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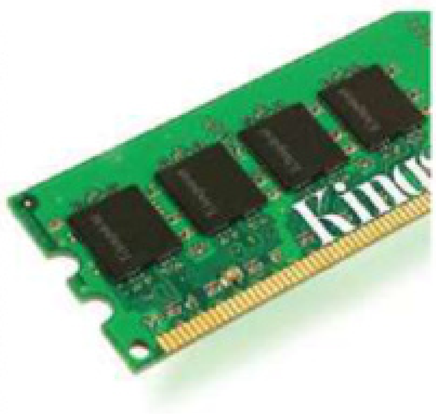

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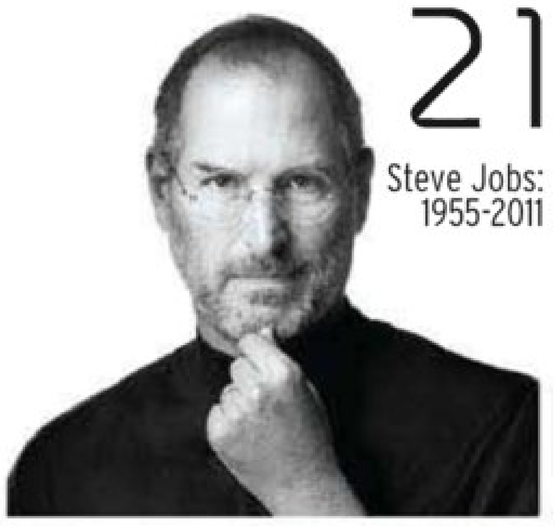

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Chillblast Fusion Claymore 128

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Toshiba recommends Windows® 7.

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WELCOME

ROSEMARY HATTERSLEY

Smarter computing is here to stay

Computers no longer shackle us to our desks, but that doesn't mean the desktop PC is nearing extinction. These machines are more personal than ever

Computers now come in so many guises that it's hard to keep up. They feature in everything from sewing machines and cars to smart card readers and printheads. Fast dual-core processors now power the miniature computers we know as smartphones. Intelligent touchscreen slabs are capable of splicing, editing and rendering video – and have cameras capable of capturing that content in the first place. They're even capable of controlling external devices: our *Great gadgets guide* (page 72) includes a £35 RC helicopter directed by an iPhone or iPad.

It's not just at the cutting-edge of technology or in very specific, personalised gadgetry that computing has changed beyond recognition, though. The everyday computers we use are also very different from those of less than a decade ago. Many visitors to our website have noted *PC Advisor*'s shift in focus from deskbound Windows PCs to portable devices. This reflects the public's changing interests: at the end of October, comScore reported that 5 percent of web traffic in the US is now accounted for by tablets and smartphones (tinyurl.com/62dae2x).

> **"It's not just at the cutting-edge of technology that computing has changed beyond recognition"**

Computer functionality and form have both changed radically. From lists of alphabetically or numerically categorised items stored in folders and sub-folders, we now head instead for the search field and type in our request. Results appear based on tags relating to its location, contents, genre, quality ratings and other criteria.

Today's powerful processors can run with sufficient quiet and cool that affording PCs a place in the living room or another shared part of the home has become the accepted norm. I don't just mean swish-looking laptops and tablets either (we've a group test of the latter on page 64). All-in-one PCs now offer a decent amount of power and graphics might, and many have responsive touchscreen interfaces; these machines are far more than pretty PCs. With a touch-friendly Windows OS coming soon, we look at which all-in-one makes the best family PC, starting on page 54.

Seven years ago, we were trying to muster some enthusiasm for Microsoft's vision of tablet computing. As we observe in *Outbox* (page 146), Microsoft is having another crack at getting tablets right. Its Metro interface is a light platform that should do what no Windows OS has been able to achieve before: operate smoothly on a tablet.

Six years ago, we were flummoxed by Microsoft and Intel's ideas of a PC-centric digital home. Nonetheless, the digital, connected home has come true. Faster Wi-Fi and broadband, plus adoption of interoperability standards such as DLNA, allow tablets, games consoles, laptops, network-storage drives, speakers and TVs to talk to each other and share content. Home-automation specialists such as NXP talk of IP-addressable fridges, lighting and doors, but many 'smart' homes already exist. They're controlled by this decade's 'PC': the tablet and the smartphone. ☒

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INBOX

Reader letters

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

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RIP Steve Jobs

In early October, the sad news broke that Apple founder and ex-CEO Steve Jobs had lost his battle with pancreatic cancer. "Sleep well SJ. Now that you're gone, I hope communications with afterlife will improve – I'm sure you'll invent a version of the iPhone out there, too. Great man, will be sadly missed," wrote **Don ProScentia Et Virtute**. His thoughts were echoed by many others, including **Anne Henwood**. "Steve changed the world of technology," she wrote.

iPhone 4S

When Apple launched its hotly anticipated new iPhone in October, we asked who would be buying one. The majority wasn't keen, finding it overpriced and overhyped. **Hedgie Tablet Holder** was more positive, and said: "Yup, my new compact camera will be an iPhone 4S. I'm going to use it as a phone as well."

pcadvisor.co.uk/news

BlackBerry outages

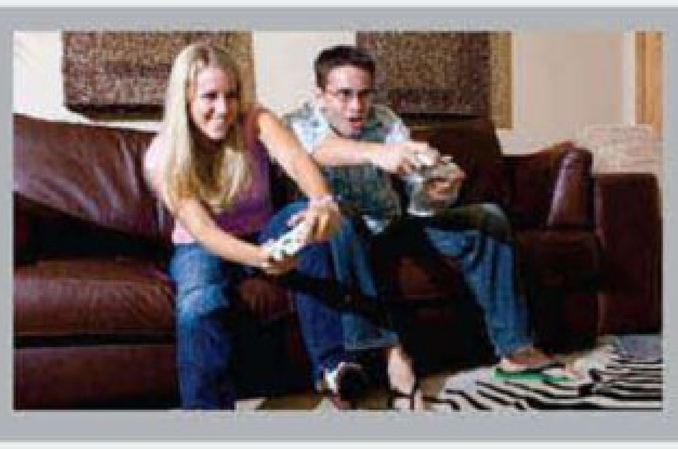
The timing couldn't have been worse for RIM, as its BlackBerry data services suffered a major outage in the same week that Apple's iPhone 4S launched (tinyurl.com/3eeL5d9). "There are six weeks left on my BlackBerry contract, and I'm definitely upgrading to an iPhone. Yes, it costs more, but at least the phone works," wrote *Chrismlost*.

To make matters worse, after four days of no service, RIM admitted it didn't know what caused the core switch at its Slough data centre to crash (tinyurl.com/5vLzdt2). Ian wasn't convinced: "It seems unlikely that a humble network switch was the sole cause of the problem. To have services for half a hemisphere routed through one critical device seems like lunacy," he said.

Try Windows 8 for free

With the aid of our tutorial, *Steve Bacon* took the Windows 8 Developer Preview for a spin (tinyurl.com/67mymnu). He wasn't happy. "It's just awful," he exclaimed. "I don't know where Microsoft gets its startup and shut down figures from, but every new operating system promises to be faster than its predecessor and never is."

In response to a related article, *Harvey Lubin* also failed to see any desirability in Windows 8. "This isn't a new operating system," he wrote. "It's two incompatible operating systems stuck together, side by side. Windows 8 is the Windows Phone 7 user interface (Metro), tacked on to a revised version of Windows 7. Whether you're using a desktop, laptop or tablet, you have two separate interfaces to deal with."



Chill out, gamers!

We couldn't help but smile when we read *Leo*'s response to an article we'd written that claimed nearly one in five gamers had broken their console in the midst of computer rage (tinyurl.com/6b6h7ze). "Some people need to chill out," he wrote. "Plain and simple." Oh, if only it were that easy, *Leo*.

Flagged: Star letter

Get a grip, iOS obsessives!

I recently logged into Yahoo Answers and was met with an avalanche of posts written by obsessed iOS users, frantically wondering when they could download version 5.

One couldn't understand why they couldn't do so before school and wanted to take the day off, unable to wait until they got home. I reminded them that although it was the official release day, it didn't end until midnight and a little patience and decorum might be in order.

They responded with a tirade of frantic (bordering on abusive) comments – how could they possibly carry on living unless they could download the update while eating their breakfast? How could they go to school without having iOS 5 on their phones? If a friend had downloaded and installed it and they hadn't, their lives would be over.

These overhyped teens were acting as if they were going to miss the second coming of the Lord or something. No Google Android users behaved in this disgusting, uncontrolled way when Froyo 2.2 was superseded by Gingerbread 2.3. It's crazy that the availability of a mobile operating system update can cause this type of reaction. *Maccyroo*

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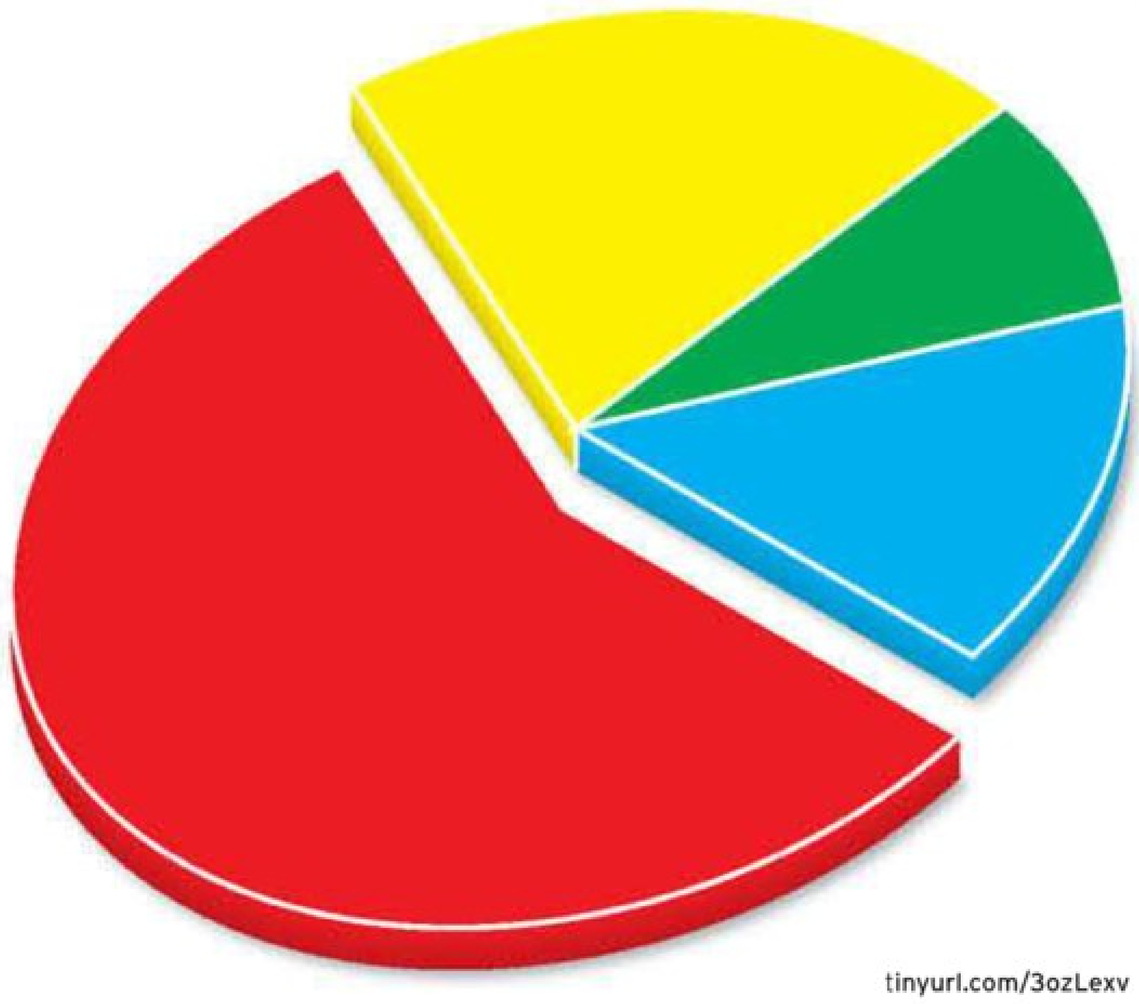
Have you ever been hacked?

21%
Yes, my email/social-media account was hacked and used for phishing

9%
Yes, my bank account was hacked

14%
I may have been hacked, but I'm not sure

56%
I've never been hacked



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letters@pcadvisor.co.uk

Irresponsible software

PC Advisor is a great magazine that's filled with useful and interesting articles, which is why I'm perplexed as to why you would include CyberGhost on your December DVD. Why include software that openly allows illegal surfing of the net, not to mention an open invitation for paedophiles to surf without anyone knowing who they are or where they live? There may be a couple of legitimate uses for it, but the disadvantages outweigh them. Hundreds of people will now have this software installed on their PCs and, in my opinion, you're now responsible for how they use it. *Dr J Newman*

Matt Egan, editor, replies: I understand your point, but I can't agree. There are plenty of legitimate reasons why someone may wish to hide their web surfing, particularly on a shared PC, and there's nothing illegal about privacy. Many people are uncomfortable with targeted advertising, for example. CyberGhost could be used nefariously, but the same could be said of almost all technology.

PC Advisor provides fair and unbiased advice, and we trust that our audience is sufficiently decent to utilise this correctly.

Long live desktop computing

I'm getting tired of all the tablet this and phone that I keep reading about. These devices are of no use for writing scientific papers, marketing reports and books, nor for maintaining large databases, producing accounts or computer-aided design. For millions of us, a computer is an instrument that allows us to complete our work and carry out efficient communication. Games, music, video and social networks have their place but, in my book, these are diversions of secondary importance. *Roger Brown*

Large-screen smartphones

You ran an article last issue about the growing number of large-screen tablet/smartphone hybrids launching on to the market (Dec issue, page 19). I'm confused. I thought the attraction of a smartphone was that it offered the power of a PC in a mobile device you could slip into a pocket. As manufacturers move more and more towards larger screen sizes, it appears that a lightbulb may have switched on. Perhaps they've realised that, actually, a smartphone can't truly compete with a full-size PC – it simply isn't big enough! *Ron James*

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Are you online?

PC Advisor's forum editor brought our attention to growing concerns that up to 17 million UK citizens over the age of 15 are refusing to use the internet, and are disadvantaged as a result. There's talk of a curtain coming down between those who are online and those who aren't, he said, as more companies offer online discounts and jobs are advertised and applied for via the internet. Have your say at tinyurl.com/3Lwdv56.

Bingalau: "These people will die out over time. Children of the past 10 or 20 years have been brought up on the internet, so I can't see a problem. Us oldies either will or we won't use the web."

AitchBEE: "None of my older siblings uses the internet. My older brother has never even used a mobile phone or a computer. But we are all 'normal'."

TopCat®: "My wife marvels at what I can do with my computer and at the enormous amount of information available from just a few clicks online. With more help from family members, many of these people could change their minds."

Autoschediastic: "I know people who refuse to go online because of all the cyberattacks reported by the media, and those who don't have the finances for a PC or broadband."

OTT_B: "For any child growing up now, not having access to this world of resource from their own home or school would be a travesty."

morddwyd: "I'm 74, and I'd be seriously disadvantaged if I was offline. I find using the phone difficult, and my bank and utility companies have no local branches. I also get all my news online."

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iPHONE 4S FLIES OFF SHELVES

Four million handsets already sold, despite consumers’ disappointment that it wasn’t the iPhone 5

Apple has launched the highly anticipated next iteration of its hugely popular iPhone handset. Much to the surprise of analysts, industry officials and consumers, however, it was the 4S unveiled by the tech giant and not the iPhone 5 as expected.

The iPhone 4S, which went onsale just days before former Apple CEO Steve Jobs passed away (see page 21), sports the same thin glass and stainless steel design of the iPhone 4. Apple has instead made its improvements under the hood, with the iPhone now powered by the same dual-core A5 processor as its iPad 2 tablet (reviewed on page 67). According to Apple, this delivers twice the processing power and up to seven times faster graphics than the chip used in the iPhone 4.

The smartphone features a dual-antenna that intelligently switches between two antennae to send and receive data. Apple hopes this will address the call-dropping issue that plagued the iPhone 4, later rectified by fitting a bumper to the handset.

The refreshed handset features improved voice control in the form of Siri – “an intelligent assistant that helps you get things done just by asking”, according to Apple. Siri provides relevant answers to questions such as ‘will I need an umbrella this weekend?’, utilising the phone’s hardware and some apps.

The camera’s megapixel count is now up to 8Mp, while low-light photography benefits from its f2.4 aperture. It also offers an onscreen grid to aid composition, image stabilisation, real-time noise reduction and the ability to capture full-HD video.

Importantly, the battery has been upgraded too; Apple claims the iPhone 4S can now endure 8 hours of talk time.

Apple iOS 5

The handset runs iOS 5, the latest version of Apple’s mobile platform. iOS 5 has 200 new features, including a redesigned Notification Centre and iMessage – a free service for sending messages, photos, video and contact information to other users of the app over Wi-Fi.

A Photos app lets you crop, rotate, enhance and remove red-eye from snaps, as well as organise photos into albums. One-click uploads to Twitter and iMessage are useful for sharing images.

Any device running iOS 5 can also access iCloud, Apple’s online storage service. Music purchased from iTunes, photos, files and contacts can be held in a free account with 5GB of online space, from which they can be streamed to compatible devices. When the content changes on one device, all others are automatically updated, too.

‘Breakthrough’ technology

“iPhone 4S, plus iOS 5, plus iCloud, is a breakthrough combination that makes the iPhone 4S the best iPhone ever,” said Philip Schiller, Apple’s senior vice-president of worldwide product marketing.

“While our competitors try to imitate the iPhone with a checklist of features, only the iPhone can deliver these breakthrough innovations that work seamlessly together.”

The iPhone 4S is available in black or white, with 16, 32 or 64GB of storage. A SIM-free version can be bought direct from Apple, costing £499, £599 and £699 respectively. The UK’s major mobile networks are also offering the iPhone 4S on a contract basis, with prices starting from £20 per month.

Within the first three days of availability, Apple said it had sold more than four million iPhone 4S handsets – that’s more than double what it achieved with the iPhone 4, which sold 1.7 million in the same period following its launch.

Turn to page 32 for our full review of the Apple iPhone 4S.

BT TRIALS 4G NETWORKS IN CORNWALL

Trial will determine whether mobile technology can bring fast broadband to UK's rural 'notspots'

BT and Everything, Everywhere – the parent company that was formed when UK networks T-Mobile and Orange merged – are trialling 4G Long Term Evolution (LTE) broadband in Cornwall.

Under the trial, which began in October and is expected to run until early 2012, the two companies will use 10MHz of the 800MHz spectrum to bring wireless internet access to around 200 residents in St Newlyn East and surrounding areas of South Newquay. This spectrum is currently used for terrestrial TV broadcasts.

It's hoped that the trial will determine the technology's potential suitability in an area classed as one of Britain's broadband 'notspots' (locations that have no internet access at all).

BT said it was committed to using technological innovation to address the challenge posed by getting the UK's remaining notspots online.

"Our proof-of-concept trial in Cornwall will test the capabilities and services that a shared fixed and mobile data network can support. It's just one of several technologies, along with fibre, that we are looking at to offer a possible solution to the rural broadband challenge," said Nigel Stagg, CEO of BT Wholesale.

4G networks have already been rolled out in a number of countries across the world, including the US. The UK is lagging behind in comparison. Ofcom has yet to auction off parts of the 800MHz and 2.6GHz spectrum that will be used by UK networks to offer mobile broadband. Eventually, speeds of up to 100 megabits per second (Mbps) could be possible.

Ofcom initially said this auction would take place at the beginning of 2012. It has now revised that timescale, with the auction expected in summer 2012. The delay follows the threat of legal action by O2, which claimed the auction was illegal under EU law. Since O2 and Vodafone already own some of the 900MHz spectrum, it believes Ofcom will ensure that a certain amount of the 800MHz spectrum goes to their rivals. This could give other mobile networks an unfair advantage, when all operators should be able to start with a clean slate.

Providing that there are no further delays to the auction, 4G LTE services are expected to be rolled out across the UK some time in 2014.

BT fibre-optic broadband to offer speeds of up to 300Mbps

£2.5bn fibre-optic network will bring super-fast broadband to two thirds of the UK by 2015

Some Brits connected to BT's fibre-optic broadband service will be able to access speeds of up to 300Mbps from 2012.

The telecoms company is in the process of rolling out a £2.5bn fibre-optic network across the UK in a bid to give two thirds of the country access to super-fast broadband by 2015. In locations where fibre-to-the-premises (FTTP) technology has been rolled out, residents will be able to benefit from the faster download speed from spring 2012.

BT is also boosting the download speeds of its fibre-to-the-cabinet (FTTC) technology – from 40Mbps to up to 80Mbps.

"These developments will transform broadband speeds across the country and propel the UK up the broadband league tables," said BT Openreach chief executive Liv Garfield.

BT's FTTP service was initially trialled and launched in Milton Keynes. It's now been extended to Ashford in Middlesex, Highams Park in North London, Chester South, St Austell and York. The network will soon be made available to other ISPs so they can offer their own super-fast broadband services.

Communications minister Ed Vaizey said the announcement was good news for the UK. "High-speed broadband is essential for economic growth, which is why we want the UK to have the best super-fast broadband in Europe by 2015," he said.

"Improving the broadband infrastructure will help our high-tech digital industries grow. It will ensure the UK is an attractive place to base the businesses of tomorrow."

FTTP trials offering speeds of up to 1Gbps are ongoing in Kesgrave, Suffolk.

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7% of Brits are victims of ID fraud

Seven percent of Britons have been a victim of ID fraud and found themselves out of pocket by around £1,190, according to Fellowes. Nevertheless, 88 percent of social networkers admit to sharing information that could be used to commit identity fraud; only 18 percent were concerned by the security risks such activity imposes.

MORE: tinyurl.com/6b54ogd

Social networks a threat in the office

Staff using social-media sites such as Facebook and Twitter in the office are a serious security threat, believe 68 percent of UK businesses. According to a survey by Websense, just 24 percent of firms have the appropriate controls in place to reduce this threat. Furthermore, 45 percent of companies don't have a policy on the use of social media in the workplace.

MORE: tinyurl.com/5rLjL46

UK Android Market gets film rentals

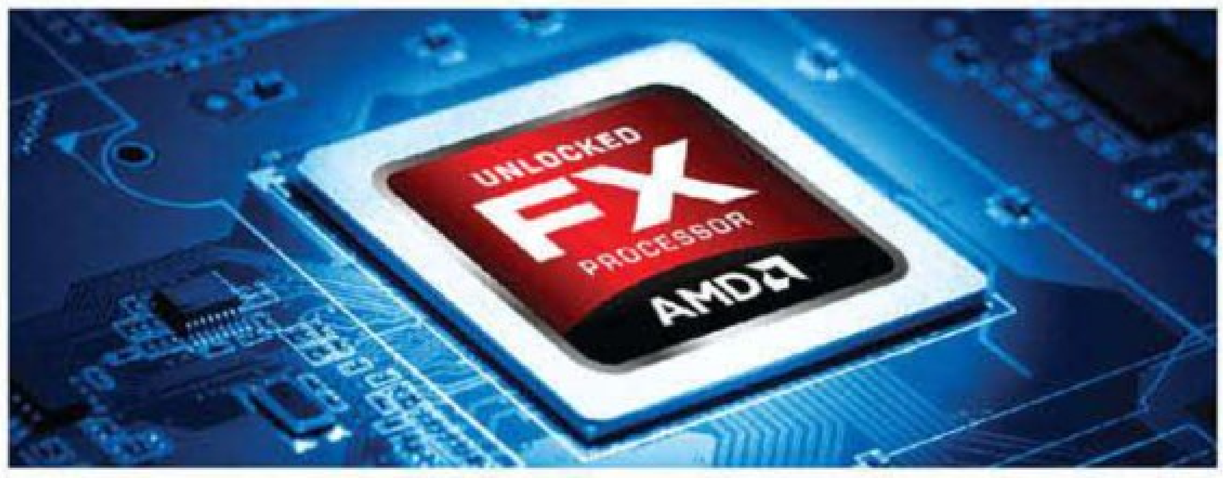
Users of tablets and smartphones running Google Android can now rent films from the Android Market to watch on the go. Around 1,000 movies, including news releases such as *The Green Lantern*, *Fast Five* and *Wrecked*, are available. Prices start at £2.49. Films can be watched at any time within a 30-day period, but this is reduced to just 48 hours once viewing has commenced. The Video app must be downloaded before viewing is possible.

MORE: tinyurl.com/6x62o9w

AMD 8-CORE CPUs TO BOOST LAPTOP SPEED

Bulldozer processors to rival Intel's powerful Core i7-990X Extreme Edition

AMD is promising faster performance for laptop and desktop PCs with eight-core processors that feature its Bulldozer architecture.



The FX-8150 and FX-8120 are the first Bulldozer processors to hit the market, and offer a speed boost of more than 50 percent compared to previous AMD chips. Both belong to the re-launched FX chip family, which is aimed at gaming and high-end systems.

The FX-8150 has a base speed of 3.6GHz, which rockets to 4.2GHz in turbo mode. The FX-8120, meanwhile, runs at 3.1GHz as standard and 4GHz under load. Built using the 32-nanometre manufacturing process, AMD said the chips are unclocked and customisable.

"AMD has historically been about total performance and not thought to be competitive in terms of power efficiency," said Rob Enderle, an analyst with the Enderle Group. "Bulldozer is a redesign from the ground up. It aims to put AMD back in the race for power efficiency, specifically with laptop computers."

AMDs chips will rival Intel's high-end Core i7-990X Extreme Edition processor, which is based on the firm's Westmere architecture. However, Intel will soon launch an even faster Extreme Edition chip that's based on its Sandy Bridge architecture.

Dan Olds, an analyst with The Gabriel Consulting Group, said the power boost and extra cores have a lot to offer high-end computer users. With a retail price of £199, these eight-core chips can also offer consumers more cores per pound than anything on the market today.

But while AMD's new processors stand to put the company back in the game, Olds said they aren't "Sandy Bridge killers". AMD still has a lot of catching up to do, he noted.

ARM processors to increase smartphone efficiency

A7 chips set to appear in both entry-level and high-end smartphones in 2013

Smartphones will no longer have to compromise between performance and battery life. ARM's A7 microprocessor uses the company's most energy-efficient chip design to date, and will bring improved performance to entry-level smartphones.

Used alongside the forthcoming Cortex A15 in the 'big.Little' power-saving architecture, the A7 will also feature in high-end smartphones.

By combining two types of core on the same chip, and assigning different applications to each depending on their requirements, ARM said it can resolve the conflict between the need for both higher performance and longer battery life.

big.Little can reduce power consumption by 70 percent, according to ARM. Gaming and video playback is performed on the more powerful A15 chip, while tasks that require less power, such as making a phone call, are assigned to the A7 to conserve power.

The A7 will be manufactured using a 28-nanometre process; combined with architectural improvements, this will make the processor one-fifth the size, with one-fifth the power consumption, compared with today's Cortex A8 processor. But the A7 will still give a 50 percent performance boost compared to the A8, according to the company.

The big.Little architecture will have a die size of less than 0.5 square millimetres and draw less than 500 milliwatts of power, said Nandan Nayampally, director of marketing for the ARM processor division. Furthermore, the A7 and the A15 will have identical feature sets, so software applications will run on both cores without modification.

ARM's designs are licensed and manufactured by companies such as Texas Instruments, Broadcom and Freescale. The chip makers are expected to produce the first A7 parts next year, and smartphone makers will begin fitting them to devices soon after that. It may take chip makers a little longer to implement the combined A7-A15 design, but ARM said this could also appear in smartphones by 2013. ☒

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Memory update to boost mobile devices

Low-power LPDDR3 memory is set to succeed LPDDR2. Agam Shah investigates how this could translate to faster tablets and smartphones

Faster laptops, tablets and smartphones running on a new form of DDR3 memory designed for mobile devices could hit shop shelves late next year.

Low-power DDR3 memory (LPDDR3) is expected to improve data-transfer rates in mobile devices. According to analysts, this could translate to better performance and longer battery life.

The Joint Electron Device Engineering Council (Jedec) is in the process of defining the specification for LPDDR3, which draws heavily from the DDR3 RAM found in PCs.

The mobile memory will replace LPDDR2, which is found in current smartphones and tablets, such as Apple's iPad 2. Samsung has developed the industry's first 4GB LPDDR3 RAM unit, which can transfer data at up to 1,600 megabits per second (Mbps). This is 1.5 times faster than LPDDR2, and consumes 20 percent less power.

"Tablets and smartphones need a faster form of memory as devices and applications become more resource-intensive," said Mike Howard, a principal analyst at IHS iSuppli.

For viewing and recording HD content, LPDDR3 will offer a better experience because of the greater amount of bandwidth available, he added.

Mobile memory is key in improving a device's ability to multitask. As hardware advances include faster processors and higher resolution screens, LPDDR3 allows the device to keep up, switching between videos, phone calls and other applications.

LPDDR3 memory is also designed to consume less power than its predecessor, said Dean McCarron, principal analyst at Mercury Research. A combination of low power consumption and more bandwidth could prolong battery life. "It allows lower power consumption that has an immediate benefit everywhere," he said.

The memory will initially be found in tablets and high-end smartphones, where performance matters more. It won't be cheap but, as production increases and LPDDR2 is gradually phased out, prices will fall. This will be reflected in the smartphone and tablet market.

"Eventually all these technologies become a commodity," McCarron said.

> **"We need a faster form of memory as devices and applications become more resource-intensive"**

Manufacturer backing

Intel has also been pushing the use of low-power memory in ultrabooks, which are being promoted by the chip maker as thin-and-light laptops with tablet-like features. Analysts said there are still many unknowns about what components these devices will use, but LPDDR3 is a clear contender. LPDDR3 offers close to a 15 percent power reduction compared to standard DDR3, according to Jedec.

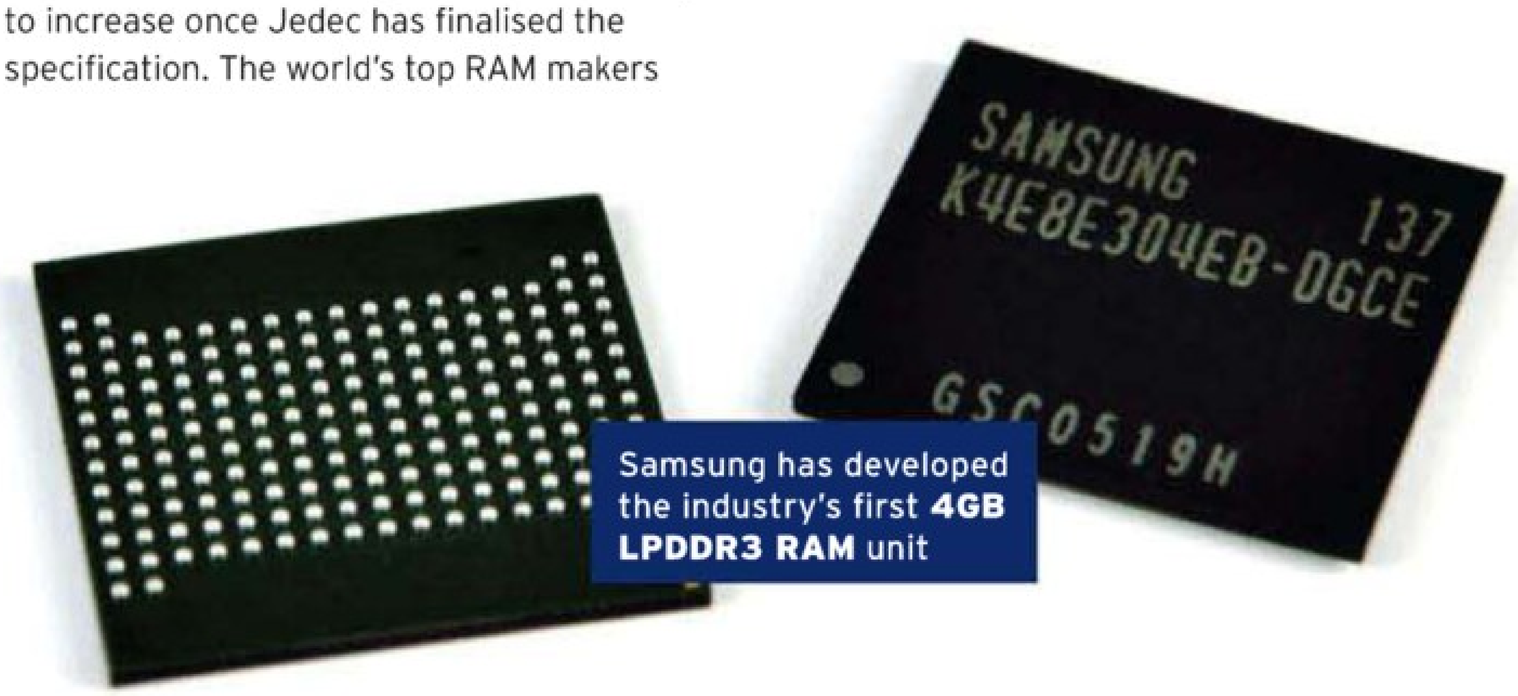
Manufacturer backing of LPDDR3 is likely to increase once Jedec has finalised the specification. The world's top RAM makers – Samsung, Hynix Semiconductor, Elpida Memory, Micron and Nanya – are all members of Jedec. The council hasn't stated when the process will complete, but analysts believe it could be by the end of 2012.

In the past, Jedec has concentrated on speed without worrying too much about power, said Jim Handy, director of Objective Analysis. With DDR3 and LPDDR3, it's worked to bring down the power specifications while continuing to increase speed.

Adoption of a new type of memory depends on other parts of the system, said Handy. For mobile phones it's less sudden than it is with PCs, where a single supplier dictates which interface the chipsets are going to support. But the power advantage is a sufficiently compelling reason for device makers to quickly switch over to LPDDR3.

"I would anticipate a quick conversion of mobile phones to LPDDR3. In tablets, so far Apple is the only supplier of any significance, so adoption depends solely on its moves," Handy said.

It's hard to predict when Samsung will ramp up production of LPDDR3. "Samsung has announced products lately that don't show up in production systems for more than a year," he said. ☒



Samsung has developed the industry's first **4GB LPDDR3 RAM** unit

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The future of malware

Security breaches look set to get worse as hacker groups target smartphones and social media and release more information online. Jeff Vance reports

Personal information leaked online is becoming an all too common occurrence. For example, Sony suffered a massive breach of its PlayStation Network earlier this year that led to the theft of names, addresses and possibly credit-card data belonging to 77 million users.

If you think the situation is bad now, just wait. Things will get worse as more information is dumped online by mischievous hacker groups such as Anonymous, and cybercriminals begin to target smartphones and social media.

In August, AntiSec (a collaboration between Anonymous and the disbanded LulzSec group) released more than 10GB of information from 70 US law-enforcement agencies. According to Todd Feinman, CEO of DLP vendor Identity Finder, AntiSec wasn't motivated by money.

"AntiSec doesn't like how various law-enforcement agencies operate and it's trying to embarrass and discredit them," he said.

But, he added, what it doesn't realise is that when it publishes sensitive personal information, it's helping low-skilled cybercriminals commit identity theft. Every week, another government department or business has its records breached – some 250,000 to 500,000 each year, estimated Feinman. Few details from those breaches are published online for all to see, however.

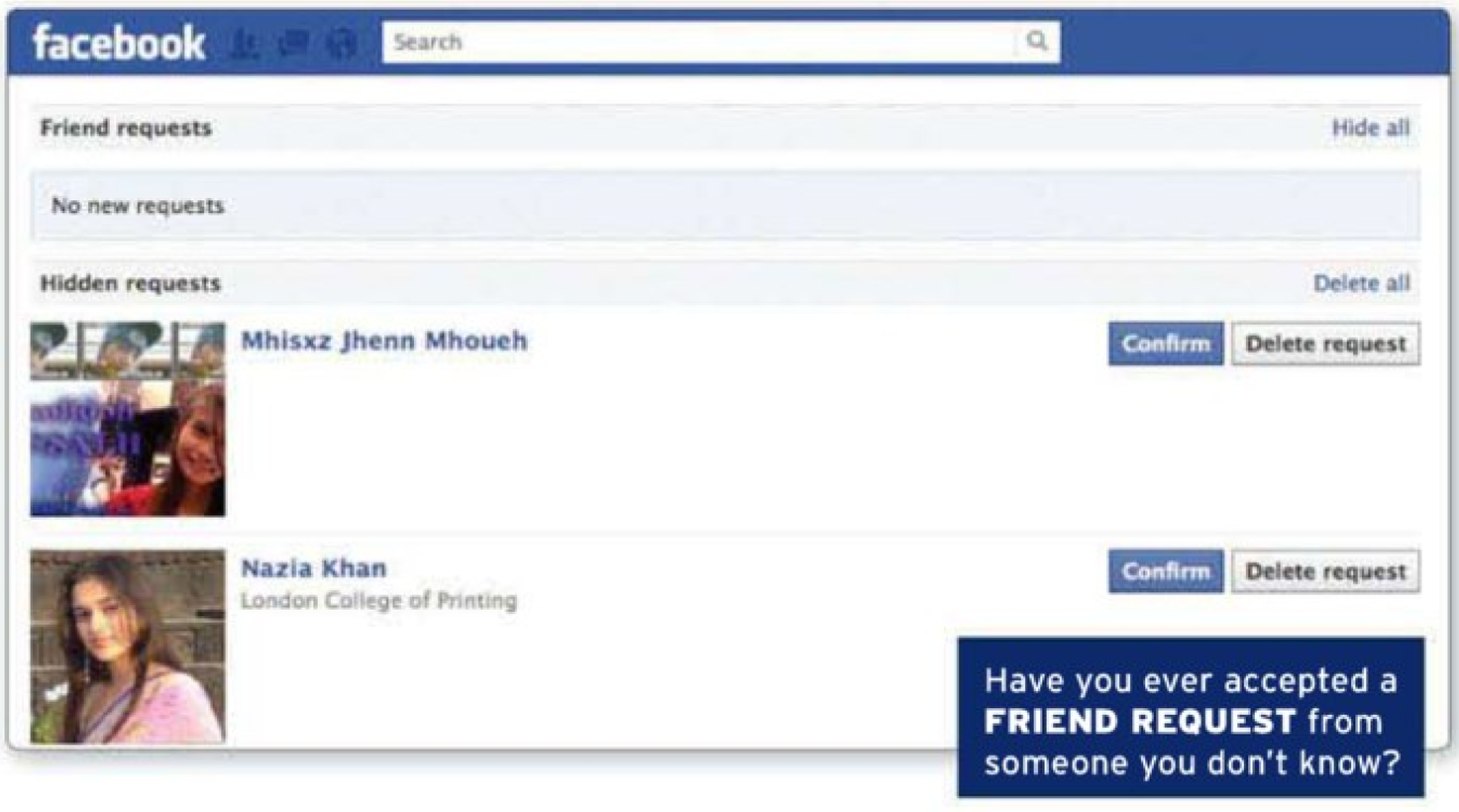
While certain high-profile attacks, such as the one on Sony, are intended to embarrass and spark change, the US law-enforcement breach could represent a shift in hacker thinking. AntiSec's motivations appear to have a key difference, with the attackers consciously considering collateral damage as a strategic weapon.

According to Feinman, AntiSec wrote online: "We don't care about collateral damage. It will happen, and so be it."

Social networking

Experts say the future of malware is more about how potential victims will be targeted than how it will be engineered. Collateral damage won't be limited to innocents compromised through no fault of their own.

Have you ever accepted a friend request on Facebook or connected to someone on LinkedIn you don't know? Perhaps you thought it was someone from school you'd forgotten about, or a former colleague whose name had slipped your mind. Not wanting to seem rude, you accepted them as a friend and quickly forgot about it.



"When people make trust decisions with social networks, they don't always understand the ramifications. Today, you are far more knowable by someone who doesn't know you than ever," said Dr Hugh Thompson, program chair of RSA Conferences.

We all know people who discuss everything they do on a social network or blog, from eating their breakfast to clipping their toenails. While most of us consider these people a nuisance and may hide their status updates, cybercriminals love them.

"Password-reset questions are easy to guess, and tools such as Ancestry.com, while not created for this purpose, provide hackers with useful information," said Thompson.

There are a few areas he believes the IT security industry needs to concentrate on: security for social media, ways to manage the information shared about you, and better methods for measuring evolving risks.

Enterprise targets

Fake security software is the most common type of social-engineering attack that researchers at Blue Coat Systems come across. Chris Larsen, head of the lab, explained that social networks aren't being used only to target individuals.

Larsen outlined a recent attack attempt where hackers targeted executives of a major corporation through their spouses. The chances were at least one of the businessmen would have a poorly secured home PC that he shared with his non-tech-savvy wife. This would provide the backdoor needed to gain access to the company.

"Whaling is definitely on the rise," said Paul Wood, senior intelligence analyst for Symantec.cloud. "Just a couple years ago, we saw one or two of these sorts of attacks per day. Today, we catch as many as 80."

> **We don't care about collateral damage. It will happen, and so be it**

According to Wood, social engineering is by far the most potent weapon in the cybercriminal's toolbox (automated, widely available malware and hacking toolkits are number two). Combine that with the fact that many senior executives circumvent IT security because they want the latest and trendiest devices, and cybercriminals have many valuable, easy-to-hit targets in their sights.

"Attacks on small businesses are increasingly dramatic because they are usually the weakest link in a larger supply chain," said Wood.

There's no sure way to defend against this. Until companies start scrutinising the cyber-security of their partners and suppliers, they can't say with any certainty whether or not they themselves are secure. While it's common for large firms to keep a close eye on their suppliers, with factory visits that result in the implementation of an array of 'best practices', companies aren't doing this when it comes to cyber-security.

Smartphone threats

Smartphone threats are on the rise, but we've yet to see a major incident. This is partly due to platform fragmentation. Malware creators still get better results by targeting PCs or websites.

Larsen believes that platform-agnostic, web-based worms represent the new frontier of malware. Platform-agnostic malware lets legitimate developers do some of the heavy lifting for malware writers. As developers re-engineer sites and apps to work on a variety of devices, hackers can then target the HTML, XML, Jpegs and so on that render on any device, anywhere.

Mobile phones are serving as a second identity factor for all sorts of corporate authentication schemes. Businesses that used to rely on hard tokens, such as RSA SecureID, are moving to soft tokens, which can reside on mobile phones roaming beyond the corporation as easily as on PCs ensconced within corporate walls.

"Two-factor authentication originally emerged because people couldn't trust computers. Using mobile phones as an identity factor defeats two-factor authentication," said Marc Maiffret, CTO of eEye Digital Security.

Today, Android is the big smartphone target, but don't be surprised if attackers soon turn their attention to the iPhone – especially if third-party antivirus programs become more or less standard on Android devices. iPhone demographics are appealing to attackers, and security experts will tell you that Apple products are notoriously insecure.

Apple is reluctant to provide third-party security entities with the kind of platform access they need to improve the security of iPhones, iPads, MacBook Airs and so on. "Apple is very much on its own with security," said Maiffret. "It almost mirrors late-90s Microsoft, and it'll probably take a major incident or two to incite change."

If we've learned anything about security in the past 20 years, it's that another major incident is always looming just over the horizon. With the number of IP-connected devices climbing to anywhere from 50 billion to a trillion in the next five to 10 years, tomorrow's hackers could target anything from home alarms and air traffic-control systems to flood control in dams. ☒

Android is a common **TARGET** for malware, but the iPhone could be next

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Web porn ban: what does it mean?

The government recently announced proposals under which ISPs will enable you to ban pornographic sites from web-connected devices, and launched a website to which you can report inappropriate content. Matt Egan investigates

As long as there's been an internet, it's been used to disseminate adult material. The web offers a great way to share information and media for the greater good, but it's also proved attractive as a means of accessing darker material. This is something the government is keen to stop, in order to protect the innocence of children.

In response, ISPs BT, Sky, TalkTalk and Virgin now say they will offer users the opportunity of banning pornographic sites from their smartphones, laptops and desktop PCs. But it's not clear exactly what this means in real terms, as the web providers all currently offer packages enabling known pornography sites to be blocked. This is, of course, something of a dark art, as not even the most solitary teenager knows where all the pornographic sites reside on the web. The four ISPs are promising that parents will be able to block all pornographic sites, forever, however. A compelling claim.

The announcement came at the same time as prime minister David Cameron announced a raft of child-protection plans, and launched the ParentPort.org/uk website.

PARENTPORT aims to protect children from inappropriate content

ParentPort will offer parents the opportunity to complain about inappropriate web content. Communications regulator Ofcom welcomed the website, saying it would make it easier for parents to report any such material that children may stumble upon.

Cameron also backed a ban on advertising billboards displaying adult images near schools, and met with industry reps to discuss an appropriate response to concerns over the sexualisation of children.

Why is it happening?

The government is driving these actions in response to a Mothers' Union report that attacked the use of sexualised images to market products to children. It also cited the use of children to market to their peers.

Commenting on the report, head of the Mothers' Union Reg Bailey said UK childhood was now beset by "commercialisation and sexualisation", on TV and the web.

Responding to Bailey's report earlier this year, Cameron said: "We should not try to wrap up children in cotton wool or simply throw up our hands and accept the world as it is. Instead, we should look to put the brakes on an unthinking drift towards ever greater commercialisation and sexualisation."

At the subsequent industry summit with Cameron and the ISPs, Bailey demanded that what he refers to as 'steamy' pop videos be restricted to older teenagers on the web, and post-watershed slots on TV. He also suggested covering up magazines that feature sexualised images on shop shelves.

> **Parents will be able to block all pornographic sites, forever. A compelling claim**

What does it really mean?

The government isn't looking to gain votes from tech-savvy onlookers. This type of announcement – thin on policy, high on headlines and gimmicks – is aimed squarely at people for whom the internet remains a scarcely understood presence on the outside of their daily lives; people whose children are much more web-savvy than they are.

It remains to be seen what, if anything, the government or industry can do to curtail the spread of pornography on the web. It's worth bearing in mind that however distasteful it may be, pornography is not illegal, per se.

It's virtually impossible to block an entire genre of websites, unless you completely unhook from the web. Most parents who have been through this process suggest that education and openness is the only way to address these concerns. And although ParentPort is – on the face of it – a great idea, the concept of simply blocking out unwanted material is a dangerous panacea.

The best advice for worried parents is to put the computer in a shared living space where you can see what your children are doing at all times. Talk to them about appropriate use of the web, and install some parental-control software to restrict and record their usage. And then cross your fingers and hope for the best. ☒

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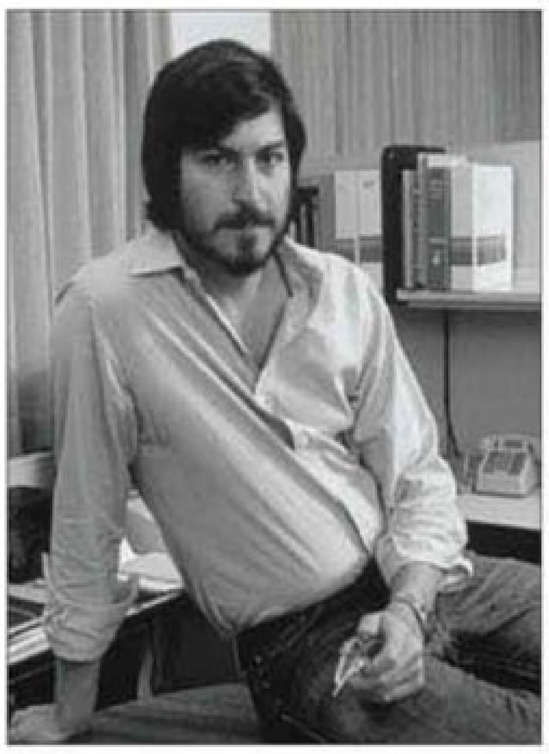

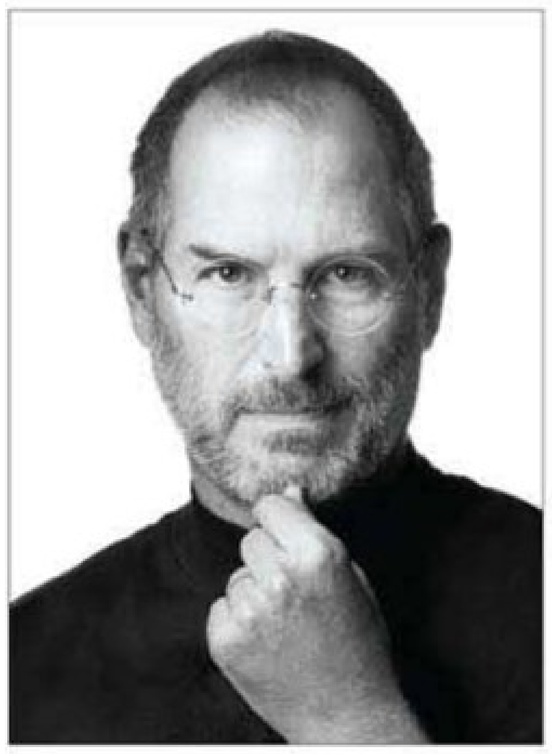

Steve Jobs: 1955-2011

As Apple mourns the loss of its founder and ex-CEO Steve Jobs, Jason Snell examines the dent he made on the world of technology

No company is truly ever ready for the loss of its founder, leader and spiritual guide. And filling a void left by Steve Jobs will be one of the most difficult tasks. But if there's ever a company that's had time to reflect on how to maintain that leader's legacy and way of thinking, it's Apple.

Today's Apple is the company that Steve Jobs built after his return in 1997. The executives are people who worked with him. For the past few years they have all been aware, as has Jobs, that the company would outlast him.

Will they succeed? There's no way to answer that question. Apple's riding as high as almost any company ever has.

If you made a movie of Steve Jobs's life, no-one would believe it. Think how many amazing creations have come from a Steve Jobs-managed company.

> **"If you look backward in this business, you'll be crushed. You have to look forward"**
>
> Steve Jobs, 2009

The Apple II, the world's first mass-produced personal computer. The Macintosh, the basis for almost every single personal computer interface on the planet today. Pixar, one of the most successful movie studios of all time. The iPod and iTunes, which transformed the music industry and changed how we listen to music. The iPhone, which upended the stagnant mobile phone industry and created the concept of a modern smartphone. And the iPad, which pays off the original Mac's promise of being a 'computer for the rest of us'.

It's hard not to look at that list and imagine that Steve Jobs will go down in the history of business and industry as a legendary figure like Thomas Edison or Henry Ford.

Steve Jobs could have left Apple at any point after his cancer diagnosis. He had enough money to buy one of those private islands that only rock stars and James Bond villains can afford. That he didn't, even after living with a death sentence before it was transmuted into a future of struggling with cancer, tells you something about his passion.

Apple was his passion. Not just the company that he founded and then rescued, but what Apple represented. Apple as an engine that took the highest technology the human race had yet invented and turned it into products that people would buy, use, and love.

Even as recently as 10 years ago, Apple was an oddball company that made weird, incompatible products, used only by a small number of people. Jobs would have been notable, especially for the Apple II and the Mac, but a lot of the story would have been how Apple lost the PC-industry battle to Windows.

Look at Apple today. It's one of the most valuable companies in the world. It's not a weird brand any more, it's one of the most recognisable in existence.

That's the story of the past 10 years of Steve Jobs's life. In that 10 years, he took Apple from being an oddity to being as mainstream as it gets. The philosophy that failed Apple in the PC industry of the 80s and 90s turned out to be a winning philosophy in the digital-appliance era of the 2000s.

It might not have looked like it in 2001, but in 2011 it's clear. This is not the story of a talented but under-appreciated man whose products were influential while his company flailed and failed and others made billions on his good ideas.

This is a story of victory. In the end, the world embraced Apple. It embraced Steve Jobs. And the world's a better place because he was in it. ☒

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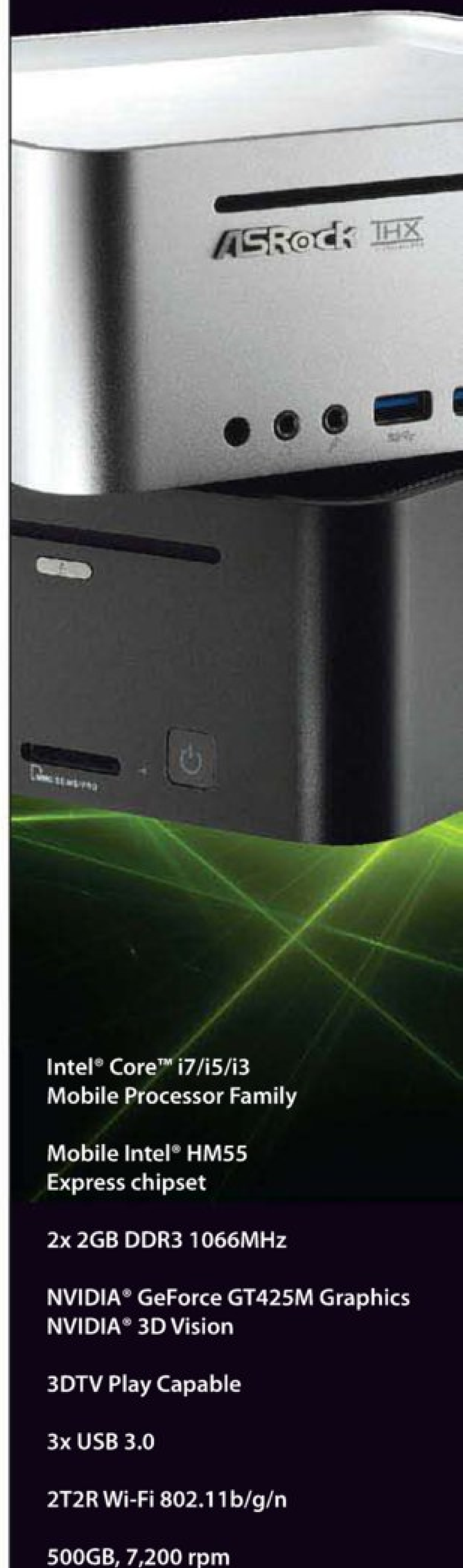

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Thunderbolt vs USB 3.0

What will be the super-speed PC connectivity hardware of the future?

Lucas Mearian pits two of the top contenders head to head

Intel says its high-speed interconnect technology, Thunderbolt, is not in competition with USB, the ubiquitous standard for connecting PCs and peripherals.

Apple has already rolled out the Intel technology across its PC and laptop lines, while a dozen or so other manufacturers displayed compatible technology at Intel's Developer Forum (IDF) in September. These products are likely to ship in 2012.

"Look forward to seeing Windows-based systems with Thunderbolt in the first half of 2012," said Intel spokesman Dave Salvator. Microsoft has also already demonstrated Windows 8 support for Thunderbolt.

Thunderbolt offers twice the speed of USB 3.0, yet Intel sees it as a complementary rather than competing technology. It's able to serve the needs of devices with higher performance requirements.

Acer and Asus have publicly stated that their 2012 products will have Thunderbolt, but PC manufacturers such as Dell, Lenovo and HP have yet to do the same. All three are said to still be "evaluating" the technology.

USB is among the most successful interfaces in the history of personal computing. More than 10 billion PCs and peripherals are connected via USB, a figure that's growing by 3 billion per year. It's hard to imagine any technology being able to effectively challenge USB.

The latest standard, known as 'SuperSpeed' USB or USB 3.0, is optimised for power efficiency. It uses only 1.5 amps of power for charging devices – that's about a third of the power required by its predecessor, 'Hi-Speed' USB 2.0.

"USB 3.0 delivers more power for faster charging," said Jeff Ravencraft, president of the non-profit USB Implementers Forum (USB-IF). "Power is king, and the way you manage it is pinnacle."

> **Power is king, and the way you manage it is pinnacle**

USB 2.0 offers external devices up to 500 milliamps for charging; USB 3.0 offers up to 900, which translates to 4.5W, he said. If the port is designed to support the USB Battery Charging specification, the amount of power is upped to 7.5W (1.5 amps at 5V).

The USB 3.0 Promoter Group has also recently announced plans to release a new USB power-delivery specification, scheduled for completion in early 2012. It will enable higher voltage and current in order to deliver power of up to 7.5W over current cables and even more over new cables.

Too much bandwidth?

On paper, Thunderbolt beats USB. It offers a 10 gigabits per second (Gbps) transfer rate, compared with USB 3.0's 5Gbps. It's 12 times faster than FireWire 800 and 20 times faster than USB 2.0. Thunderbolt can transfer a full-length HD film in less than 30 seconds; the same task would take 70 secs to complete over USB 3.0. It also offers 10W of power to a device; USB 3.0, only 4.5W.

USB-IF CTO Rahman Ismail said that while Thunderbolt may offer twice the bandwidth of USB 3.0, most people simply won't need it and, in fact, most applications will still be well served by USB 2.0. "It's a question of what markets are being satisfied by the bandwidth requirements," he reasoned.

Based on copper, the Thunderbolt specification contains two protocols: PCI Express and DisplayPort. The technology switches between the two protocols to support varying devices. DisplayPort offers HD display support, plus eight channels of HD audio. A Thunderbolt connector has two full-duplex channels; each are bi-directional and offer 10Gbps of throughput.

Intel sees Thunderbolt supporting high-speed storage devices such as Raid arrays, HD displays and PCI Express expander boxes for laptops – anything that might benefit from very fast data transfers. Salvator pointed to Thunderbolt-enabled

StoreMags.com

products shown at IDF, including high-speed storage devices, HD media capture, displays and a PCI Express expander for laptops.

However, he also said Intel will continue supporting its other interconnect technology.

Apple is the only company selling computers with Thunderbolt ports, although Sony may also unveil a compatible laptop this year. Intel is designing two lower-cost Thunderbolt controllers for developers designing systems around its Ivy Bridge CPU.

Apple was the first to add Thunderbolt ports in conjunction with USB ports on its MacBook Air, MacBook Pro, iMac and Mac mini, offering customers access to higher screen resolutions than 1080p.

Apple pitches its new 27in Thunderbolt display (reviewed at tinyurl.com/3fu9y9c) as capable of turning its ultraportable MacBook Air laptop into a workstation. The Thunderbolt port not only powers the display's 2560x1440 resolution, but allows daisy-chaining of peripherals. Up to five devices can be attached, including a Promise Pegasus Raid array or a LaCie Little Big Disk, the first Thunderbolt-enabled hard drive.

"Thunderbolt provides a lot of I/O versatility integrated into the display," Salvator said.

What products are shipping?

Not all PC manufacturers are interested in supporting Thunderbolt, however. Earlier this year, HP considered adding Thunderbolt to its PCs, but eventually settled on USB 3.0.

Other manufacturers are likely to follow suit. Because it's new, Thunderbolt is expensive. A USB 2.0 cable sells for about $1.50, and the chipset for less than $1; a USB 3.0 cable is more expensive, but still only $4.49. Thunderbolt is by far the most pricey,

with its cable costing $49. Salvator didn't reveal the price of a Thunderbolt controller, but said Intel would release a lower-cost chipset, 'Cactus Ranch', in 2012.

"You've got to sell 45 USB cables to make the same money you would with one Thunderbolt cable. But it's the same wire and manufacturing cost," said Steve Duplessie, founder and senior analyst of market research firm ESG. "USB probably isn't going to stop. For 99 percent of the world, USB 2.0 is fast enough, let alone USB 3.0," he added.

David Johnson, an analyst for desktop and mobile infrastructure and operations at Forrester Research, thinks it's still early days for Thunderbolt. The ubiquity of USB devices will be an enormous factor in future adoption of Thunderbolt by PC makers and consumers, but the interconnect is also slimmer than USB, making it ideal for netbooks, tablets and any thin PC technology, he said.

However, Johnson thinks Intel's new ultrabook category offers a "good form factor to drive Thunderbolt". While Intel doesn't require manufacturers to fit Thunderbolt ports to these computers, it's a good bet that many will.

Like Thunderbolt, USB 3.0 is also in its infancy. Uptake has been faster for peripheral devices such as USB memory sticks and external hard drives than PCs. This could soon change, though: Asus shipped 2 million USB 3.0 motherboards to PC makers in the first quarter of the year; semiconductor maker Renesas Electronics sold 30 million USB 3.0 host controllers in May; and Gigabyte expects to sell 7.5 million USB 3.0 motherboards by the end of 2011.

Certified USB 3.0 host controllers are available from seven other companies, including AMD, ASMedia and Etron. At IDF, AMD announced its first certified USB 3.0 chipset and, Intel, support for USB 3.0 integration into its Ivy Bridge chipset.

In the end, though, it will be evident only through product sales whether consumers want the added bandwidth and power that Thunderbolt offers, or would rather use the cheaper but slower USB 3.0 technology.

"If you have two machines and one has Thunderbolt and one does not, and the cost is not a big differentiator, then someone who chooses the one with the Thunderbolt port will open up more possibilities," Johnson said. ☒

	USB 3.0	Thunderbolt
Speed	4.8Gbps	10Gbps
Power for devices	4.5W	10W
Cost	$4.49 (for 2m cable)	$49 (for 2m cable)
Connector size	11.5x4.5mm	8.3x5.4mm
Downloading 25GB HD film	60-75 seconds	30 seconds

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NEW PRODUCTS

With Christmas already looming, there's no shortage of quirky gadgets vying for our attention. Rosemary Hattersley and Carrie-Ann Skinner look at which ones are worth a second look

ViewSonic ViewPad 10e

Tablet PC

ViewSonic scored a modest hit with last year's Android 2.2 Froyo 7in-screen tablet. An updated 7in-screen model running the Android Honeycomb operating system (OS), the ViewPad 7x, was announced this summer, but it's this 10in-screen model that's likely to cause the most ructions. In essence a rehash of the original iPad, the ViewPad 10e has the same form factor and specification: a 9.7in (1024x768-pixel) in-plane switching (IPS) touchscreen, a Cortex A8 processor (here a faster 1GHz version), Wi-Fi and Bluetooth. You also get an SD Card slot and an HDMI port. The catch: it runs a smartphone OS, with Android 2.3 Gingerbread preinstalled.

£199 inc VAT

viewsonic-europe.com

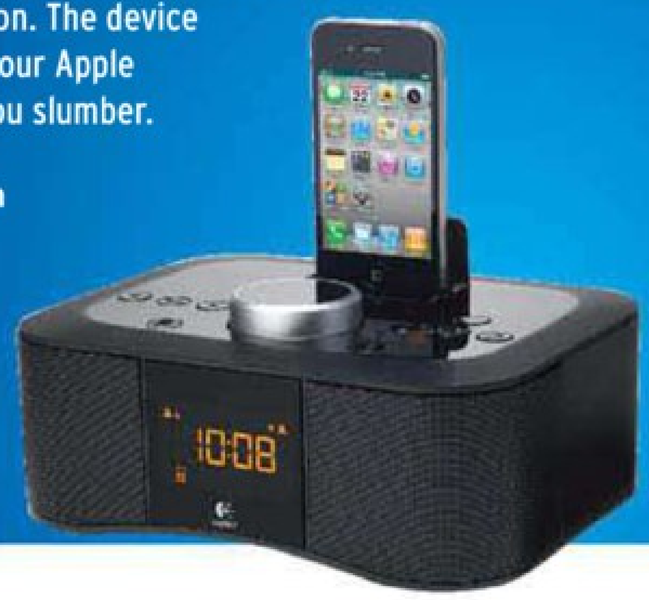
Logitech Clock Radio S400i

iPhone dock

Logitech has joined the throngs of manufacturers designing accessories for the iPhone and iPod. Unusually, there are also inserts for an iPod nano or iPod classic, ensuring owners of older iPods aren't overlooked. The S400i is an alarm/FM clock radio that can be set to wake you up with your favourite ditty, radio station or an impossible-to-ignore klaxon. The device also charges your Apple gadgetry as you slumber.

£79 inc VAT

logitech.com



Nokia Lumia 800

Smartphone

Nokia's first Windows Phone smartphone goes onsale in the UK in mid-November, with Vodafone the first operator to announce contract deals. The Lumia 800 has a 3.7in AmoLED curved display and is powered by a 1.4GHz Qualcomm Snapdragon S2 processor. This 142g handset features an 8Mp camera with a Carl Zeiss lens, which can capture HD video at 720p. Its 16GB of internal storage is supplemented with 25GB online via SkyDrive. The second Nokia Windows 'Mango' phone to come to the UK will be the 126g Lumia 710. Taking the same processor, it has a 3.7in touchscreen, a 5Mp camera with an LED flash, 8GB of internal memory and interchangeable covers.

Price TBC

nokia.co.uk

Magicbox Beam

iPod and iPhone dock

This iPod and iPhone dock is a master of disguise. It houses DAB and FM radio tuners and has built-in Wi-Fi, allowing it also be used as an internet radio. You can even plug in a USB drive or MP3 player and play music stored on that.

In its centre is a 3.5in touchscreen that's used to select tracks, albums and stations. The Magicbox Beam comes with a detachable stand, allowing the speaker dock to also be mounted on a wall.

Price TBC

magicboxproducts.com

Kodak Playfull Waterproof

Digital camcorder

Aimed at younger users, the Playfull Waterproof is a compact camcorder that weighs less than 100g and supports HD video capture. The original Playfull was light and narrow, making it easy to grip; this second-generation model is a little broader, but only 12mm deep. The Kodak is waterproof to 3m and able to withstand drops of up to 150cm. It can record up to 10 hours of video on to an SD Card (up to 32GB is supported) before needing a recharge.

£79 inc VAT

kodak.co.uk

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tinyurl.com/pcagadgets

Case-Mate Kayla

Smartphone cases

There are many smartphone cases that prove to the world that their owner is quirky, individual and has a sense of humour. There are also lots of very expensive but plain cases onsale. The Kayla range tries to combine stylish design with practicality. You can access your statement smartphone without having to unzip anything or unclip multiple catches. These cases are also priced realistically. If you prefer something zany, the company offers a Creatures range that includes a monkey with a banana.

£45 inc VAT
case-mate.com

Asus Eee Pad Slider

Tablet PC

This tablet might look familiar: it was displayed at the tech tradeshows earlier this year, but has only recently been confirmed for sale in the UK. It's not cheap, but a Polaris productivity suite lets you use this tablet for practical tasks as well as entertainment. Asus includes unlimited web storage that's free for a year. The 10in IPS touchscreen tablet has an impressive viewing angle of 178 degrees. It runs Android 3.1 Honeycomb (upgradable to 3.2) and a 1GHz nVidia Tegra 2 processor with 1GB of RAM. There are preloaded apps for reading e-books and magazines; you also get SRS sound.

£400 inc VAT (16GB model)
uk.asus.com

WD TV Live

Media hard drive

Western Digital has updated its Live media hard drives, adding Spotify to the list of services with which it works. YouTube, Facebook and Picasa photo albums remain in its arsenal. The Live box now supports 802.11n Wi-Fi, so you aren't limited to playing the content stored locally on the 500GB or 1TB drive. An Ethernet connection is also provided.

Price TBC
wdc.com/en

Maroo SA Mod

iPad 2 cases

Fans of Project Runway will recognise the name of designer Seth Aaron. The SA Mod is one of eight tooled leather designs created by the award-winning fashionista. The folio-style case has an inside pocket for a business card or other paperwork, while the iPad 2 is held firmly in place by four rubber clips. Other designs include a two-tone Union Jack.

$149 (£93)
maroo.com

AQ Audio Smart Speaker

Speaker

Apple fans can use this AirPlay-compliant wireless speaker to call up tracks from their iTunes and iCloud libraries. The Smart Speaker works over a Wi-Fi network or can be paired with a specific smartphone or iPod. The 24W unit can be used away from a mains power source for up to 30 hours before requiring a recharge, making it ideal for providing the entertainment at a party. Friends can bring along their own iPods or iPhones, then add their favourite tracks to the party playlist. An accompanying app also lets you access internet radio stations.

£220 inc VAT
aqaudio.com

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Hoodie Buddie

Hooded sweatshirt

This may look like a common-or-garden hooded sweatshirt, but it's one with a neat trick up its sleeves (or rather, in its pouch). Hoodie Buddies is a range of t-shirts and tops that feature earphones and cables in place of a cord. A headphone jack hidden in the front pouch plugs into your choice of MP3 player via a standard 3.5mm adaptor. Various designs are available, and you can even customise your own.

From £35 inc VAT

advancedmp3players.co.uk

Canon EOS 1DX

Digital SLR camera

Successor to Canon's professional EOS 1DS, this digital SLR camera offers full-frame shooting at 18Mp. It has a pair of Digic5+ processors and three Digic image processors. The ISO range now extends to 51,200 (204,800 in extended mode). There are 61 focal points, while GPS support allows the camera to automatically tag photos with the location in which they were shot. A wireless file transmitter lets professional photographers send huge image files back to a central server for uploading, editing and broadcast. Full-HD video capture at up to 60fps is also supported.

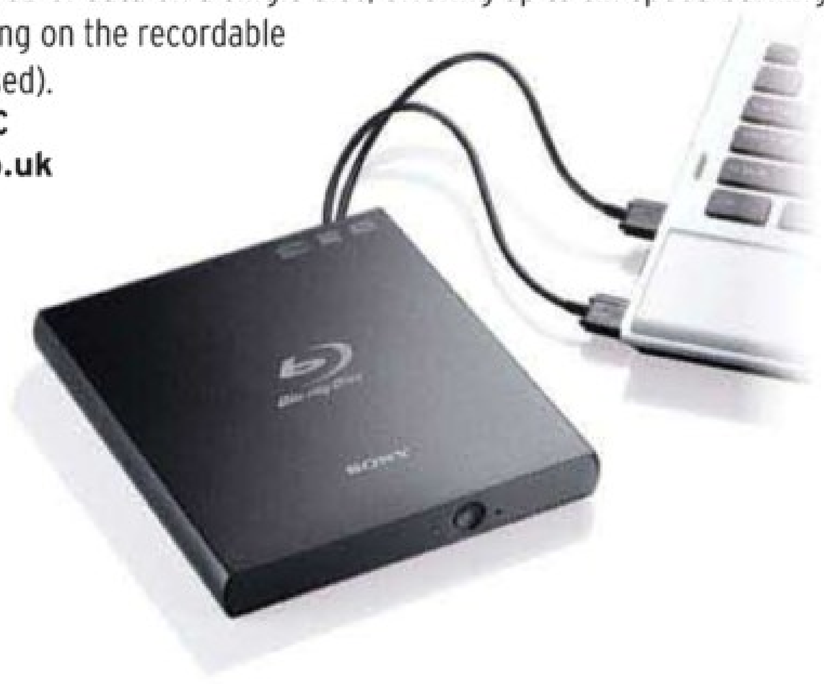
Around £5,500

canon.co.uk

Sony Optiarc BDX-S600U

Blu-ray drive

Buying a standalone Blu-ray drive or a laptop with one built-in is expensive. The Sony Optiarc ensures you won't need to splash out on both. It's the first USB-certified drive able to take its power from a pair of USB ports, negating the need for a mains power source and making it ideal for entertainment on the road. The Sony can record up to 100GB of data on a single disc, offering up to six-speed burning (depending on the recordable media used).



Price TBC

sony.co.uk

Sony HMZ-T1 Eye Viewer

3D viewer

This Personal 3D Viewer from Sony is far more imposing than some of the wraparound video glasses we've tried. Its pair of 0.7in Oled screens – there's a 1280x720-pixel display for each eye – can simulate objects shown on a 720in cinema screen up to 20m away. The 3D simulation viewer is paired with a TV via HDMI. Volume controls are found on the headset. Sony hasn't yet fully explained how source information is processed, but it won't work wirelessly.

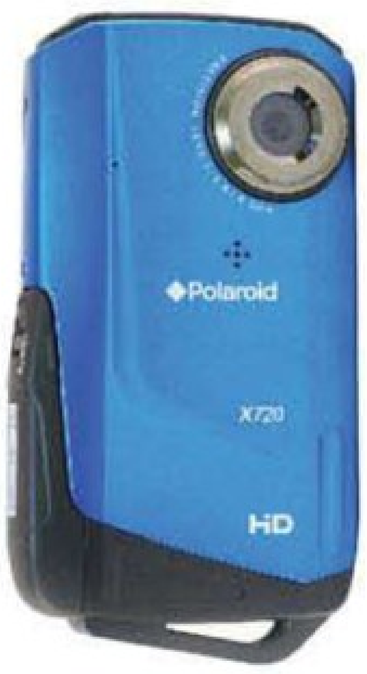
Price TBC

sony.co.uk

Polaroid X720

Compact camera

Skiing and snowboarding fans keen to record their exploits on the slopes need a camera that's as hardcore as they are daredevil. The Polaroid X720 is a waterproof video camera that can capture 720p footage at 30fps, even when submerged in up to 3m of water. The Polaroid can also withstand the extreme temperatures of mountain pursuits. There's a 3x digital zoom and support for one-click uploads to the web. Its W800 sibling offers 8Mp photos.



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Medion Erazer X8615

Gaming laptop

This gaming laptop bucks the trend for most such machines by having only a three-figure price tag. Its specifications aren't especially modest, however. Medion packs the 15.6in-screen Erazer X8615 with 4GB of RAM, a 2GHz Intel Core i7 processor and an nVidia GeForce GT 555M graphics chip with 2GB of video memory. A 500GB hard drive, a 1920x1080-pixel LED-backlit display and a Blu-ray drive also feature. The Erazer is a Windows 7 64bit machine with Bluetooth 3.0, HDMI, Dolby speakers and 802.11n Wi-Fi. Security-conscious users can add fingerprint recognition.

£699 inc VAT

medion.co.uk

Neato XV-15 Robot

Robot vacuum cleaner

Time is money, so why waste it doing domestic chores that a machine could just as easily do for you? The Neato XV-15 never gets a bad back or suffers housemaid's knee, and is therefore able to put in lengthy cleaning stints without complaint. The robot can vacuum eight rooms with carpet, rug, hardwood or laminate coverings before returning to its base station for a recharge. This programmable robot is even unfazed by the likes of pet hair or having to enter teenage boys' bedrooms.

£399 inc VAT

neatorobotics.com

Asus Xonar Essence One

USB DAC

Asus has launched a USB digital-to-analogue converter (DAC) that offers 8x symmetrical upsampling. Most converters uniformly convert the source audio to 192kHz, regardless of the quality of the original file. The Xonar Essence One offers a 120dB signal-to-noise ratio and a unique swappable op-amp design.

Asus says the Xonar Essence "upgrades digital music stored on your computer into clear and detailed, life-like sounds".

The DAC can also bypass a PC and plug directly into a CD or DVD player to convert music.

£85 inc VAT

uk.asus.com

Iomega TV

Internet TV

A couple of companies have had a stab at a Google TV, but with little apparent success. Instead, Google is now offering content via apps and a video portal on Android tablets. The content seems to have improved markedly over the past six months – the recent Iomega TV demo at Digital Winter suggested a better experience may now be arriving. Up to 2TB of storage, DLNA and HDMI compliance, plus the ability to decode and play HD content from many formats are promised.

From £229 inc VAT (diskless model)

iomega.com

Dell Inspiron One23

All-in-one PC

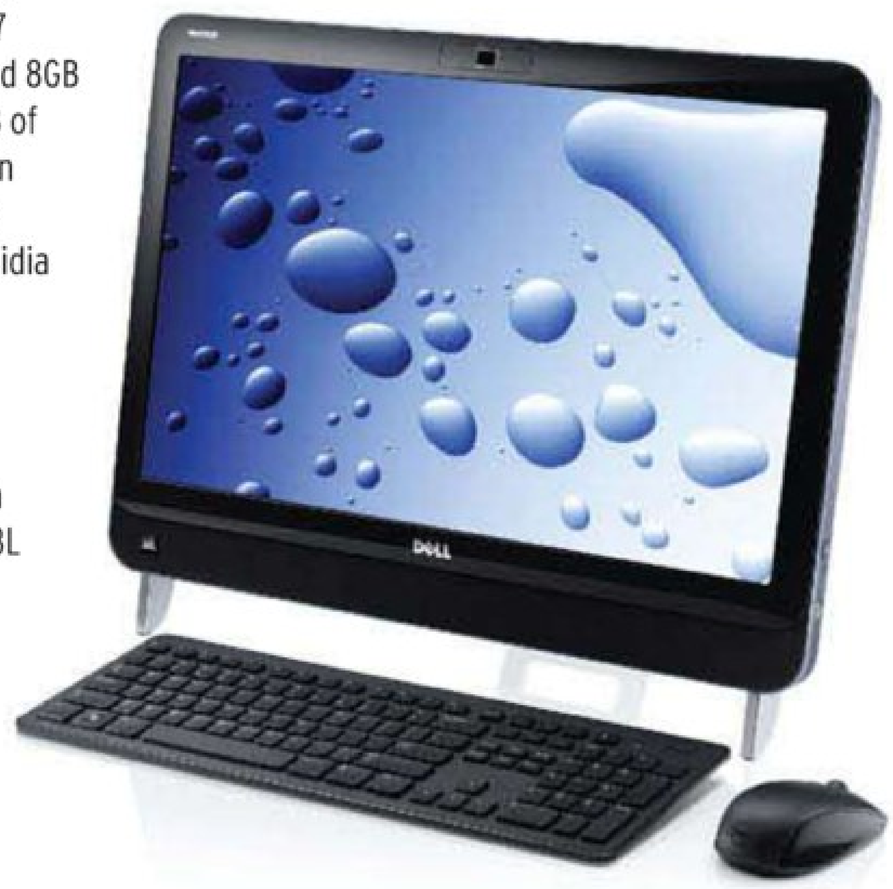
All-in-one PCs offer attractive designs and space-saving credentials, and many now support touch input, too. The next version of Windows features a touch-centric Metro interface, for which these machines make ideal partners.

The One23 is an updated version of last year's same-name 23in-screen PC. It has a choice of Intel Core i3, i5 and i7 processors, and between 4GB and 8GB of DDR3 RAM and 500GB and 2TB of storage. A 1920x1080-pixel screen supports multitouch input, while Dell also includes a dedicated nVidia graphics card.

Intended as the ultimate connected family PC, the One23 supports Wi-Fi, Bluetooth and ethernet, and has an HD webcam for video chat. A TV tuner and JBL speakers are optional extras.

From £699 inc VAT

dell.co.uk



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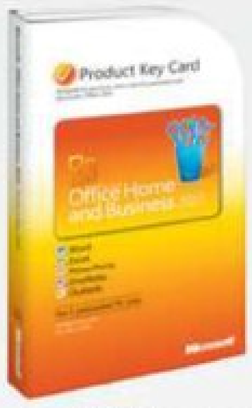

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Science diction

ANDREW HARRISON

Don't you just love the way science fiction has foretold our future? Mind you, there are probably more examples of the genre getting it absurdly wrong than right. I'm still waiting for my personal hovercar to fly me to the office each morning, and a robot Jeeves to take care of washing up and repartee.

And then there are the times science fiction got it right: huge flat-panels that hang on the wall and display colourful images and full-motion video; and surround-sound audio systems that seem to put you into another environment. Okay, it's not a holodeck, but close your eyes and you could be in a jungle, or on a battlefield with bullets zipping past your head.

I always loved the idea of the video wristwatch, to make face-to-face phone calls with friends, using a gadget you always have about you. You can find such devices now, but the wristphone has been forgotten in favour of a handheld device with a larger screen. Since the late 20th century, modern man has become reliant on the cordless outdoor telephone to talk to distant people in remote places.

Much more recently, that phone has taken on other duties, such as electronic mail, personal and automobile direction finding, and music and video entertainment. It can translate foreign languages (if still short of true Babel fish in-ear translation), and pack volumes of dictionaries and reference encyclopedias. And it gives access to that great repository of data, the internet.

Manipulating and controlling all this sophistication with a brush of the fingertip on a touch-sensitive screen is one thing. Telling your 21st-century electronic companion what to do is something else. Faultless voice recognition is still the holy grail of man-machine interfaces. Google, Vlingo and Apple now have workable systems for the mobile phone.

While Apple's Siri, exclusive to the iPhone 4S (overleaf), may not be up to the washing up just yet, he/she does have an interesting line in witty banter. It won't be long now before we start assigning gender and real personalities to our new digital companions. ☒

> **Siri may not be up to the washing up just yet, but he/she does have an interesting line in witty banter**

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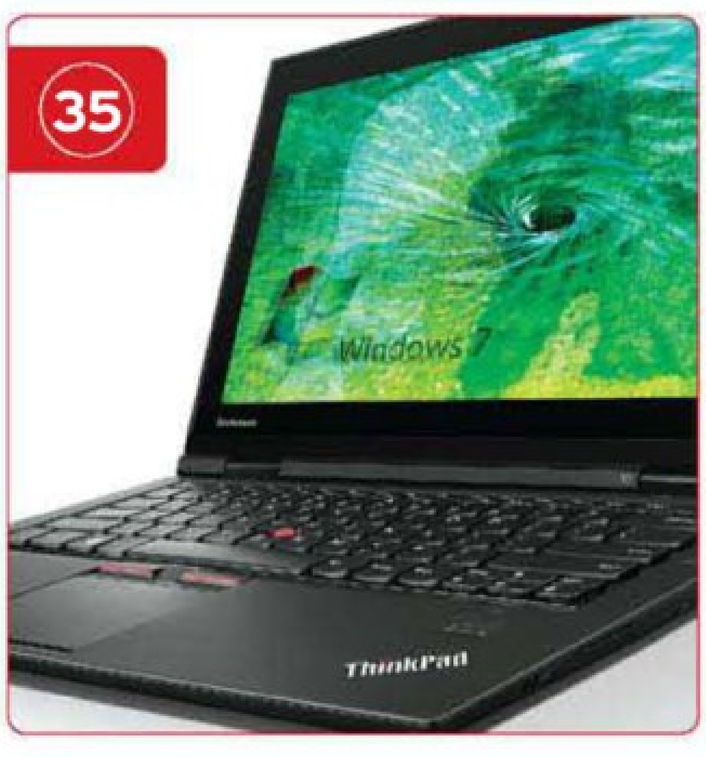

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SMARTPHONE

Apple iPhone 4S

PC ADVISOR GOLD

£499 inc VAT (16GB)

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- tinyurl.com/62teb9g

Specification

Touchscreen smartphone; UMTS/HSDPA/HSUPA/GSM/Edge; world phone: quad-band GSM 850/900/1,800/1,900MHz and dual-band CDMA; 3.5in (960x640) 3:2 capacitive IPS touchscreen; aluminosilicate glass with oleophobic coating; 326dpi; 800:1 contrast ratio; 500cd/m² brightness; 16/32/64GB Nand flash storage; Apple A5 (dual-core based on ARM Cortex A9 CPU/PowerVR SGX543MP2 GPU) processor; 512MB RAM; 802.11b/g/n; Bluetooth 4.0; rear-facing 8Mp still/1920x1080 video camera; front-facing 640x480 video camera; white LED flash; assisted GPS; three-axis gyroscope; proximity sensor; ambient light sensor; digital compass; dual mics; speaker; 3.5mm stereo headphone/mic jack; earphones with remote and mic; USB power adaptor; 5.3Wh lithium-ion battery; 115x59x9.5mm; 140g

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

★★★★½

It's because Apple sets the bar so very high that expectations can run even higher. Like Pavlov's dogs, the worldwide tech audience has been conditioned to start salivating around June-time, every year since 2007, anticipating the next incarnation of the iPhone.

So when Apple missed its own notional deadline this year, rumours refocused on an Autumn launch – pushing up that bar even higher. All eyes were now on a brand-new super-slim iPhone 5. Hardly surprising, then, that hearts sank when the 5 proved a no-show.

Instead, Apple banked on a refit of the iPhone 4, as it had done before when the iPhone 3G morphed to 3GS. This time there are more changes, but they're mostly hidden away from view.

The design is the same, with an identical armoured glass front and back covering a supremely sensitive in-plane switching (IPS) touchscreen. Eighteen months after the iPhone 4 launched, this 326ppi Retina display is still arguably the best of any smartphone. Its resolution is so fine, you simply can't see the LCD dots.

Visibly different are two tiny black lines on the outer steel band, indicating a revised twin-antennae system. This updates the original aerial system, which attracted attention for disputed reception issues. The iPhone's processor selects the appropriate antenna for optimum performance during a call. What's not clear is what parts are now used for Bluetooth, GPS and Wi-Fi.

We didn't experience dropped calls or similar issues with the iPhone 4; and in a week's steady use, nor did we on the 4S. The signal strength was about the same, gauged by the point at which we'd lose connectivity on an underground section of our daily commute.

The 3G modem has received a gentle upgrade. It's now specified for 14.4 megabits per second (Mbps) HSDPA, against the 4's 7.2Mbps. You're unlikely to see mobile data hitting double digits in the UK, but we were pleasantly surprised to see faster transfers. In central London, we measured 4.1/3.1Mbps for down/upload on Vodafone, where our fastest on an iPhone 4 at the same location was around 2Mbps. On the Three network, we saw download speeds peaking at 5.1Mbps.

An upgrade to the GPS radio brings access to Glonass, the former Soviet Union's satellite navigation network, now back in action and with worldwide coverage under Putin's Russia. Apps are already available that can tap into Glonass navigation data.

Processor

The iPhone 4 handles daily tasks such as web browsing, emailing and running third-party apps with good pace, yet Apple has potentially doubled the CPU performance in the 4S by fitting a dual-core A5 chip in the place of a single-core A4. The graphics subsystem gets a healthy boost too, and now uses the same class-leading Imagination Technologies graphics processor as the iPad 2 (page 67).

Importantly, the battery life didn't suffer in our tests. You can expect to get around two day's active life, mixing voice calls with texting, web browsing and snap-shooting.

Bluetooth is one source of battery drain. Apple has now embraced the 4.0 standard, which benefits from a low-energy mode.

Talking points

Perhaps the biggest game-changer for the 4S is nothing to do with the hardware, but a software feature available only on this model: Siri.

Once a third-party app and service, this digital assistant is the first voice-recognition system we've tried that understands every word we say. Crucially, it does so in real-world conditions.

Siri records your sound bites and sends them up to a powerful online computer to do all the brain work. Once it's understood your sentence, the correct action and/or response are relayed back to your phone. You can ask it about the weather, to set alarms and reminders, and it recognises context, such as 'Remind me to call the wife in 5 minutes'. It also has a devilish sense of humour, once you start exploring certain themes...

It all happens surprisingly fast, when you consider the round-trip journey every request must make. You must be online for Siri to work, though – no weather forecasts will be forthcoming on the Tube.

The very naturalness with which you can converse with Siri furthers the feeling that a Turing Test should be demanded to ascertain the service's sentience. We sense this is the real start of the anthropomorphisation of the computer, and a milestone in our relationship with it.

But Siri suffers one main drawback in the UK: it can't give directions, find business addresses or even tell you where you are.

There's also a minor security flaw users should be conscious of: by default, anyone can pick up your phone and send email, texts and so on – all without unlocking the phone first. If you'd rather a prankster or hacker doesn't spam your contacts with all manner of messages, switch off Siri voice recognition in Passcode Lock settings.

See page 142 for our smartphones chart

Camera

We're sceptical of specifications that trumpet megapixel upgrades you might expect to find in a digital camera. Adding extra pixels isn't difficult; ensuring the sensor and lens can show you the benefit of increased resolution is more tricky.

For the iPhone 4S, Apple seems to have put in the work to support the move from 5Mp to 8Mp. There's talk of improved optics and a backside illumination sensor. Test photos from the 4S had a conspicuous edge over the 4's, especially in terms of natural white balance. Visible noise levels are no higher, but the enhanced resolution did enable us to look deeper into any photograph. The exposure was improved too, making the HDR function more redundant.

We also noticed a distinct improvement to images captured by the front VGA-resolution camera. They had lost their blue tinge, and now had the same natural colouring as images from the main high-resolution camera.

Video footage now stretches to full-HD instead of 720p. This looks as smooth as before, only with an enhanced resolution.

The faster CPU means the camera snaps faster, from cold and between shots. With iOS 5, you can access it when the phone is locked by double-clicking the home button.

Verdict

From a company that understands the marketing of image, it was a surprise to be kept waiting for a phone seemingly identical to one 18 months old. Yet the iPhone 4S underlines the confidence Apple has in its own design, contrasting with companies taking a scattergun approach – making dozens of disparate models each year in the hope that something will sell.

If the iPhone 4 had been trounced by Android competition, there'd be more ground to make up. It remains one of the fastest, longest lasting and easiest to use smartphones on the market. The 4S simply ups the ante with a faster processor and graphics, improved camera optics and a talking assistant that can genuinely make your life easier. There's a lot to be said for refining an already winning formula. It may resemble last year's vintage, but the Apple iPhone 4S pours a lot of new wine into an old bottle.

☒ **Andrew Harrison**

NETBOOK

HP Mini 210-3002sa

£269 inc VAT

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Read more
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Specification

1.66GHz Intel Atom N570; Windows 7 Starter 32bit; 1GB DDR3 RAM; 250GB SATA; 10.1in (1024x600) glossy anti-glare LED-backlit display; Intel HD GMA 3150; 802.11b/g/n; gigabit ethernet; Bluetooth 2.1; 3x USB 2.0; SD/MS slot; speakers; webcam; VGA; 55Wh lithium-ion battery; 268x191x32mm; 1.39kg

WorldBench 6 score: 38

Battery life: 474 mins

Build: ★★★★½

Features: ★★★☆☆

Performance: ★★½☆☆

Value: ★★★★☆

★★★½☆

Netbooks are now available in a range of bright colours that don't perhaps suit the boardroom. Although the 'Matte Luminous Rose' HP Mini lives up to type, it also comes in more sensible hues. We tested the 'Midnight Grey' version.

The HP is slightly faster than the average netbook, although a WorldBench 6 score of 38 is still well short of even the slowest ultraportable. If you require something only for checking email and browsing the web on the move, it ought to be adequate.

The keyboard, according to HP, is 93 percent of a full-size model. It's very usable, enabling you to type with barely an error. The keys are well spaced, while the accompanying touchpad supports some multitouch gestures. This can be turned off while you're typing, and its textured surface makes it easier for your fingers to find without looking down.

The stereo speakers are Beats Audio-badged, and the Mini proved itself able to handle anything from bassy dance music to shrill sopranos. The 10.1in (1024x600) glossy screen is also decent, with an anti-glare coating that works well without dulling colours. The viewing angles are usefully wide, too.

Portable laptops need to withstand a bit of a battering, and the HP Mini seems to be tough enough for this kind of lifestyle. It's heavier than the standard netbook at 1.39kg, but it won't give you any back trouble.

The most vital aspect of any travelling gadget is how long it can survive without a recharge. Happily, the HP Mini isn't going to let you down on that front. It lasted 7 hours 54 minutes in MobileMark 2007. If you were flying to the US, for example, it should last until touchdown at New York's JFK, even if LAX would be out of range.

The 250GB hard drive is standard for a Wintel netbook, enabling you to cram in plenty of films and music. There are three USB 2.0 ports, plus analogue VGA for connecting to an old monitor or projector. Wi-Fi and Bluetooth connectivity are included, while an SD Card slot helps you get pictures from a digital camera.

Verdict

The HP Mini 210-3002sa is one of the better netbooks we've seen – solidly constructed, usable, and you don't necessarily have to choose a garish colour. Very good sound quality makes a case for the HP as an entertainment machine. At £269, it also offers good value... for a netbook. Low-end ultraportables are available for an extra £100 and offer far more power than the HP's underpowered Atom processor.

☒ **Ben Camm-Jones**

See page 134 for our netbooks chart

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LAPTOP

Dell XPS 15 L502X P11F

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Specification
2.3GHz Intel Core i5-2410M; Windows 7 Home Premium 64bit; 4GB DDR3 RAM; 500GB, 5,400rpm SATA; 15.6in (1366x768) glossy LED-backlit touchscreen; 1GB nVidia GeForce GT 525M; 802.11b/g/n; Bluetooth 2.1; gigabit ethernet; 2x USB 3.0; eSATA/USB 2.0; DVD±RW; SDXC/MMC/MS Pro slot; 2x headphone jacks; mic input; stereo speakers; HDMI; Mini DisplayPort; 56Wh lithium-ion removable battery; 381x266x57mm; 2.8kg
WorldBench 6 score: 117
Battery life: 288 mins

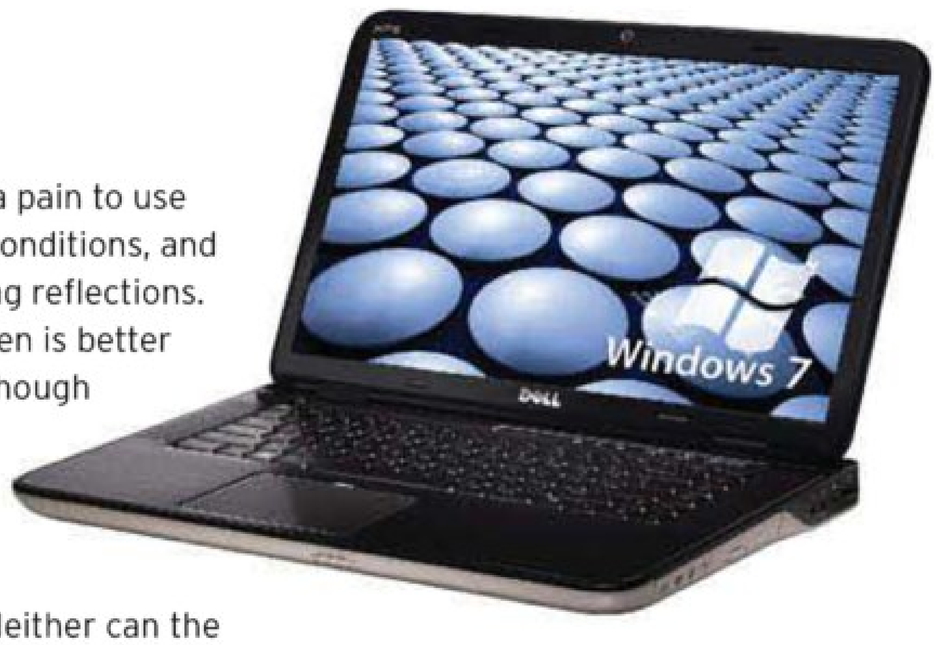
Build: ★★★★☆
Features: ★★★★☆
Performance: ★★★★☆
Value: ★★★☆☆
★★★½☆

We've seen the Dell XPS 15 L502X before (tinyurl.com/6959seo), but this P11F version adds a touchscreen display. We found this useful for entertainment, such as when watching DVDs, but not so much for general Windows operation.

Although Windows 7 supports touchscreens, there are still too many fiddly menus to navigate. And there's no getting around the fact that pressing a laptop's screen doesn't feel as natural as the same action on a handheld tablet or smartphone. It takes some getting used to, and we ultimately found ourselves using the keyboard and touchpad for most tasks.

The Dell might find itself in more comfortable surroundings when Windows 8 launches, expected some time in 2012. As we've seen from the Developer Preview (turn to page 104 for our Windows 8 tutorial), Microsoft's forthcoming operating system lets you quickly switch between two interfaces: Classic Windows, and the tile-based, touch-operated Metro environment.

For now, though, the touchscreen appears to be little more than a gimmick. No stylus is provided, and the screen's glossy surface is not a good match for finger input, with greasy marks showing up a treat.



This panel is also a pain to use in bright lighting conditions, and prone to distracting reflections.

The 15.6in screen is better suited to films, although it doesn't support a full-HD resolution, maxing out at 1366x768 pixels. Neither can the DVD drive read Blu-ray discs. You can forsake the touchscreen for a 1920x1080-pixel panel, however, while a Blu-ray drive is optional.

Gaming is well catered for, and the Dell's nVidia GeForce GT525M managed 31fps in our standard Fear test ('Maximum' detail settings). This graphics processor has 1GB of video RAM; like the DVD drive and display, it can be upgraded at purchase.

Overall performance is good, if not outstanding. A WorldBench 6 score of 117 points is indicative of a system that can complete everyday tasks with ease.

Other specifications include 4GB of RAM, upgradable to 8GB, and a 500GB hard drive. The Dell supports USB 3.0, and supplements its single port with a combo eSATA/USB 2.0 connection, plus HDMI. There's no VGA port, though.

The design is smart, yet this XPS 15 is clearly marketed for home use. The keyboard has a few quirks, including a wide but short Return key, and a Caps Lock button that's far too big and easy to accidentally hit when you're gunning for the A. A large and easy-to-use touchpad confirms our suspicions that the touchscreen was never intended to be the Dell's primary mode of input.

We were disappointed by the battery life. At just under 5 hours, it's short for today's standards. Given that the Dell weighs 2.8kg, however, you probably won't be lugging it around too often.

Verdict

The Dell XPS 15 L502X P11F is a well-balanced desktop-replacement laptop that will do an admirable job of completing everyday tasks and keeping the family entertained. But its touchscreen simply isn't worth the £160 it adds to the overall system price. ☒ **Ben Camm-Jones**

E-BOOK READER

£89 Amazon Kindle

£89 inc VAT

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Specification
6in E Ink Pearl (600x800) screen; 16 levels of greyscale; 2GB internal memory; Wi-Fi; 1-month battery life; WebKit web browser; mini-USB charger; 1-year warranty; 166x114x8.7mm; 170g

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

Amazon recently launched some new Kindle-branded products. The Kindle Fire – Amazon's first ever tablet – is garnering most of the headlines, but Amazon is tight-lipped about whether it will sell outside the US. First to launch here is the £89 non-touchscreen Kindle. Like its predecessor, it has a 6in E Ink Pearl greyscale screen that can produce surprisingly good detail for an 800x600-pixel panel.

This Kindle offers Wi-Fi connectivity, mainly so you can browse the book store (there's also a 3G model with a keyboard that costs £149). Amazon cites a repository of 750,000 titles in the UK; you also get access to one million free books via sites such as Project Gutenberg and Google Books. The 2GB internal storage is sufficient to store around 1,400. This model also supports several language options.

Navigation

Getting around the device isn't as straightforward as we'd hoped. To clear the standby screensaver you must press a power button located on the Kindle's base, while the Home button takes you to your account page and list of downloaded publications. Page turns involve pressing a long, slim forward or back button on either side of the Kindle's frame. Even so, if you're used to a touchscreen, the interface doesn't feel particularly intuitive.

Text entry via the onscreen keyboard is nippy, and you can speed across the onscreen keyboard simply by pressing down on one edge of the navipad. Search isn't always accurate, however, and the suggestion list that pops up as you type actively interferes with the text-entry process. Once you start reading, though, these quibbles are quickly forgotten.

Reading

Publications available on the Kindle are categorised into Books, Newspapers and Magazines. There are sub-categories within these, with bestseller lists that fill a single screen (eight titles or so).

Synopses are variable, but you can download samples to get a feel for a publication before purchasing it. Around 40 or 50 pages can be viewed as a sample – those hoping to

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LAPTOP

Lenovo ThinkPad X1

£1,200 inc VAT

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Specification
2.5GHz Intel Core i5-2520M (3.2GHz Turbo); Windows 7 Professional 64bit; 4GB DDR3-1333 RAM; 320GB 2.5in SATA; 13.3in (1366x768) LCD; Intel HD graphics; 802.11a/b/g/n; gigabit ethernet; Bluetooth 3.0; 3G modem; 1x USB 3.0; 1x USB 2.0; 1x eSATA/USB 2.0; SD Card slot; webcam; fingerprint reader; HDMI; Mini DisplayPort; mic; headset jack; 38.4Wh non-removable battery; 3-year warranty; 337x232x18.5-23mm; 1.76kg
WorldBench 6 score: 120
Battery life: 246 mins

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

Lenovo bills the X1 as the thinnest ThinkPad yet. At around 23mm, it's still a little chunky compared to other ultraportables. It's built for speed and durability, and the Windows 7 Professional operating system reveals Lenovo's intended business audience.

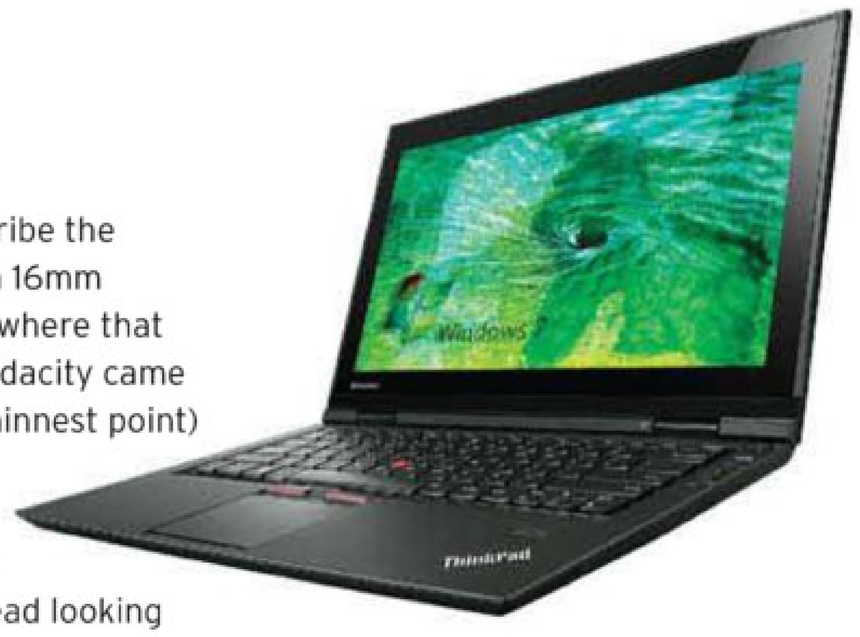
Two processor options are on the table, with the X1 available with either a 2.1GHz Intel Core i3-2310M or 2.5GHz Core i5-2520M. We tested the latter, with 4GB of memory and a 320GB hard drive. Our sample also included an optional strap-on battery that clips to the underside.

Using the built-in battery, the ThinkPad X1 lasted for 4 hours 6 minutes in MobileMark 2007; with the extra 36Wh pack, it managed 8 hrs 11 mins.

The overall speed is good, and almost as fast as a 13in MacBook Air. The Lenovo scored 120 points in WorldBench 6 against the Apple's 122. This laptop trails because of its slow storage – a 2.5in hard disk in the face of Apple's solid-state drive (SSD). You can find the X1 with a 160GB SSD if you pay extra.

The build quality is sturdy, with a rubbery matt black coating that aids grip. At 1.76kg the X1 is reasonably light, rising to 2.1kg with the extra battery pack.

Lenovo's specs describe the ThinkPad X1 as having a 16mm chassis. We're not sure where that piece of marketing mendacity came from: at the front (its thinnest point) the X1 is 18.5mm thick, rising to 23mm at the back. Slap on the extra battery and you're instead looking at a 38mm wedge.



The 13.3in screen is also tough, featuring the Gorilla Glass that's often favoured for modern smartphones. We question its value here, however. Laptops never experience the abuse of keys and pocket change rubbing against their screens, and placing a pane of glass in front of the LCD reduces screen legibility with its mirror-like sheen.

Behind the glass, the 1366x768 resolution is well-judged for a 13.3in panel. But a 16:9 letterbox ratio is less attractive to business users than it might be to consumers watching films. The LCD itself is very bright, but has a strange patina of fine grid lines when viewed closely.

Graphics integrated to the processor power the onscreen action. In our Fear game test, we saw 13fps at 'Maximum' detail.

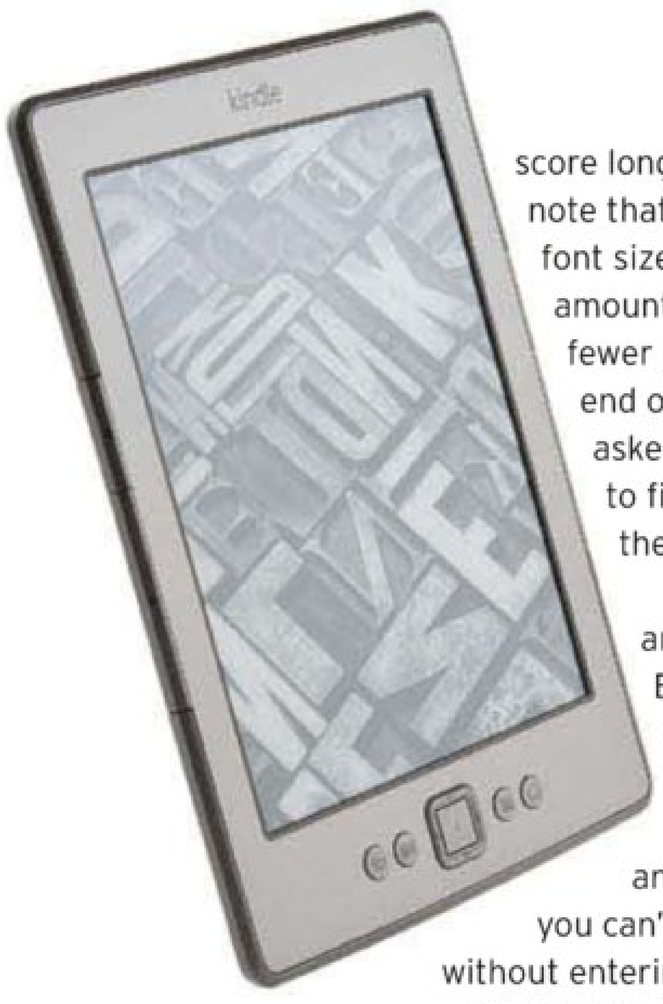
Two USB ports are available – a USB 2.0 behind a plastic flap that seems ready to tear off on the left, and a USB 3.0 at the rear. Also here is an eSATA/USB 2.0 combo port, plus HDMI, Mini DisplayPort and gigabit ethernet. Another flap conceals an opening for a SIM card, while an SD slot is found at the side.

With the lid open, we're in familiar Lenovo territory – a great tactile keyboard with dished keys, a trackpoint steerer in the centre and, new to Lenovo, a buttonless touchpad. It loses the traditional left/right-click buttons, leaving you to click in either corner for mechanical clicks.

Verdict

For corporate customers, the spill-resistant keyboard, fingerprint reader and integrated 3G may be useful. And ThinkPad old-timers may value the trackpoint mouse steerer. Against the best of the competition, though, the X1 falls short in size, weight, longevity and build quality.

☒ **Andrew Harrison**



score longer samples should note that selecting a smaller font size returns the same amount of content but with fewer page turns. At the end of the sample you're asked whether you'd like to find out more about the book or Buy Now.

Subscriptions are also supported. Buying books (actually, licensing them) requires an Amazon account and a valid card, but you can't access extracts without entering your card details.

There's a built-in dictionary and, once you license a book, you can make margin notes that are automatically stored. Usefully, you can share book extracts with others.

The Kindle's non-reflective screen ensures you don't get eye fatigue, the month-long battery means you don't really need to worry about keeping it charged up, and the automatic bookmarking makes a refreshing change from losing your place in a real book. Amazon says the page refreshes are 10 percent faster, and page redrawing, search and text entry all feel far faster than on earlier Kindles.

The extra speed makes a difference when using the Wi-Fi to visit other websites, too. Pages load quickly, even if there's a lot of graphical information to display. Video content shows up as a blank box, however, and the Kindle doesn't know what to make of non-static content such as banner ads, pop-ups or carousels of stories that periodically change. Sometimes it gives up completely, and the screen is filled with several conflicting elements. In the past, web browsing was a non-starter; now, it's simply a good advert for cleanly coded web pages and mobile versions of sites.

Verdict

The slicker, faster Amazon Kindle e-reader is a real step forward. There are a few navigation kinks, but the addition of subscriptions, extract-sharing, fast searching and the ability to successfully access other parts of the web make this an enjoyable device to use.

☒ **Rosemary Hattersley**

See page 72 for our guide to great gifts for Xmas

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TABLET PC

Fujitsu Stylistic Q550

£800 inc VAT

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- uk.fujitsu.com

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Specification
1.5GHz Intel Atom Z670; Windows 7 Professional 32bit; 2GB DDR2 RAM; 62GB SSD; 10.1in (1280x800) IPS touchscreen; 802.11a/b/g/n; Bluetooth 3.0; USB 2.0; HDMI; speaker; 1.3Mp front and 0.3Mp rear cameras; SD Card slot; SmartCard slot; optional GPS/UMTS modem; fingerprint sensor; four-cell 38Wh removable battery; 275x192x17mm; 890g with stylus

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

★★☆☆☆

Tablets demand processors and interfaces designed for the job, but that hasn't stopped Fujitsu from resurrecting the Wintel tablet.

This is a 10.1in-screen model running Windows 7 Pro, powered by Intel's Atom processor. For storage it takes a 62GB solid-state disk (SSD), with only 27GB of usable space.

On the bottom is a docking port; along the sides, USB 2.0 and HDMI, plus an SD Card slot. Buttons on the right let you flip the screen orientation and switch off the Wi-Fi.

Given the choice of operating system and absence of a keyboard, Fujitsu has included a dedicated button to invoke the Task Manager. When Windows locks up, this can help get you out of trouble. Missing are buttons to control the screen brightness and sound volume.

The build quality is tough-looking. Fujitsu has bevelled the edges to allow a more comfortable grip of the 16.5mm-thick frame. At 890g, it's around 50 percent heavier than an iPad 2 – and it feels it, too.

A netbook in disguise

In essence, the Q550 is a netbook with a stylus-activated touchscreen in place of a keyboard. As such, it carries all the baggage of running Windows on a low-power processor, combined with the awkwardness of wrestling with a desktop operating system using a touchscreen.

Fujitsu has applied its own touch-friendly interface, which it calls Infinity Lounge. Activated using the stylus from a drop-down tab at the top of the screen, it offers a calendar, calculator, an RSS reader and a notes app.

We applied a patch that added Mail (requires Outlook; not included) and a web browser. Yet there's nothing here to overcome the problems of running Windows 7 on an insensitive touchscreen.

Let's focus on the pluses. The screen offers a 1280x800-pixel resolution, and is less claustrophobic than a netbook's 1024x600. This panel is semi-matt, so won't reflect glare like the glass screens of consumer laptops and tablets. Its rough plastic surface isn't particularly finger-friendly, but the stylus means you won't come into contact with it too often.

Images are drained of colour – a trade-off of anti-glare screens – but the in-plane switching (IPS) screen is viewable from side angles. The touch-digitiser layer under the surface means the image still gets softer off-axis, however.

The screen is touted as multitouch-capable; we found it barely worked with two fingers, let alone four. You can just about scroll using a two-finger drag.

For most operations, you'll need the stylus. This is tethered to the chassis using string, which is easily tangled; when not in use, we'd prefer to be able to clip it to the body. The stylus requires an AAAA battery. We needed to be heavy-handed in prodding on files and icons just to invoke a response.

Performance problems

A serious lack of system speed is more troubling than the dull screen, however. The Fujitsu is slow, and not just a little lagging in everyday tasks. Every operation, from opening Windows Explorer to launching an app or surfing a web page, feels as though you're working through cold treacle wearing welding gloves.

Typing is also an ordeal. The onscreen keyboard is small by default and operated only using the stylus. If you expand it to full-width then it takes over the entire screen and gets in your way. This interface is useless for finger-operation.

Instant-on access is crucial for any mobile device; sleep, and wake from sleep, don't work well. It took around 10 seconds for the Fujitsu to wake from sleep, and around 40 secs to enter standby mode.

Anticipating that few consumers will desire a slow, expensive, chunky tablet running an operating system that's unsuited to touch, Fujitsu is pitching its tablet at business. In particular, those tied into Microsoft software deals, such as hospitals and local government.

To help convince these industries that they need an obsolete slab like the Q550, Fujitsu is playing the security card. In a presentation to *PC Advisor*, it insisted that business users would steer clear of the iPad, which isn't secure against hardware penetration. Fujitsu has included a fingerprint reader, a SmartCard slot and full-disk encryption.

Two battery options are offered, with two or four cells in a removable lithium-polymer power pack. Fujitsu claims the larger battery lasts up to 9 hours, but our testing with intermittent use found only 4.5 hrs.

Verdict

It was tablets like the Fujitsu Stylistic Q550 that forced the computer industry to fold on Microsoft's flawed tablet concept, long before the iPad proved it was possible to have an intuitive device that loves fingertip control. If you're a business professional and are issued with a Fujitsu Q550 for your work, we'd advise a change of career to save yourself the stress and exhaustion of battling with this relic of the past. ☒ **Andrew Harrison**

See page 64 for our tablets round-up

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PRINTER

Epson Stylus SX445W

£70 inc VAT

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■ epson.co.uk
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■ tinyurl.com/64jtsh8

Specification
Printer/scanner/copier; 5760x1400dpi print resolution; print speed: B=15.8ppm, C=5.9ppm; 1200x2400dpi scanner resolution; USB 2.0; 802.11b/g; iPrint for smartphones and tablets; 2.5in TFT; card reader; cartridge costs: B=£12, C=£12 x 3; print life (pages): B=380, C=445 x 3; 390x300x145mm; 4.2kg

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

Epson's Stylus SX445W is a simple budget printer with a built-in scanner component. Wi-Fi is supported, while a card slot lets you bypass a PC to print out snaps.

You can also hook up your smartphone or tablet using Epson iPrint. But the SX445W isn't stuffed with endless features; instead, it focuses on the facilities that most improve the user experience. And it offers these at a very modest price, even if there are a few hitches that threaten to derail the Epson.

As a member of Epson's new Small-in-one range, the SX445W is said to be 39 percent smaller than previous models. Its curves are nicely done – even, dare we say it, cute. And its compact footprint means you won't need to surrender a large part of your desk.

The control panel is a mixture of old and new. The garish orange icons aren't attractive and, while the buttons are touch-sensitive, they're used only to move up and down text menus. Yet the Epson is easy to use. The system is logical, clear and reasonably detailed. Back and Home buttons are always present, should you want to retrace your steps or return to the main menu.

Print quality is a mixed bag. The obligatory super-fast mode hits a strong figure of 15.8 pages per minute (ppm), but the text is so light that it's almost unusable. The middle-quality mode offers much darker output at a solid rate of 5.7ppm, although the characters aren't as crisp as we'd like and letters lack clarity, despite using setup options to fine-tune the ink.

Graphics printing is much better. Ignore the ultra-faint 5.9ppm fast mode, and instead go for the middle 1.8ppm option. While the speed isn't competitive, the print quality is good even when using standard paper stock. The palette is dark, but we like its intensity.

The scanner has a rather flimsy lid, and there isn't as much lift as we'd like. Nonetheless, results were generally accurate, and colours were captured with some fidelity.

The Epson's running costs aren't small. A page of text will set you back around 3.2p, while a page of colour costs 8p. The latter is typical for Epson, but some Canons, for example, can reduce this outlay to less than 7p per page. Despite a low asking price, the Epson will thus cost you slightly more in the long term.

Verdict

The compact SX445W looks good and has useful features. Should you want a modestly priced printer primarily for graphics, it will prove a decent choice. Text is disappointing, though, running costs above average, and the Stylus SX445W lacks speed. ☒ **Robin Morris**

SCANNER

Plustek OpticBook 3800

£180 inc VAT

Contact
■ plustek.com/uk
Read more
■ tinyurl.com/6jpk5wk

Specification
A4 flatbed design; CCD image sensor; 1200x1200dpi optical resolution; 48bit colour; USB 2.0; daily duty scan 2,500 sheets; Twain-compliant; 453x285x105mm; 3.4kg

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

This OpticBook has an appearance that can be politely described as functional. Its control panel is very simple to use, with dedicated buttons for colour, greyscale and black-and-white scanning.

The scanning glass comes right to the front edge, and you can scan within 2mm of a book's spine. This lets you open up a book and place one half on the glass, with the other half resting on the tabletop. A clever idea, but it's not fool-proof.

The flimsy lid demands that you exert a substantial amount of pressure to stop the book popping up and creating distortions on the page. We'd prefer to see a heavier lid or an adjustable lock system. Provided that you're prepared to hold down a hand on the lid while scanning, though, the OpticBook can create accurate results from all but the thickest, stiffest books.

We didn't like having to wait almost a minute for the device to warm up, but appreciated its fast scanning times thereafter. Using the Book Pavilion interface, for instance, it takes 6 seconds to preview your picture, and then another 11 secs to scan it at 300dpi, or 21 secs at 600dpi – irrespective of whether or not you're scanning in colour.

The scan is quickly converted to a PDF or other digital file. It took an extra 5 secs to convert our test scan to PDF. These speeds are swift, and quality is impressive. Even at a moderate 300dpi resolution, colours are reasonably accurate – if just a touch on the pale side. Up the resolution and the results are stronger still.

Many users will be buying this Plustek for its optical character recognition (OCR) capabilities, and the bundled ABBYY FineReader 9.0 software does a fine job. We were pleased with the accuracy of text recognition, and even in our fiendish dictionary test it produced surprisingly good results.

Getting the software to perfectly mirror the page layout is trickier – particularly on complex magazine articles – and the software wasn't totally at ease with switching between languages. Serious text users should invest in the latest FineReader, version 10.0.

Other interesting software packages bundled include NewSoft's Presto PageManager document-management application, and Presto ImageFolio, for editing and managing graphics files.

Verdict

Provided that you don't mind holding down the lid for books and other difficult source material, the OpticBook should offer pleasing results. It's fast, accurate and, combined with the latest OCR software, produces strong results. ☒ **Robin Morris**

See page 139 for our printer charts

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SOLID-STATE DISK

Patriot Wildfire 240GB

£380 inc VAT

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Specification
240GB SSD; 2.5in form; SATA 6Gbps; SandForce SF-2281 controller; DuraClass technology; 32nm MLC Nand flash; 3-year warranty; 101x69x9.3mm; 82g

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

★★★★☆

When set against any hard disk, even the cheapest solid-state drive (SSD) is incredibly fast. Then there are the really quick models, based on speedy third-gen SATA and using higher-spec controllers and faster flash chips to make the most of the 6 gigabits per second (Gbps) interface.

Patriot Memory is a US-based specialist in memory and solid-state storage, and its Wildfire range promises top performance. Patriot has chosen a SandForce controller to help it boast impressive-sounding figures. The specs list up to 555MB per second (MBps) sequential read speeds and 520MBps writes – both are wildly fast transfer rates.

The input/output operations per second (IOPS) are no less dazzling, quoting 85k for 4kB random writing.

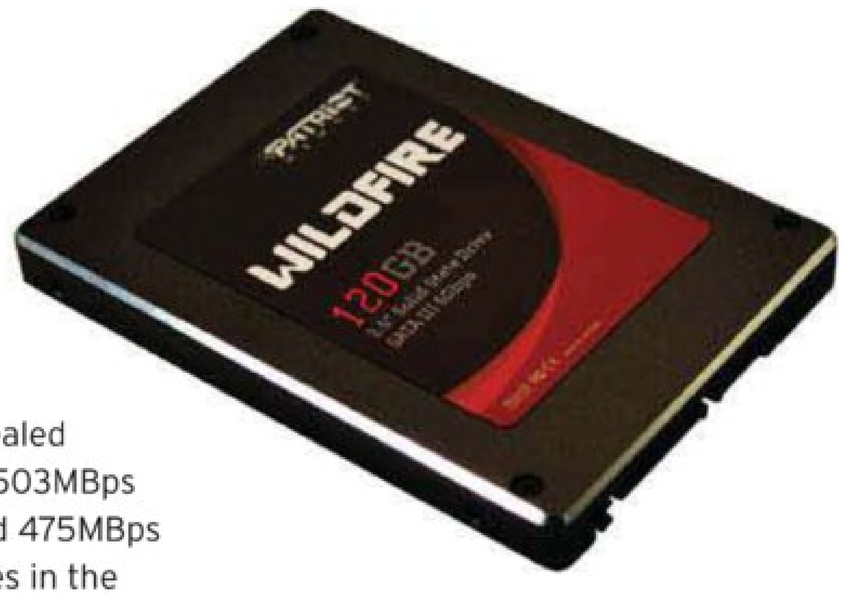
In our lab tests, we saw even faster reads, if slower writes, using the simple ATTO Bench test. Here sequential writes reached 559MBps, while reads hit 508MBps.

HD Tune Pro demonstrated good performance too, with an almost flat line plotted for reads at 526MBps, and a write plot punctuated with only short spikes, averaging 441MBps.

CrystalDiskMark revealed broadly similar speeds: 503MBps for sequential reads, and 475MBps for writes. The caveat lies in the preferred way to measure, when using the benchmark's compressible data set (all 0s or 1s). These controllers use what SandForce calls DuraWrite, to compress incoming data and accelerate performance with certain data.

Given real-world random-like data, the best sequential read speed was 498MBps. And the best write speed was just 256MBps – less than half the advertised speed.

In our test of IOPS performance, the Patriot Wildfire also fell a little short. Using the AS SSD benchmark tool, we saw IOPS reach 'only' 48.9k in 4k-64 tests. The Patriot's overall score in this test was 697 points – a very high result.



By way of reference, Crucial's older C300 measured 45k in the same test rig, while the latest Crucial m4 SSD delivered what Patriot promises for random small-file writes: 84.2k IOPS.

Verdict

While it couldn't match Patriot's advertised performance in our tests, the Wildfire is a very quick SSD. Its best-case sequential read/write tests far surpassed the bandwidth of previous-gen SATA 3Gbps. A good gauge of real-world performance can be the IOPS figure, and here the Wildfire was quick – if only half the speed of the Crucial m4 SSD.

Andrew Harrison

SOLID-STATE DISK

Kingston HyperX SSD 240GB

PC ADVISOR RECOMMENDED

£400 inc VAT

Contact
- kingston.com

Read more
- tinyurl.com/3n7284w

Specification
240GB SSD; SandForce SF-2281; Intel 25nm MLC Nand flash storage; SATA 6Gbps; Trim support; USB 2.0 drive enclosure; 3.5in mount adaptor; Acronis True Image HD software (Windows); 110g

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

★★★★½

Standing proud at the top of Kingston's range is the formidable HyperX SSD. This slab of storage promises performance that'll blow off any enthusiast's socks.

Standout specs include sequential reads of 555MBps and writes of 510MBps. If these figures look similar to those of the Patriot Wildfire reviewed above, it's because they share the same processor, the SandForce SF2281.

As such, HyperX carries our standard caveat concerning manufacturers' numbers versus actual speeds: the SandForce controller uses file compression/decompression to accelerate transfers. MP3, Mpeg and Jpeg files don't compress further, so they write much more slowly.

The Kingston has a stylish chassis made of blue plastic and brushed metal. At 110g, it's a little heavier than most SSDs.

It's available as a bare drive for £360, or as part of an upgrade kit for £400. The kit includes an external enclosure for your old drive and a smart plastic USB 2.0 case with a finger-lockable cover. Acronis True Image HD for Windows completes the bundle.

In our ATTO tests, the HyperX revealed similar results to the Wildfire. The Kingston had the edge, with reads peaking at 558MBps and writes reaching 525MBps.

CrystalDiskMark reported 507MBps for reads and 491MBps writes. Smaller-sized 512kB data wasn't far behind, at 444MBps and 462MBps respectively.

Using randomised data to better match real-world data, the Kingston HyperX reached 492MBps reads but just 302MBps for writes.

At the small-file level using CrystalDiskMark's 4K QD32 test, the Kingston held up well. Even with random data, the benchmark reported 265MBps writes and 228MBps reads. These are terrific speeds that bode well for a fast-feeling computer interface.

File-juggling agility under pressure is measured by the IOPS figure. While it wasn't as fast in random writes as the Crucial m4, the Kingston could reach 60.4k IOPS writing and 52.6k reading in AS SSD's 4K-64Thrd test.

The Crucial m4 came in with 84.2k and 40.3k IOPS in the same test, suggesting a swings-and-roundabouts trade in performance between read and write capabilities.

Verdict

The Kingston HyperX SSD 240GB is a fast SSD. Like the Patriot it showed read speeds nudging 500MBps, yet faster writes of 308MBps. In IOPS tests its read and write performances were more closely aligned, peaking at a worthy 60.3k IOPS.

Andrew Harrison

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Specification
24in LCD monitor; VA technology; LED backlight; 1920x1080; 0.28mm pixel pitch; 8ms response time; 3,000:1 contrast ratio; 250cd/m² brightness; D-Sub; HDMI; DVI; 34W power consumption; 3-year warranty; 570x215x438mm; 6.2kg

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

Iiyama's latest mid-range monitor line-up features vertical alignment (VA) panels, which offer better quality than the twisted nematic (TN) versions we usually see at this price. At £200, this 24in Iiyama therefore offers very good value.

The understated X2472HD isn't going to make passers-by stop in their tracks, but it's neatly curved and looks sufficiently business-like to blend into a home or office.

The stand is surprisingly versatile, given the price. As is evident from the image that accompanies this review, it has plenty of height adjustability; you can even rotate the screen.

It's a shame that the onscreen menu isn't easier to operate. The menu system is cleaner and more intuitive than we've come to expect from Iiyama, but we found the touch-sensitive controls too easy to accidentally press.

The Iiyama has VGA, HDMI and DVI connectors. Other specifications are relatively standard: the ProLite has a 250cd/m² brightness rating, and an 8ms response speed. This is slightly slower than modern TN panels. We noticed a modicum of ghosting in gaming, but you'll be hard-pushed to see any difference.

The main draw is the XB2472HD's VA panel, which offers potentially great 24bit colour reproduction. Iiyama quotes a contrast ratio of 3,000:1, whereas most TN screens tend to claim only 1,000:1. Both figures can be ignored – you'd have to spend £1,500 on a 24in screen to get just 850:1 – although there is some improvement here.

Colours are rich for a £200 flat-panel, with crisp images and good differentiation between shades. The Iiyama handles darker colours extremely well, and will be a good choice for a screen on which to watch films.

Its viewing angles aren't as impressive. The Iiyama's image deteriorated a little too quickly as we moved from sitting directly in front of the screen.

Verdict

An in-plane switching (IPS) panel is still the better choice if you can afford one, but VA can offer improvements over common TN panels. Thus, the Iiyama's colour reproduction is strong. It offers 24in of screen space on which to get work done, and the versatile stand is a useful bonus at this price. This Iiyama is one of the better-quality screens you'll find for £200. ☒ **Robin Morris**

GRAPHICS CARD

Sapphire AMD Radeon HD 6870 Dirt 3

£160 inc VAT

Contact
■ sapphiretech.com
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■ tinyurl.com/68ep9dk

Specification
AMD Radeon HD 6870; 1GB GDDR5 RAM; 920MHz core clock; 1,050MHz memory clock (4.2GHz DDR effective); 400MHz Ramdac; 256bit memory interface; 1,120 stream processors; 56 texture units; 32 ROP units; PCI Express; 2x 6-pin power connectors; DirectX 11.0; 2x DVI; HDMI; 2x Mini-DP; 2-year warranty

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

This Sapphire rendition of AMD's Radeon HD 6870 offers a tad more oomph for an extra £10-£15.

It has an advanced cooling system, factory-overclocked core clock speeds, and comes bundled with the game Dirt 3. The main attraction is the Sapphire's dual-fan cooler, however, which considerably improves the user experience.

The cooling system is extremely effective. The standard 6870 has a thermal design power (TDP) figure of 151W. We don't have a figure for the Sapphire, but our tests showed that this HD 6870 typically saved around 32-36W.

Noise levels were minimal, with even heavy loads inducing little more than a hum from the card.

The Sapphire features the same connections as the standard HD 6870, with an HDMI and a pair of DVI ports joined by a brace of Mini DisplayPorts. Two six-pin power connectors are required.

The core clock has been upgraded ever so slightly from 900MHz to 920MHz, but the 1,050MHz memory clock and 1GB of GDDR5 RAM haven't changed from the original specification.

The card is ripe for overclocking, but the onus is on you rather than Sapphire to eke out the extra speed. Fortunately, the 6870 is already a decent card, featuring a 256bit memory interface.

The drivers have also been improved, and you'll see a few extra frames in Dirt 3 at most resolutions. At 1680x1050 and 1920x1200, we recorded 31.2fps and 25.3fps in Crysis. The standard card scored 28.9fps and 23.8fps respectively.

In BattleForge, the figures increased from 33.8fps and 26.5fps for the standard version, to 36.4fps and 28.7fps for this Sapphire.

In Hawx, we recorded 154fps and 114fps, up from 146fps and 111fps.

The Sapphire is not attractive, with two fans covering most of the surface and leaving little room for the pictures and logos Sapphire tends to emblazon across its cards. Of course, you're unlikely to be opening up your PC case to admire its graphics card too often.

Verdict

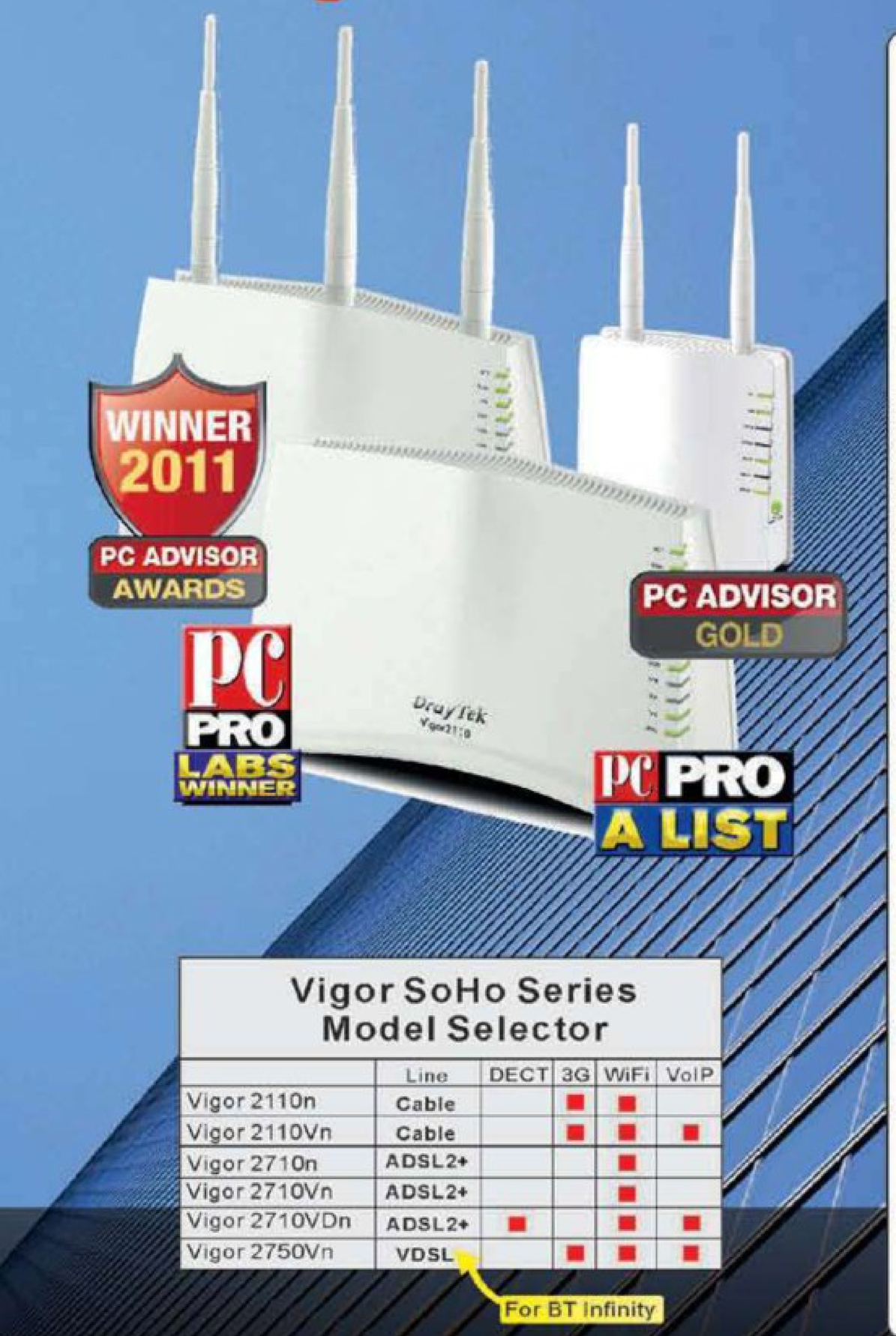
The Sapphire AMD Radeon HD 6870 Dirt 3 doesn't offer a fantastic leap forwards in performance over the original 6870, but it has untapped potential for those who want to overclock further. The cooling system does a great job of keeping down noise levels. ☒ **Robin Morris**

See page 145 for our flat-panel display charts

StandMags.com

DrayTek

Broadband Router/Firewalls



	Line	DECT	3G	WiFi	VoIP
Vigor 2110n	Cable		■	■	
Vigor 2110Vn	Cable		■	■	■
Vigor 2710n	ADSL2+			■	
Vigor 2710Vn	ADSL2+			■	
Vigor 2710VDn	ADSL2+	■		■	■
Vigor 2750Vn	VDSL		■	■	■

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DrayTek

www.draytek.co.uk

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

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ADSL MODEM

D-Link DSL-320B

£32 inc VAT

Contact
- dlink.co.uk

Read more
- tinyurl.com/5wca6dy

Specification
ADSL/ADSL2+ modem; Broadcom chipset; ANSI t1.413 Issue 2; G.992.5 Annex A/M; bridged ethernet mode; VC-based and LLC encapsulation; RFC 1483, RFC 2684; ATM QoS traffic shaping; optional Telnet/SSH access; 1x RJ11 port; 1x RJ45 port; 5V/1.2A external power adaptor; 120x105x32mm

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

D-Link is one of few companies helping to keep the useful tech of standalone modems alive. Network professionals and power users will enjoy the possibilities afforded by such devices.

The DSL-320B is a tried-and-tested ADSL/ADSL2+ modem. Launched in 2007, it's a pensioner by IT standards. But its 2009 version 1.22 firmware upgrade makes this a dependable modem.

A compact plastic box, the D-Link is just 120x105mm and stands 32mm high. Cooling vents run along the top, but the unit still gets a little warm in normal use.

A single RJ11 socket links to your phoneline, and RJ45 provides ethernet to your computer or router. There's a handy power switch, too, so you don't need to pull the plug on its 5V adaptor to turn off the unit.

Across the front are four green LEDs for Power, Status, LAN and DSL. In normal operation, Power is continuously lit, Status pulses regularly, LAN flashes on network activity, and DSL is a constant green to indicate showtime.

Three modes of operation are configured via a browser. PPPoE/PPPoA and Static IP are two options to connect the modem directly to a PC. These setups allow the DSL-320B to serve as basic router, performing network address translation (NAT) and issuing your PC a new IP address.

If you're using another router, such as an 802.11n wireless device, you should select Bridge mode. This ensures only one level of NAT occurs, with the data from your ISP passed transparently to the router through the D-Link.

For non-bridged use, built-in services include parental-control time filters and operation logs. In bridged mode, you first need to connect a PC to the DSL-320B and inspect or adjust these functions.

We tested the DSL-320B on an ADSL2+ home Be Unlimited line, which is said to offer a 24 megabits per second (Mbps) download speed and 1.3Mbps upload. Our local exchange is around 1km away.

The modem's status reported 21Mbps/1.3Mbps synching, while Speedtest.net revealed a consistent 18Mbps download speed and 1.2Mbps upload. Support for the ADSL2+ option of Annex M lets you trade some download speed for better upload performance.

Verdict

It's a simple unit, but the D-Link performed faultlessly in our tests. This is a great fit-and-forget modem, and ideal for use in conjunction with high-performance wireless routers that don't have their own ADSL modem. **Andrew Harrison**

WIRELESS ROUTER

Zyxel NBG4615

£65 inc VAT

Contact
- zyxel.co.uk

Read more
- tinyurl.com/6hacknn

Specification
802.11b/g/n; IPv6; NAT; UPnP; Dynamic DNS server; RIP; Bandwidth Management; SPI firewall; Content filter; WEP/WPA/WPA2 security; WDS; WPS; 162x106x28mm; 237g

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

The Zyxel NBG4615 is a refreshingly simple-to-use 802.11n wireless router. Wi-Fi Protected Setup (WPS) lets you secure a wireless network with a few button presses, and you're reminded to configure this option as soon as you log into the router over the network.

The standard admin page lets you change settings for the router's wireless security, prioritise bandwidth and block selected URLs, all via graphical menus. The advanced settings page clearly presents information about the router, and separates the Zyxel's network, security and management settings using a clean layout and menu structure.

As well as being easy to set up, the NBG4615 delivers nippy performance. At short range, a 1GB test file transferred to a laptop at 94Mbps. This is quicker than many other routers we've tried. The Zyxel proved no slouch at long range either; it provided 32Mbps with the data passing through two solid walls.

A plain white plastic casing and two external antennae do nothing to distinguish the NBG4615's boring appearance from a slew of comparable routers. We like its compact design, though. Some might say the device's nine status LEDs are overkill, but these can prove a useful aid for troubleshooting.

There's one LED for each of its four gigabit ethernet ports, plus another for the WAN port. A fifth LED covers the device's status, a sixth reports on the wireless network, and a seventh on your broadband connection. The final two are paired with twin USB 2.0 ports built into the Zyxel's side.

The USB ports can be used for sharing storage, turning the router into a sort of NAS drive, or connecting printers. A switch at the rear lets you manually disable the wireless network, and there's another to turn off the router itself. Power saving is supported too, with an option to disable the network at set times, such as overnight.

Verdict

It might not look it, but Zyxel's NBG4615 is a powerhouse of a wireless router. It lacks the ability to create 5GHz wireless networks, along with a few other desirable features, but its performance is among the best we've seen from a sub-£100 router. This Zyxel is worthy of consideration by anyone still using the wireless router supplied by their ISP. **Orestis Bastounis**

See page 140 for our wireless routers chart

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EXTERNAL HARD DRIVE

Western Digital My Passport Studio 1TB

PC ADVISOR GOLD

£110 inc VAT

Contact
■ wdc.com/en
Read more
■ tinyurl.com/6fawbne

Specification
External hard drive; 1x MicroUSB; 2x FireWire 800; 1TB WD Scorpion Blue 2.5in SATA disk (available in 500/750GB/1TB capacities); AES-256 encryption; FW800-FW800 cable; USB Type A to Micro-USB cable; WD Drive Utilities and WD Security (OS X); 126x84x21.5mm; 334g

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

This portable hard drive packs more than just a useful FireWire 800 port or two. Western Digital also offers sublime design and build credentials. When it's your precious data on the line, these assurances are worth their weight in solid aluminium.

Unlike previous generations of the My Passport Studio, which came in faux-metal plastic cases, this unibody version encases its disk cargo in a solid-feeling lump of machine-hewed metal.

The casualty is weight: the drive tips the scales at a hefty 334g. With mass comes authority, however; this pocket hard drive may stretch your coat lining, but it feels solid and durable. It's not indestructible, though, and with no case or other protection supplied we're sure that if we were to drop our review sample its metal edges would take a dink.

The bundled software is much improved over that included with previous Western Digital drives. You can use this to set a password for the always-on AES encryption.

Inside is a one-terabyte (1TB) Scorpio Blue 2.5in SATA disk, the fatter 12.5mm version. It's a tad slower than the 9.5mm version, but still performs well beyond the capabilities of FireWire 800.

The 2011 My Passport Studio sports two FireWire 800 ports, making possible the daisy-chaining of FireWire devices as intended.

An OXUF943SE chipset serves as the primary interface between the SATA disk and FireWire/USB ports facing the user.

We used QuickBench to test the drive's read and write performance in OS X Lion. You can expect to see peak read/write speeds of 38 and 28MB per second (MBps) using the MicroUSB port. That's slow by the standards of modern interfaces, but about as quick as you'll ever see from USB 2.0.

With FireWire 800, we measured read speeds up to 76MBps and a write performance of 69MBps. These figures are short of the circa-110MBps the disk itself can hit, so the appearance of Thunderbolt in this drive is beyond overdue. For now, though, FireWire 800 offers excellent performance.

Verdict

This sturdy example of high-tech engineering may stretch the pocket in more ways than one, but it's worth every pound and gram of it. Formidable FireWire 800 performance and decent bundled software allow the Western Digital My Passport Studio to set a new benchmark for portable hard drives.

☒ **Andrew Harrison**

BLU-RAY WRITER

Buffalo MediaStation BR3D-12U3

£199 inc VAT

Contact
■ buffalotech.com
Read more
■ tinyurl.com/453bx7L

Specification
External Blu-ray writer; USB 3.0; BD read/write speeds (*with TurboUSB enabled): 8x/12x* BD-R (SL), 8x/12x* BD-R (DL), 8x/2x BD-RE (SL), 6x/2x BD-RE (DL); specified DVD read/write speeds: 16x/16x DVD±R, 12x/8x DVD±R DL, 12x/6x DVD-RW, 12x/8x DVD+RW, 5x/5x DVD-RAM; CD read/write speeds: 40x CD-R/24x -RW; CyberLink Blu-Ray Disc Suite; 160x220x50mm; 1.2kg

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

Buffalo's MediaStation BR3D-12U3 is an external desktop Blu-ray writer that's equipped with USB 3.0 to enable '12-speed' burning. It's also compatible with legacy USB 2.0 for eight-speed burning.

Of course, the fastest BD-R blank media you can buy is only six-speed. Performance will thus be the same whichever USB standard you use.

In general use with Blu-ray media, the drive is quiet and works very well. Unlike some USB 2.0 external models, it requires a separate power supply to operate.

The MediaStation also reads and writes to recordable CD and DVD media, with Buffalo listing writes of 40-speed and 16-speed respectively. The drive ships with the TurboUSB utility, said to improve transfer rates between the PC and Blu-ray drive.

A CyberLink software suite is also bundled, letting you author, burn, back up and play discs. It includes PowerDirector, PowerProducer, PowerDVD 9.0, PowerBackup DVD Copy and Power2Go.

We experienced problems running the suite on a PC that had other video and disc-authoring software installed, but it worked fine on a second machine. The experience wasn't helped by the CyberLink software's constant nag screens, however, asking us to pay to upgrade to the latest versions of each program in the suite.

PowerProducer took well over an hour to prepare the motion menus for a 23GB video Blu-ray. To save time, we burned the project to an image, then burned the image to disc. This took 12 minutes.

Over USB 2.0, backing up 23GB of data in PowerBackup took 33 mins 10 seconds. We tested the drive with a number of similar projects, all with similar results.

CyberLink TrueTheater HD upscaling technology converts 480p standard-definition video to 1080p full-HD during playback. It also lets you apply an upscaling algorithm to view or re-record DVD or imported footage in HD quality.

Verdict

The Buffalo MediaStation performed well as a Blu-ray writer and player, with a good turn of speed and low noise levels. If only the media was available to truly take advantage of its speed. ☒ **Michael Burns**

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Release: StoreMags & FantaMag

See page 141 for our portable hard drives chart

SPEAKERS

Scandyna Micropod SE Active

£349 inc VAT

Contact
■ scandyna-uk.co.uk
Read more
■ tinyurl.com/6eehbpo

Specification
Two-way active desktop speaker system; 65mm mid/bass driver with glass-fibre cone; 20mm fabric dome tweeter; 2x 10W class D amplifier; volume control; external PSU 14V/3.21A; 130x160x121mm

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

★★★★☆

You'd expect speakers that look like the Micropod to place style above substance. But there are some sound acoustic reasons for making a speaker that looks like an undersized alien from a 50s B-movie.

Standing just 200mm high on their tripod feet, these speakers are available in passive form for use with a stereo amp; or, as we tested them, with built-in amplification to connect straight to a PC or iPod.

The main mid/bass driver has only a 65mm diameter, so they're inevitably light in bass. Scandyna sells a range of subwoofers, but don't rule out the Micropod SE Active for use alone on the desktop.

A 20mm soft-dome tweeter sits above the main cone, helping create something like a point-source radiator: with the drivers' centres so close together, all sound output appears to come from a single point in the speaker. This helps stereo imaging, making it easier to pinpoint the spatial positioning of instruments in the mix.

The righthand speaker contains a 10W amp. It's joined to the second speaker by a length of cable. You connect the pair to a PC using a 3.5mm mini-jack. A silver knob on one unit serves as volume; another jack lets you wire up a subwoofer.

The rounded cabinet is formed from two sections of ABS plastic, joined together with a visible seam running around the circumference.

With our expectations managed by the tiny cabinet, driver and 10W amp, we thought these speakers sounded remarkably detailed.

Playing lossless music from a USB digital-to-analogue converter (DAC), the Micropod did a great job of reproducing voices and lead instruments. Female vocals soared clear of the confines of the speakers. Similarly, acoustic guitar benefitted from a crisp, lean balance.

Elsewhere, though, the speakers would lose all the depth of bass guitar and drum backings, leaving a near-hi-fi tinny balance.

Cabinet coloration was certainly low, and there was little evidence of resonant plumminess to bass notes.

The integration between bass and treble was good, with no hint of the midband join you might hear on speakers with larger mid/bass drivers.

Chamber music, jazz and pop all work a treat, as does the speaker's other forté: video and film playback.

Verdict

A speaker this small is never going to be a full-range dambuster, yet the Micropod excels on the desktop. If you like the looks you're already halfway to appreciating Scandyna's delicate sound. ☒ **Andrew Harrison**

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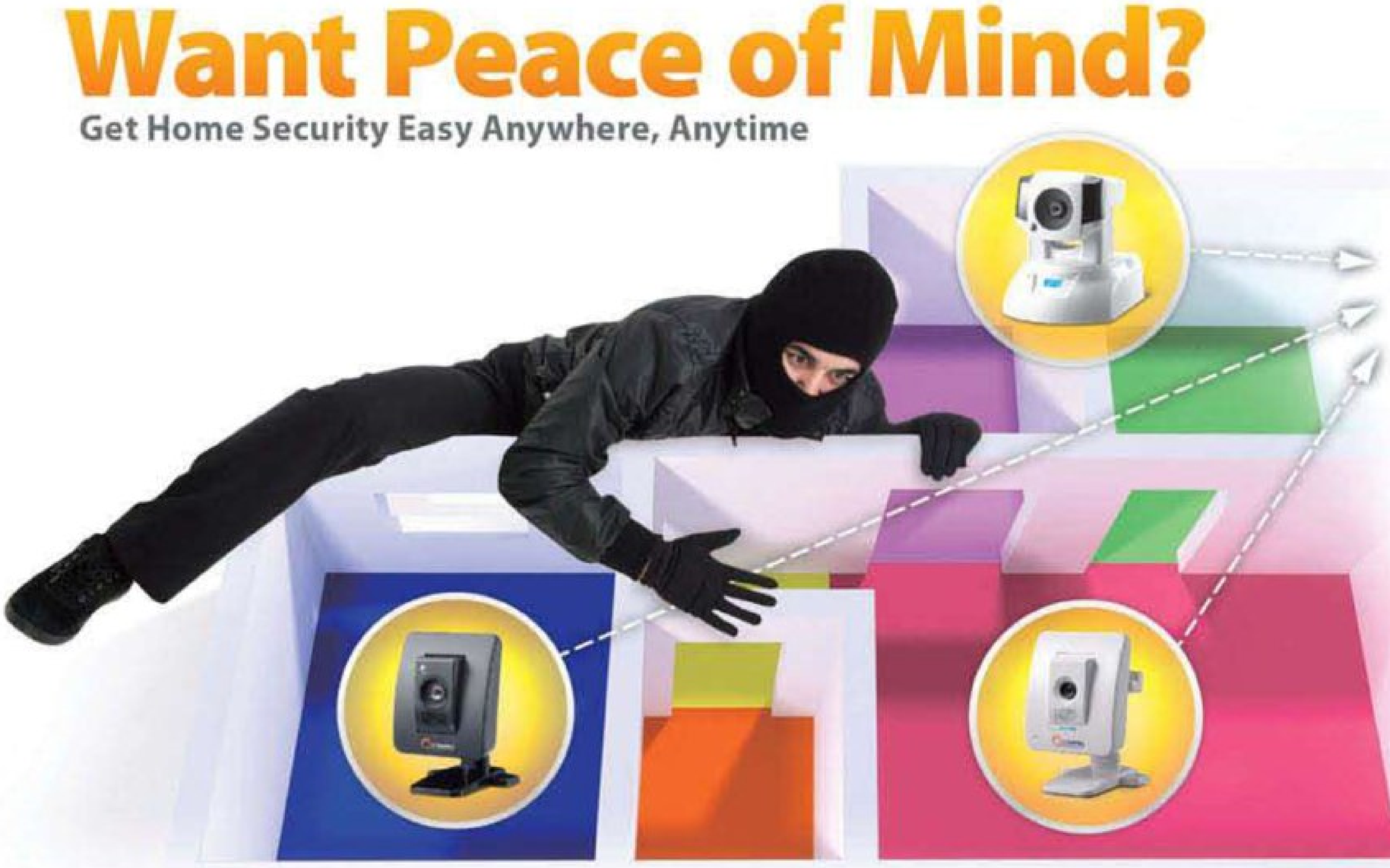

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SOFTWARE

BACKUP UTILITY

Paragon Backup & Recovery 11.0

£30 inc VAT (1 PC)

Contact
■ paragon-software.com
Read more
■ tinyurl.com/6kx4acr

System requirements
Windows 2000/XP/Vista/7; 256MB RAM; 250MB hard-disk space

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

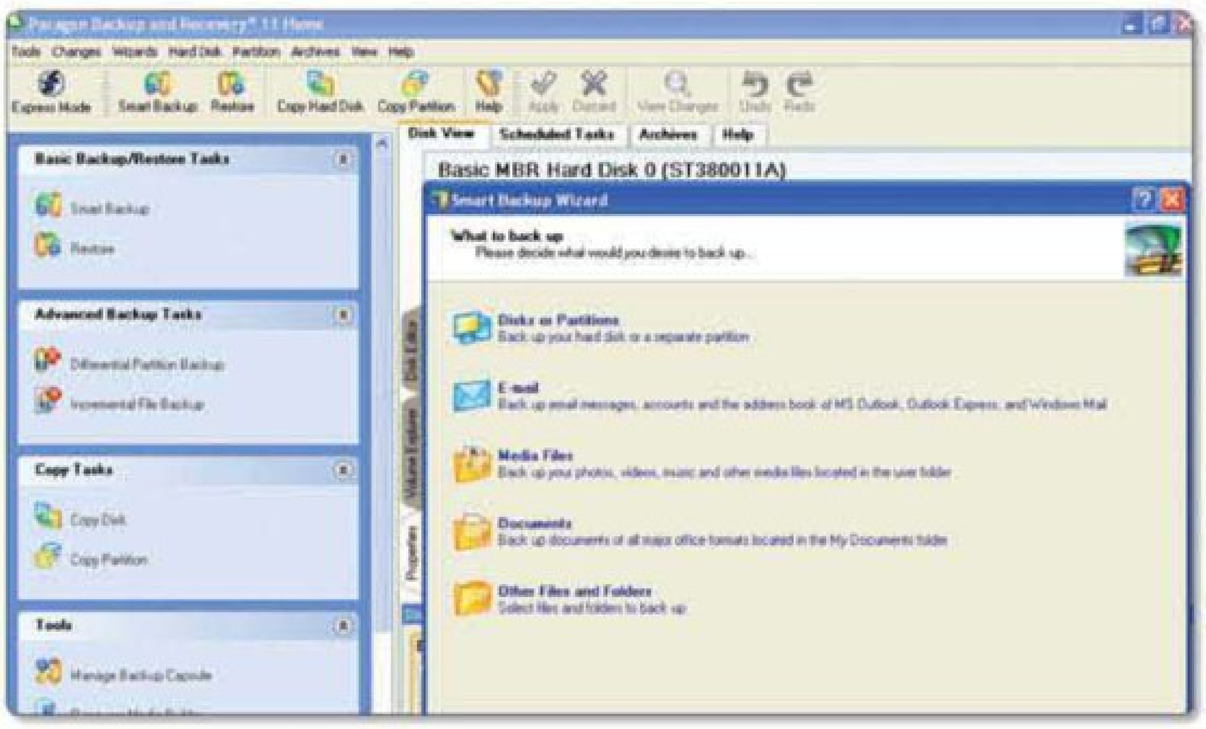
Backup falls into two distinct categories: backing up files, so your personal information is protected, and backing up the system, so your computer is protected. Recent utilities, such as Paragon Backup & Recovery 11.0, cover both.

The control screen looks more like Paragon's Hard Disk Manager 11.0 Pro, of which it's a cut-down version. This can be daunting at first, but the tabbed interface is straightforward, offering views of the selected drive, scheduled backups, archives already created and the help system.

Although the help text could use proofing by a native English speaker (Paragon, like Acronis, is a Russian software company), it covers the program's many facets.

To simplify backup creation, Paragon has embedded to the utility a comprehensive set of wizards that pop up for many day-to-day tasks. To set up a backup you simply select what you want to back up (a whole partition, media, documents or email), where to back it up (a local, networked or online drive) and when (manually or scheduled).

Although backups are combined and compressed into a single backup archive, you can examine the folder tree within it and recover individual files with ease. Backing up a 30GB system partition took 35 minutes, which is around twice as long as Acronis True Image (below).



PARAGON lets you choose what you want to back up, where and when

The progress bar isn't much use, and shot up from 3 minutes to 6 hours partway through our backup. Paragon does work in the background, however, letting you get on with other tasks.

Version 11.0 of Backup & Recovery adds support for solid-state disks (SSDs) and hard drives larger in capacity than two terabytes.

It uses the WinPE 3.0 recovery environment, based on a Windows 7 kernel, and its interface is very similar to Windows' own. It's not just about aesthetics, however; it also means the program is likely to work better with the hardware found in a modern Windows PC.

Paragon includes its Adaptive Restore 3.0 utility, meaning it should also be better-equipped to restore a Windows system to a different machine. To use it, however, you'll need to be running a retail version of the operating system and be able to show Adaptive Restore where it can find the necessary hardware drivers for the installation.

Verdict

Paragon Backup & Recovery is a well-structured backup utility, which covers the needs of most home customers. Acronis offers better value with support for three PCs, however. ☒ **Simon Williams**

BACKUP UTILITY

Acronis True Image Home 2012

£59 inc VAT (3 PCs)

Contact
■ acronis.co.uk
Read more
■ tinyurl.com/64ja66s

System requirements
Windows XP/Vista/7; 512MB RAM; local/network/online storage

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

Things can often go wrong when you least expect it, and many of us are guilty of not putting in place the necessary protections to secure our data until it's too late. A backup routine is unlikely to be implemented until after you've suffered the loss of your emails, contact list, videos, photos, music, e-books and documents on at least one occasion. But it doesn't need to be this way. With Acronis True Image, it really is simple to regularly back up your PC.

ACRONIS lets you sync files on separate PCs via its online servers

This program has grown out of the company's original system-copying application, which took a snapshot of everything in a partition of your hard drive. It can still do system backups, but also file, online, real-time and scheduled backups.

The initial installation is very time-consuming, with the three-PC Family Pack drawing out the process by not offering an option to save the download prior to installation. The 71-character serial number that Acronis demands you enter for registration purposes doesn't help matters either.

Once over this hurdle, though, things proceed far more smoothly. The startup screen offers a quick tutorial to show you what the various parts of the program do, and you can set up working backups using wizards in a few clicks.

If you want finer control, the full backup edit screen offers a comprehensive set of checks. You can schedule backups to fit in with your working day, and the program can back up open files (essential when securing Outlook PST files).

As well as being able to choose full, version chain, incremental or differential backups, the program enables you to control their number

DRIVE UTILITY

Driver Genius 10.0 Professional

£25 inc VAT per year

Contact
■ avanquest.com/uk

Read more
■ tinyurl.com/5t4qh4q

System requirements
Windows 98/XP/Vista/7; 64MB RAM; 10MB hard-disk space

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

Second only to the advice to turn Windows PCs off and back on again to cure any performance issues is to install the latest drivers. It's often amazing how many problems can be cured by updated drivers.

These tiny bits of software are what make your motherboard, peripherals and add-in cards all play happily together.

Although you could routinely visit manufacturer websites to find out whether new drivers are available, the more devices you use the more this will become a chore. Enter Driver Genius 10.0 Professional.

Driver Genius automates the process, by searching through a Windows PC and identifying all the hardware drivers you have installed. It then visits the relevant sites, checks whether there are more recent versions and offers to download and install them.

You still have to manually run through the installation procedure for each driver, but this is usually the least time-consuming aspect.

Driver Genius sensibly created a restore point on our test PC before downloading and installing updated drivers for our display, Raid array, TV tuner and Intel chipset. We didn't immediately notice a speed improvement or smoother running, but driver updates are also designed to reduce the number of glitches you've yet to encounter.

DRIVER GENIUS searches for and installs new drivers on a Windows PC

Version 10.0 adds extra features to simplify the process. It includes a scheduler, allowing you to set up regular scans at convenient times. It can also display notifications when new drivers are available, and will remove outdated drivers from your Downloads folder.

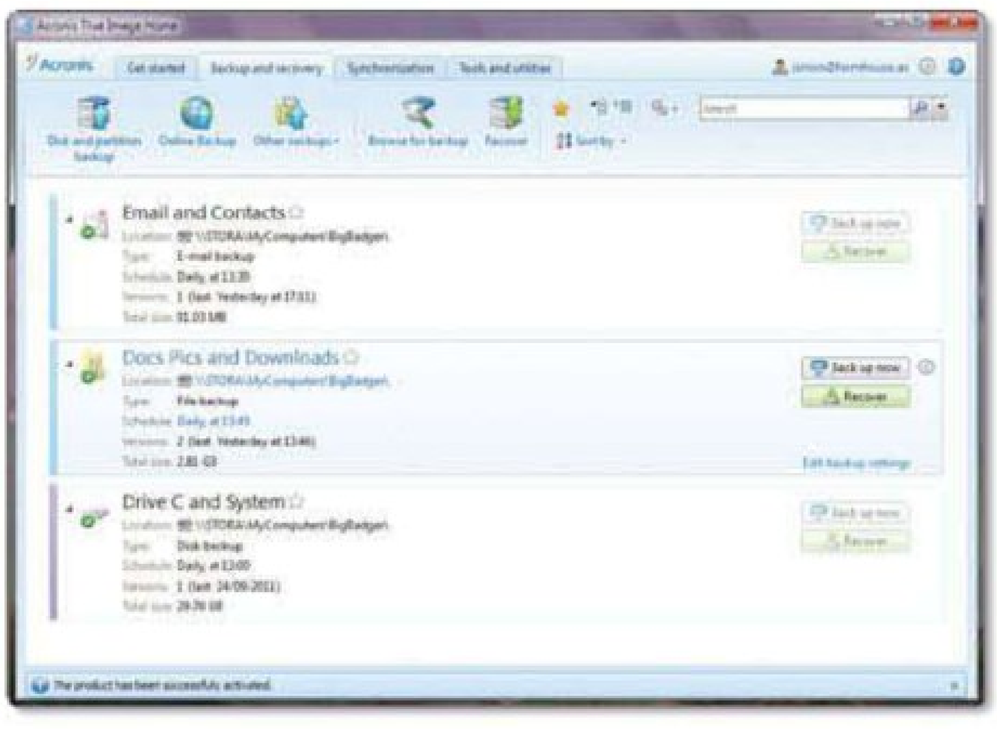
Driver Genius includes a backup feature, which makes it more straightforward to install the same drivers on a second same-spec machine. This will be useful for IT departments. The backup can be created as an executable file, too, so the driver installation will run automatically on each PC.

Plenty of sites can be found that host a range of drivers and act as a one-stop shop for downloading updates. Most charge for this privilege, however. While Driver Genius, too, requires an annual subscription, it saves you the bother of manually checking for updates. Think of it as a safeguard for your PC, like an internet security suite.

Verdict

This is a useful one-stop-shop for installing the latest drivers on your Windows PC, and it ensures all the various hardware is working to the same script. Driver Genius is very easy to use, does what it claims and works largely behind the scenes.

☒ **Simon Williams**



Backing up specific file types is simple using TRUE IMAGE HOME

and size by limiting how many backup chains you can have, how long they are stored and the total size of the backup on the storage media. Such media can be a second internal or an external drive, a networked drive or online storage space – although you'll need to pay extra for Acronis' online offering.

There's also 'non-stop' backup, which monitors the folders you select and saves any changes at five-minute intervals. This is particularly useful for email. The 2012 version can be used with NAS drives and online backup, as well as locally connected drives.

Another new feature is Sync. As its name suggests, this synchronises selected files and folders between two or more drives or PCs. You first need to set up an account with Acronis, but it then ensures that the latest versions of files are available on each PC or storage media. One user has to own the sync and invite others to join; it can be used between computers across different accounts, provided that each has access to the Acronis website.

On the technical side, the 2012 version of Acronis True Image Home adds support for drives larger in capacity than two terabytes, even if the native operating system doesn't. It also supports GPT and EFI disks.

Verdict

True Image remains one of the most comprehensive backup applications we've seen, and Acronis' 2012 update hits the right balance between features and ease of use. It lets you maintain a backup routine that's as simple or as complex as you need, and will secure your data on up to three PCs. ☒ **Simon Williams**

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INTERNET SECURITY SUITE

Eset Smart Security 5.0

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- tinyurl.com/5t2uhxs

System requirements
Windows XP/Vista/7

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

★★★½☆

Eset's internet security (IS) suite, Smart Security 5.0, combines signatures, heuristics and reputation analysis to provide protection against the main types of malware targeting Windows.

Reputation analysis works with reports from other users to rate unrecognised software. Unlike some IS suites, Eset doesn't work on a yearly cycle – it's been almost three years since version 4.0 was released.

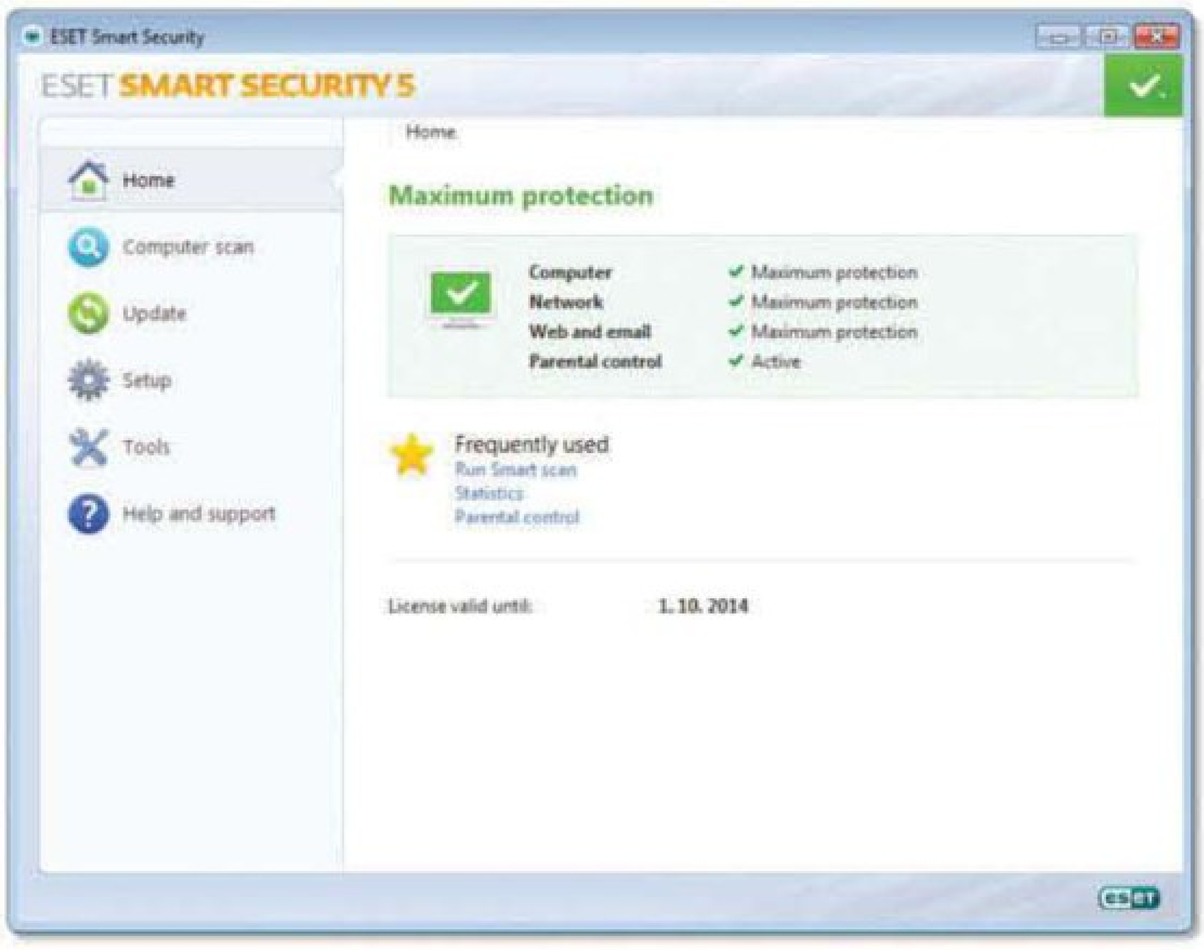
The suite includes a smart firewall, parental controls, a system rescue disk and a diagnostic module, which analyses running processes, Registry content, startup items and network connections.

The installation procedure is straightforward, and upgrading from the free trial to a full account simply entails buying a licence.

Simple security

Smart Security offers six options in a menu to the left of the screen. Home is simply a status page, and shows the security level of the PC it's protecting. Computer Scan performs smart and custom scans, while Update checks for program and signature updates (although this happens automatically in any case). Setup enables tailoring of the active program elements, and Help and Support explains how to effectively use the Smart Security.

The final menu option is Tools. In most IS programs, this might offer secure disk wiping, online backup and the like; here the range is less varied, which may account for Eset's comparatively modest asking price.



SMART SECURITY offers at-a-glance assurance that your PC is protected

You get options to prevent external drives or USB sticks from connecting to the PC, while a gamer mode stops Eset alerting you to threats mid-action, whether you're partway through a game, presentation or video.

Eset doesn't pop up alerts that'll cause you to panic, but gets on with its work in the background and opens the door gently like a Downton valet, should anything untoward need communicating: "Excuse me M'lud, but the staff downstairs believe your PC may have been infiltrated by a rogue footman. We've already locked the fellow in the coldroom and called for the groom to bring a pitchfork."

Protective power

Independent antivirus testing lab, AV-Test.org, has yet to complete its analysis on Smart Security 5.0. However, it scored version 4.2 of Eset's IS suite only 11/18 overall, with 3.5 for Protection, 2.5 for Repair and 5 for Usability. We would expect the new version to fare slightly better in Protection, and hopefully in Repair, too. As a comparison, AVG Free scored 14/18 and Bitdefender managed 16.5/18 in the same tests.

We ran our own tests to see what hit Eset had on our PC. With a full system scan running in the background, a file-copying operation was markedly slowed. The 1GB collection of miscellaneous files took 2 minutes 4 seconds to copy between two partitions of the same hard disk with no antivirus installed. With Eset performing a system scan in the background, the same operation took more than twice as long, at 4 mins 37 secs.

We then tested again with just the on-access scanner engaged, which routinely monitors all file-related operations. This time the process took 2 mins 7 seconds, suggesting a minimal performance hit under most daily tasks while the full-scan operations are dormant.

Since the program took around two hours to scan our test PC, which has around 88GB of files, it's probably best to schedule regular scans for periods when you won't be using the machine.

Eset makes much of giving you 'free' protection for virtual machines (VMs) running other operating systems (OSes) on a protected PC. However, since a VM is just another application running under the host OS, which has to be Windows XP or newer, we would certainly hope so.

Verdict

If you want a simple but solid IS product with few bells and whistles, but one which should handle the core functions properly, Eset Smart Security 5.0 is a sound choice. It's overall efficacy in spotting and blocking malware remains to be tested, though. In our tests it proved sluggish when it came to full scanning, and put a noticeable burden on the host PC; but at most other times it did the opposite and made only the lightest dent in performance. ☒ **Simon Williams**

It's best to leave full system scans to times when you won't be using the computer

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System requirements
300MHz processor; Windows 2000/XP/Vista/7; 256MB RAM; 30MB hard-disk space

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

iObit Uninstaller is a portable program that lets you see and remove any application installed on a Windows system.

The interface is divided into six horizontal tabs, listing all programs, browser toolbars (Internet Explorer only), recently installed apps, large programs, rarely used programs and Windows updates.

Not everything worked well. The Large Programs category reported one program consuming a whopping 166GB of space. When we right-clicked the application's name and selected 'Open File Folder' to locate it, we found it was 370MB.

The Rarely Used category was also strangely empty on our test PC; it ought not to have been. The Recently Installed category worked correctly, however, displaying the seven programs we'd installed in the past few days.

Batch Uninstall mode isn't always a given, even in commercial utilities, but it can save you a considerable amount of time. You simply tick the boxes next to the programs you want to remove and click Uninstall, then iObit does its magic. Or not. The software will simply run the uninstaller for each application you're trying to remove, one after the other. You still need to click through the uninstaller windows.

IOBIT UNINSTALLER lets you remove programs from a Windows PC

iObit offers an interesting Forced Uninstall feature, for applications that refuse to be removed via their own uninstallers. We tried this with an application that did have a registered uninstaller, and iObit correctly detected and ran it.

After removing a program you can run a 'Powerful Scan', which looks through your hard drive and Registry for anything left behind. The results are shown as a tree of files and Registry entries, which you can manually mark for deletion.

Verdict

iObit Uninstaller's Forced Uninstall and Powerful Scan features can help uncover leftover files, but if you're serious about application removal then you should look instead to Revo Uninstaller Pro. ☒ **Erez Zukerman**

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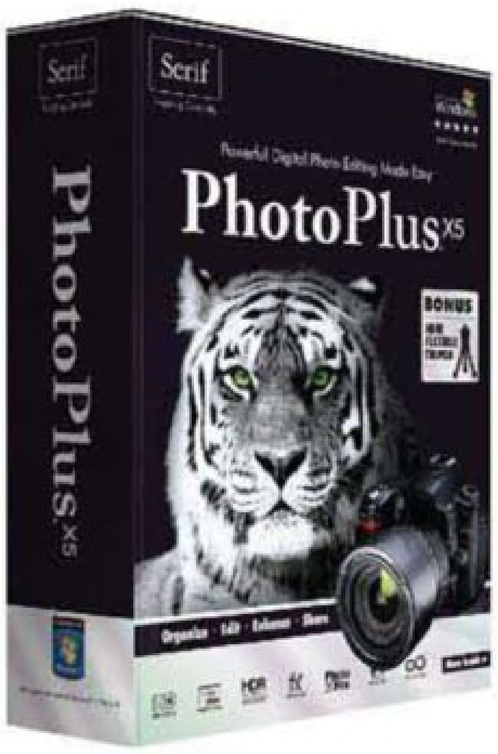

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COMPRESSION UTILITY

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System requirements
Windows 98/2000/XP/Vista/7; 1MB hard-disk space

Usability: ★★★½☆
Features: ★★★☆☆
Performance: ★★★★☆
★★★★½

When people talk about file compression, they usually mean Zip. In fact, they often make it into a verb – much like we 'Google' things on the internet, we 'zip' files before sending them over email. But Zip is just one compression format, and it isn't necessarily the best.

A more recent algorithm is 7z, and 7-Zip is the official reference implementation for the 7z format. Since it's open source, the format specification is distributed within the source code.

When you first launch 7-Zip, its interface is simple and sparse. You'll find a list of files, along with six large toolbar buttons and a menu. There are no wizards, welcome dialogs or other pesky interruptions. If you hit F9, 7-Zip will be transformed into a basic dual-pane file manager. You can even save up to 10 folders as Favorites if you use it often for traversing your file system.

To test the software, we used a folder containing 65MB of Microsoft Word and Excel documents, plus a few BMP image files. Compressed using Windows Explorer, the 65MB file was reduced to 8,881kB. 7-Zip compressed the same folder to 6,036kB, shaving off almost 3MB from the archive. That's a difference of more than 25 percent, and it's phenomenal when you consider Zip's market dominance.

7-ZIP offers a better compression ratio than Zip with most file formats

7-Zip doesn't always offer a superior compression ratio to Zip, however. When we tested it with a folder full of Jpeg files (which are already compressed), the resulting 7z archive was 78kB larger than a Zip of the same folder produced in Windows Explorer. The original archive was 34MB, however, so a 78kB difference is negligible.

Windows Explorer has been handling Zip files like folders for years, and most people will instantly recognise them and are happy to work with them. But send someone a 7z file and they may not know what to do with it. They may not even realise that the file attached to your email is a compressed archive.

Many email providers, notably Google, snoop into any Zip file you try to send and refuse to let the message go through. Compress your files using 7-Zip, however, and you can email them to anyone.

Verdict

7-Zip's user interface doesn't impress, but its compression ratio is far more appealing. This is a great alternative to Zip. ☒ **Erez Zukerman**

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All-in-one PCs

With their slim profiles, emphasis on style as well as performance, and large, bright screens, all-in-one machines make ideal family computers. Orestis Bastounis tests designer PCs with substance

It isn't hard to see the benefits of an all-in-one PC. A single unit housing both computer and display is easier to set up than a traditional desktop. It takes up less room and it looks better, too. Since wireless networking and Bluetooth are usually built-in, the only cable you need to attach is for power. These sleek machines won't look out of place in the living room, where they'll be easily accessible by the whole family.

In the past, performance was a necessary sacrifice. Surfing the web, listening to music and general productivity tasks could be accomplished, but the need to cram every component into the screen cabinet meant low-performance components that produced little heat were in order. There wasn't room for a dedicated graphics card, so gaming and video editing were a no-no, and even 720p video could slow to a crawl.

Today, all-in-one PCs are capable machines. Their dual- and quad-core processors run faster and cooler, with some using built-in graphics chips that can process HD video (Intel's second-gen Core chips offer faster graphics still). These PCs offer plenty of memory, large-capacity hard drives and full-HD displays – many of them touchscreen or 3D panels. This means you can do away with the wireless mouse and keyboard that could otherwise make your living room look cluttered, and don a pair of special 3D glasses to enjoy movie action leaping out the screen.

In fact, the all-in-one PC has become a viable, space-saving alternative to a TV and separate DVD/Blu-ray player. Some systems include digital TV tuners, remote controls and slot-loading DVD/Blu-ray drives.

Machines with touch-sensitive screens also offer a degree of future-proofing, with Microsoft placing a strong emphasis on touch input in its next desktop operating system (OS), Windows 8. The OS will include Metro, a bold interface specifically designed for touch-sensitive devices. All-in-one PCs will be able to take full advantage of its tile-based interface, switching between applications and scrolling through data with a finger flick.

All-in-one PCs are not easily upgradable. They run laptop-class components, and their custom designs make it difficult to swap out parts as you would with a traditional desktop PC. However, performance is now good enough that this may never become an issue.

Gamers, who were in the past better served elsewhere, will also be pleased to learn that many of the all-in-one PCs we review over the following pages can run the latest titles.

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

ACER ASPIRE Z5763

£799 inc VAT • acer.co.uk • tinyurl.com/3g5py5o

A major selling point of an all-in-one PC is its home-entertainment potential. Acer has squeezed into the Z5763 as much as it can to aid the enjoyment of music and films, including a digital TV tuner, Blu-ray drive and support for 3D playback (glasses are provided).

Movies look great on the PC's 23in matt display. Although the colours aren't as rich and blacks as deep as they are with the glossy screens of the competition, the Acer provides a strong image and won't suffer from distracting light reflections.

It's not a touchscreen display, but Acer provides a wireless keyboard and mouse for input. Note that these are not those pictured above: our review sample came without peripherals.

A large grey speakerbar sits below this panel and delivers very good sound quality, if lacking in bass. But it looks ugly, while a blue LED above is distracting; this PC won't blend into its home living-room environment as well as some of its rivals.

Performance isn't bad, but it's nothing to write home about. The Acer's nVidia GeForce GT435M graphics chip is neither as powerful nor up to date as the GT460M and GT540M offered by the Asus and Sony Vaio VPC-L22Z1e PCs respectively. Playable, yet mediocre, framerates are found in games – we recorded 38fps in Fear at 'Maximum' detail settings; but 3D mode slowed this PC to a crawl.

For other tasks the Z5763 puts in a respectable performance, particularly given its relatively low £799 price tag. Its 3.1GHz i3-2100 processor hails from Intel's second-generation Core family, but it can't keep up with the Core i5 and i7 competition.

Unless you need to complete intensive tasks that'll push a PC to its limit, it's unlikely that you'd notice any difference between Intel's various Core chips in a real-world setting. Combined with 4GB of system memory, this i3 CPU is powerful enough for most tasks.

VERDICT: Acer's Z5763 is a great multimedia PC, combining decent sound quality, digital TV, Blu-ray and 3D playback with a 1TB hard drive that's able to store plenty of content. We're not as convinced by its looks, however, and would like to see slightly faster performance.

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

PC ADVISOR BEST BUY

APPLE iMAC 21.5in (2.5GHz, 2011)

£999 inc VAT • apple.com/uk • tinyurl.com/6276q4s

For as long as we can remember, Windows and Mac fans have locked horns over which platform is better. They use the same components under the bonnet, with the real difference found in the OS. If you've never tried the iMac's native OS X 10.7 Lion, we think you'll find it straightforward to use. However, if you're determined to instead run Windows on the iMac, as we were to install our WorldBench test suite, you'll need to factor the extra cost of a licence into your budget.

Unlike many Windows-based all-in-ones, you won't find a Blu-ray player or USB 3.0 support here. The iMac instead offers Thunderbolt, which offers transfer speeds up to 10 gigabits per second (Gbps) with compatible peripherals. You can read more about the differences between these interconnect technologies on page 22.

Neither do you get a touchscreen, although the supplied Magic Mouse features a touch-sensitive body for scrolling. Alternatively, you can specify a Magic Trackpad for full multitouch.

This £999 version of Apple's 21.5in-screen iMac features a 2.5GHz Intel Core i5-2500 processor; it's also available with a faster 2.7GHz CPU. Apple supplies a 500GB hard drive, which is sorely lacking in capacity compared to some of the competition, and 4GB of RAM.

The iMac excelled in our benchmarks: its 139-point WorldBench score beat all others, while its AMD Radeon HD 6750M graphics chip delivered strong framerates in Fear (100fps at 'Maximum' detail).

Its 21.5in glossy display is smaller than most in this group (although it has the same full-HD resolution), but the iMac's in-plane switching (IPS) panel really stands out, with unparalleled image quality. The display complements the iMac's sleek looks and excellent build.

For once, we've been able to review an Apple computer that isn't the most expensive model in our group test; as the budget entry in Apple's line-up, this £999 all-in-one is relatively affordable.

VERDICT: Apple's iMac eschews USB 3.0 for the faster Thunderbolt connection, a large, so-so-quality screen for a smaller but far more beautiful IPS panel, a touchscreen for a touchpad, and Windows for OS X. It's Apple's entry model, but it still packs a mighty punch.

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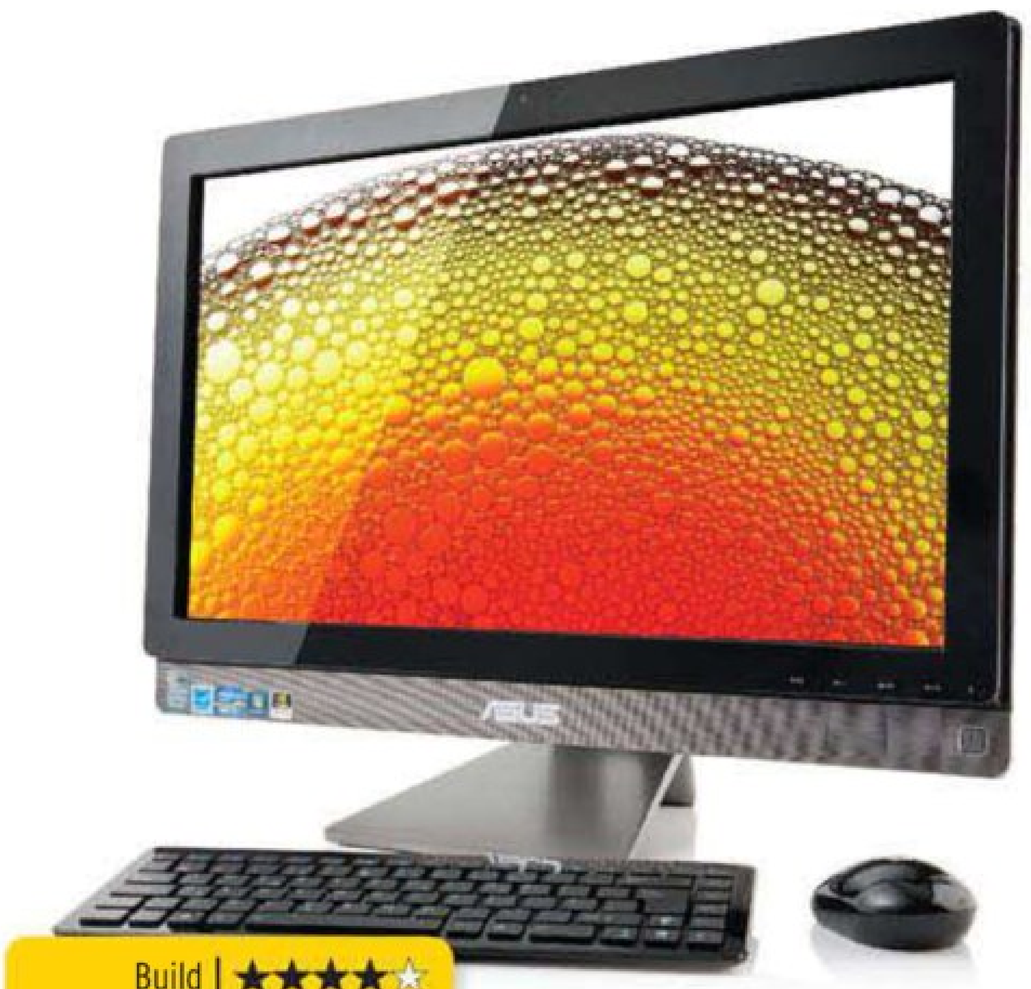

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★☆☆
Overall	★★★★☆

ASUS ET2400XVT

£1,277 inc VAT • uk.asus.com • tinyurl.com/6Lxtsn4

The £1,277 ET2400XVT is one of the top models in Asus' all-in-one PC line-up. Its strong specification includes a 23.6in touchscreen display, support for nVidia's 3D Vision technology (active-shutter glasses are supplied), two USB 3.0 (and four USB 2.0) ports, 6GB of DDR3 RAM, a Blu-ray drive and a 1TB hard disk.

The Asus' quad-core i7-740QM processor is a member of Intel's first-generation Core processor family. It supports Hyper-Threading and Turbo Boost, allowing the 1.73GHz processor to run at 2.93GHz when the machine is under load. However, it's significantly slower than the second-generation processors seen in much of the competition, including the only other Core i7-powered machine here, the Sony Vaio VPC-L22Z1e.

Although this PC supports 3D playback, a separate transmitter is required for it to function. Nevertheless, 3D worked well in our tests; coupled with a powerful nVidia GeForce GTX460M graphics chip, the Asus delivered good framerates. We recorded a playable 40fps in Fear at 'Maximum' detail settings.

The 23.6in screen isn't the most accurate we've seen, displaying a slight oversaturation of some colours – particularly with reds. We adjusted the colour profile and the problem largely went away, but none of the other PCs on test required adjustment out of the box.

Asus' bundled software isn't as polished as the suite of programs you get from Apple, Sony or HP, although it does a good job of helping you to explore the PC's touchscreen capabilities.

The ET2400XVT's build quality and appearance is also somewhat lacking when compared to the Apple, Sony and HP all-in-ones. It's the little extras that make those machines so appealing, such as their direct integration of 3D to the monitor (where applicable). When you're paying close to £1,300, you simply expect more.

VERDICT: Asus' ET2400XVT is a high-end all-in-one computer with a very good specification and plenty of power for getting most tasks done. However, it's let down by its older first-generation Intel Core processor and incomplete 3D integration.

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

HP TOUCHSMART PRO 610-1130UK

£1,200 inc VAT • hp.com/uk • tinyurl.com/69tvukz

This chunky all-in-one PC offers great potential for entertainment and office productivity. Although the HP TouchSmart's 23in screen is no larger than that of the competition, its chassis is much thicker, at 103mm. A black soundbar below the screen only adds to its bulk.

Input is via the touchscreen or a wireless keyboard and mouse; you also get a handy remote control. We like the way you can tilt the display by 45 degrees. This reduces the arm fatigue that often results from prolonged use of a touchscreen.

With its size also comes a sturdy build, and the HP feels relatively robust in use. It'll make an ideal family PC if you have young kids crashing around the house, while teenagers will appreciate HP's proprietary Beats Audio-branded speakers. These deliver crisp highs and mids, and excellent bass for their size. A slot-loading Blu-ray drive completes the HP's home-entertainment credentials.

The TouchSmart Pro combines a first-generation Intel Core i5-650 processor running at 3.2GHz with 6GB of DDR3 memory and a 1.5TB hard drive. This meaty specification resulted in a 122-point tally in our WorldBench 6 speed test. It's a good score but significantly lower than the Apple iMac's 139, which uses a second-generation i5 chip.

HP's bundled software is very good, and includes programs that make great use of the PC's touch input when working with photos.

The TouchSmart's AMD Radeon HD 5570 graphics card isn't particularly powerful. It has 1GB of video memory, and performs acceptably at lower resolutions and in older games – we recorded 72fps in the five-year-old Fear at 'Maximum' detail. Stalker: Call of Pripyat proved more of a challenge for the HP; we saw 36 and 22fps at its 'Medium' and 'Ultra' settings respectively.

The HP includes two USB 3.0 and four USB 2.0 ports, plus two HDMI connections and a multiformat card reader.

VERDICT: We aren't convinced that its tilting stand will be used all that often, but HP should be commended for its attempt to alleviate the arm-fatigue problems associated with all-in-ones. The HP isn't the most powerful PC we've seen, but it's no slouch either.

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

SONY VAIO VPC-J21L8E

£899 inc VAT • sony.co.uk • tinyurl.com/42ykrru

When we unpacked the VPC-J21L8E, we thought Sony had sent us a TV to review. The company has copied the square edges and styling of its Bravia TVs with astonishing accuracy.

At just 185mm deep and weighing only 9.8kg, this all-in-one is extremely compact. It has the joint-smallest display in the group, too, at 21.5in. It's hard to imagine how Sony has managed to squeeze inside a 2.3GHz Core i5-2410M processor, 4GB of DDR3 memory and a 1TB hard drive; it has, of course, and this machine performs admirably well with most productivity tasks. We recorded 84 points in our WorldBench 6 speed test.

Its touchscreen display is capable of two-point multitouch, but it's overly sensitive. Hovering a finger near the Start menu caused the Sony to select the Internet Explorer shortcut.

We were surprised not to find a Blu-ray drive, with Sony instead supplying a slot-loading DVD SuperMulti drive on the Vaio's right side. The PC also lacks a dedicated graphics card, and relies on the Intel HD Graphics 3000 integrated to its processor.

It delivered mediocre performance in our gaming tests, and recorded a single-digit framerate at Stalker: Call of Pripyat's 'Ultra' setting, and an unplayable 17fps in Fear ('Maximum' detail).

The bundled wireless keyboard is comfortable to type on, with isolated square keys and a similar svelte design to the PC with which it's paired. The wireless mouse is also small and fits snugly in the hand, although we aren't keen on its glossy black finish.

On the left edge are a pair of USB 2.0 ports, audio outputs and a memory card reader. At the top is the computer's power button, and another that switches off the Sony's 21.5in display (surprisingly, this isn't a given for all-in-ones). You also get two USB 3.0 ports.

VERDICT: This slim and compact all-in-one PC looks great but is let down by a lack of grunt. In daily use the VPC-J21L8E performed smoothly, however. It's pricey, but the build is solid. This Sony Vaio is ideal for anyone lusting after a cute all-in-one computer that's capable of most computing tasks.

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

PC ADVISOR RECOMMENDED

SONY VAIO VPC-L22Z1E

£1,599 inc VAT • sony.co.uk • tinyurl.com/3r9ppg6

Sony has more than a passing interest in both 3D and Blu-ray. The company is one of the biggest vendors of 3D TVs and the lead developer of the Blu-ray disc format. It makes sense that both are centrepiece technologies for its flagship all-in-one PC.

The Vaio has enough computing performance to make the most of both, with the best specifications in our group. It's based around a second-generation Core i7-2670QM quad-core processor, which usually runs at 2.2GHz but climbs to 3.1GHz with Turbo Boost enabled. There's also 8GB of system memory, a 1TB hard drive and an nVidia GT540M graphics card, with 1GB of video memory.

This PC decimated its rivals in our gaming tests, where it achieved 125fps in Stalker: Call of Pripyat ('Ultra' settings). The closest competition scored only 26fps in the same test. Importantly, the Sony is also able to deliver a reasonable framerate when operating under the extra strain of 3D mode.

We weren't able to run our WorldBench 6 speed test, but believe Sony's Vaio would have obliterated the competition here, too.

The 24in glossy display is the largest in our round-up, and offers strong blacks, bright, vivid colours and crisp text. It works very well in 3D mode when paired with the supplied glasses; unlike the Asus, 3D is fully integrated to this all-in-one.

The included webcam delivers a clear HD picture. You also get three USB 3.0 ports for attaching the latest high-speed peripherals and a combo DVD/Blu-ray burner.

Unfortunately, this dream entertainment PC carries a hefty price tag. At £1,599, it sits at the higher end of the all-in-one market. The 27in version of our Best Buy iMac, meanwhile, is available from £1,399 and offers a significantly larger and better-quality screen.

VERDICT: A stylish and powerful home-entertainment centre, the Sony Vaio includes a Blu-ray writer and a 3D touchscreen. Some useful software is bundled, and performance is fantastic for an all-in-one PC. However, it's an expensive machine at £1,599, and we believe better value can be found in Apple's 21.5in iMac.

Conclusion

Specialist components and custom designs increase the cost of all-in-one PCs, but many offer better value than you might at first think. These PCs can function as an entertainment hub, office workhorse and a gaming PC all at once, and often include touchscreen displays, Blu-ray and 3D.

Strong application performance is a key requirement for any PC, and every machine in our round-up can handle daily computing tasks with aplomb.

Equally important is the PC's build quality and design, while the supplied peripherals should meet the same standards.

We also look at preinstalled software: if it slows down the PC or fails to improve the computing experience, we're not interested.

At £799, Acer's Aspire Z5763 is the least expensive all-in-one PC in our round-up. A few compromises have been made in order to meet this low price and we aren't keen on some of Acer's design decisions, such as the ugly soundbar below the display. If you can afford to extend the budget a little, you can find a much better deal for your money.

The Asus is a powerful machine. It supports nVidia's 3D Vision technology, although we were disappointed to find this isn't fully integrated to the machine. We like its 23.6in touchscreen, but found nothing special that captured our attention.

It's a similar story with the HP TouchSmart, although we're intrigued by the company's attempts to reduce arm fatigue with a reclining display.

Sony's two Vaio offerings couldn't be more different. The compact dimensions of its J-series all-in-one make it one of the best-looking PCs we've seen, and more akin to the company's Bravia TVs. Sadly, Sony seems to have put more effort into the Vaio's appearance than its performance, and the £899 VPC-J21L8E is lacking in high-spec components.

The VPC-L22Z1E, by contrast, has the best specification in the group. It's incredibly powerful – 3D video and the latest games won't tax its nVidia graphics card with 1GB of video RAM, while it made short work of our application performance benchmark. Several extra features are thrown in, including a Blu-ray writer. All these things push up the price tag, however; if it wasn't so expensive, the £1,599 Vaio would be getting our Best Buy rather than Recommended award.

Apple's 21.5in iMac stands apart from the competition. It isn't the cheapest (although,

	ACER £799 inc VAT ★★★★☆	APPLE £999 inc VAT ★★★★½ PC ADVISOR BEST BUY	ASUS £1,277 inc VAT ★★★★★	
Model name	Aspire Z5763	iMac 21.5in (2.5GHz, 2011)	ET2400XVT	
Processor	3.1GHz Intel Core i3-2100	2.5GHz Intel Core i5-2500	1.73GHz Intel Core i7-740QM	
Screen size and type	23in matt 3D LCD	21.5in IPS glossy LED-backlit	23.6in glossy 3D touchscreen	
Resolution (pixels)	1920x1080	1920x1080	1920x1080	
Operating system	Windows 7 Home Premium 32bit	OS X 10.7 Lion	Windows 7 Home Premium 32bit	
RAM	4GB DDR3	4GB DDR3	6GB DDR3	
Storage	1TB, 7,200rpm HDD	500GB, 7,200rpm HDD	1TB, 7,200rpm HDD	
Graphics	nVidia GeForce GT435M with 2GB VRAM	AMD Radeon HD 6750M with 512MB VRAM	nVidia GeForce GT460M with 1.5GB VRAM	
Ports & connectors	6x USB 2.0, HDMI	4x USB 2.0, 1x Thunderbolt, FireWire 800, IR receiver	2x USB 3.0, 4x USB 2.0, D-Sub, HDMI	
Optical drive	DVD±RW/BD-ROM combo	8x DVD±R DL/±RW slot-loading	DVD±RW/BD-ROM combo	
Connectivity	802.11b/g, gigabit ethernet, Bluetooth	802.11a/b/g/n, gigabit ethernet, Bluetooth	802.11b/g/n, gigabit ethernet, Bluetooth	
Card slot	SD/SDHC/MS/MS Pro	SD/SDHC/SDXC	SD/SDHC/SDXC	
Other features	TV tuner, webcam, 3D glasses, wireless keyboard & mouse	FaceTime HD webcam, wireless keyboard, Magic Mouse, stereo speakers, headphone jack, mic input	webcam, 3D glasses, wireless keyboard, headphone jack, mic input	
Power consumption	73W (idle), 122W (under load)	not specified	40W (idle), 78W (under load)	
WorldBench 6 score	not tested	139	not tested	
Games score (fps)[1]	38/45/26	100/48/not tested	40/45/26	
Dimensions	570x85x484mm	528x189x451mm	582x50x495mm	
Weight	not specified	9.3kg	13kg	

[1]Framerates tested using Fear (Maximum detail settings), and Stalker: Call of Pripyat (Medium and Ultra settings) respectively

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for once, neither is it the most expensive), it doesn't feature a touchscreen, Blu-ray or USB 3.0, it doesn't run Windows, and it has the joint-smallest display and lowest-capacity hard drive in the group. But we like it. This all-in-one is undoubtedly attractive, with the best screen on test, and the iMac offers strong performance for gaming and everyday computing tasks. Uniquely, it also provides a Thunderbolt data connection.

The clincher is in Apple's gesture-driven controls. The combination of OS X 10.7 Lion and the supplied Magic Mouse arguably offers a better tactile experience than a standard touchscreen display.

For those who've used only Windows, however, OS X may seem like an alien environment. It's worth trying the iMac before purchase to make sure it's for you.

How we test

We ran each all-in-one computer through the same gaming benchmarks as we do all the systems that enter *PC Advisor*'s Test Centre. We first ran the five-year-old game Fear at its 'Maximum' detail settings, and gauged performance using its built-in framerate-measurement tool.

Next, we ran the slightly more demanding DirectX 11.0 game Stalker: Call of Pripyat at its 'Medium' and 'Ultra' settings. This gives a better idea of performance with recent titles. We enabled tessellation to push each machine's graphics hardware to the limit.

Of course, not everyone is interested in playing the latest games. Strong graphics performance is desirable, but even the most powerful all-in-one PC won't be the best choice for a hardcore gamer.

We use WorldBench 6 to measure application performance. This stopwatches a PC as it completes a series of scripted operations, using 10 real-world programs (Adobe Photoshop, Microsoft Office, Mozilla Firefox, WinZip and more). 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.

Since most people are more likely to choose an all in one PC for its space-saving and design credentials than its performance, we paid particular attention to each machine's build quality and overall design when deciding our final ratings.

Finally, we considered value for money. You'll pay extra for the privilege of having all componentry within the screen, but some offer more than others for the money. ☒

	HP £1,200 inc VAT ★★★★½	SONY £899 inc VAT ★★★★½	SONY £1,599 inc VAT ★★★★★ PC ADVISOR RECOMMENDED
	TouchSmart Pro 610-1130UK	Vaio VPC-J21L8E	Vaio VPC-L22Z1e
	3.2GHz Intel Core i5-650	2.3GHz Intel Core i5-2410M	2.2GHz Intel Core i7-2670QM
	23in glossy touchscreen	21.5in glossy touchscreen	24in glossy 3D touchscreen
	1920x1080	1920x1080	1920x1080
	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit	Windows 7 Home Premium 64bit
	6GB DDR3	4GB DDR3	8GB DDR3
	1.5TB, 5,400rpm HDD	1TB, 7,200rpm HDD	1TB, 7,200rpm HDD
	AMD Radeon HD 5570M with 1GB VRAM	Intel HD 3000	nVidia GeForce GT540M with 1GB VRAM
	2x USB 3.0, 4x USB 2.0, 2x HDMI, IR receiver	2x USB 3.0, 2x USB 2.0, HDMI	2x USB 3.0, 3x USB 2.0, HDMI
	DVD ± RW/BD-ROM combo	DVD SuperMulti drive	DVD ± RW/BD-ROM combo
	802.11b/g/n, gigabit ethernet, Bluetooth	802.11b/g/n, gigabit ethernet, Bluetooth	802.11b/g/n, gigabit ethernet, Bluetooth
	SD/SDHC/MS/MS Pro/xD	SD/SDHC/SDXC/MS Duo	SD/SDHC/SDXC/MS Duo
	TV tuner, Beats Audio, webcam, wireless keyboard & mouse, remote control, stereo speakers, headphone jack, mic input	webcam, wireless keyboard & mouse, stereo speakers, headphone jack, mic input	Kensington lock, webcam, wireless keyboard & mouse, stereo speakers, headphone jack, mic input
	67W (idle), 112W (under load)	41W (idle), 72W (under load)	87W (idle), 135W (under load)
	122	84	not tested
	72/36/22	17/18/9	116/215/125
	584x103x450mm	525x185x398mm	608x168x429mm
	11.8kg	9.8kg	12kg

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GROUP TEST

Tablets

Tablets are set to be one of the most popular technology gifts this Christmas. While Apple's iPad 2 continues to dominate the market, it's far from the only device worthy of your consideration. Rosemary Hattersley tests eight of the best

With a market share of around 73 percent, Apple doesn't need to do much to continue ruling the tablet roost. Unlike this time a year ago, however, it has some compelling competition in the form of Android Honeycomb tablets and at least one other operating system.

Most competing tablets seek to do the same things: deliver a touchscreen interface that offers uncomplicated access to the web and online services, email, social networks, calendaring and contacts, along with your music, photos, videos and games. The exceptions are the BlackBerry PlayBook (page 69), which has corporate connectedness as well as secure personal messaging embedded in its DNA, and the ill-fated WebOS-based HP TouchPad, which promised much to business users but launched too late to compete.

You can still buy an HP TouchPad, but for £400-plus rather than the cut-price £89 deal of summer 2011. As with the Palm Pre smartphone that engendered the WebOS operating system on which the TouchPad is based, its future as a footnote in the 'Tablet PCs' entry on Wikipedia will undoubtedly ask 'What if?'

Microsoft has also been trying to elbow its way into the corporate end of the tablet market but, as our review of the Fujitsu Stylistic Q550 on page 36 explains, the desktop operating system is just too hefty a burden for a tablet processor to carry. Wait for Windows 8 for better value and a 'full' computing experience worth having – and on a tablet that doesn't weigh or cost as much as a laptop.

Changing landscape

We last compared tablets six issues ago (August 2011, page 76), when the iPad 2 had recently launched and the first Android Honeycomb tablets were onsale.

Honeycomb is the first version of the Google Android operating system specifically written for tablets, and it's very different in use to the company's Gingerbread and Froyo smartphone platforms. Honeycomb tablets have themselves been subject to revision, with version 3.2 adding support for smaller screens – the Acer Iconia A100 (page 67) being the first such example. Accompanying app screen-resizing options allow developers to produce content for these smaller devices. Memory management makes it less likely apps will hang, too.

Now, almost all the Android tablets on the market are Honeycomb-ready. To take advantage of apps written for smartphones,

you'll want to update to Honeycomb 3.2 and use its zoom feature.

In our previous group test, the Motorola Xoom, Asus Eee Pad Transformer and Acer Iconia Tab A500 were the heavyweights lining up to punch a hole in Apple's tablet crown. All three drew our qualified admiration, but we still felt price, bulk and style – as well as dedicated Android tablet apps – held each tablet back.

Samsung has since pitched in with its Galaxy Tab 10.1. This 10.1in-screen tablet brought some much-needed sophistication to the Android offerings, but also drew Apple's ire over possible patent infringements – a court battle was ongoing as we went to press. From a customer perspective, however, it's good news that some competition has emerged.

In the run-up to Christmas, we were confident that better-value tablets would emerge. But encouraging price cuts over the summer seem to have been only temporary: the £400-plus demanded for a 16GB Wi-Fi-only Android Honeycomb 3.2 tablet is now about average. Adding storage via an SD Card – or choosing a 32GB model instead – boosts capacity for relatively little extra cost. You'll still pay around £500 for a 3G-enabled tablet, though, and there are very few mobile contract deals around that allow you to spread the cost.

The 'best' deals in this respect are the £499 3G-enabled Sony Tablet S with 16GB of storage and the £268 Acer Iconia Tab A100 with a 7in screen and 8GB of storage. Price comparisons are easy to make, of course. It's performance, battery life and usability that distinguish the pack.

We found the Apple iPad 2 the best of the bunch for usability and the flexibility that a choice of several thousand apps offers. Its touchscreen is the most responsive in our group test, and its build quality is excellent. Apple doesn't have things all its own way, though. The BlackBerry PlayBook equals the iPad 2 for looks, build and screen accuracy. Maker RIM has taken note of criticisms of its poor native email support for non-BlackBerry smartphone users, too: an update that's expected next year will add an email client, allowing it to function independently of a tethered handset.

We also found much to admire in the Sony Tablet S. This newcomer to the market isn't as sturdy and its screen's not as responsive as the iPad or PlayBook, but it offers the first alternative Android design. In terms of entertainment credentials, it's probably the best-equipped here, with the entire Sony PlayStation Network and Entertainment arsenal at its disposal.

Apple hasn't been sitting still either: October saw the introduction of iOS 5 for the iPad, Mac, iPhone and iPod touch. (Google has also unveiled its unified operating system, Android 4.0 Ice Cream Sandwich, but it's yet to have made its way into the tablet market.)

While the premium models we've just outlined are attracting most of the headlines, it's the less expensive models that may be a more realistic buy. Accordingly, we've taken a look at what Packard Bell can bring to the 10.1in-screen table, plus 7in models from HTC and the lesser-known Storage Options.

Budget tablets are coming, though. The Amazon Kindle Fire, announced in September, went on sale in October in the US for $199. Amazon hasn't confirmed that it will sell the Fire in the UK. Nevertheless, ignoring the fact that US prices don't include tax, if Amazon's pricing were to translate to £199 over here then it would be half the price of an iPad 2 and most Android Honeycomb tablets.

ViewSonic, meanwhile, is set to sell its ViewPad 10e for £199 (see page 24). It won't be a Honeycomb device, but the 9.7in in-plane switching (IPS) touchscreen and 1GHz Cortex A8 processor suggest it will be a faster copy of the original iPad – not a bad device to emulate. The smartphone Android platform may deter some, though.

Toshiba is also back in the game with the AT200, a trim 7.7mm Honeycomb tablet that's slimmer than the Samsung Galaxy Tab and set to go onsale at the end of the year.

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

ACER ICONIA TAB A100

£268 inc VAT (8GB) • acer.co.uk • tinyurl.com/3t2bjqL

The Acer Iconia Tab A100 is a 7in-screen tablet that comes with Android 3.2 Honeycomb preinstalled. It was the first small-screen Honeycomb tablet to launch in the UK.

It's light and solidly built, although it looks fairly chunky, and is clad in a patterned grey plastic chassis. Weighing 401g, it's almost identical in size to the smaller BlackBerry PlayBook.

Acer includes a full complement of connection options: HDMI, microUSB and a pair of speaker grilles occupy one end, together with a slim power/docking port. At the other is a silver power button, which glows blue in standby mode, and a 3.5mm headphone jack.

The screen is dark, bordering on brooding. This helps disguise the usual fingerprint smear, but also means the app icons scattered across its five home screens tend to blend into the background. Vertical viewing angles aren't great.

The 5Mp camera reproduces detail and colour well, but you may find the slew of options for viewing your gallery confusing.

Acer installs Nemo Player to display photos and play music and video. A Video Wall of favourites lets you quickly jump to recent viewings. It's not the most sophisticated media manager, but the simple setup suits the limited screen dimensions.

A separate Multimedia app serves up e-readers, games, social networks, music and video players, while Clear-fi is a bespoke media manager for accessing content over a Wi-Fi network. Using the latter, images were crisp and the detail was preserved up to 5x zoom.

Text entry is made easier by the inclusion of commonly used symbols at the right of the onscreen qwerty keyboard.

The GPS module works well. Clicking on an address given in a Calendar listing prompted Google Maps to launch and, within 5 seconds, zoom into the exact building we'd specified.

Battery life is good. The 1GHz nVidia Tegra 2 processor and 1GB of RAM doesn't seem to struggle and the device didn't crash even with nine apps running at once. You can monitor what's using the battery power and manually quit apps.

We spent 4 hours browsing the web, downloading apps and casual gaming, and the Acer had a third of its battery remaining. Video use saw the battery indicator diminish rather faster.

VERDICT: The Acer Iconia Tab A100 makes a very good case for Android Honeycomb on a 7in-screen tablet. Its performance and responsiveness were impressive in our tests, and despite its smaller screen and icon size we had no issues with accurately inputting text. We expected smaller to equal cheaper; here you settle for convenience, but Acer has set a high standard for the 7in tablet.

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

PC ADVISOR BEST BUY

APPLE iPAD 2

£399 inc VAT (16GB) • apple.com/uk • tinyurl.com/6cxnez6

Head and shoulders above most of the pack when it comes to looks, the Apple iPad 2 is the tablet to beat here. Its battery life, slim profile, beautiful 1024x768-pixel screen and accurate onscreen keyboard are second to none. Its IPS panel suffers some problems with reflections, but allows for good viewing angles.

The iPad 2 is slimmer, faster and lighter than the original model. It weighs 618g, making it a smidgen heavier than the plastic-clad Sony but far slimmer at 8.8mm.

Apple has also given the interface an overhaul. With iOS 5 (also available to owners of the original iPad) you get access to iCloud, which automatically backs up files stored on your handset. We were impressed to find content written on our iPad appear on our work computer without prompting.

If you dislike being tied into iTunes, iCloud offers a great alternative. The iTunes Match service is expected to allow you to re-buy music bought elsewhere at iTunes at modest cost. You aren't tied to using iTunes for synching anything else from your iDevices.

Using the iPad 2 is a joy. You can simultaneously browse up to nine web pages. There's no support for Flash, but you get an exceptionally smooth browsing experience with none of the stutters that plague some tablets.

Apple's multitouch control has yet to be bettered by another tablet maker. You also get by far the best choice of tablet-specific apps, without the worry of accidentally downloading rogue software. iCloud offers a workaround to the limited storage issue (Apple doesn't provide a memory expansion slot), while third-party accessories let you hook up the iPad to a TV via HDMI.

The iPad's 0.7Mp rear camera is nowhere near as good as the 5Mp alternatives of many Android tablets. You also get a front-facing VGA-resolution (480x640 pixels) webcam for video chat. Apple's FaceTime works in full-screen mode and lets you assume amusing guises and morph yourself in real time as you chat with friends. This, and the improved video handling, are benefits of the faster A5 chip.

The Honeycomb tablets here are just as good at video playback, however, and have better stills cameras. The HTC Flyer in particular is very good for zany video chats.

Really, though, this is nitpicking. The iPad 2 is the best executed and most desirable tablet around – as the market statistics suggest.

VERDICT: A poor camera and a lack of physical connections are among our only grumbles. The iPad 2 is a superlative slice of electronics with the slickest interface, most extensive choice of apps and some welcome enhancements with the introduction of iOS 5.

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

HTC FLYER

£399 inc VAT (16GB) • htc.com • tinyurl.com/44dhgfx

The HTC Flyer has a faster processor than most of the Android pack, with a 1.5GHz Qualcomm Snapdragon running the show. It's more oversized smartphone than of-the-moment tablet, though. It runs Android 2.3 Gingerbread rather than Honeycomb, reflecting the fact it was developed and first unveiled prior to the advent of Android 3.0.

HTC said it would offer an upgrade when Honeycomb launched, but the Flyer is still sold without it. For those who are prepared to do some tinkering, however, the company has 'unlocked' the phone so you can install the update available at htcdev.com.

Operating system issues aside, our main gripe with the HTC is its expense. A 7in, Wi-Fi-only version with 16GB of storage costs £399. However, Expansys now sells a 32GB Wi-Fi plus 3G model for £499.

We are fond of its aluminium finish and vibrant – albeit rather shiny – 1024x600-pixel screen, however. The large icons offered by the smartphone platform aid accuracy, but we found the way the screen orientation updates in only one direction annoying. In portrait mode there's a great preview feature for emails, plus useful icons that show which messages are yet to be replied to.

The Flyer's web browsing experience is hobbled by the need to press a + button to open a new window, but pages appear quickly and are crisply rendered. Pinch-to-zoom gesture support is welcome.

Entertainment is largely well-handled. YouTube clips are playable only through the dedicated app, and there's no SD Card slot so you'll need to stream or download content – the impressive HTC Watch portal lets you access paid-for content. The movie library is relatively limited, but you now have another option: Google has launched YouTube movie downloads in the UK.

One putative use for the Flyer is as a graphics tablet. There's no reason why touchscreen devices should be viewing and playback terminals only. A stylus is supplied. Compared with some of our finger-based drawing attempts on the Sony Tablet and Acer A100, we felt satisfactorily creative here. You can annotate photos, too.

An upside to HTC's focus on resolution and stylus input is a more precise touchscreen experience than on other tablets.

The 5Mp camera is an above-par snapper with autofocus, flash and responsiveness on its side. This is joined by a 2Mp front-facing camera that acts in a similar fashion to FaceTime, with several zany effects to try out for size. The Camcorder function doesn't directly integrate with the stills camera, however.

VERDICT: As a smaller tablet with graphics-slate aspirations and entertainment options, the Flyer is rather good. But HTC ought to drop the price if the Honeycomb upgrade isn't going to materialise.

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

PACKARD BELL LIBERTY TAB

£299 inc VAT (16GB) • packardbell.co.uk • tinyurl.com/5w55ec6

The Liberty Tab ships as a 10.1in-screen Android Honeycomb 3.0 tablet of the type that's been filling shop shelves for the past few months. It's an imposing slab, with plenty of accompanying heft. It's very well-connected, however, with slots for an SD Card, HDMI and docking. A USB port accompanies the MicroUSB charging port.

The Liberty Tab has smart silver-coloured accents along its top and bottom and a browny-red rear plate. In fact, Packard Bell has done a great job of disguising the Acer Iconia tablet that lies within. Despite its superficial gloss, this tablet has the poorest build here.

Packard Bell has dispensed with the interface frippery that bogs down some tablets. There's no confusion of media players, for example, which you get with Acer's tablet range. We were also pleased to discover an update to Honeycomb 3.2 is available.

The 10.1in screen is a 1280x800-pixel IPS panel. It does a good double act as a mirror, but is capable of wide viewing angles.

The 1GHz CPU is standard, but the graphics processor couldn't keep up with the action gaming for which we wanted to use the Tab.

Entertainment is curiously muted. Playing the preinstalled Need For Speed through reasonable-quality headphones we got hardly any sense of pace as we raced through city streets. An unsophisticated pair of speakers features low down on the rear.

Streaming professionally recorded music videos from YouTube worked well, but the screen often went blank as the content was buffering. Adjusting the timeout settings didn't fix this.

The GPS was spot-on, with directions for walking and vehicular navigation provided almost instantly. Zooming in and out using a two-finger pinch resulted in very fast detail redrawing.

Photos taken on the Liberty Tab's 5Mp camera are ropey. You can zoom in at up to 8x, but we don't recommend it. The 2Mp webcam is worse still; artificial light is poorly handled, with thick edges of purple fringing, and detail is lost at very low magnification levels. This camera also defaults to a portrait screen orientation.

Battery life depletes quickly when the Wi-Fi is active, so we suggest keeping that switched off unless you really need it. Packard Bell claims an operational life of 10 hours between charges, but we got just over 3.5 when using the Liberty Tab for music, gaming, web browsing and taking snaps.

VERDICT: We were pleasantly surprised by the responsiveness and general likability of the Packard Bell Liberty Tab. The hardware and the rather plasticky build are not without their shortcomings, but the specification and price of this tablet is above par. We also like the improvements its made to the interface.

Storekeeper.com

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

RIM BLACKBERRY PLAYBOOK 2.0

£229 inc VAT (16GB) • uk.blackberry.com • tinyurl.com/6kmsse8

We had high hopes for the PlayBook but, as with the ill-fated HP TouchPad, our ardour had ebbed by the time it eventually came to market. It finally went onsale in the UK just days before the iPad 2, which was either very confident or very foolish.

The build quality is second to none. The iPad is slimmer, but the 7in-screen (1024x600-pixel) PlayBook is far lighter at 425g. The glassware is touch-sensitive from edge to edge, and trumps other tablets for screen legibility in tricky lighting conditions.

We fell for the navigation setup of this compact tablet almost immediately. Whereas most tablets require you to press a fingertip on an item to select it, here you glide in a seamless fashion from screen to screen. You can kill off unwanted items with a swipe from the edge of the screen. The platform also supports 3D rendering.

With HTML5 and Adobe Flash 10.1 support, the PlayBook handles rich media content on the web with aplomb. These technologies are also at the heart of apps written for this tablet. Although there are still glaring holes in the AppWorld catalogue, in mid-October RIM announced its new BBX platform for tablets and smartphones. Apps written using the HTML-based BlackBerry WebWorks toolkit will work on both BB 7 and BBX smartphones and tablets.

RIM has addressed the issue of how to use the PlayBook securely and independently of a BlackBerry smartphone. A native app that allows secure messaging without a smartphone is set to go live in February. BBM Extensions also allow you to make secure payments.

RIM's media-management and -playback options are impressive. There's support for iTunes, in-app searching by genre, song or file name, rating and so on, plus the ability to MMS, upload or email photos and videos direct from the Media Manager.

Productive stuff, such as viewing and editing documents, is handled by the Dataviz document manager (RIM owns the company behind DocsToGo).

We didn't experience a single app seize-up or faltering touchscreen, and the PlayBook had no trouble multi-tasking in our tests. But this isn't an attention-grabbing tablet, and we think it's too expensive and business-focused to catch the imagination of the teenagers and young adults who admire BlackBerry smartphones.

VERDICT: The PlayBook may soon become a better tablet than it is today, with a promised February update set to bring native email with security. It's best used as a companion device to a BlackBerry smartphone, though. The PlayBook is one of the best built and slickest tablets around, but its quiet competence won't win over the typical tech-loving gadget fan.

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

PC ADVISOR RECOMMENDED

SAMSUNG GALAXY TAB 10.1

£399 inc VAT (16GB) • samsung.com/uk • tinyurl.com/3Lh239c

Since Apple created the first iPad, competitors have tried to emulate its innovation. The Samsung Galaxy Tab 10.1 fired up the Apple legal artillery enough to remove a product from sale. Court battles were ongoing as we went to press. It's therefore no surprise that the Galaxy Tab is the best attempt yet to emulate the success of the iPad.

The 8.7mm-thin Samsung is just slimmer than the iPad, and its plastic frame is lighter at 563g. Smart rounded corners and high production values ensure the Tab doesn't feel at all cheap, though.

The glass-clad 10.1in capacitive touchscreen has a 16:9 widescreen ratio. It offers better viewing angles than some of the tablets here, excepting the iPad 2, but suffers the same viewability issues in bright sunlight. The 1280x800-pixel resolution offers a tighter pixel pitch, while the iPad offers the brightest screen and contrast ratio.

Samsung has experienced issues with some of its screens, with many early customers reporting fluid leak and an 'oil slick' effect.

Under the bonnet, the Tab 10.1 has a 1GHz nVidia Tegra 250 T20 processor and 1GB of RAM. Samsung offers 16GB and 32GB versions, but there's no SD Card slot for extra storage, nor native HDMI support (you'll need an adaptor for this). Wi-Fi and Bluetooth 3.0 are supported, and there's a Sony Tablet S-rivalling audio chip inside.

Samsung ships the Tab with Android Honeycomb 3.1 and its own TouchWiz UX interface spin. This adds several mini apps, such as AccuWeather, bookmarks, an alarm clock and Buddy lists. Resizable widgets let you control how intrusive social-media updates are allowed to be. Few Honeycomb apps are available, though, and the zoom mode you get with Android 3.2 is not supported here.

The web browsing experience is slick. The Galaxy Tab 10.1's multitouch interface makes navigation nippy and zooming precise.

You can take 3Mp photos and 720p video capture from the primary rear-facing camera and conduct video chats via the 2Mp front-facing camera. Samsung's SocialHub supports direct uploads to Facebook, YouTube and Flickr.

Samsung's media-streaming hub, AllShare, allows you to access multimedia content via Wi-Fi or from connected DLNA-compliant devices. The PC part works with Windows only, while promised updates will add clever screen-sharing and display-sensing features.

The Tab comes close to Samsung's reported battery life of 9 hours, even when much of this is devoted to video and gaming.

VERDICT: Concerns over initial faulty screens notwithstanding, we found the Samsung Galaxy Tab to be one of the best built and well-designed tablets around. There's every chance that Samsung will offer updates to Honeycomb 3.2 soon. **Ross Catanzariti**

SONY TABLET S

£399 inc VAT (16GB) • sony.co.uk • tinyurl.com/3tsqkp4

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

The Sony Tablet S has bags of potential. It launched as an Android 3.1 tablet, but got an update to 3.2 just days later. Entertainment features that distinguish it from the Android herd include the Sony Reader, plus all-important access to Sony Entertainment Network services. PlayStation gaming, Music Unlimited downloads and the Sony Movie Everywhere service are now all present and correct.

There's no HDMI connection, but it's simple enough to stream content and to screen-share with another Wi-Fi or Universal Plug and Play (uPnP) device. You can also use the Tablet S as a remote control for your TV (any brand) via a native app.

It's impossible not to comment on the design. It's smaller and lighter than the iPad 2, with a page curl effect along one edge. This makes it easy to grip the 9.7in-screen tablet in one hand, and raises the display in landscape mode for convenient viewing and text entry.

Important setup issues are swiftly dealt with: the Tablet S pops up an onscreen keyboard with a numerical keypad to the right whenever you need to enter a password.

The Android Market is easy to search through, with a scrolling category list running down the right side. Photo and drawing apps and casual games are well catered for, but the Android Market for tablets has a lot of catching up to do in productivity options.

Sony doesn't include any notetaking, document-handling or calendaring options either. The Personal Space portal for sharing photos and video was undergoing maintenance when we tried it.

The Sony's interface lets you easily customise views and rearrange apps as you wish – just press the + sign at the top right. The choice of five home screens – App shortcuts, Widgets, Wallpaper, More and a blank canvas – present themselves in the upper portion of the screen. Anything you click on from the lower list of apps then gets moved accordingly.

As well as the Android Market, there's a link on the main screen to Select App. This is a landing page for recommended apps. It's not as slick as HTC's equivalent, but offers reassurance that the apps have been checked through for legitimacy and quality.

VERDICT: Hats off to Sony for its original design and for reskinning the Android Honeycomb interface. The lack of HDMI is less impressive, but offset by Sony Entertainment features. These music, video and e-book options extend the possibilities of the Sony Tablet S and make it one of the best Android tablets we've seen.

	Price	Capacity tested	Expandable memory	3G	Wi-Fi and Bluetooth	Screen	Operating system	
Acer Iconia Tab A100 acer.co.uk ★★★½★	£268	8GB	yes (max 32GB)	no	802.11b/g/n, Bluetooth 3.0	7in, 1024x600 pixels	Android 3.0 Honeycomb	
PC ADVISOR BEST BUY Apple iPad 2 apple.com/uk ★★★★½	£399	16GB	no	optional	802.11a/b/g/n, Bluetooth 2.1	9.7in, 1024x768 pixels	Apple iOS 5	
HTC Flyer htc.com ★★★½★	£399	16GB	yes (max 32GB)	no	802.11b/g/n, Bluetooth 2.1	7in, 1024x600 pixels	Android 2.3 Gingerbread	
Packard Bell Liberty Tab packardbell.co.uk ★★★★★	£299	16GB	yes (max 32GB)	optional	802.11b/g/n, Bluetooth 2.3	10.1in, 1280x800 pixels	Android 3.2 Honeycomb (ships with 3.0)	
RIM BlackBerry PlayBook blackberry.com/uk ★★★½★	£229	16GB	no	optional	802.11b/g/n, Bluetooth 2.1	7in, 1024x600 pixels	BlackBerry Tablet OS	
PC ADVISOR RECOMMENDED Samsung Galaxy Tab 10.1 samsung.com/uk ★★★★★	£399	16GB	no	optional	802.11a/b/g/n, Bluetooth 2.1	10.1in, 1280x800 pixels	Android 3.1 Honeycomb	
Sony Tablet S sony.co.uk ★★★★★	£399	16GB	yes (max 32GB)	optional	802.11b/g/n, Bluetooth 2.1 +EDR	9.4in, 1280x800 pixels	Android 3.2 Honeycomb	
Storage Options Scroll storageoptions.com ★★★★☆	£109	2GB	yes (max 32GB)	no	802.11b/g, Bluetooth 2.1	7in, 800x480 pixels	Android 2.3 Gingerbread	

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Storekeeper.com

STORAGE OPTIONS SCROLL

£109 inc VAT (2GB) • storageoptions.com • tinyurl.com/3kxetev

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

A 7in-screen device with a price tag that's likely to entice those keen to see what all the fuss over tablets is about without paying through the nose, the Scroll costs just £109. Accordingly, it has just 256MB of RAM and runs on Google's Gingerbread smartphone platform. This has larger screen icons and a less sophisticated interface.

The Scroll sits in a solid aluminium case and tips the scales at 440g, but feels much more than 30g heavier than the PlayBook. It's powered by a 1GHz Telechips processor and has 2GB of flash storage, with a MicroSD card slot providing extra storage. There's also a MiniUSB port and an HDMI output.

You don't need to rely on touchscreen buttons for everything. Storage Options' Scroll has a volume rocker and external power buttons, with Home, Back and Menu buttons on the front. These are embedded in a blacked-out and rather deep non-functional area, leaving a small widescreen display.

The capacitive touchscreen attracts greasy fingerprints more than most, while the limited memory allocation means it can take an age for the Scroll to respond to your input. Even simple stuff such as typing in a web address and browsing pages on a website is trickier than it should be. In landscape mode the onscreen keypad displays character keys as long thin strips, which isn't ideal for accuracy. Switching to portrait mode really confuses the Scroll.

Accessing content and using apps on the Scroll isn't much better. Angry Birds Rio came preinstalled, but didn't play properly, while loading up popular lightweight apps such as Twitter client TweetDeck caused the screen to blank out for ages.

The screen resolution is fuzzy – even the favicon for the BBC website doesn't display properly. And the volume buttons operate in the opposite way from to most. Turning up the sound results in the tablet vibrating, which is something of a surprise given its bulletproof

metal construction. The software also seems poorly coded – pressing the Back button within the App menu took us to a web page.

VERDICT: We wish Storage Options had paid more attention to usability, since the hardware has potential and the inclusion of an HDMI output for hook-up to an HDTV is appealing. Unfortunately, barely anything we tried on it worked with any degree of satisfaction. If you'd like to spend £100-£150 on a tablet, we suggest you look instead to the 7in Creative Ziio (tinyurl.com/6hwekwm) – with 8GB of storage and a price tag of £130, it's a far better deal – or choose a Kindle instead. ☒

	Processor	RAM	Camera(s)	Video	HDMI DLNA	Browser	Email	App store	Weight	Dimensions
	1GHz nVidia Tegra 2	1GB	2Mp, 5Mp	720p recording	yes no	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	612g	241x186x9mm
	Apple A5	512MB	0.3Mp, 0.7Mp	720p recording	via adaptor no	Apple Safari	Mail, Gmail, Imap, POP3, Exchange	App Store	604g	241x186x8.9mm
	1.5GHz Qualcomm Snapdragon	1GB	1.3Mp, 5Mp	720p recording	yes no	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	420g	195x122x13mm
	1GHz nVidia Tegra 2	1GB	2Mp, 5Mp	720p recording	yes no	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	760g	177x260x13mm
	1GHz dual-core	1GB	3Mp, 5Mp	720p recording	yes yes	BlackBerry browser	BB Mail	BlackBerry AppWorld	410g	130x194x10mm
	1GHz nVidia Tegra 250 T20	512MB	2Mp, 3Mp	720p recording	via adaptor yes	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	563g	256x173x9mm
	1GHz nVidia Tegra 2	1GB	0.3Mp, 5Mp	720p recording	yes no	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	591g	241x174x10mm
	1GHz Telechips	256MB	0.3Mp	VGA recording	yes no	Google Chrome	Gmail, Imap, POP3, Exchange	Android Market	440g	132x12x203mm

Great gadgets guide

With the Christmas buying season under way, it's time to think about the technology products that deserve to become treasured gifts. Rosemary Hattersley looks at the best cameras, laptops, smartphones, speakers, headphones and gaming accessories on offer

If ever there was a time that you could justify treating yourself to some delicious tech gadgetry, it's Christmas. But with thousands of tempting electronic delights on offer, it can be hard to distinguish between the items worth having and those that are merely well packaged or marketed.

Equally, there are some great deals to be scooped up this time of year. Yuletide may be a traditional time of excess, but retailers do the lion's share of their business over the Christmas period and need to make it pay.

October's mid-season sales segued smoothly into pre-Christmas deals to tempt early birds. But with only six weeks to go, you may need to move fast in order to get the cream of the technology crop.

If you're after an iPhone 4S or iPad 2, there's little point in shopping around for deals: Apple insists on a fixed price. But our guide to the best contract terms is still worth a read: tinyurl.com/44oevzo.

The high street is cut-throat, as retailers compete with each other and online stores. We prefer to look at a product in person before we buy it, allowing us to assess its build quality and how it feels in the hand. But there's no escaping the fact that the cheapest prices are consistently found online, even without free postage.

Each of the products featured here has been put through its paces in our Test Centre, and we've provided tinyurl links to the full reviews on our website. This is useful if you want to know more about a particular product or compare it with some similar, perhaps cheaper, alternatives.

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FEATURE

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Photography: Dominik Tomaszewski

StoreMags.com

CAMERAS

Canon Ixus 230 HS

£200 inc VAT

MORE: tinyurl.com/6bk7myc

canon.co.uk

Perhaps the most desirable camera in our group of suggested models, the Canon Ixus is as beautiful a compact camera as you're ever likely to encounter. It comes in black, silver, purple, brown or red and is very slim, given the mechanics inside.

The follow-up model to last year's popular 220 HS, it's a 12.1Mp compact with a 28mm wide-angle lens and an 8x optical zoom. Compared with the zoom range of some of the compact cameras we've tried, the Canon's is modest. However, the HS in its name refers to its combination of high speed and high sensitivity – something that wouldn't work well over a 15x zoom. The 22mm-thick body would be hard-pushed to accommodate a larger lens anyhow.

Controls are geared towards point-and-shoot photography, with a simple dial to adjust the zoom and an onscreen indicator if your hands are shaking. Video can be taken at 720p and has a dedicated record button. A switch that lets you change from automatic to manual operation resides on the righthand side, while flash and macro options can be adjusted via a navipad on the rear. Other settings are changed via the onscreen menu.

As with other HS cameras (Canon offers Ixus and PowerShot models with this feature), the 230 is capable of capturing blur-free photos under challenging low-light conditions, so you can take party shots without blinding everyone with the flash. Canon cites 210 shots before the battery needs to be recharged. Expect around 40 minutes of video footage to deplete the battery.

Fujifilm FinePix X100

£999 inc VAT

MORE: tinyurl.com/6jn2wpc

fuji.co.uk

The X100 is expensive, but there are enough committed camera fans out there for Fujifilm to have judged it worthwhile investing development resources in this fixed-lens camera.

The fully manual 12.3Mp camera is built from magnesium-alloy and has an APS-C sensor crammed in. The aperture, shutter speed and exposure compensation settings can all be checked before you switch on the X100. A 2.8in LCD offers an alternative viewing and composition option. There's also a dedicated RAW button, which lets you switch between uncompressed shooting and processing mode.

The camera weighs 445g and is a chunky 54mm thick, so you won't want to take it out and about on the off-chance it will get used. It's anything but a point-and-shoot model, and has plenty of quirks.

Having spent some quality time with this camera this summer, we can attest to the fact that the Fujifilm X100 amply rewards patient use. A less complex (and less expensive) model, the £560 Fujifilm FinePix X10, is also available.

Lomo La Sardina El Capitan

£89 inc VAT (with flash)

£49 inc VAT (without flash)

MORE: tinyurl.com/3f754g5

lomography.com

A camera doesn't need to be packed to the gills with fancy electronics in order to take decent photos. Lomo's La Sardina analogue film cameras deliberately allow you to produce photos containing images laid over each other. In fact, the guide that comes with this 35mm camera suggests creative subjects for multi-exposure photos.

The oversized flash bulb is detachable and is the one concession to electronics. The La Sardina's flash requires a single CR123A battery.

Coloured filters that fit over the camera lens offer a low-tech means of adding variety to your shot in the absence of zoom, art filters and f-stop adjustments. The La Sardina's very simplicity allows you to focus on the subject and how they're framed, rather than the mechanics of taking the shot.

Kodak EasyShare Touch M5370

£129 inc VAT

MORE: tinyurl.com/5uad8ve

kodak.co.uk

Not everyone wants to spend hundreds of pounds on a digital camera. The Kodak EasyShare M5370 packs in plenty for its £129 price tag. You get a 16Mp CCD, video capture, support for direct uploading to a range of photo-sharing sites and social networks, plus in-camera editing to finesse your images.

EasyShare software can automatically recognise that there's someone in shot that looks a lot like a person in a previous photo and suggest they might be one and the same. If so, the face detection and tagging beloved of Facebook form a formidable alliance and pre-tag your photos ready for uploading. When you next turn on the camera, it'll group photos in the gallery by subject, making it faster to find the best photo of a particular person.

A 5x optical zoom, image stabilisation and 20 scene presets all feature on this likable budget camera.

StoreMags.com

Olympus PEN Mini

£449 inc VAT

MORE: tinyurl.com/6eqwu3w

olympus.co.uk

As with the Fujifilm camera on the previous page, Olympus' PEN range ploughs the retro vein. The Mini is the most stripped-down model in its PEN Micro Four Thirds line-up, offering simple point-and-shoot photography on to which you can put your own stamp thanks to art filters and special effects. Dramatic contrast, fish-eye lens and pop art options make even the most mundane scene stand out. A Live Guide on the preview screen aids composition.

Experiment with what the Mini can do using exposure bracketing, autofocus override and ISO light settings; when you've found a setup you like, you can save up to four custom settings as My Mode shortcuts. Scene modes and auto scene-detection are provided, while this capable camera can also shoot 1920x1080i video at 30fps.

Sony Cyber-shot HX9V

£250 inc VAT

MORE: tinyurl.com/6cLaw3d

sony.co.uk

The best of the advanced compact cameras crop, the Sony Cyber-shot HX9V eschews manual settings, such as aperture priority and user-controlled shutter speeds, and doesn't support RAW file formats. Nonetheless, it produces excellent digital photographs – the most important factor in any camera.

The Sony's 16Mp CCD promises plenty of detail (we don't advise buying a camera based on megapixel count alone, but this model is a safe bet) and there's also a 16x optical zoom so you can capture extreme close-ups even from over the road. Dual-image stabilisation helps ensure shots are crisp.

All that zooming in ought to pound the battery, but the CIPA rating for the HX9V is an astounding 410 shots between charges. Really, though, it's the 3D capabilities of this camera that will astound.

Rounding things off are support for geo-location tagging and some clever in-camera trickery to make the most of your photo artistry.

Panasonic Lumix DMC-G2

£360 inc VAT

MORE: tinyurl.com/3xqcdv3

panasonic.co.uk

There's a very good reason why the Lumix DMC-G2 has dominated our interchangeable-lens camera chart (page 143) for the past six months: it's a great-value 12.1Mp Micro Four Thirds camera with a tiltable 3in LCD touchscreen for image composition. This makes it easy to specify what you'd like the focal point of your photo to be.

A good range of scene presets and an intelligent Auto setting make for a shallow learning curve, while advanced options span aperture priority – from f3.5 to f5.6 – and adjustments to light levels. ISO settings from 100 up to 6400 are supported. For unusual compositions, in-camera effects can be applied.

The DMC-G2 can record video at 720p to the Blu-ray-compatible AVCHD format. The standard camera kit includes a 14-42mm lens.

While a newer £629 Lumix DMC-G3 model is now available, there's very little wrong with this high-quality camera at little over half that price.

Kodak PlaySport Zx5

£90 inc VAT

MORE: tinyurl.com/3u3y2ca

kodak.co.uk

The PlaySport Zx5 is a pocket-sized video camera that captures 1080p video footage. Its ruggedised design makes this camcorder ideal for sports fanatics who want to show off their snowboarding escapades, but it's also a decent 5Mp stills camera.

The Kodak is waterproof to 3m, so daredevils can record their encounters with sharks too.

Previous models in the PlaySport range had a rather cramped button layout, but the Zx5 takes into account the fact you may want to use it while wearing gloves.

Kodak EasyShare software recognises people in a series of shots and tags them before letting you directly upload photos to Flickr, Facebook, the Kodak Gallery and more.

>> Look out for reviews of the Olympus PEN Mini and Panasonic Lumix DMC-G3 in our next issue

StoredMagic.com

LAPTOPS & TABLETS

Dell Alienware M18x

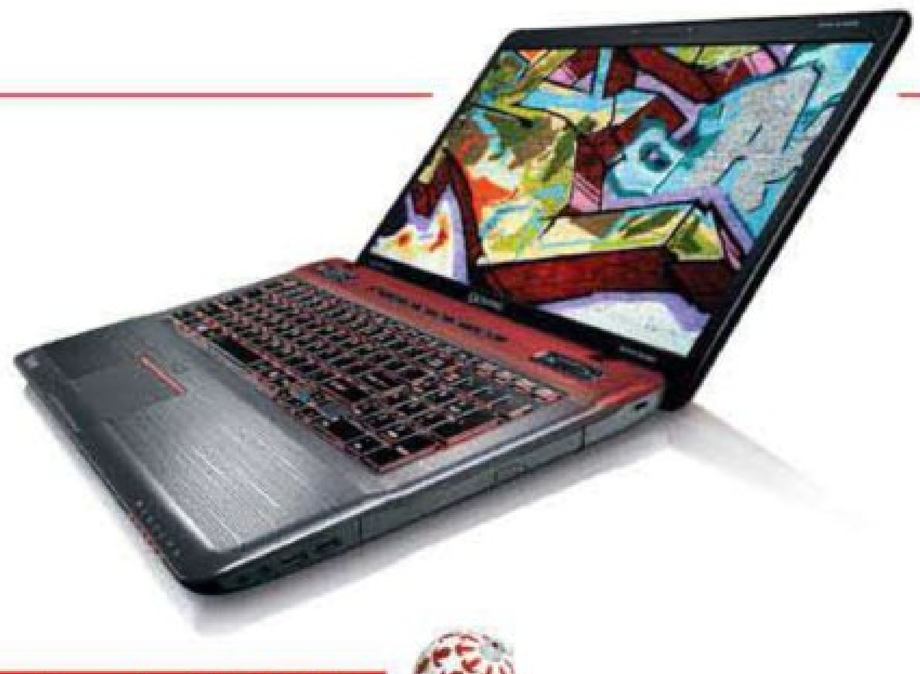
From £1,699 inc VAT

MORE: tinyurl.com/6bk5cvq

dell.co.uk

Dell reckons the Alienware M18x is the most powerful gaming laptop on the planet. This 5.4kg beast runs Windows 7 Home Premium and has an 18.4in screen, 8GB of DDR3 RAM (although you get only 4GB with the base £1,699 model), an Intel Core i7-2630M processor, either a terabyte (TB) or 1.5TB of storage and an nVidia GeForce GTX 460M with 1.5GB of video RAM.

The M18x's huge screen supports a top resolution of 1920x1080 pixels, while an HDMI port makes this laptop ideal for general entertainment duties such as DVD playback as well as frantic gaming sessions. There are two USB 3.0 ports, so you can very quickly archive off everything to a high-speed external drive and free up some space, should the need ever arise. The 1.3Mp webcam is one of few standard specifications on this extraordinary Alienware laptop.



Toshiba Qosmio F730 3D

£1,300 inc VAT

MORE: tinyurl.com/664Lgyp

uk.toshiba.com

Another quality gaming machine, the Qosmio F730 is the first laptop to offer glasses-free 3D. Toshiba achieves this by tracking the eye movements of the person sitting in front of the screen. A pair of web cameras follows your gaze and adjusts the output for each eye.

The screen is a generous 15.6in (1366x768-pixel) panel and is optimally viewed from a distance of around 60cm. A Blu-ray XL drive (which can record up to 100GB of data on a single platter), an nVidia GeForce GT 540M graphics chip with 2GB of video RAM, a 640GB hard drive, and Harman Kardon speakers all feature on this 2.9kg gaming laptop.

Apple MacBook Pro 15in Core i7

£1,849 inc VAT

MORE: tinyurl.com/5t7jzan

apple.com/uk

The MacBook Pro's beautiful magnesium-alloy unibody construction is instantly recognisable. This is the most powerful example, with a 2.2GHz Intel Core i7 CPU powering it to 132 WorldBench 6 points.

Rather than a USB 3.0 port, Apple has included an even faster (up to 10Gbps) Thunderbolt connection. Its Sandy Bridge processor and 4GB of RAM perform most of the heavy lifting, but you also get an AMD Radeon graphics chip with 1GB of video RAM. The screen is rather reflective, but has a decent 1366x768-pixel resolution.

Packard Bell EasyNote TS11HR039

£399 inc VAT

MORE: tinyurl.com/6k2pwm4

packardbell.co.uk

If you're after an inexpensive laptop and are more interested in performance than a fancy name, the Packard Bell EasyNote TS11HR039 is well worth a look. It ran away with the crown in our most recent group test of budget laptops, outshining every other contender in terms of speed. It achieves this by packing in an Intel Core i5 processor; although this is twinned with a modest 3GB of RAM, music and video plays well, although gaming isn't great.

Connections include 802.11b/g/n Wi-Fi, Bluetooth, HDMI and a trio of USB 2.0 ports. There's a dual-layer DVD-R/RW drive and a media-card slot that takes Memory Stick and xD-Picture Cards as well as the more common SD Card format.

Slight compromises in the form of integrated Intel graphics and a 500GB hard drive are our sole criticisms of this excellent and very well-priced 15.6in-screen laptop.

Dell Inspiron 14z

£549 inc VAT

MORE: tinyurl.com/6kfterx

dell.co.uk

Dell has created a following for its ultraportable Inspiron Z laptops. The 14z has a 1366x768-pixel screen, a choice of Core i3 and i5 processors and focuses on connectedness on the go. In a home Wi-Fi environment, Dell Stage kicks in to automatically synchronise music, photos and messages. Content can be called up on any Dell Stage-supported device. Bluetooth, USB 3.0, a webcam and a multiformat card reader mark out the Dell as a high-quality home laptop.

GiftXMags.com

Sony Vaio Z

From £2,000 inc VAT
MORE: tinyurl.com/692uLkn
sony.co.uk

This 13in-screen (1920x766-pixel) Vaio is very much the money-no-object suggestion in our round-up of portables to which you might consider treating yourself this Yule. Far from a run-of-the-mill model, the Z is thinner and lighter than a MacBook Air. It's also the first laptop to have its own dedicated multimedia dock that contains a dedicated graphics card, DVD drive and LightPeak optical connector.

The Sony's carbon-fibre frame is both incredibly strong and very light – a fact helped by the inclusion of a 256GB solid-state disk (SSD) rather than a plain old hard disk.

The laptop is powered by a Core i7 processor, paired with 4GB of RAM.

Ergonomics and typing comfort are marginally compromised, but the Vaio bristles with ports and connectors. It also has a webcam and Skype support, plus a fingerprint reader to control access.

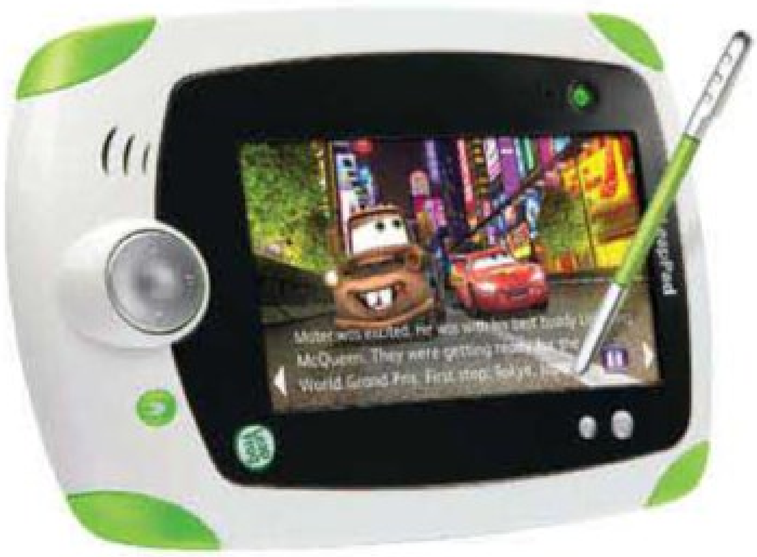
Apple iPad 2

From £399 inc VAT (16GB, Wi-Fi-only)
MORE: tinyurl.com/6cxnez6
apple.com/uk

It's no surprise that we're recommending the iPad 2: it's the best tablet on the market, effortlessly mopping up three quarters of the entire customer base. However, it's anything but chance that has placed the iPad in this enviable position. Good looks, slick performance, tight integration with iTunes, an excellent range of both useful and entertaining apps and great build have all contributed to its success. Turn to page 67 for more.

The iPad's 9.7in display is the ideal slideshow screen. It has the same proportions as US magazines. It's also a useful device on which to flip through digital copies of *PC Advisor*, and read books.

The iPad also makes a very good remote control for calling up photos and video for your Apple TV, and queueing up music playlists on a Wi-Fi connected device. It's great as a drawing pad, too.



LeapFrog LeapPad Explorer

£79 inc VAT
MORE: tinyurl.com/3tpkg7f
leapfrog.co.uk

There's no reason kids shouldn't get in on the tablet craze. If you're not keen to let them loose on your expensive Apple or Android device, you might prefer to provide one for their exclusive use. This one even comes with its own apps aimed at developing the child's skills as well as entertaining them.

The four AA-battery-powered LeapPad Explorer has a 5in resistive touchscreen and comes with a sturdy stylus. Pictures drawn on the tablet can be transferred via mini-USB to a PC for safekeeping and subsequent editing.

The tablet can be customised with your child's photo and name, and they can choose an onscreen pet to keep them company as they explore the device. Voice and video recording are offered, too.

Files are saved to the 2GB internal flash memory. The LeapPad is also compatible with other products in the Leapster range.

Motorola Atrix

£319 inc VAT (SIM-free)
MORE: tinyurl.com/6awm2mh
motorola.com

You'd be forgiven for thinking the Atrix is on the wrong page here. It's a smartphone, but it's also very much a connected device that's best used with media and productivity docks to transform it into either an entertainment hub or a PC in its own right. In truth, we're not convinced that Motorola completely pulls off the idea.

The Atrix's screen is very pretty, if super-shiny, and the idea of an external screen for a smartphone is certainly one that intrigues. When you want to do more than fire off short emails or respond to text messages or status updates, a proper keyboard is what you need. But hiding your £500 smartphone behind the screen into which it docks is surely an advert to thieves to half-inch your tech while you've thoughtfully hidden it from your own view. That said, the screen-replicating HDMI-out media hub is superb.

« Turn to page 64 for more tablet reviews and details of Apple iOS 5

PORTABLE AUDIO & SPEAKERS

Apple iPod nano

From £115 inc VAT (8GB)
MORE: tinyurl.com/3z73vtk
apple.com/uk

The iPod nano has been updated yet again, shrinking by more than 40 percent and dropping in weight to a mere 21g. Apple has given the nano a new spin as a fitness-focused player that's designed to be worn on your wrist. An onboard pedometer records your steps, helping you keep track of your training goals. Nike+ support has also been added.

The 2011 nano also gains multitouch support, letting you easily flick through menu items, zoom into photos and rearrange icons on the 1.5in (240x240-pixel) display. Tapping the cover of an album that's playing brings up playback controls.

Playlists can be built using iTunes or automatically generated by Genius Mix. The latter finds similar music and presents it in a playable suggestion list. Shaking the nano shuffles the playlist.

The only iPod with an FM radio, the nano has an onscreen tuner that you flick to change stations. Tap the screen to add the current station to your Favourites list. Apple cites a 24-hour battery life.

Apple iPod touch

From £169 inc VAT (8GB)
MORE: tinyurl.com/42mcrok
apple.com/uk

The most popular iPod model, the touch looks a lot like an iPhone. With the launch of Apple iOS 5, the touch now supports iCloud – a neat way of accessing your music from anywhere via the web. This means the 16GB or 32GB of internal storage that the player boasts is now only a theoretical limit.

Often referred to as 'the iPhone without the phone', the touch supports FaceTime video chat, can capture HD video and photos, has a games centre and works with the same apps as the iPhone: a choice of more than 100,000 awaits. Wi-Fi lets you make VoIP calls, while iMessage lets you send encrypted texts to other iOS 5 users.

The 960x640-pixel widescreen is ideal for gaming. Log in with your Apple ID, create a gaming alias and do battle with friends. It's not a bad music player either.

Sony Walkman NWZ-A866

£219 inc VAT
MORE: tinyurl.com/5usaz6e
sony.co.uk

A name to be reckoned with in music, Sony's Walkman range is all about sound quality. This media player has its own digital amplifier, dedicated bass and stereo mix controllers, plus a SensMe function that adjusts the output depending on the music playing.

The NWZ-A866 has a 2.8in LED-backlit touch-sensitive display and a highly intuitive menu system that ensures you can get to the tracks you want to hear without delay. With 32GB of storage packed into the Walkman's tiny frame, there should be plenty on offer.

Tracks can be imported from iTunes or Windows Media Player's Library. Sony's Media On The Go app helps ensure a speedy transfer from a range of sources.

Video is supported, while Bluetooth connectivity adds streaming options. The Sony also features an FM radio and a karaoke mode that displays lyrics as you belt them out.

Philips GoGear Muse SA3MUS08S

From £110 (8GB)
MORE: tinyurl.com/6eqfjdz
philips.co.uk

The Muse is a portable media player with a 3.2in (320x480-pixel) touchscreen. Broad music format support includes several lossless audio options, while SafeSound provides noise-level warnings.

The Muse lets you select a preset EQ style based on the type of music you're listening to. It's also possible to save custom audio settings, with control over bass, treble and more.

The 8GB player offers FM radio recording and is able to play BBC iPlayer content as well as podcasts and video in several formats. Audiobooks are offered via Audible.

A MicroSD slot lets you can sideload music, photos and video, supplementing the 8GB or 16GB of onboard memory. Expect up to 24 hours of playback per charge on this 106g player; dropping to 5 hrs when playing video.

Pure Move DAB 2500

£89 inc VAT
MORE: tinyurl.com/3bvsf7o
pure.com

For fans of digital radio, the Pure Move DAB 2500 will be a good choice. It offers a range of FM and DAB stations. The scrollwheel make station selection easy, and the Move can be set up with a range of favourites as presets – 10 FM and 10 digital stations can be saved. Details of the current station and any supplementary information about the track or messages from the DJ display scroll across its orange LED-backlit screen.

The battery lasts for around 14 hours between charges. The cable for the bundled noise-isolating earphones acts as its antenna, so there's no need for one to protrude. Output settings let you adjust the bass and treble.

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Release: StoreMags & FantaMag

Philips Fidelio DS9/10

£240 inc VAT

MORE: tinyurl.com/3s6xmb9

philips.co.uk

If you're on the lookout for an iPod and iPad dock with a striking design and can't stretch to an ultra-desirable Bowers & Wilkins Zeppelin (tinyurl.com/438uaam), then the Philips Fidelio DS9/10 sound dock is worth a look. It's a heavyweight speaker in more than one sense: the solid wood construction means it weighs in at 5.5kg. The curved design of the speaker dock helps reduce vibrations and prevent distortion. The result is impressive, natural sound.

The Fidelio has a pair of 1in tweeters and two 4in dome woofers, each producing 50W of power. There are two volume buttons on the speaker itself, but no other buttons.

As with many such products, there's a free media-controller app for your docked iPhone or iPad. This offers preset EQ options to further enhance the sound, along with the ability to set an alarm. Bluetooth technology offers interference-free playback, with speech and action seamlessly synchronised. These allow the OnBeat Xtreme to work seamlessly with Skype and Apple FaceTime. A bundled remote control and free apps let you control playback.

Altec Lansing inMotion iMT630

£99 inc VAT

MORE: tinyurl.com/5sjd69v

alteclansing.com

This portable iOS device dock and speaker system offers extra functions through free apps. It can be turned into an alarm clock using Alarm Rock, while Music Mood adds relaxing video. Altec Lansing also provides a handy remote control.

Dual 2in drivers produce clear, sharp sound. The 318x38x130mm speaker can be plugged into the mains when not running off its built-in rechargeable battery. Expect around 7 hours of playback.

JBL OnBeat Xtreme

£450 inc VAT

MORE: tinyurl.com/6jumzgw

harmankardon.com

The latest iteration of JBL's successful OnBeat dock offers a striking design. This rotating dock can be used with an iOS device in either landscape or portrait mode. Separate tweeters and dual Atlas bass drivers produce 90W of output. Support for Apple's AirPlay technology means those with iPhones and iPads can stream music from iTunes, while the JBL can also be paired with a Bluetooth device.

Sony RDP-V20iP Circle Sound

£150 inc VAT

MORE: tinyurl.com/698pyff

sony.co.uk

This unusual circular dock from Sony offers more than just a quirky design. It features Circle Sound technology, enabling it to deliver balanced audio to every corner of the room. Featuring a 5.6cm woofer and a 2cm tweeter, the Sony also has a bass-boost function to ensure beats aren't drowned out by the crowd at your Christmas party.

Available in black, white or red, the Sony can be plugged into the mains where it will act as a charging dock. It also has an internal rechargeable battery for use on the go. Up to 5 hours of playback can be enjoyed from a single charge, but the 13W audio output drops to 4W when running off its battery.

You can skip backwards or forwards through tracks, pause songs and adjust the volume via the bundled remote control. A second volume control is found on the speaker itself, along with an audio-in port that enables other devices to be connected to the speaker.

gear4 Angry Birds speakers

From £49 inc VAT

MORE: tinyurl.com/67L22er

gear4.com

We had to mention this cute Angry Birds-inspired iPhone and iPod dock. Evil Helmet Pig (the green one, to the uninitiated) is one of three speakers inspired by Rovio's massively successful smartphone game. Unlike the other two in the range, it features a dock that lets you to listen to content stored on your iPhone or iPod while charging it.

Powered by the mains or a battery on the road, the speaker has its own volume controls but also comes bundled with a remote. Evil Helmet Pig is sure to bring a smile to fans of the smartphone game, young or old, on Christmas morning.

Store4Egg.com

Storekeeper.com

HEADPHONES

Sennheiser HD 25-1-II by Adidas Originals

£200 inc VAT

MORE: tinyurl.com/3jhLubz

sennheiser.co.uk

Sennheiser has teamed up with Adidas to create a set of headphones that combine sound and style for the DJ market. The pair has got the style side of things spot on, and these headphones aren't lacking in sound quality either. The playback is loud and clear for everything from Simon and Garfunkel to Gnarls Barkley.

The bass rubbles down as low as you dare to go, while higher-pitched noises are clear and crisp; there's not a hint of distortion in sight (or sound).

iGo City

£99 inc VAT

MORE: tinyurl.com/44rqdrk

igo.com

If you live in a city and don't drive to work, there's a strong chance you listen to something that grinds your gears during the commute. Perhaps it's some clown talking on their phone too loud, or just the general soul-destroying noise of the Tube. If you want to do something about it, look to the noise-cancelling iGo City.

Switch on the AAA-powered noise-cancelling tech and external chaos becomes a distant whisper. So good is the effect, we failed to notice the office fire alarm sounding during our tests.

When you do get around to rocking some tunes into the headphones, the iGo starts to earn its money: it's just you, the iGo City and up to 97dBs of music. The sound quality is loud and confidently clear. A great set of headphones, and reasonably priced, too.

Etymotic hf3

£135 inc VAT

MORE: tinyurl.com/6aLo9v2

etymotic.com

We're surprised that Etymotic isn't a more widely known brand. It was the company to devise the canalphone, an earphone that slips into the ear so intimately that it forms an airtight seal and shuts out practically all outside noise. The earphone works so efficiently that overall distortion is far lower and volume can be kept down on the personal stereo. Canalphones also prevent the kind of sound leakage that otherwise makes you the pariah of public transport.

The Etymotic is no one-trick pony, though. The hf3s have a microphone for use in conversations on mobiles, with a three-button in-line remote to answer calls and control volume.

Sound quality is firmly in the high-end audio class. A solid foundation is formed from deep, extended bass – apparent as a firm kick to bass drum in rock and jazz, and a good presence in live recordings.

They perfectly recreate the atmosphere of a performance, with sweet, detailed treble. This is evident in the dulcet chime of a steel-strung acoustic guitar, letting you hear the finer strokes of the guitarist's strum.

Vocals are clear, and sound natural and well balanced in a mix where lesser earphones struggle.

Altec Lansing Muzx Ultra mZx606

£80 inc VAT

MORE: tinyurl.com/3hq8csp

alteclansing.com

With their idiosyncratic earpiece design, the Muzx Ultra mZx606 in-ear headphones look like tiny black pistols that fire music directly into your brain. There's a smart-looking remote high on the right cable; it blends in nicely with Altec Lansing's black-and-gold theme.

Sound quality is excellent, justifying the relatively high price tag. Beginning with some prog rock, we found the Muzx phones surprisingly loud. The sound is rich and warm, with good breadth across the spectrum; the bass feels punchy, without overshadowing any of the upper notes.

The earphones really came into their own with our disco sample, mustering a bass kick with plenty of impact. Female vocals were clear, with good clarity on the singer's enunciation, and there was a pleasing rendering of some fire effects. Classical piano was also a triumph, allowing the ear to separate the different dubs of the piano and producing a realistic sound.

steelseries Siberia V2

£56 inc VAT

MORE: tinyurl.com/3feb9kf

steelseries.com

If there was an award for headphones most suited to a *Star Wars* Stormtrooper, the steelseries Siberia V2 would win it. These aren't cosmos bimbos, though, and when it comes to delivering quality audio the Siberia isn't found wanting. We listened to some modern rock while playing around with the EQ settings, and the headphones' impressive response to our fiddling sounded clean throughout.

A leather cushion surrounds the ears, but held in tight to cancel noise these headphones can quickly become uncomfortable. Nevertheless, the Siberia V2 is a good set of headphones for the money.

GAMING

ION iCade

£79 inc VAT

MORE: tinyurl.com/5rp54zr

firebox.com

We couldn't resist including the iCade in our suggestions for Christmas gadgetry. Available through Firebox.com, it's a mini arcade console that works with an iPad or iPad 2 and the free Atari app.

Atari's Greatest Hits app can be downloaded from the App Store, and comes with Missile Commander as a base pack, plus the option to buy packs of other classic Atari titles such as Centipede and Space Invaders. The whole Atari back catalogue costs a mere £6.99. The iCade pairs with your iPad via Bluetooth, so you can use its oversized buttons and joystick to fire, fire, fire!

High scores can be recorded locally, but there's also the option to post them to an online leaderboard. You're not just limited to playing retro games either: Angry Birds and other classics of the iPhone age can also be played on this fun console.

The iCade has proved very popular in the *PC Advisor* office. The only complaint we've heard is that the coin slot to pay per play isn't real (if only to save us from our chronic gaming habit).

Microsoft Kinect for Xbox 360

£69 inc VAT

MORE: tinyurl.com/6y9magf

microsoft.com

It was a hit last Christmas and we think it will be a hit this time, too. The Kinect for Xbox 360 is a motion controller for Microsoft's games console and now has an impressive selection of titles designed to take advantage of its body swerve-sensing features. You duck to duck, turn around to turn around, and jump to jump.

By speaking a couple of words you can launch a navigational hub and access games and Kinect-enhanced applications. By the power of gesticulation, you can move through menus and select a film to watch or a game to play. Games work with the Xbox Live online portal, so you can show off your best moves to your online gaming buddies. The Kinect also has a selection of Wii Fit-like fitness apps and dance moves.

Adrenaline junkies will no doubt have their sights on the high octane racing game Forza Motorsport, with vehicles primed with up to 670bhp. Microsoft's gaming wheel for Xbox 360 Kinect adds to the realism and costs £79 inc VAT.

Griffin Helo TC

£34 inc VAT

MORE: tinyurl.com/6jdq54e

griffintechnology.com

This tiny remote-control helicopter can be flown from your iPhone or iPad. Helo TC features a row of four infrared controllers – presumably to adjust each of the axes through which the helicopter flies. The remote-control unit clips over the rear of an iPhone or iPod or on to the back of an iPad.

In use, the Helo TC has multicoloured flashing lights, twin-rotor wings and two types of flying mode. It can take its control cues from the accelerometer of an iPhone or iPad in Tilt To Fly mode.

The six-gear transmission aids flight stability, while a multitouch display mode can be used to control the Helo TC's throttle and flight-controlled joystick. Its battery is recharged via USB.

Sony Ericsson Xperia Play

£200 inc VAT (SIM-free)

MORE: tinyurl.com/6ka99mb

sonyericsson.co.uk

If you're after both a phone and a portable gaming option, you could do worse than the Xperia Play. Unofficially known as the PlayStation phone, it has a 4in touchscreen. Its chunky 15mm frame is explained by the slide-out keypad hiding underneath; this sports gaming navipads for the left and right hand.

The Xperia Play runs Android 2.3 off a 1GHz processor. An 8GB MicroSD card is supplied to supplement the parsimonious 400MB of onboard storage. Some of this is taken up by the six games Sony preinstalls. Classic PlayStation games can be downloaded from Google's Android Market.

Sony Tablet P

£499 inc VAT

MORE: tinyurl.com/68y8ufb

sony.co.uk

We're torn between the Xperia Play and the Sony Tablet P split-screen gaming tablet. The latter will be onsale from mid-November and allows you to play PlayStation Portable games on its dual 5.5in touchscreens. The lower half of the tablet acts as a gaming controller.

As well as standard Android apps there's DLNA tech for bouncing content from tablet to large-screen TV, support for the Sony Reader Store, plus access to the Sony Unlimited Music library.

COOL TECH ACCESSORIES

Huawei MiFi

£84 inc VAT
MORE: tinyurl.com/6f6mee2
three.co.uk

It costs around £100 to add 3G to the specification of most tablet purchases, but you could just as well spend that amount on a 3G hotspot device that allows you to add 3G connectivity to a range of devices as and when required. For example, you're unlikely to tout both a tablet and a laptop on the same journey, but you may well want to get online using whichever device you've brought along for the ride. The MiFi can also get your friends online (as long as you give them access rights), so it's a good sharing option.

The deals can be confusing, but for £84 you get the device plus 3GB of data (it's £122 for 12GB), after which you top up on a pay-as-you-go basis. Contract deals are also available.

Western Digital My Passport Essential

From £59 inc VAT (500GB)
MORE: tinyurl.com/435zgfw
wd.com/en

Who says backup drives need to be ugly bricks? Certainly not Western Digital. The My Passport Elite and Essential drives have been around for years, but remain among our favourite products for their styling and simplicity.

The 500GB My Passport Elite takes up barely any desk space, with its own neat dock into which it slots vertically. This dock attaches to a PC and draws its power from a single USB 3.0 port.

The software automatically keeps your files in sync, so when you reach the end of the working day you can simply stash the 108x84x12mm drive in your bag and plug it in when next you need to call up your files. The drive weighs just 144g, comes with protective software to control access to its contents, and is ideal for taking collections of photos, music and video with you.

Griffin A-Frame

£23 inc VAT
MORE: tinyurl.com/6zcswa5
griffintechnology.com

One of our few complaints about tablets of every stripe is that they don't stand up, making touchscreen keyboard entry awkward and viewing entertainment difficult. A stand can make all the difference, but far too many are iPad-specific.

The Griffin A-Frame is marketed for the iPad, but it works just as well with Samsung, Acer, Asus and other brands of tablet. It's simply a hefty metal easel with an open-ended rubber ledge that accommodates your choice of tablet.

The stand folds up within the A-Frame, so it doesn't take up much space. Its tough-as-boots construction has a down side, though: it weighs a whopping 510g.

Amazon Kindle

£89 inc VAT
MORE: tinyurl.com/6grzq2g
amazon.co.uk

For all the clamour over tablets, many of us would prefer something less showy and feature-laden that doesn't constantly need its battery topped up. The Kindle Fire tablet will launch in the UK soon, but the fourth-generation Kindle e-book reader also has much to commend (reviewed on page 34). Its battery runs out once a month rather than twice a day, for starters.

Wi-Fi connectivity means you don't have to plug in the Kindle to a PC to load up books. The responsiveness of the device has also been improved, so you can turn pages faster or view images onscreen without waiting for them to load. And in its fourth generation, the Kindle's slimmed down to 170g.

There's no longer a keyboard (you use an onscreen one instead), reducing the overall size to 166x115mm. A dictionary, automatic bookmarking, a choice of 750,000 titles plus space onboard for 1,400 at once make this a compelling choice.

Honestech Film Scan&Save

£79 inc VAT
MORE: tinyurl.com/3zmdhv7
honestech.com

If you're anything like us, you've probably got a drawer full of old photos and slides that never see the light of day. And it probably contains some of your best shots. After all, in the pre-digital photography days, film was expensive and rolls of it finite, which meant that each photo was composed with care.

Products such as the Film Scan&Save make light work of digitising images you'd love to see again. This Honestech device even has a lightbox on the top so you can see what those dusty negatives contain before pressing Scan.

The Scan&Save captures images at up to 1800dpi or the equivalent detail of a 10Mp digital photo. Auto image-correction is provided, and you can transfer scans to either SD Card or a PC via USB. The Film Scan&Save also works independently of a PC.

If you'd like a chance to win an Honestech Film Scan&Save and get it in time for Christmas, tell us your thoughts on the latest tech issues. Write to us at letters@pcadvisor.co.uk or visit our website at pcadvisor.co.uk/competitions. See page 8 for more details.

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Apple iPhone 4S

£499 inc VAT (SIM-free)

MORE: tinyurl.com/62teb9g

apple.com/uk

Reviewed in full on page 32, the latest iPhone may look almost the same as its predecessor, but it's still one of the hottest gadgets of the year. Significantly more powerful graphics make it eminently suitable for gaming, while Apple's also added a more powerful processor. There's now an emphasis on voice control via a character known as Siri, plus an overhauled version of its iOS operating system. The iPhone's performance has arguably caught up with the best Android phones; combined with the already refined touchscreen interface and unmatched apps library, this is the best iPhone – and smartphone – there is.

HTC Sensation XE

£456 inc VAT

MORE: tinyurl.com/6gf95tv

htc.com/uk

The large-screen Android smartphones market has been a close-fought battle between HTC and Samsung this year. Samsung's Galaxy S II proved the bigger seller, but the trump card for close rival the HTC Sensation is two new editions, the XE and XL, which step up the phone's entertainment features.

The HTC Watch portal offers music and film downloads, while DLNA and HDMI allow content to be streamed to a large screen. Dolby Mobile automatically recognises the larger screen and outputs the audio and video accordingly. For playback on the handset, it offers impressive bass. The superior audio and video on the unibody Sensation even get a Dr Dre Beats Audio endorsement on the XE.

Blue Microphones Snowflake

£35 inc VAT

MORE: tinyurl.com/3jgd8h3

amazon.co.uk

Many of us unfortunately end up spending Christmas a long way from our nearest and dearest. Photos and messages posted on Facebook or via email are a good way to keep up with important events over the course of the year but, if you aren't able to spend the day together, hearing their voice is the next best thing. A present of a dedicated microphone to ensure the conversation is as clear as possible is perfect if you're going to be chatting long-distance via Skype and the wonders of web-based telephony.

The Blue Mics Snowflake is easier to use than a headset and microphone. This USB condensing microphone can also be used for recording podcasts and sending personalised recorded messages to your loved ones.

Shop safely online this Christmas

Last year, 28 percent of UK consumers told the IMRG they would do more of their Christmas shopping online. For most people it's a slick process, but the clamour to secure a bargain means there are also lots of dodgy websites vying for our attention.

Always use an authenticity checker such as mcaf.ee or Web Of Trust (wot.org) when shopping online. An https prefix is also reassuring when you go to pay; this means the page is encrypted. Check for reassuring badges such as Trust-E, SSL encryption to secure the transaction and PayPal secure payment options. If in doubt, ask the e-tailer for details of its privacy and security measures. Being able to call them is a good sign; anonymous email accounts and no apparent office address are not.

Use a credit card to pay for goods with a value over £100, as the credit-card company is insured against rogue retailers. You can claim back money from your credit-card issuer if a product you've paid for fails to materialise. Moves are afoot to extend this protection to debit-card transactions, too.

Online transactions are covered by distance-selling regulations that allow you to return an unsatisfactory product at no cost if it proves unsuitable. High-street retailers don't have to take back unwanted goods (as you should have been able to judge this at the time of purchase). They may instead issue a credit note for unwanted items to the equivalent value.

Faulty goods can always be returned within a set time frame – usually 28 days.

When purchasing, look out for hidden costs such as shipping fees and any admin charges that might be applied. The prices quoted in *PC Advisor* are checked in advance for such costs and take into account any carriage charges. However, some websites add insurance and extended warranty deals, as well as suggested upgrades, at the point of sale.

Go through a checklist of specifications and confirm you're buying what you set out to buy before proceeding to the checkout. If you've chosen a PC or laptop based on one of our reviews, check that the model name and specification are the same. Manufacturers often sell several SKUs (variations) of a product, placing some with one retailer and others with another. ☒

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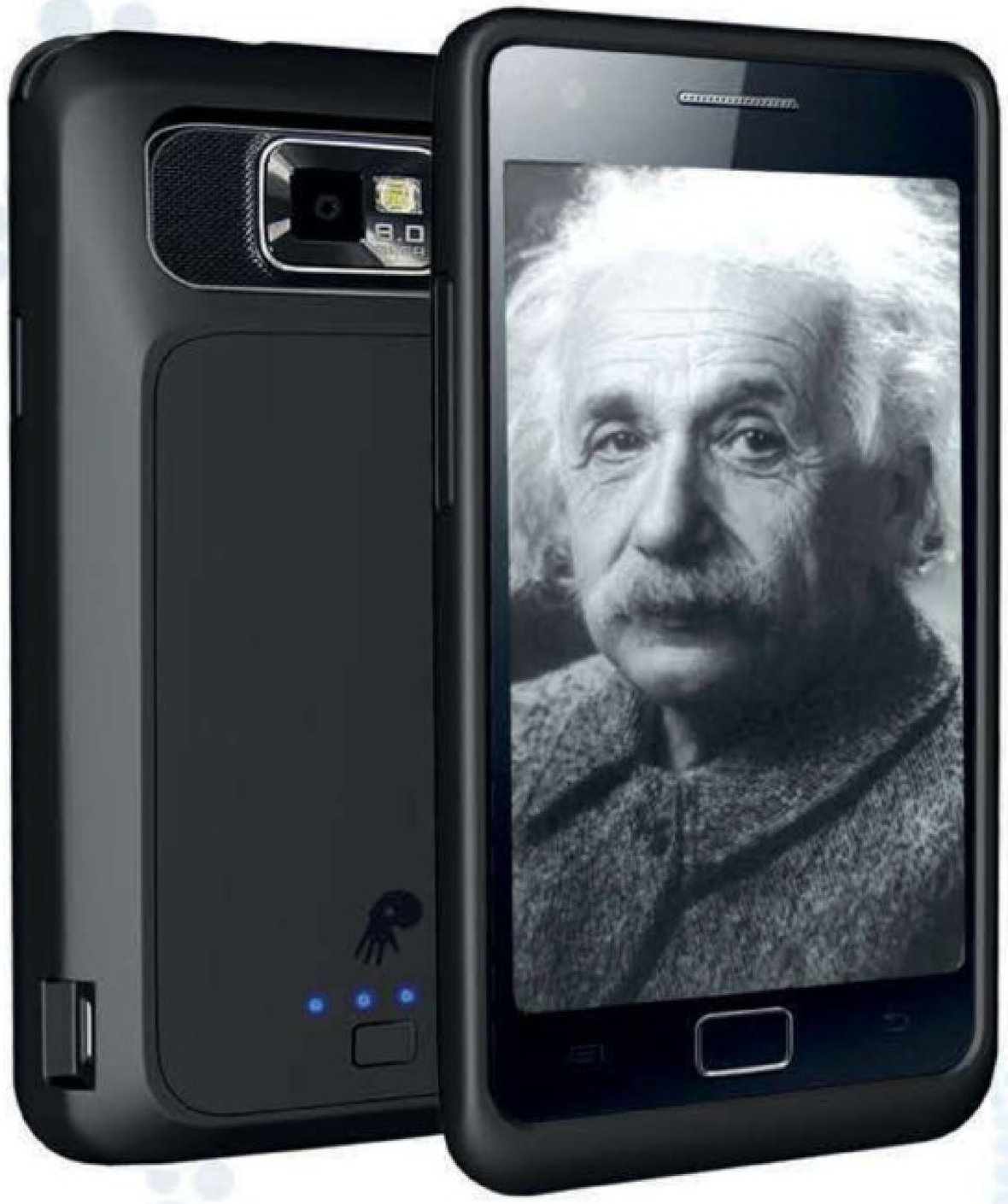

With a sleek, protective, silicone case and a built-in rechargeable battery that doubles your power, **PowerSkin® for Samsung Galaxy II** turns your smartphone into a genius phone.

Your life charges on. You can keep working. Keep playing. Keep moving. PowerSkin® is your go-to, go-anywhere, go on-and-on power source.

Because battery life *is life.*

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Call 0330 111 2222 Local Rate for more information

StoreYaps.com

FEATURE

Mobile security guide

With so much data routinely being stored on laptops, tablets and phones, securing their contents from prying eyes is a must. We look at how to lock down your portable gadgetry

Whether it falls out of your pocket in a taxi or it's stolen from a public place, your phone is vulnerable. In fact, research by security software company Symantec found that 36 percent of US consumers have lost a mobile phone. It's a worry for businesses as well as handset owners: many of us use the same device for our personal communication and our work correspondence, and access email and other sensitive information on our phones.

If that phone is a smartphone – or if the missing item is another valuable mobile device, such as a laptop or a tablet – thieves will be even more keen to get their hands on it. These days, misplacing a gadget may mean not only losing your files, contacts and photos, but also seeing your identity stolen.

To prevent unauthorised access to your information, set up a PIN, then follow the simple steps we outline overleaf. They won't prevent your laptop, tablet or phone going missing, but they will help stop unauthorised users peeking at your personal details. We've also got some suggestions of how to increase the odds that your missing gadget will find its way back to you.

Contributors: Rosemary Hattersley, Nick Mediati, Armando Rodriguez

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Preventative protection

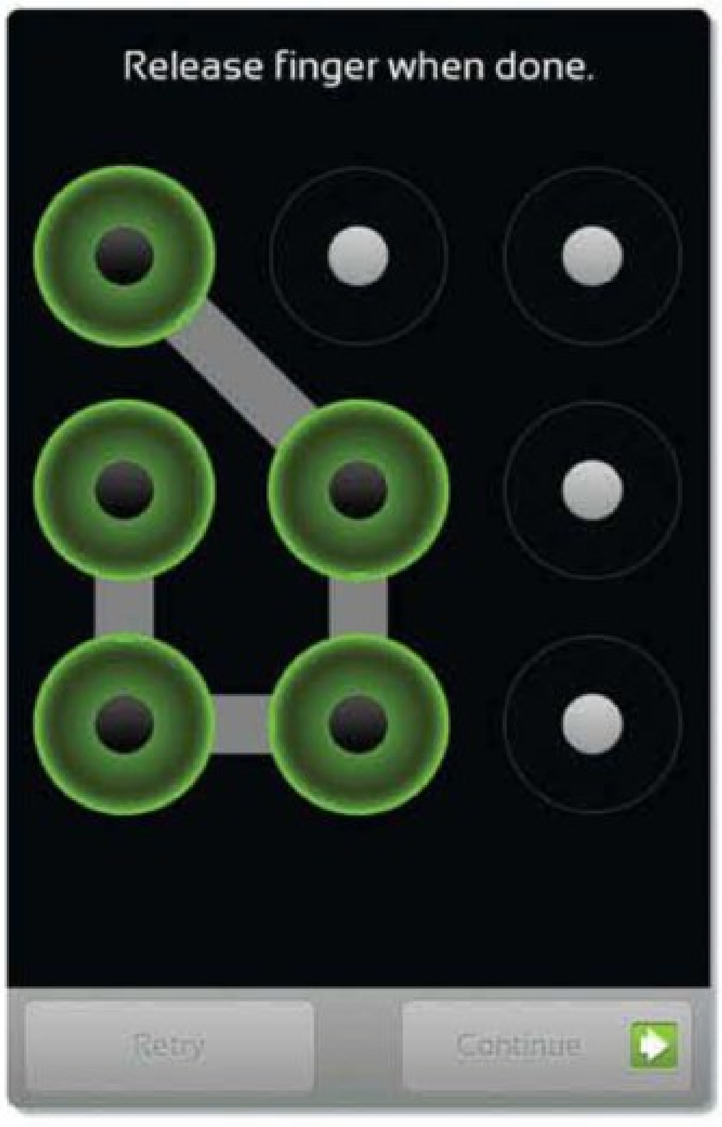
Use a password: Requiring a password whenever you use your phone may seem inconvenient, but you'll be pleased you took the precaution should the device fall into the wrong hands.

In iOS, you can assign a four-digit PIN to keep your iPad or iPhone from being unlocked. If you own an Android phone, you can use either a PIN or a pattern. With a pattern, you unlock the device by drawing a simple shape on the screen. Go to Settings, 'Location and Security' in Android, and Settings, General, Passcode Lock in iOS.

Don't choose a simple PIN, such as 0000 or 1234. You don't want to make it unduly easy for anyone other than yourself to access your device and information stored within.

Lock your laptop's screen whenever you step away from it. This will prevent prying eyes from peeking at your work. In Windows, hold down the Windows key and press L. To return to your work, simply enter your login details.

In Mac OS X, open Keychain Access in the Utilities folder, then select Preferences. Select the option to 'Show keychain access in the menu bar'. A lock icon will appear in the menu bar; use this to lock your password keychains, as well as your screen.



Install security software on your smartphone: PINs, patterns and passwords are a good first line of defence, but you'll need to do more to keep your data safe. One of the first things you should do is install a mobile security suite. McAfee All Access 2012 (mcafee.com) offers a one-stop solution for your tablet PCs, laptops, PCs and smartphones.

Android apps such as Lookout Mobile Security, Norton Mobile Security, SeekDroid and Webroot Mobile Security let you remotely locate your absent device, lock it or wipe all data from it. Some of these apps also include anti-malware and phishing safeguards, so you'll be protected even in your day-to-day activities. SeekDroid costs £3.19; the other apps listed above are free (you will have to pay to unlock all their features, however).

Apps for iOS are more limited. The latest version of Webroot Secure Anywhere includes support for iOS, however.

It's worth installing Find My iPhone (tinyurl.com/62trxqL) if you're using an iPad, iPhone or iPod touch. Use your Apple ID to sign into me.com, which opens a map showing your device's approximate location, as well as options for displaying a message on the lost hardware, remotely locking it or wiping the data. Find My iPhone requires a little setup, but operation is straightforward.

The problem is this app is easy to disable, whereas several of the Android security suites we've mentioned will either request a password or hide the app – provided that you followed our earlier advice and set up a PIN to prevent anyone uninstalling the app.

Track your laptop: You can hunt down a lost laptop in much the same way as a missing smartphone. Consider investing in LoJack for Laptops (tinyurl.com/6hoaq2q), a subscription service that makes it easier for both you and the police to find your laptop. The service permits you to track the laptop's location (some plans track only IP addresses, while others track using GPS), lock it so that no-one can access the data, remotely wipe the hard drive and perform other tasks. LoJack requires you to install a piece of software on your computer; versions are available for Windows and Mac.

If you would prefer to track your laptop yourself, try Prey (preyproject.com). This installs a small piece of software on your computer that lets you track the system's location via an online control panel. You can also capture screenshots of your laptop if it goes missing (to gather information about a thief), take a photo using the built-in webcam, sound an alarm (useful if your laptop has very recently gone missing and the thief

could still be nearby), remotely lock the computer and more. The Prey software runs on Windows, Mac OS X, Linux and Android. We found installation straightforward.

The free version of Prey allows you to monitor up to three devices, and the various Pro account options range in price from $5 (£3.18) for a personal account to $399 (£253) for a large business.

A Find My Mac program is also in development. This is similar to Find My iPhone, but finds Apple laptops rather than smartphones. Find My Mac may be available by the time you read this.

A word of caution: privacy concerns about device-tracking products have begun to emerge. Shortly before we went to press, a judge ruled that a US woman could sue Absolute Software, makers of LoJack for Laptops, for allegedly infringing on her privacy after she had unknowingly purchased a stolen laptop. If you decide to use a device-tracking product, use it responsibly.

>> For more on how to track down stolen tech gear, see tinyurl.com/3rx58eu.

Label your device: If you're optimistic that your phone or laptop will fall into the hands of someone with a conscience, use a service such as BoomerangIt.com or StuffBak.com. Both require you to attach a coded label to your device; this encourages anyone who finds the item to visit the BoomerangIt or StuffBak website and follow the instructions to report it as recovered. You can also stipulate a monetary reward on the label, which should improve the odds that the finder will do the right thing.

Back up your phone or tablet data: If you're using Android, Google backs up most of the basic phone and tablet data (contact lists, email messages and app purchases) and stores it online for you. Focus on backing up photos, videos and any documents or files you may have downloaded; those items generally aren't synched to Google's servers.

A good app for safeguarding your entire device is MyBackup Pro (£3.26), which backs up every file from your gadget and saves it to an SD Card or online storage service. If you choose the first option, be sure to put the SD Card in a safe place (not in the device). If your phone or tablet disappears forever, you can simply insert the SD Card into your new mobile and restore all your lost information.

iOS owners have it slightly easier. Every time you sync your iPhone or iPad to iTunes, you create a backup of your device on the computer. The backups contain all your app data, as well as your settings, pictures, music, movies and books. Restoring an iDevice is as easy as plugging it in and selecting Restore. The recently released iOS 5 platform should automatically sync your phone or tablet via iCloud. If you haven't upgraded your iOS 4 device, this additional backup feature makes doing so worthwhile.

Lock your laptop: A physical lock isn't foolproof, but it will help prevent someone swiping your laptop off your desk. Companies such as Kensington (uk.kensington.com) and Targus (targus.com/uk) sell products that attach to or link through a laptop's lock port. One from Targus even has an alarm that sounds when someone picks up your laptop.

Recovering a lost gadget

If the worst happens and you lose your phone, tablet or laptop, don't panic. Take a deep breath, then follow these steps to hunt it down and protect yourself.

Change all your passwords: This is the very first thing you should do after losing

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any device containing valuable data. Start with your email password. Once thieves have access to your email, they can easily break into all your other online accounts by resetting your various website passwords.

While you're at it, now might be a good time to revisit your approach to passwords, making them stronger – and easier to remember in the process. For recommendations on password managers, see tinyurl.com/5rpk2sc.

File a police report: Once you've changed your account passwords, report the theft to the police. Mobile phone companies and insurers often state that you must do so before they will consider any claim you make for a replacement. When providing details about your stolen hardware, ensure you mention any identifying features such as engravings or other customisations. You might also want to alert your local pawn shops in case someone tries to sell it.

Track your gadget: If you've installed recovery software on your gear, activate it and use it to gauge your device's location. For most tracking products, this means logging into the service's website and tracking your wayward gadget via the control panel. At this point, it's entirely up to you whether to pursue your device or just give it up for lost and wipe it remotely.

In iOS, a remote wipe will erase all content on the device. Wiping an Android phone or tablet will clear most of the user data, but SD Cards and other pieces of external media will remain untouched; this is worth bearing in mind if you store a lot of critical information on your SD Card.

Try Plan B: If you didn't install any recovery software and your Android device goes missing, you can head to the web-based Android Market and remotely install recovery software to your phone or tablet, even if it's no longer in your possession. For instance, in addition to its mobile security suite, Lookout offers Plan B (tinyurl.com/3t8e8o7). You remotely install the app through the Android Market on a PC or laptop, and it begins to run automatically, sending email messages to your Gmail account with a map showing where your equipment is. Don't rely on this app alone, though. Consider Plan B only as a last resort, rather than as your primary or sole line of defence.

Something as simple as downloading and installing a basic security program or locking your laptop doesn't take much effort. You never know: a £5 app could end up saving you thousands in the long run.

Bring your own device

Bring your own device is the term used for individuals using their own laptops and phones and setting them up to access their work email and the corporate network. Implications include not only the potential loss of important work details and data, but leaving the device more vulnerable as it isn't secured and the IT manager has no control over potentially risky apps that may be installed on it.

Managed IT company Timico researched this issue and discovered that a third of the businesses it polled believed between 20 and 100 devices are lost each year, with 42 percent claiming a loss rate of up to 20 devices. Research is based on an average company size of 280 staff. Unsurprisingly, 72 percent of business heads were concerned about the trend for staff to use their own devices to access corporate data, and the apparent lack of a unified approach to securing it.

Cast-iron security for your laptop

As well as taking preventative measures, such as verifying the applications you're downloading and loading up your phone and laptop with vigorous virus checkers, you'll want to protect your mobile devices from physically being accessed. Kensington locks help prevent someone swiping an unguarded laptop from an office environment, but it's really the data that is of most value.

A secure USB memory stick is useful for preventing access to the contents of the flash drive itself, and an IronKey goes a step further by controlling access to the PC or laptop with which it is associated. Without the IronKey and the necessary login credentials, you won't be able to get at the hard drive's contents. But because such security tools are software based, they're ultimately hackable.

If the data you need to secure is sensitive, consider investing in a high-security drive with a numeric keypad. These offer a crucial advantage over software – they work independently of the PC. The best example we've seen is the Digisafe Diskcrypt Mobile (reviewed at tinyurl.com/3zmcvq7), available through iStorage-uk.com.

It features both 10-digit fingerprint authentication and a smart card to manage access. This means you can use your PC or laptop for input and web browsing behind a firewall, and the Digisafe for storing and backing up your data. It's not a budget option, but it's about the best we've seen. ☒

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ALPHA SOFTWARE

Alpha Five version 11

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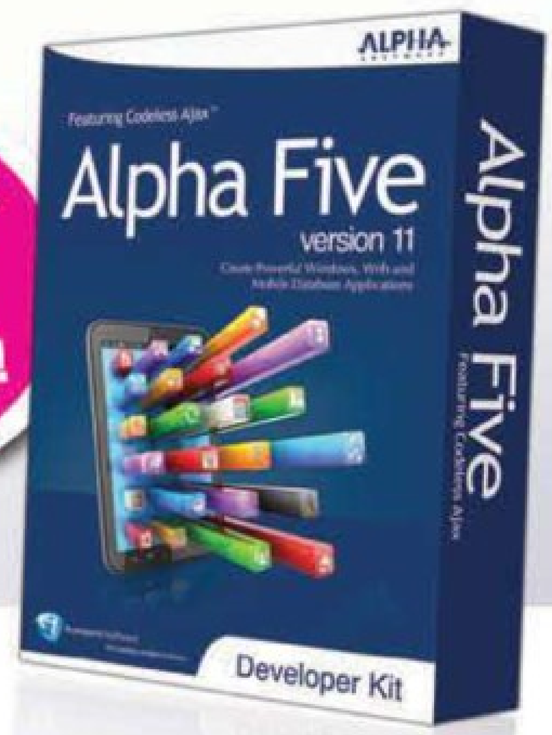

Imagine if you could quickly build a database-driven application and then use it everywhere – on the desktop, on all browsers on the web, on smartphones and on tablets?

Well imagine no more! **Desktop, web and mobile**, Alpha Five v11 is there for you!

The adoption by Alpha Five of the "The Trinity" (HTML5, Javascript and CSS3) creates a unified approach to web app development. Create it ONCE and Alpha Five will intelligently deliver your application, with a native look and feel, to any web-enabled device! Save time and money on all your development projects with this virtual swiss-army knife!

New Feature Packs Now Available for the Alpha Five V11 Developer Kit!

Google Map Component
The power to visualise data!

Version 11 will provide you with the ability to easily build GIS's (Graphical Information Systems) around your data. With Alpha Five v11's Google Map Component, you can perform geographic searches, display points on a map, find the geography data embedded in jpegs, pinpoint the location of mobile devices and much more, all at a fraction of the cost of commercial standalone systems.

Calendar Component
Scheduling made Easy!

Need to add scheduling to your application? Alpha Five allows you to easily add powerful scheduling and calendar controls to graphically display and select dates on a calendar. Whether it's for online appointment booking or synchronising employee diaries, including calendars was one of the most requested features in the new version of Alpha Five.

Image Gallery Component
A picture paints a thousand words!

The image gallery component offers a stunning and intuitive interface for displaying pictures in your applications. On mobile applications, orientation changes can be detected (and adjusted for) and touch events are supported. The component is also smart enough to detect the capabilities of each device, and browser and adapts its features accordingly!

Video Builder
Easily insert video into your desktop and web applications!

With the new 'smart' video component, you can display videos within your application and they can be hosted from virtually anywhere, including YouTube™. Since both HTML5 and Flash are supported, the videos will play across multiple browsers and platforms, including mobile phones and tablets!

Features gesture support for touch-driven devices!

Various product options and special value bundles are available for the Alpha Five v11 Developer Kit, deployment licences and the add-on feature packs. For more info, call our sales team on:

Tel: 01480 359406

or e-mail **sales@alphasoftware.co.uk** Web: **www.alphasoftware.co.uk**

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ALPHA SOFTWARE

Alpha Five 11.0

We expect there to be an app for everything these days, but developing tools for each mobile platform can be expensive. And if the apps you want to create involve complex databases, it can be very expensive.

Alpha Five isn't just a database tool; it can put together information-handling apps more quickly and easily than any competing package. It can also simultaneously develop software for multiple platforms.

A single Alpha Five design will work equally well in the browser of a PC, tablet, smartphone or any other HTML/Java-aware device. Repurposing an app for a separate platform is straightforward, with no need to rewrite the app from the ground up.

Alpha Five 11.0 is standards-based, generating HTML5, CSS 3 and JavaScript apps that run on a range of devices. It supports all popular browsers, including Internet Explorer, Firefox, Chrome and Safari.

The software includes a number of modules that take the drudgery out of preparing information for online viewing. Tools such as the Gallery module, which lets you view images as thumbnails or in full-screen mode, support the multitouch gestures that many iOS and Android users have become familiar with.

You can choose to work with Alpha Five's internal language, Xbasic, and its form designer, Xdialog, but many sophisticated, data-driven apps can be put together using little more than the supplied templates and tools.

Its graphics-handling capabilities make it easy to create good-looking apps, and Alpha Five delivers on the data-handling front, too. It's a full relational database designer that happily works with SQL and other mainstream database servers, but can also hold information in its own structures. Alpha Five's front-end features will work transparently with any data source you may be using.

Capabilities

Alpha Five 11.0 is ideal for database designers working in IT departments or consultancies, who take on custom projects to fit software to the task rather than bend the customer to the app.

Version 11.0 adds several useful features. Here are some highlights:

GIS Mapping: The Graphical Information System (GIS) ties information to visual resources, such as Google Maps. There are many applications for this type of mapping, with store locators and address finders obvious examples. You can extract an address from a data record and display a Google map within an Alpha Five app.

Calendar Support: Version 11.0 adds user date selection and the ability to develop scheduling apps, where tasks or events can be shown chronologically. This makes it easier to develop appointment systems for doctors, booking systems for theatres and garages, and even project-management tools.

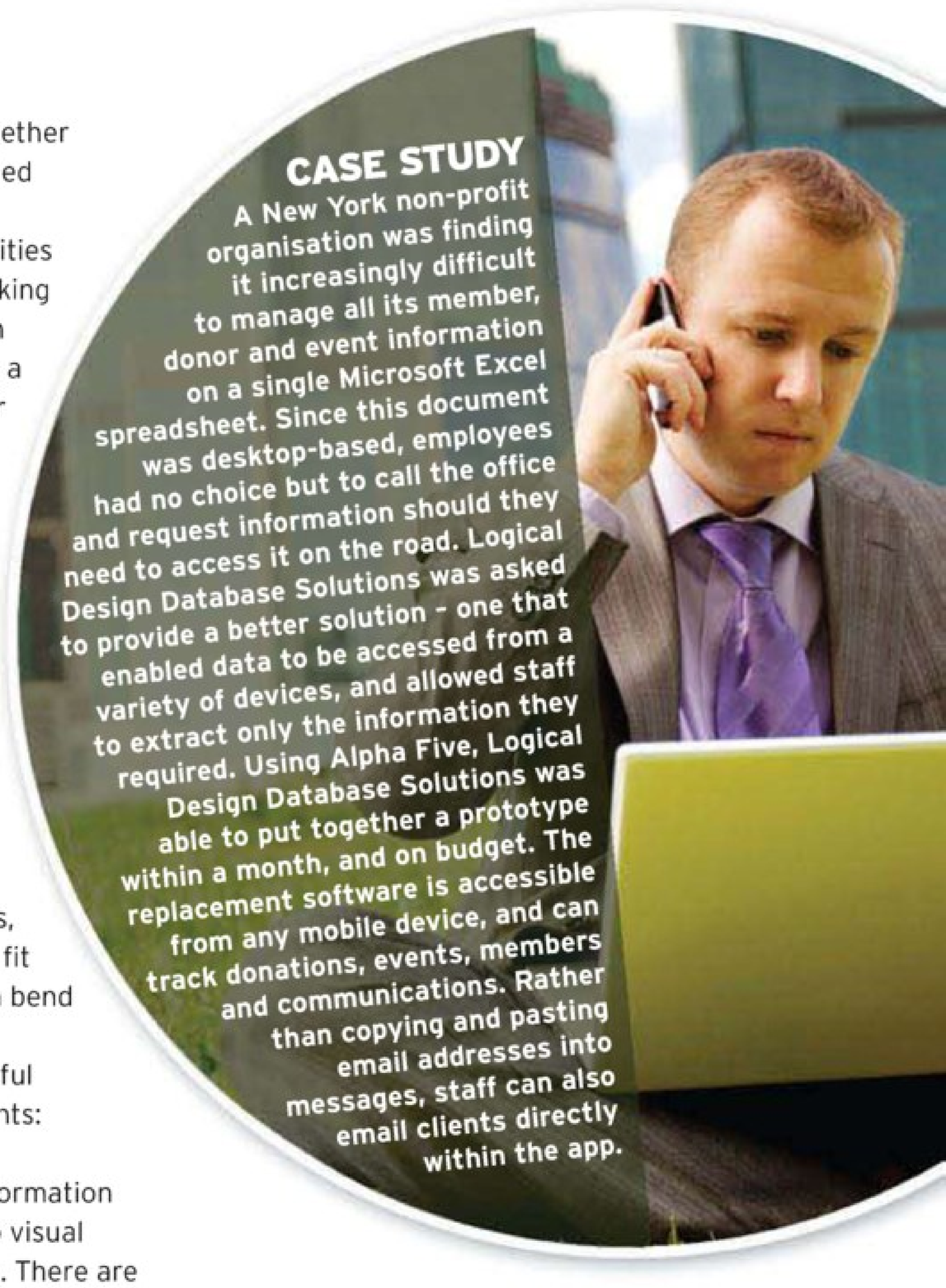
HTML Reporting: Alpha Five has long been able to generate reports in PDF format; version 11.0 adds the ability to do so in HTML. This enables you to produce online reports for viewing on a wide range of mobile and desktop platforms.

Gesturing Support: The increased use of touch-based operating systems on tablets and smartphones necessitates a change in the way people expect to interact with apps, including data-based ones. The latest version of Alpha Five includes modules that fully integrate finger taps, swipes and pinches into custom apps. This is particularly relevant when viewing images in Alpha Five's Gallery module, and when working with video and maps using GIS.

Video Component Builder: Video is an increasingly popular type of content for many websites. The Video Component Builder seamlessly integrates media into custom apps. Given how much is going on behind the scenes, such as detecting whether Flash is available in the device running the video, this is no mean feat. If a device doesn't support Flash, Alpha Five delivers HTML5 instead – but you don't need to worry about this, since the Video Component Builder handles the process transparently.

Find out more or download a free trial:
tinyurl.com/alphafive

ALPHA FIVE TUTORIALS >>



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ALPHA SOFTWARE

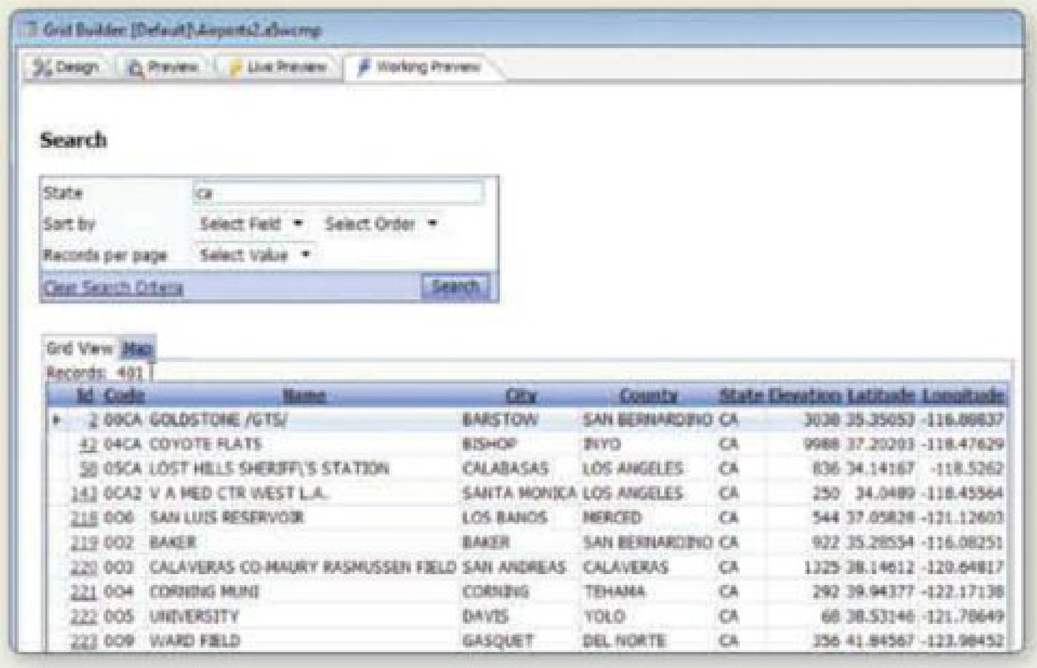
ALPHA FIVE GALLERY

START An app designed for use on tablets and phones should operate in the same fashion as the device's native software, including support for gestures and the ability to detect in which browser it's being viewed. The process is visible to the developer in this sample Gallery app.

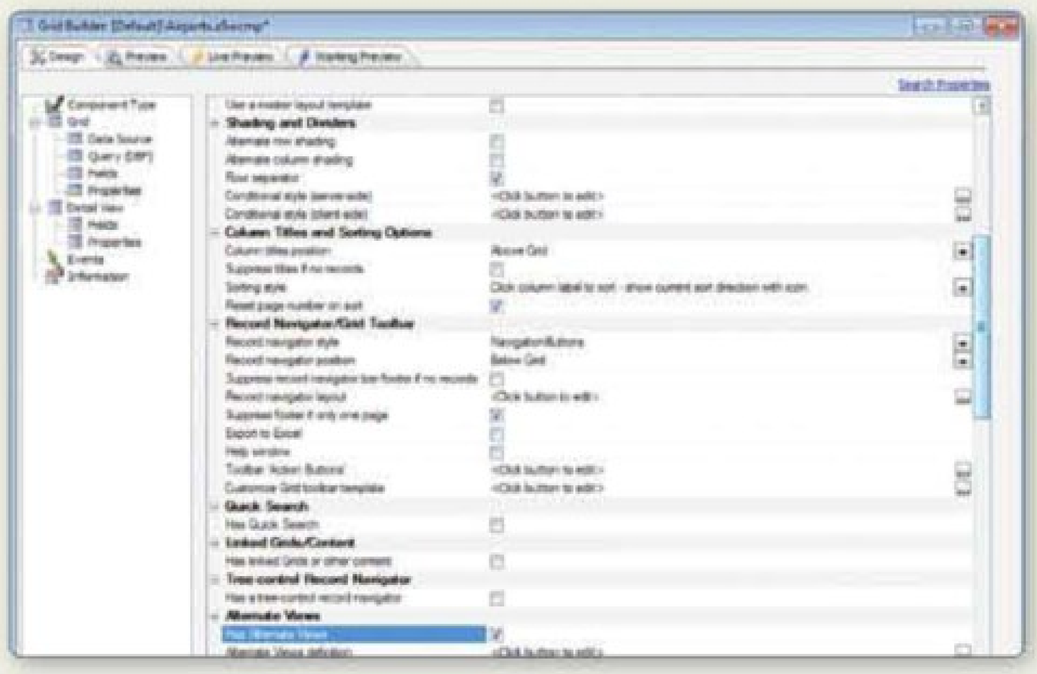
2 An app written using the Gallery component will respond to mouse clicks and drags on a desktop PC. This behaviour is selected automatically, so you needn't specify how it works with individual platforms. Simply tweak the layout to meet your needs and link to images in your Alpha Five database.

3 The same app will respond to finger gestures on a tablet or smartphone. Alpha Five's Gallery component also supports screen rotations, allowing the user to interact with the database as if it were a custom-coded app. Swipe a finger across the thumbnails at the bottom to scroll through images. ☒

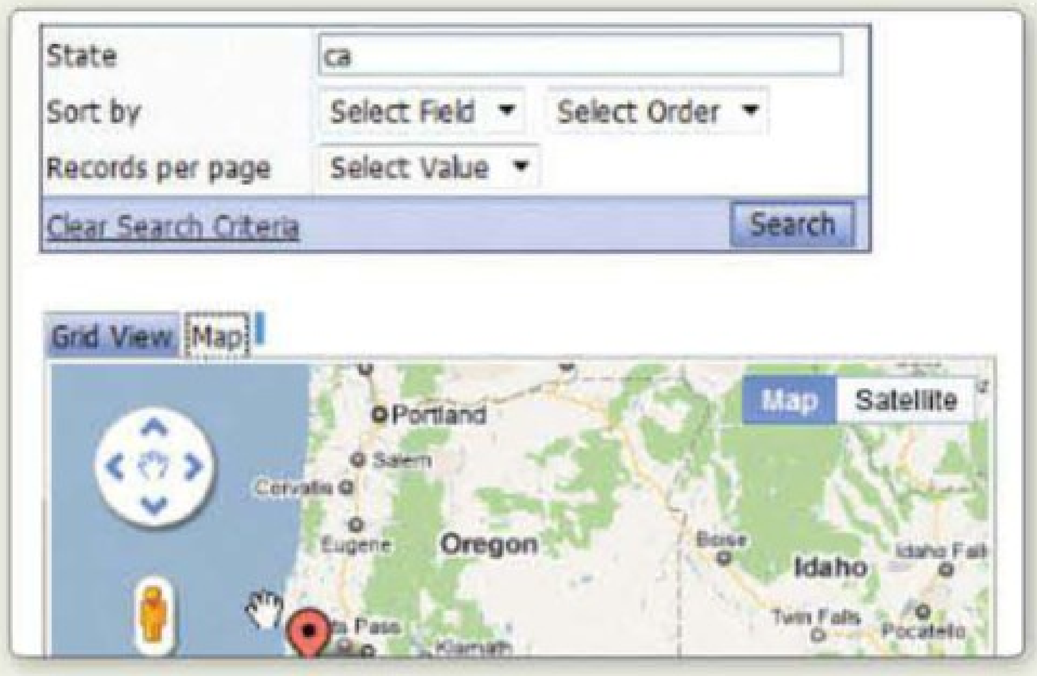
ALPHA FIVE MAPS



START Maps can be useful in database apps for store locators or finding customer addresses. The example database shown above lists US airports, along with their latitude and longitude. By tying this data to Google Maps, it's possible to show each airport as a pushpin on a map.



2 Alpha Five doesn't require prior knowledge of HTML and Java. You simply design a form or table and tell the software how the program should behave. To select an alternative view, such as a map, you just select that option in the Properties panel.



3 This alternative view can be added on a second tab within your app. Our sample app has a built-in search function that draws on Alpha Five's powerful search engine. You can search this database for airports by state, with the screenshot above depicting how you would do so for California. ☒

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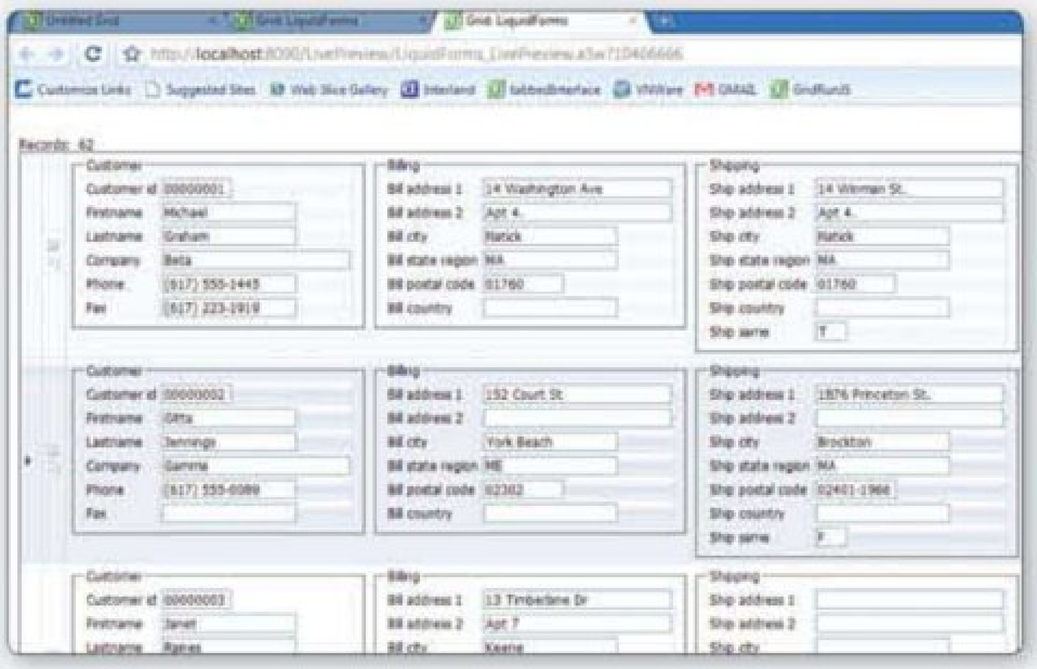
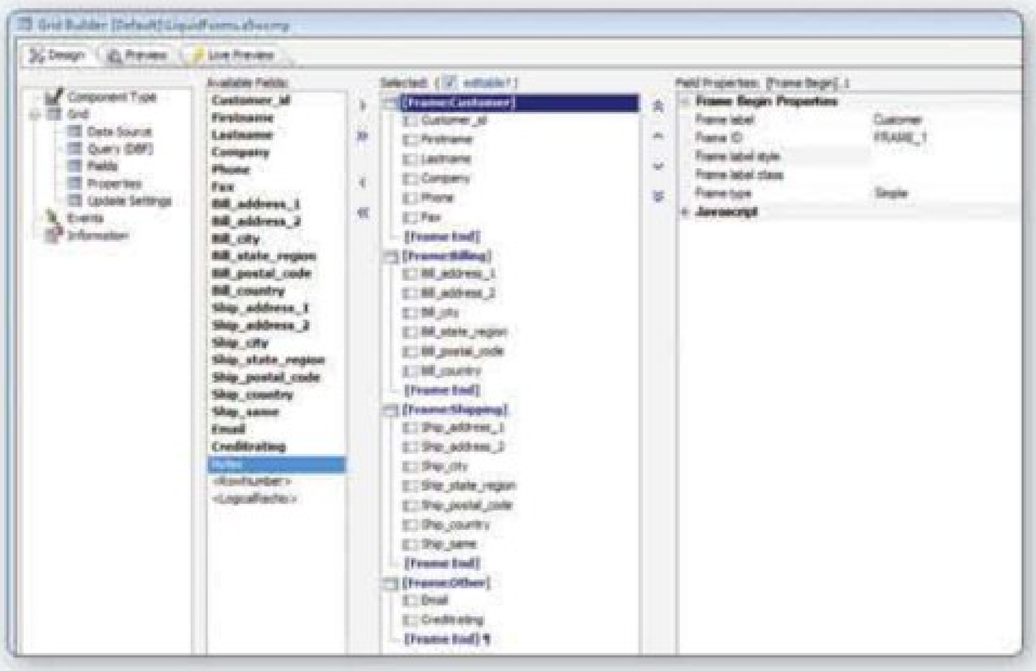
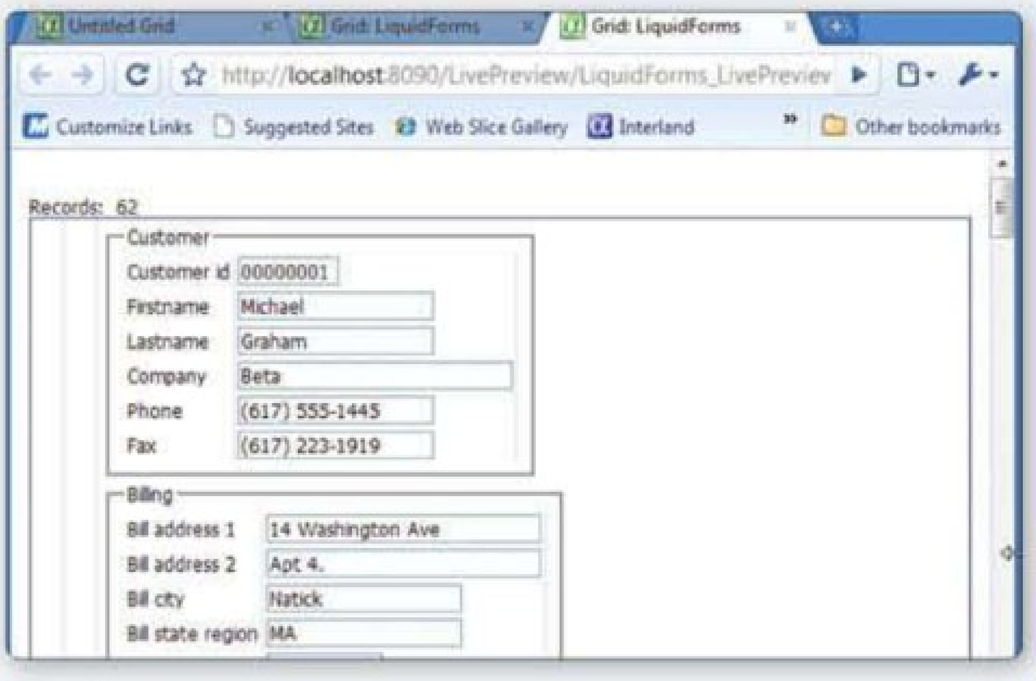
ALPHA FIVE LIQUID FORMS



START Don't make your browser forms too rigid if you're developing a multi-platform app – excessive scrolling will be required on small-screen devices. Liquid forms can handle screen-width automatically. The above form is fine for a PC, but difficult to view on a smartphone.

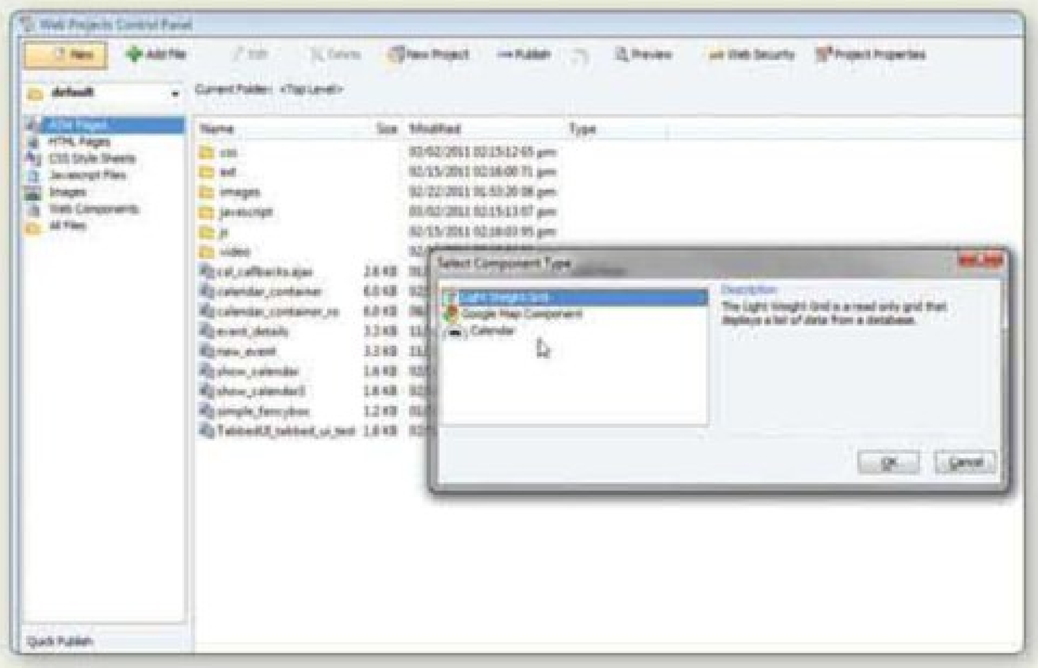


2 Look at the composition of the screen in the Design panel, and you'll see no special commands are required to achieve the liquid-form effect. Alpha Five creates HTML that realigns itself to the shape and size of the screen on which it's displayed. However, you can override this behaviour if required.

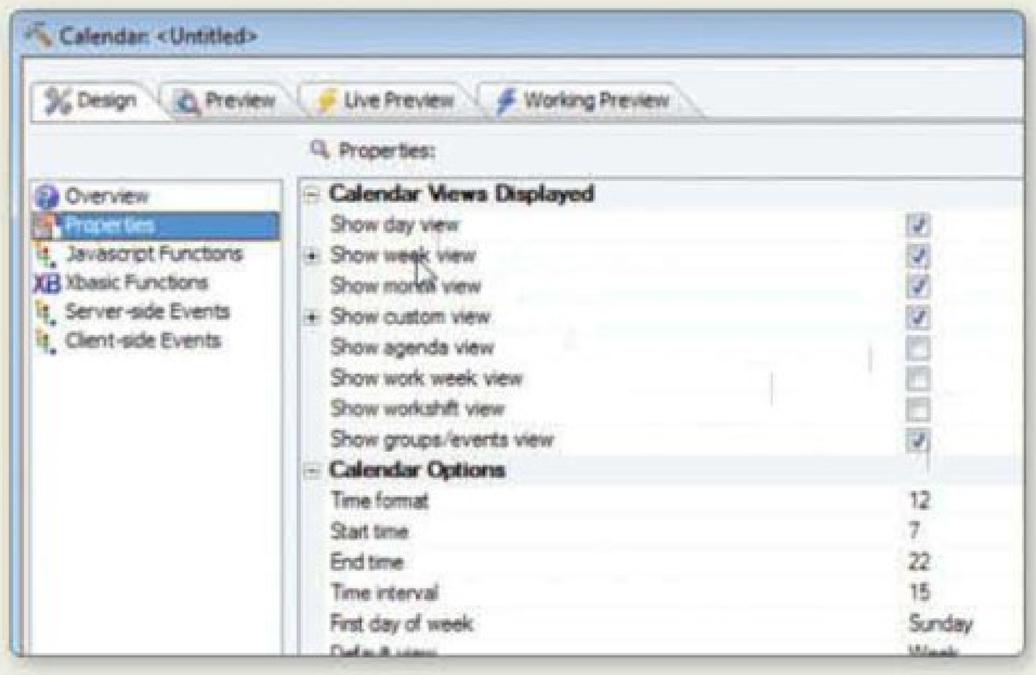


3 Narrow the width of the browser window to simulate its appearance on a small screen, and Alpha Five automatically shuffles down the grids. The software automatically readjusts the number of grids displayed in each row, depending on the width of the browser window. ☒

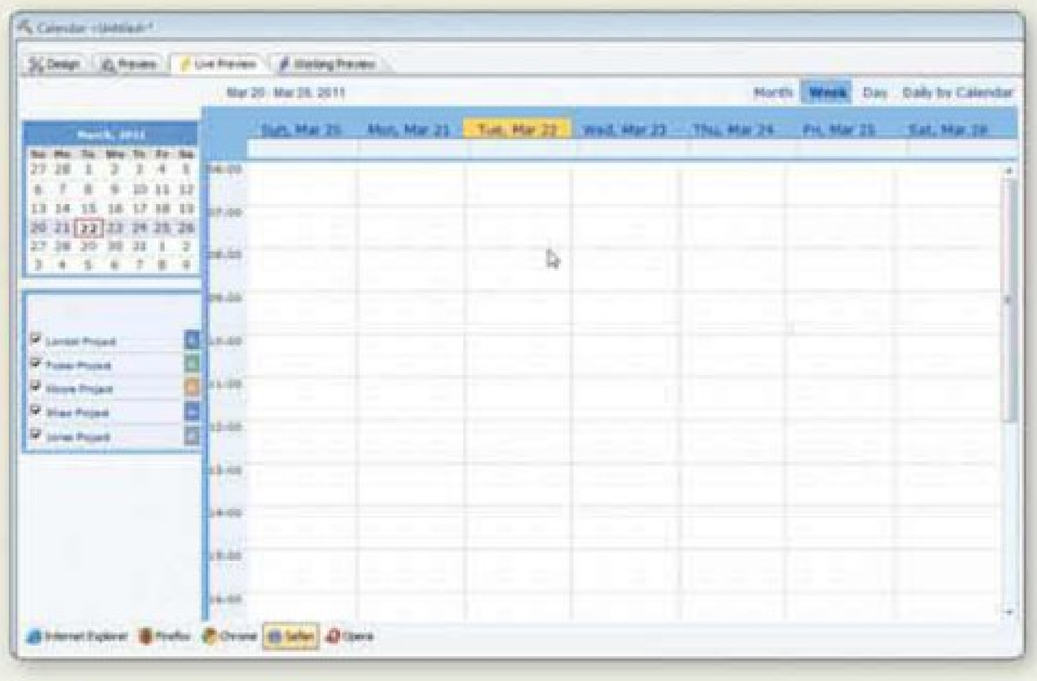
ALPHA FIVE CALENDAR



START Calendars can be built into Alpha Five databases and used for scheduling. Treat calendars as you would any other component that is added to a form, then tie events or to-do lists to them. To add a calendar, select New, then choose Calendar in the 'Select Component Type' dialog box.



2 The Calendar properties panel that appears onscreen offers a range of options. You can specify functional settings, such as when your working day starts and ends, plus cosmetic properties, such as the size of pop-up calendar panels and their colour scheme.



3 Preview the calendar to see how it will appear in your app. The screenshot above displays the weekly view, with a daily calendar to the left. Clicking on a time slot in the main panel to enter an appointment or meeting. This form can then be tailored to meet the needs of a specific app. ☒

A number of options are available for purchasing Alpha Five, with the version 11.0 Developer Kit starting at £218 ex VAT. Exclusive bundle packs are also available, offering significant savings on individuals SRPs. For more info or to download a free trial, visit:

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ROSEMARY HATTERSLEY

Tech Help

Windows spin

There's something for everyone in this issue's How to section. We continue our programming masterclass using SmallBasic in *How to: Windows* (page 108); at the other end of the complexity scale, we also tackle how to share family memories and photos on a dedicated website that only trusted members can peruse (page 112).

Windows 8 is big news. The iPhone 4S and Amazon Fire tablet may be grabbing the headlines right now but, in the long term, it's your primary device and the interface it offers that will most affect your daily computing life. Microsoft is offering a radical new look and the option of using touchscreen input for almost every task.

To find out whether this new approach is for you, you may wish to install the Developer Preview. *How to: Upgrade* shows you how to prepare and highlights some of the features to expect from Windows 8 (page 104).

Rather than a new operating system, it may be faster performance your PC requires. Our *Troubleshooter* looks at how to select suitable RAM modules for your PC or laptop and how to go about switching old memory modules for new. A few crisp tenners could enable your PC to go from juddery to smooth. See page 96.

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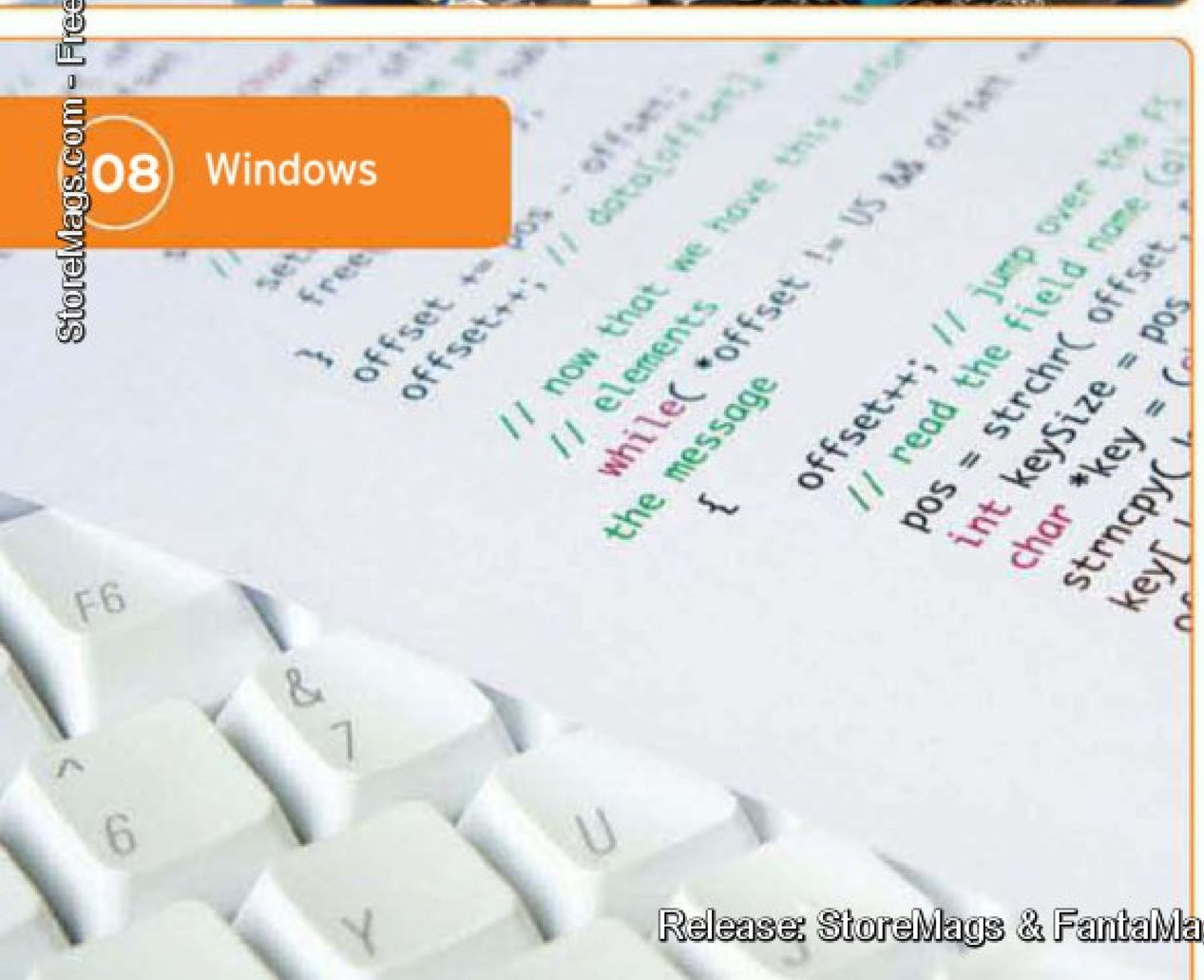

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Add RAM to boost performance

Adding more memory to your PC is one of the most cost-effective means of boosting its performance. **Loyd Case** looks at how to choose the right RAM and avoid installation issues

Now is a good time to upgrade your computer's RAM. Most PCs are sold with 64bit operating systems. Software is more memory-intensive than ever, and 64bit programs and games are shipping. Memory prices have also dropped substantially.

Buying the right memory isn't as easy as it used to be, however. Most current desktop PCs use DDR3 memory, but some older systems use DDR2. The situation is similar with laptops. Check your manufacturer's manual to find out which type of memory you need.

You can also use Belarc Advisor – an online tool that takes an inventory of your setup and suggests suitable components for it. Kingston Technology and Crucial both offer RAM and SODIMM (laptop memory module) upgrade advice, based on the brand and model of your PC.

When upgrading desktop systems, memory speed and timing can be an issue. Many motherboards are unable to simultaneously run modules in each of their memory sockets at full-speed. One strategy is to buy modules a speed grade higher than the motherboard supports, then dial them down. We once ran an X58 motherboard with 12GB of DDR3 RAM; it had six 1,600MHz modules running at 1,333MHz.

Choosing laptop memory modules is a little easier, if you know the rated speed and capacity. Laptop motherboards generally support no more than two memory modules, although a few models have three sockets.

Whether it's a laptop or a desktop PC, a general rule of thumb is to stick to the same capacity for each memory channel. For a dual-channel PC with four memory sockets, for example, it's fine to have two 2GB modules and two 4GB modules. However, you must ensure that each pair of matching modules is installed in sockets for the same memory channel.

Upgrading desktop PC memory

Set the PC on an elevated platform, such as a table or workbench. It's much easier to work inside the case if you have lots of elbow room. Clear all the wiring and clutter from around the DRAM sockets. Confirm that you have the correct module types for your desktop PC. You don't want to insert DDR3 modules into DDR2 sockets.

Most memory sockets have two locking tabs on either side that flip down to release memory modules for removal. Some motherboards may have a locking tab on only one side. If you're replacing old modules with new memory, unlatch one or both tabs to release and lift out the old module.

Your graphics card or CPU cooling fan may crowd the memory socket to the point that you can't remove or insert memory. In this case, you'll need to carefully remove the offending items first.

Never handle DRAM modules by their gold-plated contacts. When inserting new modules, make sure the locking tab or tabs are completely open.

To ensure you're inserting the new RAM modules the right way round, align the key notch with the corresponding ridge in the memory socket. Be very gentle when inserting new DIMMs. Push the new

Release the old memory modules from the locking tabs on either side

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module straight down into the socket until the locking tabs latch the module into place. Double-check all the tabs are locked and the module is firmly in place.

Reattach any hardware or wired connections you had to remove prior to installing the memory modules.

Now try powering up the system. A succession of fast beeps indicates that one of the modules isn't properly installed or may be defective. If you're trying to fill all the memory sockets, remove the old modules and check whether the PC will boot up properly with only the new ones fitted.

Upgrading laptop memory

It's usually a matter of simply undoing a few screws on the back of your laptop to remove the rear panel and access the RAM. Consult your manual for details of how to open the bay containing the memory sockets. If the manual doesn't explain this, look for the information on the manufacturer's website.

Laptop parts are delicate and very small. You may need to use a screwdriver with a special head to remove the screws from the memory compartment.

Confirm you have the correct module types for your PC (DDR2 or DDR3).

Laptops use SODIMMs, which are smaller than desktop memory modules. Their memory sockets have locking tabs; once unlatched, a spring will often push up the old modules for easy removal.

When inserting a new module, line up its notch with the matching ridge in the memory socket. Slide the module into the slot and press it into the laptop to latch it in place. Check to see whether the system boots up before replacing the compartment cover.

Learn more about your memory

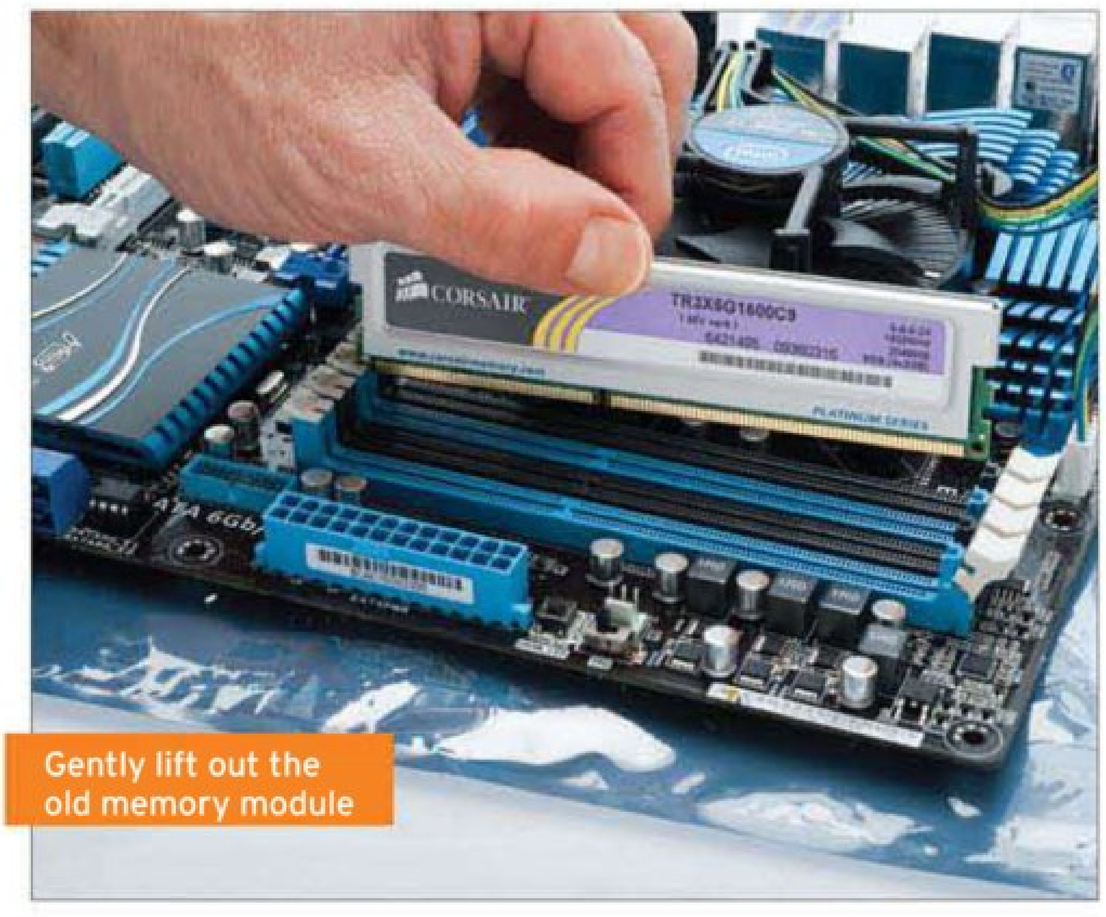
Windows Seizer 1.05 (tinyurl.com/3bLneLq) is a useful piece of freeware that displays low-level information about all the windows open on your desktop.

This information includes the window caption, its memory usage, handle, class, parent, process ID and file name, plus the window's size and position.

The initial table displays data on only the windows you can see. Select 'Show Hidden' and, after a sometimes lengthy delay, you'll also see the many more hidden windows active on your system. This can be useful for developers, but it has more general applications for Windows users, too: if a hidden window keeps locking up or hogging all your RAM, you can spot it here.

As well as watching your system, Window Seizer can also manipulate windows in various ways. It lets you close, hide or reveal windows, terminate locked programs, move them top-left of the screen (this can be very handy if they're currently not visible) and more.

There are a few problems with the program, however. Memory usage doesn't always appear to be reported accurately, for instance. And occasional lengthy pauses sometimes leave you wondering if the program has locked up. Still, Windows Seizer has plenty of useful features and offers a handy way to monitor exactly what's running on your desktop.



Gently lift out the old memory module

Push the new module straight down into the socket and lock the tabs to hold it into place

Contributor: Mike Williams

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YOUR QUESTIONS ANSWERED

Expert computing advice

Paul Monckton tackles readers' hardware and software conundrums

INVALID COM ERRORS

Q My 18-month-old Windows 7 laptop grinds to a halt every time I try to use it. Finding and fixing any Registry errors and hard-drive corruption using Iolo System Mechanic solves the problem until the next restart. I've uninstalled the programs I don't use and clear the cache twice a day. I don't know what to do next. Many of the faults reported by Iolo concern invalid COM references (see screenshot, right). *Jaki Collins*

It's difficult to diagnose this issue without further information, but the fact that a clean-up utility is able to alleviate the problem suggests that it isn't the laptop's hardware at fault. If the issue is recurring regularly, it's possible that you're running low on hard-drive space.

The Windows Registry contains hundreds of thousands of entries, which makes the 20 or so errors reported by System Mechanic a drop in the ocean and somewhat irrelevant.

Check your remaining disk space next time the problem occurs. You've already uninstalled the applications you don't need, but some additional spring cleaning may be required to free up enough space for Windows to store the temporary files it creates during normal operation. Keep at least 15 percent of your drive's capacity free.

AUTORUN WORM

Q For several years I've been using a portable hard drive to store valuable data, but I recently picked up what I believe to be a malware infection. Microsoft Word documents now feature the file extension .exe rather than .doc, while other files and directories have been converted to link files. Please help me reclaim my files. *Adeniyi Afonja*

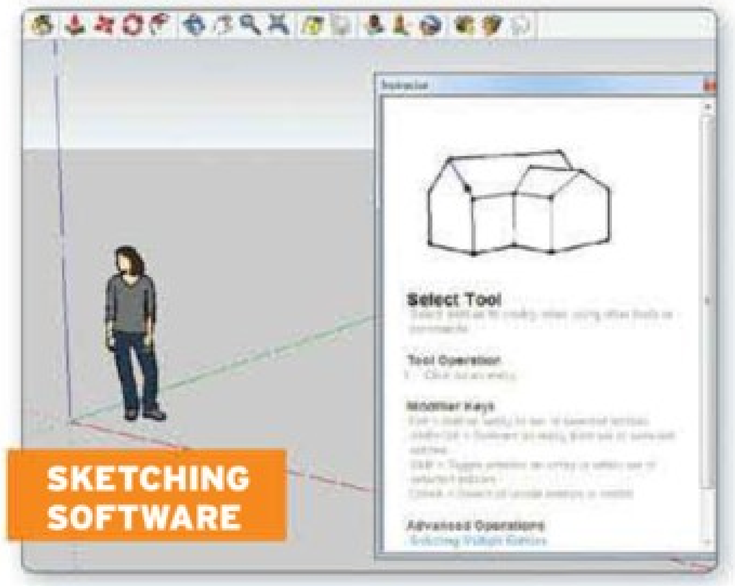
This looks like the work of an autorun worm. Such malware is designed to infect shared files on a network, or those stored on removable devices such as your USB drive.

An up-to-date antivirus should be able to detect and remove this worm. Launch your security program, install any updates, then set it to perform a full system scan.

Autorun worms use Microsoft Word files as a vehicle on which to propagate themselves, rather than destroying the information stored within. By changing the file extension to .exe, innocent users wanting to open the Word document are tricked into launching the malicious code attached.

Because the worm doesn't tamper with the data stored within the Word document, your antivirus software should be able to clean the infected files and return them to their original state for editing.

McAfee's antivirus has reportedly recovered files damaged in this way; many other programs will also be up to the job.



SKETCHING SOFTWARE

Q I'm struggling to find some interior design software for cafés and restaurants for use on my Windows 7 PC. Are you able to recommend some user-friendly software? *Cameron Carter*

Google SketchUp (sketchup.google.com) is a free application that's useful for all sorts of 3D design. It's very powerful, but designed with ease of use in mind; plenty of online tutorials can help you get started.

If you need more functionality, upgrade to SketchUp Pro. This adds professional features and a 2D LayOut module.

For more simple tasks, such as creating quick floor plans, you can try a site such as floorplanner.com. This runs within your browser, so you don't need to download and install additional software. As with Google Sketchup, the basic version is free. More advanced options can be added on a sliding price scale.

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Tech Help

TWO NETWORKS, ONE ROUTER

Q I live above my small business and use six Windows 7 and XP PCs for work and leisure. These are currently linked to a single router and Wi-Fi network. I'd like to separate my home and business networks, but control both from a master PC running Windows 7. Please tell me how to proceed. ***Ian Shilston***

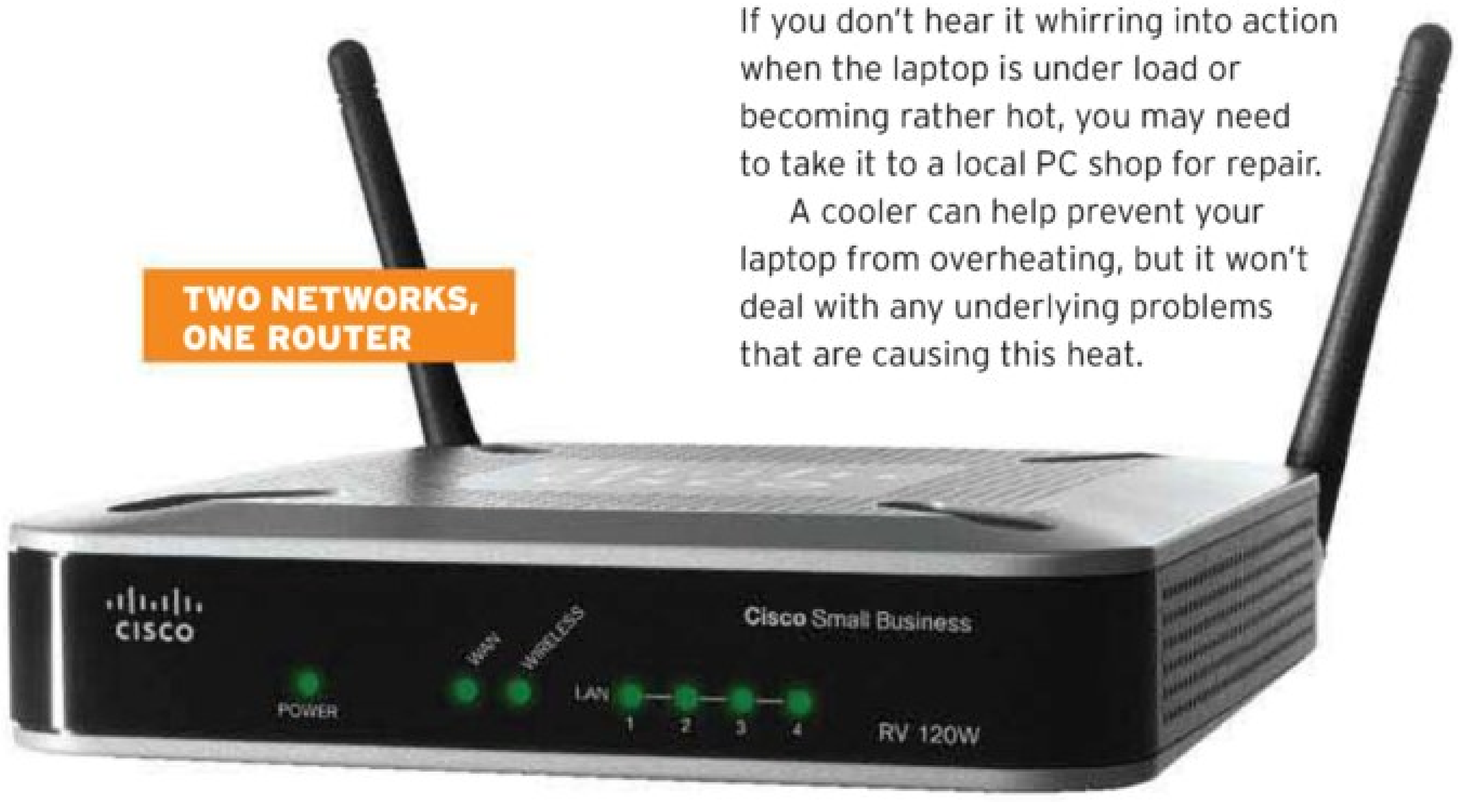
There are a number of ways you could achieve this, Ian. The most elegant solution would be to use a router that supports virtual LANs (VLANs). This feature allows a single router to maintain a number of separate networks internally and assign them to different external ports.

Using such a router, you can set up two networks as if you were using two routers. The PCs connected to one network won't be able to see those configured to access the other. You can also set up wireless clients to attach to the VLANs.

Because the VLANs are managed by the same router, your master PC will see and can be assigned to both simultaneously.

Another approach is to install a second network adaptor in your master PC (some models have two network ports as standard, in which case this isn't necessary). This solution is more complicated, however, as you would then need to configure each network as a different subnet and set up routing within Windows on the master PC. And if you're using a DHCP server to assign IP addresses, you would need to ensure that this also has access to both subnets.

If your current wireless router doesn't support VLANs, you may need to invest in a new model. Take a look at Cisco's £119 RV120W (pictured below) and Netgear's £189 ProSecure UTM5.



HOT LAPTOP

Q My laptop runs very hot, and I'm concerned that it could be on its way out. Is there anything I can do? ***Joe G***

Dust is the common culprit behind excessive heat, Joe. It's sometimes necessary to return the laptop to a service centre for internal cleaning, but in many cases you can resolve the problem by blowing the dust out of the vents. A can of compressed air designed for the purpose can be useful here.

If this doesn't resolve the issue, you may find that your fan has stopped spinning. If you don't hear it whirring into action when the laptop is under load or becoming rather hot, you may need to take it to a local PC shop for repair.

A cooler can help prevent your laptop from overheating, but it won't deal with any underlying problems that are causing this heat.

(UN)PROTECT YOUR WI-FI NETWORK

For many years, I didn't bother protecting my home network. My neighbours had their own password-protected networks, so I didn't feel the need to deal with the hassle of WPA2 keys and so forth. But now that I have a premium broadband connection that promises impressive connection speeds, I'm keen to ensure others don't take advantage of it, slowing me down.

Adding new devices to the WPA2 Wi-Fi router's trusted circle is proving troublesome, yet it's something I often need to do. Rather than endlessly entering complex passwords, I wanted a clever way to be able to auto-login.

Digital Inspiration came to my aid (tinyurl.com/3bk2cu7). As well as explaining how to check whether anyone was taking advantage of my open network in the first place, it had one simple suggestion: give my network a scary name. Choosing an unappealing or intimidating SSID (network name) may well be enough to ensure non-tech-savvy neighbours steer clear.

The Digital Inspiration site uses the example: c:\virus.exe. You might also try something that sounds vaguely threatening, such as FBIWatchdog or thievesbeware. I like 'iwillhackyou', which should keep the pilferers at bay.

A smarter option is not to broadcast the SSID at all, meaning your network will stay invisible to outsiders while remaining available to you. See tinyurl.com/5t77qfu. *Rick Broida*

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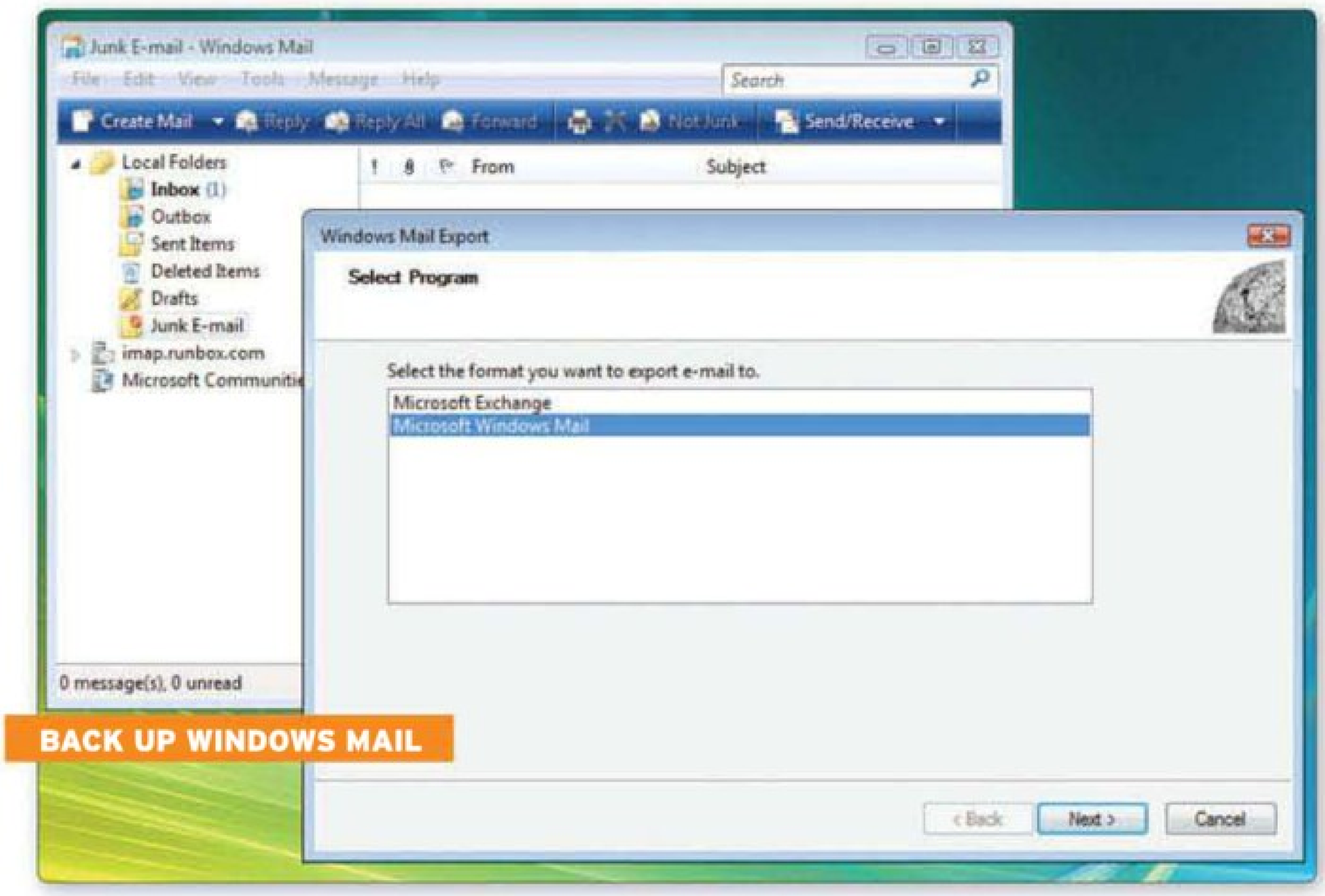

BACK UP WINDOWS MAIL

Q Where can I find my Windows Mail messages and contacts so I can back them up to another machine? *Joe G*

The easiest way to back up your Windows Mail messages and contacts is to export them from Windows Mail. You can then import the backup on to a second PC.

If you're using Vista, Windows Mail is built in. In Windows 7, you'll need to download and install the application – it's part of Windows Live Essentials, available from tinyurl.com/5vubf6L.

Launch Windows Mail and select File, Export. On the second PC, you can then transfer this file and choose File, Import.

ENDLESS UPDATES

Q I'm having problems installing Windows updates on my Vista PC. It successfully installed one of three updates, then stalled on the second. I rebooted the machine and it began installing the third, then stalled again. The PC refuses to bypass this screen and boot into Windows. *Phil Barstow*

To break out of this endless loop, try booting from your original Windows Vista installation disc (assuming one was supplied with the PC). Choose the language, click Next, then select 'Repair your Computer'.

The installer will search for any Windows operating systems residing on your hard drive. If you have only one, click Next; otherwise, you'll need to discern the correct installation from the information provided.

Select Startup Repair from the recovery options displayed. The installer should guide you through the steps necessary to boot into Windows and access the desktop.

If this doesn't work, instead select Command Prompt from the recovery options. Enter the following commands in the interface that appears, substituting C: for the relevant drive letter if this is not the drive on which Windows is installed. Press Enter after each line, then reboot.

C:
cd c:\Windows\SoftwareDistribution
ren Download Download.old

This will prompt Windows to back up all your pending updates, then move them out the way so the operating system can start up normally. You can then install individual updates via Windows Update.

FILE-SYSTEM CONVERSION

Q I want to format my Windows 7 PC, but its hard drive contains 200GB of files that I must first transfer to my external hard drive. The problem is this drive uses a FAT32 system, which won't let me transfer any file larger than 4GB, and I can't convert it to NTFS as it already has files stored on it. Is there a way to convert my external drive from FAT32 to NTFS without losing the data stored on it? *Autoschediastic*

Windows includes a utility for converting FAT32-formatted drives to NTFS. It takes a few minutes to run and is usually reliable, but we wouldn't recommend using it without having backed up your files. If something goes wrong, you stand to lose a lot of data or endure a lengthy file-recovery process.

The convert.exe command line utility can convert a drive partition from FAT32 to NTFS, keeping all data intact. Note that it can't convert in the opposite direction, from NTFS to FAT32. You will need to be logged in with administrative privileges to use it.

After you've backed up your files, head to the Start menu and type **cmd** into the Search box. Right-click cmd.exe in the results pane and select 'Run as Administrator' to open a command prompt.

In the following example, our system drive is drive C and the NTFS drive is drive E; substitute the correct drive letters for your personal setup.

It's important to select the correct drive letter for conversion. Within the command prompt type **E:**, then **DIR**, and press Enter. This will show you the list of files and folders on the drive in question so you can verify that it's the correct drive.

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Now enter the following commands, pressing Enter after each line:

C:

convert E:/fs:ntfs

As a safety precaution, you may be prompted to enter the volume label for your hard drive. Ours is called 'USB DISK'; you should substitute this with the name of your drive and press Enter.

This process may take a while depending on the size, speed and content of the drive you're converting. When it's finished, you'll receive a 'Conversion complete' message.

An easier, but more expensive, option is to purchase a new NTFS-formatted external hard drive and transfer the contents of your old drive to it. You can then convert the old drive to NTFS and use it to back up files stored on the new drive.

2010 SECURITY SOFTWARE

Q My friend gave me a copy of BullGuard Internet Security 2010. My PC was protected at the time, so I didn't immediately install it. However, the licence for my current protection is about to expire. Can I still install the BullGuard security suite or is it out of date now that version 2011 is available? *Gemma Thompson*

We checked with BullGuard, Gemma, and it said your licence period begins when the software is installed, not when the suite was bought. This licence is also valid on newer versions of the software, which we recommend you plump for instead of the slightly older suite you have a disc for.

You can download the latest version of the security suite, BullGuard Internet Security 2012, from tinyurl.com/5tvz4dj. Use your existing licence key to activate the software.

MAXIMISING MEMORY

Q I installed 8GB of DDR3 memory in my Windows 7 computer, but the System information in Control Panel reports that only 3.25GB is installed. How can I make Windows see the full 8GB for gaming purposes? *Rich*

It sounds as though you're using a 32bit version of Windows 7 (you can check this in the same screen as you verified the amount of installed memory; head to Control Panel, System and Security, System). In order for your computer to take advantage of 4GB or more of RAM, you need to be running a 64bit edition of Windows. Unfortunately, it isn't possible to upgrade from a 32- to 64bit installation as you would from 64bit Windows Vista to 64bit Windows 7. You'll instead need to back up all your files and settings, then perform a clean installation of the operating system.

This step is becoming less necessary as more software and peripherals are designed to operate with 64bit operating systems, but it's worth checking that all your software and hardware drivers will continue to work.

Depending on how you purchased your copy of Windows 7, you may find an installation disc for the 64bit edition in the box. Otherwise, you'll need to fork out for a new copy of the software.

PASS IT ON

Thanks to David Jackson for this useful tip on reinstalling Windows.

Having recently had to reinstall Windows on my daughter's laptop, I have a word of advice for PC Advisor readers: write down your licence key number and put it in a safe place.

Manufacturers have a habit of attaching the Windows Certificate to the bottom of the laptop, where everyday wear and tear causes it to become illegible. I was unable to boot Windows to access this information, and had no option other than to fork out for a fresh copy of Windows. Don't fall into the same trap.

WHICH SMARTPHONE?

Q My Sony Ericsson Xperia X1 smartphone is on its last legs. I regularly use its slide-out keyboard, while I find Microsoft's mobile apps helpful for synching emails, contacts and calendar appointments with my laptop. I want to upgrade to something similar, and I believe the HTC 7 Pro and Nokia E7 >>

WHICH SMARTPHONE?

are the only phones available that run Windows Phone 7. But which is best?

Also, I heard that Microsoft was planning to add the ability to cut and paste copy, and to directly sync emails and other files with a laptop to Windows Phone 7. Do you know when these update will be available?

Finally, can I sync my Lotus Notes business calendar with my personal Outlook calendar? *Malcolm Lane*

Nokia's E7 runs the Symbian rather than Windows Phone 7 operating system. If you insist on using Microsoft's mobile platform, the HTC 7 Pro is the correct choice out of the two phones you mention. However, a new generation of Windows Phone 7 'Mango' phones is launching now. Visit our website at tinyurl.com/6ab2rda for more details.

You'll be pleased to hear that cut and paste is now supported by Windows Phone 7, but direct synching between Windows Phone and Windows 7 is not currently possible. You might instead like to sync files via the web: if you have a Windows Live account you can upload files to SkyDrive, then access them from a web browser on any machine that's connected to the internet.

Emails are synched to the phone in the same way: via the web. They are accessible on your PC or laptop using a web browser.

There are no plans for a version of Lotus Notes Traveller for Windows Phone 7. Most current methods of synching Lotus Notes with Outlook involve importing your data into Google and then back out again. Have a look at CompanionLink Express (tinyurl.com/3dd889y) for accessing Lotus Notes email from Windows Phone 7. ☒

CONTACT US

Do you have a technical problem that needs solving? Email your Helproom questions to helproom@pcadvisor.co.uk. Please remember to use 'Helproom' as the subject header and give your full name. 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.

For more PC help go to: pcadvisor.co.uk/helproom

SEARCH THE *PC ADVISOR* FREE ONLINE HELPROOM

The *PC Advisor* online Helproom contains an indispensable database of answers to common questions regarding all aspects of PC problems. This ranges from general Windows issues to problems with specific apps, and covers all types of PC hardware and software, including system components and peripherals.

Alternatively, you can ask for help from the experts on our online forums. Sign up to be a registered user – which is free – and then browse to one of the discussion forums. In the Helproom your first stop should be the searchable database of frequently asked and previously answered queries. With more than 1.5 million forum posts, you'll almost certainly find your answer in this archive of queries – just enter a few keywords.

If our online database can't solve your problem, try posting a question in the Helproom forum, where more than 200 queries are answered every day. The forum is manned by our team of Helproom Angels, who are ready and willing to lend a hand with anything from system crashes to virus alerts.

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Try Windows 8 for free

Carrie-Ann Skinner explains how to prepare for an upgrade to Windows 8, and gets to grips with Microsoft's new 'Metro' touchscreen interface

Windows 7 is popular with consumers, but its successor has been in development ever since the operating system's (OS') launch. Windows 8 was first unveiled by CEO Steve Ballmer at CES in January 2011; in September, a Developer Preview was released at Microsoft's Build conference.

Steven Sinofsky, president of the Windows division, describes the forthcoming OS as "a reimagining of Windows, from the chipset to the experience".

This is the first version of Microsoft's desktop OS optimised for touch input. Windows 8 has two interfaces: a Classic version, operated by a keyboard and mouse; and a new 'Metro' interface, that's similar to Windows Phone 7. It's simple to quickly switch between the two interfaces.

Metro swaps desktop icons for a series of 'live tiles' that you can organise into groups. These can offer shortcuts to applications, or information that's updated in real time.

"Icons are yesterday's way of representing apps," says Microsoft.

Microsoft says the OS will offer faster boot times and run on ARM-powered devices. The new Internet Explorer 10.0 web browser will be bundled and, for the first time, Windows will have an integrated app store.

Microsoft has yet to state a release date for the final build of Windows 8. Nevertheless, the OS is expected to ship in summer 2012.

If you can't wait until then to find out what Microsoft has in store, you'll be pleased to learn that use of the Developer Preview isn't restricted to developers – but it's not something novices should attempt to install either.

"The software is provided as is, and you bear the risk of using it," Microsoft cautions. "It may not be stable, operate correctly or work the way the final version of the software will. It should not be used in a production environment."

We've had no problems running this early build, but we don't recommend trying it out on your primary PC. Neither can we accept responsibility if anything goes wrong, and advise that you first back up all your data.

INSTALL THE WINDOWS 8 DEVELOPER PREVIEW

The Windows 8 Developer Preview is open to anyone who wishes to try it out. Both 32- and 64bit versions are available, and you don't need to be part of the Microsoft TechNet inner circle to trial it. You can grab your copy from our website (head to tinyurl.com/3zqh77t for the 32bit version, and tinyurl.com/6xe4Lo2 for 64bit)*.

The download will be in the form of an ISO file, which you should burn to DVD. Right-click the file, choose 'Burn Disc Image', check your DVD drive is selected, then click Burn.

Then click Start, Computer, then double-click your disc drive. Click Yes when asked whether you want to run the program. The Windows 8 installation will commence, and should last no longer than 10 minutes.

You'll be prompted to enter a name for the PC, then click Next.

Windows will detect any wireless networks in range. Assuming that you aren't using an ethernet connection to access the web, select your wireless network from the list and enter your password. You can skip this step if you don't have this information to hand.

Click Next, and the installer will ask whether you want to accept Microsoft's Express Settings. These include a range of pre-defined options for your region, preferred keyboard

Download the correct version – 32- or 64bit – of the Developer Preview

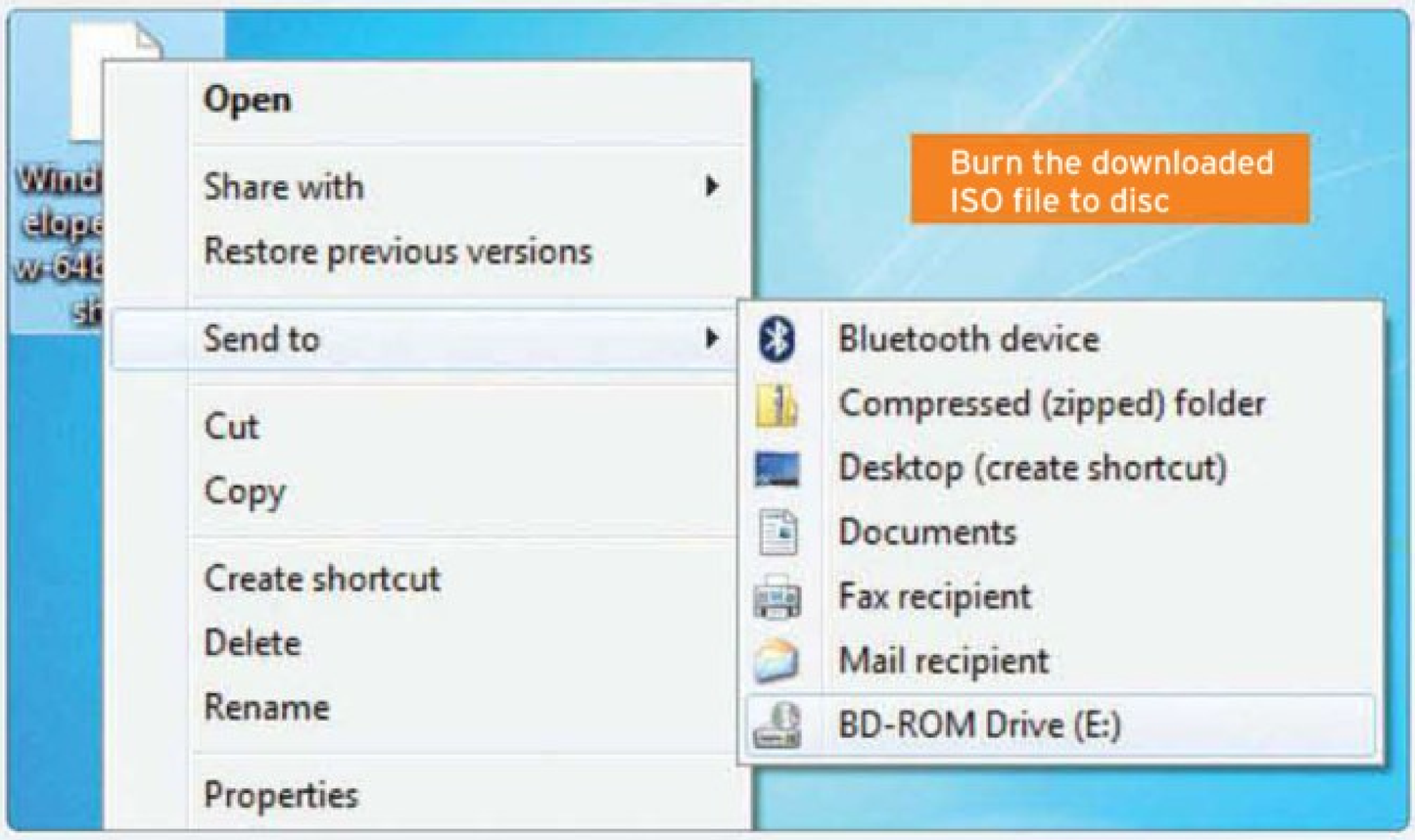
PREPARATION IS EVERYTHING

We can't stress enough that it's a very, very bad idea to install the Windows 8 Developer Preview on your primary PC. Microsoft makes no claims for the stability of the Developer Preview. It's also highly probable that some of the software you use on a daily basis won't work with this early build of the OS. Worse still, you could lose important documents, precious photographic memories and vast collections of music and video stored on the PC.

If a second machine isn't available to serve as a test bed for the new OS, you should install the Developer Preview on a separate partition of your hard drive to your current OS – or an external drive.

* The Windows 8 Developer Preview is in development code and should be installed only by experienced users. PC Advisor accepts no responsibility for any problems incurred

Tech Help



layout, automatic updates and filesharing. Click 'Use Express Settings', or select only the options that are relevant to you by choosing 'Customize'.

A Windows Live ID isn't necessary to install and run the OS, but it's useful if you'll be using more than one Windows 8 device and would like to sync your bookmarks, browser history and more between them. There's an option to create this ID if you don't already have one, although your PC must be connected to the web. Note that a mobile number or alternate email address will be requested in case you forget the password for your Windows Live account.

Following a reboot, you'll see a screensaver displaying the time and date. Simultaneously hold down the left-click button and scroll upwards to remove this. If you chose the Windows Live option in the previous step, you'll now need to enter your associated email address. Alternatively, enter your local user account name. Enter the password to reveal the Start screen.

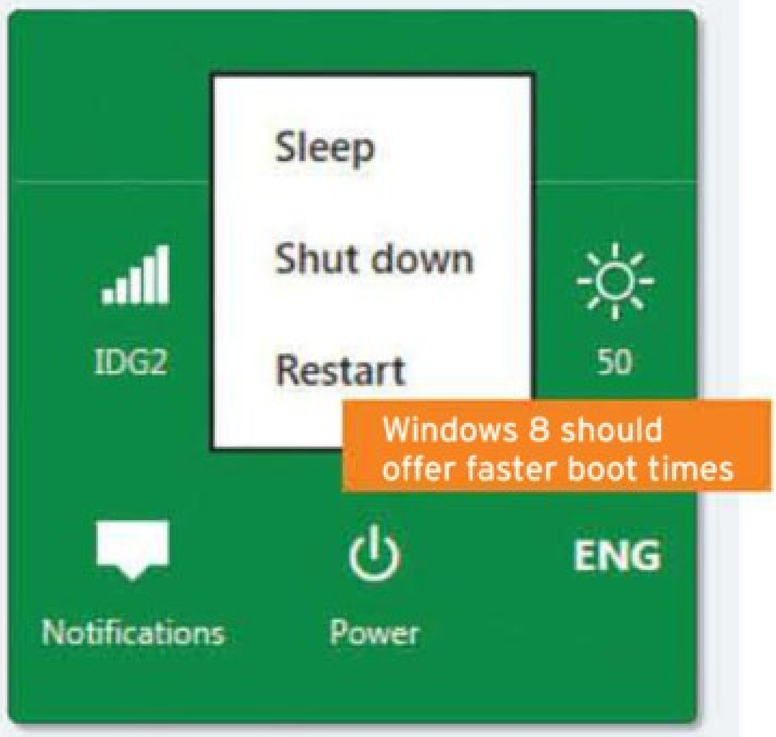
Faster boot times

Microsoft claims that a Windows 8 PC can go from powered down to the Start screen in less than 10 seconds. This is possible due to a hybrid system that mixes processes used in cold boots with Hibernation mode. "We designed Windows 8 so that you shouldn't have to boot all that often. But when you do boot, we want it to be as fast as possible," says Steve Sinofsky.

If you're worried about whether your current system is up to the job of running the new OS, don't be. Microsoft says the system requirements for Windows 8 are exactly the same as for Windows 7.

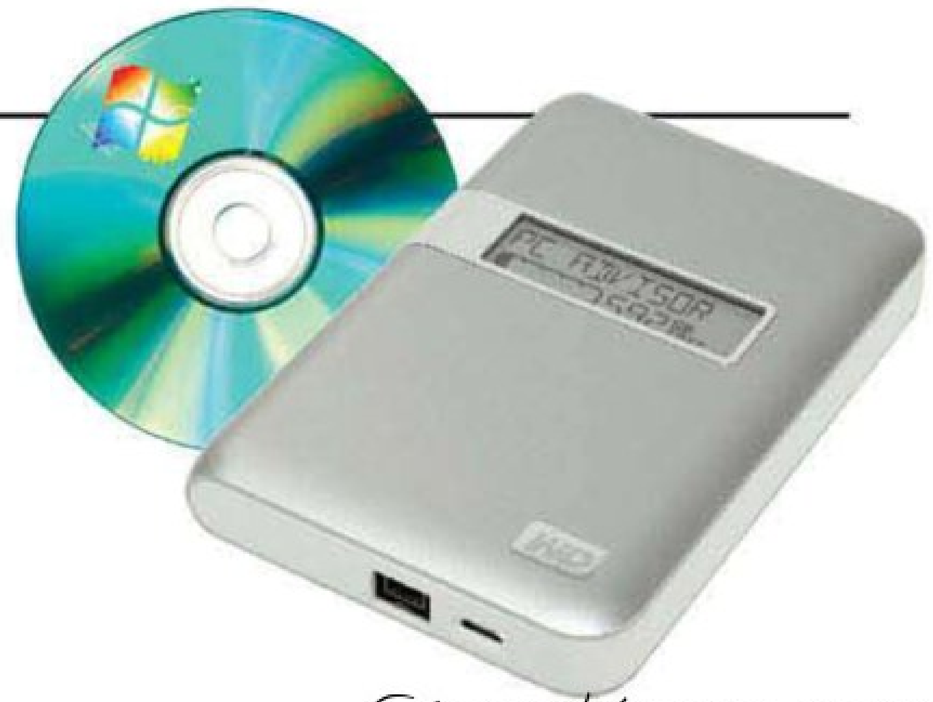
"In both our Windows 8 previews, we talked about continuing on with the important trend that we started with Windows 7, keeping system requirements either flat or reducing them over time," says Window's corporate vice-president, Tami Reller. "Windows 8 will be able to run on a wide range of machines because it will have the same requirements or lower."

The minimum system requirements for a PC running Windows 7 include a 1GHz processor, 1GB of RAM, 16GB of hard-disk space and a DirectX 9-compatible graphics card. These are also the minimum requirements for the OS' predecessor, Windows Vista. ☒



Follow the instructions we've given above for downloading the ISO image and burning it to disc. If you're using a spare hard drive, choose Windows 8 as the OS you want to use when it reboots. If you're using a separate partition of your primary hard drive, ensure that you specify as much during installation. You can then continue with the rest of the procedure as we've detailed above.

If you absolutely must install the OS over the top of your previous Windows installation, back up all your important data to an online storage service or external hard drive. Dig out your Windows disc and licence key, plus those for any software you currently run on your machine. Should anything go wrong, you can reinstall your current OS, software and data. See tinyurl.com/3zLd3aj.



NAVIGATE WINDOWS 8

START Start up a Windows 8 PC and, in place of the Classic desktop, you'll be presented with the touch-optimised Metro interface. A series of live tiles contain shortcuts to apps or data that's updated in real time (see Step 3). You can alter their grouping by clicking and dragging on individual tiles.

2 Click a tile to launch its associated app in a new window. No longer will you find a red cross in the top right corner to later close this window; instead, tap the onscreen Start button or press the Windows key (⊞) on your keyboard. Press Alt, Tab to see all running apps. Use Windows, Tab to skip through them.

5 The Share Charm lets you make content relevant to the current app available to other users. In Internet Explorer, for example, you can post a link to the site you're browsing on Facebook or Twitter. The Devices Charm lets you access items such as networked printers, while Search finds specific files on your PC.

6 If you would prefer to use Windows' Classic desktop, it's straightforward to switch between the two interfaces. Simply press the Windows key on your keyboard or click the Desktop app on Metro's home screen. Your will now see the familiar Windows desktop, complete with shortcut icons.

WINDOWS APP STORE

Rumours that Windows 8 would have an integrated app store similar to Apple's App Store and Google's Android Market were confirmed both by Microsoft itself and by the Store tile present in the Developer Preview. Click this tile, however, and you'll discover that the feature is not yet working in this early build of the OS.

Details of the store are still thin on the ground. Microsoft has yet to outline when the store will go live and how payments for app purchases will be made.

What we do know is that both traditional Windows software and touch-optimised Metro apps will be available, including apps for productivity, photos, entertainment, social networking and games. The interface will have a similar look and feel to Metro, with apps divided into categories such as entertainment, finance and games. Each category will also include featured apps, plus the lists of top rated, paid and free apps that are typical to other app stores.

Developers will be able to offer free trial periods of anywhere between 24 hours and 30 days for their apps. Microsoft has also confirmed that any apps submitted to the Store will have to undergo the same certification process that applies to Windows Phone 7 mobile apps. The company uses a similar model to Apple,

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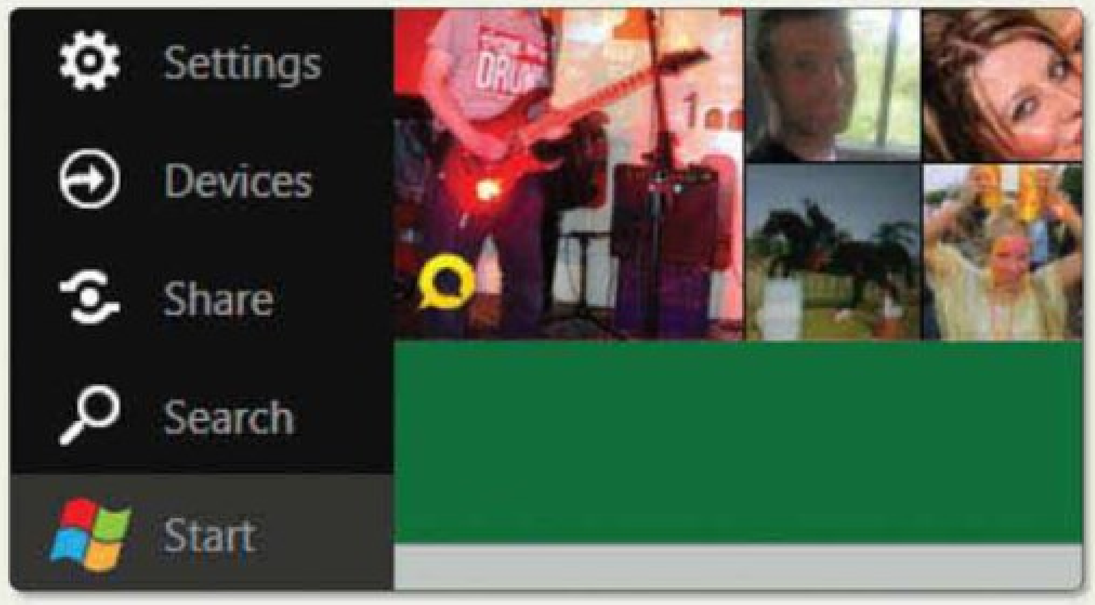
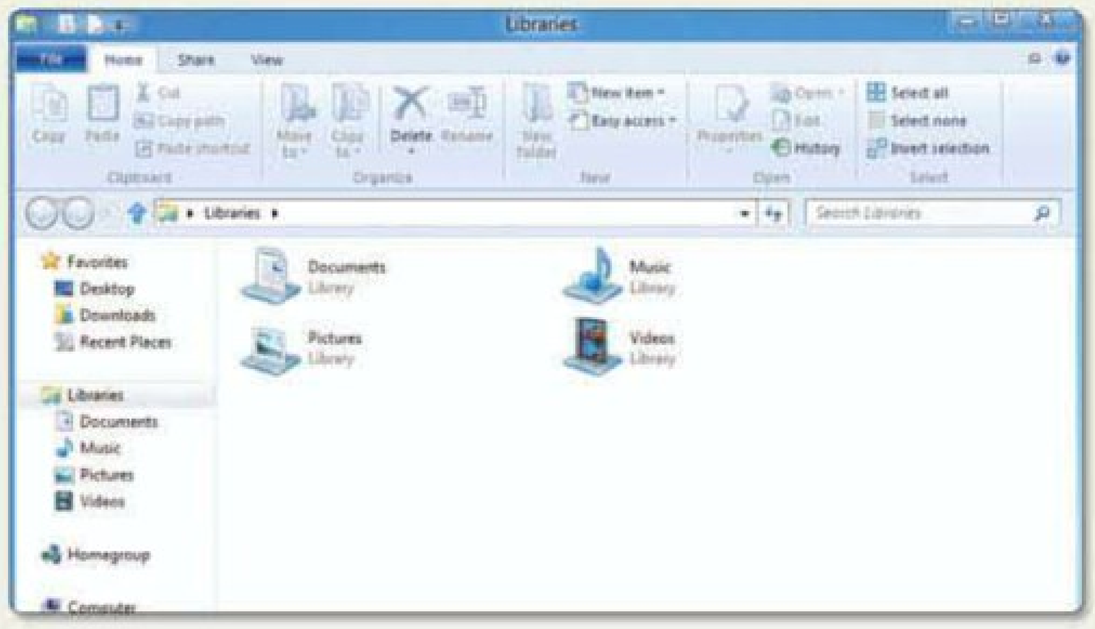
3 Various tiles offer live data, including a Socialite tile that connects with your Facebook account and displays various images on the social network. Another neat feature is Windows Snap. This lets you run two apps side by side, with one occupying around 70 percent of the display and the other taking up the remainder.



4 Hold down the left-click button and drag the cursor from the bottom right to left of the screen to access Windows 8's five 'Charms': Start, Search, Share, Devices and Settings. Start always returns you to the home screen, while the other Charms relate to the app that's currently open.

7 Internet Explorer 10.0 is bundled with the Developer Preview. In Metro, the browser doesn't support Flash or plug-ins. It also has a sparse design with no Favorites bar. Press Start, Desktop and open the browser in the classic Windows interface, however, and the browser history will remember the page you were viewing in Metro.



8 Windows Explorer has had a redesign in Windows 8, and now features Microsoft's Ribbon toolbar first introduced in Office 2007. When you've finished looking around the Developer Preview, open the Settings Charm from the home screen and choose to shut down or restart the PC from the box on the right. ☒

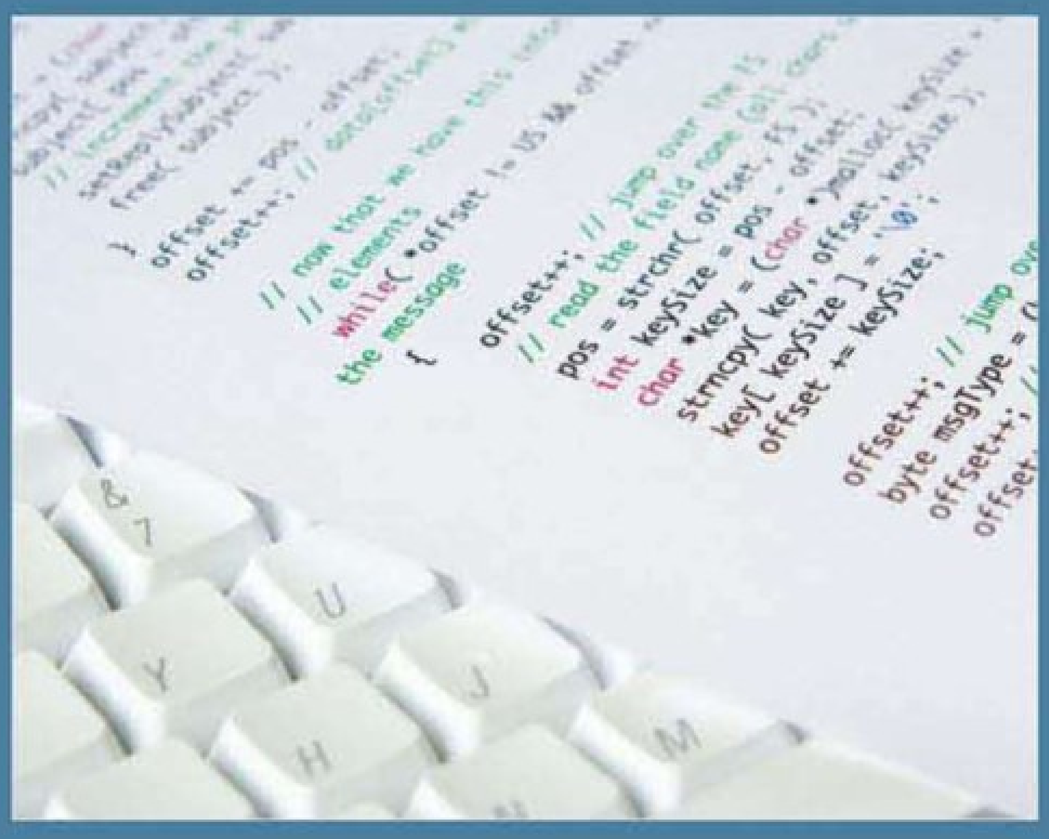
whereby the chances of malicious software getting on to user devices is reduced. The certification process also demands that apps meet basic standards of quality and usability.

Standard desktop software will continue to be available elsewhere, such as vendor websites and Amazon, but Windows 8 apps can be purchased only through the Windows Store.

According to Ted Dworkin, a Microsoft director with the Windows Store development team, the company hopes that by restricting the distribution of apps to the Windows Store it can ensure the software is secure and appropriate.

Learn to programme in SmallBasic: part II

Mike Bedford concludes his introduction to computer programming by delving further into the Basic language and setting you some challenges



Last issue, we looked at the basic principles behind computer programming using SmallBasic. If you missed the first part, you'll find it at tinyurl.com/3cs3uud or on our cover DVD. We covered a dozen or so instructions, but to write more complicated programs you'll require further knowledge of SmallBasic commands and concepts.

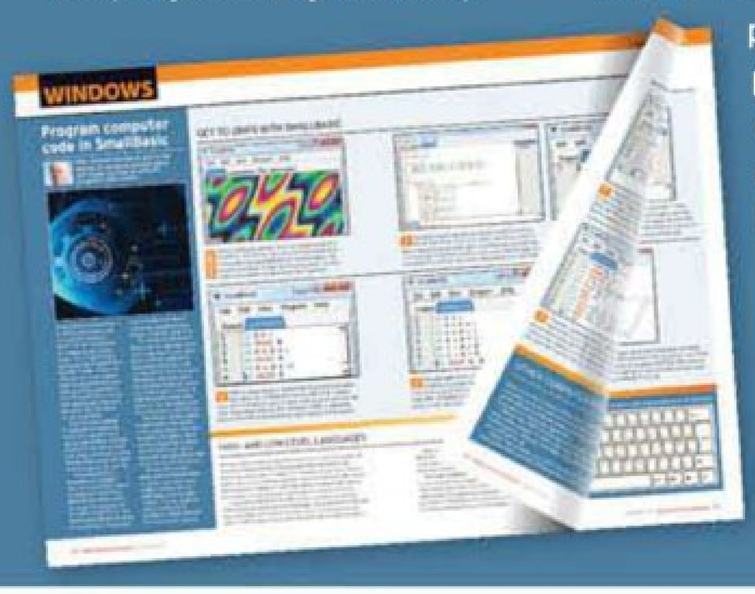
In the previous tutorial, we provided short programs to illustrate each instruction; only in the final step did we leave you on your own to write a program that would achieve a particular task. It's often true that you learn better by doing things by yourself, so we'll continue to follow that theory in the second part of our programming workshop.

If you do get stuck, however, we've included some screenshots on our cover DVD for you to consult. Bear in mind that there's more than one way to write each program, and our examples are exactly that. You may come up with a different but equally correct solution to the same task.

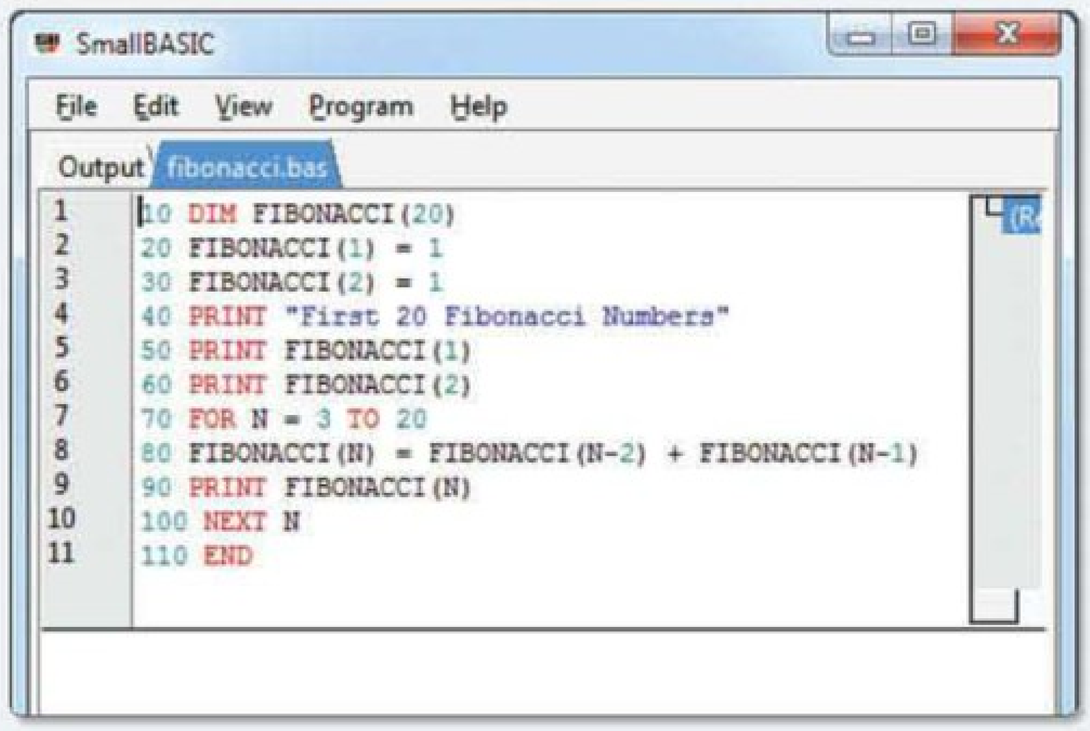
We won't set you afloat without a paddle from the outset, though. You'll first need to get to grips with some new statements and concepts. We'll introduce these by supplying you with the code that you'll need to input in order to run the programs.

Having completed this two-part tutorial, you'll have the necessary knowledge to start writing your own programs. An expert programmer you won't be, but you will understand the basic principles required to continue learning the SmallBasic language.

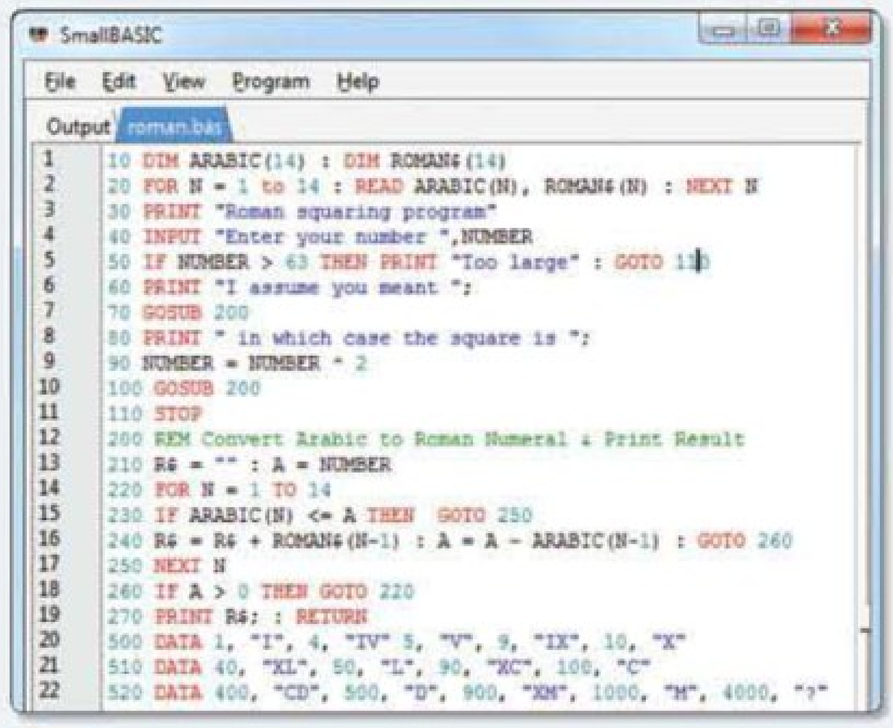
Practice makes perfect: keep at it.



BEYOND THE BASICS



START SmallBasic supports variables called arrays. These are lists of numbers. Use the DIM statement to tell SmallBasic how many values an array can hold, then assign it a name. The values can be accessed using a number in brackets after it. Try the program shown above to generate Fibonacci numbers.



4 If you use a GOSUB statement instead of GOTO, the program will jump to the line number specified; a RETURN statement returns it to the line after the GOSUB. The code between the lines referred to in the GOSUB and the RETURN is called a subroutine. These make code easier to read and allow you to use it in different parts of your program.

COMPLEX NUMBERS

To understand the Mandelbrot Set (page 110), the subject of our final program, you need a working knowledge of complex numbers and the way they're displayed on the complex plain.

'Real' numbers – positive and negative, whole and fractional – can be represented as points on a line. Negative numbers (such as -125 and -19.6) are on the left, zero is in the middle and positive numbers (such as 0.01 and 765) are on the right. Some numbers don't appear: for example, you won't find the square root of minus 1.

Mathematicians refer to the square root of minus 1 as i. It's just one of an infinite number of imaginary numbers. Like real numbers,

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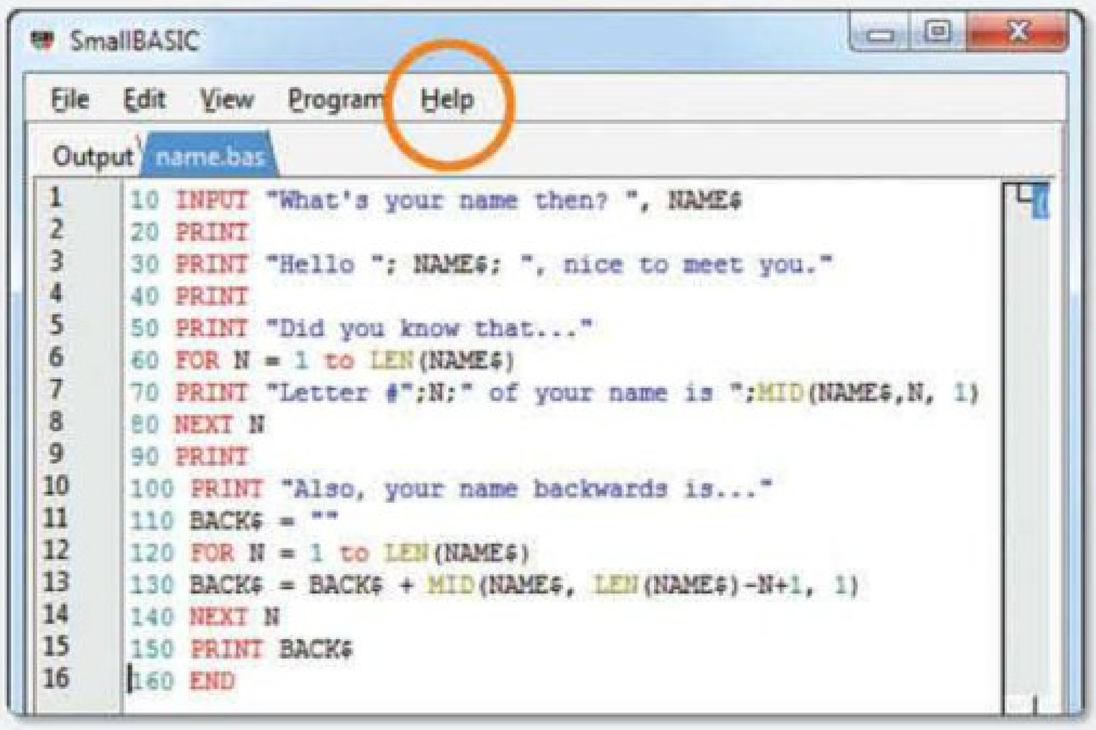
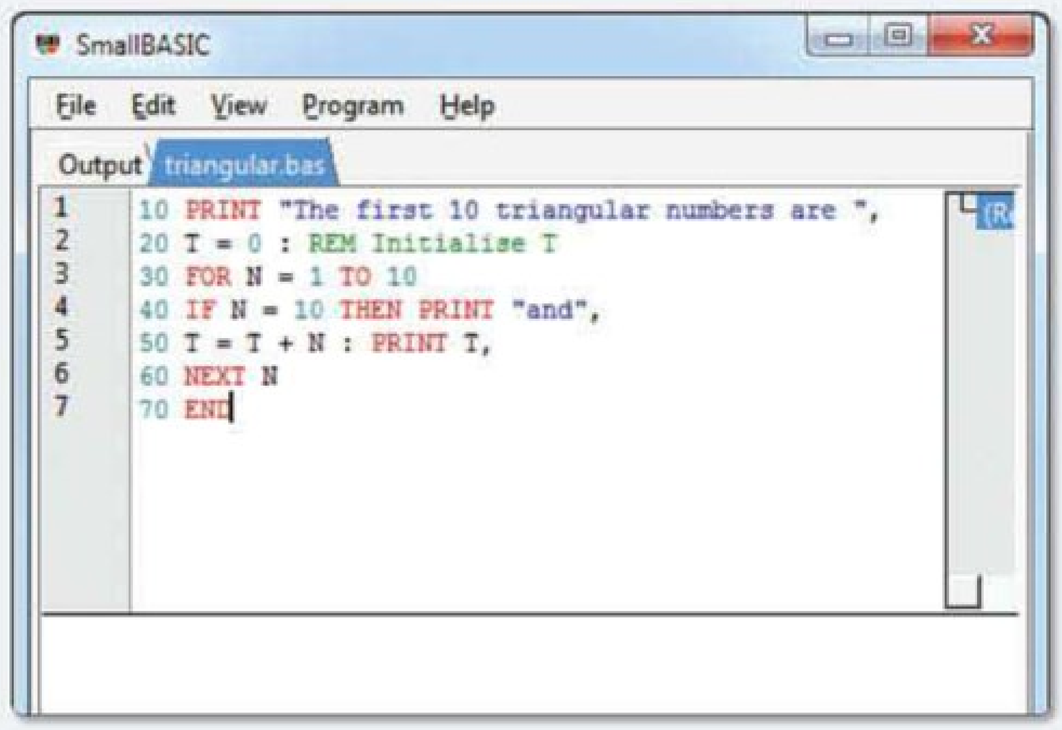
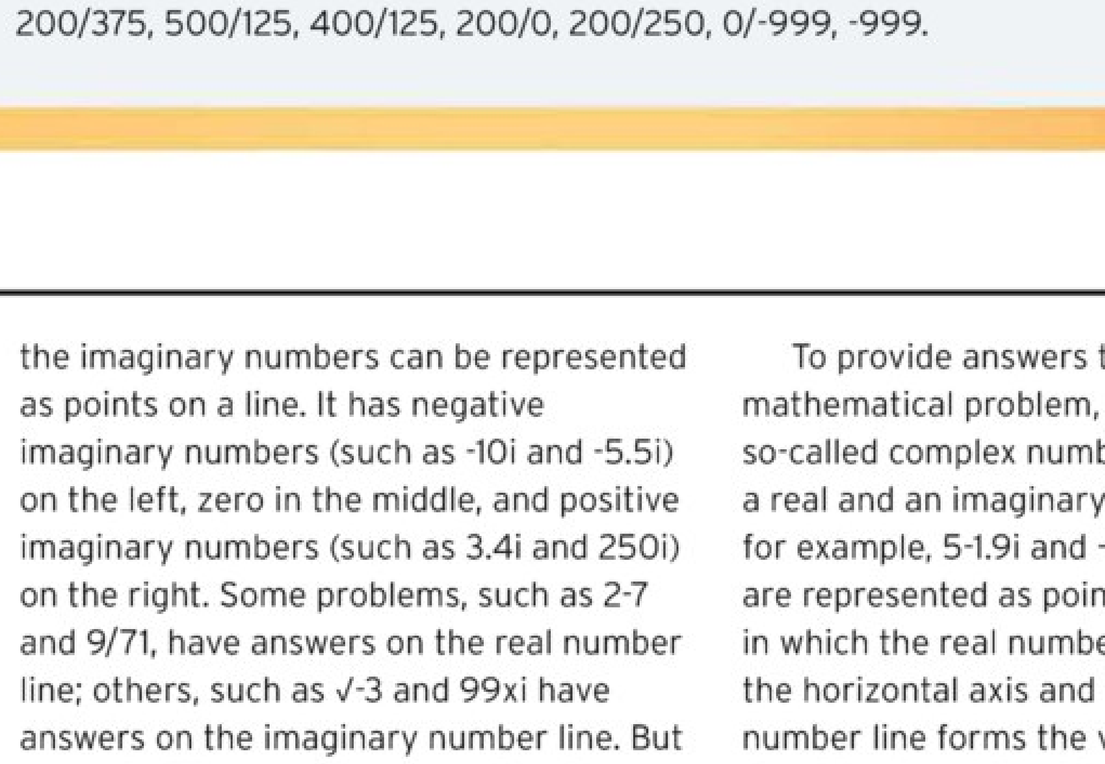
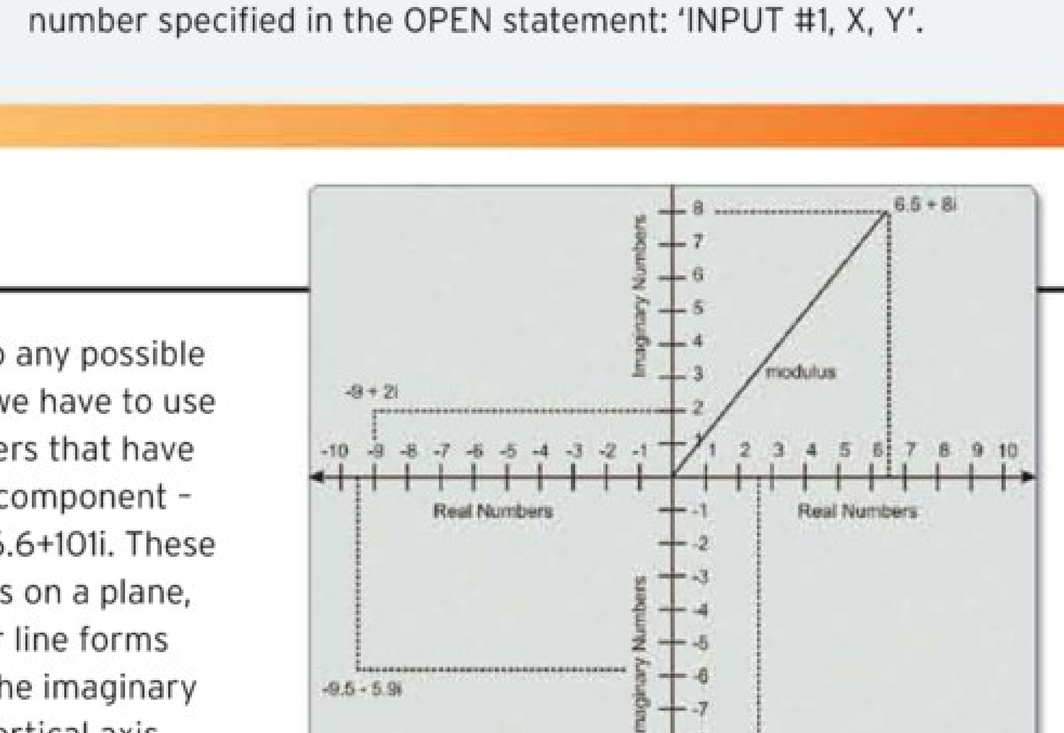




2 Variables can also contain text strings. Basic requires these to end with a $; SmallBasic does not. The + sign that joins string variables doesn't allow you to perform arithmetic, but you can manipulate them in other ways. See SmallBasic's Help file for details. The program shown above hints at what's possible.

3 Next, a couple of useful extras. You can put more than one statement on a line, separating them with a colon. If you terminate a PRINT statement with a comma (or a semicolon), the next PRINT will continue on the same line rather than starting a new one. The program shown above uses both these tricks.





5 We'll use data in a separate file to draw a pattern. Using Notepad, save a file called DATA.TXT in the same folder as your SmallBasic programs. Enter the following values (begin a new line where we've inserted a forward-slash): 250, 0/500, 200/375, 200/375, 500/125, 400/125, 200/0, 200/250, 0/-999, -999.

6 Alter last issue's Step 11 program. Add OPEN "DATA.TXT" FOR INPUT AS #1 to the beginning. Change the two READ statements to INPUT statements. These usually prompt you for input data, but the following variant reads data from the file number specified in the OPEN statement: 'INPUT #1, X, Y'.

the imaginary numbers can be represented as points on a line. It has negative imaginary numbers (such as -10i and -5.5i) on the left, zero in the middle, and positive imaginary numbers (such as 3.4i and 250i) on the right. Some problems, such as 2-7 and 9/71, have answers on the real number line; others, such as √-3 and 99xi have answers on the imaginary number line. But some don't have answers on either line.

To provide answers to any possible mathematical problem, we have to use so-called complex numbers that have a real and an imaginary component – for example, 5-1.9i and -6.6+101i. These are represented as points on a plane, in which the real number line forms the horizontal axis and the imaginary number line forms the vertical axis. (See *The Mandelbrot Set*, overleaf).

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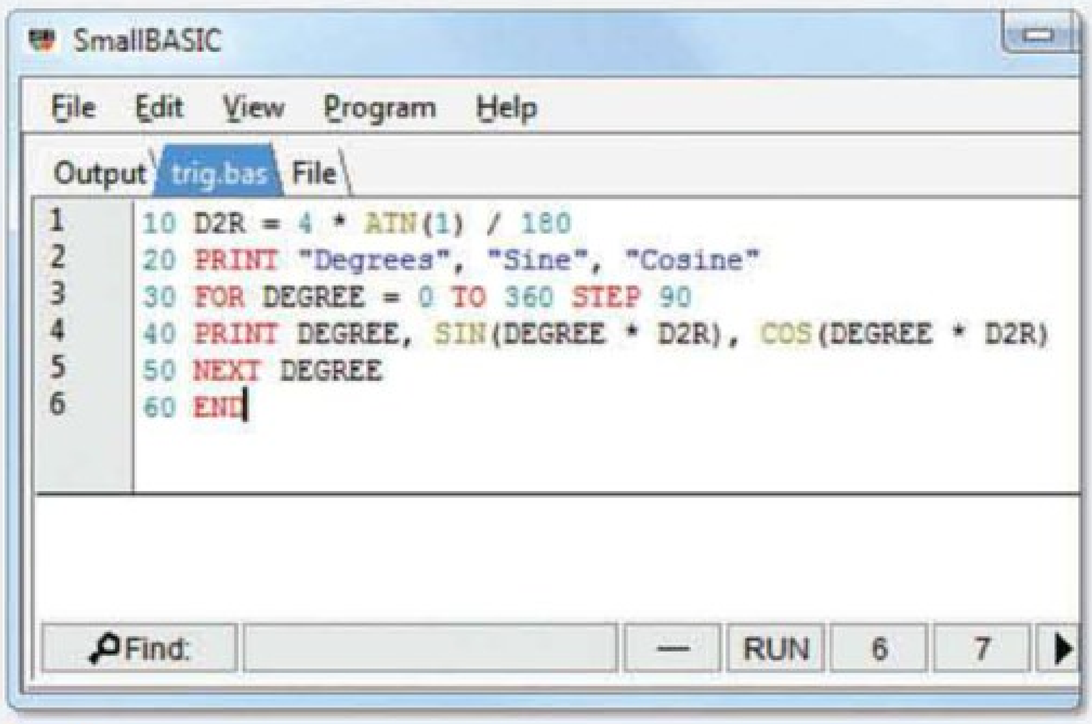
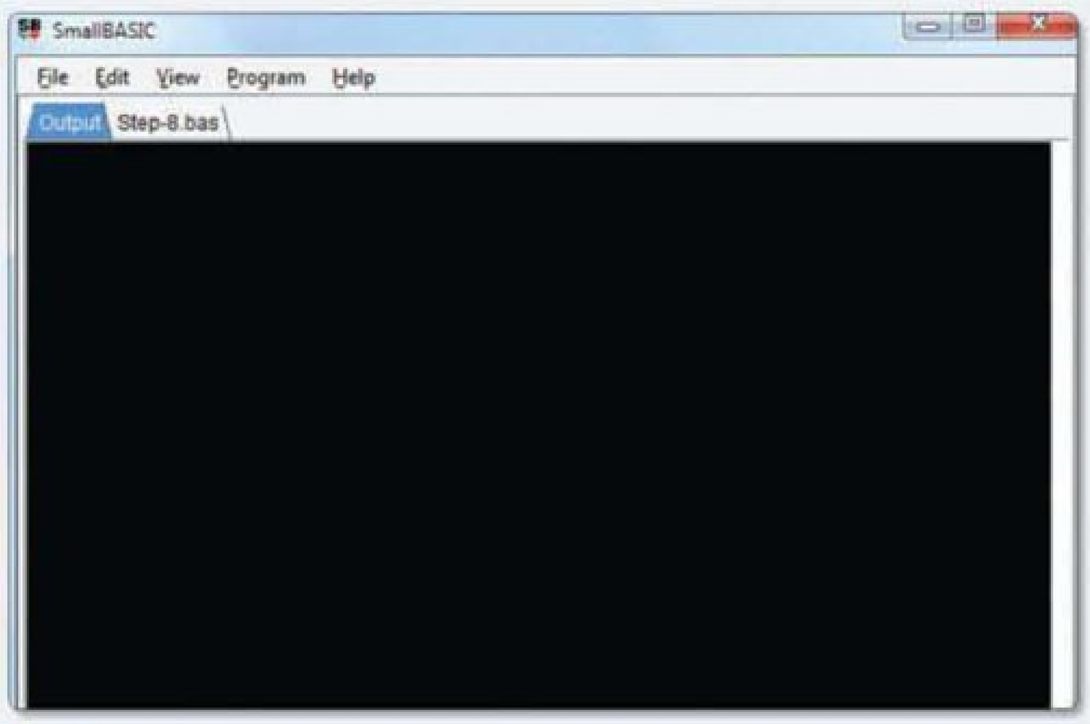
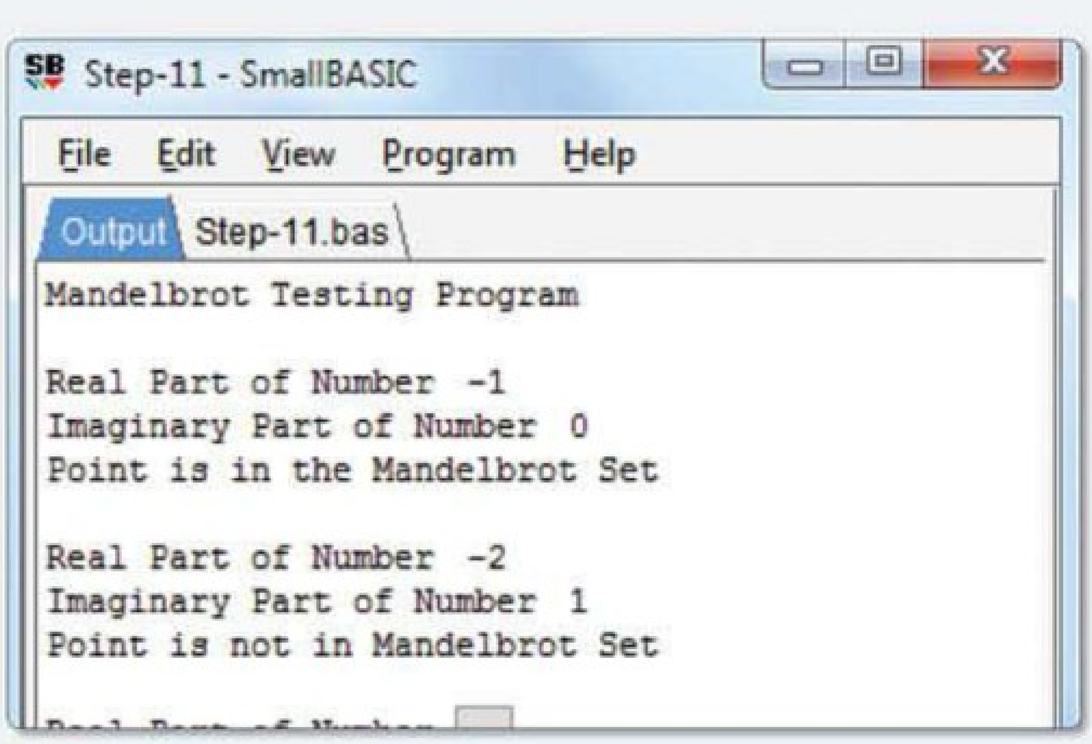


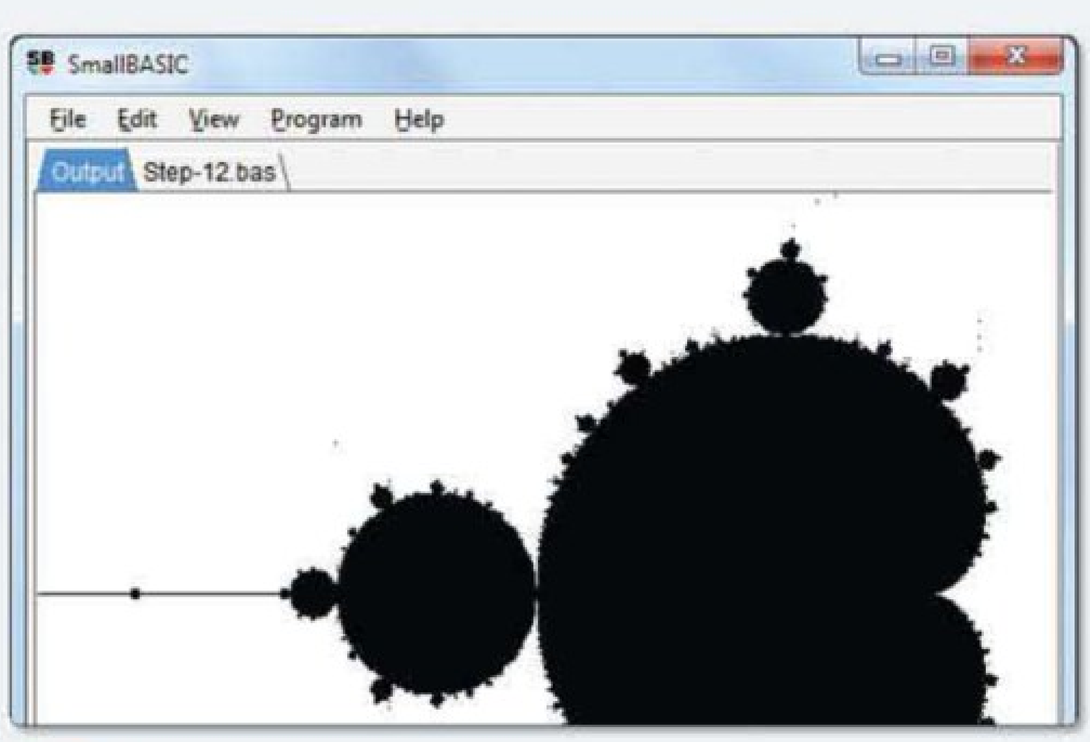
7 SmallBasic features many functions that work with numeric values. The program shown above uses SIN and COS, but for trigonometric functions the angle must be in radians rather than degrees; D2R is a conversion factor. Note the rounding errors in the results – sin(90) is really 0.



8 Enter PSET SCREENX, SCREENY COLOR 1 inside a FOR/NEXT loop that increments SCREENX from 0 to 599. Put this inside a FOR/NEXT loop that increments SCREENY from 0 to 399. You'll see a black block. Temporarily put 'DELAY 10' after the PSET to see that it draws one dot at a time. Save this program.



11 Modify the previous program to INPUT a complex number and PRINT a message as to whether it's in the Mandelbrot Set (see box below). To get the modulus square the real and imaginary parts, add them together and square root the sum. You should find that real = -1, imaginary = 0 is in the set, and real = -2, imaginary = 1 is not.



12 Use Step 11's logic inside the nested loops of Step 8's program to test points on the complex plane, drawing a dot with the PSET statement only for points in the Mandelbrot Set. Test points from real = -2 and complex = 1 to real = 1, complex = -1. Derive these from SCREENX and SCREENY (for example Real = SCREENX/200-2).

THE MANDELBROT SET

Our final program generates the Mandelbrot Set. This has been described as the most astonishing figure in mathematics: it's infinitely complicated, yet generated using a simple operation.

The Mandelbrot Set is plotted on the complex plain. If this is just a hazy memory from your school maths lessons, take a look at Complex Numbers on page 108.

To draw the Mandelbrot Set, we test points on the complex plain. Start with the value zero (where both real and imaginary parts are zero), square it, then add the complex number you wish to test. If the modulus of the complex result (this is the distance from the complex plain's origin) is two or more, the point isn't in the Mandelbrot Set.

If the modulus is less than two, perform the same operation again. Square the previous result and add the value being tested. Again, if the modulus of the result is two or more, the point you're testing isn't in the Mandelbrot Set.

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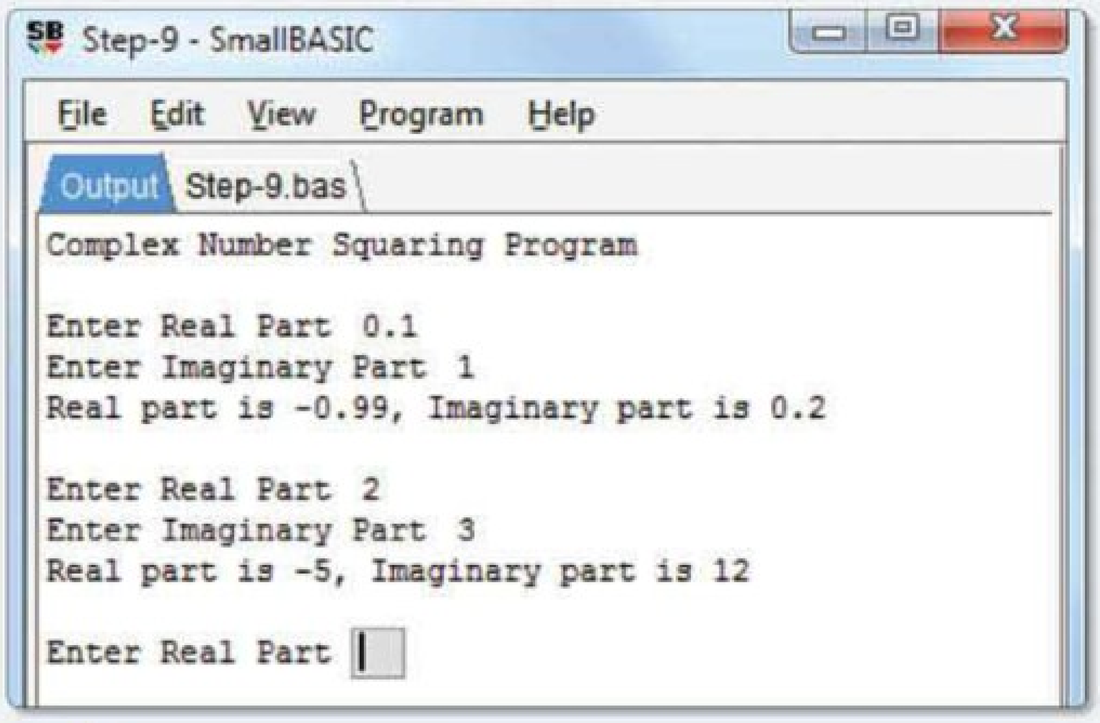
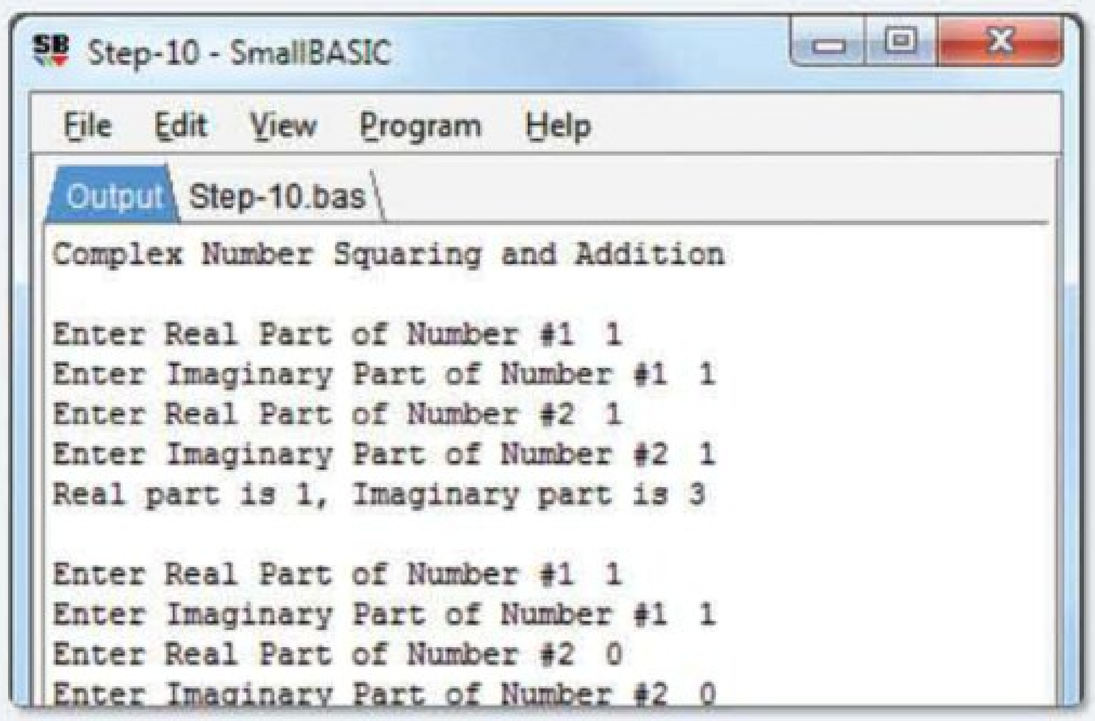
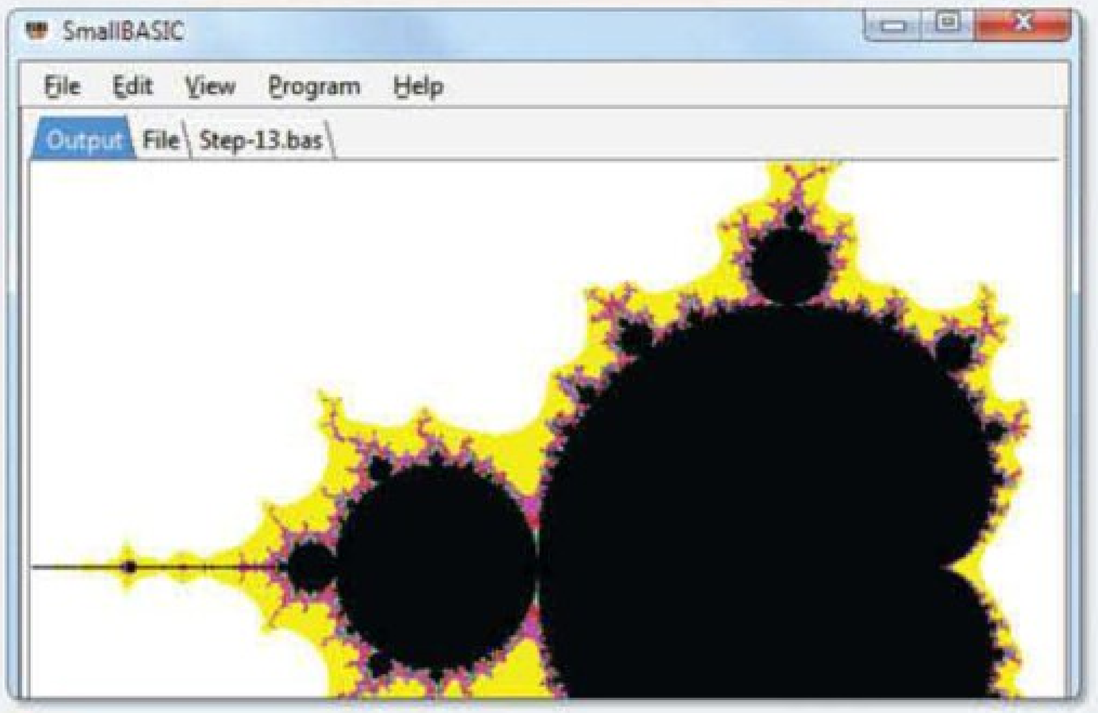


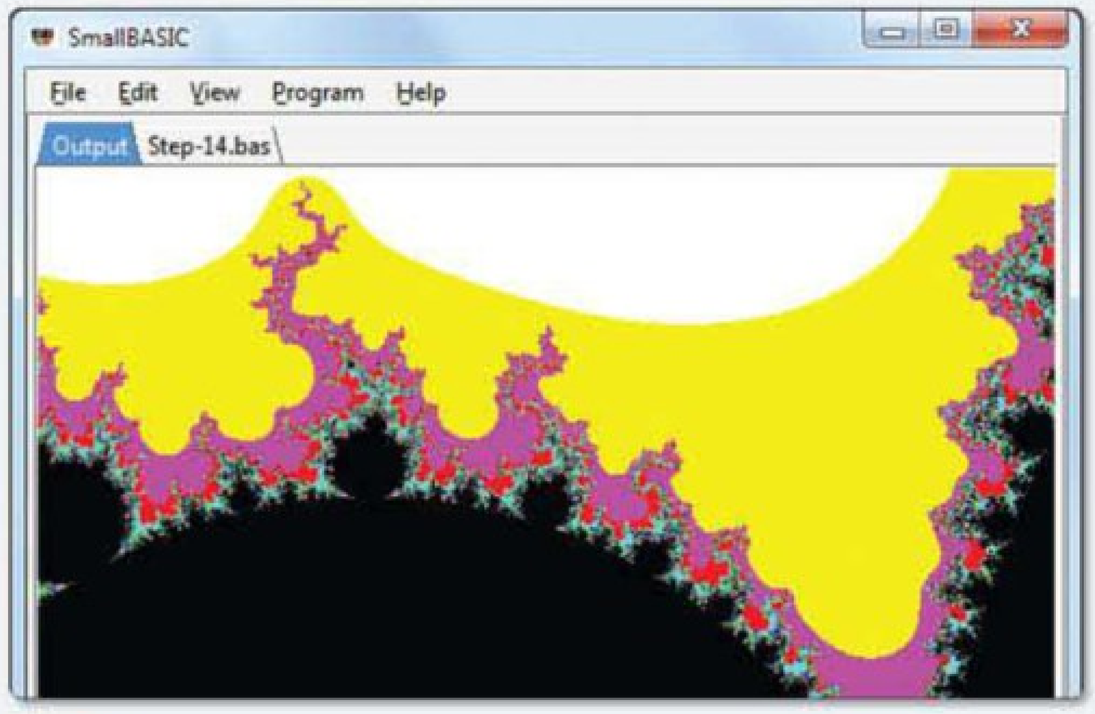
9 Start a new program. INPUT the real and imaginary parts, call a squaring subroutine (starting at line 500), and PRINT the answer. The real part is real squared minus imaginary squared; the imaginary part is two times real times imaginary. Test with real -= 0.1, imaginary = 1; the result should be real = -0.99, imaginary = 0.2.



10 Next, INPUT two complex numbers. Alter the subroutine to add the second complex number to the result of squaring the first. The real part of the sum of two complex numbers is the sum of the real parts. The imaginary part is the sum of the two imaginary parts. Verify the results with an online complex calculator (tinyurl.com/3wwq8g2).

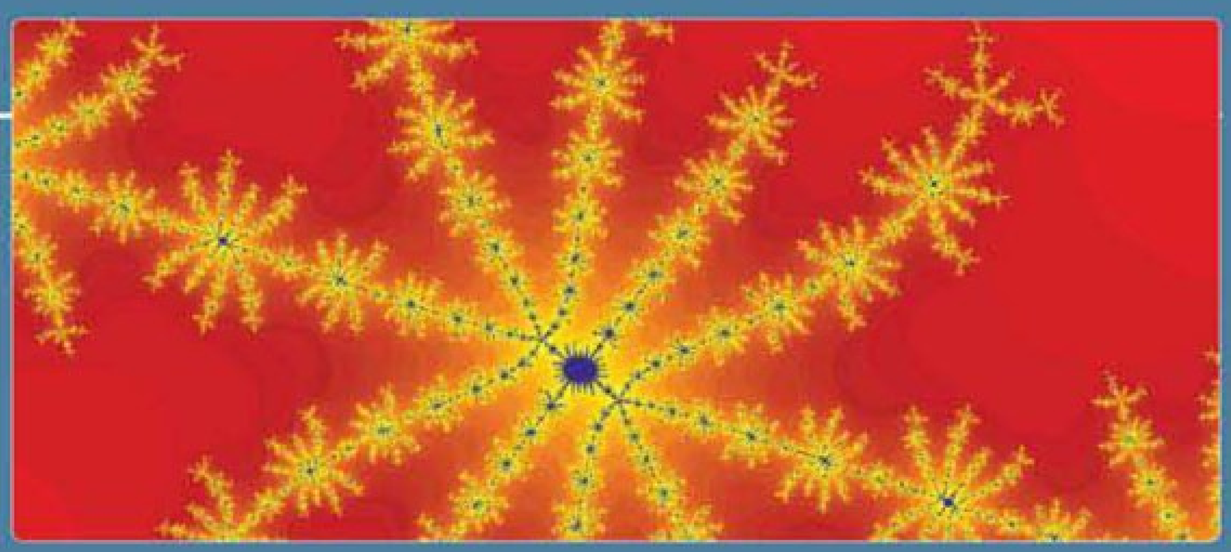


13 The Mandelbrot Set is often shown in colour, with points outside the Set displayed as contours. Modify the previous program to plot points that aren't in the Set, using a colour derived from the count of how many iterations it required to exceed a modulus of two. Colour = 16 - Count / 8 works well.



14 The Mandelbrot Set is a fractal figure. The more you zoom, the more detail you see. To fully appreciate it, modify the software to show an area for which you specify the real and imaginary parts of the complex number and a zoom factor. The screenshot shows what you'll see if real = -1.15, imaginary = 0.4, and zoom = 5.5. ☒

For some points, the modulus will never exceed two – no matter how many times this operation is carried out. These points belong to the Mandelbrot Set. It isn't possible to carry out this operation an infinite number of times, so set a limit of 200 on the number of iterations. Points are considered to be in the Mandelbrot Set if the result of the operation hasn't yielded a result with a modulus greater than two by the time this limit is reached.



Create a family website

Not all sites are for public consumption; some are just for family members. Spencer Dalziel and Rosemary Hattersley show you how to create a simple family website

We're big fans of Facebook (we've got our own page at facebook.com/PCAdvisor). Most of our family has signed up, which helps us to keep in touch. But it worries us that Auntie Joan can share the horror of our post-party exploits, and our nephews might be exposed to some choice language or interesting choices of YouTube clip. We're not that keen on the world knowing our family business either. Here, we've created a website to which only our family can contribute.

Family-tree websites proliferate, but the usual premise with these is an expanding database (known as a Gedcom file) with all the information you've managed to glean on family members. Such sites are generally public – and show up in search results – because others may be able to help you fill in some of the blanks.

It's bad practice, although it doesn't contravene data-privacy rules, to publicly post details on such sites of people who are still alive. A private site can be a real asset, focusing on photos and family memoirs, as well as invitations to meet up.

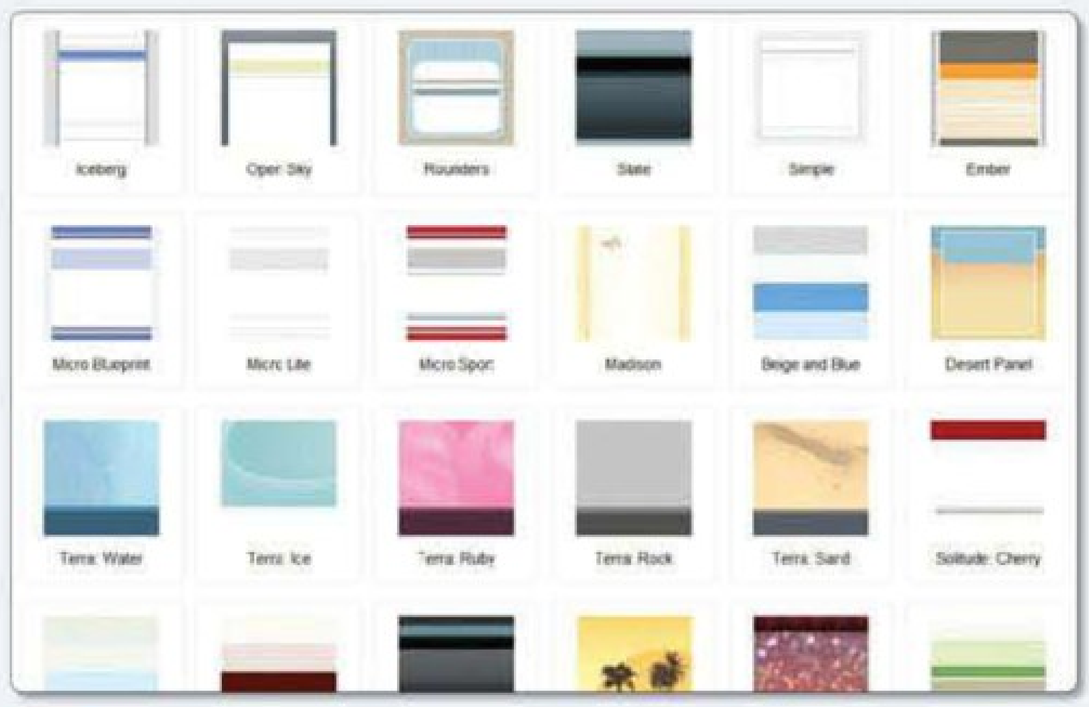
Unlike creating a website for commercial purposes, a family site isn't there to attract customers or make money. It should still look attractive and sound welcoming, of course. And unless it's to be all your own work, you'll want to encourage other family members to contribute and share their memories and photos, too.

A family or hobby website can be created from an off-the-peg template and customised with colours, backgrounds and typography of your choice. You should be able to create a site that does everything you need for free.

We've used Google Sites, which offers calendaring, group invitations and collaboration options. However, it also has a limited number of designs from which to select, so we've listed other options on page 115.

CREATE A FAMILY WEBSITE IN GOOGLE SITES

START Google Sites is an excellent free resource for building a family website. You can also use it to collaboratively organise such things as football-league meetings, and share information over a secure connection. Head to sites.google.com and click Create Site to get started.



4 Select a design template. Avoid anything too fussy as it will make your site look cluttered. Many professional sites feature a plain background and clean lines. Specify whether you want to share content with friends or anyone in the world, then give your site a brief description. Enter the Captcha and hit Create Site.

GEDCOM FAMILY TREE FILES

If you're more interesting in collating historical information about your family than recent photos and blogs, Google Sites isn't necessarily the best tool to use. You can upload profiles of family members, but you can't import and export family tree files. If this is your aim, you should instead use a package that supports Genealogical Data Communication (Gedcom) files.

Gedcom is a standard file format that's supported by many genealogical software packages and online services, increasing the chances you'll be able to hunt down long-lost family members.

Stockfood.com

Storekeeper.com

Tech Help

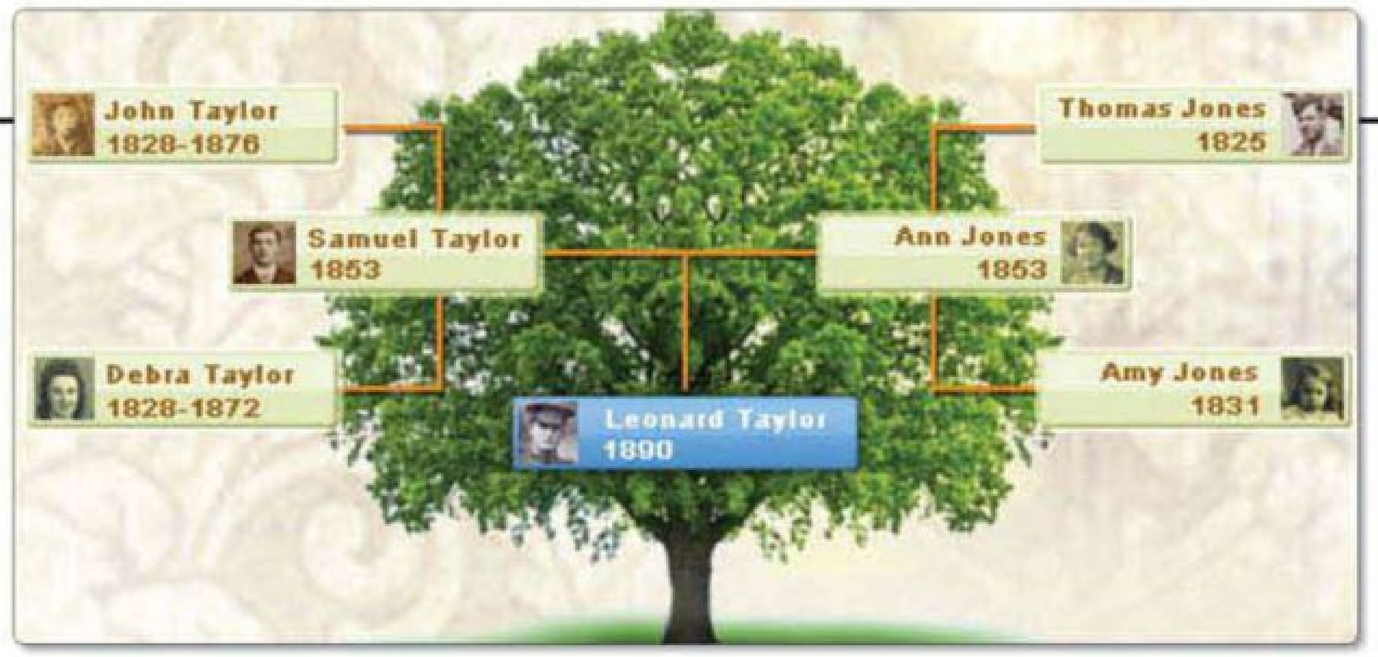
2 Choose a template on which your site will be based. Google Sites has six categories to choose from, covering almost any eventuality. Each contains a range of templates, including those created by other Google Sites users. We selected 'Personal & Family', then chose Family site.

3 Add a name for your site in the following field. Google Sites automatically generates the URL. We chose 'The Dalziel Clan'; if you have a common surname, such as Smith, you may find it more difficult to choose a unique website name. Google informs you if the site name you've chosen has already been registered.

5 Google Sites generates a website using your selected templates at the designated URL. Navigate here, then use the settings to add content. You can add links to family blogs, photo albums, calendars, profiles and even recipes on the home page. Google provides plenty of tips to get you started.

6 The first thing you'll want to do is change the pictures in the template so they feature members of your own family. Images can be uploaded from your hard drive or an online database, such as Picasa. Click Edit Page, then choose Insert. You can re-size images as necessary.

If you're determined to stick with Google Sites, however, a simple workaround can help you create a family tree. Google Docs lets you create a spreadsheet containing information about your family tree, which can then be imported into Google Sites by copying and pasting the document's URL into your site's organisational chart. It's something of a clumsy workaround, but it works.



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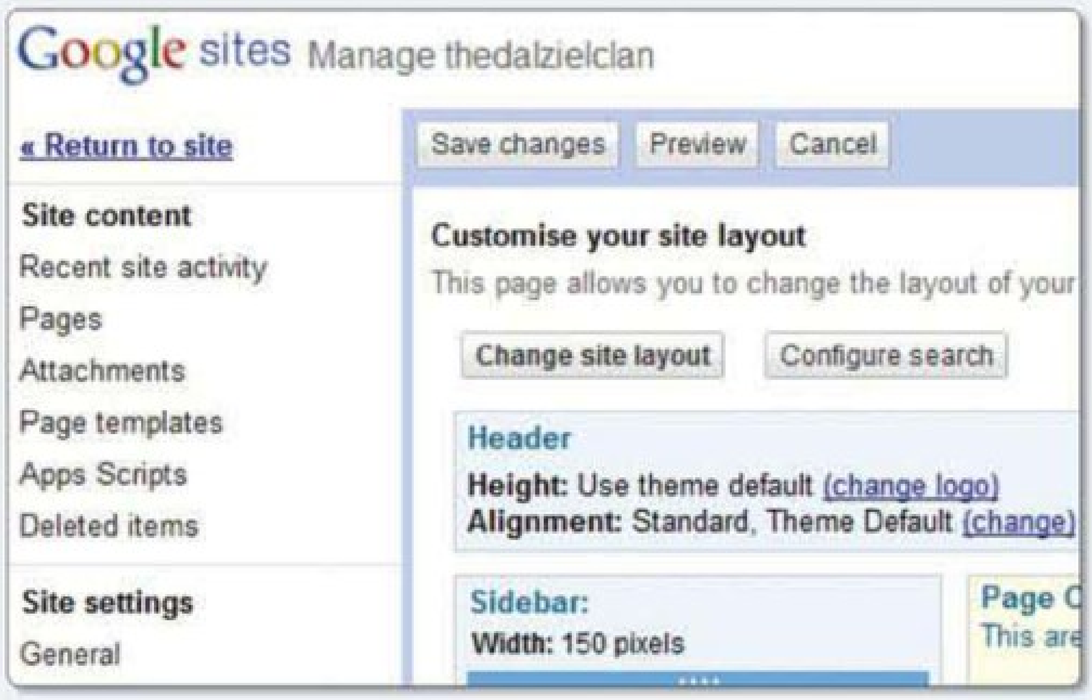
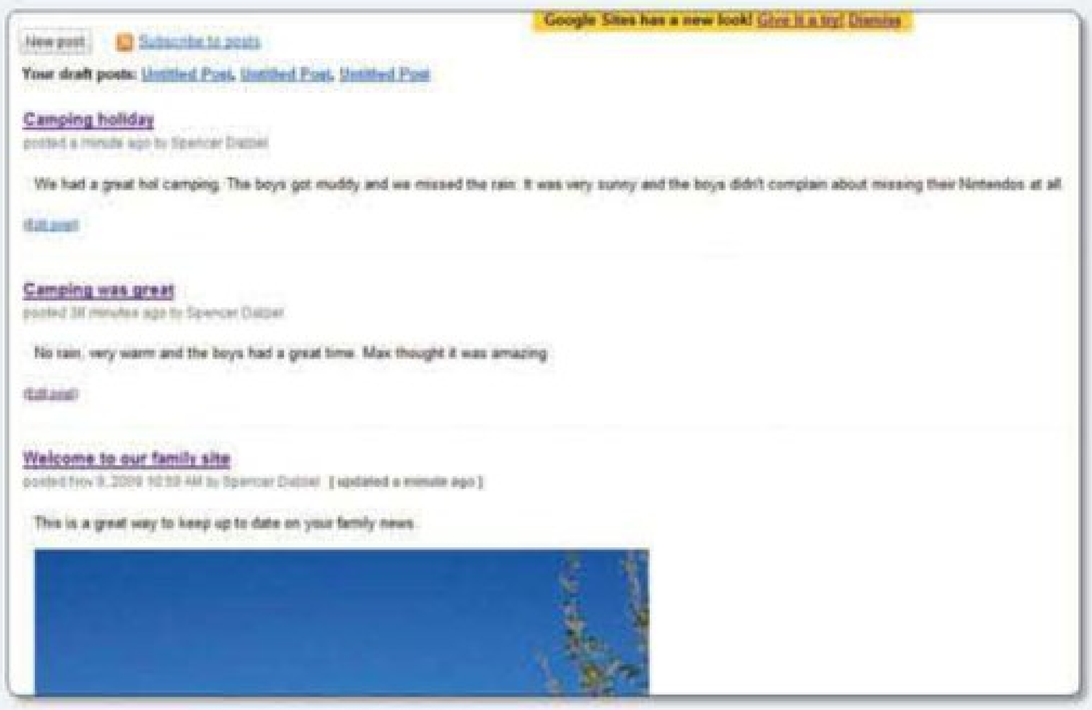


7 To add a logo to your site, click More actions, Manage site, Site layout. Click 'Change logo', then choose 'Browse for your logo'. If you don't want one, select 'No logo'. You can resize the logo once it's been imported. Save any changes as you go, and use the undo function if you're not happy with your edits.

8 Choose Google Calendar at the top of the home page and click Create. Add important dates, such as family birthdays, and enter a description for each event. Make the calendar public so you can share its contents on your website; alternatively, enter email addresses to share it with selected people. Click Save.



11 To add a blog, click Blog post on the home page. Add a title and submit the post. This can be added to family updates on your home page, so anyone visiting the site will immediately know what you've been up to. You can also set up RSS feeds and allow visitors to subscribe to your posts.

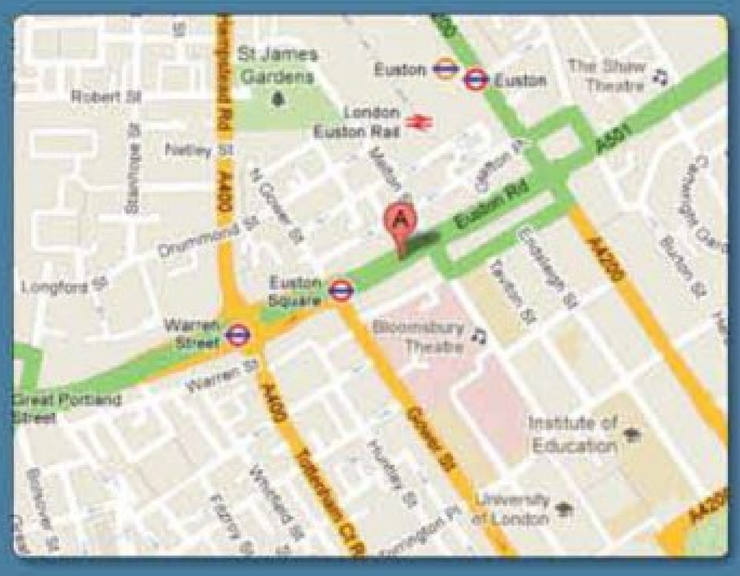
12 To add a profile, click the relevant link and click Edit page at the top right. Click the Insert menu on the left, then select subpage listing from the drop-down menu. Choose the profile page template and enter the name of a family member. You'll need to click Edit page again to add content to the profile.

GOOGLE INTEGRATION

There are plenty of website-building services online; some have better features and more templates than others. We chose Google Sites because of its integration with other Google services, including Google Maps, Google Earth and Google Analytics. Google Sites also benefits from integrated plug-ins that are unavailable elsewhere – and many are free to use.

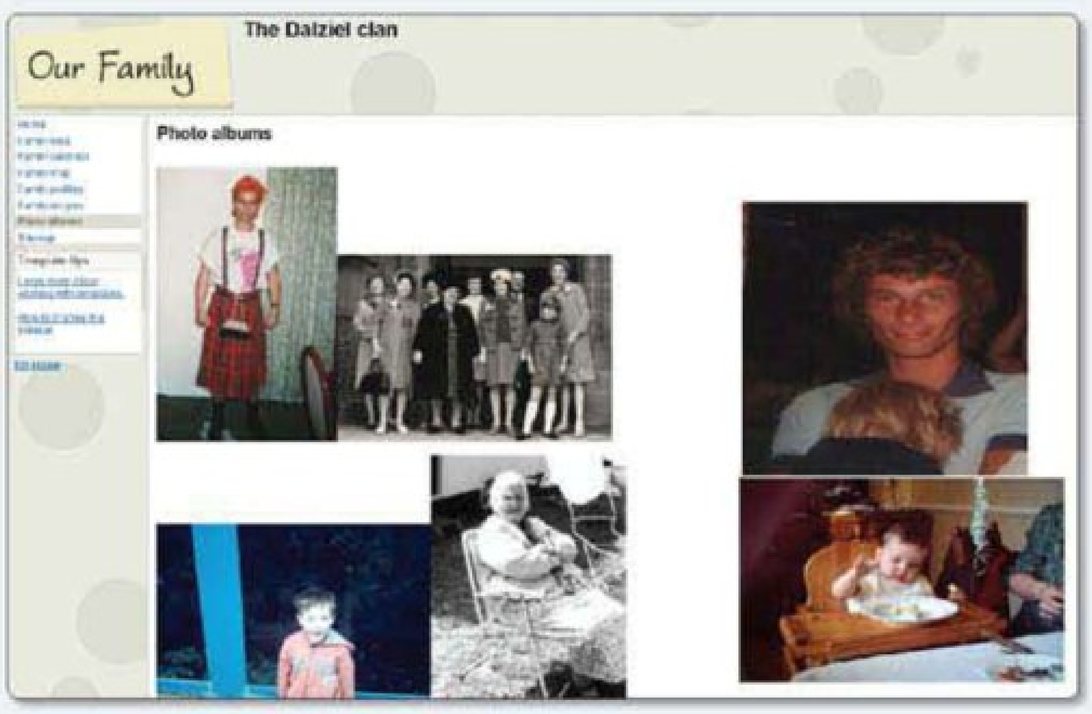
For example, you can use Google Picasa to upload images of family members to your website. You can use Google Maps to create a map with directions to your home or a place that's important to your family, then embed it into the site. Google Docs is also useful, while Google Analytics helps you monitor traffic from visitors to the site.

Finally, there's Google AdSense. If you get enough visitors, you could stand to earn some extra cash through adverts placed on your website. This is free to sign up to.



9 The sidebar on the left of your website lets you add new content, including blogs, calendars, profile pictures and albums. Click Edit to make changes to navigation and text; you can even try to earn some cash from your site by signing up to Google's AdSense scheme here.

10 Google Sites also offers a comprehensive list of site settings you can manage. Click More actions at the top right, then choose Manage site from the drop-down menu. From here you can amend design and content settings and look at your recent activity. Enable Google Analytics if you wish to monitor traffic to the site.



13 You can upload slideshow images from Picasa or choose images from your hard drive. Choose Picasa Photo or Picasa Web Slideshow. Browse to the image you want to add and click Ok. You can upload only one image at a time, and you'll probably want to resize and reposition it. Add any relevant information and press Save.

14 Open Google Maps and click the My Map tab. Choose My Places, then Create Map. We named our map 'the Dalziel family home' and then chose to share it with everyone. Find your own address in Google Maps and click Done. Next, click Edit page in Google Sites, add your map and hit Save. ☒

ALTERNATIVE OPTIONS

Plenty of other options are available if you want to create a site around a particular theme. Provided that it's a non-commercial site and has only a handful of pages, you can easily create a photo-based site using a free service such as Moonfruit.com. However, readers report that this site is rather buggy and suitable only for the simplest of web pages.

US-based MyFamily.com offers a secure family website that allows multiple contributors, with individual monthly upload limits of 1GB. It costs $30 (£18) a year per site.

You could ignore Facebook's privacy issues and create a closed Group site. This allows only specifically invited members to contribute and share content.

If your family tends to be rather verbose and would like to share stories as well as photos and family tree information, a private WordPress blog (wordpress.com) could be the way forward. This is the most sophisticated option in terms of design, and we like its flexibility in allowing you to create a public blog that includes private posts.

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Software editor:
Letitia Austin
dvd@pcadvisor.co.uk

BullGuard Internet Security 12.0

FULL PROGRAM (SIX-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 198\BullGuard Internet Security 12 and open the install file

Online registration required: follow the links during installation

System requirements

Windows XP/Vista/7; 200MB hard-disk space; Internet Explorer 6.0 or later

With an increasing number of online threats gaining sophistication, running security software is no longer an option: it's a must.

BullGuard Internet Security 12.0 is a complete security solution. It protects you and your computer from online threats, including identity theft, credit-card fraud, hackers, spam, viruses and spyware.

With security features to cover every eventuality, you'll never need to worry about your digital safety again. You can bank, shop, socialise, surf, share files, download programs and play games with peace of mind.

BullGuard protects you without spoiling your fun. You can play games without experiencing a performance loss.

With each licence offering protection for three PCs, plus parental controls, BullGuard Internet Security 12.0 is the ideal security solution for a family PC.

Features

- Antivirus
- Antispyware
- Antiphishing
- Behavioural detection
- Safe browsing mode
- Firewall
- Spam filter
- Vulnerability scanner
- Password protection
- Parental controls
- PC tune-up utility
- Gaming mode
- 5GB online backup space
- 24/7 support ☒

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Serif WebPlus Starter Edition

FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 198\Serif WebPlus Starter Edition and open the install file

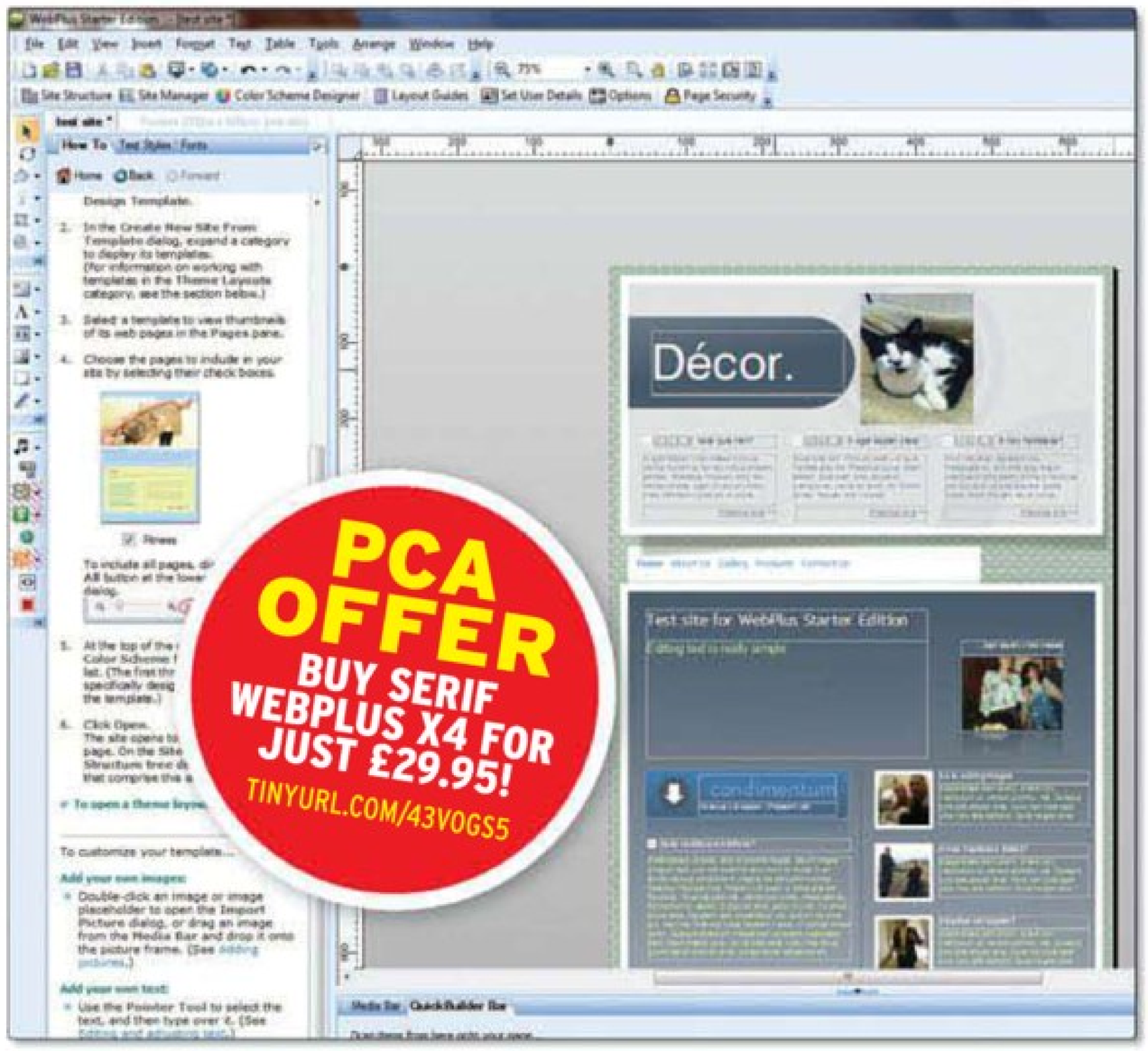
Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7; 512MB RAM; 100MB hard-disk space

Use WebPlus Starter Edition to design great-looking websites for businesses, organisations, clubs, societies and individuals.

If you've ever wanted to design a website but have been put off by the thought of HTML coding and technical jargon, WebPlus offers an ideal solution. Its DTP-style approach to web publishing lets you create stunning websites without any programming knowledge.

With WebPlus Starter Edition, creating and publishing a website couldn't be easier. Choose to design a site from scratch or use an easily customisable template, then add interactive content in minutes. ☒



Diskeeper Professional 2011

FULL PROGRAM (THREE-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 198\Diskeeper Professional 2011 and open the install file

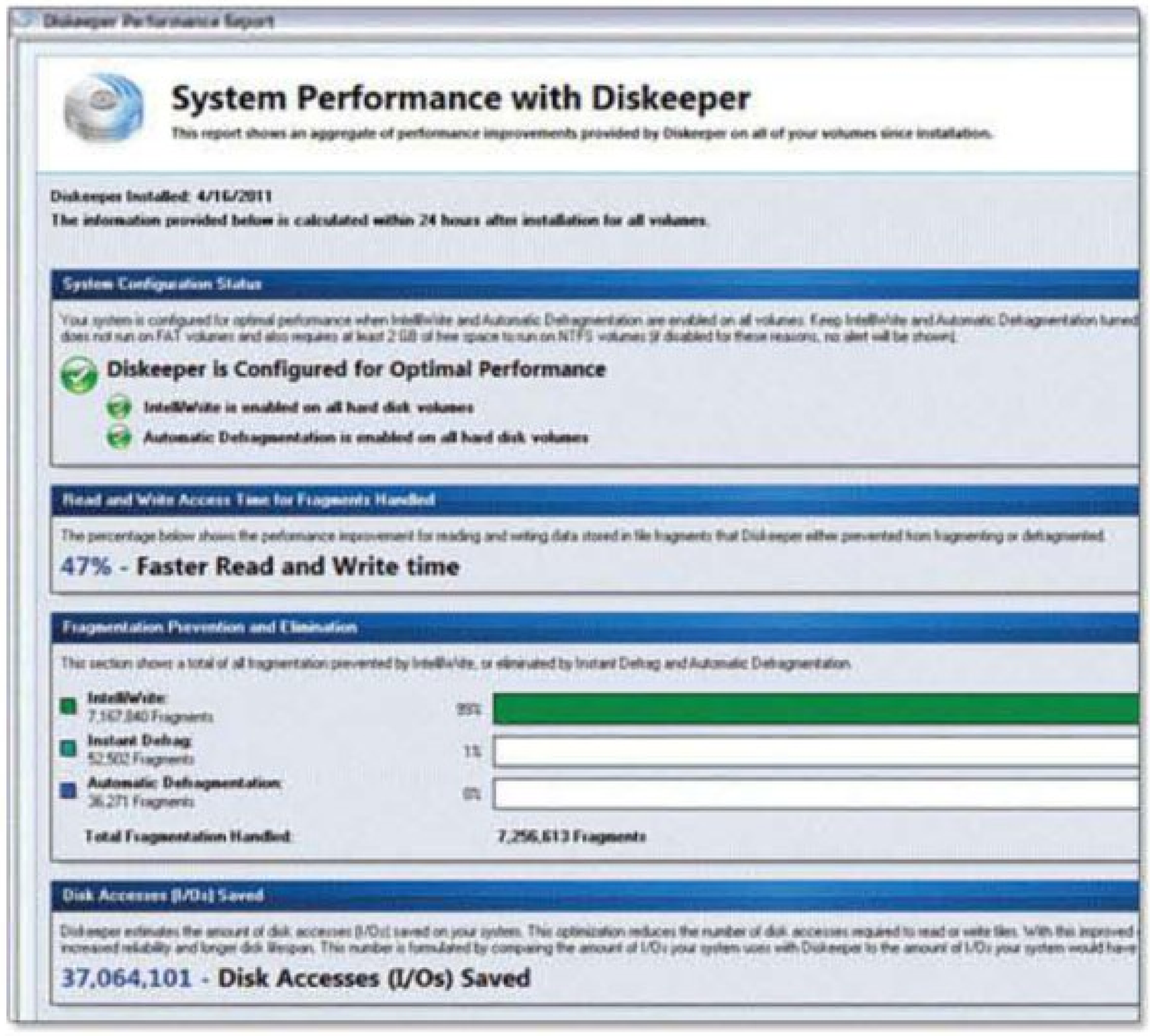
Online registration required: follow the links during installation

System requirements
Windows XP/Vista/7

Diskeeper helps your PC to function at its optimum speed. By preventing file fragmentation on the hard drive, and defragmenting any files already affected, it allows data to flow at maximum speed.

Features

- Speeds up file access, application launches, email and browsing
- Eliminates fragmentation-related performance issues
- Increases drive lifespan and storage performance
- Increases free drive space ☒



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Ashampoo Burning Studio Elements 10.0

FULL PROGRAM

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 198\Ashampoo Burning Studio Elements and open the install file

Online registration required: follow the links during installation

System requirements

Windows XP/Vista/7 (with full admin rights); CD/DVD/BD writer; graphic adaptor: min resolution of 800x600 with 1MB memory

Ashampoo Burning Studio Elements offers everything you need to quickly burn movies, music and data. Its intuitive interface lets you easily create data discs, burn backups, rip music, create audio CDs, burn film files to Blu-ray Disc and lots more.

Extra features include an integrated audio player and the ability to quickly design and print covers, labels and booklets.

Features

- Burn data to CD/DVD/Blu-ray
- Update previously burned discs
- Back up data to one or more discs
- Rip music from CD
- Burn music to audio CD or create MP3/WMA collections
- Copy CDs, DVDs and Blu-ray Discs
- Create and burn disc images
- Design and print covers, labels and booklets ☒

Eltima USB to Ethernet Connector

FULL PROGRAM (THREE-MONTH LICENCE)

ONLINE REGISTRATION REQUIRED

Installation details

Go to My Computer. Right-click the DVD icon and open the disc. Select Files 198\Eltima USB to Ethernet Connector and open the install file

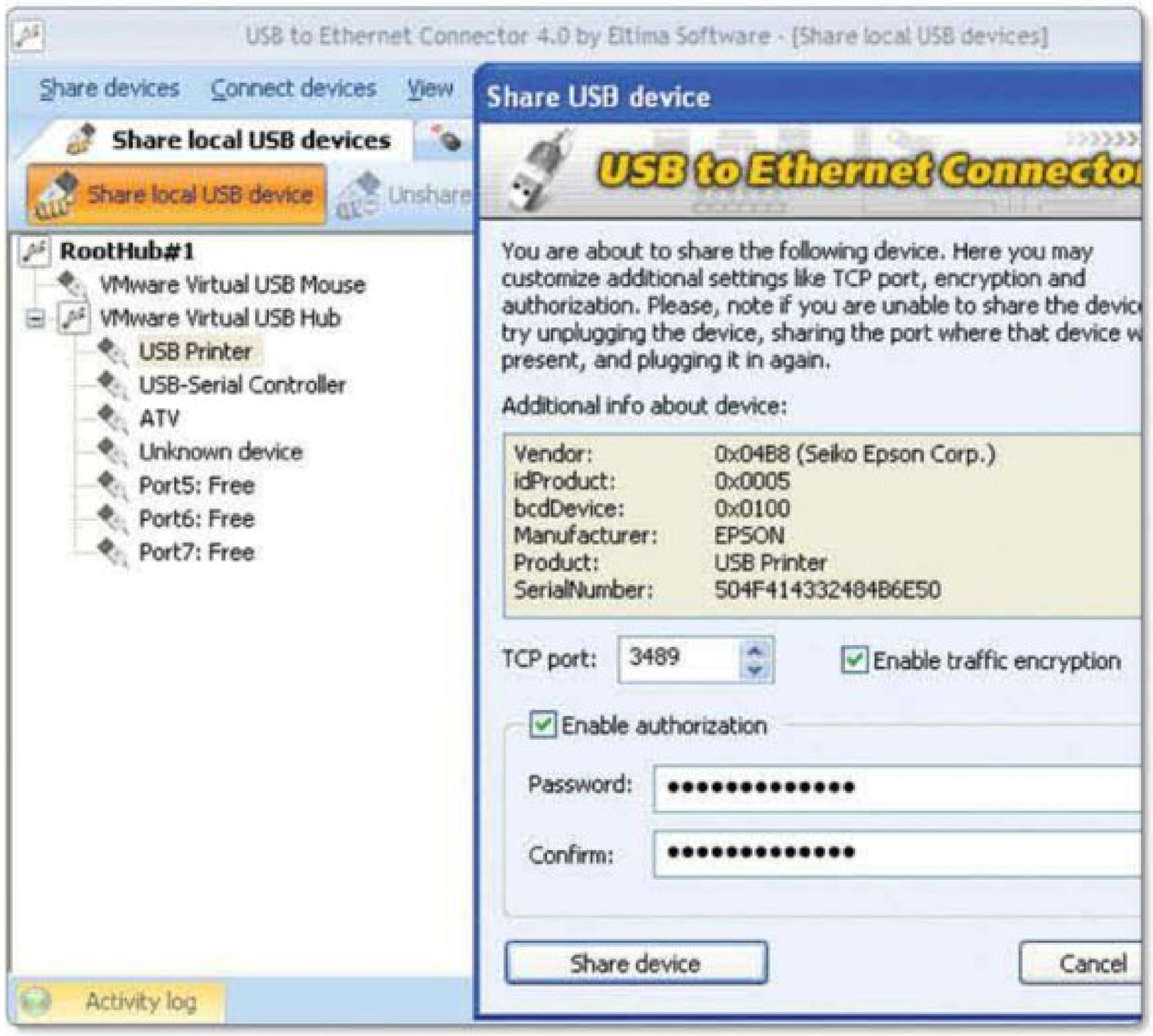
Online registration required: follow the links during installation

System requirements

Windows XP/Vista/7 (32bit); 512MB RAM; 100MB hard-disk space; Internet Explorer 6.0 or later

With USB to Ethernet Connector, you'll never again experience issues accessing and using the USB devices plugged into remote computers. You can work with these devices as if they were physically connected to your local machine.

Simply install USB to Ethernet Connector on both PCs, and the software does the rest. It works with Windows and Linux machines; Eltima's software is also suitable for virtual PCs, helping you access and use local USB devices. ☒



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Bitdefender Internet Security 2012

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 196\ Bitdefender Internet Security 2012 and open the install file

Online registration required: follow the links during installation

System requirements

800MHz processor; Windows XP/Vista/7; 1GB RAM; 1.8GB hard-disk space

No pop-ups. No configuring. No interruptions. That's the kind of silent security you'll find in Bitdefender Internet Security 2012. It integrates antivirus, antispam, antiphishing, firewall and parental controls into one hassle-free security solution.

Bitdefender's parental controls let you block inappropriate content, restrict web-access times and monitor your kids' activity. Its firewall secures your wireless network from intruders, and its social-networking safeguards protect your Facebook account from malicious links and privacy threats. Bitdefender also warns of any dodgy websites in your Google or Bing search results.

It's the perfect solution for today's internet-connected family.

Features

- Blocks viruses, spyware and spam
- Thwarts identity-theft attempts
- Filters links received from Facebook friends
- Keeps kids safe with cutting-edge parental controls
- Guards your web connection with a two-way firewall ☒

DISC INSTRUCTIONS

Place DVD in drive. Open the file 'Click here to begin.pdf' for extra information.

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All product descriptions given here are provided by original software developers.

Bonus disc

The DVD edition comes with a bonus disc containing BullGuard Internet Security 12.0. DVD subscribers, however, can access this content via their regular DVD. *PC Advisor* 2011 © IDG UK

If your disc is missing or faulty, please visit **pcadvisor.co.uk/cd/replacement** to request a replacement. The code for January's DVD is **PCA1753DVD**. Please allow 14 days for delivery. Other FAQs are answered at **pcadvisor.co.uk/cd/faq**.

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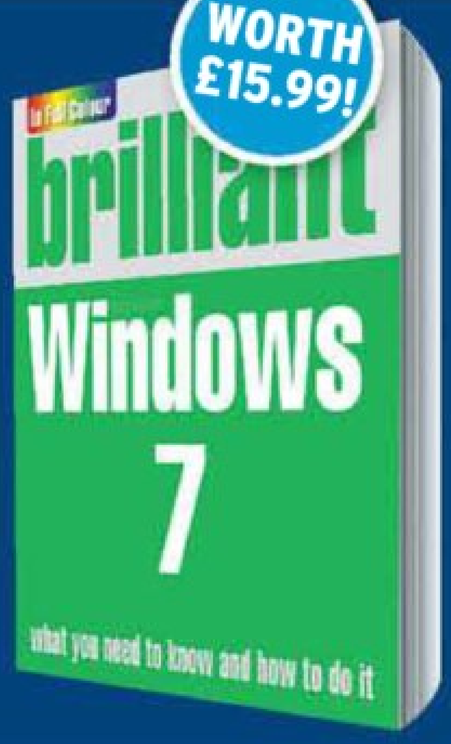
Brilliant Windows 7

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.



Brilliant Office 2010

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 phoneline to find atrocious-looking websites. Such days are gone.

> **There's no better way to get expert advice**

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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ISP AWARDS 2012 PC ADVISOR RELIABILITY

ISP AWARDS 2012 PC ADVISOR SPEED

ISP AWARDS 2012 PC ADVISOR VALUE

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WORTH £660

It's time for PC Advisor's Annual Home Broadband Survey

...and time for you to tell us what you think about your ISP. Every year we run a survey asking readers about their broadband experience and what does and doesn't come up to scratch.

The survey lets you vent your frustration or give credit where it's due. It also allows us to draw conclusions about the state of broadband provision in the UK and the organisations tasked with ensuring you get the best connection speeds and online browsing, buying and streaming experience.

You'll also be helping other readers work out which broadband deals are worth signing up for and which are best avoided. We collate feedback from customers of each ISP and use this to create report cards covering everything from connection speed and reliability to how well they deal with customer service issues.

To tempt you, we're offering a Kindle e-book reader, a £100 Amazon voucher, a Kodak Pulse photo frame, Magix software, a 500GB hard drive and more tech goodies. To enter, visit:

tinyurl.com/pcabbsurvey

EXPERT ADVICE YOU CAN TRUST
PC ADVISOR

To be entered in the draw for any of a selection of prizes, you need to provide your name and a valid email address. We won't use these details to contact you for other purposes, but we do need your email address to be able to validate winners' details. The prize draw will take place after the survey closes. Winners will be notified by email. Winners' names will also appear in the issues of PC Advisor that carries the results of the broadband feature.

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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.

TOP 5 SUB-£600 LAPTOPS

You don't need to spend a fortune on a computer to get decent performance. Today's budget laptops can handle daily computing activities with aplomb, and they're ideal for taking on the road. We rank the best sub-£600 laptops on page 136.

PC ADVISOR BEST BUY

PC ADVISOR RECOMMENDED

Sub-£500 PCs

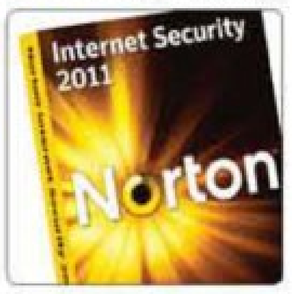
£501-£750 PCs

£751-£1,000 PCs

£1,001+ PCs

Netbooks

Laptops



PC security

Printers

External hard drives

NAS drives

Smartphones

Digital camcorders

Compact cameras

Int-lens cameras

Graphics cards

Flat-panel displays

Prices

Desktop PCs

Desktops up to £500
£501 to £750
£751 to £1,000
£1,001 and over

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.

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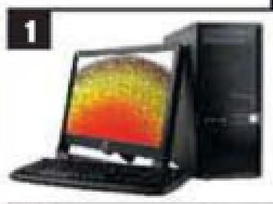
Top 5 Sub-£500 PCs

			Processor type / Processor speed	RAM / Hard-disk capacity / USB 2.0/3.0 ports[1]	Motherboard / PSU / Power rating	Flat-panel display / Pixel pitch / Native resolution (pixels)
PC ADVISOR BEST BUY	1  **Chillblast Fusion Neutrino** 0845 456 7831 chillblast.com **New**	• £499 inc VAT • 2-year collect-and-return warranty	Intel Core i5-2500K 3.3GHz	8GB DDR3 RAM 1TB SATA 6/2	Asus P8H61-M LE/USB3 EZCool 500W	21.5in AOC F22+ 0.25mm 1920x1080
			>> WorldBench 6	165		
PC ADVISOR RECOMMENDED	2 **Arbico eXcel 5250MX V2** 0845 625 2627 arbico.co.uk **New**	• £500 inc VAT • 2-year RTB warranty	Intel Core i5-2500K 3.3GHz	4GB DDR3 RAM 1TB SATA 6/2	Asus P8H61-M LE/USB3 Ace 500W	21.5in AOC F22+ 0.25mm 1920x1080
			>> WorldBench 6	159		
	3 **CyberPower Ultra Triton** 0844 371 2727 cyberpowersystem.co.uk Last month 2	• £499 inc VAT • 3-year RTB warranty (parts only)	AMD A6-3650 2.6GHz	8GB DDR3 RAM 1TB SATA 4/4	MSI A75MA-G55 WinPower 450W	21.5in AOC F22+ 0.25mm 1920x1080
			>> WorldBench 6	111		
	4 **Palicomp Phoenix i5 Sonar Advanced** 01270 898 104 palicomp.co.uk **New**	• £499 inc VAT • 1-year RTB warranty	Intel Core i5-2500K 3.3GHz	8GB DDR3 RAM 1TB SATA 6/2	Asus P8Z68-V LX WinPower 450W	21.5in AOC F22+ 0.25mm 1920x1080
			>> WorldBench 6	163		
	5 **Eclipse Voyager i525H61** 0844 472 3723 eclipse-computers.com Last month 4	• £499 inc VAT • 1-year RTB warranty	Intel Core i5-2500K 3.3GHz	4GB DDR3 RAM 1TB SATA 8/2	Asus P8H61-M LE/USB3 EZCool 650W	21.6in HKC 2219A 0.28mm 1920x1080
			>> WorldBench 6	154		

GLOSSARY • PSU: power supply unit • RTB: return to base • TB: terabyte [1]External [2]Gaming scores in fps

1 NEW Chillblast Fusion Neutrino

PC ADVISOR BEST BUY

With a tight £500 budget constraining each PC vendor's choice of components, it's no surprise to find a batch of very similar PCs in this chart. Four are based on Intel's i5-2500K processor: a wise choice. Its price/performance ratio is hard to beat, while the Core i5 chip offers performance that can keep up with systems costing many hundreds of pounds more.

With this processor, Chillblast pairs 8GB of RAM and a one-terabyte (1TB) hard drive in the Fusion Neutrino. It's a specification that will capably handle all but the most intensive computing tasks.

Chillblast specifies the same Asus motherboard as Arbico and Eclipse, which supports USB 3.0. Although this budget board's H61 chipset isn't able to take advantage of the CPU's unlocked multiplier for overclocking, the Fusion Neutrino turned in a strong 165-point score in our benchmark. This records application performance with the CPU running at stock speed. On the down side, the motherboard doesn't support 6 gigabits per second (Gbps) SATA and has just two memory slots.

This is no gaming PC, but the graphics integrated to its Core i5 CPU are able to process HD multimedia. The twin speakers and 21.5in full-HD display bundled with the Chillblast Fusion Neutrino will come into their own here.

The Chillblast's CIT Shadow system case is attractive, with its meshed front and matt black internal paint job. But it lacks good cable management and tool-free drive bays.

A two-year collect-and-return warranty includes parts and labour.

2 NEW Arbico eXcel 5250MX V2

PC ADVISOR RECOMMENDED

Arbico's eXcel 5250MX V2 offers a similar specification to our Best Buy Chillblast. However, the PC vendor pairs its Core i5-2500K processor, Asus H61 motherboard and 1TB hard drive with half the RAM, offering only 4GB.

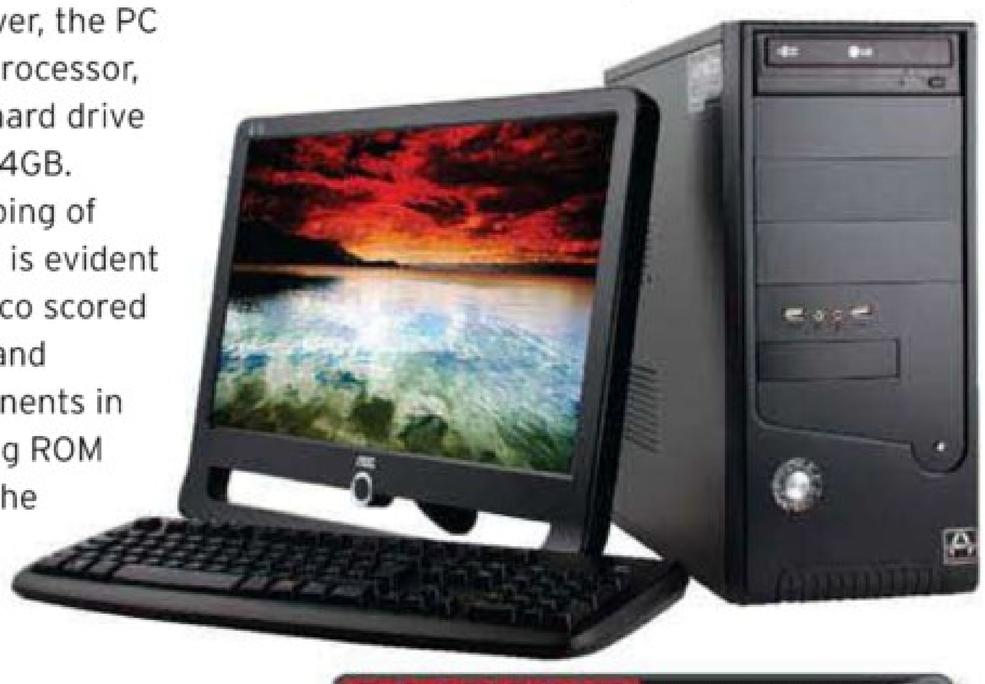
The effect of this smaller helping of system memory on performance is evident in WorldBench 6, where the Arbico scored fewer points than the Chillblast and Palicomp PCs. One of the components in this benchmark, the Nero Burning ROM test, is significantly affected by the amount of available RAM. In all other components, the Arbico's performance was indistinguishable from PCs that have 8GB of system memory.

Gaming performance is in line with the competition, with each machine in our chart relying on the graphics integrated to its processor. This PC is capable of producing playable gaming framerates, but only if you lower the quality and resolution settings.

Arbico supplies a 21.5in full-HD monitor, while support for USB 3.0 allows high-speed external storage to complement the 1TB internal provision. A pair of speakers is also thrown in, but lacks a subwoofer.

Despite its interesting design touches and illuminated power switch, the CIT 1009 system case employed by Arbico is clearly a budget model (indeed, it costs just £13 online). This case is adequate for most users, but enthusiasts and upgraders are unlikely to be satisfied.

More pleasingly, the Arbico eXcel's two-year return-to-base warranty is twice as long as those offered by some companies. Note that it's labour-only, however.



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	Graphics-card maker Graphics chip Memory/interface	Games scores: Fear (1024x768) Crysis (Low)[2]	Sound card Speakers Subwoofer	Max disc speeds	Operating system, software and extras
	Intel Intel GMA HD 3000 n/a	18 13	onboard 2 x Chillblast no	24x DVD-R/24x +R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)
	Intel Intel GMA HD 3000 n/a	18 13	onboard 2 x Arbico no	22x DVD-R/22x +R/ 12x -R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit or XP at no extra cost)
	AMD AMD HD 6530D n/a	53 23	onboard 2 x Logitech S120 no	24x DVD-R/12x +R DL/ 6x -RW/8x +RW/ 12x -RAM	Windows 7 Home Premium 64bit, Office Starter 2010
	Intel Intel GMA HD 3000 n/a	17 13	onboard 2 x Logitech S220 yes	24x DVD-R/24x +R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)
	Intel Intel GMA HD 3000 n/a	17 13	onboard built into flat-panel no	22x DVD-R/22x +R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit

3 CyberPower Ultra Triton

The CyberPower Ultra Triton is the first desktop PC in a long while to enter our round-up with an AMD processor. Its A6-3650 is slower than the Intel equivalent in application performance, but offers significantly faster integrated graphics.

Although the Triton recorded a sluggish 111 points in WorldBench 6, its A6-3650 screamed ahead of the competition in Fear, and delivered smooth gameplay at 53fps. This CPU also supports DirectX 11.0, allowing us to run Stalker: Call of Pripyat. Here, the CyberPower recorded 30fps.

The CPU can be overclocked if you crave more speed, but it isn't officially sanctioned in the same way as Intel's K-suffixed Core processors. Despite their overclockable CPUs, however, much of the competition uses H61-chipset motherboards, which prohibit this speed-boosting practice.

A gamer-friendly Azza Orion system case features an angular design with a two-tone silver-and-blue finish. It has illuminated fans and a see-through side panel, and is fitted with a 1TB hard drive and 8GB of RAM.

Peripherals include the popular AOC F22+ display and a set of Logitech external speakers. The latter offers a considerable improvement over the speakers built into the display, but lacks a subwoofer.

The CyberPower is a little noisy during operation, but the motherboard's fan-speed controls may help to alleviate this problem.

The Ultra Triton offers a real alternative to a slew of very similar Intel-based PCs. It also has superior gaming graphics.

4 NEW Palicomp Phoenix i5 Sonar Advanced

Palicomp promises a lot for your money in the Sonar Advanced. Besides the ubiquitous Intel Core i5-2500K processor, it has 8GB of DDR3 RAM and is the only PC here to include a subwoofer with its Logitech speakers. This offers improved bass.

The Cooler Master Elite 330 system case offers smart, yet relatively sober, looks. It's a budget model, but still one of the best featured in our chart.

We're far more impressed by the Palicomp's Z68-chipset motherboard, however. It makes the Sonar Advanced the only PC here able to take full advantage of the overclockable Core i5 processor.

The Asus P8Z68-V LX motherboard also offers four memory slots, which is two more than is provided by the H61 board used by the competition. It also supports 6Gbps SATA and, should you want to add a solid-state drive (SSD), Smart Response Technology. This enables the SSD to act as a high-speed cache, boosting operation of the PC's main hard drive.

At stock speed, the Palicomp turned in a respectable 162-point tally in WorldBench 6. It was narrowly beaten by the Chillblast.

Unsurprisingly, this budget PC uses integrated graphics rather than a costly dedicated card. The Core i5 chip's graphics are up to the job of low-level gaming and serving up HD multimedia.

The catch is in this PC's one-year return-to-base warranty Chillblast offers a far more appealing two-year collect-and-return policy. However, this PC offers good performance. »

PC ADVISOR TEST CENTRE

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5 Eclipse Voyager i525H61

Eclipse is the fourth PC vendor in our chart to plump for the Intel Core i5-2500K processor running at 3.3GHz. The Voyager is also one of three PCs here to employ Asus' P8H61-M LE/USB3 motherboard. With 4GB of RAM fitted, however, it fell behind the competition in WorldBench 6.

Gaming performance is closer to that of competing PCs, though, with the Eclipse also relying on Intel integrated graphics.

It offers half the amount of storage space of its rivals, although its 500GB hard drive should offer enough capacity for most users.

Its lack of external speakers is a bigger problem for the Voyager. This PC instead relies on the tiny speakers built into its HKC monitor. If you aren't too fussed about sound quality, this does mean you'll have more space and fewer wires on your desktop.

The HKC is a little pricier than the AOC F22+ supplied by the competition, but the image quality it offers is no better.

The glossy black EZCool N-800D system case conceals front-facing audio and USB ports behind a flap, while its central power switch has an attractive metallic surround.

This PC offers respectable performance, but its lack of speakers and low-capacity hard drive disappoint. We'd also like a better warranty. ☒ **Paul Monckton**

>> Buying advice Sub-£500 desktop PCs

Processor: Intel's second-generation Core i5 chips have the budget category sewn up. The 3.3GHz Core i5-2500K delivers superb performance and its integrated Intel HD 3000 graphics are more than adequate for HD multimedia and low-level gaming. The non-overclockable i5-2500 is slightly cheaper and delivers the same application performance, but it features less powerful Intel HD 2000 graphics.

'K' versions of Intel's Sandy Bridge processors support overclocking, but you'll need a pricey Z68- or P67-chipset-based motherboard (the latter also requires a discrete graphics card). A Z68 chipset provides additional support for SSD caching and auto-switching graphics.

Sandy Bridge chips also provide accelerated graphics encoding, plus VGA and HDMI outputs. While integrated graphics aren't fast enough for a true gaming PC, some titles remain playable if you lower the quality settings.

If you really want to play games, AMD's A6 CPUs are slower in desktop applications but feature faster integrated graphics. They also support DirectX 11.0.

Memory: Expect up to 8GB and don't settle for less than 2GB. Most CPUs require DDR3 RAM, while older ones can also use DDR2. Check your motherboard has free slots if you plan to upgrade later.

Storage: Falling prices mean that 1TB is well within the reach of even a budget PC. You can never have too much storage space, and digital media will quickly fill a reasonably sized drive. Hard-drive space is easy to add later, however.

If you're planning to upgrade hard drives internally, ensure that you've got spare drive bays inside your PC's case.

Get a drive that can write to the DVD±R formats at 16-speed or better. If you want to get 8.5GB on to one disc, get a drive that can write to dual-layer discs at 12- and eight-speed respectively.

Flat-panel: It's the component you'll be spending all your time looking at, but PC makers often compromise on the monitor.

Good-quality full-HD monitors are available even iat this price. Expect to find a 21.5in model, although these are often marketed as 22in screens. It's best to get one with dual inputs and a digital connection (DVI, HDMI or DisplayPort), letting you get the best image quality available and hook up additional devices.

Graphics card: With the best graphics cards retailing for more than £300, a sub-£500 PC is unlikely to satisfy a hardcore gamer. However, decent graphics cards get cheaper all the time, and budget PCs can now handle games that were unthinkable a few months ago.

Intel's Core i3 and i5 CPUs come with integrated graphics processors that deliver better performance than older Intel integrated solutions. The new Sandy Bridge chips are even faster and offer features such as dual-monitor outputs. They also support HD video without the need for a separate graphics card. AMD's A6 chips offer even faster graphics.

The AMD Radeon HD 5450 is a popular choice for a budget PC. It doesn't offer a great speed advantage over Intel GMA integrated graphics, but it offers support for DirectX 11.0. Many graphics cards can also drive multiple monitors.

If you really want to play games, nVidia's GeForce GT 240 will provide some extra speed. Be prepared to lower your graphics settings, however.

Power supply: Expect only a basic PSU at this price point. A 450W or 500W model is a good starting point.

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GROUP TEST

Top 5 £751-£1,000 PCs

		Processor type / Processor speed	RAM / Hard-disk capacity / USB 2.0/3.0 ports[1]	Motherboard / PSU / Power rating	Flat-panel display / Pixel pitch / Native resolution (pixels)
PC ADVISOR BEST BUY	**1 Chillblast Fusion Claymore** 0845 456 7831 chillblast.com **New**	• £999 inc VAT • 2-year collect-and-return warranty	Intel Core i7-2600K 3.4GHz	8GB DDR3 RAM 1TB SATA + 30GB SSD 6/2	Asus P8Z68-V LE Corsair 600W	23.6in Asus VS247H 0.27mm 1920x1080
			>> WorldBench 6	163	
PC ADVISOR RECOMMENDED	**2 Arbico Elite Z685** 0845 625 2627 arbico.co.uk **New**	• £1,000 inc VAT • 2-year RTB warranty	Intel Core i7-2600K 3.4GHz	8GB DDR3 RAM 1TB SATA +60GB SSD 4/2	Asus P8Z68-V LX Xilence 580W	23.6in Asus VS247H 0.27mm 1920x1080
			>> WorldBench 6	159	
	3 Eclipse Matrix i726R697 0844 472 3723 eclipse-computers.com **New**	• £999 inc VAT • 1-year RTB warranty	Intel Core i7-2600K 3.4GHz	16GB DDR3 RAM 1TB SATA 6/2	Asus P8Z68V LE Cooler Master 650W	23.6in HKC 2412 0.27mm 1920x1080
			>> WorldBench 6	180	
	4 Medion Akoya P5704 D 0845 434 6003 medion.com **New**	• £835 inc VAT • 1-year RTB warranty	Intel Core i7-2600 3.4GHz	8GB DDR3 RAM 1TB SATA + 64GB SSD 8/2	H6H72-EM FSP 450W	none n/a n/a
			>> WorldBench 6	168	
	5 Chillblast Fusion Volt 0845 456 7831 chillblast.com Last month 1	• £999 inc VAT • 2-year collect-and-return warranty	Intel Core i7-2600K 3.4GHz	8GB DDR3 RAM 1TB SATA + 40GB SSD 6/2	Asus P8Z68-V LE Corsair 600W	23.6in Asus VS247H 0.27mm 1920x1080
			>> WorldBench 6	184	

GLOSSARY • PSU: power supply unit • RTB: return to base • TB: terabyte [1]External [2]Gaming scores in fps. Crysis tested at basic (1024x768, 'High Quality', DirectX 9.0) and more advanced (1680x1050,

1 NEW Chillblast Fusion Claymore

PC ADVISOR BEST BUY

Despite its slower performance in our benchmark than some of its rivals, Chillblast has blended the latest technologies with premium components to produce a specification that beats all others.

Chillblast combines the 3.4GHz Intel Core i7-2600K processor seen in almost every other PC here with a 30GB OCZ solid-state drive (SSD). This uses Smart Response Technology (SRT) to operate as a high-speed cache, boosting performance of the one-terabyte (1TB) Samsung hard drive. The SSD is hidden from the user, and not used for storing files. Where a larger SSD is used to store the operating system, a greater performance boost can be achieved.

SRT is possible thanks to an Asus Z68-chipset motherboard. This also provides support for 6 gigabits per second (Gbps) SATA and USB 3.0. Note that two of the Chillblast's four USB 3.0 ports are internal.

The Fusion Claymore performs well, but this PC has 'only' 8GB of RAM. Rival systems packed with 16GB won higher scores in WorldBench 6, but whether you'd notice a difference in real-world performance depends on the applications you use.

An excellent Asus VS247H full-HD monitor is supplied, offering a noticeable improvement over some of the budget models we see in these pages. It features LED backlighting, and has the edge over the competition in quality and features. It's combined with a pair of Logitech speakers and a subwoofer, plus a Blu-ray drive.

Chillblast also supplies the fastest graphics card here: a factory-overclocked nVidia GeForce GTX 570.

2 NEW Arbico Elite Z685

PC ADVISOR RECOMMENDED

The Arbico Elite uses its 3.4GHz Intel Core i7-2600K processor to good effect, but recorded the lowest score in WorldBench 6. Nevertheless, it packs in plenty of performance and a very good specification.

As we noted earlier, using an SSD to store the operating system can provide a greater performance boost than that offered by SRT. Arbico has preinstalled Windows 7 Home Premium on a 64GB OCZ Agility 3 SSD, leaving some space free for applications.

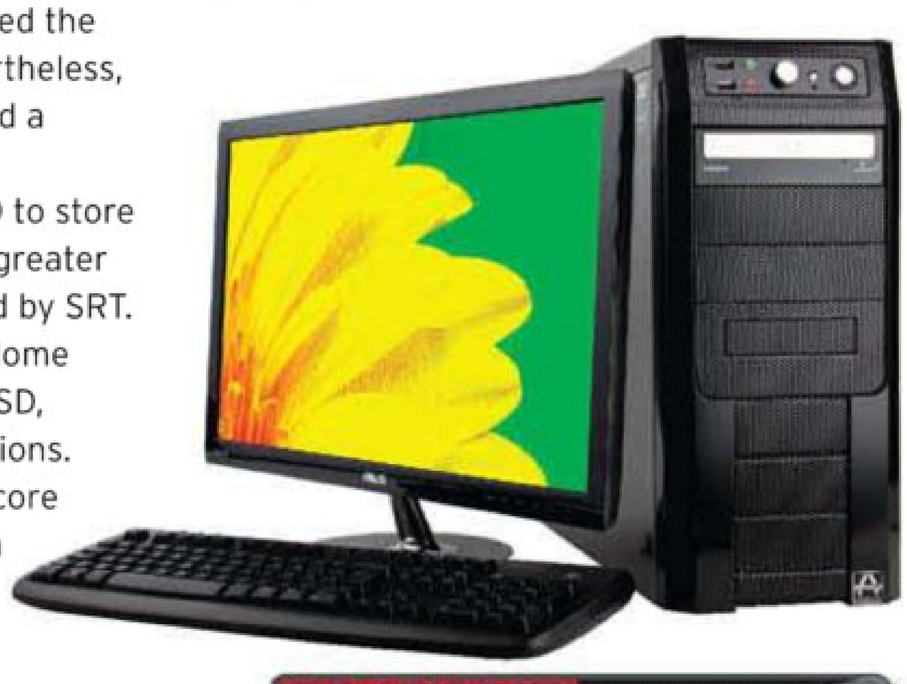
The Elite's lower WorldBench 6 score is due to its 8GB provision of system memory; some rivals pack in 16GB. Its SSD makes a huge difference to overall responsiveness, however, and reduces bootup times noticeably. You may even find this PC feels faster in use than the Eclipse.

You won't find the Arbico so fast when it comes to gaming, though. It's significantly better equipped than the Medion, but its GTX 560 Ti is inferior to the GTX 570 and HD 6970 cards seen elsewhere.

The Asus P8Z68-V LX motherboard supports 6Gbps SATA and USB 3.0, but it has only two USB 3.0 ports.

An excellent Asus VS247 full-HD monitor is included, the same display selected by Chillblast. It's complemented with a pair of Arbico-branded stereo speakers, although these lack bass. The Blu-ray drive is another appealing component for multimedia fans.

The Arbico Elite is a good all-round system. Although it feels snappy and responsive in use, it lacks the graphics firepower of some of its rivals. You'll also have to keep an eye on the remaining capacity of its fast SSD.



	Graphics-card maker Graphics chip Memory/interface	Games scores: Crysis Stalker: Call Of Pripyat[2]	Sound card Speakers Subwoofer	Max disc speeds	Operating system, software and extras
	Palit nVidia GeForce GTX 570 Sonic Edition 1.28GB/PCI Express	99/55 199/118	onboard 2 x Logitech S220 yes	12x BD-ROM 16x DVD±R/ 8x ±R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)
	MSI nVidia GeForce GTX 560 Ti 1GB/PCI Express	100/46 192/101	onboard 2 x Arbico no	12x BD-ROM/8x -R/ 8x -R DL/8x -RE/ 8x -ROM DL 16x DVD±R/12x ±R DL/ 12x ±RW/12x -RAM	Windows 7 Home Premium 64bit (choose Windows 7 32bit or XP at no extra cost)
	AMD AMD Radeon HD 6970 2GB/PCI Express	88/55 184/112	onboard built into flat-panel no	4x BD-ROM/ 8x DVD±R/8x ±R DL	Windows 7 Home Premium 64bit
	AMD AMD Radeon HD 6750 1GB/PCI Express	76/39 133/73	onboard none n/a	10x BD-R 16x DVD±R	Windows 7 Home Premium 64bit
	MSI AMD Radeon HD 6970 2GB/PCI Express	95/54 196/113	onboard 2 x Logitech S220 yes	12x BD-ROM 16x DVD±R/ 8x ±R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)

'Very High Quality', DirectX 10.0) settings. Stalker: Call Of Pripyat tested at 720p 'Medium' and 1080p 'Ultra'

3 NEW Eclipse Matrix i726R697

With a staggering 180-point scored in WorldBench 6, the Eclipse Matrix i726R697 is a force to be reckoned with. It, too, is based on the 3.4GHz Core i7-2600K processor, but scored better in our benchmark than the competition thanks to its 16GB of RAM. Note, however, that this is largely due to one component of the test; the difference in real-world performance might not be as noticeable.

The Eclipse also lacks an SSD, and doesn't feel as snappy in use as competing PCs. A Z68-chipset motherboard means its possible to add one, of course, and a relatively low-cost, low-capacity model can boost hard-drive operation using SRT.

This motherboard is almost identical to the LX version selected by Arbico, but has an extra pair of internal USB 3.0 ports.

A fast AMD Radeon HD 6970 graphics card delivers good gaming framerates. It's considerably faster than the Arbico's GTX 560 Ti, but beaten by the Fusion Claymore's factory-overclocked GTX 570.

No external speakers are provided; unless you already have some, you'll have to make do with the small speakers built into the 23.6in HKC 2412 monitor. This is an average LED-backlit model, and it doesn't offer the same level of quality as the Asus VS247H selected by Chillblast and Arbico.

The Eclipse Matrix i726R697 is a fast PC with plenty of upgrade potential. There's no SSD, nor speakers, however, so you may find yourself looking to upgrade sooner rather than later.

4 NEW Medion Akoya P5704 D

It lacks a monitor and still costs £835, but the Core i7-2600-powered Medion Akoya P5704 D offers strong performance and quality components in return.

The 1TB hard disk is standard at this price, and its pairing with a 64GB SSD is a clever move by Medion. It's preinstalled Windows 7 on this faster drive, allowing for enhanced boot times and operational speed. The PC is also quiet when booting up.

The Medion recorded 168 points in WorldBench 6. This is an impressive score for a system with 'only' 8GB of RAM.

The supplied Blu-ray drive is able to write to as well as read compatible media, which isn't always a given at this price. It promises 10-speed writing to BD-R media, plus LightScribe support. You also get 802.11n Wi-Fi connectivity as standard.

We were less impressed with the graphics, and aren't convinced that hardcore gamers will be satisfied with the system's AMD Radeon HD 6750 with 1GB of video memory. But the Medion is a solid gaming rig, and scored playable framerates in Stalker: Call Of Pripyat and Crysis.

We were surprised to find a lowly 450W PSU fitted. It's made by top-tier manufacturer FSP, however, making it a better choice than, say, a generic 600W unit.

A sizeable cooler is found inside the case, where it all but blocks access to the PC's two free memory slots. We'd prefer to get a larger, less cramped case at this price.

A multiformat card reader is supplied, and the PC's 10 USB ports include two front-facing USB 3.0 connections.

At £835, the Medion is in tough company – yet it can hold its own against similarly priced rivals. The graphics card isn't good enough for die-hard gamers who expect to play Crysis at the highest detail settings, but if you want a gaming system from a reputable brand, with a Blu-ray writer and Wi-Fi connectivity, it's a worthy contender. »

5 Chillblast Fusion Volt

Chillblast's Fusion Volt is not only the fastest PC our chart, but it also takes advantage of Intel's SRT to boost hard-drive performance.

Based on the same 3.4GHz Intel Core i7-2600K processor as three of the other systems here, the Chillblast's significant lead in WorldBench 6 was made possible by a 40GB Corsair Force SSD. This low-capacity drive is used to accelerate performance of the main hard disk, a 1TB Samsung model.

While this setup doesn't give you as great a speed boost as installing Windows on to an SSD would achieve, it allows the use of a smaller, cheaper drive, letting the vendor distribute the budget more evenly elsewhere. Because this drive is transparent to the user, it also means you don't need to worry about filling up its storage capacity.

An AMD Radeon HD 6970 graphics card with 2GB of video memory delivers excellent gaming results. Chillblast has selected the Twin Frozr III version from MSI, which offers an improved cooling solution over the standard version. If you prefer an nVidia-based solution, Chillblast's Fusion Claymore offers a slightly faster GTX 570.

The Asus P8Z68-V LE motherboard provides all the latest technologies, including SRT and the ability to access the integrated graphics-processing capabilities of the CPU for video encoding.

The same super-sleek Asus VS247H monitor that we admired in the Arbico and Chillblast's first PC is included. You also get a set of Logitech S220 stereo speakers, complete with a subwoofer. ☒ **Paul Monckton**

>> Buying advice £751-£1,000 desktop PCs

Processor: Intel's second-gen Core i5 and i7 CPUs are the only serious contenders at this price. These 'Sandy Bridge' chips are much faster and use less power than their predecessors.

The 3.4GHz Core i7-2600K is the fastest available, with its 'K' designation denoting an unlocked multiplier. K-series CPUs are designed for overclocking, but demand a compatible motherboard.

At 3.3GHz, the Core i5-2500K offers a slightly lower specification. Unlike the Core i7, it has no support for hyperthreading and has 6MB rather than 8MB of level-three cache.

Motherboard: K-series chips require a motherboard that supports overclocking. These boards cost a little more, but a good version will do the hard work for you, providing a significant speed boost without any specialist knowledge.

Never pair a K-series CPU with a motherboard based on the H67 chipset – these don't support overclocking. If you want to overclock, you should also invest in a third-party CPU cooler.

A 64bit OS will take full advantage of your RAM, but check that your software and drivers will be supported.

Storage: With storage prices falling, expect 1TB. We're even seeing systems with 2TB at this price. An SSD may be available, providing a noticeable improvement in bootup times and system responsiveness. Their price requires cutbacks elsewhere, however.

Paired with a Z68 motherboard, a low-capacity SSD can boost hard-drive performance using Intel's SRT.

Get a multiformat DVD writer that can write to a dual-layer format if you want to store 8.5GB on a single disc. Look for a minimum of eight-speed DVD+R DL. Try to get eight-speed DVD+RW.

It's not uncommon to find a DVD drive that also reads Blu-ray discs, but DVD-burning speeds will be slower. Look for separate Blu-ray and DVD drives for the fastest performance.

Flat-panel: 24in flat-panels are standard at this price. Many vendors supply cheap screens to leave more cash for other components, but it's worth spending more on a display if you intend to work with digital photos or video.

All twisted-nematic (TN) screens now have a response time of 8ms or less to minimise blur on fast-moving images. For image editing, contrast ratio and colour fidelity are more important – look for better in-pane switching (IPS) tech here.

An LED backlight doesn't guarantee a superior display, but such models are often slimmer and more stylish. A digital input preserves picture quality.

Graphics card: At this price, the AMD Radeon HD 6970 is an excellent choice for gamers. It offers multi-screen and DirectX 11.0 support. nVidia's GeForce GTX 560 Ti delivers similar performance, as well as support for 3D Vision.

You may find a GeForce GTX 570 at this price, which will give you even better gaming framerates.

Look for souped-up versions with faster clock speeds or additional memory.

Many graphics cards can be upgraded to dual-card setups. However, current motherboards have limited support for multiple graphics cards, so we advise you to buy the fastest single card you can.

Power supply: The level of power you require will depend on the graphics card you want to use. Look for at least a 500W unit or 750W-plus if you plan to add another card or overclock the CPU.

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Thanks!

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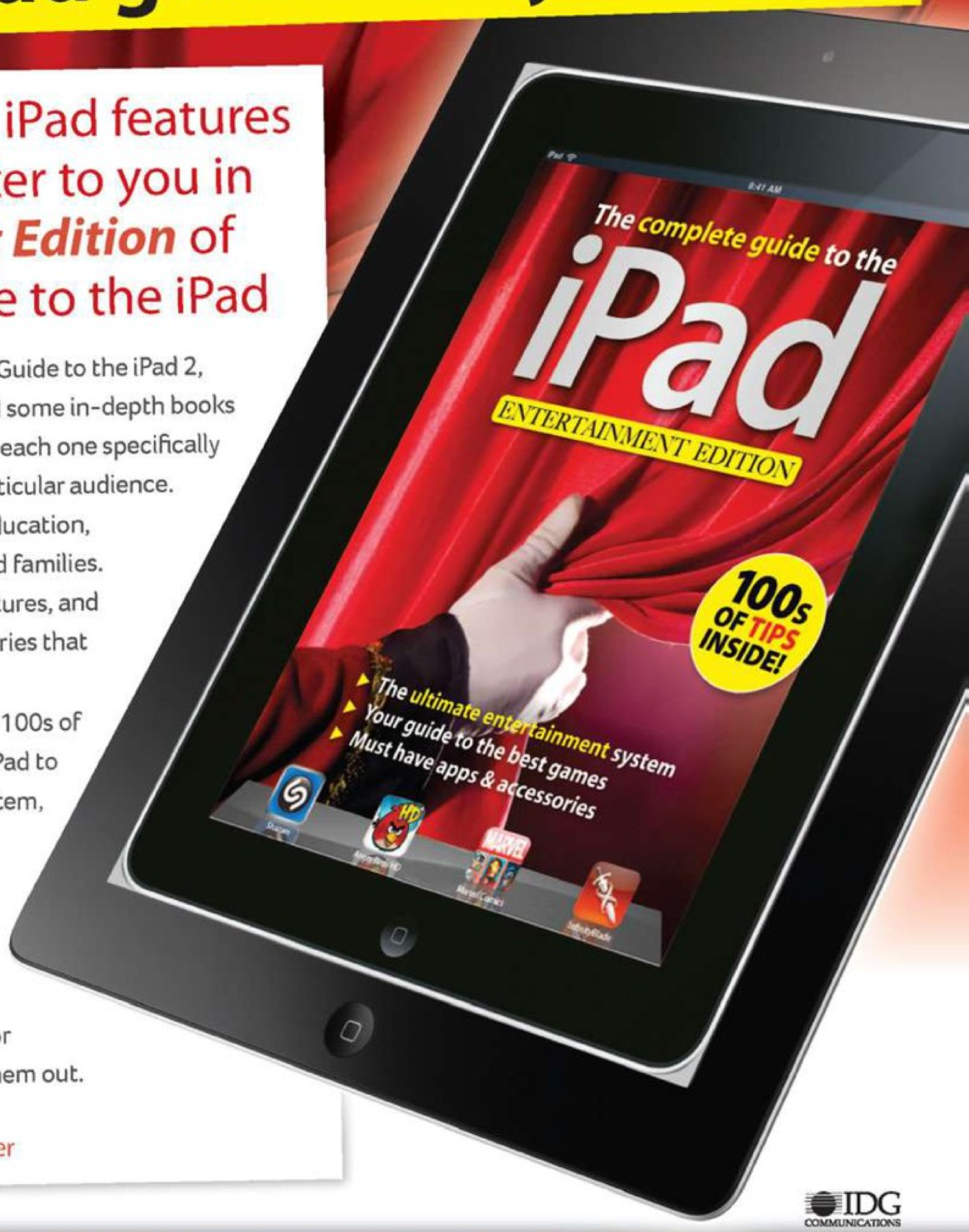

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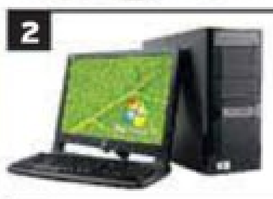
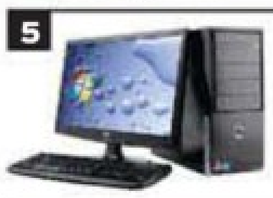
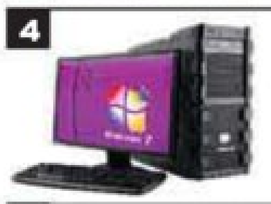
			Processor type / Processor speed / CPU cooler	RAM / Hard-disk capacity / USB 2.0/3.0 ports[1]	Motherboard / PSU / Power rating	Flat-panel display / Pixel pitch / Native resolution (pixels)
PC ADVISOR BEST BUY	1 **Chillblast Fusion Striker** 0845 456 7831 chillblast.com Last month 1	• £749 inc VAT • 2-year full collect-and-return warranty	Intel Core i5-2500K 3.3GHz standard Intel	8GB DDR3 RAM 1TB SATA 9/2	Asus P8Z68-V LE EZCool 650W	23.6in Asus VH247H 0.27mm 1920x1080
			>> WorldBench 6	161		
PC ADVISOR RECOMMENDED	2  **Dino PC Elmisaur 2600** 0844 999 4123 dinopc.com Last month 2	• £725 inc VAT • 3-year RTB warranty (labour only)	Intel Core i7-2600 3.4GHz standard Intel	8GB DDR3 RAM 1TB SATA 6/2	Gigabyte GA-Z68A-D3-B3 Xigmatek 400W	21.5in AOC F22+ 0.25mm 1920x1080
			>> WorldBench 6	167		
	3 **Arbico eXcel i5-2888 Mx** 0845 625 2627 arbico.co.uk Last month 3	• £750 inc VAT • 2-year RTB warranty (labour only)	Intel Core i5-2500K 3.3GHz standard Intel	8GB DDR3 RAM 1TB SATA 8/2	Asus P8P67 Xilence 420W	23.6in AOC E2436VWA 0.27mm 1920x1080
			>> WorldBench 6	173		
	4 **Palicomp Phoenix i5 Lightning Extreme** 0127 089 8104 palicomp.co.uk Last month 4	• £749 inc VAT • 1-year RTB warranty	Intel Core i5-2500K 3.3GHz standard Intel	8GB DDR3 RAM 2TB SATA 8/2	Asus P8Z68-V Cooler Master 500W	23.6in AOC E2436VWA 0.27mm 1920x1080
			>> WorldBench 6	167		
	5  **Eclipse Anarchy i525n560** 0844 472 3723 eclipse-computers.com Last month 5	• £749 inc VAT • 1-year RTB warranty	Intel Core i5-2500K 3.3GHz standard Intel	4GB DDR3 RAM 1TB SATA 6/2	Asus P8H67-M Pro B3 EZCool 650W	23.6in HKC 2249A 0.27mm 1920x1080
			>> WorldBench 6	159		

Top 5 £1,001+ PCs

			Processor type / Processor speed / CPU cooler	RAM / Hard-disk capacity / USB 2.0/3.0 ports[1]	Motherboard / PSU / Power rating	Flat-panel display / Pixel pitch / Native resolution (pixels)
PC ADVISOR BEST BUY	1 **Chillblast Fusion Pulsar** 0845 456 7830 chillblast.com Last month 1	• £1,299 inc VAT • 2-year full collect-and-return warranty	Intel Core i7-2600K 3.4GHz standard Intel	16GB DDR3 RAM 2TB SATA + 120GB SSD 12/4	Asus P8Z68-V Pro Corsair 600W	27in Asus VE278Q 0.31mm 1920x1080
			>> WorldBench 6	182		
PC ADVISOR RECOMMENDED	2 **Arbico Elite i7 2676 XL** 0845 625 2627 arbico.co.uk Last month 2	• £1,274 inc VAT • 2-year RTB warranty (labour only)	Intel Core i7-2600K 3.4GHz standard Intel	16GB DDR3 RAM 2TB SATA + 120GB SSD 8/2	Asus P8P67 Pro Xilence 580W	23.6in Asus VS247H 0.28mm 1920x1080
			>> WorldBench 6	181		
	3 **Palicomp Phoenix i7 Stealth Extreme** 01270 898 104 palicomp.co.uk Last month 3	• £1,399 inc VAT • 1-year RTB warranty	Intel Core i7-2600K 3.4GHz Thermaltake Contac 29 BP	16GB DDR3 RAM 2TB SATA + 120GB SSD 8/4	Asus P8P67 Pro PowerCool 850W	23.6in Samsung B2430L 0.28mm 1920x1080
			>> WorldBench 6	181		
	4  **CyberPower Infinity Achilles Extreme** 0844 371 2727 cyberpowersystem.co.uk Last month 4	• £1,298 inc VAT • 3-year RTB warranty (parts only)	Intel Core i7-2600K 3.4GHz standard Intel	8GB DDR3 RAM 1TB SATA + 30GB SSD 4/2	Gigabyte Z68A-D3 CyberPower 950W	24in BenQ G2420HDBL 0.28mm 1920x1080
			>> WorldBench 6	170		
	5 **Dino PC Maxosaur 2600K V2** 0844 999 4123 dinopc.com Last month 5	• £1,499 inc VAT • 3-year RTB warranty (labour only)	Intel Core i7-2600K 3.4GHz standard Intel	8GB DDR3 RAM 2TB SATA + 64GB SSD 10/4	Gigabyte GA-Z68X-UD3P-B3 Xigmatek 700W	2 x 21.5in LG E2260S-PN 0.25mm 1920x1080
			>> WorldBench 6	170		

GLOSSARY • PSU: power supply unit • RTB: return to base • TB: terabyte • ThB: Thunderbolt [1]External [2]Gaming scores in fps. Crysis tested at basic (1024x768, 'High Quality', DirectX 9.0) and more advanced

>> Buying advice

£501-£750 PCs

Desktop PC prices were correct at press time for issue 197 and include delivery. Vendors often honour the price of machines 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 Sandy Bridge CPUs are revolutionising all our PC categories. The 3.3GHz Core i5-2500 delivers formidable performance, but the i5-2400 is also fast and costs less.

If you want to eke out the best possible performance from your PC, go for a Core i5-2500K. The 'K' denotes that it's designed for overclocking. You'll also need a P67 or Z68 motherboard, which don't support integrated graphics.

Memory: Don't buy a PC with less than 4GB of RAM, and get a 64bit

	Graphics-card maker Graphics chip Memory/interface	Games scores: Crysis Stalker: Call Of Pripyat[2]	Sound card Speakers Subwoofer	Max disc speeds	Operating system, software and extras	VERDICT
	Palit nVidia GeForce GTX 560 Ti Sonic 1GB/PCI Express	100/49 189/105	onboard 2 x Logitech S120 no	24x DVD±R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)	Chillblast has used the latest motherboard technologies, premium components and peripherals to create a desirable PC with good upgrade potential. Intel's Core i5-2500K CPU offers excellent performance and an unlocked multiplier for easy overclocking. The motherboard provides USB 3.0 and SATA 6Gbps ports, but the Chillblast's superb 24in display and nVidia GeForce GTX 560 Ti Sonic graphics card set it apart from the competition. **TINYURL.COM/5VO5RTE**
	Palit nVidia GeForce GTX 550 Ti 1GB/PCI Express	85/24 135/59	onboard 2 x Dino PC no	24x DVD±R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit	You might expect the Elmisaur to offer the best performance here, given its Core i7 CPU. Application performance is strong, yet Arbico's Core i5 PC is faster. Some cost-cutting measures have been essential in budgeting for the processor. The 21.5in monitor is smaller than the 23.6in displays of rival PCs, and has inferior image quality. The Dino PC's also taken a hit in graphics. Other specs are strong, with 8GB of RAM and a Z68 motherboard. **TINYURL.COM/3OMNDWX**
	Asus AMD Radeon HD 6870 1GB/PCI Express	92/44 169/86	onboard 2 x Logitech S220 yes	24x DVD±R/ 12x ±R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit or XP at no extra cost)	Arbico's eXcel has a similar spec to the Palicomp, with the same processor, monitor, graphics card and sound system. This PC won the better score in WorldBench 6, with a chart-leading 173 points, but the Palicomp has twice the storage capacity and a Blu-ray/DVD combo drive. The Arbico's motherboard is limited by its older P67 chipset, but it's housed inside an excellent CIT Storm system case that's ideal for upgrades. **TINYURL.COM/6JAXCPV**
	XFX AMD Radeon HD 6870 1GB/PCI Express	87/43 166/86	onboard 2 x Logitech S220 yes	12x BD-ROM/ 8x -R/8x -RE 16x DVD ±R/ 8x -R DL/8x +R9	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)	Multimedia fans will love Palicomp's Phoenix i5 Lightning Extreme. It has a 23.6in AOC LED-backlit display, Logitech S220 speakers – complete with a subwoofer – and, uniquely in this chart, a Blu-ray/DVD combo drive. Application performance is also good, and an AMD Radeon HD 6870 graphics card performs well. There's also a high-spec Z68 chipset motherboard, found inside a well-built system case. Our only gripe concerns the paltry warranty. **TINYURL.COM/66T6AYD**
	Inno3D nVidia GeForce GTX 560 Ti 1GB/PCI Express	97/41 171/96	onboard 2 x Logitech S150 no	22x DVD±R/ 12x -R DL/16x +R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit	Eclipse's Anarchy is particularly well-suited to gaming, but its minimalist EZCool N800D case won't alert others to your secret addiction. The trade-off is considerable sacrifices in the display, sound quality and general Windows performance. The PC's 159-point WorldBench 6 score is by no means slow, but beaten by all its rivals. A 23.6in full-HD HKC monitor and a pair of Logitech S150 external speakers are supplied. **TINYURL.COM/3L2PVLE**

	Graphics-card maker Graphics chip Memory/interface	Games scores: Crysis Stalker: Call Of Pripyat[2]	Sound card Speakers Subwoofer	Max disc speeds	Operating system, software and extras	VERDICT
	Palit nVidia GeForce GTX 570 1.28GB/PCI Express	107/59 219/127	onboard 2 x Logitech yes	12x BD-ROM 16x DVD±R/8x ±R DL/ 6x -RW/8x +RW/ 12x -RAM/16x -ROM	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)	The Fusion Pulsar combines stellar performance with a top-notch feature set and premium components. You get 16GB of RAM and a 120GB Corsair SSD, plus powerful gaming framerates from the factory-overclocked GTX 570. The Z68-chipset motherboard supports SSD-based caching and auto-switching graphics. A huge 27in monitor is also provided, along with stereo speakers and a Blu-ray drive. This PC delivers outstanding value. **TINYURL.COM/68NSLLS**
	Inno3D nVidia GeForce GTX 570 1.28GB/PCI Express	100/49 201/117	onboard 5 x Trust yes	10x BD-ROM/8x -R/ 8x -R DL/8x -RE/ 8x -ROM DL 16x DVD ±R/ 10x ±R DL	Windows 7 Home Premium 64bit (choose Windows 7 32bit or XP at no extra cost)	Save for a few improvements, Arbico's i7 2676 XL is identical to its i7-2657 MX mkII (tinyurl.com/3ewcnna). Its lower price makes it the cheapest PC here. Doubling the amount of RAM has gained Arbico an extra point in WorldBench 6, while the SSD has been downgraded to an 120GB OCZ Agility 3, without a measurable reduction in performance. A 2TB hard drive is also provided. The weakest component is its graphics card. **TINYURL.COM/6CRJGNX**
	PNY nVidia GeForce GTX 580 1.5GB/PCI Express	98/58 208/131	onboard 2 x Logitech S220 yes	12x BD-R SL/8x -R DL/ 2x -RW/12x -RAM 16x DVD ±R/ 8x ±R DL/ 8x +RW/6x -RW	Windows 7 Home Premium 64bit (choose Windows 7 32bit at no extra cost)	Palicomp's Stealth Extreme offers bags of performance. It costs £100 more than our Best Buy, but includes a superior system case with a top-mounted SATA dock and enhanced cooling. Key to its staggering performance is 16GB of DDR3 RAM and a 120GB OCZ Vertex 3 SSD. You also get a fast GTX 580 graphics card, a 34in monitor, a Blu-ray drive and stereo speakers, although the PC is held back somewhat by its P67-chipset motherboard. **TINYURL.COM/6AN0E6K**
	Gainward nVidia GeForce GTX 580 1.5GB/PCI Express	100/59 204/130	onboard 5 x Creative A520 yes	10x BD-ROM 16x DVD ±R/ 8x ±R DL/ 5x -RAM	Windows 7 Home Premium 64bit, Microsoft Office 2010 Starter	An Intel Core i7-2600K-based powerhouse, the Achilles Extreme was the first PC we saw to take advantage of Intel's Smart Response Technology. This uses a low-capacity SSD to boost hard-drive performance. The Z68 motherboard doesn't support integrated graphics, but a factory-overclocked GTX 580 ensures excellent gaming performance. A very good 24in BenQ display, a Blu-ray drive and a set of Creative speakers are provided. **TINYURL.COM/42XAD9F**
	Palit nVidia GeForce GTX 580 1.5GB/PCI Express	98/59 201/132	onboard 2 x Creative Gigaworks T20 no	4x BD-ROM 24x DVD±R/12x -R DL/ 16x +R DL/6x -RW/ 8x +RW/12x RAM/ 16x -ROM	Windows 7 Home Premium 64bit	Dino PC puts the Core i7-2600K to good use in its update to the Maxosaur 2600K (tinyurl.com/3reuxcw). This revision also embraces a Z68 motherboard and is supplied with two 21.5in monitors. Both lack a digital input. Dino PC has fitted a factory-overclocked GTX 580 graphics card, a 64GB SSD and a 2TB hard drive. You also get a Blu-ray drive and some rather attractive Creative T20 speakers. It costs £200 more than its rivals, however. **TINYURL.COM/30B66EL**

settings (1680x1050, 'Very High Quality', DirectX 10.0). Stalker: Call Of Pripyat tested at 720p 'Medium' and 1080p 'Ultra'

operating system to make the most of it. Consider 8GB if you use intensive programs.

Storage: Expect 1TB, but you may get 2TB. Consider using a pair of smaller hard drives rather than one large drive – 1TB is a huge amount of data to lose in one go.

With prices falling all the time, you may find a solid-state drive (SSD) affordable. An SSD's faster file transfers can transform your computing experience, but make sure you get one at least 60GB in capacity and install your programs on a second drive.

Your DVD drive should write to the ±R formats at 18-speed or above. If you want to copy up to 8.5GB at once, look for fast DVD±R dual-layer drives. Blu-ray readers, let alone writers, are rare at this price.

Display: 19in screens offer a lower resolution than 20in/22in monitors; 22in models display larger icons. Newer 21.6in (16:9) flat-panels can display full-HD content, but onscreen elements will be even smaller. You'll find many budget 23.6in displays at this price.

DVI or HDMI will provide a better image than a VGA port. If you want to attach additional devices, you'll need two.

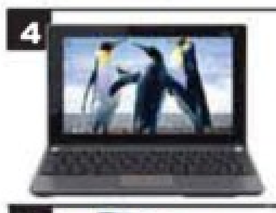
Graphics cards: AMD's Radeon HD 6850 offers excellent performance for the money. Cut back elsewhere and step up to a Radeon HD 6870 or the newer 6950 if gaming is very important to you. nVidia's GeForce GTX 560 Ti also offers good performance.

If you don't play games, you'll be fine with the integrated graphics of Intel's Core i5 processors. The 'K' versions offer improved graphics performance over standard chips.

Power supply: A 450W-plus PSU is less vital at this price point, but look for a model with a full set of SATA and PCI Express connectors to make later upgrades easier.

Sound card and speakers: To get surround sound, look for five speakers and a subwoofer.

Top 5 Netbooks

			Processor	USB 2.0 ports / FireWire ports	RAM / Hard-disk capacity	Dimensions (wxdxh) / Weight	Wireless connectivity
PC ADVISOR BEST BUY 1	**Toshiba NB550D-109** toshiba.co.uk tinyurl.com/3ebo3py Last month 1	• £298 inc VAT • £300 (RRP) • 1-year RTB warranty	1.6GHz AMD C50 Dual-Core >> WorldBench 6 31	3 0	1GB DDR2 250GB	261x189x24-38mm 1.3kg	802.11b/g/n, Bluetooth
PC ADVISOR RECOMMENDED 2	**Toshiba NB305-105** toshiba.co.uk tinyurl.com/32vbksf Last month 2	• £320 inc VAT • £360 (RRP) • 1-year international warranty	1.66GHz Intel Atom N450 >> WorldBench 6 33	3 0	1GB DDR2 250GB	266x192x24mm 1.3kg	802.11b/g/n, Bluetooth
3	**Kogan Arora Pro** kogan.co.uk tinyurl.com/43mn2ob Last month 3	• £289 inc VAT • £289 (RRP) • 1-year collect-and-return warranty	1.3GHz Intel Pentium SU2700 >> WorldBench 6 n/a[1]	3 0	2GB DDR2 500GB	290x195x26mm 1.3kg	802.11b/g/n, Bluetooth
4	 **Medion Akoya E1217** medionshop.co.uk tinyurl.com/2u9pdb6 Last month 4	• £200 inc VAT • £250 (RRP) • 1-year RTB warranty	1.6GHz Intel Atom N270 >> WorldBench 6 32	3 0	1GB DDR2 250GB	265x178x23mm 1kg	802.11a/b/g/n, Bluetooth
5	**Samsung NS310** samsung.com/uk tinyurl.com/444sktx Last month 5	• £330 inc VAT • £330 (RRP) • 1-year RTB warranty	1.5GHz Intel Atom N550 >> WorldBench 6 37	3 0	1GB DDR3 250GB	275x188x31mm 1.1kg	802.11b/g/n, Bluetooth 3.0

[1] Not tested Note: WorldBench 6 works only on Windows machines [2] Not tested using MobileMark 2007

Top 5 Sub-£600 laptops

			Processor	USB ports / FireWire / Memory card reader	RAM / Hard-disk capacity	Dimensions (wxdxh) / Weight	Wireless connectivity
PC ADVISOR BEST BUY 1	**Packard Bell EasyNote TS11HR039** packardbell.co.uk tinyurl.com/6k2pwm4 **New**	• £430 inc VAT • £430 (RRP) • 1-year RTB warranty	2.3GHz Intel Core i5-2410M >> WorldBench 6 118	3 0 yes	3GB DDR3 500GB	382x253x33mm 2.6kg	802.11b/g/n
PC ADVISOR RECOMMENDED 2	**Lenovo IdeaPad S205-1038** lenovo.com/uk tinyurl.com/6g5ekqk **New**	• £350 inc VAT • £350 (RRP) • 1-year RTB warranty	1.6GHz AMD E350 >> WorldBench 6 53	3 0 yes	4GB DDR3 500GB	290x168x29mm 1.5kg	802.11b/g/n, Bluetooth
3	**Samsung NP-RV720** samsung.com/uk tinyurl.com/4x4Lh49 **New**	• £475 inc VAT • £490 (RRP) • 1-year RTB warranty	2.1GHz Intel Core i3-2310M >> WorldBench 6 100	3 0 yes	4GB DDR3 750GB	420x275x35mm 2.7kg	802.11b/g/n, Bluetooth
4	**Lenovo G570-4334** lenovo.com/uk tinyurl.com/6fzz4xe **New**	• £500 inc VAT • £500 (RRP) • 1-year RTB warranty	2.1GHz Intel Core i3-2310M >> WorldBench 6 96	4 0 yes	6GB DDR3 640GB	377x250x35mm 2.6kg	802.11b/g/n, Bluetooth
5	**Dell Inspiron 17R** dell.co.uk tinyurl.com/64nqqk8 Last month 5	• £599 inc VAT • £599 (RRP) • 1-year RTB warranty	2.3GHz Intel Core i5-2410M >> WorldBench 6 114	3 0 yes	4GB DDR3 500GB	423x287x30mm 3kg	802.11b/g/n, Bluetooth

[1] Gaming framerate scores in fps, at 1024x768 resolution and 'Medium Quality' settings [2] Not tested

>> 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

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	Screen size Native resolution (pixels)	Graphics card Maximum memory	Flash memory drive	Max disc speeds	Operating system, software and extras	VERDICT
	10.1in 1024x600	ATI Radeon HD 6250 n/a	yes	n/a	Windows 7 Starter 32bit	With two of last issue's Top 5 netbooks being discontinued, the Toshiba extends its lead and continues to appear to be a solid choice. AMD's eventual arrival in the netbook party has produced a beautifully optimised chipset that combines the CPU and GPU into one APU. The plain looks and low-resolution screen aren't great though, and wireless connectivity is only half-n rather than full-speed 802.11n. But the keyboard is comfortable to use, and the graphics are capable of light gameplay.
	>> Battery life 8:13					
	10.1in 1024x600	Intel GMA 3150 n/a	yes	n/a	Windows 7 Starter 32bit	Differentiation is rare in the netbook market, and the Toshiba NB305-105 does little to stray from the standard mini-laptop specification. A revision of the popular Toshiba NB200 (reviewed at tinyurl.com/23w8tvm), with slightly sharper front edges, it has a 250GB hard drive and adds 802.11n Wi-Fi. The WorldBench score of 33 points is standard. However, the tubular screen hinge makes the netbook look cheap, and we don't really like the toy-like keyboard buttons. Battery life is outstanding, though.
	>> Battery life 11:30					
	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 950 n/a	yes	n/a	Windows 7 Starter 32bit, Microsoft Works 9.0	The ageing Medion Akoya continues to fall in price, and now costs just £200. The Intel Atom N270 processor is more than two years old, although the Akoya's performance is still decent and only slightly below that of the competition. The graphics are unsurprisingly poor, but we might have expected more from the battery life. Bluetooth connectivity is noteworthy, and the touchpad, while small, is of a high calibre. The keyboard is firm and positive to the touch, but the Medion's keys are a little small.
	>> Battery life 3:05					
	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					

	Screen size Native resolution (pixels)	Graphics card Memory	Games score (Fear)[1]	Max disc speeds	Operating system, software and extras	VERDICT
	15.6in 1366x768	Intel HD Graphics 3000 n/a	12	8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit	The cheaper of our two Intel Core i5-powered laptops, the Packard Bell offers a good combination of power and value. A few corners have been cut to meet the low price tag, and the integrated graphics will struggle with games. The Packard Bell also skimps on the RAM, with just 3GB of DDR3 memory. But non-gamers will find this an exceptional model. The keyboard is large enough to comfortably type on, and the screen is bright and sharp. A bit more storage space wouldn't go amiss, however.
	>> Battery life 5:51					
	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					
	17.3in 1600x900	Intel HD Graphics 3000 n/a	12	8x DVD±R/4x ±RW/8x -ROM	Windows 7 Home Premium 64bit	A big hulking brute of a laptop, the Samsung offers plenty of power. It can't keep up with the Core i5 machines, but its i3-2310M processor is capable. The lack of a graphics card means gamers will have to look elsewhere, but others will be pleased with the 750GB hard drive and 4GB of RAM. We like the vast 17.3in screen, which is ideal for working with spreadsheets. At 2.7kg, it's hardly the most portable laptop, but the keyboard and touchpad are large and luxurious. The construction is also strong.
	>> Battery life 4:42					
	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					

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.

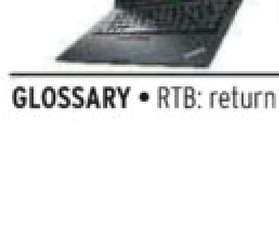
Keyboard: Cramped keyboards go with the territory, and it's useful to try out typing on a netbook before you buy it. The keyboards on netbooks with smaller than 9in screens will make touch typing impossible. Watch out for non-standard layouts; mini laptops sometimes sacrifice dedicated function keys, 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
PC ADVISOR BEST BUY 1	**Toshiba Satellite R830-143** toshiba.co.uk tinyurl.com/6xwtk99 Last month 1	• £730 inc VAT • £749 (RRP) • 3-year RTB warranty	2.3GHz Intel Core i5-2410M	2 / 0 / yes	6GB DDR3 / 640GB	316x227x27mm / 1.5kg	802.11b/g/n, Bluetooth
			>> WorldBench 6				122
PC ADVISOR RECOMMENDED 2	**Apple MacBook Pro** apple.com/uk tinyurl.com/5td25pq Last month 2	• £999 inc VAT • £999 (RRP) • 1-year RTB warranty	2.3GHz Intel Core i5-2415M	2 / 1 / yes	4GB DDR3 / 320GB	325x241x23mm / 2.1kg	802.11 a/b/g/n, Bluetooth
			>> WorldBench 6				117
3	**Medion Akoya P6631** medionshop.co.uk tinyurl.com/636p2jc Last month 3	• £729 inc VAT • £769 (RRP) • 1-year RTB warranty	2.3GHz Intel Core i5-2410M	4 / 0 / yes	8GB DDR3 / 750GB	380x260x34mm / 2.6kg	802.11b/g/n, Bluetooth
			>> WorldBench 6				121
4	**Acer Aspire 5750G** acer.co.uk tinyurl.com/3kgtspa Last month 4	• £670 inc VAT • £699 (RRP) • 2-year RTB warranty	2GHz Intel Core i7-2630QM	3 / 0 / yes	4GB DDR3 / 640GB	382x253x33mm / 2.6kg	802.11b/g/n, Bluetooth
			>> WorldBench 6				126
5	**Medion Erazer X6811** medionshop.co.uk tinyurl.com/4mqooc8 Last month 5	• £800 inc VAT • £979 (RRP) • 2-year RTB warranty	2.53GHz Intel Core i5-460M	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
PC ADVISOR BEST BUY 1	 **Apple MacBook Air 13.3in 2011** apple.com/uk tinyurl.com/3gy2Lae Last month 1	• £1,349 inc VAT • £1,349 (RRP) • 1-year RTB warranty	1.7GHz Intel Core i5-2557M	2 / 0 / yes	4GB DDR3 / 256GB SSD	325x227x17mm / 1.3kg	802.11 a/b/g/n, Bluetooth
			>> WorldBench 6				122
PC ADVISOR RECOMMENDED 2	**Apple MacBook Pro 15in Core i7 2.2GHz** apple.com/uk tinyurl.com/4bd9Ljv Last month 2	• £1,849 inc VAT • £1,849 (RRP) • 1-year RTB warranty	2.2GHz Intel Core i7-2720QM	2 / 1 / yes	4GB DDR3 / 750GB HDD	364x249x24mm / 2.5kg	802.11 a/b/g/n, Bluetooth
			>> WorldBench 6				132
3	**Sony Vaio F21Z1E/B** sony.co.uk tinyurl.com/6kj4qLz Last month 3	• £1,799 inc VAT • £1,799 (RRP) • 1-year RTB warranty	2GHz Intel Core i7-2630QM	3 / 0 / yes	8GB DDR3 / 640GB HDD	237x356x28mm / 3.1g	802.11 a/b/g/n, Bluetooth
			>> WorldBench 6				n/a[2]
4	**Dell Latitude E6320** dell.co.uk tinyurl.com/3wssbzb Last month 4	• £1,043 inc VAT • £1,043 (RRP) • 3-year RTB warranty	2GHz Intel Core i3-2310M	2 / 0 / yes	4GB DDR3 / 250GB HDD	335x223x30mm / 1.9g	802.11b/g/n
			>> WorldBench 6				101
5	**Lenovo ThinkPad X1** lenovo.co.uk tinyurl.com/4xs3nu6 Last month 5	• £1,280 inc VAT • £1,278 (RRP) • 3-year RTB warranty	2.5GHz Intel Core i5-2520M	3 / 0 / yes	4GB DDR3 / 320GB HDD	337x231x21mm / 1.7kg	802.11b/g/n
			>> WorldBench 6				n/a[2]

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
	13.3in 1366x768	Intel HD Graphics 3000 n/a	18	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	A highly portable laptop, the Toshiba Satellite's application performance was superb in our tests. Its integrated graphics are rather underpowered for gaming, however. The Toshiba looks smart. Its keyboard has small keys, but is easy to use for prolonged periods. Battery life is excellent, and the best in the chart at 7 hours and 32 minutes. The 13.3in screen has a matt finish and is usable in a variety of lighting conditions, if the colour depth suffers slightly. This laptop is ideal for taking on the road.
	>> Battery life 7:32					
	13.3in 1280x800	Intel HD Graphics 3000 n/a	18	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Mac OS X 10.6 Snow Leopard	Its £999 price tag means the MacBook Pro only narrowly makes it into our chart, but this doesn't stop it from offering very good value. Capable of dual-booting into Windows (although you will need to factor in the cost of the operating system), it produced a solid WorldBench 6 speed score of 117. It doesn't have a dedicated graphics card, and its gaming scores are poor. However, battery life is good, and the keyboard is comfortable to use. The Pro is attractive and superbly built.
	>> Battery life 6:29					
	15.6in 1920x1080	nVidia GeForce GT 540M 1GB	79	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	The Medion's killer feature is its display. The only panel here capable of supporting a full-HD resolution, this 15.6in screen offers deep, rich colours and sharp definition. It is a touch glossy, though. The touchpad is very good, while the GeForce GT 540M graphics card will keep gamers happy. The Medion has plenty of grunt, with an Intel Core i5-2410M and 8GB of DDR3 RAM inside. Battery life is rather average, although the 750GB hard drive is capacious. It looks like a budget laptop, but performs well.
	>> Battery life 4:38					
	15.6in 1366x768	nVidia GeForce GT 540M 1GB	74	8x DVD±R/4x±RW/ 5x -RAM/8x -ROM	Windows 7 Home Premium 64bit	The Aspire 5750G packs fast components into a distinctive blue textured chassis. Performance is impressive, and the Acer achieved a strong score of 126 points in WorldBench 6. Gamers will be pleased with the nVidia GeForce GT 540M graphics, which propel the 5750G to a creditable score of 74fps in Fear. Battery life is good, given this performance. The screen is marred by a reflective finish, however, and large gaps between the keys are disconcerting. The Acer has plenty to shout about.
	>> Battery life 5:03					
	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 can hit high levels of performance. 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					
	15.4in 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	Now sitting comfortably in second place, this revamp to the MacBook Pro makes Apple a true pathfinder. It offers a Thunderbolt port, Intel's hyper-fast connection standard for uniting PCs and their peripherals. The Sandy Bridge CPU marks a step up in performance, while an AMD chip replaces the older nVidia graphics controller, but still offers graphics-switching technology. The Pro's performance is very good. If you need workstation power in an inch-thick slab, don't look anywhere else.
	>> Battery life 5:18					
	16in 1920x1080	nVidia GeForce GT 540M 1GB	20	8x BD-ROM 8x DVD±R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Home Premium 64bit	This isn't the first laptop we've seen that's capable of rendering 3D, but it is the most luxurious. A heavy brute at 3.1kg, it has a raised rubbery platform that forms an extended wristrest. The screen's image quality is excellent. More importantly, the 3D experience is compelling with the supplied 3D active-shutter glasses. Gaming performance is decent – and automatically set up for 3D mode. Add Blu-ray and you have a fantastic home-entertainment centre. It is noisy and expensive, however.
	>> Battery life n/a[2]					
	13.3in 1366x768	Intel HD Graphics 3000 n/a	not tested	8x DVD±R/2.4x -RW/ 4x +RW/8x -ROM	Windows 7 Professional 32bit	The Dell E6320 isn't the most powerful laptop, but it provides good business facilities. At 1.9kg, it's light enough to take on the road, although the battery life may hinder you here. The Dell is capable of handling any business task, although its WorldBench score of 101 is low in this category. The keyboard is excellent, and the 13.3in widescreen display offers sharp definition and a non-reflective matt finish. The Dell's construction is surprisingly tough, and the keyboard is spill resistant.
	>> Battery life 3:46					
	13.3in 1366x768	Intel HD Graphics 3000 n/a	not tested	n/a	Windows 7 Professional 64bit	The ThinkPad's angular plastic case contrasts with the MacBook Air's sleek aluminium body – the X1 is thin, but even at its slimmest it matches the Air at its thickest. Add in the 340g AC adaptor, and the Lenovo is nearly 500g heavier. It's fast, though, and the 13.3in screen is bright and clear. The backlit keyboard has a range of brightness settings, and the trackpoint works well. Battery life is reasonable. A high-performance laptop, this Lenovo could do with losing 500g to truly rival the Air.
	>> Battery life 3:47					

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.

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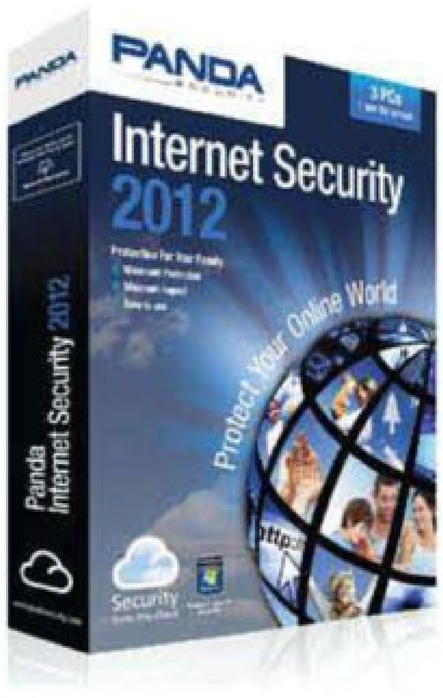
Top 5 Internet security suites

			Signature-based malware detection	Malware blocking: Fully blocked	Malware blocking: Partially blocked	Successful cleanup of active malware	Scan speed (secs): On-demand	Scan speed (secs): On-access	Interface design	Extra features
PC ADVISOR BEST BUY	1	**Panda Internet Security 2012** pandasecurity.com/uk tinyurl.com/63sbhfn **New**	99.96%	85.4%	n/a	100%	n/a	n/a	Very good	USB vaccine, virtual keyboard, safe browser, parental controls
		• 3 PCs, 1 year: £50 inc VAT	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.							
PC ADVISOR RECOMMENDED	2	**Kaspersky Small Office Security 2012** kaspersky.co.uk tinyurl.com/3cn9k8s **New**	99.4%	94.6%	n/a	94.4%	n/a	n/a	Good	staff access limits, encrypted backups, file shredder
		• 5 PCs and 1 server, 1 year: £159 inc VAT	If you run a small business with several PCs to protect, Kaspersky Small Office Security 2012 is a sensible purchase. It protects up to five PCs and a server. If you use a network server to share data and applications, it's a simple matter to share your security provision too. Small Office Security offers very good value, with centralised security and similar ease of use to the company's consumer product.							
	3	**Symantec Norton Internet Security 2011** norton.com tinyurl.com/5u49p8f Last month 1	98.7%	96%	4%	80%	126	291	Very good	rootkit/ID/network protection, parental controls, SafeWeb
		• 3 PCs, 1 year: £49 inc VAT	Symantec Norton Internet Security 2011 is a streamlined and extremely effective anti-malware application. Symantec continues to update and advance its user interface and malware-detection rates incrementally. With solid protection across the board and some impressive results in our tests with AV-Test.org, Norton Internet Security 2011 easily earned our Best Buy crown. Highly recommended.							
	4	**Kaspersky Internet Security 2011** kaspersky.co.uk tinyurl.com/4us5hzq Last month 2	95.7%	92%	0%	80%	109	315	Good	anti-phishing, virtual keyboard, parental controls, SafeSurf
		• 3 PCs, 1 year: £49 inc VAT • 1 PC, 1 year: £39 inc VAT	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 3	97.5%	68%	20%	80%	131	305	Very good	online fraud and ID theft protection
		• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	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: Fully blocked	Malware blocking: Partially blocked	Successful cleanup of active malware	Scan speed (secs): On-demand	Scan speed (secs): On-access	Interface design	Extra features
PC ADVISOR BEST BUY	1	**Symantec Norton AntiVirus 2011** norton.com tinyurl.com/4p5ycxp Last month 1	98.7%	96%	0%	80%	121	272	Very good	Pulse updates, Sonar 3 behavioural protection, Insight
		• 3 PCs, 1 year: £39 inc VAT	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.							
PC ADVISOR RECOMMENDED	2	**BitDefender Antivirus Pro 2011** bitdefender.co.uk tinyurl.com/66sk77u Last month 2	97.5%	68%	20%	80%	126	327	Very good	gaming mode
		• 3 PCs, 1 year: £24 inc VAT • 1 PC, 1 year: £14 inc VAT	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	99.4%	84%	4%	80%	111	336	Very good	cloud security
		• 3 PCs, 1 year: £34 inc VAT • 1 PC, 1 year: £24 inc VAT	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	95.7%	88%	4%	80%	103	310	Very good	Rescue CD, desktop gadget
		• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	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	98.4%	88%	8%	80%	187	249	Very good	cloud security
		• 3 PCs, 1 year: £39 inc VAT • 1 PC, 1 year: £29 inc VAT	Trend Micro Titanium Antivirus Plus 2011 is a set-it-and-forget-it security product that does a good job of blocking malware. The program is cloud-based, and dependent on an active internet connection. The upside is there's no need to worry about manual updates. Infections are consistently staved off and active malware is almost always removed. Advanced users may crave more control.							

Prices are intended only as a guide and are correct at press time



>> Buying advice

Security software

We work with world-renowned independent security testing labAV-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.

Top 5 Sub-£150 printers

			Technology / Max printer resolution	Actual print speed (ppm)	Optical scanner resolution / Fax capabilities	Supported interfaces	Cost per page	Memory-card slot/ Auto-duplex / Input capacity	Dimensions (wxdxh) / Weight
PC ADVISOR BEST BUY	1 **Oki C110** oki.co.uk tinyurl.com/yLno5rv Last month 1	• £135 inc VAT • £152 (RRP) • 3-year standard warranty	Colour laser 1200x600dpi	B=15.8 C=2.5	no scanner no fax	USB	B=3.6p C=5p	no/no 100	396x380x275mm 14.4kg
			A laser printer for £135 is a good deal; one that also offers colour is almost impossible to find. But the Oki C110 manages it. This version has no ethernet or auto duplexing options, but it's a very usable colour laser printer that produces cleanly defined text at 15.8ppm. Colour is realistic, but rather faint. The Oki C110 is slow in laser terms, but fast compared to inkjets working in high-quality modes.						
PC ADVISOR RECOMMENDED	2 **Brother HL-2130** brother.co.uk tinyurl.com/4yrrdjm Last month 2	• £70 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 **Canon Pixma MG6250** canon.co.uk tinyurl.com/3koof7a **New**	• £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
			The MG6250 isn't a cheap inkjet, but 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. We'd prefer a fully touch-sensitive interface, rather than the slightly clunky hybrid Canon offers.						
	4 **Epson Stylus SX525WD** epson.co.uk tinyurl.com/3scrzpc Last month 3	• £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.						
	5 **Samsung ML-1865W** samsung.com/uk tinyurl.com/4o574r5 Last month 4	• £100 inc VAT • £100 (RRP) • 1-year standard warranty	Mono laser 1200x1200dpi	B=15.4 C=n/a	no scanner no fax	USB, 802.11b/g/n	B=3p C=n/a	no/no 150 sheets	341x224x184mm 4.2kg
			Now pushed into fourth, the Samsung is one of the most compact printers we've seen, but its design is practical, with flexible paper trays that can be tidily tucked away. Wireless connectivity is another bonus, and the AnyWeb Print software is a smart inclusion. The Samsung is reasonably swift, but the Brother offers cleaner text at 600dpi. Running costs are typical. Its Wi-Fi capabilities may still give it the edge.						

Top 5 £151+ printers

			Technology / Max printer resolution	Actual print speed (ppm)	Optical scanner resolution / Fax capabilities	Supported interfaces	Cost per page	Memory-card slot/ Auto-duplex / Input capacity	Dimensions (wxdxh) / Weight
PC ADVISOR BEST BUY	1 **Kyocera Mita FS-1320D** kyoceramita.co.uk tinyurl.com/6gg9ukv Last month 1	• £165 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.						
PC ADVISOR RECOMMENDED	2 **Canon i-Sensys LBP7750Cdn** canon.co.uk tinyurl.com/5tejm7q Last month 2	• £450 inc VAT • £500 (RRP) • 1-year standard warranty	Colour laser 9600x600dpi	B=20.7 C=11.5	no scanner no fax	USB, ET	B=1.4p C=6.7p	no/yes 250 + 100	517x530x374mm 35kg
			The second most expensive model here, the Canon offers staggering print speeds and ticks almost every box for features. It can take 350 sheets as standard, and 850 maximum. The memory allocation is good and ethernet is thrown in. The remote-monitoring features are excellent, while duplexing is fast enough to be practical. Add high print quality, and this is a great choice for those with larger budgets.						
	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	• £260 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 (inks, paper and printheads), time and maintenance. Vendors will 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.

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Top 5 Blu-ray Disc drives

			Blu-ray speeds	DVD speeds	Max storage	Interface type	Label technology	Burning software & extras should include[1]
PC ADVISOR BEST BUY	1 **Lite-On iHBS112** liteonit.eu tinyurl.com/65pxhuj Last month 1	• £75 inc VAT • £100 (RRP) • 2-year warranty	-R/8x -R DL/ 2x -RE/8x -ROM	16x ±R/8x ±R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	SATA (internal)	none	CyberLink Blu-ray Suite
			Finally a Blu-ray drive has managed to oust the LG BH10LS30 from its perch. This Lite-On iHBS112 Blu-ray drive can also be found in a more expensive retail version (the iHBS212) with additional LightScribe facilities. Both drives are fast, with 12-speed BD-R facilities, although they're only marginally faster than the technically inferior LG. Nonetheless, the Lite-On proved the top performer.					
PC ADVISOR RECOMMENDED	2 **LG BH10LS30** uk.lge.com tinyurl.com/2bg4a37 Last month 2	• £70 inc VAT • £130 (RRP) • 1-year warranty	10x -R/8x -R DL/ 2x -RE/10x -ROM	16x ±R/8x ±R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	SATA (internal)	LightScribe	PowerDVD 8.0, PowerProducer 4.0
			The Lite-On iHBS112 is newer, faster and only marginally more expensive but, should it become unavailable, this LG Blu-ray drive is a very close contender. Indeed, the difference between the two isn't as great as you might expect, and the LG was only slightly slower in our tests. The bundled PowerDVD 8.0 software suite is useful, and playback is smooth. You can even label discs using LightScribe.					
	3 **Plextor PX-LB950UE** plextor.be tinyurl.com/43zvjlh Last month 3	• £150 inc VAT • £161 (RRP) • 3-year warranty	12x BD-R/8x -R DL/ 2x -RE/8x -ROM	16x ±R/8x ±R DL/6x -RW/ 8x +RW/12x -RAM/16x -ROM	50GB	USB 3.0, eSATA	LightScribe	PowerDVD 9.0, PowerProducer 5.0
			An external Blu-ray writer, the Plextor can be connected to a USB 3.0 or an eSATA port. USB 3.0 was faster in our test, but your choice of connection will rest on what you have built into your PC. The Plextor is a handsome drive, but requires an external power supply. Convenient and reasonably fast, it's a good alternative to the Best Buy for those who want portable 12x BD-R facilities.					
	4 **Lite-On iHOS104** liteonit.eu tinyurl.com/yccmty5 Last month 4	• £40 inc VAT • £45 (RRP) • 1-year warranty	4x -ROM	8x -ROM	n/a	SATA (internal)	none	PowerDVD 8.0 BD
			The key to the Lite-On iHOS104's low price is that it's a read-only internal Blu-ray drive. More expensive optical drives include the ability to write to DVD and CD, but Lite-On reasons that there's no sense in doubling up on features you probably already have. The playback quality is very good, video is vivid, and TrueTheater does an excellent job of upscaling standard-definition video.					
	5 **Pioneer BDR-206MBK** pioneerelectronics.com tinyurl.com/2ad6ksg Last month 5	• £170 inc VAT • £190 (RRP) • 1-year warranty	6x -R/6x -R DL/2x -RE/ 6x -ROM/4x -R XL/2x -RE XL	8x ±R/8x ±R DL/6x -RW/ 8x +RW/8x -RAM/5x -ROM	100/ 128GB	SATA (internal)	none	PowerDVD 10.0, PowerDirector 8.0
			The first of a new breed of drives that can write to the BD-XL format (capable of storing 100GB or 128GB on triple- and quad-layer media), the internal Pioneer BDR-206MBK is ground-breaking. However, this also makes it rather expensive, and this version comes without particularly fast writing of lower-capacity 25GB and 50GB BD-R discs. BD-XL technology will become cheaper in time.					

GLOSSARY • BD-XL: triple- or quad-layer Blu-ray media [1]Always check before buying

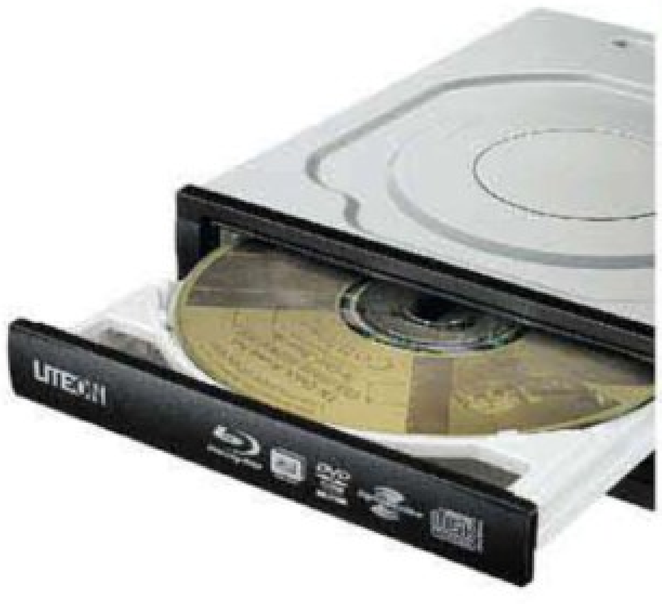
Top 5 Wireless routers

			Wi-Fi standards supported	Frequency modes	WEP/WPA/ WPA2	USB port Network port	Firewall	Eco mode Average power use	Wireless-n throughput (near/far)	Dimensions (wxdxh) Weight
PC ADVISOR BEST BUY	1 **Cisco Linksys E4200** linksysbycisco.com tinyurl.com/6z7bdkm Last month 1	• £125 inc VAT • £170 (RRP) • 1-year warranty	a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/ yes	yes 4	NAT/SPI	no not tested	226Mbps 92Mbps	225x160x25mm 355g
			A wireless router that requires a separate ADSL or cable modem, the E4200 offers four gigabit ethernet ports and stand-out wireless capabilities. Dual-band wireless, a special guest login web page (that gives visitors access to the internet but not your local network) and UPnP media serving are welcome features. Performance is also very good, and the E4200 is the fastest router we've seen.							
PC ADVISOR RECOMMENDED	2 **AVM FritzBox Fon 7390** fritzbox.eu tinyurl.com/3qujzbx **New**	• £210 inc VAT • £210 (RRP) • 5-year warranty	a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/ yes	yes 4	NAT/SPI	yes not tested	92Mbps 38Mbps	226x160x48mm not specified
			Far more than just a wireless router, the FritzBox supports landline and internet telephony, and will even help you manage your calls. It supports both 2.4GHz and 5GHz frequencies, while 512MB of internal memory and a USB port allow shared storage of larger files. The transfer speeds are superb, too. Some features are overkill for a home user, but this is otherwise a brilliant router for the money.							
	3 **DrayTek Vigor 2830Vn** draytek.co.uk tinyurl.com/3vawhsz **New**	• £206 inc VAT • £206 (RRP) • 2-year warranty	a, b, g, n	2.4GHz/5GHz (dual mode)	yes/yes/ yes	yes 4	NAT/SPI/ per-user rules	yes not tested	88Mbps 30Mbps	210x155x25mm 500g
			The DrayTek has had a price hike since our original review, but it still offers good value. Network support stretches to ADSL2+, cable or both, letting you balance the load across two web connections. A 3G failover option will keep you online should both those go down. The firewall is sophisticated and highly customisable, and the web filtering is highly effective. Transfer speed is also very good.							
	4 **Netgear N600 DGND3700** netgear.co.uk tinyurl.com/3bzz7yh **New**	• £135 inc VAT • £135 (RRP) • 3-year warranty	a, b, g, n	2.4GHz	yes/yes/ yes	yes 4	NAT/SPI	yes not tested	75Mbps 30Mbps	220x153x31mm 500g
			The Netgear offers dual-band operation across both cable and ADSL2+ networks. It's plain-looking, but its many ports and connectors include gigabit ethernet and USB. A DLNA server lets you stream music and video from an attached USB hard drive to a compatible device. The web interface looks cheap, but includes lots of configuration options. More importantly, it offers strong performance.							
	5 **TP-Link TD-W8961ND** tp-link.com tinyurl.com/3b5a34f **New**	• £35 inc VAT • £35 (RRP) • 3-year warranty	b, g, n	2.4GHz	yes/yes/ yes	no 4	NAT/SPI	no not tested	74Mbps 24Mbps	174x120x29mm 900g
			The TP-Link offers one-touch WPS security (known here as QSS), but you won't find features such as gigabit ethernet, a USB port or support for the 5GHz frequency. TP-Link's interface is basic, although it contains some useful settings. The performance is good for the money, although the router fared less well in our long-range test. It's not pretty, but it does the job – and at a very low price.							

GLOSSARY • Mbps: megabits per second • SSID: service set identifier

Prices are intended only as a guide and are correct at press time

>> Buying advice



Blu-ray Disc drives

DVD formats: To handle the bewildering array of DVD recording and playback formats, we recommend buying a drive that supports as many as possible. Look for labels such as LG and NEC's SuperMulti or Lite-On's Super All Write.

Blu-ray Disc: Six-/eight-speed BD-R (Blu-ray Disc writable) capabilities are standard, but bear in mind that even six-speed BD-R media is still rare.

Speed: Don't obsess about the highest speeds. You should be able to get 16-speed DVD writing, but it's not worth paying over the odds to save seconds.

Internal or external? External drives are easier to install and can be shared between PCs, but will cost you considerably more than internal models. Most internal drives now use a SATA interface, so check you've got a compatible port. Older PCs may not be compatible.

Top 5 External hard drives

			Capacity tested / Capacity range	Transfer speed: fastest/other	Spin speed	Interfaces	Software / Encryption	Dimensions (wxdxh) / Weight
PC ADVISOR BEST BUY 1	**Seagate FreeAgent GoFlex Ultra-Portable** seagate.com tinyurl.com/5vefv3t Last month 1	• £150 inc VAT • £200 (RRP) • 2-year warranty	1.5TB 320GB to 1.5TB	94MBps (USB 3.0) 65MBps (FW800)	5,400rpm	USB 2.0 (USB 3.0, eSATA, FW800 optional)	Seagate Dashboard 192bit	88x119x22mm 303g
			The £125 Seagate FreeAgent Go-Flex Ultra-Portable is supplied as a USB 2.0 drive, but dabs.com sells it with USB 3.0 for an extra £25. FireWire can also be added, making the versatile GoFlex drive a great choice for the future. Another adaptor streams content to your TV or share GoFlex drives over your local network. Overall speed is great, and the capacity is generous. This offers real value.					
PC ADVISOR RECOMMENDED 2	**Western Digital My Book Studio** wdc.com/en tinyurl.com/3dx8mn8 Last month 2	• £170 inc VAT • £170 (RRP) • 3-year warranty	3TB 1TB to 3TB	73MBps (FW800) 38MBps (USB 2.0)	n/a	FW800, USB 2.0	WD SmartWare none	165x135x48mm 1.1kg
			This Western Digital My Book Studio has up to 3TB in one smart metal chassis. Inside is one of WD's low-power Caviar Green disks. This spins more slowly, draws less power and produces less noise and vibration than the full-power drives. Indeed, it's near silent. Performance is very good, with FW800 recording peak reads of 73MBps and writes of 67MBps. If only it supported Thunderbolt.					
3	**A-Data NH01 Nobility** adata-group.com tinyurl.com/3xcdu9n Last month 3	• £60 inc VAT • £100 (RRP) • 3-year warranty	640GB 500GB to 640GB	94MBps (USB 3.0) 31MBps (USB 2.0)	5,400rpm	USB 3.0, USB 2.0	A-Data software none	133x82x16mm 204g
			The 640GB version of the A-Data NH01 Nobility wasn't available in huge numbers at press time, but amazon.co.uk was still offering other capacities of this drive for good prices. If you can find it, the A-Data is a capable USB 3.0 drive. Hot-swappable and requiring no additional power, it's ideal for use on the go. Our tests recorded USB 3.0 read/write speeds of 94MBps, and 31MBps with USB 2.0.					
4	**Western Digital My Passport Studio** wdc.com/en tinyurl.com/y3zq2aj Last month 4	• £97 inc VAT • £160 (RRP) • 3-year warranty	640GB 320GB to 640GB	56MBps (FW800) 15MBps (USB 2.0)	5,400rpm	FW800, USB 2.0	WD SmartWare 256bit	128x81x17mm 205g
			With the appearance of the 1.5TB Seagate FreeAgent GoFlex Ultra-Portable, the Western Digital My Passport Studio no longer seems such a good drive. It's still a good choice for Mac users thanks to its solid FireWire 800 performance, but USB 2.0 transfers are rather slow. An e-label display allows personalisation of up to 12 characters of text, and full 256bit hardware encryption is included.					
5	**Hitachi LifeStudio Desk Plus** hitachigst.com tinyurl.com/289p4vc Last month 5	• £87 inc VAT • £150 (RRP) • 3-year warranty	1TB 1TB to 2TB	29MBps (USB 2.0)	7,200rpm	USB 2.0	LifeStudio none	123x83x181mm 1kg
			Hitachi's LifeStudio Desk Plus is a 1TB external hard drive that offers pretty standard real-world transfer rates, but its strong software suite makes it easy to sort photos and video on an attractive 3D wall. It's easy to use, if not the most customisable of drives. The Desk Plus has loud fans and becomes quite hot during operation. The £80 drive offers very good value for mass-storage needs, though.					

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
PC ADVISOR BEST BUY 1	**Synology DiskStation DS211** synology.com tinyurl.com/65s4v4u Last month 1	• £220 inc VAT • £225 (RRP) • 2-year warranty	n/a up to 6TB	2 n/a	yes/yes/yes	yes 0/1	Win 2000/OS X 10.3 or later	DSM 3.0	88x218x161mm 1kg
			Synology has built this enclosure (to which you can add up to two hard drives) around its own OS, which allows almost unprecedented flexibility. Its 29 different control areas cover everything from DLNA, UPnP and iTunes server to firewalls and wireless connection. The security is excellent, and performance is very good. Noise levels are low, and this would make a great audio or video server.						
PC ADVISOR RECOMMENDED 2	**Qnap TS-419P+** qnap.com tinyurl.com/3zk5Ljg Last month 2	• £399 inc VAT • £450 (RRP) • 2-year warranty	n/a up to 12TB	4 n/a	yes/yes/yes	yes 0/1/5/6/10	Win XP or later/ OS X/Linux	TurboNAS 3.4	180x235x177mm 3kg
			A NAS enclosure (you buy drives separately for it), the four-bay Qnap can support drives holding up to 12TB of data. Its 1.6GHz ARM processor consumes less power than Intel-powered devices, and just one cooling fan is needed. The software is sophisticated yet approachable, and the choice of Raid options is capable. Performance is better than that of many home and small-business models.						
3	**Zyxel NSA310** zyxel.co.uk tinyurl.com/3voqrxx **New**	• £135 inc VAT • £135 (RRP) • 3-year warranty	2TB 2TB	1 n/a	yes/yes/yes	yes n/a	Win XP or later/ OS X	zPilot	58x196x130mm 662g
			Zyxel's NSA310 is a modestly priced but high-storage device that offers an excellent way to share storage over a home network. Little bigger than a 3.5in hard drive, it offers gigabit ethernet, eSATA and two USB 2.0 ports. The versatile software and simple web interface generally work well, although the transfer speeds aren't the best we've seen. It offers good value for money, though.						
4	**Western Digital My Book World Edition II** wdc.com/en tinyurl.com/yh8xytc Last month 3	• £295 inc VAT • £430 (RRP) • 3-year warranty	4TB 2TB to 4TB	2 5,400rpm	yes/yes/yes	yes 0/1	Win XP/OS X 10.4 or later	WD Anywhere	173x147x58mm 1.1kg
			Still available in steady numbers, this 4TB drive from Western Digital is a decent option. Based on the original Western Digital My Book, the My Book World Edition II has a pair of drives that can be used in Raid 0 or 1 arrays. Time Machine adds value for Mac users, and the web interface offers a choice of modes to satisfy all users. Ideal for cross-platform storage and media streaming.						
5	**Iomega iConnect Wireless Data Station** iomega.co.uk tinyurl.com/2ud3zth Last month 5	• £55 inc VAT • £70 (RRP) • 3-year warranty	256MB expandable	4 n/a	yes/yes/yes	yes n/a	Win XP/OS X 10.4 or later	Iomega software	27x131x161mm 270g
			Not your conventional NAS drive, this inexpensive device allows you to access and share information stored on USB devices across your home network or the internet. Usable with up to four drives, you can even attach printers and cameras to the iConnect Wireless Data Station, although there's no Raid-style redundancy. Configuration was mostly straightforward and streaming was extremely fast.						

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.

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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
PC ADVISOR BEST BUY 1	**Apple iPhone 4** apple.com/uk tinyurl.com/33hoyex Last month 1	• £499 inc VAT	Apple iOS 4	16GB none	3.5in 960x640	capacitive multitouch	HSDPA, 3G, BT, 802.11b/g/n	Safari, FaceTime, iTunes, App Store, Maps	7 hrs 300 hrs	5Mp yes	59x9x115mm 137g
		The Apple iPhone 4's slimmed-down case measures just 75 percent of its predecessor's, although it is marginally heavier. The display is richer and more colourful, with text more easily readable. Video chat is a joy to use, while the smartphone's camera gives admirable results when shooting stills or video. Phone reception is excellent and the Apple iPhone 4's battery life now extends into days.								
PC ADVISOR RECOMMENDED 2	**Samsung Galaxy S II** samsung.com/uk tinyurl.com/3hf6god Last month 2	• £475 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
		A slim, lightweight, nippy handset with a SuperAmoLED screen, the Galaxy S II is one of the first handsets to run the Gingerbread 2.3 version of Android. It takes a more angular design than its predecessor to accommodate a marginally larger 4.3in touchscreen, and feels more rigid. The CPU has been upgraded to 1.2GHz, and the camera to 8Mp. Usability and navigation are joyous experiences.								
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	**Sony Ericsson Xperia Arc** sonyericsson.com tinyurl.com/3uryj4h Last month 4	• £349 inc VAT	Android GB 2.3	1GB microSD	4.2in 854x480	capacitive touchscreen	HSDPA, 3G, BT, 802.11b/g/n	Timescape	360 mins 400 hrs	8.1Mp yes	63x125x9mm 117g
		Running the Gingerbread version of Android, the Arc uses Sony's Bravia engine to deliver balanced colours and sharp images on its huge 4.2in (854x480) display. This screen is ideal for web browsing, but it guzzles juice. The Arc is super-slim at 8.7mm, and shockingly light at 117g. An 8.1Mp camera with an autofocus and LED flash takes good-looking, vibrant pictures. Audio quality is exceptional.								
5	**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.								

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
PC ADVISOR BEST BUY 1	**Kodak PlaySport Zx5** kodak.co.uk tinyurl.com/3u3y2ca Last month 1	• £120 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.							
PC ADVISOR RECOMMENDED 2	**JVC Everio GZ-HM650** jvc.co.uk tinyurl.com/453u838 Last month 2	• £282 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
		This lightweight JVC Everio has a generous 8GB internal memory (room for up to 6.5 hours of video or 9,999 photos), which 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 touchscreen buttons. A small amount of noise is picked up by the mic during operation. It offers good value at £282.							
3	**Sony Bloggie Touch MHS-TS20** sony.co.uk tinyurl.com/332uoqj Last month 4	• £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 3	• £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).

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
PC ADVISOR BEST BUY	1 **Sony Cyber-shot DSC-HX9V** sony.co.uk tinyurl.com/6cLaw3d Last month 1	• £280 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.								
PC ADVISOR RECOMMENDED	2 **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	• £235 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	• £260 inc VAT • £379 (RRP) • 5-year warranty	10.3Mp 3648x2736	3.8x	f2.0-f5.3	3in	n/a (SD/SDHC) 1 x lithium/250 shots	125 to 3200	100x24x54mm 177g	Canon utilities
	The Canon Ixus 300 HS remains a strong buy if you don't need long zoom facilities. The dedicated low-light setting works very well in both stills and video recording, and there's a high-speed, slow-mo playback setting. The Canon's 3.8x optical zoom is another asset, securing super-sharp shots. Colour reproduction was very pleasing in all conditions, and the battery life was good. Ideal for all users.								
	5 **Canon PowerShot G12** canon.co.uk tinyurl.com/4qhaf66 Last month 5	• £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/rechargeable	ISO range	Dimensions (wxdxh) Weight	Software includes
PC ADVISOR BEST BUY	1 **Panasonic Lumix DMC-G2 (14-42mm)** panasonic.co.uk tinyurl.com/3xqcdv3 Last month 1	• £360 inc VAT • £699 (RRP) • 3-year warranty	12.1Mp 4000x3000	2x	f3.5-f5.6	3in	n/a (SD/SDHC) 1 x lithium/yes	100 to 6400	124x84x74mm 593g	PhotofunStudio, SilkyPix Developer
	The £360 feature-rich Panasonic Lumix DMC-G2 is ideal for the amateur photographer. A Micro Four Thirds camera, it supplies the advanced features of a digital SLR in a smaller package. The Panasonic's 3in touchscreen enables varied and creative composition. The electronic viewfinder is good, and shots are better than those of most entry-level digital SLRs. A worthy Best Buy award winner.								
PC ADVISOR RECOMMENDED	2 **Sony Alpha NEX-5 (18-55mm)** sony.co.uk tinyurl.com/37xozx5 Last month 2	• £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 remains in second place, despite another price cut. It 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 NEX-5's exposure, colour fidelity, sharpness and lack of image noise are impressive.								
	3 **Samsung NX11** samsung.com/uk tinyurl.com/3oLqd93 **New**	• £390 inc VAT • £399 (RRP) • 1-year warranty	14.6Mp 4592x3056	3x	f3.5-f5.6	3in	n/a (SD/SDHC) 1 x lithium/yes	100 to 3200	123x40x87mm 353g	Samsung utilities
	An update to the NX10, the NX11 offers digital SLR-like image quality and a smaller form-factor, plus swappable lenses. The 3in AmoLED is an improvement over traditional LCDs; you also get a VGA-quality electronic viewfinder. Larger buttons would be preferable, but the ability to control some functions via the lens is a time-saver. It's extremely user-friendly, and the Samsung's images are of good quality.								
	4 **Nikon D3100 (18-55mm)** nikon.co.uk tinyurl.com/4tfq4fr Last month 3	• £410 inc VAT • £580 (RRP) • 3-year warranty	14.2Mp 4608x3072	3x	n/a	3in	n/a (SD/SDHC) 1 x lithium/yes	100 to 12800	124x75x96mm 455g	Nikon utilities
	A smart design and helpful Guide mode make Nikon's D3100 ideal for novice digital SLR users who want to learn the basics. It also accommodates more advanced needs as their skills grow. It's small and light for a digital SLR, but the Nikon D3100's deep rubbery grip feels secure in the hand. The continuous autofocus isn't as fast to pick up on subjects as we'd like, but the resulting image quality is good.								
	5 **Panasonic Lumix DMC-GF2 (14-42mm)** panasonic.co.uk tinyurl.com/3ufvxym Last month 4	• £470 inc VAT • £470 (RRP) • 3-year warranty	12.1Mp 4000x3000	n/a	f2.5	3in	n/a (SD/SDHC) 1 x lithium/yes	100 to 6400	113x68x33mm 475g	Panasonic utilities
	One of the smallest Micro Four Thirds cameras you'll find, the Panasonic comes with a responsive LCD touchscreen that's simple to use. The camera feels sturdy and well balanced in the hand. Dedicated buttons operate full-HD video recording and the iAuto mode. The 3in screen offers sharp colours and is usable in direct sunshine. Images are sharp and vibrant, and don't display much noise even at ISO 800.								

GLOSSARY • APS-C: Advanced Photo System type C • SLR: single-lens reflex

Prices are intended only as a guide and are correct at press time

>> Buying advice

Digital cameras

Excellent-value 10Mp-plus cameras may be available for £100 or so. However, sensor size may be a better indicator of quality than megapixels – read the full review online for detailed specs and testing.

LCD screen: A large 3in LCD screen is useful for previewing images on a compact, but a viewfinder is also useful on any model for use in bright sunlight. Consider a 260K-dot screen as the minimum.

Image stabilisation: This is standard on compact digital cameras, but less common on interchangeable-lens models. If you're to get crisp shots using a lengthy zoom, you'll want some form of anti-shake mechanism and a small tripod. Almost every camera has a tripod mount underneath.

Zoom: Look for a large optical rather than digital zoom. Digital zoom crops an image, losing detail.

Storage: SDXC removable memory cards can store 64GB of photos and video (note that not all cameras support it), but a high-speed SD Card is far better for capturing video.

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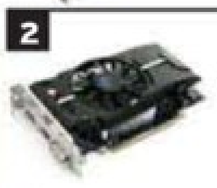
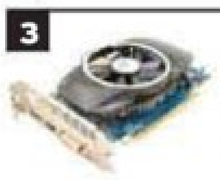
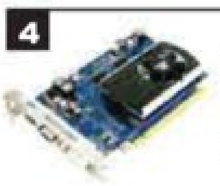
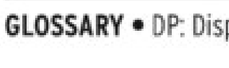
Top 5 Sub-£150 graphics cards

			Graphics processor	Installed RAM	Memory interface / Core clock	Memory clock / DDR effective	Ramdac / Stream processors	Power connectors	Interface	DirectX / Digital interface
PC ADVISOR BEST BUY	1 **XFX AMD Radeon HD 6850** xfxforce.com tinyurl.com/3xruqw5 Last month 1	• £130 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
	This XFX version of the AMD Radeon HD 6850 is in essence identical to the Sapphire we reviewed (see *Buying advice*), but marginally better value at £140. A fantastic mid-range card, the 6850 has good memory bandwidth and high-quality architecture. Noticeably fasterthan the now hard-to-find 768MB GTX 460, and not too far off the Radeon HD 6870, it's a very powerful card at this price.									
PC ADVISOR RECOMMENDED	2  **Sapphire AMD Radeon HD 6770** sapphiretech.com tinyurl.com/6feq6ap Last month 3	• £100 inc VAT • £110 (RRP) • 2-year warranty	AMD Radeon HD 6770	1GB GDDR5	128bit / 860MHz	1.2GHz / 4.8GHz	400MHz / 800	1 x 6-pin	PCI Express	11.0 / DVI, HDMI, DP
	The 6770 is little more than a rebadged 5770 – the increase of the HDMI to version 1.4a and better Blu-ray support are the only differences. That's not necessarily a bad thing, though, and the 5770 remains a decent card for the money. The power requirements are modest and, given the affordable price tag, speed is good. Owners of 5770s should keep their hands in their pockets, however.									
	3  **Sapphire AMD Radeon HD 5670** sapphiretech.com tinyurl.com/2fqgfjd Last month 4	• £65 inc VAT • £90 (RRP) • 2-year warranty	AMD Radeon HD 5670	1GB GDDR5	128bit / 775MHz	1GHz / 4GHz	400MHz / 400	none	PCI Express	11.0 / DVI, HDMI
	This Sapphire Radeon HD 5670 features the same specifications as the HIS and XFX versions it replaces in our chart. A mile away in performance from the likes of the 1GB AMD Radeon HD 6850, it struggles even in DirectX 10 games. Power levels and sound levels are modest, though, and if you need a DirectX 11.0 card for a media-centre PC, the Sapphire is an inexpensive choice at £65.									
	4  **Sapphire AMD Radeon HD 6570** sapphiretech.com tinyurl.com/3h62tj3 **New**	• £60 inc VAT • £60 (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	• £60 inc VAT • £65 (RRP) • 3-year warranty	AMD Radeon HD 6670	1GB GDDR3	128bit / 800MHz	900MHz / 1.8GHz	400MHz / 480	none	PCI Express	11.0 / DVI, HDMI
	Now priced at around £70, the Asus AMD Radeon HD 6670 remains competitive with a useful 1GB of video memory and an 800MHz core clock. However, the Asus' graphics performance is strangled by its 128bit memory interface. This version's memory is of the DDR3 variety rather than the GDDR5 seen elsewhere, which slices the effective memory clock in two. The 6570 offers better value.									

Top 5 £151+ graphics cards

			Graphics processor	Installed RAM	Memory interface / Core clock	Memory clock / DDR effective	Ramdac / Stream processors	Power connectors	Interface	DirectX / Digital interface
PC ADVISOR BEST BUY	1  **HIS AMD Radeon HD 6950** xfxforce.com tinyurl.com/6gqs8xc Last month 1	• £220 inc VAT • £240 (RRP) • 2-year warranty	AMD Radeon HD 6950	2GB GDDR5	256bit / 830MHz	1.3GHz / 5.2GHz	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 840MHz core clock and 5.12GHz 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.									
PC ADVISOR RECOMMENDED	2 **Gainward GeForce GTX 570** gainward.de tinyurl.com/3ub8u3g Last month 2	• £275 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
	Our top two cards have both increased in price by around £20. This Gainward version (replacing the PNY we originally reviewed) is good for those who can't afford the GTX 580/590, but want to add oomph to their graphics. The 152GBps memory bandwidth is significant, and it outstrips the more expensive Radeon HD 6970 at lower resolutions, while still matching it at higher detail levels.									
	3 **Asus GeForce GTX 560 Ti** uk.asus.com tinyurl.com/43uxnp8 Last month 3	• £180 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 £180 560 Ti offers affordable gaming firepower. While it has two cores less than cards based on the 550 Ti, its specs are strong – and this Asus version has a core clock 8MHz higher than the generic version we reviewed. The 384 stream processors are great, and the huge texture fill gives the 560 Ti a significant boost over the 550. Smooth framerates are possible in almost every game.									
	4 **Sapphire AMD Radeon HD 6950 Flex** sapphiretech.com tinyurl.com/3nk8wfw Last month 4	• £230 inc VAT • £240 (RRP) • 2-year warranty	AMD Radeon HD 6950	2GB GDDR5	256bit / 800MHz	1,250MHz / 5GHz	400MHz / 1,408	2 x 6-pin	PCI Express	11.0 / DVI, HDMI, MDP
	This version of the Radeon HD 6950 has a lower specification than the standard card. Its trump card is enhanced EyeFinity support, letting you connect three monitors – two connect via DVI, while a supplied adaptor is used for the third. This is a powerful card for such a feature, so it's an obvious choice if you want multi-screen brilliance. It's not likely to be available for a long time, however.									
	5 **Gigabyte GeForce GTX 560 Ti OC** uk.gigabyte.com tinyurl.com/68q3avg Last month 5	• £205 inc VAT • £250 (RRP) • 3-year warranty	nVidia GeForce GTX 560 Ti	1GB GDDR5	256bit / 900MHz	1GHz / 4GHz	400MHz / 384	2 x 6-pin	PCI Express	11.0 / DVI, HDMI
	An overclocked version of the 560 Ti, the Gigabyte pushes the core clock speed up to 900MHz. It is faster than the standard version, although not by enough to compensate for the £25 difference between the two cards. Power consumption is modest, though, and this card beats some tough competitors, such as the Radeon HD 6870. The standard 560 Ti offers better value.									

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.

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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 **liyama ProLite XB2472HD** iiyama.co.uk tinyurl.com/3dyx75z **New**	• £185 inc VAT • £200 (RRP) • 3-year warranty	24in VA	1920x1080	0.28mm	570x215x438mm 6.2kg	250 3,000:1	8ms	DVI, HDMI
			Rather more expensive than the other flat-panels in this chart, the liyama plays host to a VA panel. This gives it wonderful 24bit colour reproduction, and the depth of the palette is a vast improvement over the competition here. Viewing angles aren't without fault, but they're better than on TN models. The liyama offers height and rotation adjustments. A superb screen for the money.						
PC ADVISOR RECOMMENDED	2 **BenQ V920** benq.co.uk tinyurl.com/23thrLt Last month 2	• £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.						
	3 **Hanns-G HL231DPB** hannsg.com tinyurl.com/32mgmtc Last month 3	• £144 inc VAT • £159 (RRP) • 3-year warranty	23in TN	1920x1080	0.27mm	547x189x352mm 3.3kg	250 1,000:1	5ms	DVI
			The Hanns-G HL231DPB doesn't boast astonishing image quality, but it's very pleasing to the eye. We also like its low price tag and large 23in screen. Power consumption is a modest 27W, and the 170-degree viewing angles are standard for twisted-nematic technology. Hanns-G claims a dynamic contrast ratio of 8,000,000:1, but there's nothing else preposterous about this value screen.						
	4 **BenQ G2222HDL** benq.co.uk tinyurl.com/2f2s23u Last month 4	• £115 inc VAT • £160 (RRP) • 3-year warranty	21.5in TN	1920x1080	0.25mm	505x175x393mm 3.8kg	250 1,000:1	5ms	DVI
			The BenQ G2222HDL is a very serviceable 21.5in screen that nicely fills the middle ground between the budget but small BenQ V920 and the larger Hanns-G HL231DPB. Although hefty, this BenQ is still reasonably stylish. This flat-panel display's menu system is tricky to operate and viewing angles aren't great, but image quality is very respectable, with surprisingly rich colour.						
	5 **Hanns-G HL245** hannsg.com tinyurl.com/3zsgyjh Last month 5	• £138 inc VAT • £138 (RRP) • 3-year warranty	23.6in TN	1920x1080	0.27mm	560x200x405mm 4.1kg	250 1,000:1	5ms	DVI
			Despite its chunky style, this screen is relatively slender, measuring 20mm at its slimmest point. At 23.6in, it's the largest model in the chart – and remains affordable. Settings are kept to a minimum, and the control panel is illogical and awkward. However, the image quality is passable for the price, especially when you tone down the brightness. It's not a great choice for watching films.						

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 **New**	• £210 inc VAT • £210 (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 **NEC MultiSync EA232WMi** nec-display-solutions.co.uk tinyurl.com/4cqgnvw Last month 1	• £245 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.						
	3 **BenQ VW2420H** benq.co.uk tinyurl.com/38qnyx2 Last month 3	• £201 inc VAT • £220 (RRP) • 2-year warranty	24in PVA	1920x1080	0.28mm	434x189x581mm 3.9kg	250 3,000:1	8ms	DVI, HDMI
			BenQ has large stocks of this £201 VW2420H screen, available direct through its site, but you may be able to find it elsewhere for less than £200. Its PVA panel provides a balanced but attractive colour scheme and displays sharp text. Viewing angles are better than on a TN screen, too. Response rates aren't the best but, for general use, the BenQ VW2420H is a fantastic screen.						
	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
			Only just becoming available in the UK, this is a fascinating screen if you can find it. It's not just the astonishingly slim casing and all-in-one stand that makes this Samsung so different. A hub conceals USB 3.0 and ethernet ports, while UWB technology lets the screen connect to a laptop without cables. It's expensive for a twisted-nematic panel, but offers an interesting glimpse of the future.						
	5 **NEC MultiSync EX231W** nec-display-solutions.co.uk tinyurl.com/45qt68e Last month 5	• £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

>> 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 figures 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 should also get 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

Windows tablets: doomed to fail?

The iPad made the modern tablet market explode, but Microsoft spent the decade between the birth of XP and the iPad's launch evangelising tablets. And as we can see from the tabletisation of Windows 8, it hasn't given up yet.

Microsoft's history with tablets is as long and torturous as its struggles in the mobile sphere. Back in the early 90s, Microsoft introduced 'Windows for Pen Computing' (WPC). Not the first tablet operating system (OS), WPC was a software suite for Windows 3.1 that added pen input to early Windows x86 PCs. WPC allowed stylus-wielding execs to launch an onscreen keyboard, bark

> **To be a truly successful tablet, the OS needs to be built for touch**

voice memos and make handwritten digital notes. There was even a primitive handwriting-recognition tool.

Microsoft improved on the first WPC in time for Windows 95, and made pen input intrinsic to all Windows OSes from XP forward. In fact, the release of XP was an important event in the history of desktop, laptop and tablet PCs.

With XP's 2001 release, Microsoft defined the term 'tablet'. Tablets would be, it said, fully functional x86 PCs with pen, handwriting and voice input. Note the omission of touch.

Microsoft and its partners then produced 'tablets' that were, well, laptops that allowed you to scratch around with a pen. It tried a parallel approach with Smart Display back in 2002/3. A monitor with no standalone functions, Smart Display worked only when tethered to a PC.

Microsoft finally moved things on when it started touting ultramobile PCs in 2006. At last, its Windows OS was available on small and light, touch-centric devices.

But unlike Apple, Microsoft is reliant on third parties to design, build and market its products. So while it was promoting tablet and ultramobile PCs to an unlistening world, its partners were knocking out cheap netbooks to fulfil their clients' mobile needs. And while it was the master of the desktop, tablet and mobile remained pale imitations of the main event.

Indeed, whether it was coincidence, a spoiler or an unkind irony, only weeks before Apple's Steve Jobs announced the iPad and stole the tablet market, Microsoft CEO Steve Balmer launched with great fanfare the latest iteration of Windows tablets: the HP Slate PC. True to form, the Slate came and went, after the iPad.

Now most versions of Windows 7 offer handwriting recognition, multitouch and the rest. Specialist Windows tablets continue to find a niche in specialist business markets. But to be a truly successful tablet, the OS needs to be build for touch, not merely touch-enabled. Windows is a desktop OS grafted on to tablet hardware, useful only to those who don't want to cut the Windows apron strings, and lacking the built-for tablet ARM hardware. Apple didn't use OS X on the iPad, after all.

But there is hope for Microsoft. If Windows 8 is able to become the success story Microsoft hopes it will, it'll be the first tablet-friendly Windows, and the game will truly be afoot. ☒

>> Next issue

ISSUE 199 ON SALE 8 DECEMBER 2011

TEST CENTRE

Entertainment laptops

A fast dual- or quad-core processor and a heap of graphics firepower can make for a mighty gaming and movie-watching experience. We take a look at the latest entertainment laptops.

TEST CENTRE

Digital cameras

Compact cameras can do only so much. A small digital SLR or Micro Four Thirds camera opens up creative possibilities and helps extend your photography skills. We test six models.

How to: Upgrade

Intrigued by iOS 5, but not sure how to upgrade? Fear not. We're on hand to show you how to prepare your device and showcase the rewards for doing so.

How to: Windows

Turn an ordinary household object into a robot. We show you how to build and control one in Windows.

How to: Web

We look at how to make Twitter work for you and ensure the deluge of Tweets doesn't overwhelm you.

Troubleshooter

Using a simulator, we show the effects of different camera settings and lenses, helping you combat common lighting and composition issues.

THE GAMES WE PLAY

Our experts recommend the games most worthy of your money for PC, Xbox, Wii and PS3. We also offer advice on choosing a graphics card or gaming PC.

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