	**Samsung ML-3710ND** samsung.com/uk tinyurl.com/75rb5nz Last month 2	• £195 inc VAT • £203 (RRP) • 1-year standard warranty	Mono laser 1200x1200dpi	B=28.6 C=n/a	no scanner no fax	USB, ET	B=1.4p C=n/a	no/yes 250 + 50	366x368x253mm 10kg
			The ML-3710ND is an excellent mono laser. It's ugly, with its two-tone ridged casing, but it has ethernet connectivity for easy network integration, and the paper input can be boosted to as many as 820 sheets. Text quality is good, and duplexing is usable. Add a feature that monitors your impact on the environment (among other things) and low running costs, and the ML-3710ND is a fantastic printer.						
3	**Brother MFC-J6910DW** brother.co.uk tinyurl.com/4g8has5 Last month 3	• £335 inc VAT • £450 (RRP) • 1-year warranty	A3 colour inkjet 19200x19200dpi	B=13.3 C=3.6	1200x2400dpi 33.6kbps	USB, ET, 802.11b/g/n	B=1.5p C=5p	yes/no 2 x 250	540x489x331mm 18.5kg
			No ordinary printer, the Brother MFC-J6910DW can print on A3 as well as A4 pages. It works better in this format, and the Brother's A4 print quality isn't a patch on A3. Dual 250-sheet paper trays are convenient. The printer's 3.3in TFT screen and USB and memory card slots aid non-PC access. Connectivity options are superb, with the Brother supporting both wired and wireless networking.						
4	**Epson Stylus Office BX925FWD** epson.co.uk tinyurl.com/6bw3gu4 Last month 4	• £230 inc VAT • £260 (RRP) • 1-year warranty	Colour inkjet 5760x1440dpi	B=17.6 C=14.2	2400x2400dpi 33.6kbps	USB, ET, 802.11b/g/n	B=2.4p C=5.4p	yes/yes 2 x 250	446x368x300mm 9.8kg
			The BX925FWD supports both wired and wireless networking, and has two paper trays. The touch-sensitive control panel is intuitive. The Epson works better as a colour graphics printer than it does as a text churner - it's just too slow when operating as the latter, while duplex is so slow as to be almost a waste of time. But colour images are eye-catching, and spectacular photos are possible.						
5	**Kyocera FS-C2126MFP** kyoceramita.co.uk tinyurl.com/3sbLhjw Last month 5	• £952 inc VAT • £1,000 (RRP) • 1-year warranty	Colour laser 600x600dpi	B=25.2 C=23.4	600dpi 33.6kbps	USB, ET	B=1.3p C=5p	yes/yes 250 + 50	514x550x580mm 36kg
			A heavyweight in cost and bulk, the Kyocera is suitable for business use. It has strong security options, with SSL data encryption and IPSec allowing for private and secure network communications, plus Private Print. Its paper handling can be upgraded to 1,300 sheets, and the 1,024MB of memory doubled. Capable scanning, copying and fax facilities are included. Speed is very impressive.						

GLOSSARY • B: black • C: colour • dpi: dots per inch • ET: ethernet • ppm: pages per minute

Prices are intended only as a guide and are correct at press time

>> Buying advice

Printers

These days, many printers are multifunctional, offering printing, faxing, copying and scanning functions. The trade-off can be slower performance and a more limited resolution.

For some people it will make more sense to buy an efficient, single-function printer for producing documents, then use a copy shop or a separate photo printer for your best shots.

If you want to produce photos at up to A4 size and need a printer that can produce a combination of photos and documents, a colour inkjet or multifunction printer will be the best choice.

Long-term costs: On top of the initial outlay, consider the cost of consumables (ink/toner, paper and printheads), time and maintenance. Vendors often sell cheaply and make their money back later.

Speed concerns: Be wary of claimed print speeds, too: some printer manufacturers craftily quote print speeds based on Draft mode output.

PC ADVISOR TEST CENTRE

Top 5 External hard drives

	Capacity tested / Capacity range	Spin speed / Size of disk	Transfer speed / Encryption	Other interfaces	Software	Dimensions (wxdxh) / Weight
1 BEST BUY **Seagate FreeAgent GoFlex** seagate.com tinyurl.com/bn2z92f **New** • £190 inc VAT • £200 (RRP) • 2-year warranty	3TB 1TB to 3TB	7,200rpm 3.5in	94Mbps (USB 3.0) 192bit	Optional FireWire 800	Memo Backup	158x124x44mm 1kg
	A version of the GoFlex has been topping our charts for a while. This 3TB model has an unusual two-part design that consists of the main unit and a separate desk adaptor that houses the USB 3.0 interface. This allows you to bolt on additional interfaces, such as FireWire. The GoFlex works well, topping the chart for writing performance. Encryption and strong software are also included.					
2 RECOMMENDED **Western Digital My Passport Studio** wdc.com/en tinyurl.com/6fawbne **Last month 2** • £110 inc VAT • £110 (RRP) • 3-year warranty	1TB 500GB to 1TB	5,400rpm 2.5in	76Mbps (FW800) 256bit	FireWire 800, USB 2.0	WD utilities	126x84x22mm 334g
	This sturdy hard drive packs more than just a useful FireWire 800 port or two. Western Digital also offers sublime design and build credentials, which are worth their weight in solid aluminium when it's your precious data on the line. The bundled software has been improved, letting you set up AES encryption. FireWire 800 performance is excellent; the My Passport Studio also works over USB 2.0.					
3 **Buffalo MiniStation Extreme** buffalo-technology.com tinyurl.com/ce4z9ym **New** • £130 inc VAT • £130 (RRP) • 2-year warranty	1TB 500GB to 1TB	5,400rpm 2.5in	94Mbps (USB 3.0) 256bit	none	Backup, RAMdisk	128x89x18mm 230g
	Not available in huge quantities, the MiniStation is well worth tracking down. It's chunkier than most of its portable rivals, but that's partly due to the military-standard shock-proof casing, designed to withstand drops of up to 2.3m. 256bit encryption is strong too, and the tidy built-in USB cable slots into the body of the drive when not in use. Performance is good, and the software bundle is ample.					
4 **Iomega Prestige 1TB** iomega.co.uk tinyurl.com/d4kaLcw **New** • £100 inc VAT • £113 (RRP) • 3-year warranty	1TB 1TB to 2TB	5,400rpm 3.5in	94Mbps (USB 3.0) 256bit	none	Iomega Protection Suite	188x124x31mm 1kg
	The Iomega isn't the fastest drive here, but it's well-designed, affordable and supplied with some useful software. An extremely slim and compact 3.5in model, the Iomega is just 31.4mm thick. Performance isn't its strong point, and its 5,400rpm drive mechanism results in modest speed. But the 256bit encryption is strong, and the Protection Suite software includes a Trend Micro subscription.					
5 **Freecom Mobile Drive Sq 500GB** freecom.com tinyurl.com/bmvzw3r **New** • £105 inc VAT • £105 (RRP) • 2-year warranty	500GB 500GB to 1TB	5,400rpm 2.5in	94Mbps (USB 3.0) none	none	Nero BackItUp & Burn	120x120x11mm 195g
	This drive is just 10.5mm thick, and weighs a mere 200g, so it'll be easy to slip into a pocket. The performance is respectable but not outstanding, and it struggles with smaller files. Nero's BackItUp & Burn is supplied, and you also get a 'green button' feature that allows you to suspend the drive to save power. There's no encryption or password protection, but it is one of the cheaper drives here.					

GLOSSARY • FW: FireWire • MBps: megabytes per second • TB: terabyte

Top 5 NAS drives

	Capacity tested / Capacity range	Internal drives / Spin speed	UPnP / DLNA / Remote access	USB port / Raid options	Operating systems	Software	Dimensions (wxdxh) / Weight
1 BEST BUY **Netgear ReadyNAS Duo v2** netgear.co.uk tinyurl.com/bmsdr74 **New** • £150 inc VAT • £150 (RRP) • 3-year warranty	n/a up to 2TB	2 n/a	yes/yes/yes	yes 0/1/JBOD	Win 2000/OS X 10.3 or later	ReadyNAS	88x218x161mm 1kg
	The Netgear straddles the small-business and home-media usage categories. It's a compact two-bay NAS, with a sober but purposeful metal dress that's almost military-looking in its gunmetal finish. The ReadyNAS is available diskless, or with one or two 1TB drives. The interface is very approachable, and supports remote access to your files. Low power consumption and quiet operation seal the deal.					
2 RECOMMENDED **Synology DiskStation DS211** synology.com tinyurl.com/65s4v4u **Last month 1** • £210 inc VAT • £240 (RRP) • 2-year warranty	n/a up to 6TB	2 n/a	yes/yes/yes	yes 0/1	Win 2000/OS X 10.3 or later	DSM 3.0	142x101x220mm 2.07kg
	Synology has built this enclosure (to which you can add up to two hard drives) around its own OS, which allows almost unprecedented flexibility. Its 29 different control areas cover everything from DLNA, UPnP and iTunes server to firewalls and wireless connection. The security is excellent, and performance is very good. Noise levels are low, and this would make a great audio or video server.					
3 **Qnap TS-419P+** qnap.com tinyurl.com/3zk5Ljg **Last month 2** • £410 inc VAT • £450 (RRP) • 2-year warranty	n/a up to 12TB	4 n/a	yes/yes/yes	yes 0/1/5/6/10	Win XP or later/ OS X/Linux	TurboNAS 3.4	180x235x177mm 3kg
	A NAS enclosure (you buy drives separately for it), the four-bay Qnap can support drives holding up to 12TB of data. Its 1.6GHz ARM processor consumes less power than Intel-powered devices, and just one cooling fan is needed. The software is sophisticated yet approachable, and the choice of Raid options is capable. Performance is better than that of many home and small-business models.					
4 **Zyxel NSA310** zyxel.co.uk tinyurl.com/3voqrxx **Last month 3** • £125 inc VAT • £135 (RRP) • 3-year warranty	2TB up to 2TB	1 n/a	yes/yes/yes	yes 0	Win XP or later/ OS X	zPilot	58x196x130mm 662g
	Zyxel's NSA310 is a modestly priced but high-storage device that offers an excellent way to share storage over a home network. Little bigger than a 3.5in hard drive, it offers gigabit ethernet, eSATA and two USB 2.0 ports. The versatile software and simple web interface generally work well, although the transfer speeds aren't the best we've seen. It offers good value for money, though.					
5 **Synology DS1511+** synology.com tinyurl.com/cbLh883 **Last month 5** • £615 inc VAT • £615 (RRP) • 2-year warranty	1GB up to 15TB	5 n/a	yes/yes/yes	yes 0/1/5/6/SHR	Win 2000/OS X 10.3 or later	DSM 3.2	157x248x233mm 4.3kg
	The Synology DS1511+ is a powerful, expandable storage solution that would suit a small or medium business, with the potential to form part of an even larger network. File copying performance is very good, although write speed is a little below Intel-based dual-core solutions. Its user interface is one of the best we've seen, accessible to home users as well as trained network admins.					

GLOSSARY • DLNA: Digital Living Network Alliance • ET: ethernet • NAS: network-attached storage • UPnP: Universal Plug and Play   *Prices are intended only as a guide and are correct at press time*

>> Buying advice

NAS drives

NAS drives are ideal for businesses or home users who require large amounts of dependable and secure storage, accessible to anyone logged into the local wired or wireless network.

Instead of connecting a hard disk directly to one PC, the NAS is typically connected to a network router. Drive enclosures are also available that let you add your own choice of hard drives.

Most NAS drives allow virtual partitions, letting you keep data such as PC backups separate from media files. Home-oriented NAS drives also include media servers to allow easy streaming of content.

To augment data integrity, access speed, capacity, or all three, individual hard disks can be combined in a number of Raid configurations. Raid 0 'stripes' data across multiple drives to increase access speeds. Raid 1 mirrors the contents of one drive on to another, providing a cloned backup. Raid 5 is available with three or more drives and combines both advantages.

PC ADVISOR TEST CENTRE

Top 5 Smartphones

		Platform	Storage Media supported	Screen size/res (pixels)	Input method	Connectivity	Apps	Battery life talk time/standby	Camera GPS	Dimensions (wxdxh) Weight
1	**Apple iPhone 4S** apple.com/uk tinyurl.com/33hoyex Last month 1 • £499 inc VAT	Apple iOS 5	16GB none	3.5in 960x640	capacitive multitouch	HSDPA, 3G, BT, 802.11b/g/n	Safari, FaceTime, iTunes, Siri, App Store, Maps	8 hrs 200 hrs	8Mp yes	59x10x115mm 140g
	The 4S is an impressive handset, but faces some stiff competition from its neck-and-neck Samsung rival. The retina display is still the best screen we've seen, while the graphics have now been bolstered. The 3G modem is twice as fast, and the new 8Mp camera works well. Siri voice recognition feels natural to use. The 4S resembles last year's vintage, but Apple pours a lot of new wine into an old bottle.									
2	**Samsung Galaxy S II** samsung.com/uk tinyurl.com/3hf6god Last month 2 • £406 inc VAT	Android GB 2.3	16GB microSD	4.3in 480x800	capacitive touchscreen	HSDPA, 3G, BT, 802.11b/g/n	TouchWiz	not specified	8Mp yes	66x125x8mm 116g
	The S II isn't the newest handset here, but it's the best example of an Android Gingerbread 2.3 phone. It's available on contract and SIM-free for less than the iPhone, but just lags Apple's handset in performance and ease of use. Slim and lightweight, its design accommodates a larger 4.3in touchscreen over the original S. It feels more rigid, too. The CPU runs to 1.2GHz, and the camera to 8Mp.									
3	**HTC Sensation** htc.com/europe tinyurl.com/5w5kc7d Last month 3 • £499 inc VAT	Android GB 2.3	1GB microSD	4.3in 540x960	capacitive touchscreen	HSDPA, 3G, BT, 802.11b/g/n	FriendStream, Torchlight, Mirror, Watch	500 mins 285 hrs	8Mp yes	68x126x5mm 148g
	HTC calls the Sensation a 'multimedia superphone' and given its razor-sharp screen, decent video playback and great audio, we can see why. If you can handle its sheer size, this is an excellent phone and a superior entertainment player. There's a 1.2GHz dual-core CPU, a 4.3in screen and an 8Mp camera. A touch-sensitive ring guides navigation. The Mirror app will be a useful inclusion for some.									
4	**RIM BlackBerry Bold 9780** uk.blackberry.com tinyurl.com/3kj33gs Last month 5 • £331 inc VAT	BlackBerry OS 6	512MB microSD	2.4in 480x360	SureType keyboard	HSDPA, 3G, BT, 802.11b/g	BlackBerry AppWorld, Browser, Maps	6 hrs 408 hrs	5Mp yes	109x60x14mm 122g
	The Bold 9780 looks identical to its Bold 9700 predecessor, but features more memory and the new BlackBerry 6 mobile platform. A refreshed home screen, various software enhancements and a better web browser are improvements. It feels well built and has one of the best screens we've seen on a BlackBerry handset. As you'd expect from a BlackBerry, the Bold 9780's email support is strong.									
5	**Motorola Defy+** motorola.co.uk tinyurl.com/77uLwsj **New** • £246 inc VAT	Android GB 2.3	1GB microSD	3.7in 480x854	capacitive touchscreen	HSDPA, 3G, BT, 802.11b/g/n	Google Maps, Connected Media Player	6.8 hrs 237 hrs	5Mp yes	107x59x13mm 118g
	A rugged handset with IP67 compliance, the durable Motorola can withstand immersion in up to 1m of water for 30 minutes. The Gorilla Glass screen is scratch-resistant, and yet the Defy+ remains relatively slim. The processor is perfectly adequate, while the music app is particularly impressive. More solid than typical smartphones, the Motorola Defy+ is nicely priced for such a versatile handset.									

GLOSSARY • BT: Bluetooth • GB: Gingerbread • GM: Google Maps • MS: Mediascape • NFC: near-field communications • TS: Timescape

Top 5 Digital camcorders

		Max resolution (pixels) Aspect ratio	Display CCD sensor	Zoom	Formats	Internal storage Compatible media	Connections	Dimensions (wxdxh) Weight
1	**Kodak PlaySport Zx5** kodak.co.uk tinyurl.com/3u3y2ca Last month 1 • £100 inc VAT • £149 (RRP) • 1-year warranty	1920x1080 16:9	2in 1/3.2in	4x digital	Mpeg4, Jpeg	128MB SD/SDHC	Micro-HDMI, MicroUSB	58x112x18mm 125g
	The Zx3 was our favourite compact camcorder of 2010, so this ruggedised Zx5 has a lot to live up to. The buttons on the rear are now better spaced, and Kodak's added a dedicated Share button, a speaker and a removable battery. Build quality is faultless, with the 125g PlaySport able to fit comfortably into one hand. Our outdoor test shots revealed lush green grass and punchy red and blues.								
2	**JVC Everio GZ-HM650** jvc.co.uk tinyurl.com/453u838 Last month 2 • £300 inc VAT • £420 (RRP) • 1-year warranty	1920x1080 4:3, 16:9	2.7in 1/4.1in	200x digital 40x optical	Mpeg4, Jpeg	8GB SD/SDHC/SDXC	HDMI, USB 2.0	51x55x111mm 195g
	It no longer offers such good value at £300, but this lightweight JVC Everio remains a decent model. The 8GB internal memory (room for up to 6.5 hours of video or 9,999 photos), is expandable via SD/SDHC/SDXC cards up to 32GB in capacity. It fits comfortably in the hand and is easy to operate, despite some rather small buttons. A small amount of noise is picked up by the mic during operation.								
3	**Sony Bloggie Touch MHS-TS20** sony.co.uk tinyurl.com/332uoqj Last month 3 • £150 inc VAT • £220 (RRP) • 1-year warranty	1920x1080 16:9	3in 1/2.5in	4x digital	Mpeg4, Jpeg	8GB SD/MS	HDMI, USB 2.0	47x9x106mm 125g
	A £25 price cut sees the Sony Bloggie Touch move up to third. This is an excellent model where the primary focus is video blogging. Its unconventional shape is potentially hampering, and the fixed cameraphone-style lens isn't the best for setting up stationary shots. The intuitive interface makes the Sony Bloggie easy to use, though, and recording quality is generally good, even if there's no flash.								
4	**Canon Legria HF R106** canon.co.uk tinyurl.com/2vfvLqx Last month 4 • £275 inc VAT • £425 (RRP) • 1-year warranty	1920x1080 16:9	2.7in 1/5.5in	80x digital 20x optical	AVCHD, Jpeg	none SD/SDHC	HDMI, USB 2.0	60x64x124mm 319g
	Canon's build quality is as impressive as ever in this budget camcorder with a 2.7in flip-out LCD screen. A camcorder first and foremost, the Legria HF R106 has a large lens and a 20x optical zoom, enabling it to capture great-looking full-HD (1920x1080-pixel) video. Colour balance in natural light was superb in our tests, and we were also impressed with the Canon Legria's close-up shots.								
5	**FlipVideo Flip UltraHD** theflip.com/en-gb tinyurl.com/nesp78 Last month 5 • £98 inc VAT • £160 (RRP) • 1-year warranty	1280x720 16:9	2in 1/4.5in	2x digital	H.264, Mpeg4, Jpeg	8GB n/a	USB 2.0	109x56x30mm 168g
	For sheer ease of use, the FlipVideo Flip UltraHD sprints ahead of the competition. The simple button layout enables anyone to pick it up and get shooting. The Flip UltraHD improves on its predecessor by adding HD (1280x720-pixel) capture, and the 8GB of storage (sufficient for 2.5 hrs filming) means no worrying about memory cards. The Flip's 2in screen is excellent and video quality is good.								

GLOSSARY • CCD: charge-coupled device

Prices are intended only as a guide and are correct at press time

>> Buying advice

Digital camcorders

Camcorder manufacturers have moved from devices based on tapes and hard disks to gadgets with flash memory. A 'proper' pistol-grip camcorder with a flip-out LCD screen will help you follow the action more easily, pan and zoom.

HD video: HD video can be of a higher visual quality than broadcast TV or DVD – it captures video at either a 1280x720- (720p) or 1920x1080-pixel resolution. Beware that '1080' can refer to either 1080i or 1080p, and the latter progressive-scan is preferable.

Video is usually compressed with Mpeg4, and often wrapped in its Blu-ray-friendly variant AVCHD. However, you'll need to watch out for compatibility issues with your video-editing software.

Shooting in HD can produce crystal-clear footage, but you inevitably end up with huge files. Consider investing in an external hard drive (see our pick of those available on page 141 or online at tinyurl.com/ybw3s6w).

PC ADVISOR TEST CENTRE

Top 5 — Compact digital cameras

		Megapixel rating / Max resolution	Optical zoom	Max aperture	LCD size	Internal storage (memory card) / Battery/life	ISO range	Dimensions (wxdxh) / Weight	Software includes
1 PC ADVISOR BEST BUY	**Sony Cyber-shot DSC-HX9V** sony.co.uk tinyurl.com/6cLaw3d Last month 1	• £270 inc VAT • £299 (RRP) • 2-year warranty	16.2Mp 4608x3456	16x	f3.3-f5.9	3in	n/a (SD/SDHC) 1 x lithium/410 shots	100 to 3200	105x34x59mm 215g	Picture Motion Browser
This Cyber-shot model may omit RAW, aperture- and shutter-priority modes, but it compensates with innovative in-camera settings and superb still-image and video capture. It can grab 3D images, and you also get GPS for geotagging, plus a 10fps high-resolution burst mode. The lens remains steady, with optical stabilisation and Active Steady Shot. It's compact, but a little too big for the average pocket.								
2 PC ADVISOR RECOMMENDED	**Nikon Coolpix S9100** nikon.co.uk tinyurl.com/6e457py Last month 2	• £200 inc VAT • £234 (RRP) • 2-year warranty	12.1Mp 4000x3000	18x	f3.5-f5.9	3in	74MB (SD/SDHC) 1 x lithium/270 shots	160 to 3200	106x35x62mm 214g	Nikon utilities
The sleek Nikon S9100 is a small camera with a very big 18x zoom. The sensor-shift anti-shake feature reduces blur, and a rubberised surface is effective at preventing slippage. Full-HD video shot at 30fps is smooth, and the Nikon can create slow-motion clips in standard resolution at a superb 240fps. The Coolpix is extremely accessible, with a fantastic 3in LCD screen, and the image quality is excellent.								
3	**Panasonic Lumix DMC-TZ20** panasonic.co.uk tinyurl.com/6xnrwuo Last month 3	• £215 inc VAT • £300 (RRP) • 1-year warranty	14.1Mp 4320x3240	16x	f3.3-f5.9	2.8in	18MB (SD/SDHC) 1 x lithium/260 shots	100 to 1600	105x33x58mm 219g	PhotofunStudio 6.1 HD Lite
The DMC-TZ20 has an excellent 14.1Mp resolution and 16x optical zoom. Geo-tagging is automatically embedded in an image file's Exif data. You can shoot full-HD video in AVCHD, or standard-definition in Motion Jpeg. The camera also features a 3D mode. A range of options is available for hands-on photographers, but the buttons can be confusing. Output is consistent, with colours veering between natural and warm.								
4	**Canon Ixus 300 HS** canon.co.uk tinyurl.com/35zg6bp Last month 4	• £220 inc VAT • £379 (RRP) • 5-year warranty	10.3Mp 3648x2736	3.8x	f2.0-f5.3	3in	n/a (SD/SDHC) 1 x lithium/250 shots	125 to 3200	100x24x54mm 177g	Canon utilities
The Canon Ixus 300 HS remains a strong buy if you don't need long zoom facilities. The dedicated low-light setting works very well in both stills and video recording, and there's a high-speed, slow-mo playback setting. The Canon's 3.8x optical zoom is another asset, securing super-sharp shots. Colour reproduction was very pleasing in all conditions, and the battery life was good. Ideal for all users.								
5	**Canon PowerShot G12** canon.co.uk tinyurl.com/4qhaf66 Last month 5	• £400 inc VAT • £450 (RRP) • 1-year warranty	10Mp 3648x2736	5x	f2.8-f4.5	2.8in	n/a (SD/SDHC) 1 x lithium/370 shots	80 to 3200	112x48x76mm 401g	Canon utilities
By far the most expensive model in the chart, the G12 is a great option for those users who want something more powerful. An extremely advanced point-and-shoot camera, the PowerShot offers fantastic image quality, along with a good number of other useful features such as top-mounted dials and a high dynamic range scene mode. The Canon G12 is remarkably easy to use, despite its considerable complexity.								

Top 5 — Interchangeable-lens cameras

		Megapixel rating / Max resolution	Optical zoom	Max aperture	LCD size	Internal storage (memory card) / Battery/life	ISO range	Dimensions (wxdxh) / Weight	Software includes
1 PC ADVISOR BEST BUY	**Nikon D5100 (18-55mm)** nikon.co.uk tinyurl.com/6ute9kk Last month 1	• £599 inc VAT • £599 (RRP) • 3-year warranty	16.2Mp 4923x3264	3x	f3.5-f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/660 shots	100 to 6400	124x97x79mm 510g	Nikon software
The D5100 delivers superb image quality, particularly in low light. It offers excellent ease of use for the beginner, plus some advanced features so that the camera can grow with you. The display provides helpful and accessible information throughout, and the automatic digital correction of flaws is good. There aren't enough dedicated function buttons. Plenty of lenses and accessories are available.								
2 PC ADVISOR RECOMMENDED	**Panasonic Lumix DMC-G3 (14-42mm)** panasonic.co.uk tinyurl.com/7jcxjcr Last month 2	• £430 inc VAT • £468 (RRP) • 3-year warranty	16Mp 4592x3448	3x	f3.5-f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/270 shots	100 to 6400	115x84x47mm 336g	Photofun Studio, SilkyPix Developer
Combining the features and handling of an SLR with the reduced dimensions of a compact, the Panasonic is a tiny camera that serious photographers will love. Its 3in rotating touchscreen enables shooting from all angles. The viewfinder doesn't automatically activate when you look through it, but video capabilities are strong and images are surprisingly clean. The autofocus system is blisteringly fast.								
3	**Sony Alpha NEX-5 (18-55mm)** sony.co.uk tinyurl.com/37xozx5 Last month 3	• £400 inc VAT • £549 (RRP) • 1-year warranty	14.6Mp 4592x3056	3.1x	f3.5-f5.6	3in	n/a (MS/SD/SDXC) 1 x lithium/yes	200 to 12800	111x59x38mm 229g	Sony utilities
The Sony Alpha NEX-5 bridges the gap between compact and digital SLR with high-performance features. This petite camera's 14.6Mp, APS-C CMOS sensor, 25-point autofocus system and 7fps burst mode are unlikely to be found in your average compact. More importantly, the Sony Alpha NEX-5's exposure, colour fidelity, sharpness and lack of image noise are impressive. A very good deal at £400.								
4	**Canon EOS 600D (18-55mm)** canon.co.uk tinyurl.com/72ste88 Last month 4	• £550 inc VAT • £585 (RRP) • 1-year warranty	18Mp 5184x3456	3x	f3.5-f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/440 shots	100 to 6400	133x100x80mm 570g	ZoomBrowser EX, ImageBrowser
The EOS 600D takes the entry-level EOS 1100D and adds to it a host of features. Shooting modes range from fully automatic to complete manual. The image quality is top-notch, and the camera is extremely flexible, with a fold-out articulated LCD screen that enables shooting from any angle. The video options are advanced, and the EOS 600D's larger range of control buttons makes it ideal for advanced users.								
5	**Olympus PEN Mini E-PM1 (14-42mm)** olympus.co.uk tinyurl.com/bLmymjw Last month 5	• £390 inc VAT • £450 (RRP) • 2-year warranty	12.3Mp 4032x3024	3x	f3.5-f5.6	3in	n/a (SD/SDHC/SDXC) 1 x lithium/330 shots	200 to 12800	110x64x34mm 217g	Olympus Viewer 2.0
The mini maintains the core values of the stylish and expensive-looking Olympus PEN range in a considerably smaller package. Built-in flashes and electronic viewfinders are jettisoned to save size, although both are usable as attachments. The 3in LCD gives plenty of help, though. The PEN mini is surprisingly flexible – and fast. Image quality is fine, provided that you steer clear of the highest ISO settings.								

GLOSSARY • APS-C: Advanced Photo System type C • SLR: single-lens reflex

Prices are intended only as a guide and are correct at press time

>> Buying advice

Digital cameras

Excellent-value 10Mp-plus cameras may be available for £100 or so. However, sensor size may be a better indicator of quality than megapixels – read the full review online for detailed specs and testing.

LCD screen: A large 3in LCD screen is useful for previewing images on a compact, but a viewfinder is also useful on any model for use in bright sunlight. Consider a 260K-dot screen as the minimum.

Image stabilisation: This is standard on compact digital cameras, but less common on interchangeable-lens models. If you're to get crisp shots using a lengthy zoom, you'll want some form of anti-shake mechanism and a small tripod. Almost every camera has a tripod mount underneath.

Zoom: Look for a large optical rather than digital zoom. Digital zoom crops an image, losing detail.

Storage: SDXC removable memory cards can store 64GB of photos and video (note that not all cameras support it), but a high-speed SD Card is far better for capturing video.

Top 5 Sub-£150 graphics cards

	Price	Graphics processor	Installed RAM	Memory interface / Core clock	Memory clock DDR effective	Ramdac / Stream processors	Power connectors	Interface	DirectX / Digital interface
1 PC ADVISOR BEST BUY — **Sapphire AMD Radeon HD 6850** sapphiretech.com tinyurl.com/3xruqw5 Last month 1	• £125 inc VAT • £160 (RRP) • 2-year warranty	AMD Radeon HD 6850	1GB GDDR5	256bit 775MHz	1GHz 4GHz	400MHz 960	1 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
		The Sapphire version of the 6850 is now a better choice than the previous XFX card in this slot. MSI also does a faster version for only marginally more money. A fantastic mid-range card, the 6850 has good memory bandwidth and high-quality architecture. Noticeably faster than the 768MB GTX 460, and not too far off the Radeon HD 6870, it's a very powerful card at this price.							
2 PC ADVISOR RECOMMENDED — **Sapphire AMD Radeon HD 6790** sapphiretech.com tinyurl.com/6p9b7kz Last month 2	• £100 inc VAT • £100 (RRP) • 2-year warranty	AMD Radeon HD 6790	1GB GDDR5	128bit 840MHz	1,050MHz 4.2GHz	400MHz 800	2 x 6-pin	PCI Express	11.0 2x DVI, HDMI, DP
		In essence a pared-down version of the 6850/6870 processors, the 6790 offers less in the way of stream processors and texture units. But the 256bit memory interface is good and the clock speeds are capable, with a strong memory bandwidth figure. In terms of performance it falls short of the 6850, but it still offers playable framerates. This is the best choice at around the £100 mark.							
3 **HIS Radeon HD 6770** hisdigital.com tinyurl.com/6feq6ap Last month 3	• £95 inc VAT • £110 (RRP) • 2-year warranty	AMD Radeon HD 6770	1GB GDDR5	128bit 850MHz	1.2GHz 4.8GHz	400MHz 800	1 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
		Should this HIS version be sold out, Asus also does a similarly zippy version of the 6770 - in essence a rebadged 5770 with the HDMI version increased to 1.4a and better Blu-ray support. The 5770 remains a decent card for the money, so the 6770's similarities aren't a bad thing, with modest power requirements and an affordable price tag. Speed is relatively good too. The 6790 offers better value.							
4 **Sapphire AMD Radeon HD 6570** sapphiretech.com tinyurl.com/3h62tj3 Last month 4	• £65 inc VAT • £65 (RRP) • 2-year warranty	AMD Radeon HD 6570	1GB GDDR3	128bit 650MHz	900MHz 1.8GHz	400MHz 480	none	PCI Express	11.0 DVI, HDMI
		Graphics cards don't get much cheaper than this. This tiny card consumes little power and has half-height dimensions that make it ideal for a media PC, but it still surprises with some of its specifications. The 1GB of memory is generous, even if it is of the DDR3 variety. Its overall capabilities are limited, but video playback is smooth - as an upgrade from onboard video, the 6570 works well.							
5 **Asus AMD Radeon HD 6670** uk.asus.com tinyurl.com/3Lm8hge Last month 5	• £65 inc VAT • £65 (RRP) • 3-year warranty	AMD Radeon HD 6670	1GB GDDR3	128bit 800MHz	900MHz 1.8GHz	400MHz 480	none	PCI Express	11.0 DVI, HDMI
		Now priced at around £65, the Asus AMD Radeon HD 6670 remains competitive with a useful 1GB of video memory and an 800MHz core clock. However, the Asus' graphics performance is strangled by its 128bit memory interface. This version's memory is of the DDR3 variety rather than the GDDR5 seen elsewhere, which slices the effective memory clock in two. The 6570 offers better value.							

Top 5 £151+ graphics cards

	Price	Graphics processor	Installed RAM	Memory interface / Core clock	Memory clock DDR effective	Ramdac / Stream processors	Power connectors	Interface	DirectX / Digital interface
1 PC ADVISOR BEST BUY — **HIS AMD Radeon HD 6950** hisdigital.com tinyurl.com/6gqs8xc Last month 1	• £220 inc VAT • £240 (RRP) • 2-year warranty	AMD Radeon HD 6950	2GB GDDR5	256bit 800MHz	1250GHz 5GHz	400MHz 1,408	2 x 6-pin	PCI Express	11.0 DVI, HDMI, DP
		The 6950 has commanded a high position in our chart for several months now. This HIS version offers an 800MHz core clock and 5GHz memory clock speed. The specs sound impressive, with the narrower stream processor unit allowing for an increased number of SIMD engines. It isn't as fast as nVidia's GeForce GTX 570, but a big price difference allows the 6950 to take top spot.							
2 PC ADVISOR RECOMMENDED — **MSI GeForce GTX 560 Ti 448 Edition** uk.msi.com tinyurl.com/cm2mk8q **New**	• £240 inc VAT • £240 (RRP) • 2-year warranty	nVidia GeForce GTX 560 Ti 448	1,280MB GDDR5	320bit 750MHz	975MHz 3.9GHz	400MHz 448	2 x 6-pin	PCI Express	11.0 DVI, Mini-HDMI
		This '448 edition' of the GTX 560 Ti isn't likely to be around for long. While stocks last, however, it's an interesting product that offers only slightly inferior performance to the 570 and costs a good deal less. It's not so much a 560 Ti as a cut-down GTX 570. The shader processors are typical for an nVidia model, but the card offers good performance. It's not particularly quiet, though.							
3 **MSI GeForce GTX 570** uk.msi.com tinyurl.com/3ub8u3g Last month 2	• £270 inc VAT • £275 (RRP) • 2-year warranty	nVidia GeForce GTX 570	1,280MB GDDR5	320bit 732MHz	950MHz 3.8GHz	400MHz 480	2 x 6-pin	PCI Express	11.0 DVI, Mini-HDMI
		This MSI version is very similar to the PNY incarnation of the nVidia GeForce GTX 570 we originally reviewed. Gainward does an extremely good version, too. Cheaper than a GTX 580, but still adding a bit of oomph to graphics, the 570 is a great graphics card. The memory bandwidth is good, while it outstrips the HD 6970 at lower resolutions and still matches it at higher detail levels.							
4 **Asus GeForce GTX 560 Ti** uk.asus.com tinyurl.com/43uxnp8 Last month 3	• £170 inc VAT • £190 (RRP) • 3-year warranty	nVidia GeForce GTX 560 Ti	1GB GDDR5	256bit 830MHz	1GHz 4GHz	400MHz 384	2 x 6-pin	PCI Express	11.0 DVI, HDMI
		The £170 560 Ti offers affordable gaming firepower. While it has two cores less than cards based on the 550 Ti, its specs are strong – and this Asus version has a core clock 8MHz higher than the generic version we reviewed. The 384 stream processors are great, and the huge texture fill gives the 560 Ti a significant boost over the 550. Smooth framerates are possible in almost every game.							
5 **Gigabyte GeForce GTX 560 Ti OC** uk.gigabyte.com tinyurl.com/68q3avg Last month 4	• £200 inc VAT • £250 (RRP) • 3-year warranty	nVidia GeForce GTX 560 Ti	1GB GDDR5	256bit 900MHz	1GHz 4GHz	400MHz 384	2 x 6-pin	PCI Express	11.0 DVI, HDMI
		An overclocked version of the 560 Ti, the Gigabyte pushes the core clock speed up to 900MHz. It is faster than the standard version, although not by enough to compensate for the £30 difference between the two cards. Power consumption is modest, though, and this card beats some tough competitors, such as the Radeon HD 6870. The standard 560 Ti offers better value.							

GLOSSARY • DP: DisplayPort • MDP: Mini DisplayPort

Prices are intended only as a guide and are correct at press time

›› Buying advice

Graphics cards

Graphics processor: The GPU determines the quality and refresh speed of images. The GTX 570 is the highest-performing card here, while the 460 and Radeon HD 6850 represent excellent value. Gamers may have to switch off some detail settings with a cheaper card. Substituting one brand of card for another with the same graphics chip and memory allocation won't affect performance.

RAM: Even those on a budget should be able to get a minimum of 1GB of DDR RAM. For high-end cards, look for 1,280MB or even more. **Features:** DirectX 11.0 support is required only for the most advanced games; cheaper cards are likely to lack the firepower to do justice to DirectX 11.0 games. Demand a DVI or HDMI connection. **Dual-display support:** This useful feature adds a second HDMI port to your PC setup.

PC ADVISOR **TEST CENTRE**

Top 5 Sub-£200 flat-panels

			Screen size/ LCD type	Native resolution (pixels)	Pixel pitch	Dimensions (wxdxh) Weight	Brightness (candelas per m²) Contrast ratio[1]	Response time (milliseconds)	Digital connector
PC ADVISOR BEST BUY	1	**AOC i2353Fh** aoc-europe.com tinyurl.com/7twLb2a **New**	• £150 inc VAT • £150 (RRP) • 3-year warranty	23in IPS 3D	1920x1080	0.27mm	550x388x188mm 5.6kg	250 1,000:1	5ms	2x HDMI
		This AOC monitor is one of the best-looking displays we've ever tested. It's just 10mm thick, with most of its workings found inside the stand. The latter is a beautiful circular disc, surrounded by an attractive clear plastic rim. The IPS panel delivers excellent colour and wide viewing angles. The control panel buttons are easy to operate. The AOC beats all TN-based comers and the price is outstanding.							
PC ADVISOR RECOMMENDED	2	**LG IPS236V** lg.com/uk tinyurl.com/cwmp7m8 Last month 1	• £145 inc VAT • £150 (RRP) • 2-year warranty	23in IPS	1920x1080	0.27mm	549x230x422mm 4kg	250 1,000:1	5ms	DVI, HDMI
		The LG is a tricky screen to find, but a number of stores have stock remaining. It showcases some fabulous features at a stunning price. The headline act is its IPS panel, which delivers wider viewing angles and considerably better image quality than TN versions. Colours were accurate out of the box. The casing looks great, too. Throw in the low price tag, and the LG IPS236V is an amazing deal.							
	3	**Iiyama ProLite XB2472HD** iiyama.co.uk tinyurl.com/3dyx75z Last month 2	• £200 inc VAT • £200 (RRP) • 3-year warranty	24in VA	1920x1080	0.28mm	570x215x438mm 6.2kg	250 3,000:1	8ms	DVI, HDMI
		Now bumped down to third place, the Iiyama also benefits from an enhanced panel – in this case VA. This gives it wonderful 24bit colour reproduction, and the depth of the palette is a vast improvement over the competition. Viewing angles aren't without fault, but they're better than on TN models. The Iiyama offers height and rotation adjustments. A lovely screen, but it's no match for the LG.							
	4	**BenQ V920** benq.co.uk tinyurl.com/23thrLt Last month 3	• £90 inc VAT • £130 (RRP) • 2-year warranty	18.5in TN	1366x768	0.3mm	355x157x457mm 2.4kg	250 1,000:1	5ms	DVI
		BenQ's V920 continues to hold firm at a tempting price. The viewable screen size is a mere 18.5in but, assuming this is acceptable, this polished, nicely curved monitor is fantastic for the money. The monitor's tricky menu system and narrow viewing angles aren't ideal, but the colour is bold and punchy given the price. The BenQ V920 monitor also offers great value for money at £90.							
	5	**Hanns-G HL231DPB** hannsg.com tinyurl.com/32mgmtc Last month 4	• £110 inc VAT • £159 (RRP) • 3-year warranty	23in TN	1920x1080	0.27mm	547x189x352mm 3.3kg	250 1,000:1	5ms	DVI
		Now offering even better value at £110, the Hanns-G HL231DPB boasts an astonishingly large 23in screen. The image quality isn't the best we've seen, but it looks nice. Power consumption is a modest 27W, and the 170-degree viewing angles are standard for TN technology. Hanns-G claims a dynamic contrast ratio of 8,000,000:1, but there's nothing else preposterous about this value screen.							

GLOSSARY • HDCP: High-bandwidth Digital Content Protection • IPS: in-plane switching • PVA: patterned vertical alignment • TN: twisted nematic • VA: vertical alignment

Top 5 £201+ flat-panels

			Screen size/ LCD type	Native resolution (pixels)	Pixel pitch	Dimensions (wxdxh) Weight	Brightness (candelas per m²) Contrast ratio[1]	Response time (milliseconds)	Digital connector
PC ADVISOR BEST BUY	1	**ViewSonic VP2365-LED** viewsoniceurope.com tinyurl.com/5wmjLr9 Last month 1	• £215 inc VAT • £215 (RRP) • 3-year warranty	23in IPS	1920x1080	0.27mm	548x433x250mm 5.4kg	250 1,000:1	6ms	DVI
		Aimed at professionals, the 23in VP2365-LED combines premium-grade monitor technologies, ergonomic features and superior image quality. It's ideal for those who work regularly with HD video. The IPS panel delivers the best colour reproduction and widest viewing angles, while the LED backlight makes for a slim, lighter and less power-intensive design. There's no HDMI port, however.							
PC ADVISOR RECOMMENDED	2	**LG DM2350** lg.com/uk tinyurl.com/83hr2sb Last month 2	• £270 inc VAT • £270 (RRP) • 2-year warranty	23in TN 3D	1920x1080	0.27mm	547x424x180mm 4kg	250 1,000:1	5ms	HDMI
		A combined TV/monitor, the DM2350 can also handle 3D when used with either nVidia or AMD graphics cards. It uses passive polarised glasses to achieve this effect, and can play 3D films direct from a Blu-ray player. The Picture Wizard is user-friendly, and the display quality is good – with relatively accurate colours for a TN panel. Stylish and very versatile, this is a versatile choice.							
	3	**NEC MultiSync EA232WMi** nec-display-solutions.co.uk tinyurl.com/4cqgnvw Last month 3	• £235 inc VAT • £300 (RRP) • 3-year warranty	23in IPS	1920x1080	0.27mm	550x220x379mm 5.8kg	300 1,000:1	14ms	DVI, DP
		The ViewSonic offers slightly better value, but the NEC overcomes some sluggish response rates to establish itself as an excellent choice for general PC and graphical use. The high-calibre IPS panel provides for considerable depth of colour. The styling may be sober, but the features (which include a height- and pivot-adjustable stand) are immense. The menu options are impressive, too.							
	4	**Samsung C27A750** samsung.com/uk tinyurl.com/4xqkxpe Last month 4	• £475 inc VAT • £475 (RRP) • 1-year warranty	27in TN	1920x1080	0.31mm	639x233x485mm 5.2kg	300 1,000:1	2ms	HDMI
		Not particularly easy to source in the UK, but a screen of wonders if you can afford it. It's not just the astonishingly slim casing and all-in-one stand that makes this Samsung so different. A hub conceals USB 3.0 and ethernet ports, while UWB technology lets the screen connect to a laptop without cables. It's expensive for a twisted-nematic panel, but offers an interesting glimpse of the future.							
	5	**NEC MultiSync EX231W** nec-display-solutions.co.uk tinyurl.com/45qt68e Last month 5	• £234 inc VAT • £260 (RRP) • 3-year warranty	23in TN	1920x1080	0.27mm	540x215x401mm 4.2kg	250 1,000:1	5ms	DVI, DP
		NEC's lightweight EX231W has a high-quality construction that suggests it's built to last. However, its twisted-nematic panel means colour reproduction isn't as good as on an IPS panel. The overall image quality is acceptable, though, with decent viewing angles. Human Sensing can detect when you're not sitting at the screen and dim the brightness, but needs tweaking for best results.							

[1]Figures given are manufacturers' static contrast ratios unless otherwise stated

Prices are intended only as a guide and are correct at press time

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>> Buying advice

Flat-panel displays

Response time: How quickly the pixels can switch, typically cited as grey-to-grey response time. The lower the figure, the smoother the motion.

Pixel pitch: How closely packed picture elements are and, consequently, how finely detailed the image will be. The lower the figure, the better.

LCD type: Most are TN; IPS and PVA offer better colour depth and viewing angles.

Colours, brightness and contrast: A spectrum of 16.7 million colours is the norm. Discount manufacturers' contrast-ratio claims greater than 1,000:1. This will usually be the dynamic ratio. Expect brightness figures of 250 candelas per square metre (cd/m²) or more.

Extras: A DVI, DP or HDMI connection is crucial to achieving a clean signal, but you may also need a VGA option. Flat-panels often feature integrated speakers, but quality varies. Height-adjustment and tilt facilities can be useful for avoiding a sore neck.

MATT EGAN

A hundred devices to rule them all

Beside reacquainting myself with proper tea and chips, writing this piece is the first thing I've attempted since stepping off the plane from Las Vegas, where I attended CES. This IT tradeshow, along with February's Mobile World Congress, has become a key event in the tech calendar.

If you want to take the pulse of the technology world, you need to be at the show. It's why we go – why else would anyone take a fully paid trip to Las Vegas or Barcelona?

It's a privilege, of course, and one only slightly offset by the tendency of everyone you meet on your return to ask 'what was the best thing you saw?' Reasonable though that query is, we're living in a technology world so diverse that it's impossible to answer.

> ## Diversity can only be a good thing for consumers

At CES I saw personal computing products great, bad and indifferent, ranging in size from tiny phones to hulking great smart fridges. I saw displays from 2in to 100in, with all manner of connected technology installed within, and software that can do almost anything. More importantly, I witnessed a subtle shift in the way we evaluate and use technology.

The hunt has long been on for a single device to rule them all. The assumption has been that if one piece of technology was sufficiently good, it could be all things to all people. What's happened instead is that even amazing products such as Apple's iPhone and iPad are merely great for certain tasks. The iPhone's a brilliant portable entertainment and productivity device, but you wouldn't want to use it to type a dissertation. And though it's possible, who would actually use an iPad as a phone?

Throw in the fact that the vast majority of iDevice users have Windows PCs, and you'll see what I'm getting at. For a proportion of the tech-savvy population, the 'one device' that rules is a Windows laptop or PC, with two Apple devices as peripherals.

You could add an Android or BlackBerry phone or tablet, and an Amazon or Sony e-book reader, and still have a feasible multiplatform, multiscreen setup. This happens, in the real world. And this divergence is only set to increase, putting PC technology into every corner of every home.

From connected TVs to smart fridges and cookers, innovation in the microchip, display and software worlds is bringing into the reach of consumers a multitude of products. Rather than coalesce around a single platform, form factor or device, people are choosing to express themselves via a plethora of tech toys, their individuality reflected in combinations, rather than single gadgets.

Cloud computing is allowing consumers to access media from gadgets large and small, and a variety of platforms. And even as they do battle, Google, Apple, Microsoft, BlackBerry, Amazon and the rest know that they need to make their devices able to talk to their rivals', and their services accessible to all.

In the short term this makes keeping up with the neighbours an expensive business. But in the medium- to long-term diversity can only be a good thing for consumers. ⊠

TEST CENTRE **Flat-panels group test**
In-plane switching (IPS) monitors offer superior viewing angles, even colour distribution and good response times. We test six of the latest models to see which is the screen of choice for gaming and everyday computing use.

TEST CENTRE **Gaming PCs on test**
PCs can be an awful lot of fun, especially if you've got the processing firepower to keep up with your favourite shoot-'em-up. We test the latest rigs specifically aimed at gaming excellence.

TEST CENTRE **Video-on-demand services**
Netflix's entry into the UK market makes things very interesting. We probe the ins and outs of the on-demand viewing services and look at which offer the most choice and best value.

PC Advisor Awards 2012
The votes are in and the nominees are champing at the bit to find out whether they've snatched victory from their rivals. We bestow rosettes on the best retailers, laptop, printer, camera and tablet makers and recognise the best innovations of the past year.

How-to: Web
Google Chrome now has its own app store, offering everything from simple news tickers and weather widgets to in-depth games and programs. We explain how to integrate them into your existing PC setup.

BEST BROADBAND PROVIDERS REVEALED
After many months of research, we reveal the results of our annual broadband survey. Based on feedback from thousands of customers in the UK, it's our definitive guide to choosing and switching to the best ISP for you.