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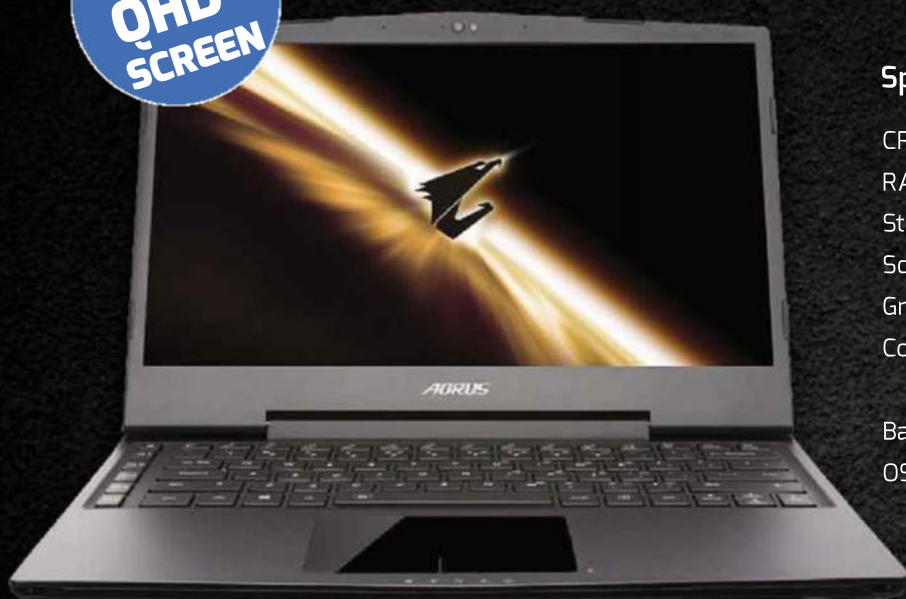
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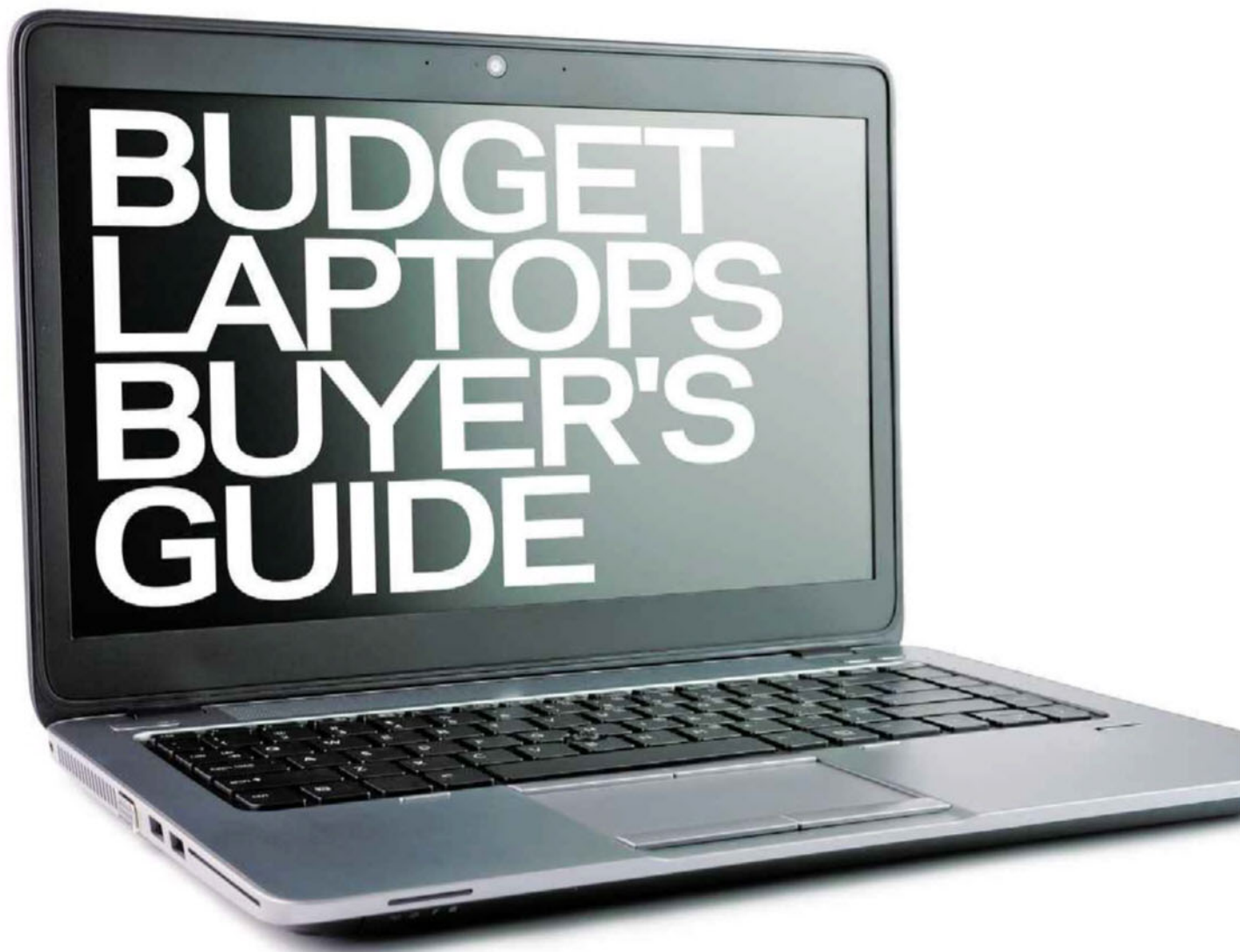
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They may not be at the cutting edge of technology, but even a budget laptop can still do lots of things a tablet can't...

Although the world is currently going crazy over tablets and ultrabooks, a significant portion of the laptop market – the ones most people buy – are still low-priced, mid-powered systems designed to be good all-rounders. Unlike tablets, they usually run Windows and they have hardware keyboards you can actually work on. Unlike Ultrabooks and other high-end systems, they don't cost an arm and a leg. They're designed to be conveniently portable, but not to be carried around with you day-after-day, everywhere you go.

The world of the budget laptop might not be especially interesting to newsmakers and industry analysts, but when it's your money on the line it's often the most attractive sector of the market.

That's why we've put together this guide looking at the most interesting budget laptops we can find in various price brackets. They're not necessarily the best, but they are a good barometer of what you would expect to get for the money they cost. So, if you don't want to pay the earth for your portable computing, you'll be able to find an appropriate system right here – or, at the very least, a pointer in the right direction.

Budget: <£200

If you're buying a budget system, the absolute cheapest laptops on the market currently cost somewhere under £200. While it's possible to spend even less money by shelling out for a second-hand system, laptops retain their value so well that buying new actually makes about as much

sense as buying an old one. Unless you're buying a laptop that's two or three years old (in which case the discount should be huge) then buying second hand means you're just trading off a small amount of money for a lot less time with your device.

£200 is also the threshold beneath which it's possible to buy budget tablets. These casual-use devices are fine if all you want to do is check your email – but what if you actually need to write something? Nothing beats a real keyboard, and that leads us to suspect that even a laptop costing you less than £200 will actually be far more capable. They might not be as portable as tablets, but they will be more powerful at this price, more familiar and easier to use. That's more than enough to justify looking at them instead of a similarly priced handheld device.



Lenovo B50 (£199)

If you want a Windows laptop, you won't find any new system that costs less than the Lenovo B50, which is currently available to buy at retail for just £199. Despite the price, the hardware is actually not bad. It's clearly not going to work as a gaming laptop, but only an incurable optimist would think otherwise. In sharp contrast to the much cheaper HP Chromebook, it's a little more powerful than the average tablet at this price, and while the CPU – a Celeron N2815 – is the least convincing part of the package, it'll do the job.

The rest of the specs are a little more up to scratch. There's 4GB of RAM, which is an adequate amount for any Windows laptop. While the 320GB hard drive might be slicing things a little too thinly for many users, you're not going to run out of space unless you consciously fill the system with HD videos – besides which, if you do fill it up you can buy external USB storage for a

fairly small amount of money. The 15.6" 1366 x 768 display (while not full HD) is sharp, large and vibrant enough that you probably won't notice that you're getting a slightly lower resolution.

Integrated into the top of the screen there's a 720p webcam for video chat, and it has Bluetooth capabilities so that you can attach extra peripherals wirelessly. There's an HDMI-out port, a 4-in-1 card reader, and three USB ports in total: one USB 3.0 and two USB 2.0. As well as an Ethernet port it also has built-in wireless N, so there's no need to buy any extra hardware. Essentially it has

everything a modern laptop needs – it just saves on price by having less of it than some others offer. It's not even as stripped-down as it could be, though: unlike some low-end laptops this one still has an (occasionally handy) DVD drive.

The only real problem is the operating system. Hardware like this would benefit from a slightly less resource-intensive operating system than Windows 8, especially since it doesn't have a touchscreen. If you can handle a Linux installation, this hardware would greatly benefit from one, but even a Windows 7 downgrade would help. Keep that in mind if you're buying one.

“ Hardware like this would benefit from a less resource-intensive OS than Windows 8, especially since it doesn't have a touchscreen ”



HP 255 G1 (£199)

The price of the HP 255 G1 has only recently been reduced enough to qualify it for this threshold, but that makes it a potential bargain that's worth checking out. It comes in various configurations, but we've gone for the cheapest we could find, which (rather unusually) offers Linux as an operating system. Specifically, that means Ubuntu – in case you're wondering.

Costing only a shade more than a basic iPad Mini, the HP 255 G1 is a basic business system with a 1.48GHz AMD E1-1500 APU at its core. It's not going to impress anyone trying to use it for anything processor-intensive, but its onboard Radeon HD 7310 graphics is more than enough for light recreational

use. 4GB of RAM is a little more substantial, while the 750GB hard drive is well beyond the 500GB average for even more expensive price ranges.

The system is mainly cheap because of its display. Although 15.6" is reasonably large, its resolution is quite low for that size – just 1366 x 768. Despite this, you do get a webcam, integrated microphone, Bluetooth and built-in wireless N, some of which you can't even guarantee in laptops at higher prices, but all of which will be found in tablets of equivalent price. You also get a DVD-RW drive, which – since they're falling out of fashion – is something not every laptop comes with. It's even got three USB ports and an HDMI port.

The reason it's this cheap is, quite simply, because you're saving the £50 or so that'd normally go on a copy of Windows. Linux laptops are quite popular in less economically developed regions, but haven't caught on over here. You could, theoretically, wipe this and install Windows on it, but the processor wouldn't be overly forgiving of that course of events, so don't get the wrong impression: it's not a good way to get a cheap laptop if you've already got a copy of Windows.

It is, quite plainly, a system designed for the basics – email, browsing and word processing – but as it's cheaper and larger than a tablet that's not such a bad deal. It'll tide you over for a year or two before you need to look at replacing it, and at this price that's enough.



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Budget: £200-£400

Above £200, laptops really start to distance themselves from tablets. Pay up to £400 for a tablet and you might get a reasonably fast processor and a screen up to 10 inches in size – but laptops are running mobile A-series and Intel Core CPUs and comfortably offering screens of anywhere from 12 to 15 inches. They're good all-rounders for casual use, work or entertainment, and while gaming might be something of a stretch, it's also not impossible if you pick the right hardware.

Acer Aspire V5-122P (£299)

As laptops go, the Acer Aspire V5-122P occupies an odd space. Although it's unashamedly a budget machine, looking not unlike a netbook in its sizing, its form factor emphasises the Ultrabook-style thinness. Still, for a laptop that costs less than £300, it's well-made and well-engineered, and when you see it next to the bulky, brick-like monoliths that dominate this price point it's hard not to be intrigued.

The 11.6" screen is what gives it that netbook quality, but in sharp opposition to the expectations that creates, it's probably the best thing about the laptop. As with most devices at this price range it's under HD – 1366 x 768 – but it's also an IPS-panel touchscreen, so the colours look great and the viewing angle is huge. The touchscreen functionality is both unexpected and hugely welcome for this amount of money.

The performance is perhaps a little more modest. The CPU is an AMD A6-1450, a quad-core chip clocked at 1GHz. The integrated graphics give it a bit more oomph, though, thanks to the onboard Radeon HD 8250 GPU. It's not a gaming system, but won't balk at casual or older titles. 4GB of RAM and a 500GB hard drive are on the conservative side, but then they're also the easiest to upgrade should you choose to do so.

The connectivity is one area where it feels a little lacking. A single USB 2.0 and USB 3.0 port make it feel considerably under-prepared considering that it doesn't have built-in Bluetooth, and the lack of an Ethernet port is close to baffling, even if it does have built-in wireless N. We'd have like to have seen an HDMI-

out or DisplayPort socket, but instead there's a proprietary Acer Converter Port for displays, which doesn't even come with an adaptor, so you'll have to figure it out for yourself.

The big downside, though, is the battery life. Even Acer admits that – between the high specs and slimline form – it's only got about four hours in it. Don't buy this laptop if you plan to stray too far from a socket, is the only conclusion we can draw here. It's a good piece of kit for the money, but that battery life means it's only really useful if you're keeping it around the house or office. If you want a laptop that goes where you go, try something else.

Asus X551CA-SX222H (£350)

The closer you get to the £400 mark, the better the hardware becomes, but we think the X551CA represents particularly good value. It's part of Asus' all-purpose X Series, and packs in some of the latest technologies to ensure a high-end computing experience without the expense of a high-end price.

For example, rather than a cut-down budget CPU, you get a genuine Intel Core i3-3217U clocked at 1.8GHz. The screen is a comparatively huge 15.6" IPS panel with a resolution of 1366 x 768, and the hard drive is a good size too, with 1TB capacity. Only the RAM feels conservative, with 4GB. And of course, there's the built-in webcam and DVD Re-Writer too.

Although it doesn't have a touchscreen, the X551CA does have its own way of taking advantage of Windows 8's touch-features with a 'smart-gesture touchpad', which allows you to swipe and pinch as if you were interacting with the screen, which is the next best thing, and far more intuitive than a simple mouse-replacement touchpad as found on cheaper laptops.

Asus' X-series is also better-suited to entertainment use, particularly thanks to its superior onboard speakers. They use proprietary SonicMaster technology and Asus' AudioWizard to tweak and adjust the audio to give the best sound possible.

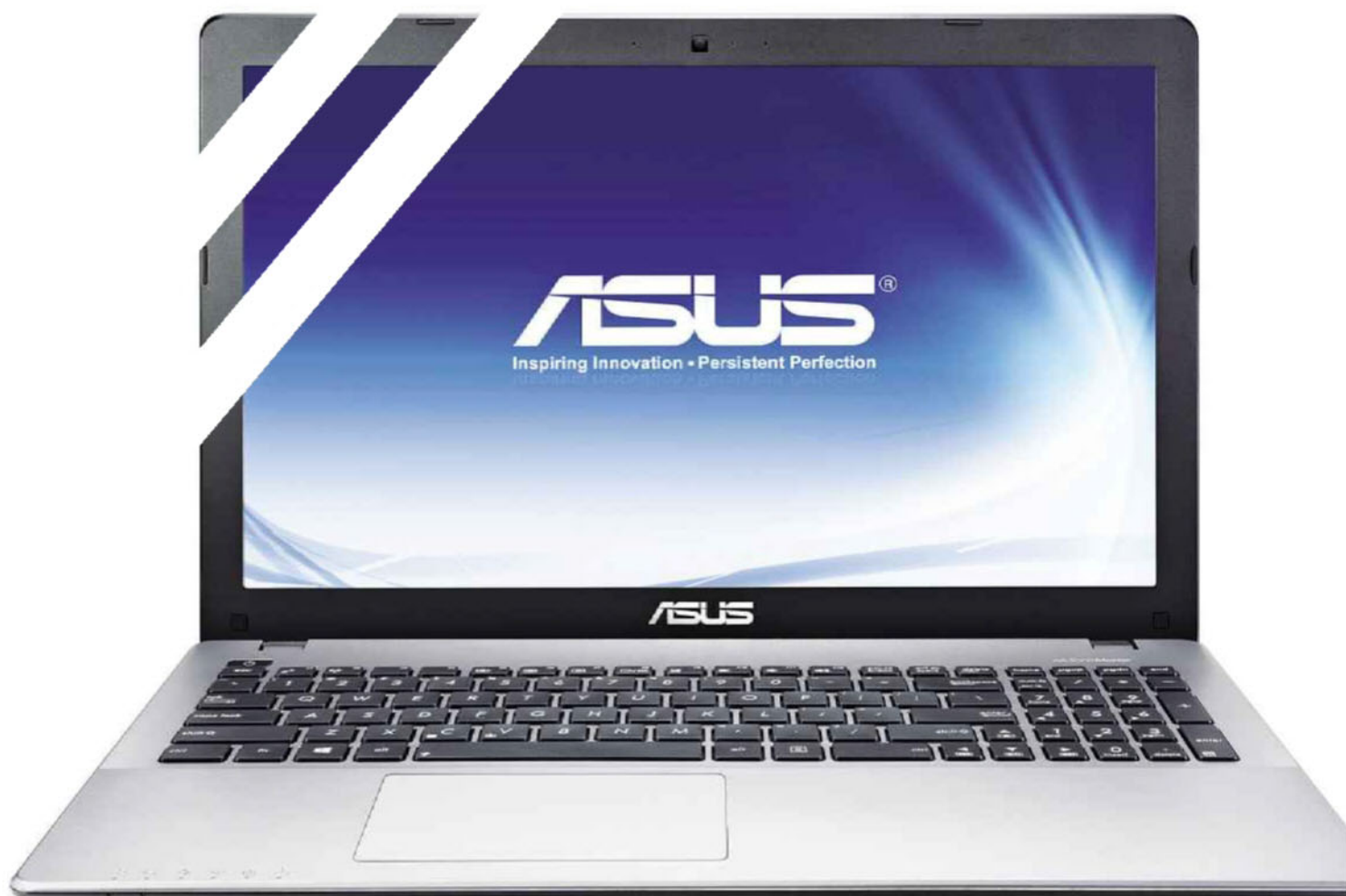
Connectivity includes a USB 3.0 port, USB 2.0 port, Fast Ethernet port, wireless N networking and both VGA and HDMI graphics ports. Storage is augmented by Asus' proprietary



WebStorage service, which can sync files across multiple devices, and a 4-in-1 card reader. The lack of USB ports feels like a cut too far, but you can't fault the internals.

Unless you're a very basic user, this is the minimum laptop we'd recommend. The Intel Core CPU makes a huge difference and the connectivity is superior to laptops that cost only a little less. At £350 it's the same price as a decent full-size tablet, but much more powerful. A system like the Asus X551CA should last you several years, and for £350 you're going to save money in the long run over the false economy of anything cheaper.





Budget: £400-£600

Clear the £400 barrier and systems become more powerful yet again. Although they're still only in the lower to mid-range of pricing (with the upper-limits being Ultrabooks that cost £1200-£1600) you'll find hardware that can satisfy much broader purposes than the price suggests. For work, gaming or entertainment, a £600 laptop makes for a capable, long-term purchase, and those are the terms under which one should be considered.

Compared to the tablets you will come across in this price range, laptops offer a huge amount more power and screen real estate, though it's worth noting that a £600 tablet is likely to have a considerable amount of SSD storage, while notebook and laptop systems are still struggling to make room for a 1TB hard drive. When it comes to storage we broadly prefer quantity over quality, and laptop manufacturers evidently do as well, so don't go looking for an SSD in any of these machines. If you want one of those, you'll have to install it yourself later on!

Asus X550CC (£450)

If you want a laptop that'll allow you to do everything you want – and what you want to do includes playing games – then the cheapest reasonable example we've found is the Asus X550CC. It costs £450 on a good day, and even though it's over a year old there's still a lot of life left in it.

You do have to make one major compromise: the CPU is an Ivy Bridge-based Intel Core i5-3337U clocked at 1.8GHz, as opposed to the Haswell chips you might find in some similarly priced devices. Haswell chips are only about 10% faster than Ivy Bridge ones, so the two are very similar in terms of raw processing power. What makes this system a good purchase overall isn't the CPU, though – it's the GPU. A Nvidia GT720M graphics processor, which lifts much of the graphical burden off the CPU.

As a result, the speed of graphics-intensive tasks is greatly improved, and an otherwise standard laptop becomes one that can handle gaming and high definition video with ease. This laptop is also the first we've looked

at which provides a full complement of RAM – 8GB meets any consumer need, even considering the RAM-hungry Windows 8. A 1TB hard drive finishes off the internals.


Outside it's a little more pedestrian. The standard 15.6" screen has a 1366 x 768 resolution, you get a 720p webcam, and an optical drive. Once again you get Asus' smart touchpad and WebStorage features. Unlike the cheaper model we looked at, wireless N is paired with Gigabit, rather than Fast Ethernet, but you still only get one USB 3.0 port and one USB 2.0 port.

The superior performance of the laptop more than makes up for this uninspired exterior. It's clearly aimed at users who want a bargain, rather than a low price, and unlike other systems, which might need significant maintenance (if not a complete replacement!) after a year or two, we can imagine this remaining competitive. Look at it this way: while there are things we'd change about the outside – extra USB ports would be particularly welcome – we can't think of anything wrong with the components inside it. That's a pretty good vote of confidence.

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Toshiba Satellite L50-B-1LN (£550)

If you're not especially taken with the idea of buying previous-generation hardware, you only have to spend around £100 more to get the Toshiba Satellite L50-B-1LN, which has the newer Haswell chip in it. Indeed, it doesn't have just any Haswell chip, it has the Core i5-4200U clocked at 1.6GHz, which might be the best value of all of Intel's mobile Haswells.

In addition to that, this is another machine with more than 4GB of RAM, this time a princely 6GB. The display is again a 15.6" 1366 x 768 screen, there's a built-in webcam and DVD-rewriter, and connectivity includes gigabit Ethernet, Bluetooth and (for the first time at any price tier) wireless AC. You still only get two USB ports, but at least they're both USB 3.0, and there's also an HDMI-out port.

The only real let down is the hard drive, which is just 500GB. At this price we'd expect a 1TB drive, especially since the price difference between 500GB and 1TB is peanuts in supplier terms. A £550 price point should've provided a little bit of wiggle room to accommodate such an upgrade.

The most impressive thing about the hardware, though, is

the graphics chip. A Radeon R5 M230 with 1GB of dedicated video RAM makes it the most graphically impressive system on this list. As a gaming system or entertainment PC, you'll find the Satellite L50-B-1LN to be fast, responsive and capable.

As budget laptops go, it's clearly punching above its weight, and that's highlighted by the latest 'improvements' to the Toshiba Satellite line. A recent refresh has removed the DVD drive and slimmed the system down, but although the internals are near-identical the battery life is worse and the system benchmarks lower. For that reason, we still prefer the slightly older version. Perhaps it all depends on whether you think a DVD drive is worth carrying around an extra 200g for, though if you want the newer version then you also have to drop the graphics processor or pay an extra £100, which is why we think it makes more sense to stick with the older, cheaper version.

Of course, even the newer model is out-competing the other laptops at this price point, so it's still a good choice in those circumstances. It may not be the last word in luxury computing, but we can't think of a way to spend £550 on a laptop and come out with anything better. [mm](#)

HP Chromebook 11 (£180)

One way to get a super-budget system is to consider buying a Chromebook, and the HP Chromebook 11 is one of the cheapest available. At £180 it's priced more like a mid-range tablet, and in many ways that's because it sort of is one masquerading as a laptop. The hardware is powered by the Exynos 5250 CPU (recently rechristened the Exynos 5 Dual), which is the same one you'll find in the Google Nexus 10, and the younger sibling of the CPU you'll find in the Samsung Galaxy S4. That's the sort of computing power we're dealing with here: phones, rather than desktops.

Clearly under these circumstances it's not going to be a powerhouse system – but it has the durability of a laptop and the comfort of a keyboard and trackpad, so if you're trying to spend as little as possible on a laptop it's worth taking a look at.

For most people, the obvious hurdle is that it runs Chrome OS rather than Windows. It's not a bad operating system, but the fact that it's an unfamiliar one might put low-end buyers off. Chrome OS is essentially just a browser, and within that you can do anything you want online with limited capabilities elsewhere.

As well as being one of the cheapest Chrombooks around, the HP Chromebook 11 is actually one of the better ones. It's less than a year old but despite the low price the hardware is well-made and up-to-date. There's an 11.6" 1366 x 768 IPS screen and a genuinely good keyboard, 16GB of SSD storage and 2GB of RAM. Wireless N networking is built in, though it sort of has to be because without an Internet connection it's not much good for anything.

It's only a laptop in form, though. In function, it's more basic than most tablets. It's very much a casual-use machine, good for watching video, writing emails or browsing the web, but not for much else. It's lightweight and well-built, and while the battery life isn't great it does charge over microUSB (you know, like a tablet). The question you really need to answer if you look to buy this system is why you aren't just buying a tablet. If your response to that question involves the words 'larger screen' or 'hardware keyboard', then carry on. If not, then the truth is that you might be better off with a Nexus or Kindle Fire.



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THE TOP FIVE PRODUCTIVITY TABLETS OF 2014

You don't necessarily need a laptop to get work done, as these tablets show...

The general rule for mobile computing is that if you want a system for casual uses, like web-browsing, answering email and checking Facebook, you should buy a cheap tablet, whereas if you want a system you can do your work on, you buy a more expensive laptop. But just as there are cheap, casual-use laptops, you can also buy high-end tablets, which are more accommodating to the hardware and software you need if you're trying to work on them.

These so-called 'productivity' tablets tend to be expensive, somewhat niche purchases, but they also have the many advantages of mobile systems, such as the portability, long battery life and low-priced software. If you'd like to try one out instead of a laptop, we've taken a look at the best on the market.

Apple iPad Air

Although it's technically a 2013 release, no round-up of high-end tablets would be complete without a look at Apple's flagship tablet, which has been one of 2013's biggest selling tablets and which Apple insists is a piece of productivity hardware. Indeed, as if to underscore its status as a productivity device, the launch of Apple's iPad Air last year coincided with all new iPad users being given free access to the iWork suite, meaning it effectively came with fully featured word processor, spreadsheet and presentation creation applications (Pages, Numbers and Keynote respectively).

And there's no doubt that within the boundaries of a 9.7" mobile device, the iPad can be used for work. As well as a huge range of software, it's reasonably fast, and it has its own cloud storage. But there's no getting away from the fact that Apple sells it more as a lifestyle accessory than a productivity system, and everything about the iPad runs in the direction of considerably more casual uses than work.

For example, it runs on iOS rather than Windows, so it's incompatible with existing productivity software. The input is touch-only, which means it can be imprecise and slow. And most of all, there's no official keyboard dock, so you either have to face using a touch-screen for extended periods (which is massively unsatisfying at best, actively painful at worst) or pay another £59 for the official Bluetooth keyboard, which makes it even more expensive.

The cost of the iPad Air is also something of a burden. Even its cheapest iteration, the 16GB Wi-Fi model is £399, which doesn't include the frankly necessary smart cover/stand, for which you pay an extra £29. If you want a more competitive 64GB of SSD storage, that model costs £559, and if you want built-in mobile data, it's an extra £100 on top of any given model. Go all-out and buy a 128GB iPad Air with smart cover and Bluetooth keyboard to make sure you've got a genuine productivity system tablet, and it costs £827, which is far too high a price given the iPad's admittedly limited range.

Don't get us wrong, we think the iPad has a lot going for it, and it's clearly one of the best tablets on the market, but when it comes to productivity, it's just not designed for that purpose. You're bashing a square peg into a round hole, and all you'll do is spend a lot of money on a frustrating experience.



Microsoft Surface Pro 3

The latest (and indeed, most successful) iteration of the Surface Pro, Microsoft's Surface Pro 3 has been available for a few months and was literally given the strapline "the tablet that can replace your laptop", which is a bold claim. But is it an accurate one?

The Surface Pro 3 is clearly priced at that sort of level, starting at £639 for the most basic model. For that money you get a 12" higher-than-HD display, a Core i3 Haswell CPU (upgradable to Core i7), between 64GB and 512GB of SSD and between 4-8GB of RAM. You also get wireless AC, a full-size USB 3.0 port, a mini-DisplayPort socket and a micro-SD card reader. Clearly, in hardware terms, it is undeniably competing with a laptop, and the fact that it runs the full Windows 8, rather than the reduced version found on some versions of the Surface means it's consciously competing on that level too.

Unlike the iPad Air, the Surface Pro 3 already has its extras in the box. The tablet itself has a kickstand on the rear so that you can prop it up, laptop-style, while the screen's snap-on cover incorporates an ultra-thin keyboard and trackpad, so you can actually use your tablet like a laptop if you prefer. There's also the 'Surface Pen' stylus included for free. The only accessory you have to pay for is the Ethernet adaptor, which adds gigabit Ethernet over the USB port. It's steep at £34.99, but it's also wholly unnecessary.

Of course, while the cheapest (£639) Surface Pro 3 is almost a bargain in laptop terms, the more expensive versions seem less and less so. The 128GB/Core i5/8GB RAM version is £849, the 256GB/Core i5/8GB RAM version is £1,109, the 256GB/Core i7/8GB RAM version is £1,339, and the best, the 512GB/Core i7/8GB RAM model, is a whopping £1,649. Given that there's almost no change in the hardware and that 64GB of SSD with 4GB of RAM is already a strong showing, it seems ludicrous to even consider anything other than the most basic model.

But if you've got the money, the hardware won't disappoint. We're not sure it's going to replace everyone's laptops, but if you do want a productivity tablet, then it's a very solid choice. Microsoft was slow to get into the tablet game, but the Surface Pro 3 is performing as well in shops as it looks like it should on paper. Perhaps they have genuinely turned a corner with it.



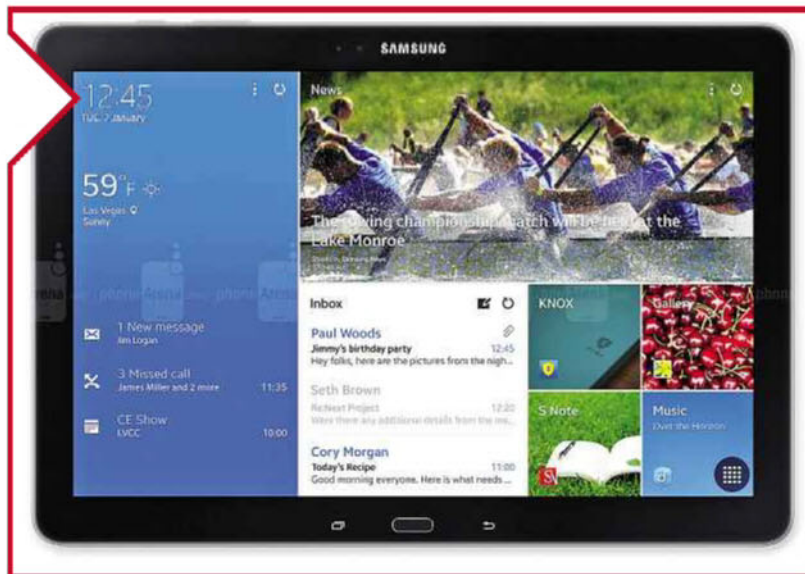
Samsung Galaxy Note Pro

Although Apple's tablets reign supreme in the consumer market, Samsung's Galaxy Note range has occasionally given the iPad a run for its money. In the productivity arena, Samsung convincingly leaves the iPad Air in its dust with the Samsung Galaxy Note Pro, a 12.2" device which is currently on sale for just £499, considerably lowered from its launch price of £649.

In many ways, the Galaxy Note Pro is midway between the steadfastly mobile iPad Air and the more laptop-like Surface Pro 3. The Note Pro has USB 3.0 and wireless AC support but no cellular data connection. It's much too large to hold in one hand, but it also lacks its own stand. In many ways, it's not actually sure whether it's trying to be a mobile device or a desktop one.

Like the iPad Air, it's running on a mobile CPU (the Samsung Exynos 5 Octa) with a mobile operating system (Android 4.4). But like the Surface Pro 3, the cheapest version gets you 64GB of storage and a free stylus. If you thought Apple's Bluetooth keyboard was expensive, prepare to be astonished: the official Samsung one retails for £70 – though it is currently reduced to £63. Again, it's hard to properly replace your laptop with a tablet unless you've got something to type on, but in this case we'd recommend going for a third-party option or even buying the cheaper, superior Apple keyboard.

Still, it's powerful and large, and has a decent battery life despite those two qualities. The lack of a keyboard is as frustrating here as it is with the iPad, but it's a relatively easy hurdle to overcome. If you want an Android productivity device (perhaps because you're already tied into the ecosystem by a phone or previous tablet) and you have £700 to spend, there aren't many features missing from this one.



Asus Vivotab Note 8

As the company behind the hardware in the wildly popular Google Nexus 7, you'd think that Asus would have a strong productivity tablet in them somewhere. Unfortunately, you'd be wrong.

The first thing we should highlight about the Asus Vivotab Note 8 is that it is, as the name suggests, an 8" tablet. Productivity tablets tend to be conspicuously large in an attempt to rival laptop displays, so what's one this small doing on the list at all?

Well, it's because it provides a full Windows 8.1 experience. Indeed, it might be the smallest tablet around to run the full version of Windows 8.1. It was released in January this year, and at the time the most expensive version retailed at £409.99. Over the ensuing months, the price has dropped to just £263, which might be enough to make you overlook its flaws. It is, after all, getting close to half the price of a fairly basic iPad.

Unfortunately, the truth is that it's just not up to being a productivity device. Windows suffers on an 8" screen, as does its software. The start screen with its tiles makes sense on this screen, but the standard Windows 8 desktop does not. It comes with Microsoft Office for free, but using it is a frustrating experience. You have no choice but to use the stylus to interact with the screen because doing it with your fingers is imprecise and rage-inducing. There are no software enhancements to make it work – just standard Windows on a screen smaller than it was designed for.

Connectivity isn't bad, at least, with a micro-USB jack, micro-SD slot and wireless N networking, but there's no cellular data option, and it's running on the thoroughly mobile CPU the Intel Atom Z3740. As well as being too small, the screen struggles with its brightness, and the battery is slow to charge but quick to discharge. It was a bold move to put the full edition of Windows 8 on a tablet this small, but it's not one that's paid off. You probably could use it as a laptop replacement if you were willing to combine it with a Bluetooth keyboard, but then you wouldn't have enough hands free for the stylus and magnifying glass you'd also need to use it. Sadly for Asus, it just doesn't work as it should.



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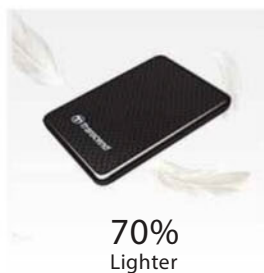
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Lenovo Thinkpad 10

Another Windows 8.1 tablet, the Lenovo ThinkPad 10 is a little smaller than most high-end productivity tablets with just a 10.1" screen, and it also contains a less powerful version of the Intel Atom CPU found in most high-end tablets. With that comes a slightly cheaper price: models start at £439.99, a price that is only beaten by the most stripped-down iPad Airs and the wholly inadequate Vivotab Note 8. So is this the productivity tablet for budget users?

Only to an extent. The price is certainly one of its good points, and it's not the only one. The screen is a pleasingly sharp 1920 x 1200 pixels, and the device is even thinner than the Surface Pro 3 – 8.9mm versus Microsoft's 9.1mm, making it one of the cheapest tablets available.

Although the ThinkPad 10 is just a tablet, there's an official keyboard add-on, which turns it into something more like a laptop, although it doesn't really prop the screen up high enough for you to actually use it comfortably. But it also costs £100, so actually buying it would mean the price advantage evaporates in one fell swoop. Ditto for the keyboardless docking station, which adds a full-sized HDMI port, two USB 3.0 ports and an Ethernet port.

The tablet's integrated ports are hidden behind various covers, which make the tablet look nice but aren't exactly convenient when you want to use them. There's a micro-USB port, a micro-SD slot, space for a SIM card and a full-size USB 2.0 port. It also has its own power adaptor, which sounds like a nice idea, but isn't really that much help when you get to work and don't have the charger handy.

The basic model is about on a par with the devices of its price range, with 2GB of RAM and 64GB of SSD storage, both of which can be doubled for more money. If you're looking for a budget option, though, we don't think you'll gain any practical advantage that would offset the extra expense enough to make it worth doing. It's not perfect as a stand-alone device, but it performs well for the price. The Vivopad is cheaper, we admit, but if you want a budget productivity tablet you can actually use, the ThinkPad 10 does fit that description.

“ So-called 'productivity' tablets tend to be expensive, somewhat niche, purchases – but they have the advantages of mobile systems, such as the portability, long battery life and low-priced software ”



The Verdict

In a way, all of these tablets have their advantages. The Galaxy Note Pro is the biggest and runs Android. The iPad Air gets you access to Apple's unparalleled ecosystem. The ThinkPad 10 balances price and performance for budget users, and even the Vivopad stands out for being considerably more portable than the rest.

But of all the productivity tablets we looked at, the only one that truly stood out as a possible laptop replacement without any significant disadvantages was the Surface Pro 3, which is why it's hardly a surprise that it was also the most expensive by a couple of hundred pounds. Still, if you paid around £650 for a laptop, that wouldn't seem unacceptable, so if you're looking for productivity hardware, the lesson is an old one, but a clear one: you get what you pay for. [mm](#)



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GAMING LAPTOPS VS GAMING DESKTOPS

How much power do you sacrifice for portability? James Hunt takes a look

The idea of a gaming laptop sounds like a contradiction in terms. Laptops, by their very nature, are designed to be portable and low-powered. Gaming systems are the exact opposite: performance systems that throw both space and power efficiency to the wind. In addition, laptops cost a premium, whereas the low cost of desktops mean you can focus every pound you spend on making sure you have the best-performing components you can afford.

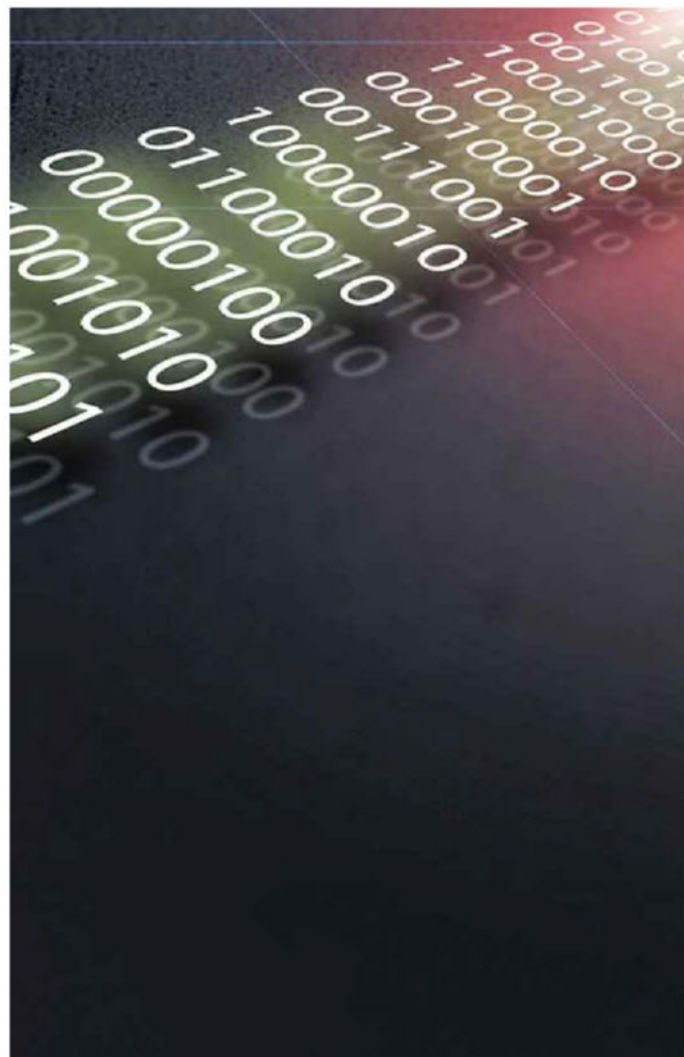
So what do you find inside gaming laptops, and how do their components compare to gaming PCs? We've taken a look at the hardware in both so that we can figure out whether gaming laptops are really a credible alternative to a gaming desktop or whether you'll have to stick with a full-size PC to get the best results out of your favourite titles.

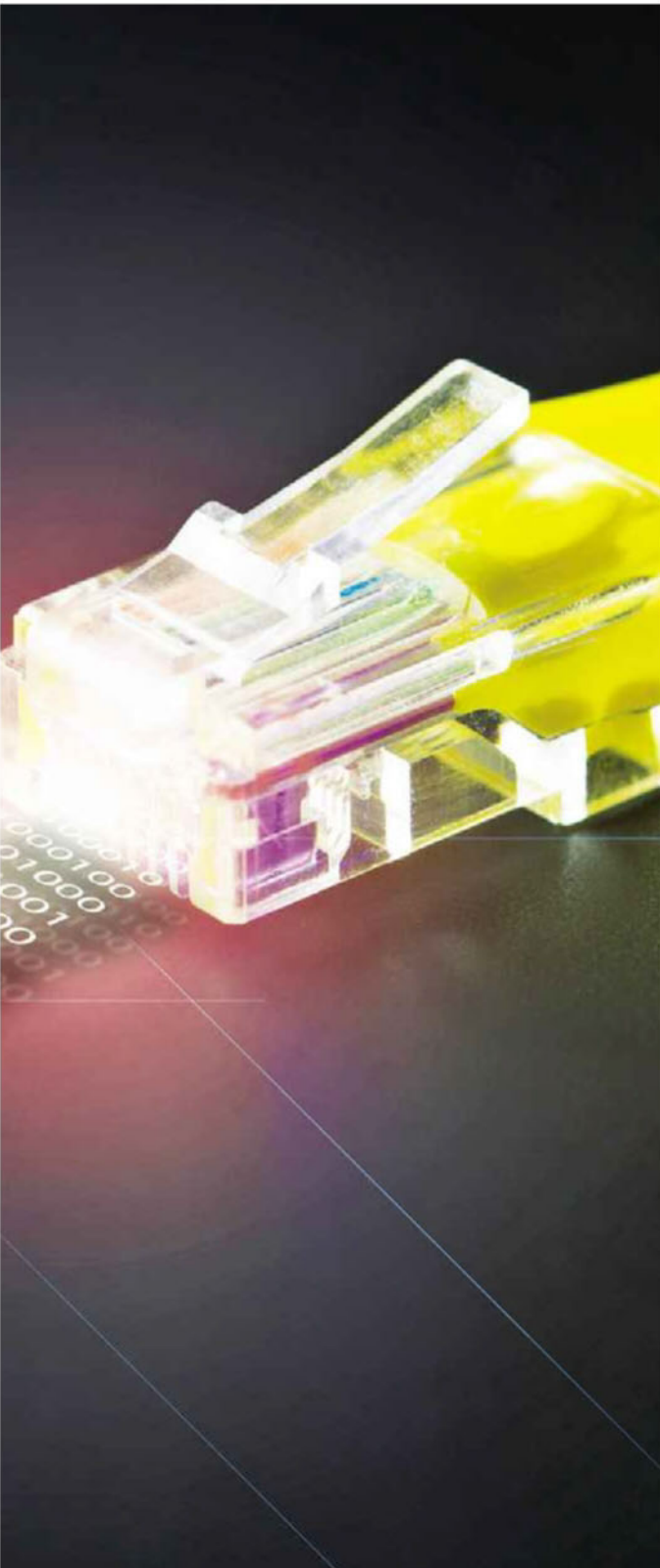
Mobile Vs Desktop CPUs

Although the latest round of Kaveri-based AMD chips are good for budget gaming, in that they combine a reasonable CPU with a

high-end GPU, no self-respecting gamer would be seen without an Intel chip in their system. That's because Intel's CPU performance, particularly in the single-threaded modes used by games, is vastly superior to AMDs. While much of the burden does fall on the GPU, a strong CPU provides an invaluable underpinning to any gaming system. That applies to both laptops and desktop systems.

A basic gaming desktop probably contains an Intel Core i5 CPU. Although Core i5 chips are technically the mid-range Intel core chips, they're a strong choice for gamers, because they omit features that are of low value to gamers. Core i5 chips have four hardware cores and no Hyper-Threading, allowing them to process four threads at once, whereas Core i7 chips have four hardware cores with Hyper-Threading, allowing them to tackle eight threads at once. Since games very rarely require anything like eight simultaneous threads, the speed increases you see by moving from a Core i5 to a Core i7 tend to be a result of the additional clock speed and materials fidelity.





Gaming laptops also contain Intel Core chips, although these are the mobile equivalents of the full-size CPUs found in gaming desktops. Alienware's cheapest gaming laptop cost £999 and runs on an Intel Core i5-4210M (the 'm' signifying 'mobile'). An equivalent desktop gaming PC, such as the Falcon Elite BR9I (£999), contains by default an Intel Core i5-4690K.

The differences in the capabilities of these two chips are considerable. The i5-4210M is actually a dual-core chip with Hyper-Threading, whereas the Core i5-4690K is a true quad-core chip. The i5-4690K is also faster in the sense that it has a faster clock speed (3.5GHz against the i5-4210M's 2.6GHz) and twice as much cache – 6MB rather than 3MB.

The reason for this is easily traced back to two qualities: laptops need to draw less power and produce less heat. The maximum TDP (thermal design power) of the i5-4210 is just 37 watts, whereas the i5-4690K is more than double that amount, at 88 watts. It's for this reason that the CPUs found in gaming laptops, while based on similar technology to desktop CPUs, are invariably worse performing. They can't get as hot (because laptops are harder to cool), and they can't draw as much power (because laptops need to remain power-efficient to function when not plugged into the mains supply).

To illustrate the difference in performance, PassMark gives the Intel Core i5-4210M a score of 4306, but the Intel Core i5-4690K scores a considerably higher 7751. In fact, the closest desktop CPU to the i5-4210M is the Intel Core i3-3240, which is a low-end Ivy Bridge CPU. To get a laptop chip that performs as well as the i5-4690K, you'd need to buy a laptop containing an Intel Core i7-4710MQ, which costs an extra £100.

Even when you have equivalent-performing hardware, gaming desktops still have one advantage, and that's overclocking. Custom cooling for gaming laptops is basically non-existent, which prevents any serious overclocking being done to mobile CPUs. Of course, when you can't switch them out, it's not surprising: if the worst happens and you damage your desktop CPU through overclocking, it can be easily replaced. Damage the laptop CPU and the entire device is essentially written off!

But CPUs are just one piece of the gaming puzzle. What else is there to consider?

Mobile Vs Desktop GPUs

A good graphics coprocessor is essential for building a strong gaming PC. At present, all major Intel chips and increasing numbers of AMD chips contain their own GPU coprocessor, but for the most part these chips aren't much good for gaming. Even Intel's high-end HD 4000 on-board GPUs are damp squibs when it comes to gaming, and while Kaveri's on-board Radeon GPUs are much better, they're still towards the lower end of the spectrum, and in any case, the GPUs don't really reach their full potential when paired with an AMD CPU.

In desktop systems, adding an extra GPU in the form of a graphics card is both a simple process and an essential one. In many ways, the performance of a gaming system relies more on having a high-end graphics chip than a high-end processor. In objective terms, there's very little ground between the two main GPU manufacturers, AMD and Nvidia. The best one to buy depends on a variety of personally determined factors, from budget to desired feature set.

But when it comes to laptops, you don't have a huge amount of choice as to which GPU you get. Like the CPU, even separate graphics chipsets are integrated into the motherboard. There are rare exceptions, but in the vast majority of consumer purchases, the graphics card you get with your laptop is the one you're stuck with forever. That makes choosing the right one even more important.

Again, using Alienware's gaming laptops as a benchmark, the only card

“ While much of the burden does fall on the GPU, a strong CPU provides an invaluable underpinning to any gaming system ”

on offer is a Nvidia GeForce GT 750M with 2GB of GDDR5 RAM. According to 3D Mark, this performs about as well as a Radeon HD 7660D, which is one of the faster on-board chips found in AMD's A10-series APUs – but while it's a strong performer, that's only in the context of an on-board GPU. Compared to full-size graphics cards, the GT 570M just about meets the level of the Radeon HD 5770, which is almost four years old. The closest modern equivalent to the GT 570M is the AMD Radeon R7 250, which is an entry-level budget card costing around £60. Very few cards are cheaper if bought new.

The virtual inadequacy of this card as a gaming card is further underscored when you look at what's being offered in the equivalent-priced desktop systems. The Nvidia GTX 760 is commonly found in desktop systems around £1,000, and its 3D Mark rating is almost three times as good. To reach that level of performance on a gaming laptop, you'd need some of the absolute latest hardware: a Nvidia GeForce GTX 880M, which is found in laptops that cost literally twice as much as the one we're looking at.

As with CPUs, the chief obstacles to getting a high-performance graphics card into a laptop shell are power and heat: obtaining the former and removing the latter, especially when you don't have space for a monster heatsink. In fact, the difference is even more pronounced than with CPUs. The TDP of a GT 750M is just 33 watts, whereas the GTX 760 has a TDP of 170 watts. In fact, look at it that way, and the mobile GPU doesn't come off so bad: it offers a third of the performance for a fifth of the power. Indeed, if you can spend the money on a high-end mobile GPU, then the GTX 880M is even better: its max TDP of 100 watts gives equal performance to the GTX 760 while using only three fifths of the power!

Of course, the mitigating factor here is that gaming laptops tend to have lower screen resolutions than gaming PCs, so it's not that your games will be unplayable – they'll either look a little less sharp or run slower. But ultimately, the restriction on mobile GPUs isn't the performance; it's the price. Even the modest capabilities of the GTX



880M requires you to pay almost double the price of a GTX 760, and you can't even move the card to another system when you're done with it. That, if anything, is what makes mobile GPUs hard to deal with, and it's unlikely to change any time soon.

Mobile Vs Desktop RAM

If the performance differences between desktop and laptop RAM have you feeling slightly glum, then at least there's some good news for you here. When it comes to RAM, desktop and laptop varieties are more or less on equal footing.

That's not to say they're identical, of course. Desktop systems use DIMMs (dual in-line memory modules) while laptops use SODIMMs (small-outline DIMMs) which are smaller than standard memory modules so they can fit comfortably inside a laptop's low-profile case. DDR3-DIMMs have 240 pins, while DDR3-SODIMMs have 204, with smaller pins which allow them to be half as wide as standard DIMMs.

Although reducing the pin count on SODIMMs does involve making some technical changes to the way the RAM operates, the features lost along the way largely apply to server and workstation use, rather than consumer purposes. Games are practically unaffected. The only real difference between SODIMMs and DIMMs is that the former are slightly more expensive.

It's for this reason that we see broadly the same type and amount of RAM in desktop gaming systems and gaming laptops. Alienware puts 8GB of RAM in its laptops as standard, while Falcon's similarly priced gaming desktops contain a similar amount.

The main difference is again related to overclocking. Faster clock speeds on RAM allows it to shift more data in less time, with lower latency. The effect on frame-rates is small in practical terms – maybe a frame or two a second – but it's big enough to be measurable, which is why gamers often will overclock their memory as well as their CPUs. But again, gaming laptops can't really be

“ As with CPUs, the chief obstacles to getting a high-performance graphics card into a laptop shell are power and heat: obtaining the former and removing the latter ”



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overclocked, and the RAM modules are limited to their default speed (usually 1600MHz), while desktops can be pushed as high as 2133MHz or even beyond.

The only real practical concern to be aware of when considering gaming laptop RAM is the potential (or lack thereof) for expansion. A good gaming configuration requires a pair of dual-channel SODIMMs, which can act in unison. All other things being equal, two modules are better than one, but if you already have two modules installed, you're unlikely to have space for two more like you would in a desktop system. The only way to improve your memory capacity under those circumstances is to replace the memory completely with higher-capacity modules.

Again, while it's possible to buy gaming laptops that have high-capacity, high-speed RAM, the premium you pay to get hold of it is through the roof. Luckily, few games can even take advantage of 8GB of RAM, and games that make use of 16GB are far and few between. It might help your multitasking or improve load times, but a large amount of RAM has a minimal impact on a gaming system above a certain point, and that holds true for laptops as well.

Mobile Vs Desktop Networking

Good networking capabilities are essential for a proper gaming machine – not just because of the opportunity for player-vs-player match-ups, but because so much of modern gaming relies on the internet for its experience to be complete. From in-game marketplaces to social gamification to zero-day patches, playing a game without a network connection means you're only getting half of it.

Of course, it's hard to get a computer that doesn't have some networking capabilities these days. Virtually all motherboards come with wired Ethernet connections built in. The question isn't whether or not you get networking support with your new PC; it's how good it will actually be.

Although some systems still come with Fast Ethernet ports, which offer speeds of 100Mbps, it's much more common for new hardware to support gigabit Ethernet, which

The Gaming Desktop - Falcon Elite BR9I (£999)

Within this article, we mentioned using the Falcon Elite BR9I as our benchmark for a gaming desktop. In case you're wondering, here are the default specs of that system, along with our recommended customisation of it.

Case: Cooler Master 912 Advance

Case Cooling: 2 x Cooler Master 120mm red LED case fans

CPU: Intel Core i5-4690K

CPU Cooling: OEM cooler

Board: Asus Z97-A motherboard

RAM: 8GB Kingston HyperX 2400MHz

Graphics: Asus GTX 760 OC DCU II 2GB

Storage: 250GB EVO Series SSD and 2TB SATA 7200rpm HDD

PSU: 750M Cooler Master modular PSU

DVD: 24X Samsung DVD-RW drive

OS: Microsoft Windows 8.1

Networking: Gigabit Ethernet

Considering how cheap a gaming system the Falcon Elite BR9I, its specs are pleasingly high end. If we were to recommend any alterations, it'd be that you add a better CPU cooler to allow for the possibility of overclocking (customising the system with a Zalman CNPS14X adds an acceptable £35 onto the price). Another £5 gets you a slightly better Gigabyte Z97X motherboard, so that's also worth doing, and finally a wireless N networking card costs just £15 to add.

If you like, you can offset these upgrades slightly by dropping to a 1TB hard disk drive (saving £22) and dropping the largely unnecessary optical drive (saving £13). If you have your own operating system, you can save another £75, but we'll assume you don't. With these changes, the system comes out at just £1,019.

A great entry-level gaming system for anyone, at a thoroughly good price too.

allows network speeds up to 1000Mbps. Although most people might consider that the end of their concerns, it turns out that not all gigabit Ethernet controllers are created equal. Some high-end gaming motherboards, such as those in Asus's Republic of Gamers line, have controllers that are specifically chosen because their performance with game-sized packets (i.e. smaller ones) is better than a standard Ethernet controller.

Laptops do usually have the edge when it comes to wireless networking, though. Most desktop gaming PCs don't have wireless capabilities at all, with retailers expecting buyers to choose and install their own wireless networking solution, be it a PCI card or USB adaptor. Laptops, though, would be nothing without a solid networking component.

In fact, even Alienware's lowest-end gaming laptops contain an adaptor for the latest wi-fi standard, wireless AC, as well as Bluetooth 4.0



“ While it's possible to buy gaming laptops that have high-capacity, high-speed RAM, the premium you pay to get hold of it is through the roof ”

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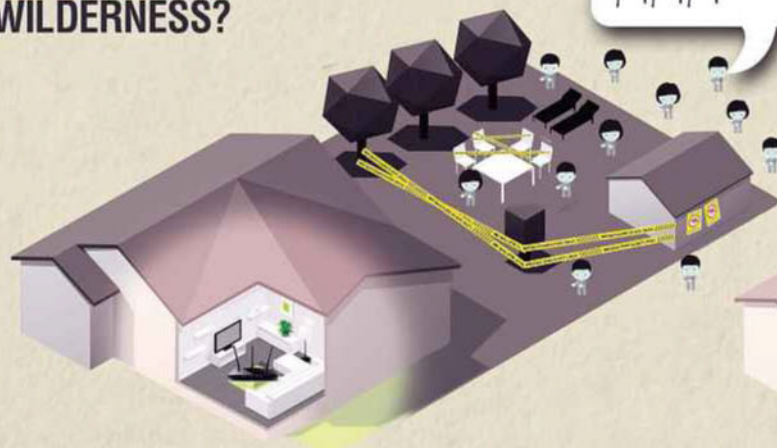
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capabilities. In gaming desktops, wi-fi is a luxury and Bluetooth a ludicrous extravagance. You might make the case that a focus on wired Ethernet rather than wireless networking is an attempt to keep the CPU free for gaming, but the impact of a wireless signal on a gaming system of any stripe is so close to negligible that it might as well not exist!

You don't have to be a rocket scientist to work out why it might be that laptops have better wireless connectivity than desktops, given how it's largely the only way they can communicate with other systems, but in a world where online gaming, instant delivery and online digital rights management mean you literally can't play a huge number of games without a network connection, a focus on the latest wireless standard is definitely a tick in the plus column for gaming laptops.

Desktops Vs Laptops

Since this is a laptop special, it seems a little unfair that we've just spent several pages pointing out just how good gaming laptops aren't when compared to their desktop cousins. In all fairness, gaming laptops might not perform as well as the equivalent gaming systems, but they do still have some major advantages, which are worth pointing out.

For a start, there's the obvious thing laptops do well: portability. If you're playing games with your friends or attending gaming events, laptops are considerably less hassle to transport than a gaming desktop. It's enjoyable to have an absolute beast of a gaming system at home, but it's probably small comfort when you find yourself visiting relatives or on a long train journey.

Gaming laptops aren't necessarily great at being portable, though. Better than a desktop, yes, but they're also expensive. The combination of a large screen, a large

battery and extra internal hardware (like the graphics card) will mean a gaming laptop can be three times the weight of an Ultrabook – as much as 3-4 kilograms! They're also large in the physical sense, which limits how and where you can use them. Their size and weight means that you really do need a desk-like surface to prop them on.

Although gaming laptops are expensive, it's worth remembering that there's a certain amount of false economics going on when you

compare the money you spend on a gaming laptop to the money you spend on a gaming desktop. The major difference is that laptops come with more hardware integrated into the unit and therefore included in the cost.

For example, we've noted that most gaming desktops don't contain wireless adaptors or Bluetooth receivers, but that's not the end of it. Gaming desktop pricing doesn't usually include a keyboard, nor does it include a screen, which is a major cost proposition even on smaller systems.

Take a keyboard, wireless adaptor, Bluetooth receiver and 16" HD display out of the amount you spend on a laptop, and suddenly the value-for-money gap between gaming desktops and laptop closes slightly. Not completely, but definitely enough to make you wonder.

Of course, it's not necessarily a good thing that you spend money



“ **Gaming desktop pricing doesn't usually include a keyboard, nor does it include a screen, which is a major cost proposition even on smaller systems** ”

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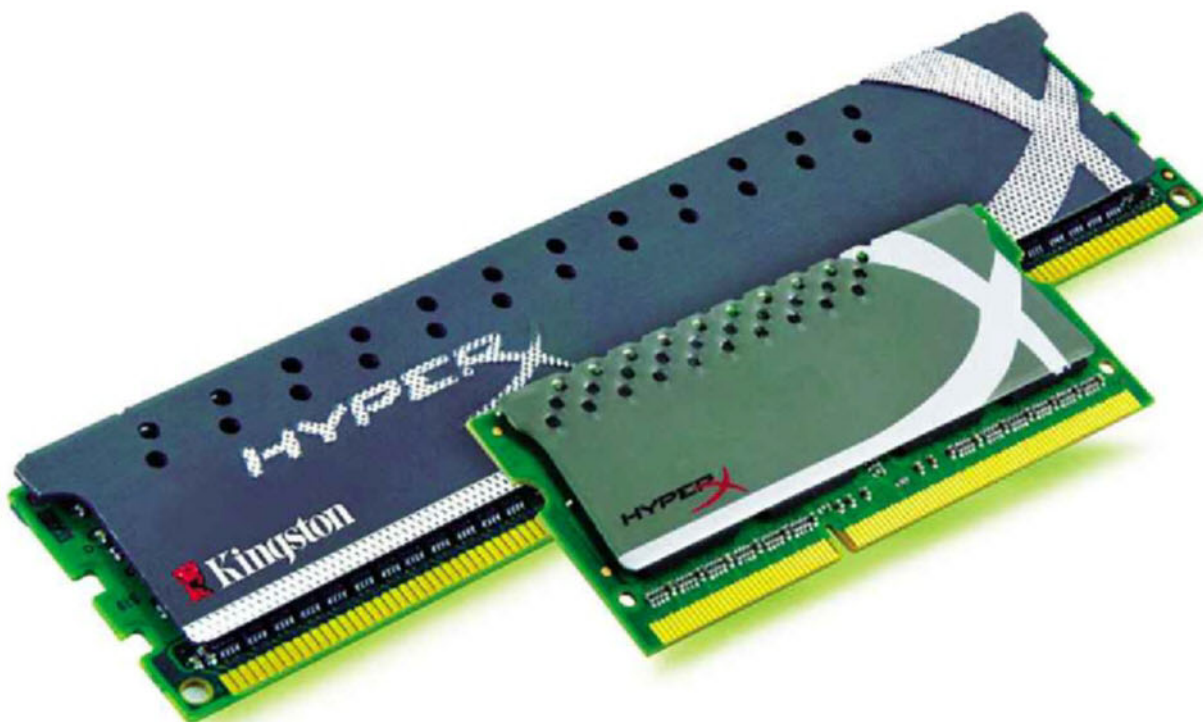
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on these extra peripherals. Some people would prefer to choose their own keyboard, wireless hardware and screen rather than compromise on the examples the laptop manufacturer favours. The point is, whether you agree with it or not, a good 10-20% of the price of a gaming laptop is going on hardware that the price of a gaming desktop usually omits. If laptops seem inordinately expensive, that's why.

Of course, desktops do have their advantages. The ability to upgrade is a massive one. When you buy a gaming laptop, its specifications are broadly fixed. You can add more RAM, you can replace the storage, and you can buy new peripherals. But the core components of the system – the motherboard, the graphics processor and the CPU – they're fixed. When they start struggling to keep up or get pushed towards obsolescence by new hardware releases, there's no way to spruce the computing back up. You have to sell it on.

That's not to say that desktops are future-proof, but crucially, if you want a new motherboard and CPU, you can keep the rest of your components. In that way, gaming desktops are ongoing projects that you shape and prune like a bonsai tree. Laptops, by comparison, are like kitchen appliances. All you can do is look after them as best you can until they no longer do the job you need them for.

Clearly, neither approach is the correct one, but they are both

aimed at very different people. The thing you need to determine is which type of person you are. Do you value power and customisability? Or do you prefer portability and simplicity? Once you know that, you'll know whether to buy a gaming laptop or a gaming desktop. And once you've made your choice, you can go and settle the argument the way it should be done: in the games. [mm](#)



The Gaming Laptop – Alienware 14 (£1,048)

As well as choosing an example desktop system, we also did the same for laptops. The example we picked as our benchmark for what a gaming laptop can be is the Alienware 14, which starts at £899. To make it a fair comparison, we customised the laptop to cost roughly the same as the Falcon Elite BR9I. Here were the final specs in case you want to check it out yourself.

CPU: Intel Core i5-4210M

RAM: 8GB 1600MHz DDR3L

Graphics: Nvidia GeForce GT 750M (2GB GDDR5)

Storage: 500GB SATA 7200rpm HDD

Display: 14.0" WLED anti-glare display (1920 x 1080)

DVD: Slot-loading 8x SuperMulti drive

OS: Microsoft Windows 8.1

Networking: Gigabit Ethernet and Intel dual band wireless-AC 7260

Although the specs are generally lower than the desktop version, the only way we think this falls short in comparison to other gaming laptops is in its hard drive. An SSD or even a 1TB drive would make this a far better system. If you're going to upgrade anything, that's the area to focus on!

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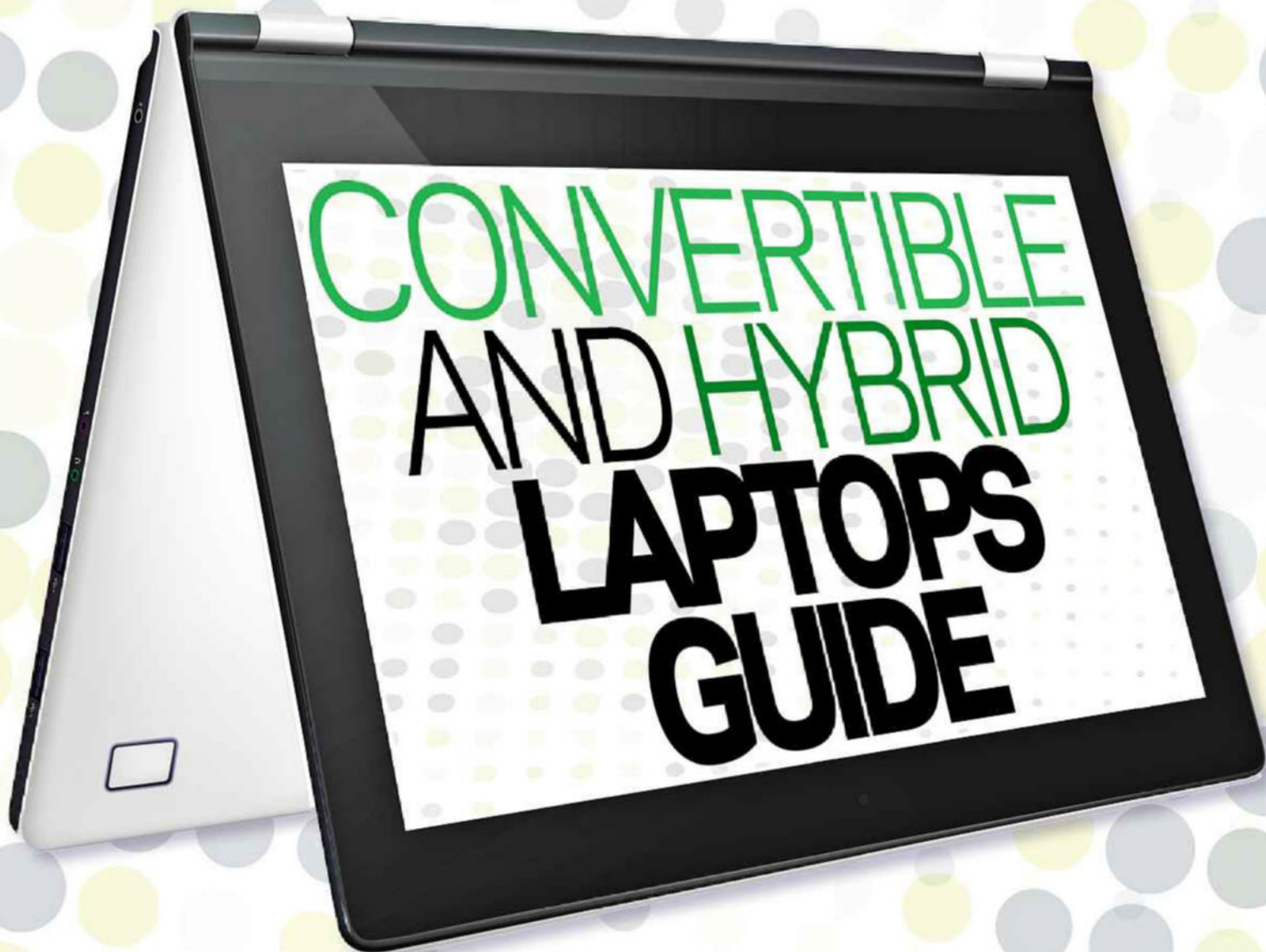
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Is it really possible to get the best of both worlds? Convertible and hybrid tablet designs certainly try, but do they manage it in reality?

If you spend a lot of time wondering whether you need to buy a laptop or a tablet, then there are a few devices out there that might just be able to fulfil your needs on both sides of that internal debate. The 'convertible' and/or 'hybrid' laptops take different approaches to satisfying people's needs.

Convertible laptops tend to fold back on themselves, hiding or disabling the keyboard and essentially becoming a tablet, albeit a rather thick and heavy one. The advantage of this is that you retain the full use of a full-fat Windows OS and the full computing power a laptop provides. Which, frankly, is something no tablet can currently compete with.

Hybrid tablets, by comparison, have a detachable screen with its own processor. Sometimes the screen remains in wireless contact with the base unit, but in other cases when you remove the screen you can no longer access the files or computing power of your main laptop, instead getting access to a secondary operating system (usually Android) which can operate the screen in tablet mode.

Regardless of which approach you prefer, there are plenty of laptops around that can satisfy a desire to get the best of both worlds. Here, we've rounded up a selection of our favourites to see what each one does best, and why you might want to buy it... So if this seems right up your street, read on.

Lenovo ThinkPad Yoga 11e

Although it isn't yet available in the UK, the Thinkpad Yoga 11e was released in the US in August, giving us a chance to look at it. It's a convertible Chromebook rather than a full-powered laptop (although a Windows 8 version is available too), which folds back on itself in much the same manner as Lenovo's other Yoga devices. Although Chromebooks are renowned for being cheap, sub-£200 devices, the ThinkPad Yoga 11e doesn't subscribe to that ethos. It costs \$479 in the US, which suggests a price approaching £400 when it finally comes to the UK.

Specs wise, it is slightly better than the average Chromebook, with 4GB of RAM rather than 2GB. The screen is a standard 11.6" 1366 x 768 display, but unlike most Chromebooks it is a touch-screen (to enable tablet-style use) and the panel is based on IPS technology, which gives it a fantastic viewing angles and vivid colour reproduction.

What it's actually designed for, though, is use in the classroom. Anchored keys, reinforced corners and scratch-resistant glass means that while it isn't fully rugged, it's certainly a lot sturdier and damage-resistant than the average hardware. It's got USB 3.0 and HDMI support, dual-band wireless AC and a built-in webcam, so you do get all the features you'd expect of a decent laptop, and the 1.83GHz Celeron N2930 means its quick and responsive.

Ultimately, it's a premium Chromebook rather than a laptop, and that's what's going to put off people who are looking for a convertible. For educational institutions trying to furnish classrooms with low-priced but capable hardware, it's going to be great. For individual buyers, the lack of Windows means that in a practical sense, you might as well just spend the money on a more powerful Android tablet. It's a tough sell, and ultimately too tough.



Acer Aspire Switch 10

A hybrid tablet which runs Windows 8.1 and comes with Microsoft Office Home and Student edition, the Aspire Switch 10 can drop the keyboard and base unit to go from a lumbering 1.2kg laptop into a spry 580g tablet. The 1366 x 768 IPS display is 10.1", making it on the small side for a laptop but the large side for a tablet. The snap-hinge actually allows the screen to be folded back as well, so you essentially get a convertible and a hybrid form factor, which puts it at an advantage over the competition.

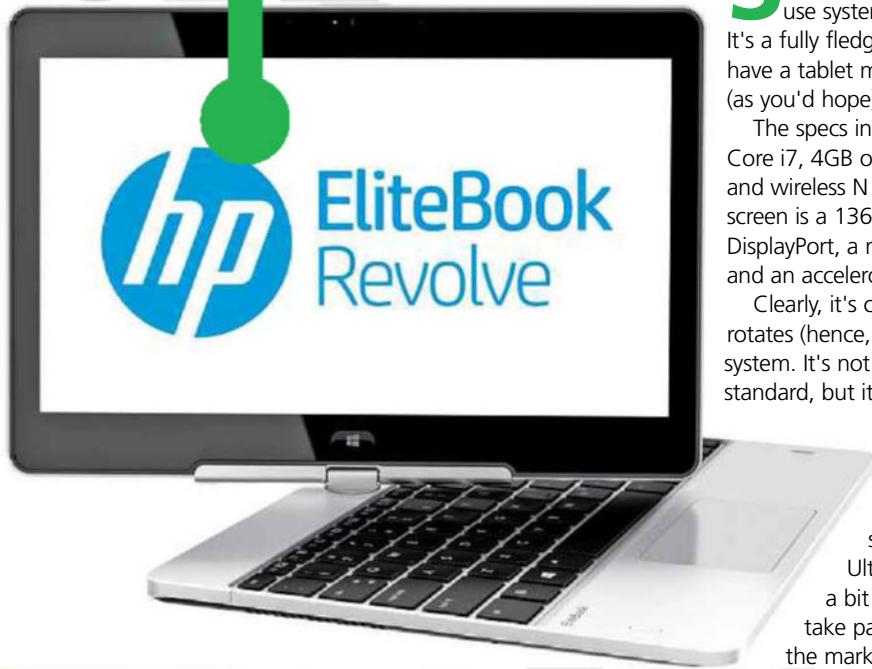
Specs-wise, it's not bad either. A 1.33GHz Bay Trail Intel Atom CPU powers the entire thing, there's 2GB of memory and 64GB of SSD storage, and you get that for £330, which is less than a similarly specified tablet would ask of you. Certainly no more, at any rate. Laptop interfaces are all present and correct – as well as the headphone jack and pinhole mic, you get a volume rocker, micro-HDMI, micro-USB and micro-SD card slot. They're all on the screen, though. The keyboard dock has just a single USB 2.0 port. Bluetooth and wireless N are included as standard, and there's a full-HD webcam.

What makes the Aspire Switch 10 a very desirable bit of kit are its design touches. There's a certain pleasing cleverness to the latch, which is fully magnetic. To detach it you just hold the base and give the screen a firm pull. To attach it, simply lower it into place. The hinge supports around 3kg of weight, though, so you can still carry the laptop by the screen without worrying that it'll detach. Interestingly, the screen can be attached forwards or backwards, which gives you extra options about how you position and use it.

Indeed, of all the devices we've looked at, this one comes closest to making the convertible device class seem like a genuine confluence of tablet and laptop form and functionality. If that's what you want, there's no question that this is the one to beat.



HP EliteBook Revolve 810 G2



Some hybrid and convertible laptops are aimed more at the tablet market, providing buyers with a more familiar form factor for a basic-use system. The HP EliteBook Revolve 820 G2 is the opposite of that. It's a fully fledged laptop, aimed at laptop users, but which happens to have a tablet mode. That alone accounts for the price of over £1,100, but (as you'd hope) you get a lot for your money.

The specs include a minimum Haswell Intel Core i3 upgradable to a Core i7, 4GB of RAM upgradable to 8GB, 128-256GB of SSD storage and wireless N upgradable to wireless AC. It runs Windows 8.1, and the screen is a 1366 x 768 11.6" touch-screen. Connectivity includes USB 3.0, DisplayPort, a micro-SD slot, and extras like NFC, an ambient light sensor and an accelerometer. There's also a 720p webcam and a backlit keyboard.

Clearly, it's competing with high-end laptops, but the screen also rotates (hence, Revolve) and folds back on itself to become a tablet-mode system. It's not as easy to fold as Lenovo's IdeaPad Yoga, which is the gold standard, but it's not a particular hassle either.

Despite its high specs, the problem is that for the price, it isn't quite high enough. For more than a thousand pounds, we'd like to see a full HD screen, slightly more storage and definitely better battery life than the rather stingy five hours it offers. HDMI wouldn't hurt either.

Ultimately, while it's a good laptop, the tablet mode feels like a bit of an afterthought (it doesn't really have any features that take particular advantage of it) and the competition at this end of the market is already strong. For this much money, HP couldn't afford to drop the ball in any aspect. The few fumbles they do make mean we're inclined to look elsewhere first.

Lenovo Yoga 2 Pro

The latest iteration of Lenovo's full-size convertible laptop line is another expensive piece of kit, starting at £1000 for the 13.3" July 2014 refresh, but the hardware you get for that amount of money is, quite frankly, sublime. Where some convertible laptops struggle to deliver a full HD screen. The Yoga 2 Pro casually slips in a 3200 x 1800 IPS touch-screen, which blows past HD and approaches (though falls slightly short of) 4K resolutions. The CPU has been upgraded to a Haswell – £1000 gets you a Core i5, while £1200 nets you a Core i7. Other features include 4-8GB of RAM, up to 512GB of SSD, a backlit keyboard, 720p webcam, micro-HDMI port, Bluetooth and built-in wireless N. There's also an SD reader and USB 3.0 ports.

The form factor's largely the same as previous Yoga, with the trademark foldable screen's 360° positioning. It's still quite a heavy in tablet mode (1.4kg), though, and it only has a five-hour battery life – but when the rest of it's so good that's easy to forgive.

If you like the sound of the Yoga, but want a lower-priced version and don't mind lower specs, you could always ditch it for the non-Pro version, which contains a Core i3 CPU is available at a much more competitive £550. In almost every way that matters, the Lenovo Yoga 2 is the best of the high-end convertible laptops. The reason it loses out on our recommendation to the much lower-specced Aspire Switch is simply that its tablet mode is fine for propping up in bed or lying on a desk, but its size and weight mean it's not something you can hold. Until it solves that problem it's only second-best – but if you want a high-end laptop rather than a mid-range one, definitely look here first.



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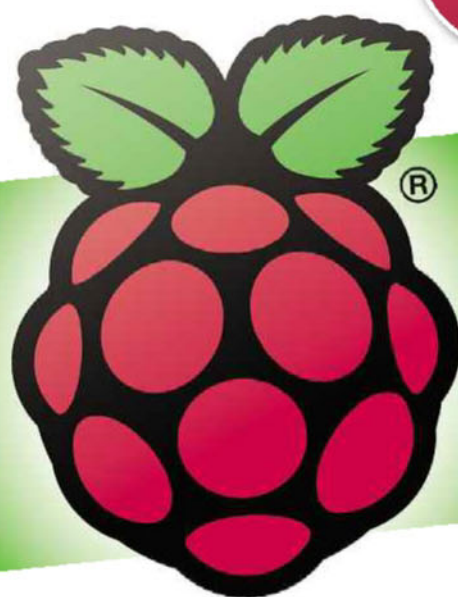
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Dell XPS 12

It's now more than year old, but that means you can find the Dell XPS 12 for a considerable discount. Originally £1500 for the Core i7 version, you can pick one up at retail for closer to £1000. The question is: is it actually worthwhile?

The XPS 12 has an unusual convertible form factor. Rather than spinning on its base, the screen spins across a horizontal axis inside its frame. The effect is broadly the same, and it doesn't really make a difference in practical terms, but it is at least a suggestion that Dell is trying out its own ideas. In any case, it works, but that's the only real compliment you can give it.

The rest of the hardware is more or less standard for a 2013 Ultrabook. A full HD 12.5" screen, Haswell CPU, up to 8GB of RAM, up to 256GB of storage, Windows 8.1 and built-in Bluetooth and wireless N. One good thing about the XPS 12 is that it contains a larger-than-average battery, which adds to the weight but gives it a good seven to eight hours of use on a single charge.

There's little here that's particularly special, either as a laptop or in tablet mode. Really, its age hurts it. You pay similar money to the Lenovo Yoga Pro but get an older configuration. The battery life is a definite boon, but is it enough of one? We're not convinced. Like many high-end convertible laptops it tries to shoe-horn the tablet form onto a device that doesn't really benefit from it, and when you consider it as a laptop alone, it just feels a bit old and overpriced, and that's enough to keep us from recommending it for now. Keep an eye out for a hardware refresh, though.



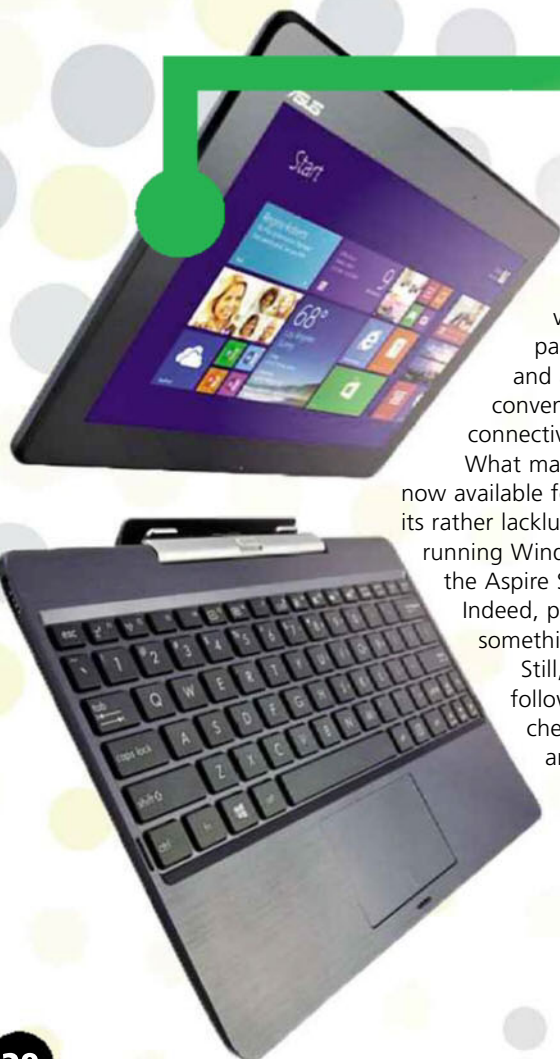
Asus Transformer Book T100

One of the original hybrid devices, the Asus Transformer Book T100 is, essentially, a 10.1" tablet with a full-size keyboard base-station it can connect to, and its latest iteration is less than a year old. The fact that it's more tablet than laptop means it's incredibly lightweight – 550g in tablet mode and just 1kg in laptop mode.

Windows 8.1 replaces the Windows RT operating system found in earlier versions of the hardware. The 10.1" 1366 x 768 display is based on an IPS panel. It's powered by an Intel atom, and you get 32GB of storage, 2GB of RAM and a battery that lasts a comfortable 8-10 hours. Again, you enjoy many of the conveniences of a laptop with the versatility of a tablet. MicroHDMI ports, USB 3.0 connectivity and micro-SD card support all come as standard.

What made the T100 a hit was undeniably the low price. It launched at £360, and is now available for around £280. This superbly affordable amount is tempered somewhat by its rather lacklustre capabilities. It's slow and doesn't multi-task well, being essentially a tablet running Windows 8, rather than a laptop with a tablet form. Its closest competitor is currently the Aspire Switch 10, which costs more but performs better with more demanding tasks. Indeed, pair any full-size Android tablet with a Bluetooth keyboard and you'll have something that'll be more powerful, though admittedly less convenient and familiar.

Still, it's not hard to see why it was the inspiration for the hybrid tablets that followed, and there is still something in the low price. It's definitely one of the cheapest ways you can buy a Windows 8 tablet. If you can stretch your wallet another £50, though, you can get a newer, better Acer Aspire Switch, and that's what we'd have to recommend. [mm](#)



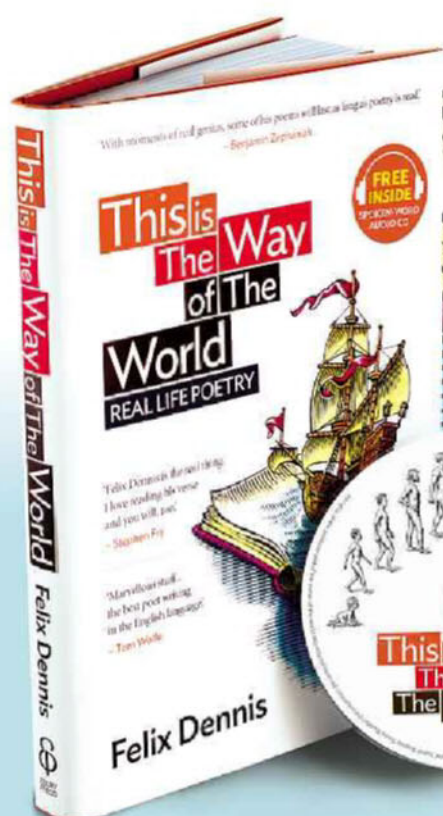
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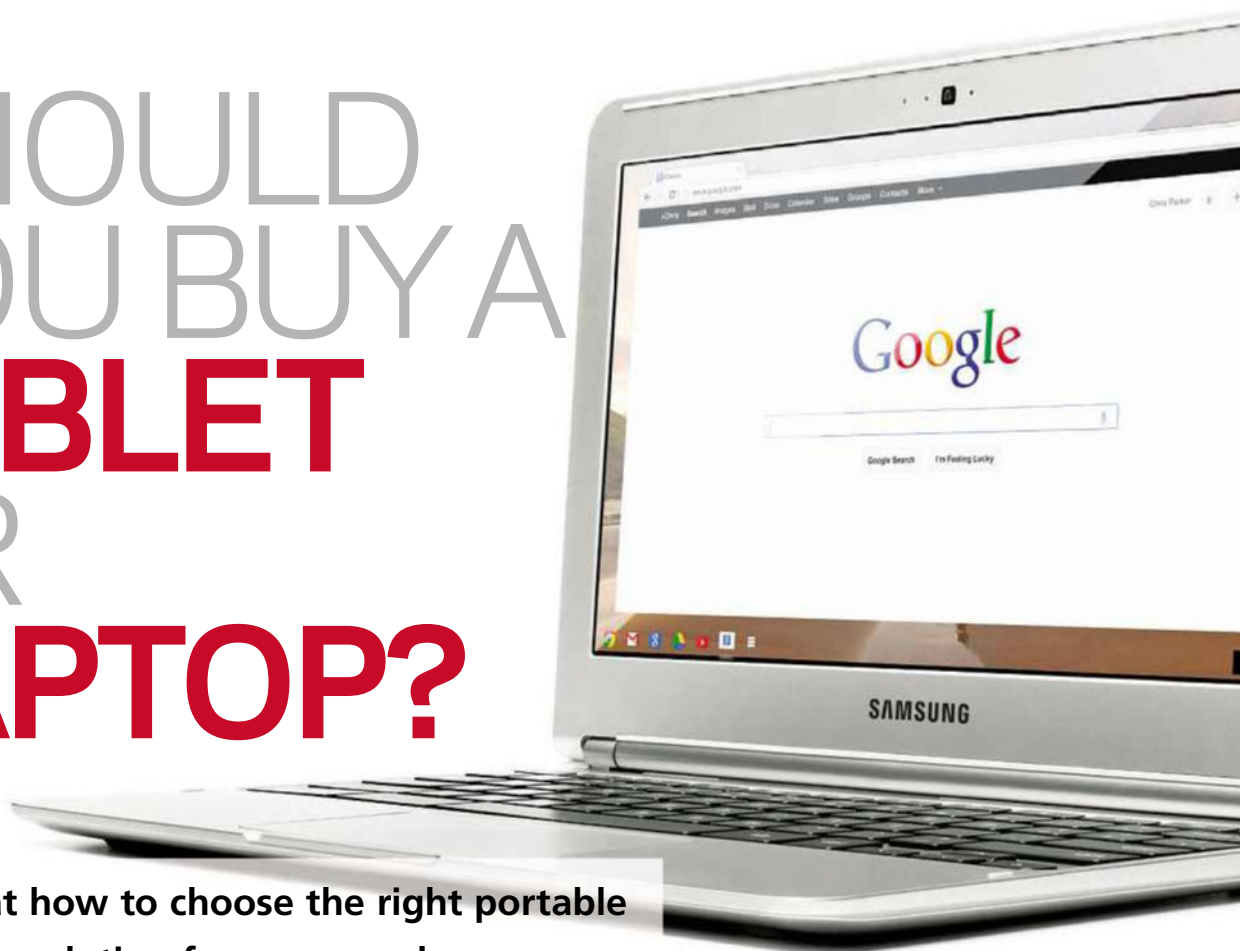


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SHOULD YOU BUY A TABLET OR LAPTOP?



We look at how to choose the right portable computing solution for your needs

Although tablets and laptops are very different classes of devices, they also have a huge amount in common. They're both fairly casual devices compared to a full-size desktop system, so you don't have to spend a lot of time maintaining them. They're both quite cheap, so you don't have to spend a lot of money on them. And they're portable, so you can take them anywhere you like whether that's on holiday or simply into the next room.

But that's where the similarities end. Although they're often mentioned in the same breath, there are as many differences as similarities. At some point, you have to decide whether you actually want a tablet or a laptop. To try to help you do that, we've taken a quick look at the advantages and disadvantages of each class of device so you can decide which makes sense for you.

Why Get A Laptop?

In many ways, buying a laptop should be the default choice for computer buyers. They're good all-rounders, they're not too expensive, and they retain value incredibly

well – and yet laptops have fallen slightly out of favour in recent years. Not so much at the premium end of the market, where a MacBook Air or Ultrabook remains an important status symbol, but for home users. Either through over-familiarity or disinterest, they're not quite the desirable purchase they once were.

Part of that is because the laptop market has become increasingly fragmented over the last couple of years as manufacturers attempt to revitalise sales by squeezing devices into whatever tiny market gap they can find. From Chromebooks to standard notebooks to Ultrabooks, you no longer have to choose a laptop; you have to choose the right kind of laptop.

It could be argued that this has the effect of making laptops seem less versatile and more specialised, when the opposite is really true. While certain types of laptop are specialised, that's only at the extreme ends of the price spectrum. If anything, those in the middle are getting better at doing more things.

It's easy to see how laptops are good all-rounders. Unlike desktop systems, they're space-efficient, easily portable and

simple to set up. They're more powerful than tablets, run on familiar software and incorporate a hardware keyboard. They genuinely combine the best qualities of desktops and tablets.

However, one of the unavoidable problems with laptops is that they struggle to compete with tablets when it comes to offering value for money. They provide more power, certainly, but power isn't everything to the casual user. If you can check your email and watch iPlayer on a tablet, do you really need a laptop at all? This is the question that often swings buyers in favour of a laptop. If a tablet meets your needs, why spend more money for abilities you won't use?

Luckily for laptop manufacturers, there's one saving grace: it takes an expensive tablet to act as a productivity device. If you're the sort of person who creates anything on their PC, whether that be writing with it, editing photos and multimedia or even just making presentations for work, there's no doubt that you'll benefit from using a laptop to do it. While it's not impossible to work on tablets, but it's very difficult to do so

Buy A Tablet If:

- You only check email, browse the web and social networks.

- You only want something to watch videos and read ebooks on.
- You want a cheap, versatile device.

- You find laptops too complicated.



exclusively because of the simplified file systems and touch-based interfaces.

That's the best reason to get a laptop rather than a tablet. Some people will just need a device that lets them poke around Facebook and Twitter in idle moments, and that's fine. But if you're the sort of person who actually uses applications on your PC other than the web browser, it's a solid bet that you'll benefit from a new laptop over a new tablet.

Why Get A Tablet?

Tablets have quickly become a must-have accessory for people in all walks of life, so when the time comes to replace your laptop, it's fair to wonder whether you might be better off with one instead of another laptop. And while tablets aren't quite the magic all-in-one device they're sometimes treated as, you can at least argue a case for them being a good alternative to large, cumbersome laptops. After all, tablets are cheap, wireless and versatile, and the software they run is inexpensive and easy to get hold of. You can even play games on them, which is hard to do on low-end laptops!

The problem is that there are a lot of tablets on the market right now, and deciding which tablet is right for you is a choice that takes in multiple factors. How good is the tablet's support? What is its lifespan like? How well does it perform? Do you get the same operating system as you have on your phone or do you take the plunge on an unfamiliar one?

Like anything, the practical limitations all eventually boil down to one question: how much are you willing to pay? Although some tablets can seem quite expensive for what they are, that doesn't change the fact that they're still quite cheap compared to buying an actual computer system. Admittedly, you're getting a lot less for your money, but in absolute terms there's a solid argument to be made that a Nexus 7 or Galaxy Note offers considerably better value than any laptop, especially when you factor in the cost of software. A game for Android or iOS might cost a few pounds; for Windows, it'd cost at least ten times that. Certainly, in that respect, tablets are the thrifty buyer's choice.

Something that might encourage you to buy a tablet is their various extra abilities.

Some laptops incorporate webcams, but tablets have video conferencing, can be used as a camera and are small enough to use as an audio recorder. Laptops might have better connectivity to USB devices, but tablets are ready to go whenever you need them, with battery lives that can span weeks of use. Unless you want to watch a DVD, there's almost nothing your laptop can do that the tablet doesn't also do wirelessly.

Obviously, as a traditional computing magazine we still see the potential of laptops when compared to tablets, but even we can't deny the popularity explosion tablets have undergone. The deciding factor should really be how much use you actually get out of your laptop currently. If, more often than not, you only ever open your web browser and mail client when you switch your laptop on, a tablet might be the right way to go. If you run anything else, stick with a laptop.

And hey, look at it this way: there's no rule that says you can't have both. Some overlap doesn't mean they're identical, and the low pricing means you might as well enjoy the full range of computing while you can! **mm**

Buy A Laptop If:

- You need a system that you can work on.
- You prefer speed and power over price.
- You want to run Windows software.
- You want a large screen at a reasonable price.



LAPTOP ACCESSORIES GUIDE

Picking the right accessories can make life with your laptop a whole lot easier...

As good as laptops are at cramming in all the hardware you need, it's simply impossible to fit everything one person needs within one tiny case. Of course, that's not necessarily a bad thing. Tricking out a new system is always good fun, and the chance to select the best accessories for your new laptop is, in many ways, a fitting reward for the rather more painful process of figuring out which one to buy in the first place.

So that you can spend less time browsing and more time buying, we've picked out a selection of the best laptop accessories we can find, covering a wide spread of budgeting options. The cheap, the expensive, the conventional and the unconventional. If you can't find what you're looking for here it might exist, but we're not sure it's actually worth buying!

Laptop Bags

Although laptops are ostensibly portable, you can't just walk out of the door carrying them under one arm – not unless you want it to be destroyed the first time it rains. Although some laptops seem large enough that you could arguably just attach wheels to the base and ride them around, a smarter solution is to find a proper bag, backpack or carrycase. Here are our favourite choices for protecting and transporting your hardware, wherever you happen to be travelling.

be.ez LE Reporter (£20)

The be.ez LE Reporter is large enough for a 15" laptop, but still small enough for you to carry it around without feeling overly encumbered. The interior features an elasticised main compartment for your laptop, as well as a huge

“ Although laptops are ostensibly portable, you can't just walk out of the door carrying one under your arm – unless you want it destroyed ”

variety of slip and zipped pockets of various sizes so that you can stow your peripherals, gadgets and accessories alongside it. A PVC coating ensures the bag remains water-resistant even during heavy rain, and the nylon strap features a padded shoulder protector for added comfort.

The LE Reporter is available in a variety of subtle two-colour combinations: Grey/Blue, Black/Safran, Blue/Orange ('Kingfisher') and Turquoise/Burgundy ('Angel Park'). It's perfect for casual or professional use, and although it takes a no-frills approach, it's far from basic. Although it retails at almost £60, it's currently available from a number of outlets for just £20, which is so far beyond a bargain that it's hard to pass up even if you think you've already got the perfect laptop bag. Don't let this chance pass you by!

Targus Beluga Backpack (£40)

Not every laptop is light enough to carry around in a briefcase-style bag, and sometimes you need your hands free for other bags you've got to carry. So, rather than slinging your laptop over one shoulder in the hope it doesn't slide off, why not get something like the Targus Beluga? Designed for laptops up to 15.6" in size, this thin, lightweight backpack keeps your laptop safe while allowing you to carry it in the most convenient place of all. No hands required!

As backpacks go it's intended to be quite minimalist, so there aren't many extras. It's essentially a big pouch for your laptop with a pair of shoulder straps on. That said, it's not completely without features. There's padding around the main body of the bag to protect your laptop from being knocked or scratched, there's internal storage space for accessories, as well as two side pockets and a water bottle holder on the exterior. The shoulder straps are even padded with air mesh to keep you cool.

As bags go, you can probably find more versatile backpacks for £40 – but if you want one that'll fit your laptop and keep things otherwise simple, it's high-quality and built for exactly the job at hand.

Knomo Troon (£95)

At the high end of the pricing spectrum, you'll find bags like this: the Knomo Troon. Knomo makes high-quality laptop and tablet bags designed for those who value style as much as function, and the Troon is their version of a lightweight messenger-style bag. With a twill cotton canvas exterior and adjustable leather shoulder strap, it's comfortable and lightweight but incredibly durable as well. Don't think that high price tag means it's not rough and ready – this is actually towards the bottom of their range.

By design, the Troon is built to fit laptops of up to 13", and there's a separate pouch built into the lining for you to store your smartphone in too. An additional secondary pocket can also be used to store thinner items, such as tablets or portable keyboards. Finished with leather trim, solid brass fastenings and real leather, it's a bag that suits any situation, protecting your hardware without sacrificing your appearance. The Troon is available in black, olive or blue, with free postage and you can get 10% off at Knomo's site if it's your first order.

Cooling Platforms/Stands

Sometimes, especially as they age, laptops have trouble cooling themselves as efficiently as they need to. This can result in additional noise, stepped-down performance or at worst, complete system shutdown. Luckily, fixing the problem is easy – you just need to buy a riser (or, if you're feeling extravagant, an active cooling system) to encourage airflow and get your laptop operating like new once more. It's much less expensive than buying a new laptop,



“ **Sometimes, especially as they age, laptops have trouble cooling themselves as efficiently as they need to** ”

and if you're having trouble with noisy or underperforming fans, one of these might just solve your problem in a cheap and simple way.

Belkin Cooling Platform (£18)

It's not the most powerful cooling platform around, but with a single central fan the Belkin Cooling Platform offers a good balance of cooling performance, low-noise operation and practicality that'll ensure your laptop's temperature is kept down without your work being actively impeded. The fan itself can be powered from your laptop's USB port, while its patented (and relatively stylish) wave design directs air away from the unit.

Although the fan is a big draw over entirely passive designs, the Belkin Cooling Platform can be used without it. If you opt to do that, the air-flow enhancing design gives your laptop's own fans and vents the extra clearance they need to perform without getting backed up.

In addition to cooling, Belkin themselves list a host of additional benefits the Cooling Platform performs, such as reduced wrist and neck strain thanks to better positioning and grip pads to stop your laptop slipping. We take those with a pinch of salt, however. This is one device which is entirely about temperature, and in that regard it does the job. If the air circulating around this can't keep your system cool, it may be time to think about getting a new one.

Fellowes Smart Suites Riser (£25)

Most laptop risers only tilt your laptop at a slight angle to keep it off the desk and encourage airflow. As you can probably see from the picture, the Fellowes Smart Suites riser takes a much more extreme approach. That's because it's not just designed to help the laptop cool itself – it's also intended to raise the screen to eye level so that you can

work on it more comfortably and without risk of neck strain injuries.

As well as gripping the laptop securely upright, there's a built-in lip so that you can place your phone and/or tablet in front, allow you to keep your important devices within easy, visible reach. It's clearly designed for desktop use, and you'll need a separate keyboard and mouse if you want to keep working on the laptop while it's in the stand, but if you're having cooling problems, neck strain problems or you simply want to recover a bit of desk space, this is an accessory that can solve all of those problems in one go.

Coolermaster L-Stand (£25)

The CoolerMaster L-Stand is a passive cooling device based on a unique but deceptively simple idea: by securing a notebook in a vertical position it allows greater natural airflow around the unit, saving space while ensuring that fans and vents get the space they need for optimal performance.

Although it's designed specifically for Apple MacBooks, it's compatible with other notebooks as well. As well as being constructed from high-grade aluminium, it has large rubber grips on the base of the unit and within the stand itself, ensuring a tight grip on your system while maintaining a stable, space-saving orientation.

As you may have guessed, the stand is designed to hold systems that aren't being worked on directly. Rather, you're supposed to attach a monitor, keyboard and mouse and use it as if you're using a desktop system. That approach won't appeal to everyone, but it is a guaranteed winner if you want to get results. It is a little minimalist, but in a tasteful rather than an under-engineered way. If you like high-quality materials, simple design and instant results, the CoolerMaster L-Stand is perfect for getting all three.



Power Accessories

Laptops have a lot going for them, but their ability to function without an external power supply has to be the root of their success. Whether balanced on your lap in the living room or nudging people's lunches out of the way on a train, the portability of a laptop is what makes it great. It's also the most frustrating thing about them thanks to the slow charge times of laptop batteries and the short amount of time you get to use them before a recharge becomes due once more. That's why, in this section, we're looking at a few accessories that help you get around those problems in one way or another.

ReTrak 90W Retractable Universal Notebook Charger (£35)

One of the problems with taking a laptop out and about for any extended period is that you also need to throw your charge cable into the mix. Chances are that it's bulky, cumbersome and gets tangled around itself the first time you put it down. Luckily, the ReTrak retractable notebook charger solves this tricky problem to the fullest possible extent.

Unfortunately, notebook chargers can never be able to be any less portable than the transformer packs they need to function properly, so there's always going to be some degree of bulk to them. However, the ReTrack 90W cable does its best to make sure things are no more complicated than that. With its wind-up, retractable wires and slimline mains plug design, this is one charge cable that remains compact, neat and tidy no matter where you take it and how often you unwind it.

As an added bonus, the transformer even includes two USB ports for charging additional devices. It costs a lot for what it is, but it's compatible with all major laptop brands so you should get plenty of use out of it, for your current laptop and any future ones.

Energizer Power Lap (£60)

If you want to add extra portability to your laptop, you'll need to buy a battery pack. There are a lot of suspicious-looking third-party battery packs on the market, which

don't cost a lot of money – but don't be tricked by the apparent bargain. Cheap batteries are of notoriously poor quality. If you want a better alternative, go with a battery pack by a name brand such as the Energizer/Go Portable Power Lap, which can be yours for a reassuringly expensive £60.

The 6000mAh capacity gives you essentially a second battery's worth of power supply for your laptop, and there are three additional ports – two USB, one mini-USB – in case you want to charge any other devices, such as phones or cameras. There's a three-year limited guarantee and it even comes pre-charged, so you can buy it and begin using it immediately. It's quite small and weighs less than half a kilogram, so portability shouldn't be an issue. It's interchangeable tips are compatible with a huge range of devices, and if yours isn't included you can buy extras for a minimal price. Worth buying, if only for peace of mind.

Powertraveller Solargorilla (£110)

Attempting to harness the power of the sun might seem like a pointless endeavour when you live in the UK, but have a little faith. Whether you're heading off grid and want to give your laptop a chance at life or are just hoping to save a few quid on your bills, the Powertraveller Solargorilla is the device you need.

As the name suggests, the Solargorilla is a portable flip-out solar panel capable of providing up to 40 watts of power through either a 5V USB socket or a 20V DC socket. That's more than enough to charge phones and laptops, as long as you can get the sun to come out and shine on the panels that do the work. It's made from tough, rubberised and water-resistant casing, so it's completely ready for outdoor use, and it comes with a protective case and Velcro strap.

Admittedly, it's not much use in winter, and at £115 it might take a while to pay off, but hey, at least you're saving the planet in the long run. Combine it with its sibling device, the portable Powergorilla battery pack, and you might never need to use a wall socket again. Well, weather permitting. [mm](#)



LAPTOP BATTERIES EXPLAINED

They're essential to any laptop, and often a hot topic

If there's one thing most laptop owners will agree on, it's that they'd all like a better battery. Poor battery life is the number one frustration laptop users have to deal with, and no matter how careful you are, the battery life gets worse and worse the more you use a laptop. Eventually, they fail to hold a charge entirely, meaning you have to shell out for a replacement – no small expense, especially when you haven't done anything with the battery that it wasn't designed for.

But why is that? And why, when processors, memory, hard drives and screens get better and better every year, does it seem like battery technology is standing still? We've looked into it, and while we may not be able to improve laptop batteries for you, at least we can explain them.

Li-On Taming

For years, the preferred type of battery for any mobile computing device, be it smartphone, tablet, digital camera or laptop, has been a lithium-ion or li-on battery. The problem manufacturers face is that the basic capabilities of li-on technology hasn't really improved since it reached a viable commercial state in the 1990s. There have been slight refinements in the technology, but broadly speaking the li-on batteries

of today are identical to the first ones you could buy.

Unfortunately, they're being asked to power considerably more powerful devices, which see far more use than the ones they originally powered. The problem is that at a physical level, the batteries simply can't improve. Li-on batteries store the lithium ions using graphite, and there's a hard limit to the amount of ions that can be stored. Modern batteries are so efficient that the only way you can improve a battery's capacity is to add more graphite, which makes the battery bigger and heavier, which makes the device bigger and heavier, which makes it more expensive and less attractive to buyers.

Although manufacturers are doing their best to bring down the power requirements of modern systems by shrinking processor dies and creating more economical power-saving firmware modes to be employed when the hardware idles, the simple fact is that li-on technology isn't going to get better.

It's not for lack of trying either. In the past, new batteries were trialed using silicon electrodes, rather than graphite, which has ten times the theoretical capacity. But the silicon swelled when it was charged, which caused minute fractures in the



▲ *Lithium-ion batteries haven't changed much over the years*



▲ *Mobile batteries need to improve in future*



▲ Laptop batteries can be expensive, but cheap ones often aren't worth bothering with

materials, which quickly reduced the overall capacity of the battery. When you consider that mobile devices have to last for years at a time, accepting hundreds of charges, durability is as important as capacity.

Other attempts at improving laptop batteries have been just as doomed. A graphene-silicon hybrid, which combines the stability of graphite with the capacity of silicon has been proven to work, but it's currently impossible to manufacture in commercial quantities due to the scarcity of graphene. Alternative technologies like lithium-sulphur and lithium-air are being trialled for the automotive industry but have yet to come anywhere near computing.

Although battery life is a big issue for laptop owners, it's not just that which bothers the manufacturing industry. Current battery technology can run a modern system for five to eight hours of normal use, but new hardware and protocols draw more power. Suddenly, to keep a system running for five to eight hours, batteries will need to be bigger or more efficient.

Essentially, if you want the laptops of the future to support features like 4K video, wireless mirroring, and next-gen wireless like 4G and wireless AC without a drastic reduction in battery life, manufacturers need to find a way

to get better batteries into our laptops. One way or the other, it's possible. Only in the next few years will we find out whether the solution is bigger batteries or better ones.

Charging More

Finding better technologies is only half of the battle, though, and one that's largely out of the hands of the consumer. What about the things you can effect, like replacing or upgrading your current battery?

Like all rechargeable batteries, li-on-based cells lose their ability to hold charge as they age. If you've had your laptop for a year or two, you'll no doubt have noticed the drastic decrease in its capabilities compared to when you bought it. Eventually, batteries will cease to hold any usable charge, and it's at this point that you have one option: replace it completely.

Replacing a laptop battery isn't actually difficult. They're designed to be removable, and most don't even require a screwdriver to remove. Much harder is the task of actually selecting a new battery.

It can be difficult to know which battery brands are trustworthy and which are dubious. The list of capabilities and specifications laptop batteries offer can be full of impenetrable numbers and acronyms designed to look impressive but

which don't tell you what you want to know about batteries: are they actually any good?

When it comes to choosing a battery, one of the important values to look at is the milliampere-hour or mAh rating. This gives you the capacity of the cells inside the battery, which broadly indicates their quality and size. For reference, an AAA battery is a single 1000mAh cell. A good laptop battery should be at least 5200mAh, while lower-quality generic brands are often 4400mAh.

The difference is that higher-capacity laptop batteries use high-quality cells, as manufactured by big name companies such as Sony, Samsung and LG. Cheaper, lower-quality batteries use cheaper cells with poorer quality control, which makes them more likely to fail – sometimes catastrophically.

A good way to check whether you're buying a good or bad battery is to check the pricing. Good batteries cost toward, if not more than, £100. The least reliable cost as little as £10, but anything under £30 is cheap enough to be highly suspicious. Don't let yourself get taken in by good reviews on sites like Amazon – cheap batteries might perform as normal for the first six months or so, but their performance drops off quickly.

The reason the prices of bad batteries can be set so low is because the manufacturers have very low standards with regards to service lifespan, power capacity and safety performance. Power cells can also degrade even when they aren't being used, so if you see a name-brand battery being sold extra cheap, it might be that you're seeing old, depleted stock being sold at as low a price as possible to recoup some of their cost. Buy a cheap battery, and it might be only weeks away from becoming impractically inefficient.

In essence, if you're trying to replace your laptop battery, be prepared to pay for quality. If you don't think your hardware will last more than a year, you can chance a lower-quality battery, but even then try to stick to the higher end of the price range. If you stay away from low-quality hardware, a battery upgrade can make your laptop feel like new. But buy the cheap stuff, and that's what your laptop will feel like. **mm**

6

WAYS TO IMPROVE YOUR LAPTOP PRODUCTIVITY



There's no denying the convenience of laptop, but they are not ideal for long hours of work unless you're willing to make a few improvements

Laptops are great for getting work done on the go, but when you need to work – properly work – you can't beat the finely tuned and configured setting of a desktop system. That doesn't mean you have to abandon your laptop entirely, though. A few choice accessories can help you turn your laptop into a work area that'll compete with any desktop system. If that sounds like something you want to pursue, here's what you need and why.

1 An External Monitor

You have to spend a lot of money to get yourself a laptop with a really good quality screen, but even then things are rarely perfect. Portable screens tend to have very tight viewing angles, uneven brightness, and low resolutions. Even in absolute terms, they're small,

which limits the area you can work on and the amount of screen real estate you have available to use up.

Screen size and quality are just the practical issues you face when using a laptop screen. Just considering those factors doesn't even begin to tackle the health issues that can arise from using one. The problem with laptop screens is that, by their very nature, they're attached to the keyboard and therefore your desk. As you probably know the screen for any computer should be placed at eye-level to minimise eye, neck and back strain. Using laptop screens is fine if you're only working on them for a short amount of time, but if you're doing a day's work, or even multiple days' work then you want to make sure you're not putting your physical health at risk by hunching over your laptop for extended periods.

An external monitor solves these problems for relatively little cost. For as little as £100 you can buy a 24" full HD monitor which can be raised, lowered, tilted and rotated into the optimum position. All laptops have some kind of graphics output port, whether that's VGA, DVI or (increasingly) HDMI, so all you have to do is plug the two together. In addition to giving you extra screen space to work on, it'll ensure that you can use your laptop for long periods of time without putting strain on your body.

As an added extra, you can even use your laptop's screen as a secondary display! Whether you use it as a storage area for Windows that aren't currently in play, as extra workspace, or as an always-open browser window, having a multi-screen setup available to you is guaranteed to improve your productivity.



Example: LG 24MP55HQ-P 24"

For around £125, you can pick up this 24" LG monitor, which has an IPS panel, rather than the TN panels found in cheaper ones. The colours will be better than your laptop, the viewing angle will be far beyond it, and between a 24" screen and full HD resolution, you can guarantee that you'll work better using it.

2 An External Hard Drive

On one hand, it makes a certain amount of sense to keep all of your important files on a single device, so that they're always accessible the very moment you need them. When you think about more carefully about it, though, there are severe downsides to this practise – not least the potential for disaster.

Keeping an external drive at home offers you the best of both worlds. You can keep the most current versions of your files on your laptop, but back them up to your external storage once or twice a week, ensuring that should the worst happen (be it breakage or theft) then you don't lose anything too important or otherwise irreplaceable.

External hard drives can also help you manage your data better. Unless you've bought a particularly high-end drive, laptop hard drives can be comparatively small. You might even have an SSD, which is great for speed, but not ideal for data archiving. Keeping large, seldom-needed files such as photos, videos and old music on your external drive will ensure that

your main storage is kept free for more important purposes. A clean hard drive is a fast hard drive, and the quickest way to keep your main hard drive free is to use another one as a dumping ground.

The best thing about external hard drives, though, is that they're cheap. You can buy a 1TB USB-powered drive for under £50 without too much shopping around. That's going to get you a drive with twice, if not four times as much storage as an average laptop. For most of us that means



you enough space to mirror an entire drive if we need to, with space left over for the things we can't store on your main drive.

If you're feeling particularly flush with money, you could even buy a NAS unit and make the contents of that drive available no matter where you are, as long as you've got an Internet connection. Having your own personal cloud storage ensures you're never stuck for a file you desperately need – as long as you've got time to download it. NAS storage is considerably more expensive than picking up a standard external drive, though, so a cheaper way to get the same effect would be to see if your router already has file-sharing capabilities (most modern ones do) and attaching a standard external drive to it. It's not just less expensive, it's also much easier to set up, and keeping things simple is the best way to keep your productivity up.

Example: Seagate 1TB Backup Plus

The Seagate Backup Plus houses 1TB of storage and costs just £50. Its vertical orientation keeps the desktop footprint to a minimum, and the integrated backup software makes saving copies of your most precious files as simple as you could want it to be!

3 A USB Hub

The original goal for USB was that it could be used to provide a data and power connection for virtually any device. If anything, the plan worked too well. Most laptops manage to contain two or three USB ports, which is fine if you're setting up on a train or in a café and just need a place to charge your phone – but it's not quite good enough if you've established a desktop with keyboard, mouse, speakers, monitor and more.

If you find yourself with more USB plugs than your laptop has USB sockets, a USB hub is the way to go. For a comparatively small cost, you can turn one USB port into several. The standard is designed for this kind of daisy-chaining, so you're not putting additional strain on your hardware: all you're doing is giving yourself additional convenience. Best of all, if you plug hardware into your hub rather than the ports on your laptop, you only have to unplug one thing when you pack up! The hub can be left on your desk, ready for the next time you return.

USB hubs range from the most basic portable kind, which cost a few pounds, to much more expensive high-speed adaptors costing £50 or more. If you're just charging phones, using input devices and trying to power basic hardware, you shouldn't need



an expensive USB hub. If you're connecting external drives and network hardware you may benefit from a more expensive adaptor, which will be better able to handle the data throughput and keep the power supply rock solid.

It's worth noting that some USB ports require a separate power supply, so do remember to look out for that. As a general rule, however, anything with four ports or less will be unpowered (or rather, take its power from the main USB port) and anything with more will require its own power supply. Powered ones do offer a few benefits – for example, they can charge devices even when your laptop is switched off or disconnected – but remember that there's no requirement to use one.

Example: Belkin F5U701

It might only be USB 2.0, but this seven-port hub has one feature that makes it stand out: it's optionally powered, meaning you can turn it into a stand-alone charge point even if it's not plugged into your PC. seven ports is enough for practically any setup, allowing you to instantly connect to all of your devices in one swift action. And it costs just £15!

4 Desktop Speakers

If there's one thing that even the most expensive laptop can't replicate, it's the power of a good pair of speakers. The tinny, treble-heavy speakers embedded in your laptop are fine when you're on the move (and probably using headphones anyway), but when you're at your desk in your own home, you deserve something that can shake your fillings loose with a combination of bass and volume. The only way to reach such heights is to buy a pair of desktop speakers.

Speakers aren't technically necessary for improved productivity, of course. You probably don't *need* your computer to

make a sound in order to get your work done, but good speakers do have the added benefit of making the working environment generally more pleasant, and that can't hurt in the long run. The less motivation you have to leave your desk, the more work you'll get done.

If you're buying desktop speakers, you've got two main options: wired or unwired. Although wired speakers are considerably cheaper, they do have the generally negative effect of cluttering your desk with wires – something that's distracting and potentially obstructive. If you want your workspace to be truly seamless, we recommend buying a decent Bluetooth speaker that will be able to automatically connect to your laptop whenever it's in range.

As a result, you're afforded the convenience of not having to fiddle with wires just to get a decent sound out of

your PC, and if (or rather, when) the unit needs recharging, you can simply plug it back into a free USB port to give it the power it needs.

A good pair of wired speakers can cost as little as £20, though if you want something with some proper kick, start looking at prices around double that. Wireless speakers are available across a larger range of pricing, but you shouldn't start looking anywhere below about £40 if you want a pair with a good range, good output and strong rechargeable battery. As an added bonus, you'll also be able to chuck the speaker unit in your bag and take it with you if you so desire – something wired desktop speakers are normally too cumbersome for.

Example: JBL Flip 2

At £75 it's a little on the expensive side, but the JBL Flip 2 gives amazing sound while charging from any USB port or its own mains USB adaptor. It comes with a hard shell case for protection and portability, and a built-in speakerphone capability makes it great for home office use, too!

5 A Full Size Keyboard

Adding a full-size keyboard to your laptop might seem counter-intuitive, but hang on a second. Is it really? Laptop keyboards aren't primarily designed with comfort in mind. First they have to be lightweight and thin, then durable, and only then is whatever wiggle room that's left within those parameters spent on making the experience of using them nice. that's not ideal for getting lots of work done.



If you've ever switched from a full-size keyboard to a laptop keyboard, you'll have noticed that a lot of the most useful keys seem to have gone missing in the translation from full-size to compact. The cursor and page controls get all squished up, and the F-keys and number pad tend to disappear altogether. They might be hidden beneath a secondary function-shift command, but let's face it, that's one keypress most of us can't be bothered to make most of the time.

There's no question that using a full-size keyboard is as much easier on the brain as it is easier on your wrists, and as an added bonus it negates the chance you'll accidentally graze the trackpad mid-way through your paragraph and doom yourself to typing half a page of gibberish. Not only do you reduce the potential for carpal tunnel by giving yourself a full-size keyboard to type on, you reduce the chance you'll get frustrated with the lack of easily-accessible functions and keys.

A decent keyboard is cheap, too. You can get Microsoft-branded ones for around a tenner, which are as good a non-gaming/non-mechanical keyboard as you'll find. Beyond that point, more expensive ones are only adding media keys and fancy features like backlighting, so don't worry too much about them. Again, a wireless or Bluetooth keyboard might be a good idea in terms of reducing desktop clutter, but beware of the increased price!

Example: Microsoft 800 Keyboard

Microsoft's no-frills approach to this keyboard ensures that you get a purchase that's simple and compact while containing all of the features you could want of a full-size keyboard. Far superior for working on than any laptop's keyboard, at just £20 it won't remotely break your bank.

6 A Mouse

In purely theoretical terms, trackpads are a good idea. They allow you to control the cursor like a mouse, but in a way that's far more portable. Unfortunately, the actual implementation of trackpads



“ **The implentation of trackpads can leave a lot to be desired. Even the best examples are imprecise, fiddly and generally slow you down** ”

can leave a lot to be desired. Even the best examples are imprecise, fiddly and generally slow you down when you want to be doing something quick, like selecting an icon, browsing a menu or highlighting some text.

Although the quickest way around this is to try and learn the necessary keyboard shortcuts so you never have to touch the trackpad, if you don't have to worry about portability you can take a more familiar route and simply buy a mouse. Like keyboards, mice are cheap, convenient, and vastly improve the experience of using a laptop. Plug one into a USB hub and you don't even have to face the inconvenience

of attaching and detaching it every time you put your laptop down to work.

A standard mouse can cost as little as £9, but you might want to pay a little more for a five-button one, which makes browsing the web considerably quicker. If you're using a wireless keyboard, it's definitely a good idea to get the same brand of mouse – there's a good chance you'll be able to use the same receiver for both peripherals, which means less stuff on your desk. While Bluetooth mice do exist, they tend to be 'portable' mice, which means they're undersized and not much more comfortable to use than a trackpad anyway. Double-check the size before you buy one!

Example: Microsoft 4000 Wireless Mouse

Built on the same wireless technology that underpins Microsoft's keyboards, the 3500 Mouse is simple but classic in its design and operation. With a cracking 10-month battery life, super-accurate BlueTrack optical sensor, five-buttons and a and four-way scrollwheel, you could scarcely think of a feature you want it hasn't already got (unless you're a hardened gamer, that is). It's not too pricey at £25, either. [mm](#)



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The **Best** Money Can Buy: Laptops

Don't have room for a desktop PC or need to compute on the go? Then you'll want a laptop

There something to be said for convenience and freedom in terms of computing. Desktop PCs are great and are really the best option for many users who need power and flexibility of a system that can be expanded on and upgraded. However, for a large portion of the computing public, this isn't as important as the ability to check your email, browse the internet and even watch movies and game wherever you like.

Of course, mobile phones and tablets enable all of this too, but if you want much more power and flexibility, while retaining portability, then the laptop is your go-to solution. They may be larger than phones and tablets, but they're still portable and can handle almost everything a standard desktop PC can. In fact, there are some laptops that are more powerful than most PCs, and many professionals and even gamers have ditched the desktop PC in favour of the smaller laptop.

Of course, to obtain this kind of power, you need to spend a lot of money, which is lucky, as that's what our series is looking at: the expensive options for those who have the cash to burn. There's no shortage here when it comes to laptops, so let's have a look at some of the most expensive portables ever unleashed onto the computing market.

Product: Luvaglio

Price: \$1,000,000

There are expensive laptops, ridiculously expensive laptops, and there are laptops so expensive, many may suggest you see a psychologist if you plan on buying them. Surrounded in mystery, with a website that even hides its About Us information behind private viewing, the Luvaglio laptop is certainly the most expensive laptop in the world, at a mind-melting \$1 million. That's if it exists.

It surfaced in 2007 and was met with much cynicism. The company behind the laptop is very secretive and all appointments to see the laptops are by appointment only. Little was released about the actual specs, save for its 17" self-cleaning screen, diamond power button that doubles as jewellery, Blu-ray drive (a big thing back then), 128GB SSD, built-in USB memory stick and MP3 player and an automated opening system of some sort. The whole laptop is hand made, with precious metals and jewels used in ways that are more than simple decoration, and much of the construction is chosen by the buyer. The unit was also claimed to be future-proof, able to be upgraded indefinitely, which is a good job really, given the monumental cost.

Obviously, this isn't a laptop that you're going to be buying any time soon, but we had to include it here, as there are simply no other laptops around that'll top it for price.

Product: Tulip E-Go Diamond

Price: €283,000

This is a pure designer laptop that's clad in leather and is shaped more like a fashionable handbag than it is a laptop. The covering of the unit is



▲ Luvaglio



▲ Tulip E-Go Diamond



➤ MacBook Pro 24Carat Gold

customisable, with a range of different leather styles, and there's also an option for fabric covering. However, the pinnacle of the range has to be the E-Go Diamond. This includes solid palladium white gold plates encrusted with thousands of cut diamonds. There are also a couple of rubies set into the Tulip logos on the unit.

The actual specification of the laptop includes an AMD Turion 64-bit CPU. 1-2GB RAM, 1280 x 800 WXGA 12" display, ATI Radeon Xpress 200 GPU and 160GB HDD. Other features include a sound system with bass reflex, the ability to play media without booting into Windows and an integrated webcam.

Yes, those are pretty meagre specs, and you can probably get a laptop for less than £1,000 that's better in terms of power and storage, but that's not the point here. This is about extravagance and making a statement, which is something you'll certainly do if you're carrying one of these into your local Starbucks.

Product: MacBook Pro 24 Carat Gold

Price: \$30,000

The Apple MacBook Pro is expensive enough in its normal form, but when you cover it in 24 carat gold and encrust the Apple logo in diamonds, you climb to a whole new breed of expense. This is one seriously bling-heavy, fruity laptop.

The system itself is a normal MacBook Pro, so if you're only in it for the power, than you're best sticking to the far cheaper alternative, but if you're looking for a status symbol, this is a laptop that you'll want to keep your eyes on at all times.

The company that makes the unit, Computer Choppers, will also perform decadent upgrades on other devices, such as the iPad or mobile phones, but this is probably the most expensive example.

Product: Stealth MacBook Pro

Price: £6,000

According to reports, the Stealth MacBook Pro, created by ColorWare, is one of the rarest laptops in the world, as there are only ten of them in existence. The laptop itself isn't all that different from the normal MacBook Pro (much like the gold plated one). However, it does come in stealthy matte black, complete with a custom matte-black screen.

The real reason for buying this is for the rarity and possible collector-power it boasts. With only ten in the world, though, the price may well be far more than the original price. Just be sure you don't lose it in a dark room.

Product: Alienware Area 51 m15x

Price: \$5,500

Alienware has always created some of the most powerful and pricey laptops around, and that hasn't changed after becoming part of Dell. The Alienware Area 51 m15x is an older example that commanded a huge price when it arrived. Billed as a portable but powerful gaming laptop, the unit features a 15" screen, an Intel Core 2 Extreme 2.8GHz and 4GB of RAM. It also features a 200GB hard drive, as well as a removable 320GB HDD. The Nvidia 8800 GTX gives it its portable gaming muscle.

As with other expensive laptops on this list, the specs here aren't as good as many cheaper models now, and it's a sign of the times that portable tech has dropped in price. At the time, however, this was cutting-edge stuff, which is why this is one of the most expensive laptops ever made.

Product: Rock Xtreme SL8

Price: \$5,500

Called the fastest personal laptop in the world, the Rock Xtreme SL8 is a Core 2 Quad CPU machine that uses an SLI configuration. It features 4GB RAM, and the graphics are handled by two Nvidia 9800M GTX cards. It'll even handle a 1TB RAID array, for plenty of storage.

On release, this was a seriously powerful and fast laptop and easily lived up to its price. Although there are far more powerful laptops around now, this is still a fast and useful laptop if you can find one for a good deal.



▲ *Stealth MacBook Pro*



▲ *Alienware Area 51 m15x*



▲ *Lenovo ThinkPad W700DS*



▲ *Rock Xtreme SL8*

Product: Lenovo ThinkPad W700DS

Price: \$4,500

We had to include this 2008/9 laptop from the Lenovo ThinkPad range. Not only did it command a \$4,500 price, but it's one of the most unique and useful laptops we've ever seen.

The design of the W700DS incorporated an integrated tablet and came with a stylus, making it a great option for designers. However, the most impressive feature is the second mini display. This slides out from the side of the display and gives you another screen that's a quarter of the size of the main display. Although its size makes it unsuitable for some tasks, such as browsing the internet, it's perfect for placing toolbars and palettes for design programs like Photoshop. It's also useful for email and chat programs, if you're talking or mailing while working away.

The 2.53GHz Core 2 Quad Extreme makes for a very powerful work machine, able to do plenty of tasks, including gaming, and it can hold up to 8GB of RAM. The GPU is an Nvidia Quadro FX 3700M. Great specifications for a machine of the time, and thanks to the unique features, it's still a handy laptop to have.



▲ Dell Precision M6400

Product: Dell Precision M6400

Price: \$3,500

Including an Intel Core 2 quad-core CPU, up to 16GB of RAM, 256GB HDD and a large, 1900 x 1200 display, Dell's Precision M6400 has to be one of the most costly laptops from the computer giant.

It's aimed at the business user and features the latest tech to facilitate a much more efficient work stream, and it also caters for those who may put the unit through its paces, both in operation and in terms of physical stress. The case is made using magnesium alloy with steel hinges, and it features shock absorbers to protect it from impact and damage.

Because of this hardy construction, the Dell Precision M6400 is heavier than many other laptops, so it's not a great everyday portable system. If you need a strong and powerful system to take with you, though, this is a good pick.



▲ Acer Ferrari 1100

Product: Acer Ferrari 1100

Price: \$3,000

Ferrari produces some of the most expensive cars in the world, so a laptop themed after the brand is, unsurprisingly, going to be expensive too and, with a little luck, as fast as the cars it's named after. The Acer Ferrari 1100 lived up to its moniker when it arrived in 2008, and underneath the classy Ferrari colours and logo that covered the case, the unit was fast enough for most.

It came with a Bluetooth mouse, also Ferrari-branded, and a VoIP phone, as well as Dolby speakers. Sadly, the overall performance wasn't as good as many had hoped it would be, and the laptop was considered to be overpriced and more about the looks than performance.



▲ Razer Blade Pro

Product: Razer Blade Pro

Price: £2,299

Razer Gaming Systems' range of laptops are aimed at the gamer and are built for high-end performance. They're powered by the latest Core i7 quad-core CPUs and host Nvidia GeForce GTX 765M graphics cards. To facilitate high-end hardware, they also have a very efficient thermal design that's built to channel as much heat out of the system as possible.

The laptop also includes a gamer specialised interface, complete with game-specific buttons and touchpad layout, and the whole design is sleek and snappy. It includes the Synapse 2.0 software that can be used to save custom settings and various add-ons to the cloud. These can then be retrieved from anywhere. [mm](#)

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Your Letters

PC Or Not PC?

As a man of advanced years, I come from what could be called a bygone age. Although it's probably not politically correct anymore, I still open doors for women and say 'Ladies first', and still sometimes refer to women as 'Dear' (though I do try not to). Call me a dinosaur if you like, but none of this is done with malice – it's just what I was taught was polite.

Do I care if company (or even the country) is run by a woman? Not a jot. Would I mind being on a aeroplane with a female pilot? No, because she's no doubt every bit as trained and qualified as any man.

In spite of my age, I think it's today's generation that need to be taught a thing or two about sexism and equality. First, we have the boys and men who think it's okay to share intimate, private images of women without the permission via the internet, whether that's a movie star or an ex-girlfriend. The disgusting attitude they have toward the fairer sex (again, probably not politixally correct) was demonstrated yet again this week as the feminist games critic Anita Sarkeesian had to cancel a talk because she received death threats. Seriously!?! Death threats for just stating your opinion!

On the other side of the fence, though, we have the women and girls who take the feminism thing too far, and who seem to live to be offended. The word misogyny gets thrown around a lot, but I suspect half the people using it don't know what it means. Too

often have I read stories about people being set upon on Twitter (of which I don't really see the point, but that's an entirely different story) because they've made a suggestion regarding the welfare of women, but these overzealous feminists accuse them of hating women – the very people they are trying to protect.

The simple fact is we could with some common sense. Everyone deserves access to the same education, the same jobs and the same level of respect. Do to others as you would have them do to you. It's not that hard.

At the same time, though, you should realise that not everyone is out to get you and that there are genuine differences between the sexes, just as there between people of different cultures. In fact, those differences should be celebrated, because without them life would be much less interesting.

Anyway, that's just my tuppence worth. I know not everyone will agree with me, but that's a good thing, because discussion is part of the fabric of life. Could my views offend some people? Probably, but they're certainly not meant to, and surely that's what's important in the end – what someone means, rather than what you think they could mean if you interpreted their words to fit your own agenda.

As a wise man once asked, "Can't we all just get along?"

CM Robbins

GET IN TOUCH...

More On Linux

Have read with interest, tales of joy and woe lately from people trying Linux for the first time. I remember getting my first PC after using a BBC'B, it was a Vectra286 with 10MB hard drive and ran MSDOS3.2 (I think). Windows was a marvellous way to launch software and manage data and I used each successive version up to XP. I also enjoyed messing with Redhat, Suze & Mandrake at the time.

Nowadays, I like easy, and seeing people trying Debian (which is a great Linux) as a first experience makes me cringe. If you wish to

get into Linux from XP then Mint Cinnamon (a Ubuntu derivative) is so closely modelled on XP, it is almost second nature (there is even a theme to make it look like XP). It'll happily install beside XP and give access to a wealth of software (mostly free) without ever having to go to the terminal.

First impressions can kill. Linux is bigger than just one distro, but the transition needs to be as smooth as possible.

Best regards,

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Component Watch

James Hunt picks out a selection of deals for Intel Haswell boards

Last week on this page, we looked at a selection of prices for AMD's Kaveri-compatible motherboards. Thus, in the interests of fairness, this time it's Intel's turn as we scour the range of Haswell-compatible Socket 1150 motherboards looking for the best hardware at the best price, whether you're building a low-end budget system or a gaming monster.

Deal 1: MSI H81M-P33
RRP: £35 / Deal Price: £30

The MSI H81M-P33 is one of, if not the single cheapest Haswell board on the market at the present time. Like all Intel boards, you could put any Haswell chip in it, but anything above a Core i3 would probably benefit from a better model than this one. The board is pretty limited, with support for two DIMMs up to 1600MHz and just two PCIe slots. As well as two SATA-3 ports, you get two SATA-2 ports, and there's a pair of USB 3.0 ports along with six USB 2.0 connectors to add to this, though. Integrated audio is provided by the RealTek ALC887, and the on-board LAN controller supports gigabit Ethernet. It's about as basic as you can get, but could get you up and running.

Where to get it: Scan (bit.ly/1efxvGF)



Deal 2: MSI H87M-E33
RRP: £62 / Deal Price: £45

In an echo of our first deal, here MSI is offering one of the cheapest motherboards for the H87 chipset (as opposed to the H81 chipset used in the board above). The MSI H87M-E33 is technically a mobile board, though, so it doesn't have a full set of features. However, if you're not trying to base a gaming rig on it, then you shouldn't have much trouble fitting in everything you need. Once again there are two DIMM slots and a PCI-E 3.0 x16 slot (for graphics cards, if you want to add one) and one PCI-E slot. The true incentive to choose this model over the H81 motherboards, though, is the additional HDMI port, which makes it perfect for watching high-definition media – and puts a great many more display options on your menu.

Where to get it: CCL Online (bit.ly/1nyTDmt)



Deal 3: ASRock Z87 EXTREME3
RRP: £90 / Deal Price: £84

This ASRock Z87's chipset mean it supports K-series chips for overclocking, and RAM up to speeds of 2933MHz – if you've got the modules to support that kind of power. The rest of the specs are good too, with two PCI 3.0 x16 slots and one PCI 2.0 x1 slot allowing support

for multi-card graphics setups. On-board graphics output gives you DVI, D-Sub and HDMI, and there's gigabit LAN support, of course. An ideal set of features for basic Core i5 systems.

Where to get it: Eclipse (bit.ly/1qNSaDj)



Deal 4: Gigabyte GA-Z97X-Gaming 3
RRP: £105 / Deal Price: £92

The Z97 chipset, designed for high-end i5 and i7 chips, has SATA Express support for up to 10Gbps and a specially made low-latency Gigabit LAN adaptor. Three PCIe x16 slots can supports three-card CrossFireX and dual-card SLI, and there are 14 USB ports (six USB 3.0), six SATA-3 ports, and four DIMM slots supporting RAM up to 3000MHz. It might look expensive, but you get a lot.

Where to get it: Scan (bit.ly/1qNSguA)



Deal 5: Asus MAXIMUS VII HERO
RRP: £165 / Deal Price: £157

For committed gamers, Asus is a prime choice, and the Maximus VII Hero proves that. For a princely sum, you get gigabit LAN support with LANGuard and GameFirst technologies built in, SupremeFX/Radar II sound, TrueVolt USB for a rock-solid power supply, four DIMM slots with RAM overclocking up to 3200MHz, three PCIe x16 slots, six SATA-3 ports, and HDMI, DVI and D-Sub on-board graphics ports and an M.2 socket for SSDs. There's even a dual-colour, matte-finish PCB. What more could you possibly want?

Where to get it: Ebuyer (bit.ly/1opPv2U)





Mojang: Microsoft Won't Ruin Minecraft

Smartphones For The Older Generation

'Grandroid' touchscreen with a few less bits and bobs

Welcome to this week's *Did You Know...*

Did You Know that only 3% of over 65s own a smartphone? Probably not a particularly shocking statistic, but it's this fact which Amplicomms is hoping to change with its new M9000 smartphone.

Promising all the benefits of an Android touchscreen, but with hardware and software adapted for the less tech-savvy out there, its feature-set includes an easy-to-use OS with big icons and loud, clear sound for those hard of hearing – it offers a volume level 100 times louder than standard mobiles, and excellent hearing aid compatibility. There's also a unique SOS button for emergencies, which

can be user programmed to call or text selected numbers.

The whole point of this release is that services are increasingly heading online, but that doesn't mean that older users be forced to miss out on online shopping, video chats and the like just because they find traditional smartphones a bit fiddly to navigate around? Digital inclusion is the watchword here, people, and with options to surf, listen to music with the built-in player, or look at what's on the calendar, this should do much of what most phones do.

The best place to go for this £140 phone, for yourself or someone you may know, is www.hearingdirect.com for prices and stockists.



Boss puts fears to rest

Vu Bai, COO of Mojang, has called for fans of *Minecraft* (and let's be honest, that's a lot of people) not to worry over the fate of their favourite game when Microsoft takes control.

Bui said: "Nothing's really changing. We have no plans on anything changing and, of course, I can't talk about the deal and I don't know

everything but we're still here, the game's still here and it's business as usual."

Business as usual, you say? In all honesty we doubt that very much as this is a huge acquisition for Microsoft to invest in, so there are bound to be some teething problems along the way. However, you know what they say. If it ain't broke...



Remember the days when all laptops were expensive? It really wasn't that long ago. Nowadays, though, you can easily pick up a serviceable notebook PC for less than £300. That's great if you're a student or casual user, looking for something to type on or for browsing the web.

If you want enough power for gaming, though, you're still going to have to pay big, and from my experience it seems to be the graphics card that's responsible for most of this cost. I've seen plenty of relatively cheap laptops with decent processors, loads of RAM and hard drive space, but they've been saddled with weedy on-board graphics that will make most modern games look like a slideshow.

Of course, many people play mobile games on tablets and phones but, having been asked on more than one occasion for a gaming laptop recommendation, I think there's a huge market for more affordable solutions. I certainly know I'd be interested in one – wishful thinking and all that.

See you next time...

Anthony

Editor

ViewSonic Debuts Ultra-Portable Projectors

LED-based beauties ready for wireless projection on the go

If projection is your thing, ViewSonic's work in this area will be no doubt known to you already. Now, the company has released a couple of mobile projectors in the form of the PLED-W600 and PLED-W800, both LED models with up to 600 lumens and 800 lumens brightness respectively.

Both feature WXGA resolution compatible with Full HD 1080p content, a contrast ratio of 3500:1 and SuperColor enhancement technology offering richer colour quality for vivid, "amazing" imagery. Both also feature 2x digital zoom and adjust automatically to match 4:3, 16:9 or 16:10 for the perfect picture.

Of the two, the PLED-W800 (pictured here) is the flagship, coming with a built-in media player for projecting Microsoft Office docs, PDF files, photos and videos directly from a SD or USB drive, with connectivity options such as HDMI-MHL, VGA-In and USB alongside an optional wi-fi dongle.

Both should be out there by the end of the month and you can expect to pay around £500 for the W800 model and £399 for the W600 – www.viewsoniceurope.com is the place to find out more.



Meanwhile... On The Internet...

If you're going to build the unique selling point of your internet service around the fact that it affords people anonymity, and thus a platform to get things of their chests that they'd never want to come back to haunt them (and then go so far as to describe said service as 'the safest place on the internet'), in this day and age you better be damn sure you're living up to those claims. Which is why the recent *Guardian* revelations about **Whisper.sh** are so worrying (tinyurl.com/Motl1334a).

The mobile app, and accompanying website, is famous for allowing users to make 'confessions' to the network in the form of image macros; and they do – by their thousands, every single day. While many are fairly mundane observations and admissions (more cringeworthy than criminal, sensitive than secret), in the two years or so since it was launched – initially as *WhisperText* – it has also become something of a repistory for confessions from members of the US military and other organisations (even countries) where speaking out without anonymity would cause significant problems.

It's this crossover with public interest – rather than the purely cathartic nature of sharing the odd confession or chunk of parochial gossip – that has caused *Whisper* to widen its horizons of late. At the start of the year, it recruited erstwhile Gawker 'viral guru' Neetzan Zimmerman (tinyurl.com/Motl1334b) to become 'Editor in Chief' at the service, and presumably explore opportunities for monetising and promoting content on the site. The first truly visible evidence being a deal with *Buzzfeed*, that would see the site's journalists have access to the site's content (tinyurl.com/Motl1334c) and analytics to source content that could be themed and generate stories for the viral news specialists. It would appear, however, that its attempts to court *The Guardian* and strike a similar deal has backfired, as it tipped the newspaper's staff off to some back-end activities which they considered to be contrary to *Whisper*'s very public claims – and even its terms of service (tinyurl.com/Motl1334d).

The Guardian claims that, the company's bespoke analytics software – to which it was granted access – tracks users locations even if they've requested that not happen, allowing the staff there to sort content by location and identify sources that may be posting from places of interest – say: military bases, government offices, even The White House and The Pentagon – and help determine the veracity of any statements it deems potentially newsworthy. What's more, the articles go on to claim that the site's staff are actively tracking individual users they feel may

Last week, we reported that the Crown Prosecution Service had updated its directives on how to deal with individuals who upload explicit images of people without their consent (tinyurl.com/Motl1333c) – and how they were looking to come down especially hard on those who seek to do this as a means of extortion or coercion. As part of that we also speculated that the new guidelines were an attempt to avoid creating specific legislation to target this so-called 'revenge porn', and to ensure it was punished under existing laws. However, it appears – if a report in *Ars Technica* (itself quoting *The Telegraph*) is true – that lawmakers are considering bringing legislation to deal with sites hosting such material as well, specifically as part of the Criminal Justice and Courts Bill currently working its way through parliament (tinyurl.com/Motl1334j). If true, it would offer another avenue for prosecutors to pursue, which can only be a good thing if applied properly.

be valuable sources, again without their knowledge, using information gleaned from their phone. Perhaps the most shocking claim, though, is that when *Whisper* learned that *The Guardian* planned to go public with the findings, it quietly changed its user terms to accommodate some of its actions.

Apparently *Buzzfeed* has suspended its working relationship with *Whisper* following the revelations, while *The Guardian* said it is no longer exploring a potential partnership. Unless it moves to counter some of these accusations soon, you may also see users abandoning the service in droves too.

Remember Dorian Nakamoto? The guy *Newsweek* identified as being the man behind the creation of Bitcoin? Well, he's now seeking to sue it for the trouble it caused with those apparently erroneous claims – and he's (irony of ironies) seeking to fund the legal campaign with crowdfunded Bitcoin donations (and good old Credit Card ones, too) – in the light of its refusal to respond to his request for sixteen "factual errors and incorrect quotes" to be retracted (tinyurl.com/Motl1334e) statements and quotes used in the article to be withdrawn. Good on him, we say... If you want contribute, or just read his side of the whole sorry story, you can do so via www.newsweeklied.com.

Side note: don't you just love websites that leave you in no doubt as to exactly what they're about?

.AVWhy? Videos For Your Eyes... Not Necessarily For Your Brain

It may have taken us a while to come across The Racka Racka's YouTube video *Most Epic Nerf War in History*, and it may have already clocked up something in the region of 3.5m views in the month or so since it was first uploaded, but we're afraid it's just too good not to share here – if only to make absolutely sure that there's nobody out there who hasn't seen this three-and-a-half minute slice of fried internet gold (tinyurl.com/Motl1334k). Oh, and because it brings back fond memories of *Spaced* (tinyurl.com/Motl1334l).



Aaaaaaaaand Finally...

Can't be bothered to watch whole movies (I mean, what is this, the 80s)? How about these helpful little pieces of work, then? The first, which comes courtesy of the aptly named *tl;dw* (which stands for 'too long; didn't watch': tinyurl.com/Motl1334f), attempts to explain the whole *Matrix* trilogy in less than 180 seconds (tinyurl.com/Motl1334g) but ultimately (like the rest of us) loses the will to live halfway through *Reloaded*. The second bravely tongue-twists its way through all 13 – yes, THIRTEEN – *Halloween* movies in less than two minutes. The fact that's even possible probably says more about the plots *Halloween* has used than the narrator's fast talking, though (tinyurl.com/Motl1334i).

Caption Competition

"I like the old way of getting my sight checked more than Apple's new iTest"



This funny looking fella was the star of our caption competition in issue 1332. There are no prizes for getting the best caption, just a whole load of kudos – and once again y'all responded with some excellent suggestions...

- **John Crawley:** "Harry Hill reviewed the selfie he'd just taken - that wiped the smile off his face."
- **RiceDG:** "So that's what MPs keep in their pyjamas."
- **John Crawley:** "Greg Wallace read the Strictly fans' tweets, and vowed he'd never attempt to dance again."
- **MrGifster:** "Look... look... I think it's Bending!"
- **Thomas Turnbull:** "My doctor told me to keep taking the tablets so I took this one from Argus"
- **Freakshow:** "Still waiting for these spinning circles to finish and for the damn forum to load..."
- **HunterTony:** "Note to self: never use my tablet for Chatroulette again... is he wearing a mankini?"
- **Doctoryorkie:** "Oh dear... I made a video in portrait view. I have vertical video syndrome!"
- **Doctoryorkie:** "With screen auto rotation enabled it is not possible to 'turn that frown upside down'."
- **Tis Me JB:** "My head's hurting, the missus said take a tablet, surely not?"
- **The VFM Addict:** "It was at that moment that he realised that he'd forgotten to tell Grandma how to turn off the webcam."

The winner this week, though, was Thomas Turnbull who sent "I like the old way of getting my sight checked more than Apple's new iTest." to us via email. Thanks Thomas!

To enter this week, head to the 'Other Stuff' section of our forum (forum.micromart.co.uk) and say something funny (but not too rude) about the picture below or email us via caption@micromart.co.uk.



Image: Jimmie [Oreo IS THAT ME?] Uploaded by JohnnyMrNinja via Wikimedia Commons

HTC Launches Selfie Snapper

New phone comes with 13MP camera

Phone maker HTC has released another new mobile, this one aimed at anyone who likes a good selfie. Well, isn't that everyone? No? Ah well.

Aside from the (arguably) gimmicky front-facing camera, the Desire Eye has a large 5.2" screen and is powered by a Snapdragon 801 processor with storage expandable with an SD card slot up to 128GB.

Available exclusively on Three, you can presume that this will be priced around £400-£500.

Also from HTC, the RE camera has opened up its hardware portfolio and is hoping to take on the likes of GoPro with its 16MP lens

which can record in full HD. Controllable via a smartphone, which can act as the viewfinder, the RE's existence would appear to place some questions around the firm's confidence in its place in the mobile market. Whether or not placing faith in powerful cameras is the right way to go remains to be seen, and we'll find out when this launches in the States this month.

htc

▲ Ironically, no photos, we're afraid – so here's a lovely logo instead

Now Symantec Splits Itself

Latest tech company to double up

US security software firm Symantec is the latest in an increasing line of technology companies to split its operations. The company has announced that it's now going to run two publically-traded firms

with one focusing on security and the other on storage. HP and eBay have made similar moves of late and analysts have commented on this by stating that it will likely make the company more attractive to a possible takeover.

 Symantec™

Snippets!

Samsung Wi-fi Claim

In the world of wi-fi, Samsung's name may not exactly leap out at you, but we could have the company to thank for what could be a significant technological leap. According to the company, its engineers have overcome a couple of technical problems that had previously restricted the transfer of data to rates well below theoretical limits. Indeed it claims to have made wi-fi data travel five times faster than currently by limiting the amount of interference data travelling on different channels. Let's hope this isn't just bluster from the company.

GTA5 Walk For Charity

Tommy Refenes, the co-creator of indie gaming favourite *Super Meat Boy* spent October raising funds for a diabetic alert dog for his mother. To do this, he undertook a sponsored walk, but not the conventional kind – oh no, for this stunt he virtually walked across Rockstar's open-world maps including *Red Dead Redemption*, *GTA: San Andreas* and *Grand Theft Auto 5*. The latter of these took him over six hours to complete, attested to by a live stream on Twitch. Anyone who donated was entered into a raffle to win some *Super Meat Boy* prizes and he reached his target of \$15,000 with well over a hundred days remaining.

Tesco Cuts Hudl By £40

Tesco's recently launched its second Hudl tablet, and accordingly has decided to drop the price on the original Hudl to just £79. The store will only have limited stock of the newly-priced Hudl as it brings its new Hudl 2 onto the market. While the offer is tempting, it's worth noting that the new model's been picking up some decent reviews around the web, so it may be worth a spot on your Christmas list. As for a Tesco Hudl phone? That's on hold for the moment.

Web-Designer Software For All

Powerful, but simple to use

Incomedia has announced version 11 of its popular, award-winning WebSite X5 software. The whole ethos surrounding X5 is that it's a combination of simplicity and power, providing a complete beginner or power user the means to cobble together a professional-looking website in no time at all.

New for this year is a host of features, as you'd expect, including a new graphic interface with a modern,

functional look, a renewed gallery of over 1,500 default templates, new apps including optional objects for dragging and dropping page content easily, a renewed text editor for better text selection, and the tools to provide your site with page optimisation to appear among the first on Google.

Available in five versions, from Home to Professional (which includes a year's free web hosting), you can look this up over at Incomedia's website www.incomedia.eu.



Devices In Police Evidence Wiped

Remote wiping found in investigation

Having remote access to your mobile device has always been pitched as a thing for good, as it means you're within easy reach of your digital content wherever you may be. However, for the UK Police it's become a bit of a headache.

It seems that, according to Auntie Beeb, smartphones and tablet devices that have been seized by Police forces in Dorset, Nottingham and Derbyshire (to name a few) are being

wiped remotely, thus destroying evidence in the process. It's also frighteningly easy to do as the technology behind it is there in case a phone is stolen or lost, in order to protect yourself from nefarious activity.

It's worth noting that a forensics expert was also quoted by the BBC as stating that seized phones should be placed in radio-frequency shielded areas to prevent remote wipes, but that presumably hasn't happened in these

Gaming School Launched

Now that's an education!

British gaming industry guru and entrepreneur Ian Livingstone has applied to launch a free school with lessons built around video gaming.

Quoted by the BBC, Livingstone said that he wanted to use games-based learning rather than "relentless testing, stating: "I'm passionate about children who have been born into the internet. I think they learn in a different way."

Were this to go ahead, the school would likely open in 2016 in Hammersmith. A formal application has gone to the Department for Education, so he's quite serious about offering students a chance to learn how to solve problems instead of worrying over exams. Let's hope this comes to pass – also, let's also hope that it works, raises some fiercely intelligent pupils, and finds a way to introduce *Match Day 2* into the curriculum.

3Tbps Speeds Achieved In Broadband Trial

BT and Huawei claim fastest ever fibre broadband speeds

Congratulations to both BT and Huawei; for, if there claims are true, they have just recorded incredible speeds as part of a field trial of broadband technology.

Using a 369km fibre cable in order to do so, the pair partnered up and increased the capacity of fibre cables by compressing gaps between

transmission channels. By increasing the density of the channels, they provided 50% more efficiency than standard network cables, with the result being a 3Tbps channel consisting of 15 sub-channels at 200Gbps.

In layman's terms, this is just really, really quick, able to transmit around 100 high-def films in just one second.

according to figures released in its Internet transparency report

Lenovo Launches YOGA Tablets

Ashton Kutcher adds a little glamour to launch

You know what every technology launch really needs? Aston Kutcher. You may recall that the Hollywood star and sometime Steve Jobs impersonator was recently brought on board at Lenovo as product engineer, presumably to help it ship a few products. Well now he's been given his first assignment in unveiling the new YOGA Tablet 2 Pro at a launch event in London. He wasn't there in person, though. Oh no. Satellite link-up was the way to go – Kutcher obviously loves Lenovo a lot, just not enough to actually get on a plane and turn up in person.

What did he have to say, though? Lots of stuff about how great the firm's YOGA Tablet 2 Pro is, presumably. Perhaps he sang its praises to the rooftops

over its built-in Pico projector, 8-watt sound system and QHD 2560 x 1440 screen. Or maybe he just showed his face on screen for a bit, said the right things and promptly went away. We'll never know as we weren't there, but we bet it was a hoot.

The tablet was launched alongside the YOGA 3 Pro and YOGA 2 Tablet. While Kutcher didn't talk about them, among the key features of the YOGA Tablet 2 are its larger kickstand and 8MP rear camera, while the YOGA 3 Pro comes with a 14nm fanless Core M processor, 13" 3200x1800 resolution QHD+ screen and 15 hours battery life.

Next up, Victoria Wood to sing a funny song to introduce the next Raspberry Pi model*.

(* Note: This isn't going to happen. Sadly)



▲ The YOGA Tablet 2 Pro's "Hang" mode. Erm, hang it anywhere you like



System Prep

Mark Pickavance talks through fully preparing a laptop for use, from unpacking to deployment

Here's an odd fact: until this feature, I didn't own a laptop. No, really. Working from home, I always have a desktop system handy, and I rarely travel away from base. That said, I like to be more sociable in the evenings, and having a laptop to work on would facilitate that, I decided.

The trouble with that choice was that I wanted something decent, performance-wise, and stumping up the money for a new Ultrabook seemed an unrealistic expenditure. So, in the end, I went with a refurbished machine, because it seemed a better value choice than getting something lower spec and totally new. I'm sure some people will slap their heads when they see what I bought and from whom, but it had the features I wanted at a price I could just about afford.

The reason I'm sharing all this with you is to help anyone who, in the next couple of months, is likely to get a new-ish laptop, perhaps for a student going off to university, perhaps as a present. The temptation is to get a new laptop, power it up and just start using it, but that needs to be resisted for a short while, because there are a series of procedures that you need to go through before it's ready for deployment.

Is that the courier I hear trying to push a card through the door and run away without delivering anything? Yes, it is – but despite his best efforts to abscond with my new toy under his arm, I just have time to nab him and explain some preparation work that I've already done between ordering and delivery.

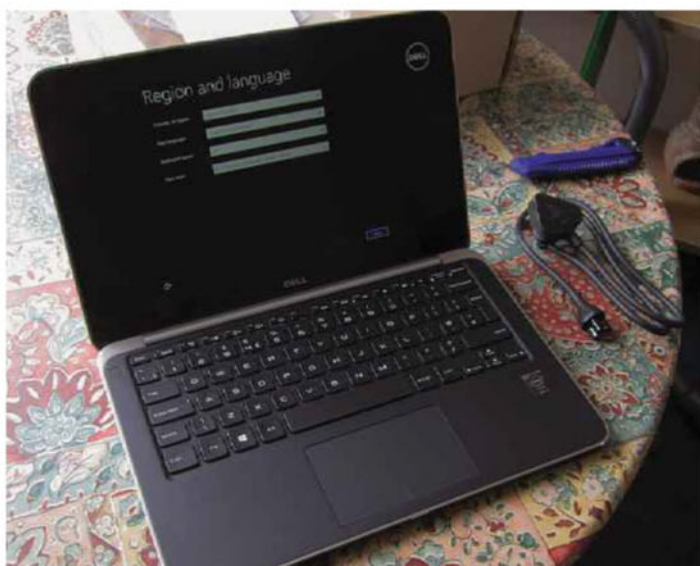
Pre-prep

Once you've got your equipment on the way, it's time to make some plans about exactly what you intend to do with the system once it goes live. Here's what you need to ask yourself:

- What software will it need?
- How will it connect to the internet?
- What's my plan to secure the personal information on there?
- Are there any possible upgrades I might want to make now?
- Who will use the system from a user account perspective?
- Does it need physical protection for travelling?

These might seem straightforward enough points, but it's amazing how many people use a machine for a few months before asking themselves any of them. By answering some or all of those questions you can purchase upgrades and buy software licenses ahead of the machine arriving at the doorstep, and you can also organise yourself an external drive for storing backups.

A good plan – and a great time saver – is to get spend a while with that external drive and putting on it all the things you're likely to need from a driver and software perspective. Having all these handy bits and bobs organised into folders – say, 'Drivers' and 'Install' – is also helpful should the system die and you need to repeat this work. As you go along, if you add something via the internet, it's worth copying it to these folders, so it's ready for a bare-metal installation. Other information you



need handy are all the logins and passwords you use, especially the one for your local wi-fi.

With the files that might be need and information you'll certainly need, you'll be ready for the next stage when the hardware actually arrives. The preparation I'd done covered those bases but also involved researching how a person who works almost exclusively with Windows 7 and Google services could best adapt a system that has Windows 8 installed and is orientated towards Microsoft's services.

Windows 8

From reading enough tech forums, I'm well aware what a generally divisive subject Microsoft's latest OS is. It's not my intention to rub anyone the wrong way, so if you're a fan of Windows 8, I'd look away now and perhaps skip to the end of the feature. Or even the next issue.

When the system arrived, it had Windows 8.1 on it, though not the 'Windows 8.1 update' additions. It also, by chance arrived on a Patch Tuesday, so almost the first entire day of use involved watching huge amounts of file installations take place, one after another.

But before I got those underway, I added myself as a user, which you're invited to do when the machine powers up for the first time. I'm not a fan of Microsoft's services or the Modern interface ('Metro' if you prefer), so what I don't need is a Microsoft account.

But Microsoft doesn't make operating without one easy, because it hides the option until it's forced to eventually provide it.

If you don't want a Microsoft account, then the simplest method is to enter a junk address when you're asked for the information. Windows 8 will go off and work out that the



account doesn't exist, and then – and only then – will it offer you a box with 'Create a local account'. What's important to understand is that you can convert this to a full account later, if you suddenly decide that you love Metro apps, but I can't see this happening to me personally.

Adios Tiles And Charms

After I'd got the system up and running I was confronted with the tiled interface, providing rapid access to lots of apps I had no intention of using. How few of these default apps I needed became very apparent when I initially started to unpin them from the Start layout. The more I removed, the sillier it got, to the point where I realised I'd be left with a single tile: Desktop.

“ It's not my intention to rub anyone the wrong way, so if you're a fan of Windows 8 I'd look away now ”

Thankfully, before I got to that point, the 8.1 upgrades finished and I had the new option to go directly to the desktop at boot. This feature is part of the 'Taskbar and Navigation properties' that you can access if you right-click on the desktop taskbar.

This 'Taskbar and Navigation properties' panel has a number of really useful tick boxes on it for the desktop user. The one you need to tick is the one that starts 'Go to the Desktop', as this allows the system to bypass the Metro interface completely. If, like me, you keep bumping into the charms, you can





also disable the corner navigation that brings that panel up. However, the problem with doing these things is that getting to some of the functionality you need isn't easy without those two features, so I need to add something back that gives me easy access to them.

There are some good paid-for tools that do the same, but I went with Classic Shell (www.classicshell.net), a free application that brings the Start menu back almost exactly like the one Microsoft took away. For a short while, I also considered purchasing and installing 'ModernMix' by Stardock, an application that allows Metro apps to run in a Window, but before I'd spent £3 on that, I came to the conclusion that there weren't any Metro apps I really needed, so I saved myself that small investment.

After these changes, my laptop effectively worked like a Windows 7 system, but it wasn't without a few Windows 8 oddities I was determined to address.

Yet More Fixes

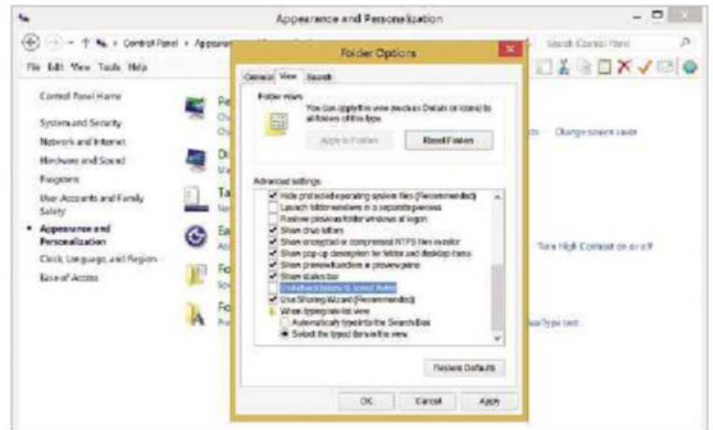
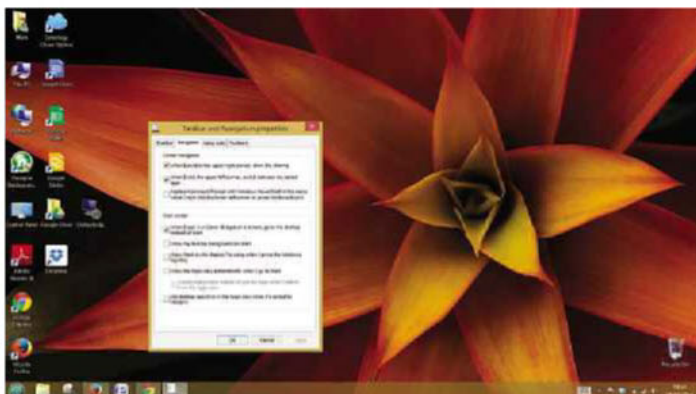
One feature that annoyed me from the outset was the tick boxes on all the desktop icons. Not sure why this was done, because you can see the icon highlight much easier than the tick, even if you use touch.

Thankfully, eliminating this feature isn't difficult if you can open the control panel and select 'Appearance and Personalization' and then 'Folder Options > Show Hidden Files and Folders'. A quick scroll on this panel will locate 'Use check boxes to select items', where you can uncheck it.

That wasn't the only tweak I made; here are a bunch more:

Disable Bing Online Search

If you leave Bing Online searching enabled, whenever you look for a file on the PC, it insists on checking the internet for it too, unhelpfully. You can disable this in 'PC settings' and 'Search and



apps, a Metro interface that Classic Shell provides a route to on its 'apps' menu.

Enhanced Win-X

Microsoft put a useful feature in Windows 8 and then decided not to tell anyone about it. Pressing the Windows key and X brings up a useful menu. It would be nice if you could put your own feature on this menu, which you can if you install WinAero's free Win+X Menu Editor (winaero.com).

Remove The File Explorer Ribbon

Windows 8 seems determined to use up screen space for no real benefit. One of the examples of this is the Ribbon that appears in the Explorer panel. You can get rid of it with another tool made by Winaero (winaero.com) that recovers this space. What's clever about this is that it doesn't ruin Paint or Wordpad doing it.

Stop Opening Modern Apps

If you have a desktop app and a modern version, why would you want the modern one to default? You wouldn't. If you go into the Control Panel and select Programs you can get to the defaults, and set the desktop apps as 'default'.

No Swipe

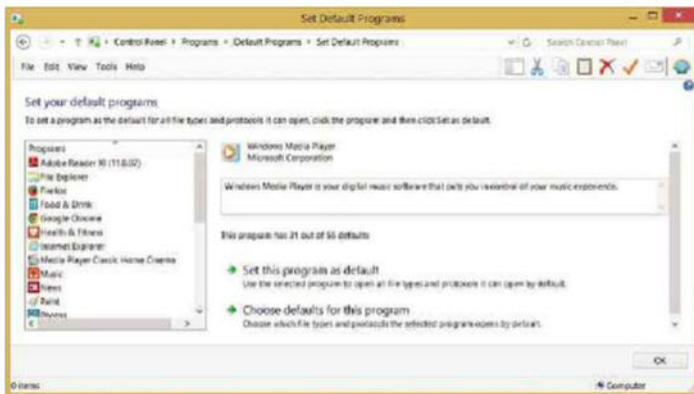
This is a super annoying feature that I was glad to banish. When you power the PC on, it insists on covering up the login with rubbish that you must either swipe or spacebar away before it allows you to log in.

To fix this, you need to find or add a 'Personalization' Key to HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows in the registry, and then add a DWORD 32-bit to that called NoLockScreen, with the value 1.

Special Sauce

With Windows 8.1 declawed and the PC operating pretty much as I wanted, it was time to load up the tools that I use on a daily basis. When I installed all the updates, one of them was the tool that the EU insists that Microsoft includes to allow you to easily install alternative browsers to IE.

So which browser did I pick? This might seem odd, but I actually use both Firefox and Chrome at the same time. I use Chrome mostly to access Gmail, and I use Firefox for general links. By having both, I always know that if I get an email alert that I'll find that email on Chrome and not need to search through the Firefox tabs to locate the Gmail page. Or that's the theory. It also allows me to avoid using IE – something I've managed successfully since version 6.0. With both browsers, it's possible to sync the bookmarks with other versions on my tablet and desktop PC, which is well worth the extra time to do.



The final piece of my software jigsaw is an application that comes from Synology, a company that makes high-quality NAS devices. I have a Synology NAS box, and I've installed a feature called 'Cloud Station'. What this does is live duplicate a given folder on the PC to a home storage location (login based) on the NAS, and it does this for multiple systems. So I can create a document on the laptop in that folder and close it, and before I get to my desktop PC the file will already be there. It can go wonky on occasion, and it should be more flexible than it is, but most of the time it works wonderfully, with my files following me around.

Once I activated this, I left the laptop for a while to fully synchronise with the Synology Diskstation, at which point the machine was ready for deployment.

“ It's time for a totally different and marginally more brutal approach ”

Or it would be, if I didn't need to make a major modification to it before it was used in anger and also make sure it was fully secured against drive/system failure.

Creating An Image

Microsoft actually provides a system imaging tool these days, rather than you needing to deploy a commercial to do that work for you. Or that's the theory, anyway. To find this well-hidden feature, you need to open the Control Panel, go to System and Security, select File History and look for 'Create a System Image' in the left-hand pane.

I used a Seagate Backup Plus drive as the location for the image, as it's a reasonably quick drive when attached with a USB 3.0 port. Less than ten minutes passed, and I had copied the whole system to the external drive.

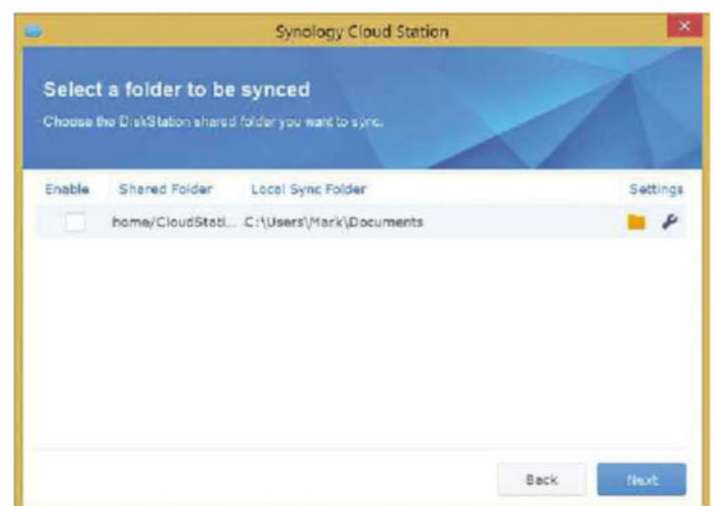
After that, you need to create a 'Recovery Drive', which you can boot to start the process of recovering the image to the empty SSD. You can do this to a DVD disc, but I chose to use an old Corsair USB key that fit the criteria of having at least 8GB of space on it.

With the image and recovery key both made, the next stage was to upgrade the XPS – something that Dell doesn't really encourage

I also need Microsoft Office installing, even if these days I almost exclusively use only Word. I could probably ditch that too in favour of a cloud-based editor, but I've worked this way for at least 25 years, so I'm not very inclined to change now.

There's also a necessity for a pile of software junk without which a PC isn't really configured. These include Adobe Reader, Winzip, Printer utilities (Canon), the CCCP codec pack, Dropbox and Google Drive.

I also have a couple of special tools that I use, one of which is an interface to an old Belkin device, the USB Hub. This remarkably useful gizmo allows you to network USB devices, and I use it with my Brother laser printer and Canon Pixma printers. However, Belkin stopped making and supporting this device some time ago, but I discovered that it was possible to install the Windows XP software once I'd located a special device driver from Silex, the company that makes the technology in the Belkin USB Hub.



you to do. In fact, the SSD is the only upgrade you can reasonably perform on this system, as you can't even access the RAM or other parts. It's also worth noting that to add confusion, Dell also has its own backup solution called 'Dell Backup & Recovery'. What's really odd about this is that it's managed to insert it into the Microsoft recovery USB software as the default technology.

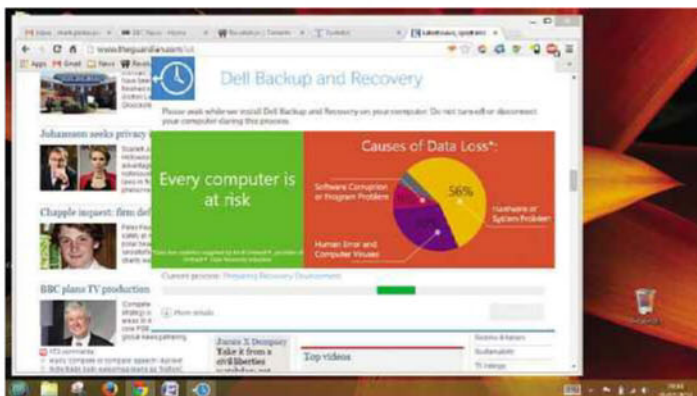
I need to state right now that Dell's backup solution isn't great, for a number of critical reasons. Firstly, the version that comes on the XPS only operates in its 'Premium' network mode for 30 days, and beyond that it can only back up to locally attached storage. Premium mode allows you to secure to network locations – something Microsoft's built-in solution does for free. The entire purpose of the Dell solution seems to be to sell you something you don't need, and on the back of 'Premium' it also tries to flog you cloud storage for your backup image to be secured away from local fiascos.

For numerous reasons, I don't want either of these, and I've since uninstalled Dell's tools. That leaves me with the Microsoft solution, which should surely do what I want in this instance? No, that would be an entirely wrong conclusion.

I tried that, and it refused to restore, giving an entirely spurious reason for not performing this straightforward action. I think the problem lies between partition sizes and UEFI, but frankly that it doesn't work shows how little any of this stuff is ever tested. It's time for a totally different and marginally more brutal approach.

An SSD Swap

Even before I'd installed everything needed, I began to notice that the 128GB SSD that Dell installed was rapidly filling up. Luckily, those nice people at Corsair had recently sent me a bigger and better mSATA drive, which could replace the one in the Dell. There are only a couple of potential problems to doing this, the first of which is that I'd just spent some time applying patches and apps, and I didn't fancy repeating that exercise.



The other is that Dell doesn't provide Windows 8.1 installation media, so the only place to get the OS is from the existing installation. My original solution was to image the existing SSD to an external hard drive and then go a bare-metal recovery. That is drastic, but as there isn't a second mSATA slot on this machine, there wasn't any other realistic option.

“ This, as a bonus, solves the problem that neither Microsoft nor Dell can provide a means to effectively image this system between them ”

It's worth saying that this probably invalidates my warranty. Realistically, I'm not going to want to use it with so little disk space, so it's nearly time to deploy the screwdriver. On the other hand, as a bonus, this solves the problem that neither Microsoft nor Dell can provide a means to effectively image this system between them.

The Not Easy File Transfer Wizard

What you might have noticed is that I didn't transfer my files and settings from my desktop computer, which would have been the logical thing to do. That might be logical maybe, but achievable? Not so much.

If you're tempted to do this, as you might have done previously moving from Windows Vista to 7 perhaps, then you need to realise that Microsoft has entirely mucked up that upgrade path, mostly through utter incompetence.

Under Windows 8.1, the Easy Transfer Wizard would normally be expected to interface to the identically named tool under Windows 7, which generates a special code at the Windows 7 end to initiate the connection.

Well, it did – once. After being upgraded from Windows 8, the network option under Windows 8.1 is no longer an option. That's not a typo, I can assure you.

Since the upgrade to 8.1, you can't connect two computers over a network (wireless or wired) and use Easy File Transfer in this context. You can do it with an external drive or a special cable, but the easiest option is now defunct. Oh, and you can only use it where the source system is Windows 7 or 8; Vista and XP are both very ugly children and are therefore entirely ignored.

You also can't use the tool to move between two 8.1 installations either, in case you wondered. Given that Microsoft is having a mighty



struggle getting people to move to this platform, you'd think that it would smooth the way, rather than paving it with landmines.

Thankfully, none of this information was news to me, like it would be for most users, and I avoided going down this route. If you insist on transferring from an existing system to a new one under Windows 8.x, you might want to consider Laplink or something similar, because that tool has the features to achieve this task.

My solution was to take the mSATA SSD out of the Dell, connect it to my test rig and make an image of it using Paragon Backup & Recovery. Then I swapped that drive over for a blank 256GB Crucial M550 mSATA and wrote the contents to that, before putting it back in the Dell. I still have the original LiteOn 128GB SSD in case I need to return to the point where I swapped storage, and my system is now both bigger and much faster than it was previously.

As a belt-and-braces approach is my favourite, I've also kept the Paragon partition files, so I can blitz another SSD if that's needed.

With my documents being secured by CloudStation and my installation secured by Paragon, I'm reasonably well covered for potential system catastrophe.

Final Thoughts

I wrote this to show that there is usually a fair amount of work to do in preparing a system for use, rather than just taking it out of the box. The temptation is often to start using it before many critical tasks have been done and then to get annoyed when the system doesn't know what to do with a common file type.

That's irritating, but it's nothing compared with the pain of losing all your files and configuration if you don't do an effective backup. I've seen so many people who say 'I'll do that later' and then never do.

With my system I was actually able to combine that exercise with an upgrade, although as I documented, the tools that are provided for this job might let you down when you most need them to work. A backup you can't restore isn't a backup, whatever the system tells you.

As for my System, I'm still getting to grips with some of the changes that Microsoft made between Windows 7 and 8. Perhaps in another six months I'll create another image when I've tweaked things further – or after Windows 9 has come along and entirely changed the landscape once more.

Despite the issues surrounding recovery, I'm generally pleased with the computer, as it fulfils the brief I set out in terms of performance, battery life and portability. It would be nice if you could fill out a page on Dell's website when you order a PC and have it pre-tweaked, but some things are probably best left to the individual.

I'm certain that I've probably annoyed fans of Windows 8 and Microsoft by almost entirely ignoring all the new features of this OS. However, if I'd had the choice, this machine would have been pre-installed with Windows 7, so I'm just making the system closer to what I originally wanted.

Getting a modern 'Haswell' processor Ultrabook with Windows 7 on it isn't easy, and what I did was take an alternative route that does open the possibility of upgrading to Windows 9 later, should that be worthwhile. [mm](#)





The Fuze Project

David Hayward returns to basics, with this wonderful Raspberry Pi endeavor

The Raspberry Pi has ignited the imagination of countless people since its release a few years ago now. We've seen it sent to the edges of space on a weather balloon, stuffed into the insides of a retro computer, turned into an arcade machine, fitted into the dashboard of a car and put to many other innovative and interesting uses.

While these are all fine and well, the main aim of the Raspberry Pi project was primarily to help children and young adults become more adept at programming a computer, learning electronics and basically being more aware of what's happening inside the technology they use daily. As with the home computer boom of the 80s, where scores of youngsters took to the keyboards of the Spectrum, BBC Micro, C64 and other machines, the Raspberry Pi is designed to instil that same kind of fascination and experimentation with technology.

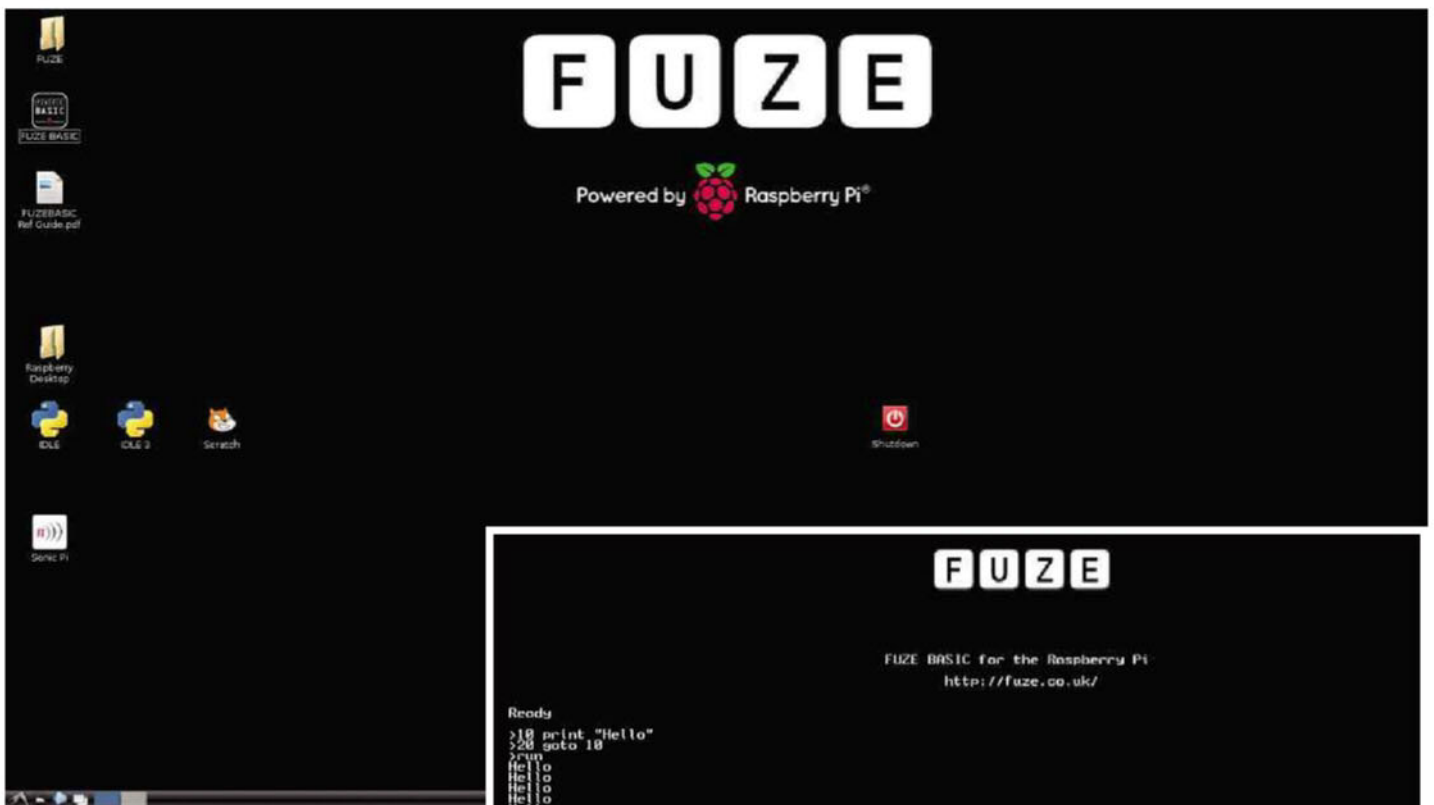
However, for all of its good intentions the Raspberry Pi does have its problems. For

one, it's not particularly powerful, which keeps the overall cost down, but it does limit it somewhat when a user is waiting for something to load up or install. And secondly, it's not very appealing to the 'average' child, teenager or even older enthusiast.

The fact that it comes as a naked printed board can be quite off-putting to some degree. We've seen high school age students groan when one is placed in front of them, thinking that it's something they're going to have to solder and toil over to get even a beep out of.

It's also not the friendliest interface either. Raspbian is a great example of a Linux distro done right, but it's still quite difficult to get your head around if you're used to Windows. And there's also a rather niche clientele associated with it or at least the ones who have jumped on the bandwagon – the type who would scoff at someone simply because their own knowledge of Linux is better.

These are, admittedly, minor complaints that can be overcome easily enough if you



▲ The customised Raspbian desktop has everything you'll need to get started

► The familiar 10..., 20... still works, but there's more involved here

take the time to set the RPi up beforehand and you have a fixed goal in mind; that can be time consuming though. What you need is a complete educational solution, one that packages the Raspberry Pi in a suitable environment, one that can easily be considered as a computer and not some random bit of electronics, and one that has everything you'll need to get into programming and electronics without the hassles of first getting it off the ground.

The Fuze

The Fuze is a remarkably designed project: a Raspberry Pi powered, programmable computer and electronics workstation that's neatly packaged in a well-crafted all-in-one keyboard that's slightly reminiscent of the BBC Micro.

The casing is made from sheet aluminium and is tough enough to stand the rigours of the classroom. Housed by the case is an 88-key keyboard with a lovely tactile feel to it, despite not being mechanical. Along the top of the keyboard you'll find a raised plastic Fuze logo and 'Powered by Raspberry (the RPi logo) Pi', along with an LED strip indicating Numlock, Caps and Scroll Lock.

Further back, along the top of the Fuze, is a recessed area where you'll find a custom,

Fuze-specific GPIO break-out board with ample room to lay the accompanying slim breadboard alongside.

The rear of the Fuze features a connection to the HDMI port on the Raspberry Pi inside the case, along with mini USB, audio jack, Ethernet, SD card slot, four USB ports, power socket and power button. The ports are fitted neatly into the casing and are screwed in place to stop them popping into the casing – something which we're pleased to say didn't feel like happening anytime soon.

Inside the casing you'll find a model B+ Raspberry Pi (on the newer Fuze units), together with the extra functionality that comes with the more recent version of the RPi and the decent 512MB of system memory. In the box you'll receive a wireless optical mouse; branded Fuze mouse mat; the aforementioned 840 slim breadboard; setup instructions and project cards (which we'll cover in a moment); a programming reference guide; and a sectioned toolbox electronic component kit consisting of various

jumpers, wires, LEDs, sensors and micro switches. The entire package is put together extremely well and offers the user, student or teacher the foundations for programming and small-scale electronic experiments.

The Fuze is the brainchild of Jon Silvera, founder and managing director of Fuze Technologies. Jon is a former Spectrum owner himself and a chap who, like many of us of a certain age, was getting his hands dirty and up to his elbows in Basic nigh on 30 years ago. His vision therefore is to use the ethos of the Raspberry Pi Foundation and offer a more compelling platform on which students can learn how to program and interact with a computer and electronics with far greater ease. To this end, he and the Fuze team have created a base: the Fuze itself, a customised Raspbian installation on an SD card and their own version of Basic, Fuze Basic.

Fuze Basic

With the SD card inserted and the Fuze hooked up to a monitor and network, it



doesn't take too long to boot into the Fuze customised Raspbian desktop. Once in there, the main educational titles are placed on the desktop for easy access, along which Fuze Basic resides.

Fuze Basic can best be described as a tribute to the classic BBC Basic, a programming language that many of us cut our teeth on. But it's more than a mere resemblance: Fuze Basic is a text editor in itself and contains various commands and syntaxes familiar to those who have an understanding of the Basic language, with the added benefit of being able to program, using Basic, directly to the GPIO board. This of course means that with the right Basic commands, you could light up a row of installed LEDs you've placed on the breadboard or, better still, you could even program a GPIO-connected robot arm.

Granted the same level of interaction can be achieved through Python, the language that the Raspberry Pi Foundation pushes, but there's something lacking in Python that Basic makes so much more interesting, clear and fun. This is where the Fuze and Fuze Basic shines. It's designed to make learning programming fun, fast and friendly.

Needless to say, one of the first experiments you'll no doubt test when opening Fuze Basic is:

```
10 print "Hello"
20 goto 10
```

This work, but the Fuze version of Basic allows for a little more control over the process, so its stylised syntax of the same program would look like this:

```
10 cycle
20 print "Hello"
30 repeat
```

After this, you'd execute with the all too familiar 'Run' command.

The included project cards, which we mentioned earlier, detail the beginnings of the Fuze Basic language, walking you through the first steps of the 'Hello World' listing through to a more complex setup of changing the screen colours, the text colours, asking for input and storing it as a variable.

This is particularly interesting, because rather than getting to computer to output something, the student is actually interacting with it. And furthermore the language is familiar to those of us who did this the first time around:

```
10 CLS
20 Input "What is your name? ", name$
30 Print
40 Print "Hello "; name$; ", how are you
today?"
50 End
```

It doesn't take a programming genius to understand the concept, and it's a more understanding way of learning the structure of a program. All the student then needs is to familiarise themselves with more commands until they eventually come up with a working game, of a sorts.

As the student (since we're assuming it's a student using the Fuze) progresses, there are numerous assessments at the end of each stage of the project card, such as asking what their favourite food is, how old they are and using If and Then statements to respond to someone entering an age over a certain value. It's easy enough to understand, but it's the building blocks of programming that makes it important, and regardless of its age, Basic remains the most accessible programming language for the beginner.

The final section of the included project card starts to introduce the student to the basic electronics package that comes with the Fuze. Rather than going into great depths where electronics are concerned, the Fuze

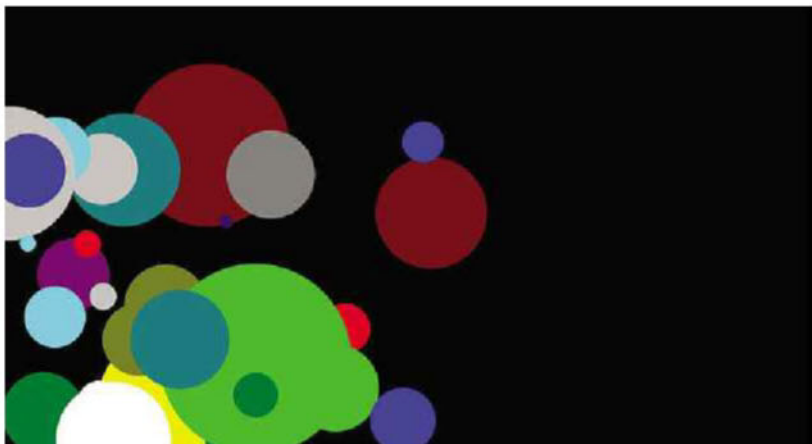
F-Key Assignments

The Editor F-Keys can be called up at any time by pressing the F1 key, but here's a handy list just in case:

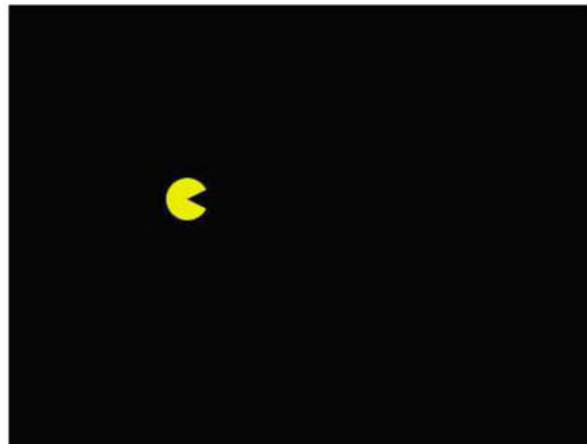
F1: Help
 F2: Load a program into the editor
 F3: Load and Run the program
 F4: Toggle Keyword colouring
 F5: Save current program to file
 F8: Load a new file
 F9: Revert to the last save
 F10: Insert a file
 F12: Erase the edit buffer
 Escape: Exit the editor

Furthermore, the following keys are used for editing:

Arrow keys: Move the cursor
 Ctrl+A or Home: Start of a line
 Ctrl+E or End: End of a line
 Page up/down: Page up or down
 Ctrl+Z: Centre page on the current line
 Ctrl+F: Find specified character
 Ctrl+W: Search for a word
 Ctrl+J: Jump to a line number
 Ctrl+G: Display the current line number
 Enter: Insert a new line
 Ctrl+O: Insert a new line over the current one
 Ctrl+S: Swap the character with the one to the right
 Ctrl+D or Del: Deletes the character under the cursor
 Ctrl+H or Backspace: Deletes the character to the left of the cursor
 Ctrl+K: Kill and copy the current line into the paste buffer
 Ctrl+U: Paste the deleted lines above the current line
 Ctrl+V: Paste the deleted lines below the current line



▲ The end results are what fired the imaginations of the previous generation of programmers



▲ The Pacman listing being run (from the boxout)

team have devised some simple instructions to connect a series of LEDs to the GPIO and breadboard and, using some Fuze Basic commands, to get them to light up:

```
10 CLS
20 Pinmode (0,1)
30 Cycle
40 DigitalWrite (0,1)
50 Wait (.1)
60 DigitalWrite (0,0)
70 Wait (.1)
80 Repeat
90 End
```

This will light up one of the LEDs connected to GPIO zero, then power it back off again. Obviously the project expands from then on and includes multiple LEDs across six GPIO connectors to produce an array of flashing LEDs.

Although brief, the project card does do justice to the inner depths that Fuze Basic can reach. Where one student will program it to ask for a name and age, another will incorporate flashing LEDs and tuneful ditty based on set responses from the user. In many ways, that's the beauty of Basic and the overriding educational aims of the Fuze project: each student can achieve what they want from the kit.

Finally, it's worth mentioning just how surprisingly powerful the Fuze Basic Editor actually is. Rather than it being a simple text interface, the Editor has a number of functions to help with programming, including syntax colour coded highlighting.

To enter the Editor function, you simply launch Fuze Basic and type in 'Edit'. From there you can program as you would normally through any Python or Notepad++ editor, and by using the F-keys you can save, load and run, load new files, revert to last save and erase the edit buffer.

There's also a complex graphics mode that far exceeds the traditional Basic limitations. Fuze Basic has two graphical modes: high resolution and low resolution, each with their own number of pixels.

The high-resolution graphics mode can be accessed with the HGR command and follows a structure similar to this:

```
HGR
COLOUR=AQUA
CYCLE
CIRCLE (GWIDTH/2, GHEIGHT/2, 100, TRUE)
UPDATE
REPEAT
```

This will display a circle on the screen. To adapt that further, you can include random numbers, variables and the 'Update'

command to update the screen graphics in a loop, such as:

```
HGR
Cycle
CLS
Col=RND(15)+1
Wid=RND(1023)+1
Hi=RND(767)+1
Radi=RND(250)+1
Colour=Col
Circle (Wid, Hi, Radi, true)
Update
Repeat
```

This, as you can imagine, will display filled circles of varying sizes and colours at random points on the screen (indeed, if you take out the CLS the screen will fill with coloured circles forever). You can extend this even further by calling BMP images and using them as sprites using the 'LoadSprite' command.

Back To Basics

As with the hardware involved with the Fuze, the operating system, desktop look and Fuze Basic, everything is in continual evolution and improves with each new release. Sections are fine-tuned, additions are made and the documentation is updated to reflect these changes in a manner that's easy to understand for students, teachers and home users.

The hundreds of commands available through Fuze Basic, the ability to load external files into a program, draw sprites, incorporate sounds and interact with the GPIO board makes the Fuze an ideal educational and hobbyist tool. Added to this is the fact that although it's built on a customised Raspbian, you can also run Python, Scratch and all the other usual educational programs available to the Raspberry Pi. It's hard to fault the Fuze at all, and its educational impact is certainly worth considering, especially for IT teachers.

Conclusion

A lot of passion and hard work has gone into creating the Fuze and Fuze Basic, as well as its accompanying projects and kits.

It's a hobbyists dream come true and one of the better uses for the Raspberry Pi that we've seen since its launch. The fact that its design is that of an old BBC Micro, the school computer, is a wise decision on the part of the developer. And of course the amount of effort that has been put into creating Fuze Basic is commendable. The only limit therefore is the imagination of the students, teachers

Pacman

Using an example from the Fuze Basic guide, here's an interesting look at sprites and movement.

1st Program to run:

```
HGR
COLOUR=Yellow
CIRCLE(100,100,50,TRUE)
SaveRegion("pacman1.
bmp",50,50,101,101)
END
```

2nd program to run:

```
HGR
COLOUR=Yellow
CIRCLE(100,100,50,TRUE)
COLOUR=Black
TRIANGLE(100,100,150,125,150,75
,TRUE)
SaveRegion("pacman2.
bmp",50,50,101,101)
END
```

3rd program to run:

```
HGR
COLOUR=Yellow
CIRCLE(100,100,50,TRUE)
COLOUR=Black
TRIANGLE(100,100,150,150,150,50
,TRUE)
SaveRegion("pacman3.
bmp",50,50,101,101)
END
```

And to make Pacman cross the screen, the 4th program to run:

```
HGR
pacman=NewSprite(3)
LoadSprite("pacman1.
bmp",pacman,0)
LoadSprite("pacman2.
bmp",pacman,1)
LoadSprite("pacman3.
bmp",pacman,2)
FOR X=1 TO GWIDTH STEP 25
CYCLE
FOR S=0 TO 2 CYCLE
PlotSprite(pacman,X,GHEIGHT/2,S)
UPDATE
WAIT(.05)
REPEAT
REPEAT
HideSprite(pacman)
END
```

and users. The Fuze, however, is more than capable of keeping up.

For more information regarding the Fuze and a link to the site shop as well as resources, downloads and updates visit www.fuze.co.uk. [mm](http://www.fuze.co.uk)

Canon Pixma MG7550

Michael checks out a six-cartridge multifunction device from Canon

DETAILS

- Price: £190
- Manufacturer: Canon
- Website: www.canon.co.uk
- Required spec: Windows XP or later / Mac OS X 10.6.8 or later, 3GB disk space



Forming part of Canon's latest line-up of inkjet printers is the Pixma MG7550 unit. This multifunction device offers print, scan and copy functionality with a choice of USB, Ethernet or wi-fi connectivity.

The overall appearance of the Pixma MG7550 is reasonably stylish, and you have the usual arrangement of an A4 flatbed scanner mounted on top of an inkjet printer.

Providing access to the unit's features is a touch-sensitive control panel positioned below the scanner lid. This panel features various buttons and a colour screen displaying menu items and status messages. Generally the available buttons, power and wi-fi apart, only become visible when they're relevant to the current operational mode. To the right of this control panel is an area designated for NFC functionality, enabling a smartphone to communicate with the printer.

The Pixma MG7550 is a six-cartridge device. Along with the usual black, cyan, magenta and yellow cartridges, the printer makes use of grey and pigment black offerings, with the latter being nearly twice the size of the others. Once the cartridges have been inserted, a light will glow red to indicate that each is firmly seated, and the printer will



produce a test sheet to check on head alignment. Normally this process should take six minutes. In my case, the time was doubled as the printer rejected its first attempt and reran the process.

The Pixma MG7550 comes with two paper input cassettes. The top cassette is for small photo paper, such as 4 x 6 inches and 5 x 7 inches, while the lower cassette allows you to insert A4, B5, A5 and letter-sized copy or

photo paper. When replenishing either of these cassettes, a message will appear on the screen asking you to confirm the type of media.

Printed documents are ejected onto a tray, which automatically drops down prior to the printing process. With this tray lowered, you gain access to memory card slots for MS Duo and SD formats.

A supplied CD will lead you through the setup procedure

for your choice of connection. When I opted for wi-fi, I needed to initially have a USB connection before the wi-fi link could be achieved. The CD contains the usual Canon bundle of drivers and utilities that include My Printer, My Image Garden and Easy WebPrint Ex.

Using my standard 101-word document, with and without a small image, I ran various tests of the Pixma MG7550 print speeds. The results can be seen in the table below. Print quality was fine even with the fastest Draft mode. It was easier to spot the different between the different modes when examining the small image, which has far better definition with High quality.

Switching to photo printing, using the My Image Garden software, I achieved the following timings when printing borderless photos. Image quality with all the photos was of a high standard.

The unit's copy facility, with a maximum run of 99 copies, took 17 seconds to scan and print a full colour A4 copy with a resolution of 9600 x 2400. Replacement cartridges are priced at £10.16 for black and £8.70 for the individual colours.

mm Michael Fereday

Reasonable speed and good quality but slightly pricy

Pixma MG7500 Print Runs		
	Monochrome	Colour
Draft	24ppm	17ppm
Standard	22ppm	13ppm
High	9ppm	3ppm

Pixma MG7550 Photo Printing		
A4	10 x 15cm	13 x 18cm
2 minutes 15 seconds	10 seconds	27 seconds



Wacom Bamboo Stylus Duo

The master stylus maker creates something useful for all tablet owners

DETAILS

- Price: £25
- Manufacturer: Wacom Technology Corp.
- Website: www.wacom.com/en/gb
- Required spec: Tablet with capacitive touch-screen
- Product code: CS-170



Anyone who owns an iPad or Android tablet and uses it on a regular basis will be familiar with the repeated exercise of removing oily fingerprints from the screen.

Until someone devises a cost effective and durable hydrophobic coating for glass, fingers will leave visible marks on, it obscuring the display.

For a while now, I've lessened this problem by using a stylus. That reduces the fingerprint problem and also allows for more precise selection of small items in games and apps.

The Bamboo Stylus Duo (third gen) is designed specifically for this job, coming from a company that's made a big business out of pen-like devices. The 'Duo' part of the Bamboo Stylus design is that it's added a good-quality ballpoint pen at the opposite end of the barrel.

In use, the cap can be placed on either end, depending if you're writing or using a tablet, and it doesn't feel quite right to hold if it's left off.

But where this device really impressed me was the design of the soft tip for tablet work, which is a major improvement over any others that I've used.

A couple of years ago, I got an STM stylus, which has a rubber cushioned tip on one

end. In use, this had developed two problems, the first of these being a lack of durability and lack of replacements from STM. The other is that the rubber material picks up oils deposited by fingers and transfers it around the tablet surface.

I can categorically say that the Bambo Stylus Duo doesn't have either of these flaws, even though it costs roughly the same as the equivalent STM product. Replacement nibs are sold in packs of three for £4.99, and the material they're made from doesn't leave visible streaks at all.

According to Wacom, the nib is made from carbon-fibre woven fabric with a silicone core, and it glides over glass like a hot puck over ice. This makes it great for

fast paced games or those that require a degree of dexterity, and it's a pleasure to use generally.

I have only two caveats to air about this product, and the first is the 'Duo' aspect.

Having had a stylus for two years with a built-in pen, I don't recall ever using the pen part. In fact, I'd be concerned that I'd use the ballpoint accidentally on the tablet if I did.

Wacom does make a version without the pen component called the Bamboo Stylus Solo, and it sells for just £16.99. That hints at the other issue: the price.

If it was £5 cheaper, I'd probably be more comfortable, and the price of the Solo seems about right. Unless you're forced to switch between

tablet and paper continually, then I'd recommend the Solo, because the Wacom Bamboo stylus technology is certainly worth experiencing.

Whatever one you choose, they come in a pleasing range of metallic colours, one of which should be appropriate to your chosen ensemble.

mm Mark Pickavance

A pen and pointer combo for regular tablet users



Brother HL-L2365DW

Mr Fereday places a new printer in charge of his documents

DETAILS

- Price: £155
- Manufacturer: Brother
- Website: www.brother.co.uk
- Required spec: Windows XP or later / OS X 10.7.5 or later, 80MB disk space

Aimed at the home and small office market sector, the Brother HL-L2365DW is a monochrome laser printer. Possibly explaining the 'DW' part of the product's title, this monochrome laser printer has duplex printing capability, while offering a choice of USB, wired or wireless connectivity to a computer system.

With dimensions of 356 x 360 x 183mm (W x D x H), this unit relegates its power, USB and Ethernet connections to the rear. Positioned on the front of this laser printer is a drop-down flap. This feature gives access to the toner cartridge compartment, into which you need to insert the supplied 1,200-page starter cartridge.

Also available from this flap is a pull-out paper input tray with a capacity of 250 sheets of A4 paper. This tray is of the totally enclosed type. As a result, with no small window allowing you to check when paper supply is running low, you will need to open the tray in order to check on its content. Printed documents emerge into a recessed area on the top of the unit. This area, helped by a small flip-up retainer, can hold up to 100 pages.

Located to the left of the paper output area is the printer's control panel.



Providing feedback and status information is a small LCD screen displaying a single line of text, which doesn't leave much scope for great detail. The control panel also features buttons for power, ok, back, up, down, plus and minus, along with a wi-fi indicator light.

A CD in the box contains drivers and various software utilities including a link to the online Brother Creative Centre, with Business and Family sections. There's also a wizard to lead you through the process of setting up the printer using your choice of connectivity. Those opting for wi-fi can use a WPS or AOSS feature. A PDF version of the user guide is included on the CD, but unfortunately this offered no information, and I

was forced to use the online version of the user guide.

Rather than the fairly standard draft, normal and high print qualities, the HL-L2365DW offers various predefined profiles covering different types of print jobs such as General, Save Paper and Save Toner. You can also create your own profiles made up of paper type, a print resolution of 300, 600 or 1200dpi, with a choice of graphics or text printing, among other features.

Running various print jobs, using a 500-word document with the three resolutions, there was, on average, a 13-second delay before the appearance of the first page. I was able to match Brother's quoted print speed of 30ppm. I could detect little difference



between 300 and 600dpi, but there was a definite darkening of print with the 1200dpi setting. Using the duplex option, run at 600dpi with a 1,000-word document, I achieved a print speed of eight double-sided pages per minute.

The HL-L2365DW laser printer supports a range of cloud and remote printing features including AirPrint, Cortado, Cloud Print and Brother's iPrint&Scan app. When you need to replace the toner cartridge, there's a choice of the standard unit (1,200 pages) priced at £35 or the high yield cartridge (2,600 pages) costing £55.

mm Michael Fereday

An excellent laser printer for those just wanting monochrome output



Edifier Studio 980T Speakers

A new set of budget-priced powered speakers from Edifier

DETAILS

- Price: £50
- Manufacturer: Edifier
- Website: tinyurl.com/nuohcxg
- Required spec: Sound source with a 3.5 stereo jack



Although not an essential addition to a PC system, a set of speakers certainly provides another form of entertainment, particularly if you use your PC for more than word processing. The fact is that PCs and computer devices in general do far more these days than they were originally conceived for, everything from video editing to running a full DJ studio. Or perhaps to simply play a few games to provide an escape after a long day poring over figures in an office.

In fact, statistics tell us that most users tend to buy a set of speakers not long after their initial purchase. If you've travelled this road, you'll already know there are literally hundreds of speakers out there to choose from. Ranging in price from a couple of pounds to many hundreds, which obviously has a bearing on the output you can expect. For example, the cheapest speakers you can buy are generally unpowered and rely on the output from the PC's own sound card, which could be a separate device or one built into the PC's motherboard. This type is not very efficient and would create what I consider to be a noise rather than sound. Now before we get bogged down in the fact that all

sound is actually noise, I think you know what I'm saying... Whether you're pumping out Beethoven's Fifth or the roar of a formula one engine, they don't reproduce the sound with any degree of fidelity.

If you climb the ladder a bit higher, you get speakers that are usually powered from the USB port on your PC. This normally indicates that they have some form of amplification built in, so they have the ability to produce a more reasonable sound with less distortion. And for gaming or listening to background music, I'm sure they're fine, but for anything more than that you need powered speakers, like this latest release from Edifier.

The Studio 980T speakers are quite compact at 140 x 226 x 197mm, yet they produce a sound that is both clear and with a decent amount of bass. They achieve this from a 106mm bass unit and 13mm silk domed tweeter. While not in the same class as a set of Bose or Bowers & Wilkins speakers, they can pump out 21W RMS and are perfectly suited for the purpose they were designed for.

The enclosure is a sealed and reasonably heavy construction, made from a black wood grained composite material. The front is removable, for those that like to hear the speaker units without any possible chance of distortion. Having said, that the covers are made from very fine cloth, so I don't feel they impede the sound quality anyway.

There are rotary controls for volume and bass on the back of the right speaker. This also has two sets of input RCA phono sockets, an on/off switch and a pair of red/black sprung connectors to link the speakers together. The inputs sockets are marked PC and aux and unusually the package includes all the necessary cables.

For those that like to see the statistics, the signal to noise ratio is $\geq 85\text{dBA}$, the frequency response is 70 Hz-20 KHz $\pm 9\text{dB}$ and the input sensitivity is $700 \pm 50\text{mV}$ for PC and $550 \pm 50\text{mV}$ (THD+N=1%) for aux.

Personally, I prefer to simply listen to the output, which for their size and price (in my opinion) is excellent. I'm pleased to see that the designers have not pushed



the drivers beyond their capabilities either, so even at full volume, there's practically no distortion. In fact, with a decent sound source, they're better than some dedicated midi systems I've sampled.

mm Joe Lavery

Sound quality that belies the price



Klipsch Reference R-10B Soundbar And Subwoofer

David Hayward rocks out (listens to Status Quo's greatest hits) with this stylish speaker set

DETAILS

- Price: £479
- Manufacturer: Klipsch
- Website: goo.gl/a76xIP
- Required spec: Optical digital port for best performance, spare RCA otherwise

Klipsch is a company that produces some exceptional audio equipment. From standard headphones, through to complex and cinematic surround sound setups, it's a company that delivers the goods with a quality you can trust.

Its most recent release in the Reference line of audio equipment is the R-10B Soundbar and Subwoofer set. An impressive, lightweight design that curves gently in a pleasing, although simple, aesthetic for the living room. The looks of the soundbar are important, to a degree, as it's capable of being wall mounted, ideally placed under a wall mounted TV. So a certain level of minimalism is required, without affecting its connectivity or audio quality.

The soundbar is finished in a satin black, with a perforated grill fitted over the two 19mm textile dome tweeters and two 76mm polypropylene midrange drivers. Along the front are various media controls for mute, volume up and down, and input source, with a power LED one side of the strip of buttons and another the other end indicating which of the soundbar's features are engaged or not.

The rear of the soundbar houses the connectivity in a cut-out section, for easier access



▲ Klipsch certainly knows how to put a stylish audio package together



▲ The remote isn't great, but the sound performance is simply stunning

should the bar be wall mounted. Here you'll find the main power switch, power port, digital optical and RCA.

The next component in the package is the subwoofer. This is a wireless, satisfyingly heavy and sturdy box that will auto-connect to the soundbar when both are powered on and will work up to 50 feet away. The good-quality MDF sub is finished in a brushed black vinyl, with a side-mounted perforated grill protecting a single 203mm side-firing fiber composite cone.

With the two connected, the combined power hits you with 250 watts, which is no small thing for the average sized living

room. Our test setup to the TV via the included digital optical cable and running a Blu-ray copy of *Gravity* was immense. The power delivered by the sub alone could be felt in our rib cage without setting our teeth on edge. The soundbar was equally good, although the midrange didn't quite deliver as much impact, but the higher frequencies more than made up for any lack of midrange depth.

The R-10B also has a trick up its sleeve in the form of Bluetooth connectivity, which obviously allowed us to connect our phones and other devices and listen to the music collection stored on a NAS drive.

This setup is indeed an audio delight, although there are a couple of negatives to take into consideration. For one, there's no HDMI connectivity on the soundbar. Although this shouldn't be too much of an issue for most users, the cinematic audiophile will no doubt criticise the lack of DTS-HD Master Audio or Dolby Digital trueHD.

The other issue we have is with the rather poor remote. Although it's certainly functional enough for the features of the R-10B, it feels extremely cheap when compared to the rest of the package. Also, it's the primary source for powering the soundbar on and off, due to a lack of a physical power button on the bar itself, which to us feels like a poor decision on Klipsch's part.

Having said that, once you've connected everything up and are immersed in the powerhouse audio that this thing delivers, you'll soon forget all about dodgy remotes and lack of HDMI inputs.

Klipsch has outdone itself with the Reference R-10B Soundbar and Subwoofer. For £479 you may want more features, but it's the sound quality that's important, and the R-10B has that in abundance.

mm David Hayward

A superb audio experience



SteelSeries DeX Gaming Mousepad

Mark luxuriates in silicon and textured fabric combo of the SteelSeries DeX

DETAILS

- Price: £33
- Manufacturer: SteelSeries
- Website: steelseries.com
- Required spec: An overriding urge for smooth mouse movement

In my daily work I use an old SteelSeries mouse pad, one of its older S&S designs. Made from a very durable hard plastic, it adheres to my desk with a soft rubberised coating that stops it moving around.

Unfortunately, being at least seven years old, the rubber coating has started to shed like the tire of an F1 car that's done far too many laps.

With perfect timing, SteelSeries sent me its new DeX pad, and what a wonderful replacement it is. The DeX, as you can see in the images, is made from two distinctively different materials that are heat bonded into a single flexible pad. On the underside is a brightly coloured orange silicon surface that has sufficient tack to maintain zero slippage, however aggressively you move your mouse.

Not having the pad move is important, but so is the upper

surface that the mouse should glide over with the minimum of lateral force.

Being soft and not hard like the S&S pad, this surface should offer greater friction to a sliding mouse, but for whatever reason, it actually seems even better.

What's really odd is that the upper surface isn't even totally smooth; instead it's a series of raised hexagon ridges, which reduce the contact points on the mouse to the absolute minimum. It might seem counter-intuitive, but the theory appears to work well in practice.

SteelSeries has also addressed, to a point, the biggest issue of soft mouse pads, which is what you do with them when they get dirty. Washing some pads will destroy them utterly and causes others to separate top from bottom.

The DeX is designed to be both liquid resistant, so a spilt drink will pool on the surface and can be wiped off easily, and it's even washable.

I've noticed that SteelSeries describes the DeX as 'Wash It If Needed', which I'd take as don't throw it in the laundry every week, but when it's really grubby it can take a hand wash.

So where could the DeX be better? The only complaint I've seen about this product is from some gamers who think that the 32 x 27 cm area is too small. Personally, I think those people need to up their mouse sensitivity, because a mouse isn't a Corgi car, is it? For those who disagree with me, SteelSeries also makes the enormous (and pun-tastic!) QcK+ for them to race their mice around.

The only real problem here is the price, which seems like

far too much for what is – a mouse pad.

The American's get to pay \$40 for the DeX, the Europeans the same number in euros, for no obvious reason. Based on today's sterling exchange rate with the US dollar, it should be around £25, but it's marginally more probably because of VAT.

I really wish this was cheaper, because it's a lovely place to rest your wrist and move your mouse over.

mm Mark Pickavance

An excellent and durable mouse surface that's priced high

Dimensions

Width: 320 mm /12.6"
Length: 270 mm/10.8"
Height: 2 mm/0.08"
Weight: 212g/7.48oz

Additional Features

Heat-bonded edging
Speed-optimised,
tooled surface
Washable

DeX
GAMING MOUSEPAD



Alien: Isolation

You can't run, but you can hide in this latest Xenomorphic outing

DETAILS

- Price: £32 (Steam)
- Manufacturer: Sega
- Website: alienisolation.com
- Required spec: 3.16GHz Core 2 Duo or better, 4GB RAM, 35GB disk space, 1GB AMD Radeon HD 5550 or Nvidia GeForce GT 430, DirectX 11

Hard to kill. As well as being an old action movie starring a very slim-looking Steven Seagal, it's also a fairly accurate way to describe the Xenomorph in Ridley Scott's 1979 sci-fi classic *Alien*. How apt, then, that the franchise itself should prove to be so resistant to meeting its end. Burn it with fire if you like, but it'll keep on coming back.

Even after the embarrassment that was *Alien: Resurrection*, it returned, and we all got to suffer the travesty of the *Alien Vs Predator* movies. More recently, in the world of videogames, Sega gave the world *Aliens: Colonial Marines* and prayed to every deity that might listen that no one would notice its utter lack of any positive qualities, other than as a starting point for a conversation about disappointment.

And now here we are in 2014 with yet another game, *Alien: Isolation*. Yep, this franchise simply refuses to die. I'm not sure if it would be possible to milk an actual Xenomorph, but both the movie and the games industries seem intent on squeezing this one for all it's worth.

The good news, though, is that rather than making a generic shooter like *Colonial Marines*, the developer, The Creative Assembly, has taken a different approach,

by returning to what made the original movie great: fear.

Yes, *Alien: Isolation* is a horror survival game. And although it's played from a first-person perspective and you do get a gun, you won't be doing a lot of shooting. Instead, you'll spend most of your time creeping around in the shadows, sneaking past enemies and occasionally running for your life. It's all about survival, and direct confrontation is the perfect way to fail at that.

You play as Amanda Ripley, the daughter of Ellen (Sigourney Weaver's character from the film series), on a mission to find out what happened to your mother on the ill-fated spaceship Nostromo. This leads you to the setting of the game, the space station Sevastopol, which is currently holding the flight data recorder for your mother's ship. Somewhat unfortunately, it's also now home to an Alien. Also less than ideal is the fact that the ship's human inhabitants have turned on each other and will shoot first and ask questions later. On top of all that, there are the androids, known as Working Joes, which at the behest of the company in charge, have changed from helpful robotic

“A dark, moody unforgiving game, where every step you take could be your last”

servants into creepy, monotone executioners, whose preferred style of killing people is to beat them to death.

With no one close by to help you, the term 'isolation' seems something of an understatement. Indeed, *Alien: Isolation* is a dark, moody unforgiving game, where every step you take could be your last – until you load up your last save and carry on playing, of course.

The game itself recommends you play at the hardest difficulty setting, which it describes as 'Challenging and terrifying', which roughly translates as 'You will die a lot and will probably swear at your screen every five minutes'.

Thankfully, you can alter the difficulty setting at any time – an option that proved vital for me. Early on in the game, I had to cross a huge hall to get to a door and staircase at the other end.

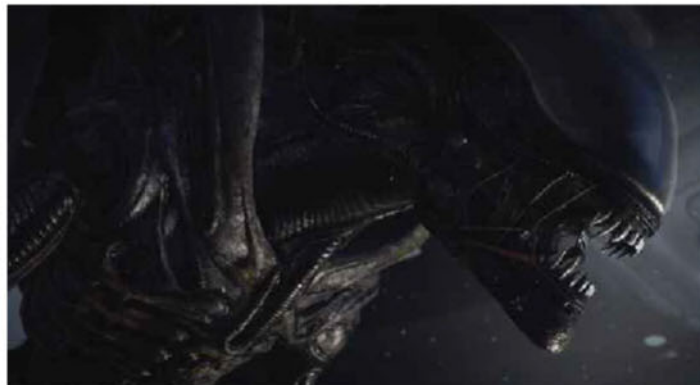
The only problem was that it was populated by two or three other people, armed with handguns, who weren't particularly keen on meeting new faces.

I tried creeping round in the dark, but they spotted me. I tried sneaking past them when they weren't looking, but then they turned around and spotted me. And each time, they shot me once or twice, and I was dead – as you would be if someone shot you.

After many, many abortive attempts to get across this room, I eventually changed the difficulty to Normal and tried a new tactic: running straight at them. Yes, they spotted me, but before they could shoot me enough times to kill me, I'd bashed them over the head with my only weapon, a huge wrench for opening locked doors.

This section of the game highlighted two problems, the





first being that once you've taken down a gun-toting enemy, you can't simply pick up their weapon and all their ammo. Understandably, this is to keep tension high and stop *Alien: Isolation* from becoming an all-out shooter, but it still doesn't make sense (also, it caused a bug, where the guns were left suspended in mid-air).

More concerning, however, is the inconsistent AI. There are times in the game where you swear that an enemy couldn't have seen you, but there they are chasing you and trying to kill you. At other times, though, it seems like they're completely blind, failing to notice you as you walk right past them.

Of course, a high level of difficulty is to be expected from a survival horror game; after all, you have to feel like your character could die while playing it.

To its credit, *Alien: Isolation* makes a good attempt at sending chills down your spine, with a minimal but effective score and fantastic use of sound effects, like the echoey thudding of the Alien rattling through the ventilation shafts above you. The graphics, while not revolutionary, also put you on edge with judicious use of lighting and shadow.

And just like the first *Alien* film, the scares come from fear of the unknown and apprehension as you turn each corner. As you wander slowly through the desolate spaces of the Sevastopol, you might not encounter any danger at all, but at any time you could, and if you aren't prepared, then certain death awaits.

Fans of *Alien* will no doubt be pleased with this, and The Creative Assembly should be congratulated for returning to

the true spirit of this franchise (including making all the settings and props look like they're from a 1979 sci-fi movie), but other players might not be so enamoured with its pacing.

Beyond the sound and graphics, *Alien: Isolation* is a rather plodding stealth game with a broken stealth system. It forces you to walk or creep everywhere you go, all the while holding up a motion tracker so you can keep an eye on where your enemies are and where the Alien is. Spot movement and you have to stop dead in your tracks to work out if it's the Alien. If it's moving unnaturally fast, then it is, and your best defence is to stand still and wait for it go away. But then it appears again seconds later and you have to do the same thing again. Try running or make too much noise, and it'll jump down from a vent, and as Bill Paxton so famously declared, it's 'Game over, man! Game over!'

There are things you can pick up as you explore, and the *Alien: Isolation* includes a rudimentary crafting system, but most of the time, this beautifully lit environment allows for almost no interaction. So for long periods of play, you'll simply be meandering from one place to another doing pretty

much nothing. Then when you do meet a hostile, you'll most likely die, have to return to your last save point, then play the bit you just played (including any unskippable in-game dialogue sequences) and try again.

If you're a fan of the genre or if the story motivates you enough to want to carry on, this will make for a tense, nervy experience – one that perfectly adheres to the ideas behind Ridley Scott's masterpiece. Others, like me, might find the gameplay gets old fast, and ultimately the experience will be one of boredom. As long as you think carefully about what kind of player you are before you make a purchase or not, then you shouldn't be disappointed.

mm Anthony Enticknap

Has many positive qualities but it certainly isn't for everyone



GROUP TEST

High Capacity SSDs

SSDs used to be exceptionally small in terms of their data capacity. 6GB, 8GB and 12GB were the norm a number of years ago, with more recent averages hitting the 200-300GB mark.

Now, though, it's possible to get hold of a terabyte of ultra-fast storage. Which should you choose, though? David Hayward has a look at six possible candidates and sees which comes out on top

High Capacity SSDs

Transcend SSD370

DETAILS

- Price: £339
- Manufacturer: Transcend
- Website: goo.gl/50c13l
- Required spec: SATA-3 connection for best performance

Transcend has recently released its newest brand of SSDs, the 370 range, with capacities ranging from 32GB through to an impressive 1TB. Needless to say, the 370 range offer the latest SATA-3 6Gb/s interface for breakneck read and write speeds, along with exceptional low power use thanks to the incorporation of the SATA Device Sleep Mode (DevSleep), which conserves laptop battery power by shutting down the SATA interface completely – though it is reportedly capable of firing back into life in less than 100 milliseconds, thus enhancing the hibernation functionality on your device.

The SSD measures 99.8 x 69.8 x 7mm and weighs as little as 52g. This means it's small and light enough to fit into the tiniest of cases or

devices without too much trouble. Fitting into a standard desktop case, though, is helped by the addition of a 3.5" bracket that's included in the box, along with a quick start guide and warranty card.

The drive may well be as light as a feather, but it's by no means flimsy. That said, it's probably not going to be the drive of choice for an external SATA-to-USB setup. Inside a machine, though, and left alone once fitted, it's more than suitable for the job.

Transcend has helped alleviate the reliability problems most SSDs suffer from by including an advanced wear-levelling system and error correction code. This helps to increase the life of the drive and reduce any errors that may occur when transferring data. This feature also works hand-in-hand with the accompanying Transcend software, SSD Scope, which offers an interface to help transfer an existing system and its data to a new drive. It can also check the drive's health, update firmware, enable TRIM support, securely erase data and provide numerous details and specifications you may need.

We fitted the drive to an older Gigabyte GA-970A-DS3 board,

and with AAT0 Disk Benchmark in place we measured an impressive read speed of 560MB/s on the 8192KB file size, along with a reasonable 305MB/s write speed. Windows 7 booted up in just under nine seconds, and Linux was booted in less time than it takes to get out of our chair.

We were pretty impressed with the Transcend SSD370 range, the test systems performance was greatly improved beyond any other upgrade we've attempted before on this motherboard. We were also impressed by the Transcend software, although in all honesty you can use your drive without ever having to install it. This is an excellent drive with ample space and speed that will be an advantage to any desktop, laptop or media centre.



▲ The Transcend SSD370 is good value for money and reasonably quick

► Write speeds could be better, but it's not too bad



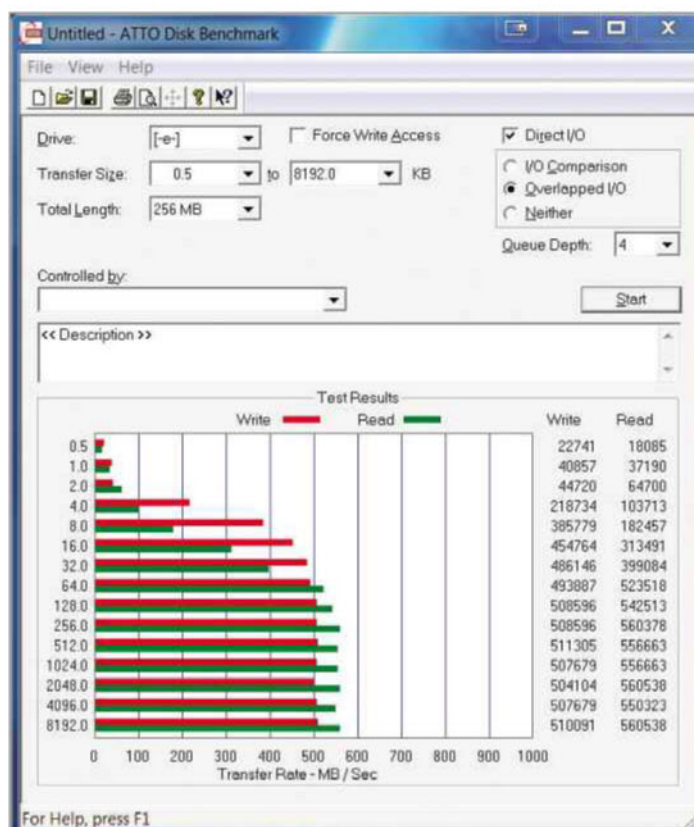
Crucial M550 1TB

DETAILS

- Price: £360
- Manufacturer: Crucial
- Website: goo.gl/YJsoeL
- Required spec: SATA-3 connection for best performance

The Crucial M550 was a highly regarded SSD of last year; fast, available in higher than normal capacities and priced reasonably as well. Now Crucial has released the follow up, the M550, but can it keep up the good work laid out by its older sibling?

The M550 still comes in a variety of capacities from 128GB, through 256GB, 512GB and on to the 1TB version we tested. Its 2.5" form factor drive uses a 20nm Micron MLC NAND flash storage, with a more modern Marvell 88SS9189 controller and a whopping 1GB of DRAM cache to help sweeten the performance numbers. This results in faster than average read and write performance and should lead to extended drive life expectancy – the longevity of the drive is rated at 1.5 million



▲ Good speeds across the board, though

hours, with an estimated 72TB total bytes written, equating to something like 40GB a day for five years.

Err... Crucially, the Crucial M550 is exceptionally fast. The AATO benchmark recorded an immensely impressive 560MB/s read on the 8192KB file size, with

510MB/s write speeds. Even the smaller 4KB file size speed tests were pretty good, with 103MB/s read and 218MB/s write.

The price isn't too bad either. At roughly £360 (although you may be able to find it cheaper) it's only slightly more expensive than the Transcend SSD370 across the page. Either way, £360 isn't too bad for a one terabyte of extremely quick solid state storage. We can only imagine how fast a pair of these in RAID 0 configuration could be – largely because we'd have to shell out over £700 for the luxury of finding out in reality.

It's worth noting, though, that this product doesn't make any attempts to become a de facto upgrade kit in the same way as the Transcend offering does. As with the other Crucial M550 SSDs, and many other

SSDs for that matter, you won't find a copy of a backup program or some kind of imaging software to aid the transition from a traditional drive in its box. In fact all that's in said box is the drive itself and a 9.5mm adapter mounting bracket. That doesn't mean that the drive is lacking in any way, or that Crucial has short changed potential customers in any way. Imaging software, and the like, is freely available and easy to find with a simple search; this belies the fact that the M550 is pitched slightly differently from the majority of other drives in this class.

Installing any SSD in a PC can make a tremendous difference to its performance, this much we already know, but when you install 1TB of this type of speedy storage the benefits are simply astounding. Whether you decide to use this as a second drive or as the main OS and programs drives, you can be sure you'll be getting the best possible setup in your machine.

The Crucial M550 1TB SSD has the right combination of read and write speeds, driven by its updated controller. Add to this its 1GB of cache and of course the large capacity, and the M550 is certainly puts itself forward as an SSD you should be considering very seriously come your next storage upgrade.



▲ The Crucial M550 is an extremely capable drive at a decent price



High Capacity SSDs

Samsung 850 Pro 1TB

DETAILS

- Price: £490
- Manufacturer: Samsung
- Website: goo.gl/eT1biv
- Required spec: SATA-3 connection for best performance

We reviewed the Samsung 840 EVO in last week's group test of fast SSDs, which came out as our Highly Commended selection and proved to be a very worthy SSD to have in your system. This time around we're going to be looking at the more mature, high powered and technically innovative line of Samsung SSDs – its 850 Pros.

There's certainly a lot to get hot under the collar over the 850 Pro 1TB we have here: for starters, this 2.5" form factor

drive comes with a ten year warranty, and claims that you can write at least 150TB of data to it before it even thinks of beginning to fail. It also utilises the Samsung Magician Software, of which RAPID (Real-Time Accelerated Processing of I/O Data) is a feature that uses any available system RAM as a cache boost to enhance the already impressive performance of the drive. This analyses the users' use of programs and data and optimises the I/O to effectively eliminate any controller specific bottlenecks. Think of it as more DRAM cache for the SSD controller, and you're not far off.

However, the star of this feature-laden show is the 3D VNAND flash storage, in the form of the Samsung 86Gbit 40nm MLC V-NAND – making its debut in this range. Behind the imposing name this means that, rather than the more traditional method of placing NAND flash memory flat on the silicon wafer,

the 850 Pro stacks 32 cell layers on top of one another creating a higher density, better performing drive in a much smaller space than ever before.

Let's talk about speeds, then: without the RAPID mode engaged we scored 560MB/s read in the 8192KB ATTO benchmark and 510MB/s write – which was equal in performance to the Crucial M550 – but with RAPID switched on, though, the numbers were significantly altered. The 8192KB read test gave us an eye-watering score of 3,107MB per second, along with 914MB/s write.

It's worth noting that we conducted that test on a system with 16GB of system RAM installed, of which RAPID can utilise up to 4GB for its caching algorithm. Nevertheless, the results confirm that it works perfectly well.

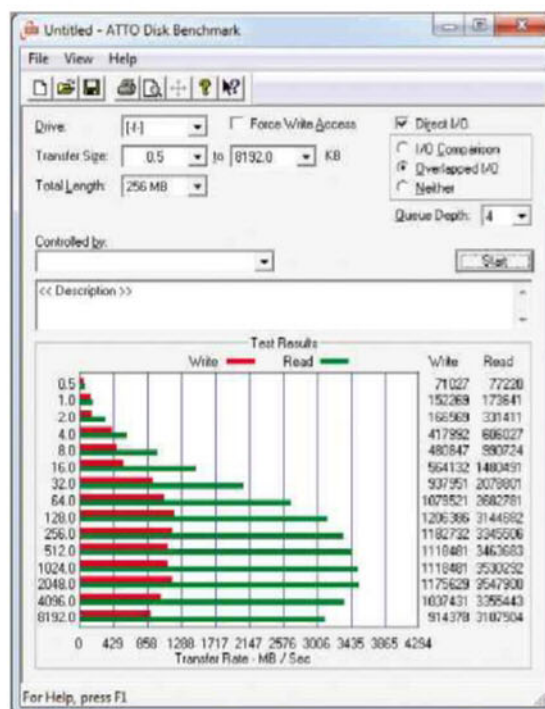
Having lured you in with the promise of incredible speeds, it's



now time to state that all this extra technology and go faster stripes do come at a heftier than normal price. The performance may well be eye watering, but so too is the cost.

The Magician software can also be used to perform benchmarks, update the firmware and enable the inbuilt 256-bit AES encryption on the drive. All of which adds up a package that would make a petty impressive addition to any PC – although, to be fair, it comes across as a server and enterprise class unit rather than a consumer drive.

You get what you pay for, as the saying goes, and you certainly get a lot for your money with the 850 Pro. However, it does beg the question: is it overkill for the average user?



▲ The Samsung 850 Pro is an incredibly capable SSD

▲ With the RAPID technology enabled, the benchmarks are through the roof

Intel DC S3500 Series 800GB

DETAILS

- Price: £545
- Manufacturer: Intel
- Website: goo.gl/sG7NFX
- Required spec: SATA-3 connection for best performance

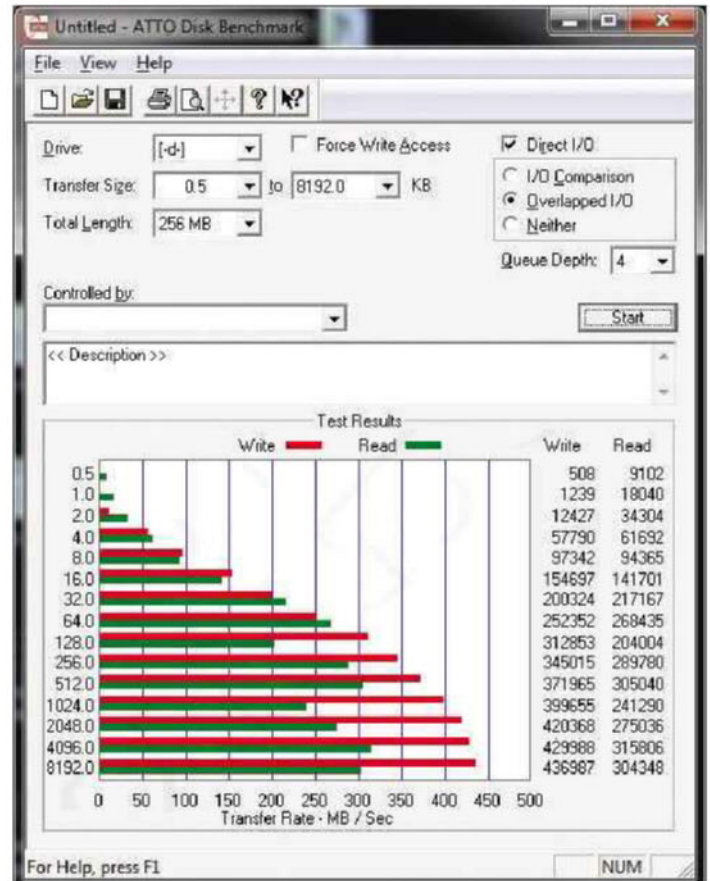
Intel have two distinct SSD product lines: the 730 series (aimed at the home or light use consumer) and the DC S series (geared towards the commercial users). In reality, though, the line between business and home use can be extremely thin, which is why we decided to include this model in the high capacity group.

This drive, then, is an 800GB, 2.3" form factor SSD, utilising 20nm MLC NAND and a custom Intel controller, is built for endurance and longevity rather than blistering performance with extreme capacities. Indeed, the projected endurance capabilities of this drive are really quite impressive, when compared to the other drives on test. A two million hour mean time between failures rating, and a lifetime write rating of 450TB certainly speaks of its datacentre heritage. However, the model

above this – the S3700 Series – claims a lifetime endurance of 14.5PB (yes, you read that right: 14.5 Petabytes), so considering both share roughly the same kind of technology, you can rest assured you're in good hands and that that's probably a conservative prediction.

Admittedly, its benchmark scores weren't brilliant. The 8192KB file size test in ATTO scored just 304MB/s read, whereas the write tests were slightly improved at 436MB/s. However, if 'slow data is better than no data' as far as you're concerned, such disappointments could be mitigated somewhat by the fact that there are a pair of integrated capacitors on the S3500 Series that can hold just enough of a charge for the data currently in the cache (of which is there 1GB DRAM) to be written to the NAND flash in the event of a power failure.

Included with this SSD is the management kit that allows you to secure the drive with a 256-bit AES encryption level, perform all manner of tests and upgrade the custom Intel firmware when necessary. Plus, although we didn't test this, setting this drive and others like it in a RAID array is made easy thanks once more to the advanced management side of things.



▲ It's certainly a solid drive, though, one that will last a long time

The Intel DC S3500 Series isn't going to most people's first choice of SSD, but a business user shouldn't dismiss it, despite the obvious lean toward datacentre applications. Its performance over time is highly rated, while its endurance, reliability and consistency will no doubt appeal to those who aren't necessarily after breakneck speeds as much as dependability.

Saying that, though, the MTBF of the other drives on test isn't all that far from the numbers quoted by Intel for this model, and they'll offer more capacity for a better price. Indeed, the Intel DC S3500 Series may well be as solid as a rock, but £545 is a lot of money to part with considering it's 200GB down on some. A couple of Transcend SSD370's

would cost £140 more and you'll have 2TB to play around with instead of just 800GB.

However, you can't fail to be impressed with the on-paper claims as to of the drive's endurance. Indeed, this may mean that from a business perspective, the numbers add up in a way they simply don't for a consumer customer.



▲ The Intel DC S3500 Series is more of a business orientated SSD



High Capacity SSDs

ADATA Premier SP610 1TB

DETAILS

- Price: £338
- Manufacturer: ADATA
- Website: goo.gl/Df52Su
- Required spec: Free SATA-3 connection for best results

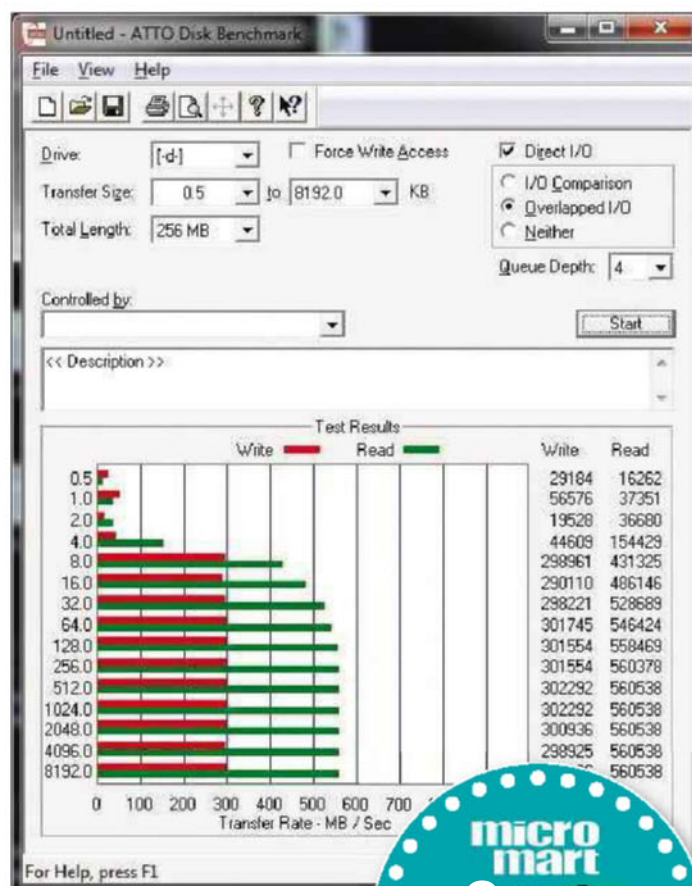
ADATA isn't a name that immediately springs to mind when you consider the SSD market. Names such as Samsung, Crucial – even the Toshiba-owned OCZ – are usually the first brands that people tend to look up. As it happens, though, ADATA has quite the SSD line-up, ranging from server-grade drives through to smaller capacities offering blistering performance.

The Premier SP610 is one of its mid-range SSDs; a 2.5" form factor model that comes in a variety of capacities, ranging from 128GB, through 256GB, 512GB and our test subject, the 1TB version. It has an MLC

Micron 128Gbit 20nm NAND flash with a new Silicon Motion SM2246EM controller, which itself incorporates a single core 32-bit ARC (Argonaut RISC Core) processor. This means the I/O requests are handled with extreme efficiency through the use of extra instructions, which in theory should lead to a better performing SSD overall.

In our tests, the ADATA Premier SP610 managed to score a read speed of 560MB/s on the 8192KB file size test and a write speed of 300MB/s. This isn't the best score we've had so far in the group, but it's still good when compared to a normal spinner hard drive which would score on average something in the region of 140MB/s read and 135MB/s write.

While those benchmark speeds may not set the world on fire, the SP610 does offer an advanced form of data protection in the form of a technology called Advanced BCH ECC – basically, a hardware error correction code.



▲ Okay scores, but a bit low on the writes



Additionally the Silicon Motion controller offers an improved low power consumption over other controllers, such as the Sandforce and Marvell versions, and to complete the package ADATA has included a 7mm to 9.5mm laptop disk day spacer and a copy of Acronis True Image HD 2013 to aid the task of upgrading.

This is a decent enough SSD for £338. It's the cheapest so far in the group, and it performs well enough for most average users. Those who would require more speed for their money would no doubt rather opt for the likes of the Crucial M550, though. It's only £20 or so more and has significantly faster write speeds, according to our benchmark numbers at least.

The ADATA Premier SP610 is very similar to the Transcend SSD370. There's very little between the performance numbers and only a pound difference in the price. So, in the end, it probably all depends on the brand name. Who would trust more? A company that you haven't necessarily heard of, over one that's popular in the pages of a magazine? Whichever side of that quandy you fall, we recommend you look into the ADATA range as there's probably something there that will suit your needs and budget.



► The ADATA Premier SP610 isn't a bad SSD; reasonable price for 1TB too

Kingston SSDNow V310 960GB

DETAILS

- Price: £410
- Manufacturer: Kingston
- Website: goo.gl/1YmQ5X
- Required spec: Spare SATA-3 connection for best results

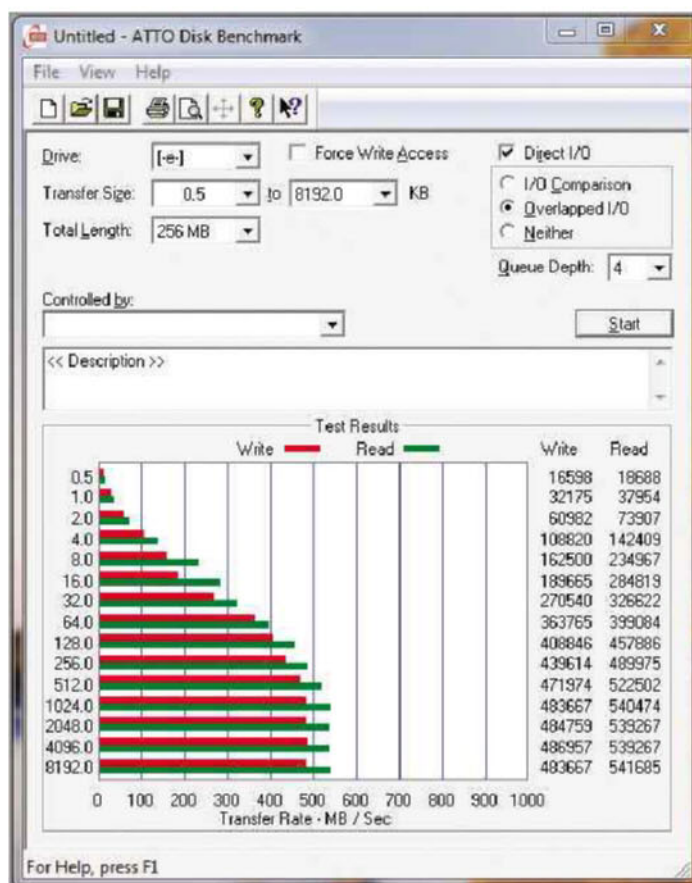


▲ The Kingston SSDNow V310 is a fantastic SSD

We reviewed the Kingston SSDNow V300 in last week's group test of fast SSDs, now it's the turn of its larger capacity sibling, the V310 – which has a few differences from its smaller cousin apart from capacity. For starters, there's a different controller: where the V300 used an older LSI SandForce 2281, the V310 instead uses a much improved (although lesser known) Phison 3108-S8, which we've seen used in the Corsair Force LS series of SSDs. The type of NAND flash is also different; instead of the Toshiba Toggle, the V310 uses a 20nm Micron MLC NAND along with 1GB of DRAM cache.

960GB seems an odd capacity, but we considered it close enough to 1TB to warrant inclusion in this high capacity group. The space on the drive is certainly appealing, and the speeds from the benchmark aren't too bad either. The ATTO 8192Kb file size test scored 541MB/s read and 483MB/s write; which strangely enough beats the advertised speeds on the blurb that comes with the drive. A rare occurrence indeed.

The drive comes in a selection of different packages. There's a stand-alone kit (drive only); a desktop upgrade kit, with a 3.5" bracket and mounting screws, SATA cable, cloning software and a handy installation DVD; a notebook upgrade kit offers a 2.5" enclosure, cloning software and



▲ Good overall speeds, capacity and features. A tad too expensive, though

the DVD; while the combined desktop and notebook upgrade kit comes with both sized mounting and enclosure kits, SATA cable, 7mm to 9.5mm adapter, cloning software and of course, the installation DVD.

The combination of the Phison controller and Micron 128Gbit MLC NAND make for a good price-to-performance ratio, and seems a wise move on the part of Kingston. This way the 960GB drive can

perform well and keep on performing well thanks to the MTBF of one million hours and TBW (total bytes written) of 2,728TB. Other features include 256-AES encryption, TRIM/RAID support, Bad Block Management, DEVSLP (Device Sleep) and Static and Dynamic Wear Levelling. In fact, components and technologies you would normally associate with a more enterprise product.

Mind you, all of this comes at a price of around £410 for the stand-alone model, with the price increasing slightly for the various upgrade kits. When you consider that longevity, though, the performance and the capacity, it looks much better value for money than the Intel DC S3500.

Kingston has produced some great quality SSDs of late. The aforementioned V300 version was the best overall in last week's group, which focused on speed over capacity. To be honest, it's beginning to look that way for the V310 too. The only thing that's really holding it back is the price; had it been just £50 cheaper, then it would have knocked the socks off anything else available.

So, if you don't mind paying a little more than the average and want a drive that's quick, has good capacity and a feature list as long as a reviewer's arm, then the Kingston SSDNow V310 is certainly one to look out for.





Crucial M550 1TB

We think the Crucial M550 1TB offered the best combination of capacity, price and speed. The support and the longevity are certainly impressive enough and overall, it's simply a great, high capacity SSD



Kingston SSDNow V310 960GB

Okay so the Kingston V310 is more slightly more expensive than the other SSDs that scored the same (except the Samsung 850 Pro), but we think it's a good all-rounder when it comes to performance, price and capacity.

How We Tested

We tested each SSD in a system comprised of a Gigabyte GA-970A-DS3 board, with 16GB 1600MHz RAM and an eight-core AMD CPU. Where possible we installed both Windows 7 64-bit and Linux Lite 2.0, but mainly we used the drives as secondary installations, with ATTO as the benchmark software.

	Transcend SSD370 1TB	Crucial M550 1TB	Samsung 850 Pro 1TB	Intel DC S3500 Series 800GB	ADATA SP610 1TB	Kingston SSDNow V310 960GB
Price	£339	£360	£490	£545	£338	£410
Capacity	1TB	1TB	1TB	800GB	1TB	960GB
Controller type	Transcend TS6500/ SM2246EN	Marvell 88SS9189	Triple core MEX controller	Custom Intel controller	Silicon Motion SM2246EM	Phison 3108-S8
NAND type	Micron 20nm NAND	20nm Micron NAND	Samsung 86Gbit 40nm MLC V-NAND	20nm MLC NAND	Micron 128Gbit 20nm NAND	20nm Micron MLC NAND
ATTO read speed at 8192KB	560MB/s	560MB/s	560MB/s	304MB/s	560MB/s	541Mb/s
ATTO write speed at 8192KB	305MB/s	510MB/s	510MB/s	436MB/s	300MB/s	483MB/s
Encryption support	Yes	Yes	Yes	Yes	Yes	Yes
Other features	DevSleep, TRIM support, wear levelling, SSD Scope software	1.5 million hours MTBF, 72TB TBW	RAPID mode for extreme speeds, Samsung Magician software	2 million hours MTBF, 450TB TBW	Magic error correction hardware, various software included	TRIM/RAID support, DevSleep, wear levelling, upgrade kits

Tech Origins

Multi-touch Interfaces

David Briddock reveals how fingers superseded the mouse

Early touch-screens could only recognise inputs from a single finger or stylus contact, but the advent of multi-touch systems, which could capture between two and ten simultaneous contacts, revolutionised user interfaces.

Early Days

Research into practical multi-touch technology began to bear fruit in the 1980s. At the University of Toronto they devised a system where a camera was placed behind a frosted glass screen. Fingers placed on the screen would appear as black blobs against the white background. The position (and size) of these dark blobs was identified by custom-built image processing software.

A few years later at the same university, a group which included Bill Buxton built a working multi-touch tablet, which used a capacitance material coating. Around the same time, Bell Labs published a comprehensive discussion paper on the virtues of touch-screen interfaces.

FingerWorks

John Elias and Wayne Westerman founded FingerWorks in 1998 to develop a family of multi-touch products. Westerman's interest in touch technology was in part down to an RSI problem, which evolved while he worked on his university dissertation.

FingerWorks products included a Touch Stream multi-touch keyboard and the iGesture Pad line of touchpad devices for Windows and Mac PCs.

Apple

However, in the early 2000s, FingerWorks started to struggle as a business and began to talk to potential investors. In 2005, Apple Inc quietly acquired FingerWorks and all its multi-touch patents.

Less than two years later, in January 2007, Apple launched the iPhone. It's multi-touch capacitive screen, which Jobs rather disingenuously called an Apple innovation, was hailed as the future of smartphones by the media and the buying public.

Microsoft

Also in 2007, Microsoft unveiled its Surface technology. Born out of a six-year development project at one of its many research laboratories, the media event showcased the potential of multi-touch technology as a natural user interface.

The demonstration involved a large 30-inch (76cm) projection with five infra-red cameras, positioned to capture fingers (and other objects) moved over the display. The whole system was oriented horizontally and mounted in a table top.

Demonstrations showed how images, text, documents and other classic desktop elements could be moved, scaled and rotated using multiple fingers and hand gestures. Rumour has it that Steven Spielberg consulted Microsoft researchers in the early days of Surface development while sketching out concepts for the film *Minority Report*.

Surface was renamed to PixelSense ([goo.gl/VshVc9](#)) in 2012 when Microsoft launched its new range of Surface tablets.

De Rigueur

Apple's iPhone was a phenomenal success. Yet not everyone could afford to pay the premium price. This encouraged manufacturers to launch a wave of similar multi-touch smartphones.

The same technology was used in 2010 for the Apple iPad. This in turn created another scramble to deliver alternative multi-touch tablet devices in a range of sizes and prices. Google Android products in particular have benefited from the widespread appeal of Apple multi-touch products.

Today it's hard to imagine a world without multi-touch technology. Museums, kiosks, supermarkets, remote control handsets, navigation devices and in-car entertainment systems are just a few of the everyday applications, and it's also used extensively for art, music and interactive entertainment. [mm](#)



The Download Directory



James Hunt scours the internet for the best freeware, shareware and paid-for application releases

This month's applications include Hypersnap, a screen-capturing and capture-management tool; CopyTrans Manager, an iPod management tool to replace iTunes; Terminals, a multi-tabbed suite of terminal tools, and grepWin, a powerful Windows Search replacement application.

As well as all that, we also have the usual look at the latest beta versions to be released in the last month to help you keep track of the new releases that are coming your way soon, and the latest instalment of our regular look back on previous Download Directory entries where we see what happened to the programs of the past and how they've improved – or not.

Hypersnap 8.0

Release Type: Freeware

Official Site: www.hyperionics.com

The screen capture tool in Windows is unashamedly as basic as they come, which means there's plenty of room for an application that can fill in the feature gap between what Windows does and what people need it to do. Hypersnap might just be that application, and the release of its latest version gives us a good excuse to find out. And it doesn't take

long to see that HyperSnap is a versatile piece of software with numerous tools and features related to its primary function.

As well as allowing you to take multiple screen dumps without having to manually save each one, it contains a huge number of alternate capture types too. Instead of the current screen, you can automatically capture the active window, a small predefined region of the screen, an entire virtual desktop across multiple monitors and more. Some of those features we've seen elsewhere, but the ability to capture entire scrolling windows (such as web pages) and freehand shapes are features we've rarely seen, if ever.

Once you've got the capture, you can perform basic editing. Basic functions such as crop, resize and rotate are easy to access, but there are also a variety of simple special effects, which allow you to add captions and draw shapes, lines and freehand graphics for annotation. If you don't want to edit, you can capture the images straight to a file, but again Hypersnap takes this common feature a step further: you can also set the captures to be automatically uploaded to an FTP server, sent to the printer or even pasted directly into another piece of software.



One of the software's stranger features is its ability to capture editable text, which makes it a useful tool for revision and note taking. Hit printscreen (or your preferred hotkey) and you can dump the contents to a file in one keypress, allowing you to save huge amounts of useful information without the laborious copy-and-paste process taking up your time. It even works on tables!

The latest version of the software introduces a number of new capabilities, including thumbnail list improvements, an expanded set of drawing tools and a 64-bit version of the software, bringing it in line with the latest hardware capabilities. It couldn't be easier to get started with, and once you're up and running, its features will quickly become apparent – as will the best way for you to use them.

Pros: Plenty of unique features

Cons: None, really!

Rating: 5/5

CopyTrans Manager 1.010

Release Type: Freeware

Official Site: www.copytrans.net

Anyone who's used iTunes for any length of time will have something bad to say about the way it manages files, from the frustrating indirect process of getting music onto your device to the chronic slowness of the app itself. Between all the dragging, dropping, importing and syncing, it always seems like there must be an easier way.

One of the possible alternatives is CopyTrans Manager. It's actually part of a large suite known as the CopyTrans Tools,

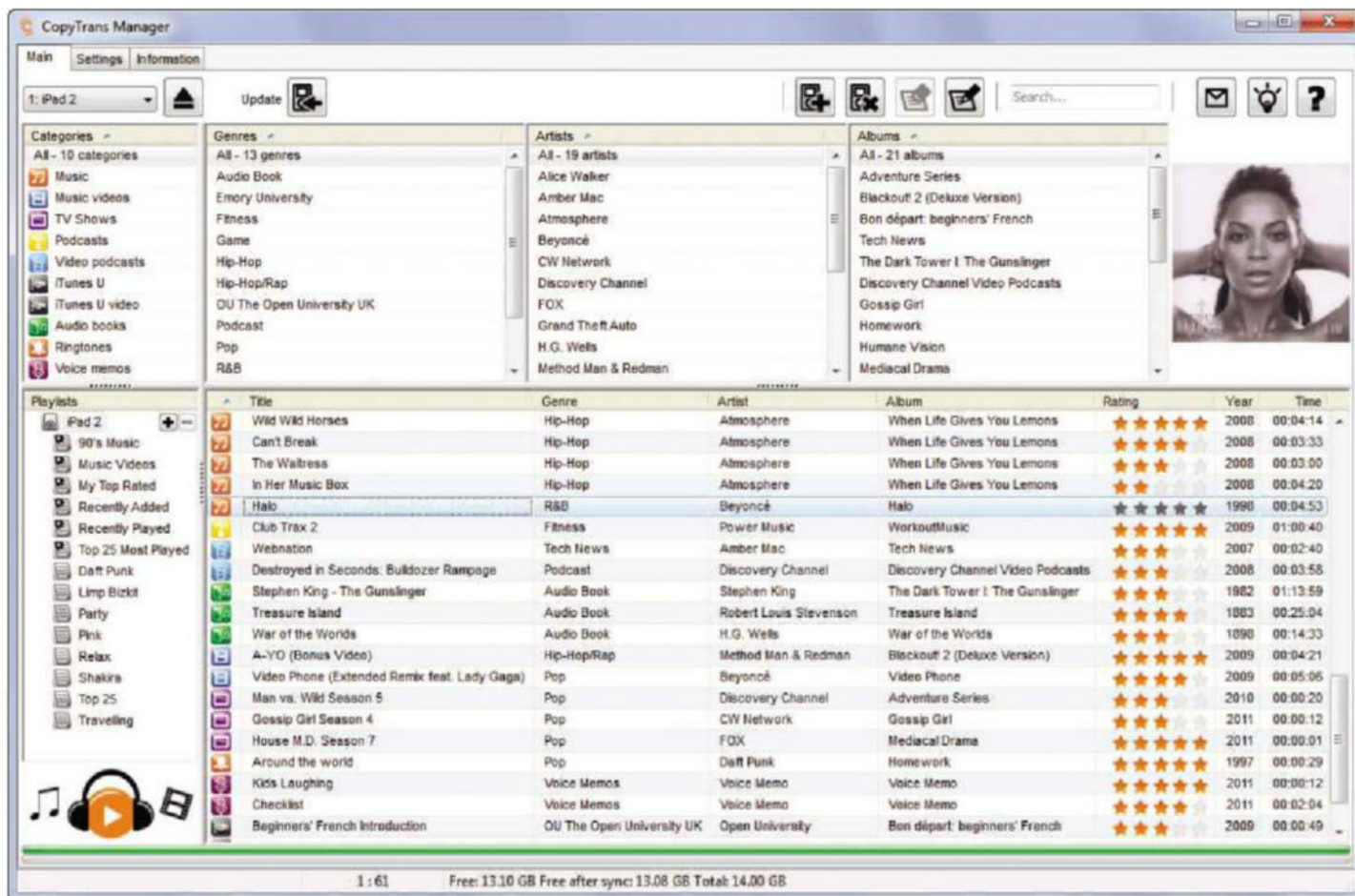
which you have to download and install to use the manager component. That's irritating, certainly, especially since the other tools are paid-for, and you therefore have to install

“ Anyone who's used iTunes for any length of time will have something bad to say about the way it manages files ”

programs you don't really want and can't use. But then again, the same is true of iTunes, and this is much smaller and less obtrusive overall.

When the CopyTrans Manager has been launched, it'll prompt you to plug in an iPad, iPod or iPhone. When you do, it'll detect the contents and allow you to start browsing and modifying them in a far more direct way than iTunes allows. Adding a track to your device is as simple as dragging and dropping it from any Explorer window and then hitting 'update' as soon as you're ready to transfer them. There's no need to mess around with a library or worry that music will be taken off your device if you select the wrong option.

Other features include the ability to add, edit and remove playlists or correct ID3 tags and metadata. You can browse other categories (such as podcasts or video) with similar



functionality to music, and you can do it all without having to launch the lumbering behemoth that is iTunes.

As you may be able to tell from the screenshot, the main problem with CopyTrans Manager is that it isn't exactly a compact program. It's quite information-dense and fairly light on instructions. If you're the sort of person who likes an obvious workflow or hand-holding, this program might prove initially vexing, but once you get the hang of how to move content on and off your phone, there's nothing that's actively confusing.

Aside from the additional downloads you have to commit to in order to use it, CopyTrans doesn't have any actively poor qualities, although it is one of those applications that was clearly designed by a programmer, rather than someone with the user in mind. As iTunes alternatives go, it's adequate. It's best described as a less technologically involved version of iTunes, and for some people that's going to be enough.

Pros: Not too complicated

Cons: Poor design, forces you to install extra software

Rating: 3/5

Terminals 3.5

Release Type: Freeware

Official Site: terminals.codeplex.com

If you've ever tried to use a terminal program, you'll know they almost seem to revel in their basicness. One window, a command prompt and absolutely no hint of anything that might be considered a GUI. Terminals is the antithesis to that: a multi-protocol, multi-connection terminal client that combines the power of the command line with the kind of direct-manipulation and visual organisation that makes GUIs so popular.

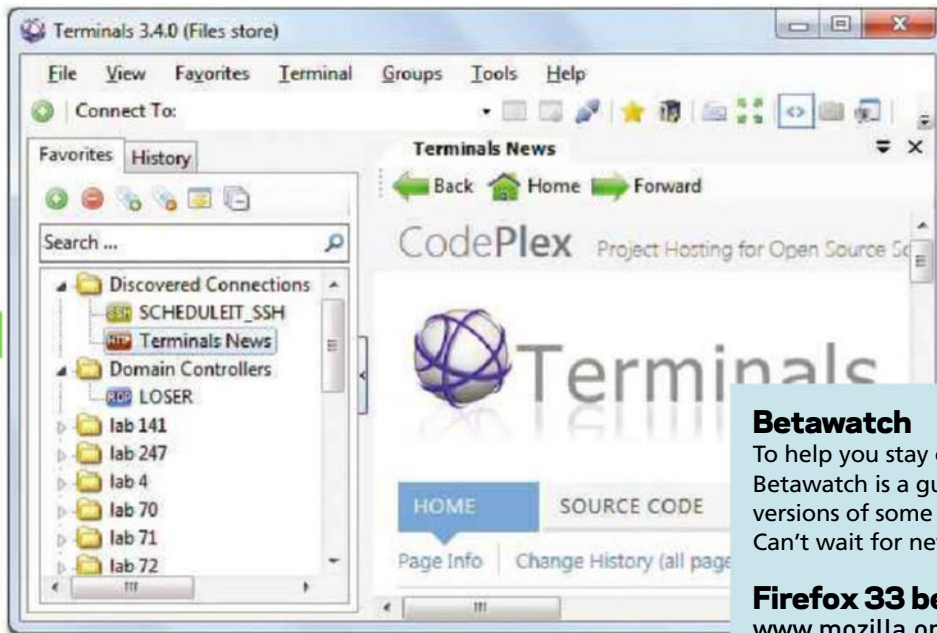
The program supports all of the major terminal protocols, as well as some others. Telnet and SSH are given, but it also supports VNC, RDP, ICA and RAS, as well as both HTTP and HTTPS. Whether you're using it as a debut tool or to connect to another system remotely, that level of support is incredibly useful.

If you're at all familiar with terminal access, you'll be able to figure it out pretty quickly. You create connections, which can

“ If you've ever tried to use a terminal program, you'll know they almost seem to revel in their basicness ”

be organised on the sidebar, then double-click them to launch it. While the tabs are open it'll automatically ping the server to keep the connection live, allowing you to keep multiple connections open simultaneously without fear that one will die while you're not looking at it. Meanwhile, a history pane keeps track of everything you've done in case you need to retrace your steps later on.

There are loads of settings to configure, particularly in remote desktop mode, which allows you to choose whether you get sound redirection or how the keyboard is treated. You can set up groups that launch multiple connections at the same



time or you can set up pre-start scripts that configure your connection environment as you prefer it.

Finally, there's a huge variety of built-in network tools, from basic ones like ping, traceroute and DNS lookup, to more advanced features like remote shutdown and reboot, a wake-on-LAN utility, packet capture and port scanner.

Despite its apparent polish, it's a little rough around the edges at times. It crashes if you don't launch it in administrator mode, which isn't exactly user-friendly behaviour. It's powerful and well pitched at its users (novices need not apply), and although it hasn't been updated since April, it seems to have received a fair amount of care and attention up until now. Worth a look for terminal fans.

Pros: Superbly powerful

Cons: Crashes on occasion

Rating: 4/5

grepWin

Release Type: Freeware

Official Site: stefanstools.sourceforge.net

If you've ever used Linux, you'll know that the grep command, which allows you to find and replace text within any file, directory or filename is utterly indispensable. Indeed, the lack of any such tool is one of the most frustrating things about Windows in general: the built-in search is slow, disk-churning and frustratingly vague in how it interprets your commands. A Windows version of grep would seem like an ideal project for someone. The mystery is why it took so long for a good one to appear.

Still, grepWin is here now, and that's what matters. Although it's similar to grep in how it operates, it's been given a GUI-based remix so that it's more palatable to Windows users.

There are tons of options available, and you can augment your choices by using regular expressions and wildcards to control the way grepWin searches for text. Shell integration allows you to launch it from any point in Windows Explorer, which is hugely useful for performing quick, off-the-cuff searches.

One of the better features allows you to save the regular expressions you construct, which means if you've found one that works for a certain type of file (or indeed, one that allows you to filter out data constructs, such as an email address), then you can save it to be instantly redeployed later on.

Betawatch

To help you stay on the bleeding edge of software releases, Betawatch is a guide to the experimental and unfinished versions of some of the most popular applications around. Can't wait for new features? Now you don't have to!

Firefox 33 beta

www.mozilla.org/en-US/firefox/33.0beta/releasesnotes

We look at Firefox's latest beta versions a lot, but they usually only contain incremental updates. Well, not this time. Firefox 33 introduces a rather significant new feature called 'Enhanced Tiles'. Tiles are the official name of the page thumbnails you see when you open a new window. The new enhanced tiles will allow site owners to choose what it is you see there.

So rather than a thumbnail of the page as you last visited it, you might see the latest headline or the company logo or an image that might entice you to open the page up. If the page owner is particularly cynical, you might see a paid-for advert instead. You can preview the feature now on the beta channel, but keep an eye out for it to appear in the main release strand soon.

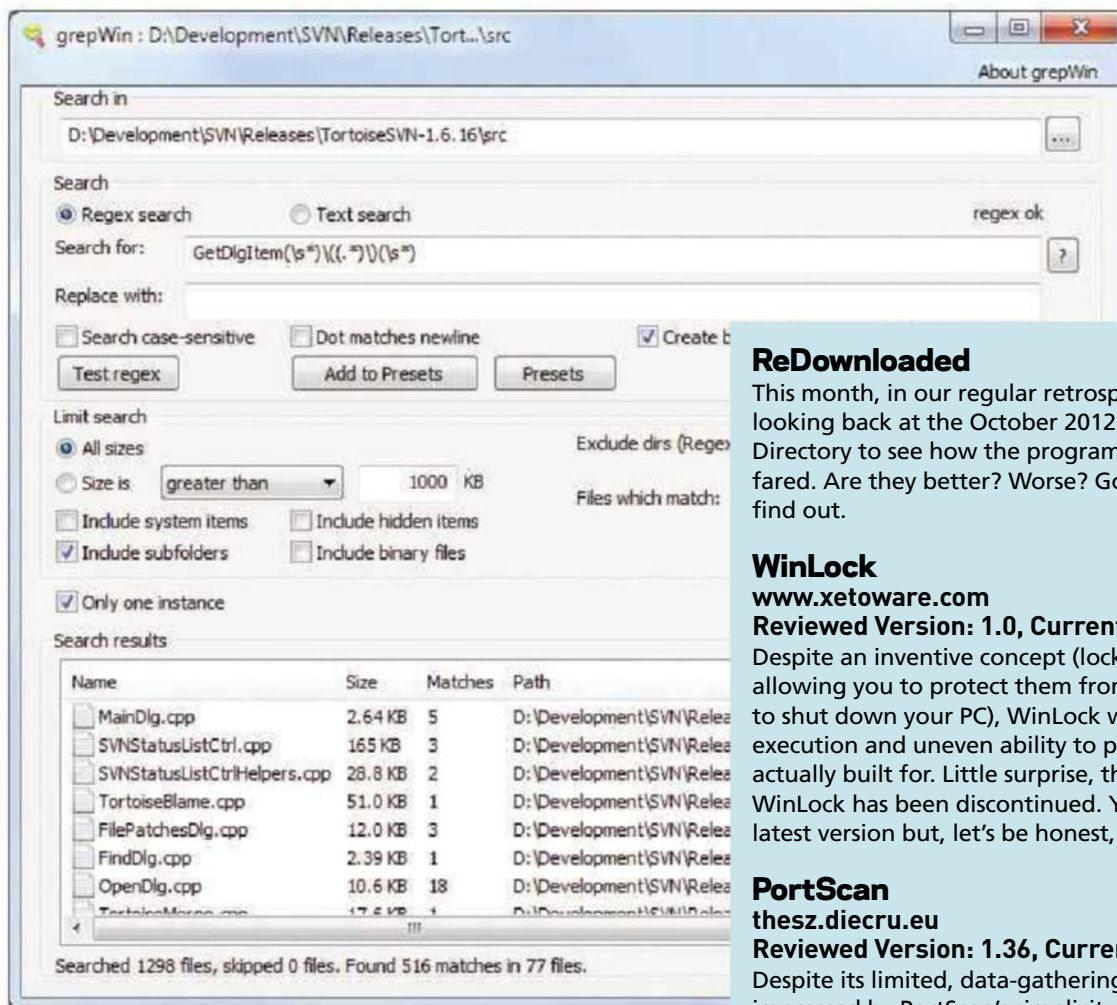
Of course, this feature comes alongside numerous other updates, including improved session restoration, support for OpenH264 video, better search experience in the location bar and HTTPS support for HTTP proxy connections. No complaints there.

Chrome 38 beta

www.google.co.uk/intl/en/chrome/browser/beta.html

Chrome and Firefox spend a lot of time jockeying for position as to which browser people would want to use most, but at least we can agree that the betas of Firefox are more transparent about what's actually changed in them. Some digging means that we can confirm that the latest version of Chrome is largely just an array of minor bug fixes of no consequence to most users.

Still, if you want to try it out and see what the actual updates are, you're free to switch to the beta download channel using the link above. Remember that this'll ensure you always have the latest beta version installed, so remember to switch back if you're particularly upset by random browser changes. Given that Chrome has occasionally done odd things like change the sizes of context menus and completely alter the way the browser renders fonts, that's a warning that applies here more than it does in most cases!



“ A Windows version of grep would seem like an ideal project for someone ”

Although it's a useful search tool and one that demonstrates huge superiority over the built-in Windows one when it comes to establishing filtering rules and behaviour, it's not one that novices can necessarily make use of. You need to know regular expressions to use it to its fullest potential, and while there's an online tutorial, they take weeks, if not months of continued use to truly master. As RegExp fans, we enjoyed this tool, and it might be a helpful way to learn them, but it's clear that not everyone's going to get a huge amount out of the software.

Pros: Powerful and fully featured

Cons: Novices might not notice that!

Rating: 3/5

That's all for this month. As ever, if you've got any programs that you'd like to see us look at – whether it's something you want to find, something you like and want to share or even a program you've written and want us to review – don't hang around. Get in touch, and we'll make sure it ends up in the download directories everywhere – courtesy of The Download Directory! **mm**

ReDownloaded

This month, in our regular retrospective section, we're looking back at the October 2012 instalment of Download Directory to see how the programs we reviewed have fared. Are they better? Worse? Gone completely? Here, we find out.

WinLock

www.xetoware.com

Reviewed Version: 1.0, Current Version: n/a

Despite an inventive concept (lock individual Windows, allowing you to protect them from view without having to shut down your PC), WinLock was hampered by poor execution and uneven ability to perform the job it was actually built for. Little surprise, then, that two years on, WinLock has been discontinued. You can still download the latest version but, let's be honest, you wouldn't want to.

PortScan

thesz.diecrueu

Reviewed Version: 1.36, Current Version: 1.47

Despite its limited, data-gathering scope, we were impressed by PortScan's simplicity and speed in conducting what is quite a technical task. The latest version is as good as it ever was, and it's good to see that even a program with relatively niche appeal is still being maintained. The latest version was released in August this year and contains a number of new features and updates. Still a great security tool.

AxCrypt

www.axantum.com

Reviewed Version: 1.7, Current Version: 2.0b

We were hugely impressed with AxCrypt the first time we looked at it, and in theory it's still as good as it was. However, while version 2.0 is available in beta, it doesn't appear to have been updated for over 18 months, and the chance of a certified stable release seems slim. As encryption programs go, AxCrypt is good, but abandoned development means it's impossible to recommend.

Uniblue Powersuite 2014

www.uniblue.com

Reviewed Version: 4.1.5, Current Version: 4.1.9

Despite apparent good intentions of speeding up systems, when we reviewed Uniblue it largely seemed to focus on tools that did a lot but had no real impact in performance terms, such as a registry defragger. Combined with a £39.95 price and virtually no movement in development over two years, Uniblue Powersuite remains a program worth avoiding.

Remembering...

3.5" Floppy Disks

A new series where we look at technology from the past

It's hard to believe that a mere 11 years ago, Dell Computers announced that they were phasing out 3.5" floppy disk drives from its line of products. The announcement came as no surprise to those who follow technology. The ancient form of data storage was getting a bit long in the tooth. In fact, it's surprising it managed to last a few years into the 21st century.

In a time where the average file size had grown to be nearly ten times its equivalent just a few years earlier, the user demanded a more portable means to carry their data around with them. Email was expanding beyond the miniscule population it had enjoyed in the late 90s, to the point where files and compressed folders could be sent across the world in an instant, and the optical disc was currently the king of the portable storage medium. For the poor old 3.5" floppy, though, its time had come.

Its history

The 3.5" floppy disk (or diskette) was a thin, plastic, high-density storage medium that had a long and illustrious history.

Its genealogy can be traced back to the 60s, where the big 8" floppy disks were used in laboratories and dedicated computing institutes the world over – although the computers then were behemoth structures that filled entire rooms. By the mid-70s, the smaller and more capable 5.25" floppy was available, and this managed to reign supreme until the mid to late 80s when the 3.5" floppy was first introduced and became the predominant form of portable storage.

The hardened plastic body and the thin aluminium sliding gate protected the magnetic material within. The small sliding tab in one corner provided far better write protection than anything previously, where tape was needed to stop overwriting, and you also got a selection of coloured sticky labels to try to fit in the sectioned area below the sliding gate.

They came in 720KB double density initially, and later a whopping 1.44MB high density version. And for the most part, they were pretty indestructible, when compared to the previous options available.

The Good

The 3.5" floppy and Phillips screwdriver were the only tools an IT technician ever needed. With a DOS boot disk they could perform complete OS reinstalls from images stored on servers, through to virus removal and a myriad of other fix-it solutions.

The home user could boot their PC specific to their needs, with a little more high memory available for a game, with a Soundblaster driver loaded or even with DriveSpace enabled.

Entire games from the covers of magazines could be loaded, and with some carefully placed tissue over the write-protect, the floppy could be wiped and used for something else.



▲ The 3.5-inch floppy disk was the computer enthusiast's trusted friend



▲ They also made extremely good defensive weapons

The Bad

Anyone who worked in a school or college would often be seen with a pair of tweezers trying in vain to carefully remove the broken gate from the internals of the disk drive. Likewise, you would save your dissertation at home, then take it to the uni library, only to find that somewhere in between the floppy disk had other ideas and decided to never work again.

They did, however, make excellent coasters.

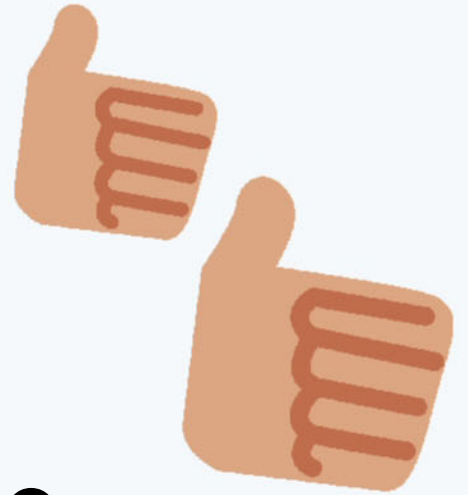
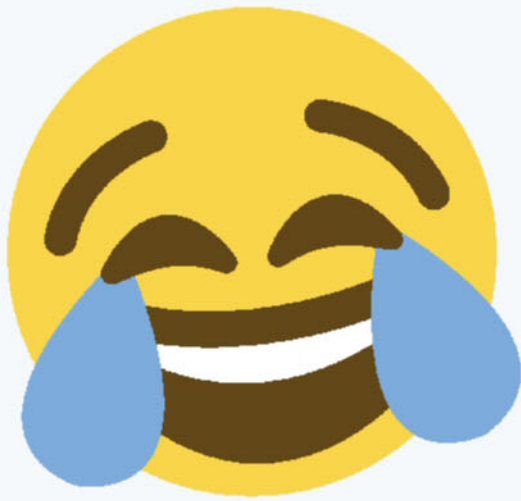
Conclusion

Farewell then, dear friend. You saved our bacon on more than one occasion, yet – like friends can, from time to time – you also made us swear a bit and want to throw you against a wall in anger. You even managed to make an appearance as the storage solution for an early digital camera. Incredible.

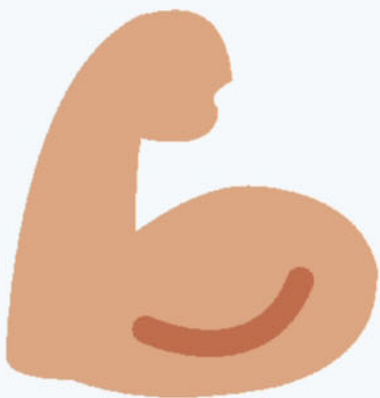
You will be missed, 3.5" floppy disks. [mm](#)

Did You Know...

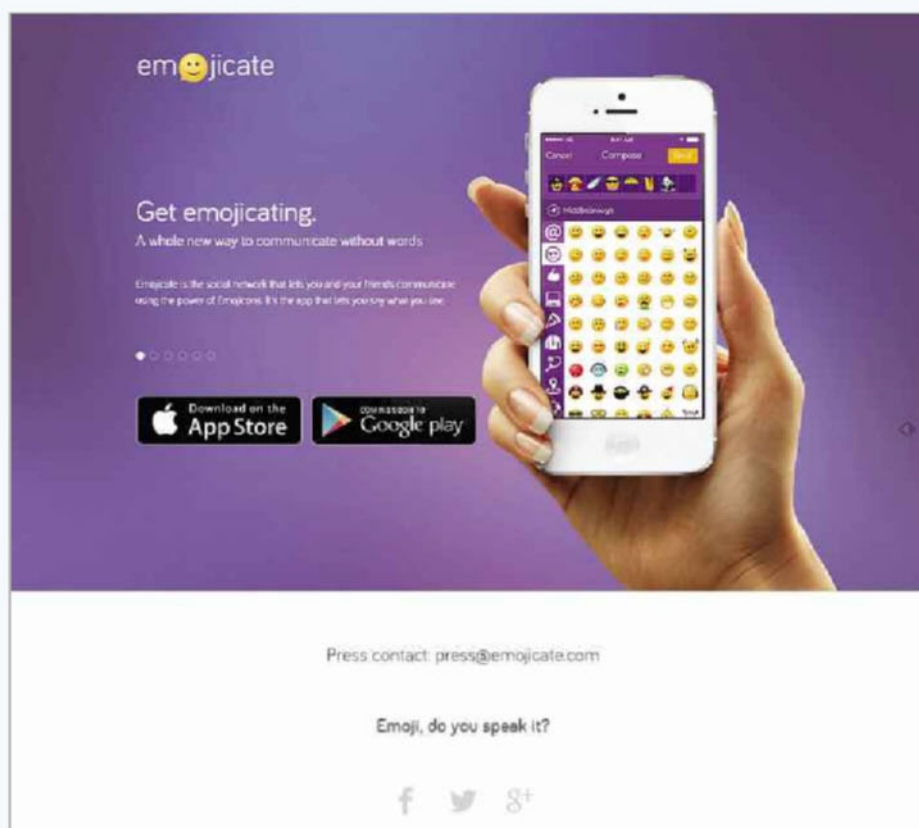
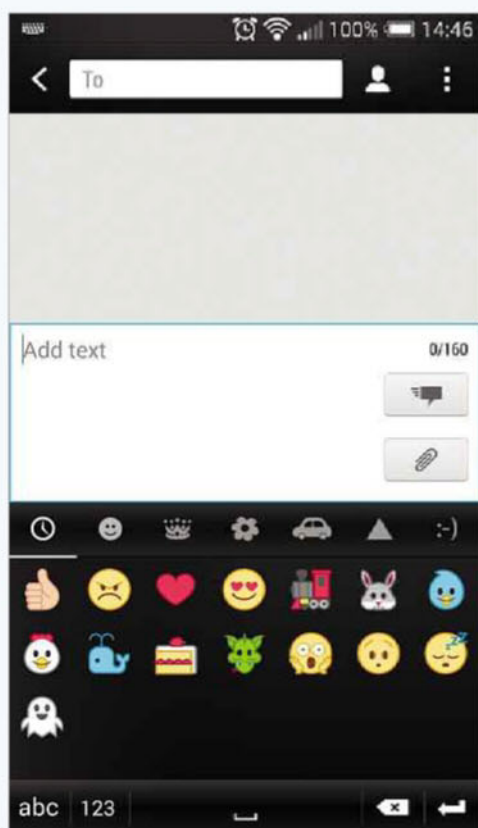
- It would take roughly 8,738 floppy disks to install *Skyrim*
- Floppy disks are still used to update ticket printers in some airports
- Some till systems still are still using floppy disks to store the day's transactions
- Manufacturing CNC machines still use floppy disks to load up their data
- Cash machines, apparently, still come with floppy disk drives installed
- Nuclear weapons silos still run computers that use floppy disks (now there's a scary thought)
- The Social Security of Panama still requires all submitted health care records to be on a floppy
- The National Milk Records still provide data on floppy disk for the InterHerd cattle monitoring program



Everything You Need To Know About Emoji



What's the best emoji to use when you need to tell someone you've done something stupid? Or when you're celebrating a victory? **Sarah Dobbs** explains all about emoji, starting with what they are...



If you're a regular Twitter user, you'll have seen them starting to pop up over the last few months. If you're an iPhone owner, you might already be using them with your friends. Emoji are the tiny graphics that express emotions, ideas or otherwise add a bit of colour to a text or tweet. They're awfully similar to those things we used to call 'smileys' or 'emoticons', but they've recently seen a massive surge in popularity again, with all sorts of emoji-related crazes popping up. Since we wouldn't want to look like we're not down with the kids or anything, we've put together a guide to what emoji are, how you can use them and when you might want to be a bit more careful...

“ Discounting animals, it turns out that there are 59 food emoji ”

Where Do Emoji Come From?

It will probably come as no surprise whatsoever to hear that emoji originated in Japan. In the late 90s, a team working on a mobile internet platform for operator NTT DoCoMo decided to include some cute symbols to help users communicate quickly and effectively – and also to attract customers to its network. The first set of 176 emoji were created by Shigetaka Kurita, who used manga and kanji as inspiration for a set of particularly expressive symbols.

Those first emoji were pretty simple, but when they took off for DoCoMo, other networks took heed and started

A Picture Is Worth 140 Characters

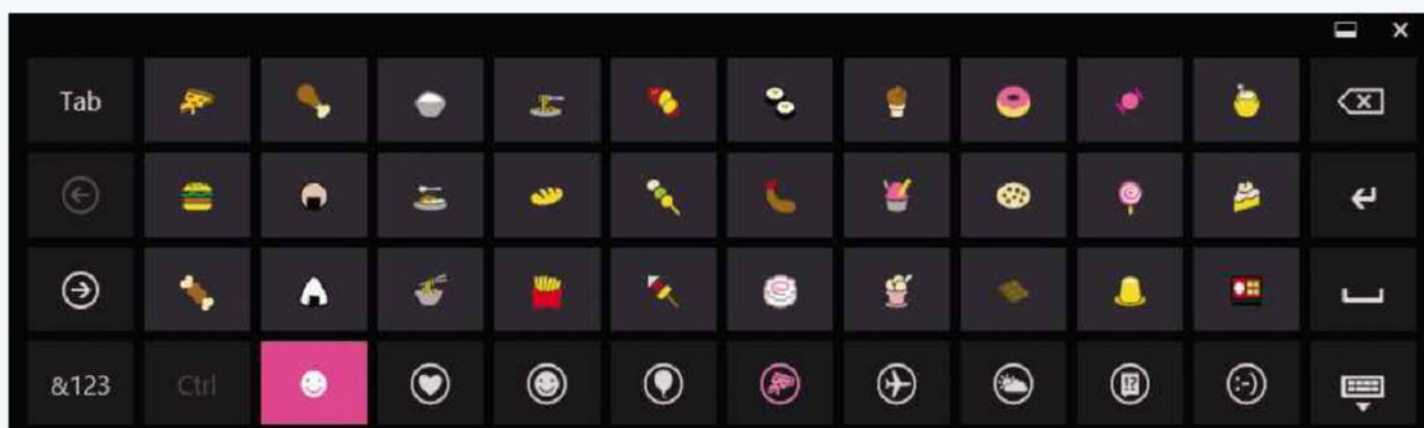
Emoji are usually used alongside text, but could they replace it completely? Emojicate, an app available for both iOS and Android, is testing the idea. It has a massive library of its own bespoke emoji – or emojiicons, as it calls them – which can be sent to friends through the app in place of text messages. There are so many emojiicons built in that you can probably communicate most ideas, but for anything more complex than 'pint?' it's more time-consuming and open to misinterpretation than old-fashioned words. We'll stick to using these weird stick-like figures we call 'letters' for now, ta.

Can You Live On Emoji?

Obviously you can't actually eat pixels on a screen. But since there are so many food-related emoji, Kelsey Rexroat, a writer for The Atlantic, decided to see if she could live on a diet of only emoji foods for a week.

Discounting animals, it turns out that there are 59 food emoji, covering a reasonably decent variety of foodstuffs, though they do lean quite Japanese. How easily you could replicate this diet probably depends on whether you have a decent Japanese supermarket or restaurant near you, otherwise you might struggle to source oden and dango.

By the end of the week, Rexroat found she'd eaten loads of fruit, seafood, white rice... and alcohol. I'll leave you to draw your own conclusions about whether following the emoji diet is an entirely good idea, but if you want to read the full experiment, you'll find it here: goo.gl/0zrl2n.



designing their own emoji. Soon the symbols were becoming more elaborate and more like little pictures than simple pixel shapes. Apple even got involved, introducing an emoji keyboard for iPhones sold into the Japanese market.

The problem with emoji at that point, though, was that the emoji weren't standardised across different networks, even in Japan. And outside Japan, they weren't in use at all, so if they were attached to international text messages, recipients would either see a jumble of code or just an empty box where an emoji should have been. That's why The Unicode Consortium stepped in, to tidy up the mess.

How Do They Work?

Unicode, as you probably know, is the industry standard for encoding and representing text on computers. Basically, it makes sure that characters can be understood and transmitted between different devices without losing their meaning, regardless of font or size or colour. The idea for Unicode came from Apple employees Lee Collins and Mark Davis and Xerox's Joe Becker, in 1987, but as the project developed, other organisations got involved. At the beginning of 1991, The Unicode Consortium was incorporated; nowadays members include Adobe, Google, IBM, Microsoft, Yahoo! and of course Apple.

Anyway, most new operating systems support Unicode, as do most web browsers. So if a character is recognised in the Unicode Standard, it can be understood and interpreted by most computers, phones and other similar devices. And in 2010, The Unicode Consortium introduced a library of 722 emoji. Those weren't newly designed ones; they were the emoji that were already in use on Japanese phones, but bringing them into the Unicode Standard meant that they could then be used and interpreted in different ways by all kinds of devices. The result was that an Android phone might display a particular emoji differently than an Apple one, but they would have the same meaning. You could send an emoji of a smiling face and know the recipient, even if they had a different phone, would see a smiling face too, in much the same way you could send the word 'hello' and have it understood, even if it was in a different font.

More emoji have been added to the standard since then too, though introducing new emoji is a complicated process. The Unicode Consortium will only introduce new emoji if they're already in use and therefore deemed necessary to communication, which means there must be an awful lot of people desperate to send spiders, joysticks and rolled up newspaper emoji to one another.

How Do I Use Them?

At this point, you're either in a state of despair over the decline of language (and perhaps even western civilisation in general) or wondering how you can get in on the emoji party (hopefully it's the latter). The answer is different depending on what kind of device you're using, but there's usually a way.

If you've got an iPhone or iPad, you'll have an emoji keyboard built into your device already, though you might have to enable it. Open the Settings menu, tap General and then Keyboard. Under Keyboards, there's an option to Add New Keyboard, and from there you just tap Emoji. Now whenever you're typing a message, you can insert emoji by tapping the Globe icon to open the emoji keyboard.

“Emoji weren't standardised across different networks, even in Japan”

On Android devices, things might be a bit more complicated. Some Android devices have an emoji keyboard built in, so you just have to enable it like you would on an Apple device: open Settings, tap Language and Input, and tick the box next to iWNN IME Emoji Input, if it exists. If not, try touching Android Keyboard or Google Keyboard, and in the settings there you might find Emoji For English Words under the Add-on Dictionaries.

If neither of those things works for your device, you'll probably have to install an app instead. Don't bother paying for one, though: SwiftKey works perfectly well for both normal typing and emoji typing, and it's free.

If you're running Windows 8.1 on your computer, you'll find there's an emoji keyboard tucked away there too. To access it, right-click on your toolbar, hover over Toolbars, and click on Touch Keyboard. Now when you click on the Touch Keyboard icon in your toolbar, you'll be able to insert emoji into anything you're typing. Depending on the program you're working with, though, they might not always show up – but try typing emoji into a tweet and you'll see how Unicode works, as the representation of the emoji in your Windows keyboard looks completely different after you tweet it and Twitter reinterprets the emoji for you.

And if you're not running Windows 8.1, you can get plug-ins for your browser to enable you to type and view emoji on the

12 Of The Most Used Emoji

There are way too many emoji to cover them all here (250 new ones were launched in June, putting the grand total somewhere over 900), so we thought we'd focus on some of the most commonly used ones. After all, how often are you going to need to use 'Man In Business Suit Levitating'?

Thumbs Up Sign

Want to express your approval? Here you go – because sometimes, succinct is best, and you don't get more succinct than a thumbs up. It's also sometimes deployed sarcastically, for things that really don't merit a raised thumb.



OK Hand Sign

Another one for indicating either approval or sarcastic disapproval, this emoji hand is giving the universal signal for 'OK'. Good for ending arguments or just agreeing quickly with something someone's proposed.



Face With Tears Of Joy

At first glance, you might think emoji represented sadness (it's got two massive teardrops streaming down its face, after all), but this is actually a happy crying emoji, used for occasions of great happiness or hilarity.



Flushed Face

This emoji's red cheeks and wide open eyes indicate, basically, embarrassment. Sent a message to the wrong person? Want to tell Twitter about something daft you just did? This is the one to use.



Smiling Face With Open Mouth And Tightly Closed Eyes

Also known as the 'big grin' emoji, this one is pretty self-explanatory. Although in some versions of this emoji, it looks does look more like gritted teeth. It's meant to express happiness, though it can also carry a hint of antagonism.



Smiling Face With Heart-Shaped Eyes

Another one that's pretty obvious, this one is used for expressing love. Whether it's for a person or a thing, it's basically just about feeling lovestruck. There's a cat version too, though it's not seen as often.



Sleeping Face

Tired? Bored? This face, snoring away, can encompass both. The Android version even has a bit of drool coming out of the emoji face, though that is markedly less cute.



Raising Both Hands In Celebration

The two raised hands here are meant to represent someone lifting both arms in celebration, in a 'hallelujah' gesture. It seems to be get co-opted into a sort of high five symbol, sometimes, though actually, is there much difference?



Smiling Face With Smiling Eyes

This is the emoji for proper happiness. Look how happy it is! Its rosy cheeks and closed eyes are meant to show true contentment. Much better than just a colon and a bracket, right?



Face Throwing A Kiss

There's lots going on in this one: it's winking and blowing a kiss, symbolised with a heart. So it's either flirty or sort of antagonistic again. It's quite good for ending an argument you can't be bothered with on Twitter.



Flexed Biceps

A bulging bicep can represent hard work or a hard workout. No, we have no idea when you'd ever use that either, but plenty of people do.



See No Evil Monkey

There's an emoji for each of the Three Wise Monkeys, but for whatever reason, the See No Evil monkey gets most play. Usually it's used to express embarrassment, like the monkey is face-palming or covering his eyes from something awful he doesn't want to see.



web; just Google for your browser plus emoji to check out the best options for whatever you're using.

A Word Of Warning

Now you know all you need to know about using emoji, but before you go too mad, a quick warning: some mobile networks don't handle emoji very well and will attempt to convert emoji inserted into text messages into image files. And then you get

hit with a charge for sending an MMS message rather than a text message, which, if you use a lot of emoji in texts without realising, can soon add up.

It shouldn't happen, since emoji are Unicode characters, but, well, sometimes it does, and *Micro Mart* wouldn't want you guys accidentally running up massive phone bills sending out pictures of smiling cats. So please do check, and if you are going to get charged for texting emoji, stick to tweeting them instead. [mm](#)



Alarm Clock Apps For iOS

Never be late for work again with **Keir Thomas's** look at six of the best alarm clock apps

Mobile phones and tablets have replaced a lot of tech in our lives – video cameras, music players, and even televisions to name just a few items. One thing they've replaced that's rarely if ever talked about are timepieces. Several times a day we fish our phones out of our pockets/bag or peek under a tablet's smart cover to find out what the hour is. Indeed, it's been pointed out that one issue the new Apple Watch faces is training a generation to wear watches. Teenagers have become used to glancing at mobile devices.

Of course, the world of apps is rarely if ever going to deliver a simple way of telling the time, and most clock apps reviewed below come with quite a few bells and whistles – literally, in some cases. In fact, most aim to push aside the clock radio on your bedside table, which makes a lot of sense considering most of us charge our devices there at night. Why not simply leave the phone or tablet running, displaying a faux LED time display? With modern LED lighting and LCD technology, permanent screen burn (known as image persistence) or wearing out of backlighting is impossible.

As usual, all the apps are free from the App Store and are tested on a Retina iPad and an iPhone 5.

Alarm Clock HD

Modelling itself on a bedside clock radio, Alarm Clock HD works in either landscape or portrait mode on iPhones and iPads and looks almost exactly the same on both devices, with one difference: on

the iPhone the app opts for 12-hour time, while on the iPad it displays 24-hour time. Rather strangely, there doesn't appear to be a settings option to switch modes on either device.

You'll probably want to run the app in landscape mode because portrait mode means an always-visible ad is shown. Landscape mode means the ad disappears and also allows the best emulation of a genuine clock radio display. The app deactivates the device's Auto Lock setting, meaning that it keeps the screen alive for as long as it's running. We must admit that we'd prefer a setting option only to do this if the device is charging, but we suspect iOS, with its sandbox approach of stopping apps doing much outside their own area, offers no method of allowing apps to probe whether charging is happening.

The display is totally authentic recreation of an LED time display. A really lovely touch is the faint outline of the segments of each numeral that aren't active – just like on a real LED display. Swiping left or right on the display lets you adjust the brightness – ideal for avoiding being blinded in the dark.

Of course, this being an app, the clock radio LED display has magical abilities. It tells you what the local weather is, for example, and on an iPad will also scroll through news headlines. Via the settings panel you can also tune into your Facebook and Twitter feeds, so that updates from friends appear within the list. RSS feeds from websites can also be shown via a Feedbin.me account. Alas, this part of the screen is limited to just two lines,



▲ *Alarm Clock HD takes a cue from bedside alarm clocks but includes neat features such as tuning into Facebook headlines*



▲ *Sleep Time measures your sleep patterns via vibrations on your mattress (yes, really) and wakes you up at an optimal time*

with a line above declaring who made the posting (or the source of the headline), so you're only going to see the first sentence or two – and nothing at all if they've posted a video or image without a description. It's a nice feature nonetheless. The scrolling headlines disappear after five minutes, so that they stop being a distraction as you head off to sleep.

“Several times a day we fish our phones out of our pockets/bag or peek under a tablet's smart cover to find out what the hour is”

Tapping on an icon at the top left lets you activate torch mode. On the iPhone this activates the LED flash, but on both the iPad and iPhone the screen is turned entirely white. This is just enough illumination for finding something in a dark room or making your way to the toilet without (a) tripping over the dog or (b) disturbing a partner.

Alarms can be set to repeat and can play music or one of three notification sounds (don't forget to unmute the device before going to sleep). There's also a sleep timer that lets you play music before fading it out after a certain amount of time has passed.

The settings panel lets you modify just about any element of the display, including hiding the seconds update, which might be distracting.

Alarm Clock HD is a classy app that does everything you might need. Alas, we noticed a few bugs, such as the Stop button not

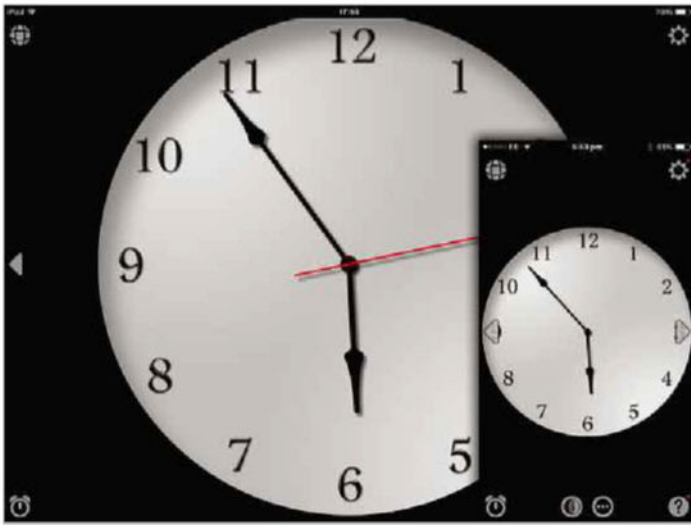
disappearing after silencing an alarm once or twice. 69p for an upgrade will remove adverts, but the core feature set is available for free. Note that this app is produced by Alarm Clock Company and shouldn't be confused with similar apps from a variety of other developers.

Sleep Time

It's becoming increasingly obvious that our mobile phones (and smart watches) will one day know more about our internal workings than we do. Able to tie in with the all-new iOS 8 Health app, the Sleep Time alarm clock app (iPhone only) aims to measure your sleep pattern and then wake you up at the ideal moment – rather than in the middle of a dream, for example. It claims it can do this by measuring small movements we all make while sleeping, which apparently give the game away, so you need to lie the phone face down on your mattress all night while sleeping. You may already be scratching your head here if you sleep each night with a partner, for example, or even a beloved pet. Additionally, if you like to charge your device overnight, then this becomes difficult although not impossible, and there's even the risk that more frenetic sleepers may push the phone off the bed entirely.

The approach of monitoring sleep patterns means any alarm you set is 'fuzzy' in that the alarm might sound up to half an hour before the time you choose if the app determines it's a good time to do so. There's not much wrong with this, we guess, but it'll rub up against those who run their lives with clockwork precision.

The app runs only in portrait mode and shows a friendly if chunky 12-hour clock dial (24-hour can be activated in the Settings panel). The 'Set' handle is dragged to the alarm time (only one alarm can be set), and then you must tap the Start button, at which point you'll be given instructions to lay the phone on the bed (the display sleeps automatically at this point). If you wish you can select a Soundscape to help you get off to sleep. One is provided free with the app, Gentle Waves, which reminded us of



▲ Thankfully not influenced by Coldplay, *The Clocks* lets you switch between a variety of clock faces and set up to five weekly alarms

a faulty public convenience, but stumping up £1.49 for the full version lets you choose from other soundscapes as well as your own iTunes library. You'll also remove an annoying pop-up advert that appears occasionally and get a greater selection of alarm tones beyond the five supplied.

Once the app has slept with you, you can tap the Sleep Lab button to see a graph of your (ahem) nocturnal activity, split into light sleeping, REM, deep sleeping and awake. This info can be shared with the Health app.

A nice feature hidden within the Settings panel is that the alarm and soundscape can be plumbed through to a stereo or TV via AirPlay.

We might be sceptical about this app, but there are many App Store reviewers who swear by it to the extent of maximum five-star ratings. All we can say is: give it a try!

The Clocks

The chief boast of this simple app is that it can show the time in a variety of popular clock faces. These can be cycled between by tapping the left and right arrows on the display or swiping left or right. The default face is an analogue circular display, but also available are LED-based displays and flip clocks. In fact, there are two versions of each clock face: the analogue clock can switch between a ticking and smooth second hand, for example, and second counts can also be added to the LED and flip clocks. As if that wasn't enough, tapping the icons at the bottom let you personalise the clock faces even further – adding a bezel surround to the analogue face, for example, or changing the colour of the LED display.

Up to five alarms can be set across the seven days of the week, and three alarm sounds are possible – beep, bell and buzz – although you can also choose your own title from your music library. An option in the Settings panel lets you fade in the alarm noises, which is perhaps useful because the three alarm noises are pretty aggressive in nature (well, aggressive if you're fast asleep, anyway).

The app keeps the display alive automatically, and there's no option to turn this off, so this is an app that anticipates being used when the device is charging. Swiping up and down on the screen alters the brightness of the display – vital in a completely dark room – and an option in the Settings panel lets you alter whether this controls the device's brightness or just that within the app.



▲ *iHome+Sleep* is a clever alarm clock that aims to monitor your bedtime and wake-up times

A world clock view is also available, showing five other places in addition to your own. Like the built-in iOS Clock app on the iPad, clock faces that are white indicate daytime at that location, and black clock faces indicate night. New York, Tokyo, Paris, Beijing and Moscow are shown by default, but changing the clock faces to a new location is as easy as tapping it and typing the new place when prompted. You're limited to capital cities, though – London is on the list, but not Manchester.

The app works in both portrait and landscape mode on the iPhone and iPad.

There's a lot to like about *The Clocks*, which is simple to use and entirely free of charge. The LED display struck us as particularly authentic and, unlike some other apps here, is nice and basic: all you see is a slowly updating time display to soothe you to sleep, with no other distractions.

iHome+Sleep

Claiming to be from "the experts on alarm clocks" (surely that's Binatone?!), this app has won a variety of awards, which isn't bad for an app category that's ultimately trivial in nature.

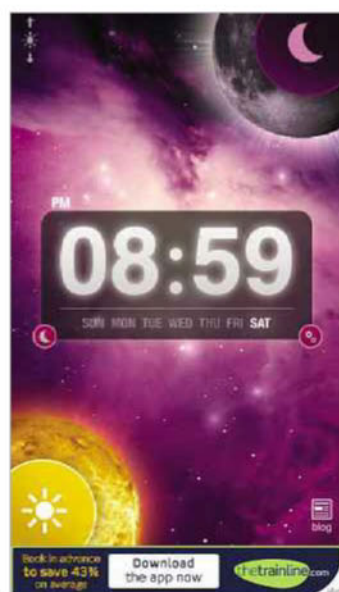
What you get is a fundamentally simple alarm app that works on both the iPad and iPhone, in both landscape and portrait modes. There are a handful of features that lift it out of being an also-ran, however.

The first is that a lot of separate alarms can be configured. If you want to wake up at 8am on Monday, 6.30am on Tuesday, 7am on Wednesday, and more, then this app is for you. Rather cleverly, each alarm can be set with two sounds: one for bedtime, and one for wake up. The sounds for bedtime can be music from your collection, from the Zen app also made by iHome or a TuneIn radio station. Wake-up sounds offer an identical choice, but you can also use one of seven tones.

The bedtime sounds feature works in a clever way, because before you get into bed, the app requires you to drag a slider across the screen. This then has the effect of putting the device into alarm mode, with a darkened screen showing just the time, and the audio will start playing for a default of 60 minutes (this can be adjusted in the Settings panel). If you subsequently wake up before the alarm sounds, you should then drag across another slider to let the app know. If you're woken by the alarm, it can be silenced the same way or snoozed, and a handy feature is that you can shake the device to snooze (easier on the iPhone at 6.30am than with an iPad!).



▲ *Speak to Snooze introduces speech recognition and speech synthesis into the process of waking up to an alarm*



▲ *You can meditate yourself to sleep with Alarm Clock Sleep Sounds, which also pulses your brain to activate brainwave patterns*

Because you tell the app when you go to bed and wake up, it keeps track of your bedtime and wake-up times, and you can see this data as a table and also a graph by dragging up from the bottom of the screen.

Another terrific feature is the ability to set nap alarms. Simply tell the app how long you want to sleep for by rolling a dial in increments of 15 minutes, then put your head down to rest. Again, the screen will dim and you can wake prematurely if necessary by dragging the on-screen slider.

The final cherries on the cake are the ability to create an account with iHome so settings are synced across devices and a weather display that shows the weather right now, for the upcoming day or for the coming five days.

The only fly in the ointment is the always-displayed banner advert at the bottom of the screen. As is typical, these can be removed for a 69p upgrade.

Speak To Snooze

As its name suggests, this app is all about speaking. You speak to it, and it speaks to you. In particular, it provides the ability to silence or snooze alarms simply by saying 'Alarm off' or 'Snooze alarm'. You'll have to speak up, though, because the phone may have trouble hearing you over the sound of the alarm itself. At any time of the night you can also ask what the time is, with a slightly rosey synthesised voice answering, and command it to activate flashlight mode whereby the LED flash is activated and the screen switched to white full brightness. Stump up 69p for an in-app upgrade and you can also command it to create alarms, saving the bother of tapping the screen.

As you might expect, for the app to listen all the time without killing battery life, your device really needs to be connected to the power, although this won't be an issue if you charge your device at night.

Multiple alarms can be set, although only within the same 24-hour period. The option to set different alarms for different days of the week comes as part of the Pro upgrade, although a welcome feature for all users is 'I Have To Get Up By', by which you can set a time period upon the expiration of which snoozing

will no longer work. A variety of alarm sounds can be chosen, including two funky remixes of the default Marimba alarm sound, but the ability to choose from your own tunes by way of wake-up alarm is another 69p upgrade. Some frankly poor-quality celebrity impersonation alarm sounds (Stewie from *Family Guy*, Sean Connery, Barack Obama and more) are all an additional 69p upgrade away.

By the way, rather than letting you pay directly for in-app purchases, the app forces you to buy 'Espresso' tokens. 100 of these can be bought for 69p, 200 for £1.49, and so on. This is just irritating, although tokens can also be earned; one can be gained by simply waking up to an alarm each day, for example, so over the space of one third of a year you'll be able to buy an upgrade. More can be earned by watching advertising videos, and on creating your first alarm you'll gain 95 freebies.

In addition to the slightly overwhelming in-app upgrade offers that lurk around every corner, the app also displays a banner ad at all times. The app doesn't work on the iPad either except in zoomed-in mode, although for an app like this that isn't too burdensome.

Speak to Snooze is a nice idea, but with the advent of iOS 8 you can now say, 'Hey Siri!' when a device is charging to issue similar orders, with no need to even touch your device. This limits the appeal of this app to devices on which Siri can't run.

Alarm Clock Sleep Sounds

New age meets new technology with this app, which aims to both send you off to sleep and then wake you up via guided meditations, soothing ambient sounds and brainwave entrainment (sic) involving alpha, beta, gamma, delta and theta waves. As far as I can tell the latter are basically low-frequency wobble noises, although this probably isn't the scientific description.

Key to the whole thing is creating wake or sleep programs, typically lasting 30 to 60 minutes, and the process is virtually identical in both instances, except that an alarm time must be set for the wake-up program. In each case you're invited to choose from brainwave pattern ('Energised Mind', 'Deep Sleep' etc), ambient noise (rain, birds, sitar etc.) and guided meditation voice (American female, probably from the west coast). In each case, you're limited to only a few choices, and more can be added by upgrading to the full app for £4.99.

The app is designed for an iPhone but will work on an iPad in magnified mode, and it can be switched between landscape and portrait modes on either device. An always-present time and day display fill the middle of the screen, while animated sun and moon icons can be tapped to create the wake-up or sleep programs respectively. Dragging up and down on the screen lets you alter the app's brightness, although the always-present banner advert remains at full brightness. Additionally, tapping a small icon at the bottom left of the time display lets you switch to night mode. This mutes the colours and turns off the animated effects.

Like most of the apps here, Alarm Clock Sleep Sounds needs to keep running all the time if the alarms are to work, and the app will keep the phone alive although there's an option within the Settings panel to deactivate this.

If you're somebody who genuinely has trouble getting to sleep or finds traditional alarm clocks too harsh, then this is an app worth checking out. Personally we found the guided meditation voice a little annoying (imagine the voice behind a US infomercial after she's taken Valium), and it would have been nice to turn this feature off in order to stick with just the brainwave massaging and ambient noises. **mm**

How-to Basics

Choosing Free Anti-virus Software

Need protection for your PC but don't want to spend anything? Read on...

Unfortunately, we live in a world where it's nearly impossible to connect to other computers and visit websites without picking up nasties that can affect our own computer.

It doesn't matter if you're using Windows, Mac OS, Linux, Android or any other modern operating system; you can guarantee that some little oik out there has developed a bit of code that will vandalise your setup and create untold havoc.

Thankfully, we have anti-virus programs to help combat and prevent such nasties from entering our system, or if they do, they can quickly be quarantined and dealt with. Many of these programs cost a few pounds, and if you're on a tight budget you could be left unprotected. However, there are many that are free to use and are just as good at protecting you as their paid-for relations. The problem, though, is knowing which one to choose.

Microsoft Security Essentials

Microsoft Security Essentials is an anti-malware and anti-virus package that's

designed for home users with Windows XP, Vista or Windows 7 installed. Windows 8.x users also use Microsoft Security Essentials, but in their case it's built into Windows Defender and is a slightly different beast.

Although it's generally good for most lightweight browsing users, Microsoft Security Essentials is essentially a basic foundation providing a simple layer of protection. This of course means that those who frequently visit the more, er, colourful side of the internet, should really be looking at employing a significantly more capable form of protection.

Saying that, though, MSE does a fairly good job. It has very little impact on the user's PC, it's updated regularly and it'll keep you informed of any potential threat to your system, as well as notifying you when there's a system scan due.

Okay, so it's not the best AV product ever conceived, and because it's Microsoft developed, everyone loves to denounce it. But it's not all that bad, and for those who use the internet less than most, it'll certainly suffice.

Avast Free Antivirus

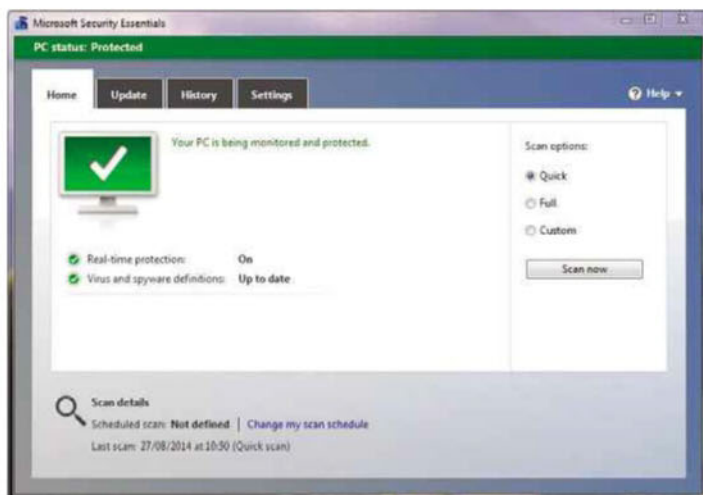
Avast is one of most highly regarded free anti-virus products available today. It's a well and truly capable virus scanner that includes different modules designed to prevent infections of emails, sharing programs, messaging and obviously browsing.

Avast Free Antivirus is fast, simple to use, easy to understand and has as little impact on your system as MSE. Plus, Avast also includes a Browser Cleanup tool, which will help you remove any unwanted add-ons from your browser and, as an extension to its AV product, a Ransomware Removal tool that also works on Android devices.

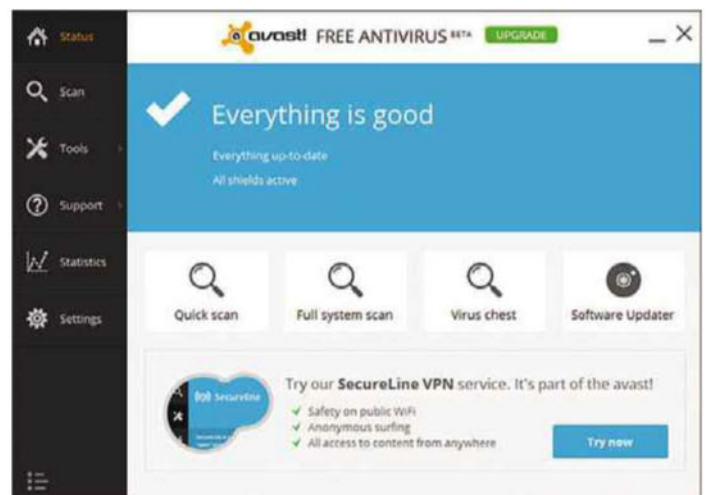
So for an excellent, intelligent anti-virus, browser clean-up option, anti-spyware and anti-phishing, you won't go far wrong with what Avast Free has to offer.

Panda Cloud Antivirus Free

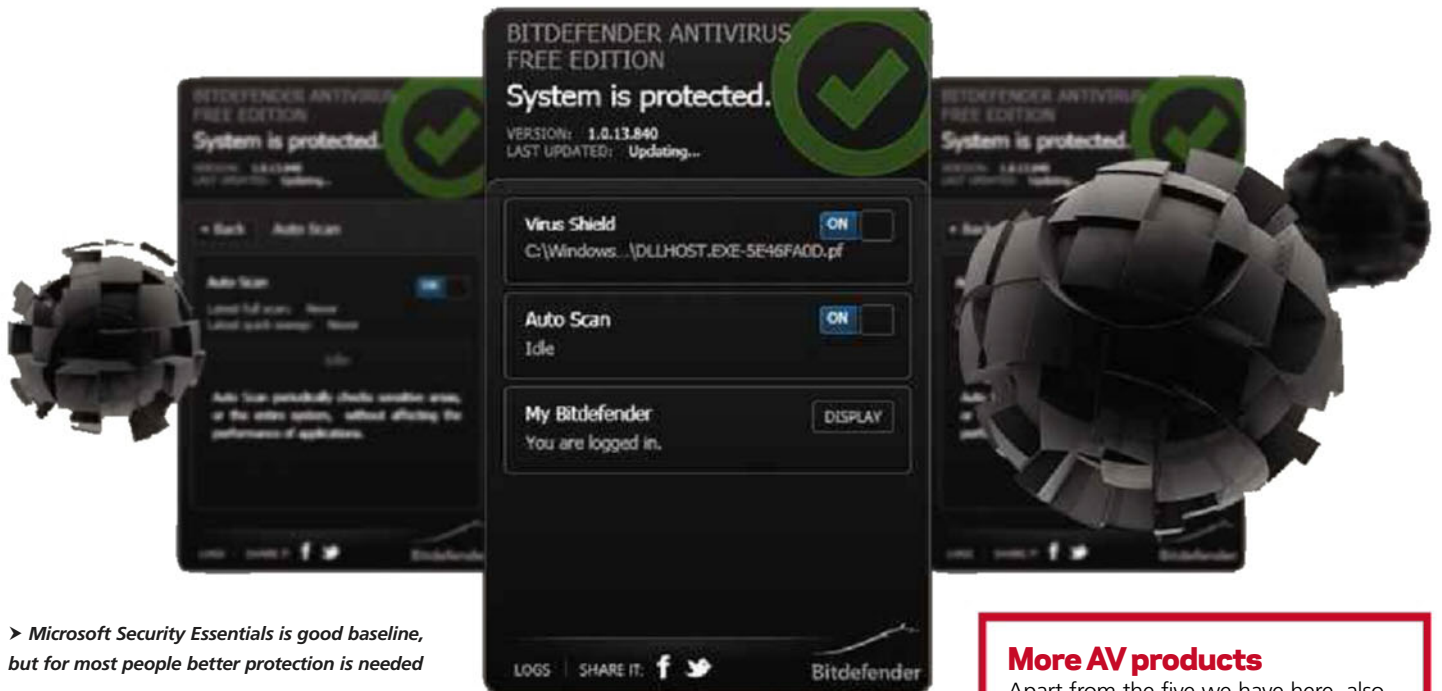
Panda Cloud Antivirus is a small, lightweight and extremely simple to use, free anti-virus product. Viruses,



▲ Microsoft Security Essentials is good baseline, but for most people better protection is needed



▲ Avast Free Antivirus is currently classed as the leader of the free AV world



► *Microsoft Security Essentials is good baseline, but for most people better protection is needed*

spyware and other suspicious items are all monitored and dealt with should you come into contact with any of them, and any dangerous operations that pose a threat to the security of your PC are blocked through some clever process monitoring modules.

There's also a tracking blocker, which will eliminate any current tracking cookies and protect you against any future intrusions, and there's a URL and web filtering element implemented to help further your protection when online.

The Cloud element of the title doesn't just mean you're protected when uploading or downloading files from the likes of Dropbox; it's mainly due to the fact that this product is based on a Collective Intelligence system, which will share updated virus and virus-like behaviour with all other Panda users through the Panda Cloud.

In theory, then, if someone picks up a virus that's little heard of, the other computers connected to the Panda Cloud will benefit from the information gained by that client and will then be automatically updated accordingly to deal with the threat should it ever become something bigger than a single instance.

It's certainly a good idea, and if you're interested, then head on over to the Panda Security website for more information.

Avira Free Antivirus

Avira Free Antivirus isn't one of the more well-known AV products, but it's actually rather good and well worth looking into if you're after a product that's different from the rest of the pack.

It has a good and highly rated anti-virus engine, with a higher than normal level of behavioural analytics, a Browser Tracking Blocker and 5GB of free online storage with the Avira Cloud servers.

There's even an Avira Search Toolbar, which includes a Web Safety Advisor that offers a safety rating system for any sites you visit.

Naturally, a toolbar is something most people will avoid like the plague, but the Avira version seems to be pretty good and doesn't interfere too much with your usual browsing habits.

On the whole, it's not a bad product. It's probably not as good as Avast, which is fast becoming the benchmark for all free protection products, but for the most part it's better than MSE and will no doubt keep you safe while online.

Bitdefender Antivirus Free Edition

Bitdefender Antivirus Free Edition is a part of the company's Tool Box range of products. It shares some of the technology used in the more elaborate and main product range and is highly optimised to be maintenance free and easy to use.

It's an unobtrusive product that is quick, simple and doesn't hog system resources like many other products tend to do. There's a gaming aware function, which will pause a scan or become silent when it senses you're playing, and it's optimised for Windows 8 and Windows 8.1.

It uses a combination of cloud-based scanning and advanced behavioural

More AV products

Apart from the five we have here, also check out:

- ZoneAlarm Free Antivirus and Firewall
- AVG Free Antivirus
- FortiNet FortiClient
- 360 Internet Security 2013
- Ad-Aware Antivirus+
- Amiti Antivirus
- Baidu Antivirus 2015
- Comodo Antivirus 2014

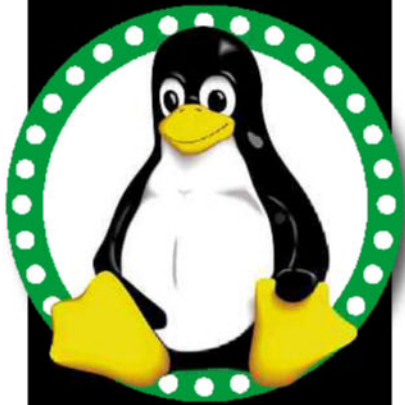
No doubt you'll be able to find hundreds more.

analysis to better protect your system. With a real-time shield, AV control, intrusion detection, HTTP scanning and an anti-rootkit element to help protect you from malicious software, this is one of most comprehensive free protection products available.

There's More

Needless to say, the handful we picked out here are just the tip of the proverbial iceberg. If you want more to sample, then check out the boxout.

In the end, there's a fine balance between what you want from an AV client, who you trust as a company and what levels of protection are on offer. Many will swear by MSE; others will allow nothing to touch their system other than Avast. The same applies to the other free AV clients available. Which you'll choose is up to you, but give them a go and read as much as you can about them before deciding to commit. [mm](#)



David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

Linux

Getting Sparky

SparkyLinux GameOver Edition gets some attention this week

Gaming on Linux is nothing new, we've droned on for years in *Micro Mart* about how good a platform a Linux machine is for games, despite the (still) lack of triple-A titles that appear on Windows machines. Steam has made things a little more interesting on the Linux gaming front, of course, and a wealth of games developers are now taking the platform more seriously than they did a few years ago.

However, there are still a vast number of Linux-bred gaming titles available, and there are even a number of gaming-specific distributions available as well. One of which is SparkyLinux 3.4 GameOver Edition, which uses a basic LXDE approach that's quick to boot and fast to use. The result is a desktop that uses minimal system resources so there's plenty left available for the games you plan to run on it.

The top of the desktop houses a panel dedicated to the games that come pre-installed with the 3.9GB

image, along with a Conky readout displaying the CPU, time, and a few other basics on the right-hand side. The bottom of the desktop has the regular LXDE panel, with Menu button and connectivity and notification areas.

There are also links to the install client installer Steam and Desura, and Wine is included for any Windows based titles that can actually run – the same goes for PlayOnLinux as well. For some extra old school gaming, the developers have decided to bundle a copy of MAME, DOSBox, DeSmuME, Stella (Atari 2600 emulator), PCSX-Reloaded, and a number of other emulators including some game ROMs to help get you up and running. All-in-all, it's not a bad selection, and the retro gaming enthusiasts will no doubt be perfectly happy spending several hours going through the available titles.

The true Linux titles include: *0 A.D.*, *3D Chess*, *Airstrike*, *Alien Blaster*, *Maelstrom*, *Robots*, *Scorched 3D*, *Warzone 2100*, *Tux Racer* and many more.

What Else, Then?

Beyond the gaming side of things, we have VLC, Radiotray, Dropbox client, Iceweasel, Pidgin, Transmission, and several other additions. But since the emphasis here is on gaming we don't see any signs of LibreOffice or any other productivity. Naturally though, they're not too difficult to install for a more complete system.

Conclusion

SparkyLinux may not be everyone's first choice of distro when it comes to gaming, but for the sake of an easy to use and quick desktop it's not that bad. The retro side of things greatly appealed by me – more than the dedicated Linux gaming side of things, if I'm honest. It's worth noting, though, that all these programs can be installed onto an already established system relatively easily.

So, while SparkyLinux doesn't necessarily bring anything new to the distro table, if you fancy something different, and you've not tried it, then it's certainly worth a go at least.



< Lots of Linux gaming here, with a good choice of retro emulation

A Question Of Taste

If there's one thing Apple always had that Microsoft didn't, it's taste. Has the tide turned, though?

It's quite unpopular in the Windows world to say "I actually like Metro", in much the same manner you wouldn't stomp about Old Trafford in a Manchester City scarf, but there's no denying Microsoft was really on to something with the stripped-back, minimal approach of its (initially) mobile OS. On first using Metro, it immediately struck you as beautiful and different in a ballsy manner that felt utterly alien coming from Microsoft; perhaps it's this as much as some of the inherent usability issues the company never quite managed to solve that have seen the new design language increasingly sidelined, now seemingly to be welded to the Windows 10 Start menu and largely forgotten about.

As someone who mostly uses Apple kit, Metro was a wake-up call to the fact Apple wasn't alone when it came to taste. Here, very suddenly, was something from the square of the squares that merged Swiss graphic design with fluid touch-based content-first interaction, in a manner that made Apple's texture-heavy design of the time look positively prehistoric. What's

curious is that since then, Apple has decided to upend everything, from an interface standpoint. In that process, it's created one definite success, but also something that could well become – from both taste, aesthetics and usability standpoints – something that's seen to be a bit of a dud.

It would be naïve to suggest Metro alone was responsible for Apple's shift in design language; a move that occurred between iOS 6 and iOS 7. Around the time, Jony Ive became ultimately responsible for software, with his penchant for minimalism ousting the remnants of Scott Forstall's passion for textures and real-world analogs (which themselves were an echo of what Steve Jobs reportedly enjoyed when it came to interfaces).

However, Apple nonetheless forged ahead to create a mobile operating system that blazed a similar trail to Metro. Despite some snags regarding usability and some questionable icon design, a little refinement has shown iOS 7 (and now 8) to be a remarkably good product. It's light and airy in all the right places, pushes content to the fore, and for the most part is big on clarity. In terms of taste, have been big successes.

It's therefore baffling to sit in front of OS X Yosemite and grapple with the fact it comes from the same company. While Jony Ive talks about a shared design language across Apple products (rather than Microsoft seemingly having the goal of a single flavour of Windows essentially running everywhere), there's little evidence this has been taken to heart by Apple's designers; worse, it seems taste is in scant supply when it comes to the end result. Yes, Yosemite is in some ways simpler than its predecessor; the last vestiges of Aqua — 3D buttons, candy-coloured window controls — have been washed away, replaced by simpler and flatter equivalents, but there's no class anywhere when it comes to typography. Clarity is a problem, with contrast levels set far too low; and worse, some of the design is just plain 'bad'.

The icons are a case in point. Aesthetics are objective, of course, but even iOS 7's much-derided app icons made sense when seen in the proper context of the operating system; by contrast, the new goofy Finder icon, the weirdly overly blue Mail icon, the bevelled artwork for iBooks and App Store, the mess that is Contacts, and the dreadful folder icons in Finder, are baffling in their ugliness. Throughout, Yosemite feels disjointed and ugly, like a half-baked mod of how someone thought OS X combined with iOS might look, but without them having the skills to make it a reality. Here's hoping it gets some serious refinement and finds some taste – fast.

< Yosemite: surprisingly ugly, coming from Apple, and too often bereft of taste



Craig Grannell is a writer, designer, occasional musician and permanent loudmouth. He's owned Macs since 1996, when Apple was facing certain doom, and is therefore pleasantly surprised by its current success. Find Craig on Twitter at @craiggrannell



Mac



Ian is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

Mobile

Going Dark

Ian McGurran looks at the smartphone that claims to be more private than the rest

Security and privacy in the mobile world has come under increasing scrutiny over the last 18 months. We've had the revelation of alleged collusion between mobile phone makers, internet service providers, phone companies and more, with secret instruments of the state – such as the USA's Central Intelligence Agency and the UK's GCHQ, for what appears to be unfettered access to any and all the data that passes through these channels.

Then there has been the raft of hacking claims, resulting in millions of passwords for secure sites such as eBay being published, and even intimate photographs lifted from Apple's supposed secure iCloud storage being released to all and sundry. Naturally there is concern for the safety of people's data, and what can be done by these companies to protect it. However, there is a smartphone that claims it is able to secure and encrypt everything at source, meaning you are able to take care of your security yourself.

That phone is the Blackphone; though, to look at it, you would be forgiven for thinking it was a fairly ordinary Android smartphone – a little too ordinary, perhaps? Looks are not the object of this exercise, though.

Still, it's got a 720p 4.7" screen, Nvidia Tegra 4 CPU working at 2GHz, 16GB storage, cameras of the 5MP and 8MP variety (front and back respectively), a microSD slot – but, somewhat disappointingly, just 1GB system RAM. In use it is also very ordinary, very much like a vanilla Android device. However you'll notice that there are some important apps – actually no, you'll not notice them because they are not there, and those apps are the Google suite of apps. So, while the Blackphone is Android-powered, it isn't Google-powered, and therefore doesn't use Google's all-encompassing services such as Gmail, Hangouts, AdSense, Play store or anything else.

The Blackphone instead uses PrivatOS, the variant of Android 4.4.2 KitKat, with a myriad of privacy-focused, encrypted applications that replace your everyday smartphone tools.

These range from something as simple as the messaging software or cloud storage, to integral functions of the phone itself, such as making a voice call.

You can still use most applications you want on here, but they won't be more secure because you're using the Blackphone. While it'll encrypt data such as an image on the device, if you upload it to Dropbox (as an example) it'll lose its encryption and be as much at risk as any other data on there. SGP technologies, the makers of the Blackphone, will advise an alternative to many apps, though. For example: it advises using SpiderOak for cloud storage, given it has a very high level of encryption.

In practice, many users have found it a mixed bag. Being Google-less, anything that requires Play services won't work. You may find other apps may not work due to the encryption and tight security within the PrivatOS either. Even installing apps is a bit tough given there's no kind of app store or even APK installer present. You can grab the Amazon app market, but must be aware you're again moving outside of the Blackphone's protection. Others have complained the heavily rerouted over-IP voice calling has a low quality about it.

However, there are few who would buy a Blackphone for a day-to-day personal handset. It's really more of a tool and should be regarded as such. If your line of work may have a requirement for such as device then the fact *Riptide GP2* may not run on it will not be your greatest concern.

At \$629 the Blackphone is not cheap, and it certainly feels like a 1st generation device. It is, however, a promising start and it points the way for the level of security that could and may well be afforded to mobile device users in the coming years.



Cybernoid XE

Raffaele Cecco's hit Cybernoid is finally making its way to the Atari XE/XL some 26 years after its initial release. Better late than never, as they say

The noted Sinclair ZX Spectrum classic *Cybernoid*, which was published by Hewson Consultants Ltd back in 1988, is currently making its way to the Atari XE/XL thanks to the work of an Atari enthusiast known as XXL and who has posted a work in progress video on his YouTube channel at [youtube.com/user/atari8xxl](https://www.youtube.com/user/atari8xxl).

Cybernoid is a creation credited to Raffaele Cecco. It plays as a 2D flick-screen shoot-em up in which you are put in charge with recovering many stolen items that are the rightful property of the ominous sounding organisation known as The Federation. These pilfered items are well guarded by some very repelling forces which protect the intergalactic hoards stolen by the said pirates. The game won almost universal praise at the time, and had some quite awesome eye candy and a devious learning curve.

The remake is using much of the Speccy game's original graphics, though (like other recent conversions to the XE/XL) they will be monochrome versions. Whether the gameplay will be tweaked to make it a little less impossible is not yet known, but I would imagine that it'll end up being just as rock solid playability wise as it always was. The direct YouTube video is available to view at youtu.be/or8BW5RYKU0.

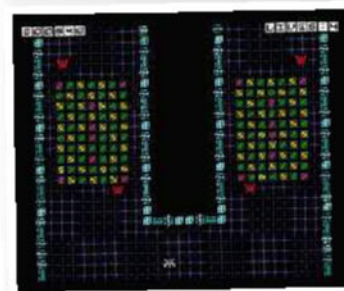
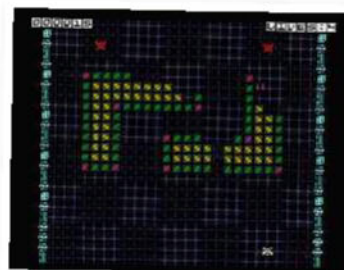
At the time of writing, there is not much more info, but XXL has been involved with other conversions – including *Jet Set Willy* by Software Projects and the Ultimate Play The Game title, *Nightshade*, so I'm expecting a high quality production.

Invasion

I may be a bit late on this one, as I missed Denis Grachev's initial announcement of a follow-up to his excellent single-screened 'collect-em up' for the Sinclair Spectrum called *Sector*.

Sector Invasion, his new iteration, has the same look and feel of its predecessor but with a twist in the gameplay – it's be a shoot-em up that'll test your reactions.

Played within the confines of a single screen, the task is to move your armoured ship along a horizontal plane to clear each sector of, err, solid inanimate blocks by blasting each piece that you see. Within certain areas are enemy crafts that will fire at you if they detect that you are within one block of them. These enemies tend to move in set patterns, which are easy to learn, but dodging their bullets require sharp reactions. Their shots will obliterate the inanimate blocks that need clearing, but each attacking vessel cannot be destroyed.



▲ Denis Grachev's *Sector Invasion* for the Sinclair ZX Spectrum

The game is pacy and well developed, with nothing more than functional and simplistic-looking graphics. I found the learning curve to be weighted well, with some nice touches (such as AY or Beeper music) depending on the host hardware.

To find out more, and to grab the download, head over to tinyurl.com/qcha3ca.

1K Gaming Fun

Viper Jr is a game that has been discovered by its original author who developed it in 1982 as a proof of concept for the Sinclair ZX81 with at least 4K of extra RAM. A real blaster from the past, then...

It's developer, known as DavidG on the **SinclairZXWorld.com** forums, has realised that there is actually no extra RAM required as it'll run quite happily on a 1K machine. It's quite a simple concept and is like a version of *Space Invaders* but with only one invader (presumably the 'Viper') heading towards the ship at the bottom of the screen, which is constantly moving left to right and back again. There are two control keys, one to change the direction of the ship and the other to fire a shot at the invader. The game and source code for this can be downloaded from tinyurl.com/o9orxt9.



Shaun has a passionate interest in 8-bit computing and gaming and has been finding novel ways to use retro technology since 1994

Retro



Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

Gaming

Apocalypse Now

There's more than a hint of black comedy to be found in *Human Resources*, the RTS where giant machines and Lovecraftian monsters feast on our planet's tiny citizens

This week, Ryan checks out the new RTS from the makers of *Planetary Annihilation*, and takes a look at the crash-filled multiplayer racer, *Wreckfest*...

Plug & Play

What will humanity do when machines finally achieve sentience and try to kill us all? According to the forthcoming RTS *Human Resources*, we'll open up a portal to another dimension and unleash the Ancient Ones. Yes, in a clear nod to the writings of HP Lovecraft, the game sees huge, octopus-like monsters spill out into our earthly realm and take on the various giant robots and machines that have taken over our cities.

It's a typically over-the-top scenario from Uber Entertainment, who appear to be trying to corner the market in real-time strategy games with outlandish spectacle in them. The studio's previous game was *Planetary Annihilation*, a game that saw warring factions swing planetoids at each other like unfeasibly large wrecking balls. That game was one of the success stories in Kickstarter's boom year of 2012, raising a staggering \$2.2m during its fundraising period. Reactions to the resulting game were somewhat mixed, but the general consensus was that, once some of its technical issues had been ironed out, it could be a great successor to the RTS that inspired it, *Total Annihilation*.

Human Resources, meanwhile, offers a new twist on familiar RTS

mechanics we're used to. Here, humans become the unwitting pawns in a war between machines and monsters, so "Instead of mining minerals, or money, or gems, or whatever" explains John Comes, design director, "you're mining humans."

In other words, the ant-like people scurrying around at street-level in a typical game of *Human Resources* are essentially your food supply. *Human Resources* is, therefore, a blackly comic take on the *Command & Conquer* series – which John Comes used to work on before he joined Uber Entertainment. Players can choose between either faction – the Japanese-influenced machines, with their humanoid mecha – or the Lovecraftian monsters in a top-down war for the planet's fleshy resources.

What you'll find, though, is that one side plays rather differently from the other. "We have these asymmetrical factions," the designer explains. "The machines are all mobile – you have to deploy them to build your troops. Or you can play the Ancient Ones, and they're more about consuming humans and building temples, and sending units out of their temples rather than being mobile."

Visually, *Human Resources* looks like the movie *Pacific Rim*

rendered as a comic book: the robots and monsters are all cel-shaded in fresh, bright colours, and there's something oddly pretty about the sight of a dozen machines scurrying up the side of a skyscraper and all the people scurrying out of it like ants.

As we reported last week, Kickstarter hasn't been attracting quite the level of support it has in the past, and it's likely that Uber won't get quite the same level of funding that they did with *Planetary Annihilation*, but *Human Resources* looks as though it's being crafted with a lot of love by a studio unafraid to think big, and that may be enough to push it to its ambitious \$1.4m funding goal.

You can find out more by visiting tinyurl.com/q5go63a.

Online

Bugbear Entertainment previously brought us *Ridge Racer Unbounded*, an arcade-style driving game which made up for its hideous title with its thrilling turn of speed. The developer hit a bit of a road bump earlier this year when a free-to-play version of that 2012 game, called *Ridge Racer Driftopia*, was abruptly cancelled by Namco.

Undeterred, Bugbear's pressing on with a driving game it originally announced back around



▲ Formerly known under its working title *Next Car Game*, *Wreckfest* is a crash-obsessed multiplayer racer from the makers of *Ridge Racer Unbounded*

the time when *Ridge Racer Unbounded* was released. For the past couple of years, it's been going under the working title of *Next Car Game*, but the studio's recently announced its proper name: *Wreckfest*. Apparently, that's a common expression among motorsport circles, and refers to what happens when lots of cars are all bunched together on a racing track.

In other words, *Wreckfest* is all about crashes – violent, high-speed crashes full of twisted metal and bouncing bits of debris. Along with the grand unveiling of the game's title, Bugbear's also opened up a little bit about its multiplayer mode, which, we've learned, will support up to 18 competitors in any one race. There'll be four modes to choose from – conventional racing, Demolition Derby, Deathmatch and Team Deathmatch.

A build of *Wreckfest*'s on Steam Early Access now, and while the game's obviously still a work-in-progress, it's already easy to see what the studio's going for here. What's immediately noticeable, even from some of the multiplayer footage we've seen (youtu.be/Dda6LxWGbVc),

is that *Wreckfest* is the polar opposite of the shiny racing sims we've seen over the past few years, where the camera lingers over every curve of a supercar's pristine body. *Wreckfest* is all battered wheel arches, chipped paint and smoke, and it's not uncommon for the track to be littered with debris by the end of a race.

Bugbear have said they've been influenced by games like *Destruction Derby* and *Burnout*, and it's easy to see those games in *Wreckfest*: the racing physics have been set up to create drama and spectacle rather than the illusion that you're at the helm of an 800 horsepower muscle car. As such, don't be surprised to see your V8 Mustang lookalike cartwheeling through the air six or seven times after a collision. To balance things out, you can also cross the finishing line in something so mangled that it looks more like a crushed beer can than an actual car.

Wreckfest, then, isn't polished or particularly sophisticated – and that's why it looks like so much fun. You can follow its development over at nextcargame.com.

Incoming

The PR surrounding Ubisoft's latest stalk-and-kill epic *Assassin's Creed Unity* has focused on its (potentially exciting) multiplayer co-op mode and its slavish recreation of Revolution-era Paris. The sequel's road to release has seen a few own-goals, though. First, there was the lack of female characters, and the excuse that it would have required "double the visual assets" to provide them. Now there's "the great framerate debate."

Earlier this month Ubisoft revealed that *Unity* would only run at 30fps on next-gen consoles. Ubisoft's explanation as to why sparked slightly puzzled conversations: first, *Unity*'s producer said the studio had

locked the framerate to "avoid all the debates" about specs. Then a level designer said that 30fps was "more cinematic" than 60fps, which is downright weird as games are all about fast movements and smooth in-game camera moves – things that always suffer at lower framerates. As a bit of PR spin, Ubisoft's approach hasn't, unsurprisingly, convinced many gamers so far. Interestingly, the PC version's specs haven't been announced at the time of writing, but given that the Windows version will almost certainly be based on the Xbox One and PS4 build, it seems likely that this too will be limited to run at only 30fps as well.

Assassin's Creed Unity is out on the 14th November.



▲ *Assassin's Creed Unity*'s been in the news of late due to its 30fps lockdown on next-gen consoles. We don't yet know if the PC version will be restrained

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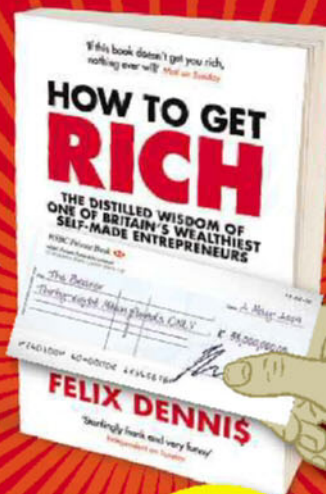
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HP 4Gb memory Microserver with two hard disc drives. £110. One with Linux MINT. Other with Linux FreeNAS. This will also run Windows 7 and Windows Server or Home Server. (Win 8 I've not tried it) Two spare HD slots with appropriate caddies. Slot for your SATA DVD drive also, (or use external usb or DVD drive if needed. 4 usb sockets on front, 2 on rear. VGA, network, power sockets on rear. Supplied in original HP box with CD and leaflets etc. Collect from Harrogate, North Yorks, or posted via Hermes for £12 (or less if I can do it). Cash on inspection and collection. (Highlands and Islands might obviously cost more on delivery)
Tel: (01423) 872045 Email: it_central@ntlworld.com

400GB IDE drive 3.5 inch formatted ready for use. Only £20 plus £3 for p&p. I can load genuine XP Professional from Microsoft with genuine certificate of authenticity for an extra £10. Refurbished.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Amstrad PCW 9256 in good working condition with software. Offers.
Tel: John Adams (02088) 641202 Email: meeching@uwclub.net

CRUCIAL 8GB (4x2). PC3-10600 unbuff. CT25664-BA1339A. (4X2) = £48.00. (2X2) = £25.00. Boxed kit of CORSAIR Vengeance 4GB (2X2) = £35.00. Prices include P&P.
Tel: Bob Williams (01507) 602914 Email: flipinek@hotmail.co.uk

EPSON PRINTERS T715 12 multipack F.O.C. to good home, just pay postage £2.50. (Tesco equivalent original cartridges £120 current special offer!) Perfect crisp printing etc.
Tel: Pete Dew (07526) 988594

EPSON PRINTERS T481-T486 6 multipack F.O.C. to good home, just pay postage £2. Perfect crisp printing etc.
Tel: Pete Dew (07526) 988594

EPSON PRINTERS T711 6 multipack F.O.C., just pay postage £2. Perfect crisp printing etc. May have others F.O.C. if model older than 12 months.
Tel: Pete Dew (07526) 988594

Intel 3930K processor. Used, but not overclocked. No box or fan. £220 ono. Will ship to UK address.
Tel: Tim (01623) 624509 Email: tim.stirlind@btinternet.com

Apple Mac G4 Tower. 400MHz cpu, 640MB Ram, 2xHardDrive 40GB,20GB. DVD & ZIP Drive. OS X v10.3 Panther+OS9. NO KEYBOARD OR MOUSE. £25 ono Buyer collects
Tel: (07941) 254296 Email: jasonnd@hotmail.com

Wireless Motorised IP Surveillance Camera. White In Colour - Control from your mobile phone / tablet / pc when out of the home - ideal for home security, baby monitoring, has sound and remote recording etc Brand new in Box - £25 Price includes post and packing.
Email: amendata@gmail.com

Blueberry I-MAC. Good condition, all in working order, £55.
Tel: (01386) 832758

Lexmark Printer Z601, still working and in good condition, £25.
Tel: (01386) 832758

Dell Inspiron 660 Intel i5 QUAD CORE with ACER 23 Inch LED monitor. AS NEW. Operating System: Windows 8.1. MPN:620MT. Memory (RAM): 4 GB. Hard Drive: 1 TB. Processor Type: Intel Core i5. Primary Drive: Optical DVD+/-RW. Processor Speed: 3.0 GHz. Features: Graphics Card GT620 1GB, Acer LED monitor 23" HD. £520
Tel: Hitesh Rao (01163) 198895

PRINTER CARTRIDGES. Suitable for Epson printers range T711 - T714. Work perfectly. 50 pence each, plus postage (brand new unused sealed). Over a dozen available.
Tel: (07541) 222678 Email: petedew@gmx.co.uk

Panasonic KX-P7105 mono laser duplex printer. Some toner left. Up to Windows XP only - hence £25. Buyer collects from N2, East Finchley
Tel: (02083) 431527 Email: pnnikie@gmail.com

Exchange wanted! My HP Pavilion 17"W8 laptop for laptop with Windows 7 or XP that MUST be able to play MSTs. Poss. Cash adjustment.
Email: Alandick@gmail.com

INKJET CARTRIDGES suitable for Epson Printers T711 - T714 range, and T481 - T486 range. 79 pence each, plus postage. Work perfectly, good crisp printing quality.
Tel: (07526) 988594 Email: petedew@gmx.co.uk

50 copies of Micro Mart magazine. Mainly 2013 through 2014. Pick up as heavy. Devon. Price £20,
Tel: David Pike (01404) 813691

Powered PCI Express x1 to x16 Riser Card Extension via USB 3.0 + Power Cable Adaptor. Allows you to add an extra Pci-ExpressX16 slot to your Pc converting an existing x1 slot to x16. Useful for adding an Extra graphics card to create a Crossfire triple configuration or for Bitcoin data mining up to 7 cards can be installed using these adaptors. Quality model - Brand new still boxed. £10. Price includes p&p.
Email: amendata@gmail.com

Laptop Removeable drive tray. Allows you to add an extra hard drive to your laptop by taking out the CD/DVD Drive. This device inserts into the Cd/Dvd Empty Slot and holds 1 Hard Drive. Excellent Engineers Gadget - Great for data recovery or just beefing up your laptop. Two types available - standard Sata To Sata or Sata To Ide (Pata) Slot type. Brand New Still In Box. £20.
Email: amendata@gmail.com

Amstrad PCW 9256. In perfect working order Including on-top printer with a few 3" disks. Offers.
Tel: John Adams (02088) 641202 Email: meeching@uwclub.net

2 HP Laserjet 3100 printer-fax-copier-scanners. In good working order. £25 each.
Tel: John Adams (02088) 641202 Email: meeching@uwclub.net

Mini-Tower. P4 / 3.06, 1.5 gigs, 80 GB, DVD, Floppy, Network, Sound, USB 2 etc. XP-pro fully updated, with Office suite, Anti-Virus & all usual Utilities, COA sticker & System Image. £55 (P&P £11)
Tel: Pat (07710) 348638 Email: pat4cars@aol.com

Esprimo Mini Tower. Pentium 2.8 Dual-Core, 2.0 gigs, 250 gig, DVD-RW, Gigabit network, sound, XP-pro fully updated, with Office suite, Anti-Virus & all usual Utilities, COA sticker & System Image. £65 (P&P £11)
Tel: Pat (07710) 348638 Email: pat4cars@aol.com

HP DC5700 MiniTower. Dual-Core E2160, 160 gig, 2.0 gigs, DVD-RW, card reader, sound, Gigabit network, XP-pro sticker, upgraded to Vista Business, activated, Word, Excel, usual utilities, Recovery image. £65 (P&P £11)
Tel: Pat (07710) 348638 Email: pat4cars@aol.com

Dell Mini-Tower. Intel P4 / 3.00 HT, 1.5 gigs, 80 Gig, DVD-RW, Network, Sound, XP-pro fully updated, with Office suite, Anti-Virus & all usual Utilities, XP-pro COA sticker & System Image. £55 (P&P £11)
Tel: Pat (07710) 348638 Email: pat4cars@aol.com

Lian LI PC-X2000 Computer Case. Supports mATX, ATX, eATX; hot swap SATA drives, six 3.5" & two 2.5" hot swap disc holders. Three 140mm intake plus two 80mm and one 140mm exhaust fans. £140.
Tel: Ian (01932) 856971 Email: a2345@btinternet.com

1.5tb SATA drive. Fully refurbished by government acknowledged company. All data taken off (some drives are still under Western Digital warranty) ONLY £40 including P & P
Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

1tb SATA drive. Fully refurbished by government acknowledged company. All data taken off (some drives are still under Western Digital warranty) ONLY £38 including P & P
Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

2tb Western Digital SATA drive. Model WD2002F-YPS 64mb cache, fully refurbished by government acknowledged company. All data taken off (some drives are still under Western Digital warranty) ONLY £50 including P & P

Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

GEFORCE 1 GBYTE 24- PCI express PC card. HDMI DVI VGA PC video card. £10 plus p&p £4.50. 2 for sale. £10 each.

Tel: (01707) 339063 Email: Email: awhishaw@aol.com

6 P314 PC bases for sale, £100. The lot all with XP must be collected.

Tel: (02380) 733312 Email: zen96403@zen.co.uk

Motherboard Bundle. 2.4Ghz AMD Athlon XP 32bit CPU 512MB Ram 5xpci 2IDE LAN sound good for gaming, office work, surfing the net, watching movies generally a good all round system spec can slightly be changed if required please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

4 gb (2 x 2gb) of OCZ Reaper PC2 6400 ddr2 memory. Fast gaming memory, used but in excellent condition, £49.95 inc postage.

Email: baslake@blueyonder.co.uk

500GB SATA drive. 3.5" formatted ready for use. Software can be installed for an extra charge. Windows 7 extra £35 includes disk and certificate of authenticity. Only £23 including P&P.

Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

Retro Commodore 64 with 1541 diskdrive tape deck. All in original boxes, mags. Pick up from Somerset. £75 ono.

Tel: (01278) 691606

6 P314 PC bases for sale. £100 the lot. All with XP. Must be collected.

Tel: (02387) 333212 Email: zen96403@zen.co.uk

MAC BOOK PRO A1151. Spares and repairs 17" screen 2.16GHz intel CPU looks in good condition screen appears to work. Please email or call me for a price and more information.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

CISCO CONSOLE CABLES. I have a lot of Cisco console cables all new let me know how many you would like please email or call me for a price and more information.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

750GB SATA drive for sale. Perfect working order. Formatted ready to use. Only £25 plus £3 p&p. Genuine Windows XP with Certificate of Authenticity can be pre installed for an extra £10.

Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

5x p3/p4 PC with XP. £100 the lot. Buyer collects. Get in touch for more information.

Tel: (02380) 733312 Email: zen96403@zen.co.uk

Socket 775 System. Cooler master Case, audio + USB. Asus PSKPL-AM EPU E6600 CPU. 250 GB Hdd. DVDRW, ATI 5450. Boxes, drivers. Samsung 19" Monitor HDMI USB. Keyboard mouse. Windows 7 Professional SP1. £100 collect from Louth, Lincolnshire.

Tel: (01507) 602914 Email: fipineki@hotmail.co.uk

2 x 2GB Samsung DDR3 pc3-8500 1066 SODIMM. 204 pin as new laptop memory. £15 inc postage to inland UK.

Email: fvital@mail2web.com

HP 5101 5102 5103 Netbooks and Notebooks. Lots of parts available down to the tiniest screw. Contact with requirements.

Tel: (01892) 833413 Email: fwfent@gmail.com

Dell OptiPlex 755 (80 GB, Intel Core 2 Duo, 2.33 GHz E6550, 1GB memory, DVD/CDRW) Ultra small form factor. Fantastic small and very fast computer. You will need to load the drivers. XP Pro or Vista Business can be loaded for an extra £10. The hard drive and memory can be upgraded for an extra cost. £70 plus £10 for delivery.

Tel: Dave Thomas (01942) 706572 Email: davethomas96@aol.com

Internal Card Reader. Compatible with most camera memory cards. Also has a USB port. Colour: black or silver. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

AGP, PCI and PCI-e graphics cards. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Motherboard Bundle. 3Ghz AMD 64bit CPU 512MB Ram 5xpci 2xSATA 2IDE 1Gb LAN 6 channel sound firewire. Comes with driver CD and manual. Good for gaming, office work, surfing the net, watching movies, generally a good all round system. Spec can slightly be changed if required. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

PC gaming hardware. I have got 1 x force feedback steering wheel, 1 x force feedback joystick, 1 x normal joystick, lots of game pads. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Vintage Apple Macintosh Classic II PC for sale. Complete with keyboard, mouse and microphone. Offers.

Tel: 07733 628986 Email: 576924@tiscali.co.uk

Brand new USB brackets. Add 2 extra USB2 ports to your computer at little cost. Very simple to fit cable connects onto the motherboard and uses a spare slot on the back of your computer. No drivers required. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Internal 3 1/4 floppy drives. Choice of white/black/silver/no face plate. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Brand new Laptop bag. Still sealed in the plastic bag and never used (it came as part of a bundle). Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Brand new flatbed scanner. Still boxed and never used (it came as part of a bundle) Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Desktop cases. AT and ATX types and tower and flatbed form factor different sizes and colours can be posted or picked up from Manchester please email or call me with your requirements.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Laptop RAM. 2x1GB PC3-8500 DDR3 1067MHz pulled from a working mac book pro but can be used in other laptops this is the quickest way to boost your laptop's speed. Please email or call me for a price.

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

160GB 3 1/2 inch desktop Hard drive IDE. Clean pull (little to no use) no bad sectors tested all you need to do is plug in and go. £20 +p&p

Tel: David (01616) 888119 Email: pcmadnessitd@yahoo.co.uk

Asus Transformer Prime TF201 Tablet PC. NVIDIA Tegra3, 32GB Flash, 1GB RAM, 10.1" LED, Wifi, Bluetooth, 2 x Webcam, Champagne Gold, Android 4.2, with keyboard dock. £150.00.

Tel: Rob Pratt (01189) 781753 Email: robpratt@bizitsolutions.co.uk

Computer Monitor. HP s2231a. 1080p, 22 inch display, 1920x1080 resolution. 60 Hz, contrast 15,000:1. Price £40 ONO

Tel: Matthew Taylor (01842 813630) Email: checkpobly12@hushmail.com

Two Apple G4 iBook Laptops. 12" screen, 800 MGHZ CPU 640MB RAM. OSX (Tiger) 30GB HDD batteries ok M/Chargers, nice machines. £105 each or £200 for the two.

Tel: Matthew Taylor (01842 813630) Email: checkpobly12@hushmail.com

Gaming PC HAF-X case. ASUS P6X58D-E, i7 930 4GHZ 6GB Corsair i7 mem, gigabyte gtx470, Asetek CPU LCLC 240mm radiator + watercooling. Two 12cm fans, PSU needs replacing. DVDRW, networking, original software, extra cabling. (Price: £400 ONO).

Tel: Matthew Taylor (01842 813630) Email: checkpobly12@hushmail.com

SATA Drive Tray For Laptops. Allows you to remove your CD/DVD Optical Drive and Insert a second Hard drive.

Very useful for backups, file recovery and RAID setup on a laptop. Brand new, still sealed and boxed. £10 including P&P.

Tel: Gary Gemmell (01415) 712822 or (07551) 293083 Email: amendata@gmail.com

Gold Northbridge Heatsink. £3 including P&P. Tel: Gary Gemmell (01415) 712822 or (07551) 293083 Email: amendata@gmail.com

Rugged Magnesium Alloy cased HP 5101 Business Netbook. 120Gb HDD 2Gb Ram, running Linux Mint 16. Excellent for Uni, Holiday or just as a spare machine. Complete except for PSU. £60 plus £8 P&P

Tel: Fred Lemont (01892) 833413 Email: fwaKent@gmail.com

Mid tower PC. Windows XP, Office XP, 230GB HDD, FDD, 2x DVD drives, HP Photosmart printer & Canon scanner. All relevant discs. £50.00.

Tel: Alan Phillips (01745) 354614. Email: alan.phillips747@talktalk.net

Two Apple G4 iBook Laptops. 12" screen, 800 MHz CPU 640MB RAM, OSX (Tiger) 30GB HDD batteries ok M/Chargers, nice machines. £105 each or £200 for the two.

Email: micksharp@live.co.uk

XFX Radeon HD 6870. 1GB GDDR5. Original packaging, never overlocked...£75 plus £6.95 pp.

Tel: Simon Hardwicke (01536) 724334 Email: simon.hardwicke1@ntlworld.com

Asus Sabertooth 990FX Mobo. £100 plus £6.95pp (with Phenom II 980 add £50).

Tel: Simon Hardwicke (01536) 724334 Email: simon.hardwicke1@ntlworld.com

Lian Li PC-X2000 Computer Case. Supports mATX, ATX, eATX; hot swap SATA drive compartment. Includes

six 3.5" & two 2.5" hot swap disc holders. Three 140mm intake plus two 80mm and one 140mm exhaust fans.

Tel: Ian (01932) 856971 Email: a2345@btinternet.com

Maticom G Box Midnight MX2 Android HTPC. New boxed. £85 ono. Postage £3.

Tel: Mick Young (02072) 321695 Email: mick.young@a2.co.uk

Funai D50M-100Y VCR recorder, 6 head A2 stereo. New boxed. £90 ono. Postage £4.

Tel: Mick Young (02072) 321695 Email: mick.young@a2.co.uk

Cartridges for a Xerox 8500/8550 Phaser Colour Laser Printer. 6 Black, 5 Cyan, 4 Magenta, 2 Yellow solid black cartridges going very cheap! Check out cost new from Choice Stationery and make me an offer. My Xerox has given up the ghost after several years.

Tel: Ken Driver (01890) 820295 Email: ken@stonehaven2.plus.com

Gaming PC. HAF-X case ASUS P6X58D-E, i7 930 4GHZ, 6GB Corsair i7 mem, gigabyte gtx470, Asetek CPU LCLC 240mm radiator + watercooling, two 12cm fans, PSU needs replacing. DVDRW, networking, original software, extra cabling. £390 ONO

Tel: Alex Thomas (01842) 813630 Email: chack-pobly12@hushmail.com

Custom PC. AMD FX-4100, 8Gb Ram, 500Gb HD, DVD Writer, AMD HD-6750 GPU, Keyboard & Mouse, 19 inch LCD Monitor, Genuine Windows 7 Pro, £250 + delivery.

Tel: Mike Whittington (07533) 270020 Email: mike.whittington@blueyonder.co.uk

XFX HD 7950 GPU. I have 2 for sale, both have 6 months guarantee, willing to split, £180 for pair or £100 each + delivery.

Tel: Mike Whittington (07533) 270020 Email: mike.whittington@blueyonder.co.uk

Maticom G Box Midnight MX2 Android HTPC. New boxed. £85 ono. Postage £3.

Tel: Mick Young (02072) 321695 Email: mick.young@a2.co.uk

Nvidia GeForce 9500GT Super + 1GB DDR2 Video Card (Palit). Unboxed. Great Condition. Not Been Overclocked. £30 inc P&P

Tel: Steven Saward (01354) 656578 Email: steven_saward@sky.com

16GB Corsair Vengeance DDR3 RAM (2 X 8GB). £120 ONO. Brand new and unopened

Tel: Chris Paul (07827) 447779 Email: cmpaul25@gmail.com

New Cooler Master HAF X USB 3.0 XL ATX Case. No PSU. Reason for sale it will not fit in my computer station. Buyer collect only. £80.

Email: paul_999@sky.com

Two laptop hard drives for sale. 1- HITACHI 250GB - SATA3 - 5400rpm. Sell for £25. 2- WD SCORPIO BLACK - 250GB - SATA3 - 7200rpm. Sell for £30. Paypal only please.

Tel: Wolfgang Dahn (07590) 440475

Intel Core 2 Duo T5600 Dual Core Laptop CPU. Removed from working Dell D630 Latitude laptop due to Gfx chip failure, Now no longer needed. Tested and fully working using CPU Burnin test. £15. Price includes P&P.

Tel: Carole Walker (07551) 293083 Email: amen-data@gmail.com

Mini-USB Finger Optical Laser Mouse. Attaches to your finger and has two side buttons. Great replacement for standard mouse. Ideal for disabled users or for use where a normal mouse would not work. £10 p&p included.

Tel: Carole Walker (07551) 293083 Email: amen-data@gmail.com

Arima HDAMA rev G serverboard. Dual Opteron 250 cpus Included. Totally unused stock. Extended format. 4GB SDRAM, Socket 940. Updated bios to 2.18b, Windows 7 compatible. A real bargain. £45 courier incl.

Tel: (01223) 360986 Email: jhturner77@outlook.com

ASUS P5N-Sli Motherboard with SATA and IDE sockets. Includes manual cables and Intel 2 core panel, cables and Intel 2 core 2.4 ghz. CPU cooling fan and 4GB RAM. £75 including postage.

Tel: (01359) 270218

Gateway MT6220G Laptop. Dual Core CPU, 2GB memory, 200GB HDD, 15"4 WXGA screen, Vista license. Excellent condition long battery life. Wireless superb, some disks. £120 with free postage.

Tel: (01619) 501218 Email: medicineman@ntlworld.com

Toshiba Satellite L350-159 17 Inch screen laptop. 320GB HDD, Vista license, 4GB memory. Restore disks, charger, WED lightly. Wireless excellent, long battery life, excellent condition. £165 with free postage.

Tel: (01619) 501218 Email: medicineman@ntlworld.com

ASUS P8B75-m socket 1155 motherboard. With Pentium 620 processor and 4 gigs memory drivers for XG7.8 on disk. Original box and rear 1/0 cover £50. Free postage, please ask questions.

Tel: (01619) 501218 Email: medicineman@ntlworld.com

Be Quiet Power Zone 750W/80 Plus Bronze/ Fully Modular Power Supply. I won this in a competition, brand spanking new. This PSU normally retails for £100, selling for a bargain-tastic £75.

Tel: Martin Welch (07971) 528739 Email: welch_martin@yahoo.co.uk

Mini-USB finger optical laser mouse. Attaches to your finger and has two side buttons - great replacement for standard mouse. £10 p&p included.

Tel: Gary Gemmell (01415) 712822 or (07551) 293083 Email: amendata@gmail.com

HP P02015dn extra lower 250 page feed tray. £20. Tel: Gary Gemmell (01415) 712822 or (07551) 293083 Email: amendata@gmail.com

New, boxed Belkin 24-Port CAT 5e Patch Panel. Part # F4P338-24-AB5. The RJ45 CAT 5 patch panel is 19 inch rack mountable and supports both S68A and S68B installations. Compatible with both 110 and Krone punch down tools. £15.00.

Tel: Robin Hewlett (02083) 930301

TP-Link TD-W8968 wireless N USB ADSL+ Modem Router. Unused, boxed, with all cables and set up CD and installation guide. £20.00 plus postage.

Tel: (01748) 886885 Email: hturner@hotmail.co.uk

ALPS floppy drive (3.5"). Originally purchased as one of a batch for spares but never used. £5.00 plus £1 for P&P.

Tel: Alan (01258) 446500 Email: alan@asandco.co.uk

SATA/64MB Cache, Model No: WD20EARS. £40.00 inc p&p.

Tel: Michael (01452) 303732

HD 5850 XFX Black Edition for sale. It has been flashed with the Asus Bios and can be made to run as fast as a HD 5870. This is a high end card, has no problems playing all the latest games. Comes with box. £65 Including P+P.

Tel: Martin Welch (07971) 528739 Email: welch_martin@yahoo.co.uk

Nvidia Geforce GTX 670 2GB. Made by MSI O/C model. Not overlocked. VGC. £110 plus postage.

Tel: Tim Stirland (01623) 624509 Email: tim.stirland@btinternet.com

4 Belkin Master Cube Surge protectors. Not only mains but telephone line protection too. Three were used for a short time, one is brand new. The part number is F9T110ukCW. £15 inc p&p.

Tel: Alan (01258) 446500 Email: alan@asandco.co.uk

HARDWARE WANTED

Trying to breathe life back into an old machine? Why not submit a wanted ad to MicroMartClassifiedAdverts@gmail.com and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?

WANTED: Corsair PSU cable bag. Please email me if you can.

Email: Paul@planetvoodoo.co.uk

Wanted: HD 3850 Graphics card, must be AGP.

Tel: (07817) 861011

Wanted: Fully working mainboard for AMD socket AM2+/AM3, micro ATX size. Must use DDR2 RAM.

Tel: Brian Taylor (07570) 452557 Email: bmorgant@yahoo.co.uk

Wanted: Factory system restore disc for a Dell Inspiron 1750.

Tel: Darren Day (07707) 556193 Email: ddshaggy@btinternet.com

Wanted: 4GB (2 x 2GB) of Corsair DDR2 RAM. 800MHz XMS2-6400. Must be in good working condition.

Tel: (01928) 733808 Email: wilsal9@aol.com

Wanted: One Series Printer HP DESKJET 610c In good working order. One servicing manual (Not Users Instruction Manual) for the HP DESKJET 610c Printer. Old Zip Discs.

Tel: (01214) 777691

SOFTWARE FOR SALE

Windows XP Professional. New and sealed. Book, software and license (certificate of authenticity) 100% genuine and unopened. (Dell branded but will install on any machine) ONLY £15 including P&P.

Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Microsoft Office Small Business Edition 2003 with Business Contacts. Legitimate Office Small Office Business Edition comprising Word, Excel, Powerpoint, etc. Comes with small piece of OEM hardware and original license code (coa) £10 incl. delivery, cheque or PO. £10.50 by Paypal.

Tel: (07794) 528857 Email: it_central@nthworld.com

Norton Utilities 16 for 3 PCs. Runs under Windows 8, 7, Vista or XP. Original Symantec CD with unused product key £12.50

Tel: Ian (01932) 856971 Email: a2345@btinternet.com

Dell Windows XP Pro SP2 Reinstall Original Cd. Allows You To Restore Your Dell PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.

Email: amendata@gmail.com

HP Windows XP Pro SP2 Re-Install Cd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.

Email: amendata@gmail.com

HP Windows 7 Pro Sp1 Re-Install Dvd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.

Email: amendata@gmail.com

HP Windows 8 Pro Re-Install Dvd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price Includes p&p.

Email: amendata@gmail.com

HP Windows 8.1 Pro Recovery Dvd X 2. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £15. Price Includes p&p.

Email: amendata@gmail.com

Windows 7 ULTIMATE 32 bit version. NEW software and license (certificate of authenticity) 100% genuine and unopened software. ONLY £45 including P & P.

Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Windows Small Business Server 2003 Premium Edition, 7 Disc Set, £30.

Email: amendata@gmail.com

Windows Server 2003 R3. 2 Disc Set. £20.

Windows Vista 32bit for sale. Genuine item with genuine product key. £35 including P&P.

Tel: Ian (01132) 629028 Email: ianmatthewuk@yahoo.co.uk

Windows 7 Professional. I have both 32 and 64 bit versions. NEW software and license (certificate of authenticity) 100% genuine and unopened software. ONLY £35 including P & P.

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Email: ianmatthewuk@yahoo.co.uk

SOFTWARE WANTED

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Tel: (01983) 613464 Email: tony@tonyfogg.plus.com

Wanted: LG GSA 2164 D software disc to replace broken original.

Tel: Glen Fremantle (01387) 248976 Email: blidamsys@yahoo.co.uk

Wanted: Nero 9 reloaded for Windows 7. £80 given.

Tel: (01629) 732623

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Dennis Publishing
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Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

Misaligned

My printer isn't working as it should do, despite me having it for a long time, and it was working with no issues. I had the printer in storage for a long time but have recently pulled it out of mothballs, as I have another PC in another room that I'd like to use it on.

I suspected the ink cartridge would have dried up or become unusable, so I bought replacements and fitted them. When I turn on the printer, which is an HP C4180, it asks me to align the print heads. I did this, but after it attempted to do so, it said the alignment had failed. I printed with it anyway, and it looks fine.

I'm not too concerned about the alignment message, as it prints okay, but every time I turn on the printer, it says that the heads need aligning again, and I have to go through the same procedure, which wastes paper.

Can I get rid of this message so I can just use the printer right away, without using blank paper on an alignment test I know will fail anyway?

and turn it off. Remove any paper from the unit, and wait ten to 30 seconds for it to power down and remain off for a little. Now, turn the printer back on and it'll ask you to insert some paper. Don't do this. Instead, press and hold both the Setup and Cancel buttons, and press OK. The paper message will vanish, and the printer will move to the main screen. And that's it. From now on, or until the next cartridge change, you won't see the message again.

To actually solve the problem is a little more difficult, as there can be more than one cause. I've seen the it caused by dirty print heads and other internal parts that are clogged with old ink, and others where the print cartridges themselves are either damaged or the wrong ones for the printer.

If the printer has been in storage for a while and has a printer cartridge in it, then it could very well be dirty inside, so I'd suggest you carefully have a look inside and clean it. Also, try cleaning the print heads using the printer's software tools.

Of course, as your printer is printing okay anyway, it probably won't matter, and the print heads would seem to be okay. It may be something to look into, though, in case other problems crop up in future.

Mich

If you just want to stop the message appearing and printing seems okay, then yes, there's an easy way to stop this prompt appearing. To do this, first disconnect the printer from the PC

▼ Printers left unused for a long time often need a good clean before they're used again



Flash! Aaarrgghh!

My PC's mouse cursor is driving me crazy. For some reason, it now won't stop blinking, and no matter what I'm doing, it constantly flashes, which can be very distracting when doing some things on the computer. This happens in all programs, and it's not limited to the text cursor, but also the arrow that's normally on screen.

I've made no changes to my PC, and I don't think any programs have either, but it's started to happen. I did install a web toolbar, which mentioned something about mouse schemes, but I don't think I selected it, as I never clicked any installs for it. Can you help? My PC is a couple of years old and runs Windows 7.

Andrew

Going from your description of the problem, I'd have to guess that browser toolbar install is to blame. Browser toolbar installers are often packaged with other software. This is often software you wouldn't ever want, and

it has been known to be a method used to transfer viruses and other malware. What's more, these extra installations are usually set to install by default, and you have to opt out of them. So, if you don't remember clicking anything, this may have actually installed something, which by the sounds of it has interfered with your mouse pointer.

As it sounds potentially dodgy, I'd first set about removing the toolbar and any software it may have installed. Go through your program list, and make sure you get rid of anything that you suspect may be intruding.

If this doesn't make any difference, then go to Control Panel and then into the mouse settings. Next, go to change the mouse pointer (under the Pointer tab, unsurprisingly) that's in use and have a look at the scheme section. Try changing the scheme to another, and click Apply. With luck, the mouse pointer will stop blinking. If so, try changing back to the scheme you like and see if it's still fixed.

Alternatively, you'll also see an option for allowing themes to change mouse pointers.

This will likely be checked. Try disabling this option by removing the tick and clicking apply. This should then solve the problem.

▼ **Problems with mouse themes can often be solved by simply changing to a new one, and switching back again**



Run Fox, Run!

As a proud user of Firefox, I'm always telling my friends that it's the best browser and is certainly a lot better than Internet Explorer (then again, which browser isn't?). I've always been able to win any arguments, as Firefox is clearly faster and more stable than other browsers, at least in my opinion and experience.

That was until recently, when Firefox on my PC started to go really slow. It now takes a long time to load up web pages, and when friends come around to use my PC, they've remarked how slow it is, more so than their installations of Firefox or, more annoyingly, IE.

Can you suggest anything I can do to get my copy of Firefox running well again?

Rich

A good deal of people prefer Firefox or other browsers over IE, so you're certainly not alone in your love for the Mozilla browser. However, like any other browser, software or even PC, over time Firefox will become slower, so it's a good idea to routinely clear out your cache and history, as this can keep the browser running smoothly for longer. If you haven't upgraded Firefox for a while, I'd also suggest you think about getting the latest version and installing that. Even uninstalling and reinstalling your current version, if it's one you prefer, should help.

Alongside these basic tips, you could also venture into Firefox's hidden settings and make some changes that can greatly speed up the browser. Be aware, though, these tweaks can cause instability and problems with the browser. It doesn't say "Here be dragons!" for no reason. You make changes here at your own risk. To get to these options, type 'about:config' in the address bar and press Return, and click the button on the warning.

There are a couple of tricks I always use here that give Firefox a noticeable boost. First we'll change the rendering speed of the browser, which will give the browser longer to load content, without

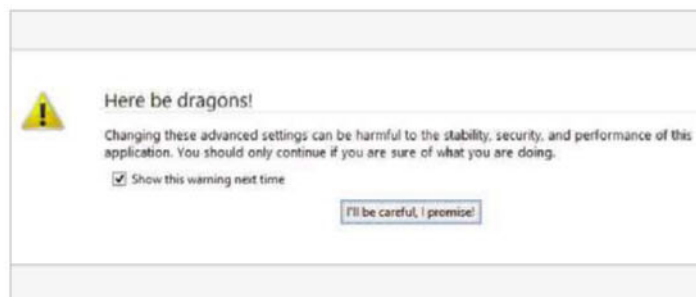
having to display updates as often. This actually speeds up the loading process. To do this, Right-click anywhere in the list and select New > Integer. In the name box, type 'content.notify.interval' and click OK. Set the value to 500000 and click OK again.

Next, we'll activate the pipelining options that allow the browser to send more requests to servers without waiting too long for a response, which can slow things down. To do this, find the entries 'network.http.pipelining', 'network.http.proxy.pipelining', and double-click them both to activate them. Now find the value 'network.http.pipelining.maxrequests' and click this and change the value to 8.

Now we'll reduce Firefox's low frequency interrupt, which can purposely cause the browser to become less responsive. Right-click the list and select New > Integer, and name it 'content.switch.threshold'. Set the value to 250000 and click OK.

These tricks should now give your copy of Firefox a boost, and it should be much more like its former self. You also don't need to install any special software, which is nice. Needless to say, this is only a small example of the tweaking options open with Firefox, and there are many more.

▼ **Firefox has a host of advanced options, but be warned, you can cause problems if you don't know what you're doing**



ASK JASON



Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

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While we try to cover as many questions as we can, we regret that Jason cannot answer your questions personally, but he'll cover as many as he possibly can each week. Please ask one question per letter and remember to include the full specification of your computer, including its operating system.

Jason

Bar Talk

A couple of weeks back I dropped my iPhone 4S and the screen smashed. A guy at my workplace said he could fit a new screen, which he's done. Ever since, though, I've had trouble getting a signal. In my house I'd previously get four bars out of five (I'm with EE), but now I get one bar if I'm lucky. Often the phone just shows 'Searching' or 'No service'. Has something been broken during the repair? Is there anything I can do?

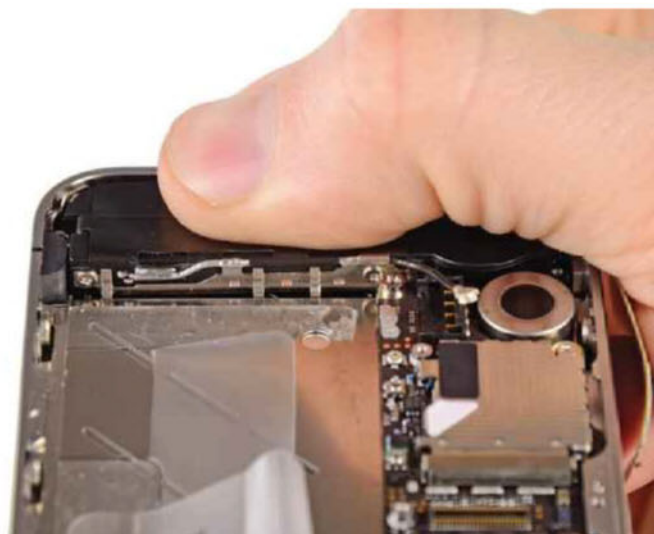
M. Tennant, Gmail

eBay is loaded with 'for parts or not working' iPhones with this exact symptom. Sometimes there'll be an actual hardware problem, but often a phone will simply have been reassembled incorrectly after a repair. As it's always been with PCs, so it is with phones: everybody knows someone who knows someone who can fix them, but the number of people who genuinely understand what they're doing is a tiny fraction of the number of people who merely think they do.*

At the bottom of the iPhone 4 and 4S (internally they're similar) lies the loudspeaker module. This also houses the cellular aerial (GSM/3G). The module has to be removed and refitted during screen replacements and many other repairs, and along the lower edge are four grounding fingers. These need to be pushed below the lip of the mounting frame. If they're not, the module won't sit right, possibly resulting in a bulging or cracked rear cover. Worse, the cellular signal can be weakened.

The loudspeaker module also incorporates a Hirose U.FL connector†. During repairs, this has to be prised off the phone's mainboard. It's easy to forget to refit it, and the outcome is barely any cellular signal at all.

Also, near the module lies the battery connector, and under that sits a spring clip that pushes against a metal strip on the phone's rear cover. The strip serves to extend the aerial. The



▲ Reassembling an iPhone, and not ending up with bits lost or left over, takes care and attention [Photo courtesy of www.ifixit.com]



▲ The widely used Hirose U.FL coaxial connector

clip often gets lost or forgotten, which again kills the cellular signal. A replacement clip costs about 99p on eBay.

Luckily, the loudspeaker module can be removed and refitted without complete disassembly of the phone. The screen doesn't have to be taken out, for instance. If a new module is needed (maybe there's damage to it), a new one can be had for under a fiver. Take off the phone's rear cover and have a look at what's what. Only basic tools are required – nothing fancy or expensive. Chances are, you'll be able to affect a fix and begin making calls again. For pictures and a helping hand, try this guide at www.ifixit.com: bit.do/Tk2y.

* To be fair, iPhones are darned fiddly. I used to think they were over-engineered – more screws, screws within screws, clips, brackets, and gaskets than were strictly necessary, lending extra tolerance and reliability. But now I think they're under-engineered – flawed designs patched up with extra bits and bobs to make them work properly.

† The Hirose U.FL (often just 'Hirose') is that tiny circular job with the pin in the middle, onto which snaps a cap on a wire (a 'pigtail'). You'll have seen them on laptop wi-fi cards. The name comes from the Japanese company that makes them (though clones exist, naturally): Hirose Electric Group.

Turn It On Again (Again)

In issue 1,331, David Wood wrote: "Each system on my network needs to have 'network discovery' turned on, but for some reason two of those systems 'forget' my settings, so whenever they boot up, 'network discovery' is turned off."

He wondered if some sort of script could be devised, one that ran at boot and automated the sequence of actions needed to turn everything back on. The name of the game was some macro or task-automation software, and I recommended the free Do It Again: bit.do/SLtK, but I added that "Sadly, one snag is that it needs to be launched before a task can be run, and the task then needs to be double-clicked. What you really need is a program that'll create a macro that can be triggered as soon as you log on." I couldn't suggest anything free, however. I continued:

"An alternative is to write the macro long-hand. Quite a few free tools exist that use simple scripting languages. Check out this Wikipedia page and try a couple for size: bit.do/SLUv. Some of these will indeed create a file for launch at log-on."

My parting advice was to reinstall Windows and be done with it – but it seems Dave has now hit the jackpot..

I had a thought! On my systems I've been using TinyWall (tinywall.pados.hu), a neat little firewall that improves on Windows' built-in effort. I decided to contact the developers, and they said this: "TinyWall disables all pre-programmed network rules in Windows and adds its own versions. This is to make it compatible with all editions and languages of Windows."

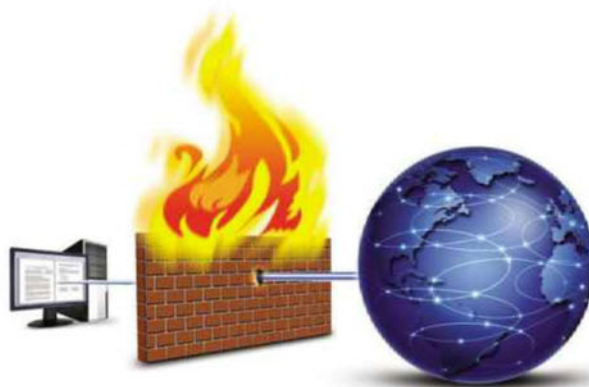
Apparently, to fix the issue, large parts of C# would have to be rewritten in C++. They suggested a workaround, but I've simply uninstalled the program and my networking troubles have vanished!

David Wood, TalkTalk

Well, well, well. Thanks for writing in, Dave, and putting this to bed. I doubt you'll miss TinyWall, good as it might be. I've not used an additional firewall in years and I've yet to have any problem directly resulting from that. You'll find Windows' own firewall is sufficient, at least when used in conjunction with the firewall built into your broadband router (almost all routers have one).

As to the developers of TinyWall, I think it's just one guy: Károly Pados. I expect the income he receives from the product, and his focus on newer projects, means the required rewrite will never happen. I don't understand why C# would be a factor, but then my coding experience with C# runs only to a Top Trumps game featuring games consoles past and present – which was pretty spectacular, actually, especially with the volume cranked up to show off the sound effects robbed from Family Fortunes.

▼ Do you really need an additional firewall?



It's All About The Image

Thanks to your link to the HeiDoc site in issue 1,332 (bit.do/jiCp), I've downloaded ISO images of every edition of Windows 7 (the 'refreshed' SP1 versions). I'm often asked to build or repair laptops and desktops for people, so having the installation media to hand to cover most eventualities is fantastic. However, I seem to recall that all Windows 7 ISOs and DVDs actually contain all editions, so do I really need to have so many huge files eating up space on my SSD?

Martin, Nottinghamshire

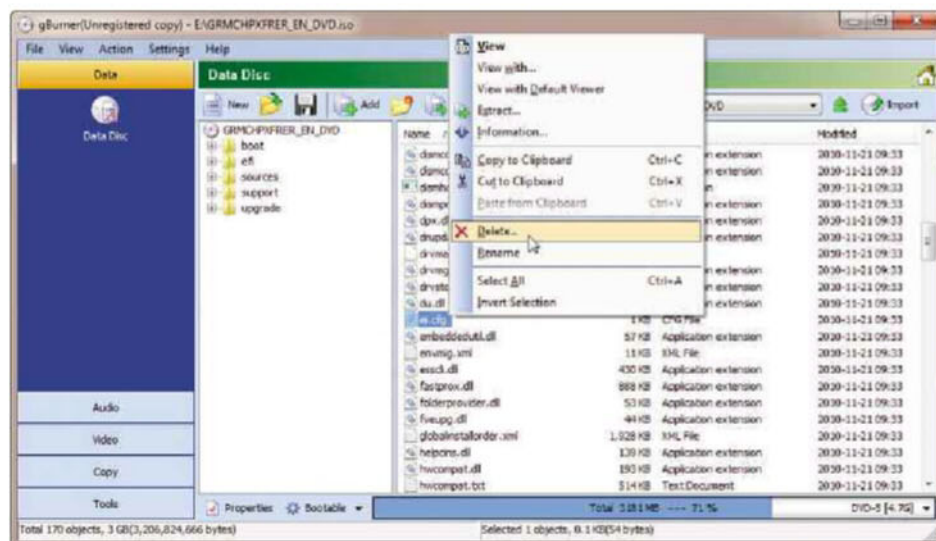
Yes, Windows 7 ISOs and DVDs do contain all editions. However, they usually include an 'ei.cfg' file that tells the installer which edition to set up, based on what's been downloaded or what's stamped on the disc. The key is to remove this file, which then forces the installer to present a menu offering every edition.

For users with a Windows 7 DVD, the first task is to make an ISO image of it. The image can then be edited, deleting 'ei.cfg', and lastly burned back to a blank disc. A great tool

for doing this is gBurner (bit.do/Tm8h). This costs \$29.95 (about £19), but helpfully there's a 30-day, restriction-free trial.

As you're already in possession of an ISO image (any of them will do), you can skip the image-making step, Martin, and jump straight to the editing and burning stage. Or you could skip the burning stage, too, and

just keep the edited ISO on your SSD until you need it. I won't bother describing how gBurner works, as it's intuitive enough, and of course there are help files. The end result will be that you can delete all your other ISOs, but bear in mind that the 32-bit and 64-bit ones really are different, so you may want to build edited versions of both.



Crowdfunding Corner

Crowdfunding allows you to play games that might otherwise never get made. If you want to be part of their story, we've got two hand-picked projects for you to try out

Battle Chef Brigade

Games about cooking are far and few between, but *Battle Chef Brigade* aims to change all of that. Play as a magical chef, hunting monsters then cooking them into dishes that have to wow judges and defeat your opponents.

In case it isn't clear, this is an action game where hunting your ingredients is as important as following the recipes. Stock your pantry by defeating monsters in different areas of the land, each of which have their own dangers and ingredients. There are several chefs to choose from, each with their own abilities. When the cooking starts, you decide how to combine and prepare the food, and you can use spells to enhance the process so that the judges are fully impressed.

As well as unique mechanics, the game promises high-quality sound and visuals, from hand-drawn art to a variety of songs specially composed for the game itself. It's already some way along in development after a year of work – the Kickstarter is there to help the studio finish it off.

A PC, Mac or Linux copy of *Battle Chef Brigade* can be earned by pledging just \$15, while higher tiers get you additional content. \$25 includes soundtrack, artbook and wallpapers; \$35 gets you beta access; and \$45 gets you exclusive content only available on Kickstarter. There are even more tiers to explore, so open up your browser and have a look at what's there. This is one game you definitely won't feel like you've played before!

URL: kck.st/1spEjKQ

Funding Ends: Tuesday, 28th October 2014



Bedlam

Influenced by post-apocalyptic fiction and inspired by other popular games such as *FTL* and *XCOM*, *Bedlam* is a strategic single-player RPG with roguelike elements, being developed for the PC and Mac.

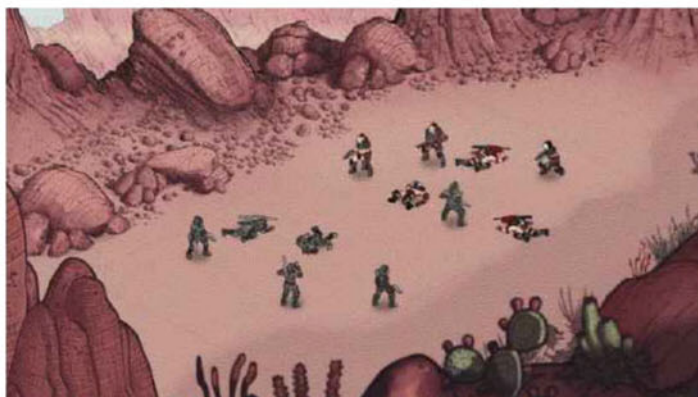
Players are cast as the mysterious Mechanic, the last member of a once-thriving guild of inventors. As this Mechanic, you're charged with commanding your crew in battles, managing your resources, all while improving your vehicle and protecting your passengers while navigating through the post-apocalyptic wasteland known as Bedlam.

You only get one life per game, and the combat is an innovative turn-based system, which uses heavy strategy and no turn-order to keep things interesting. There are four factions to encounter and even a New Game Plus mode for people who manage to complete the game. Designed for single-player gaming and filled with randomly generated content, it's one game that's different every time you play.

For \$15 you can get a digital copy of the game when it's released or pay \$20 for a version with Kickstarter-exclusive content. \$25 gets you a digital artbook and soundtrack, while \$30 gets you all that and beta access. There are even more extras to get, so if you like the sound of this, check it out and help them on their way to completion!

URL: kck.st/1pkTJJt

Funding Ends: Saturday, October 25th 2014



Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

Battlestation First Contact

David Hayward takes on the interstellar forces of evil this week

What better way to introduce and launch a PC game than to first create and launch a mobile mini game? *Battlestation: First Contact*, from Bugbyte Ltd, is the mini game in question here. It offers the player an incredibly addictive, real-time space rougelike quest set over four episodes, where humanity has to do battle with a variety of unique aliens and their advancing armada.

To Battle!

It's not easy having to fend off our ever violent cosmic cousins hell-bent on the domination or destruction of our species. Thankfully, though, we have the Battlestation itself to help protect us, as well as a number of military and scientific types who are well prepared and eager to get stuck in.

The game is split into 50 waves of approaching enemy, who swarm out of hyperspace jump gates in varying degrees depending on the level. With each enemy dispatched to wherever it is they go after shuffling their mortal coil, you're awarded with cash, which can be used to buy further weaponised fortifications, hangars for fighters and shuttle bays for marine-laden landing parties.

You also have at your command a legion of scientists, who will concentrate their

research on specific areas, such as energy, projectiles and augmentation. The scientists will then start work, and depending on how many you have allocated to the task at hand will then inform you of the advancement they've made, be that a new weapon or the improvement of an existing item.

The Battlestation is a pretty tough nut to crack. The shields can be tweaked for more power with less recharge time, less power with a faster recharge or an average of both. The hull, when exposed, though, is the weakest part, but you do have at your disposal an army of engineers who can be micromanaged to repair certain elements when things are starting to look a little dire.

With clever use and micromanagement of the combination of scientists, engineers, marines, pilots and placements of weapons on the Battlestation, you should be able to take on the enemy waves and ultimately last until the final wave where you have to battle the enemy mothership.

It's Very Addictive

The concept of the game isn't new, we'll grant you that, but it's delivered with such a way and with such excellent graphics, sound effects and music that it soon becomes an extremely addictive addition to your collection of Android and iOS games.

With each new enemy and each new wave, a slightly different tactic is needed. And with funds running low, the action soon becomes frantic, and you find yourself having to swap personnel and items at speed while trying to stay alive long enough before the next wave hits you.

Conclusion

Indeed, we've already spent a good part of the weekend doing battle with various forms of life and subsequently losing through a lack of tactical know-how.

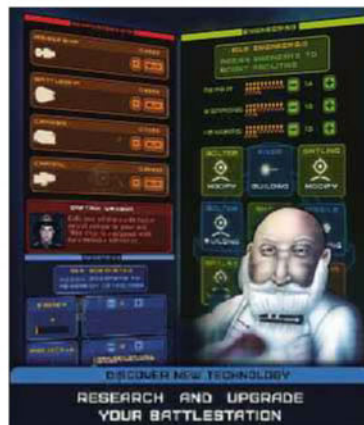
Needless to say, we went back for more, and we think you should too. So don your admiral's hat and get on over to goo.gl/bKqRjz for links to the mobile versions of the game and a look at what the PC version will be like. And if you're feeling flush, why not help Bugbyte out with the development by donating to its Kickstarter project.

Features At A Glance

- Episode 1 is free; the rest cost from £2.47
- Incredibly addictive space-based RTS game
- Infuriatingly hard at times, but requires intense tactics to win
- Great graphics and music score



▲ With each advancing wave, the difficulty levels are upped significantly



▲ It's challenging but well worth the effort



▲ Bugbyte has a great mobile game on its hands here

Logging Off

This is an odd time of year, in the world of high technology, because in many other sectors not much happens in October, but for computing we're already preparing for the seasonal melee, and product launches abound.

The objective is to grab the sales rush and ride its coattails to 2015, before the cycle of renewal begins once more.

What's fascinating is that there are businesses as I write making plans for what they'll launch this time next year and the year after that, and possibly even further into the future.

However, what's become increasingly apparent is that these new products arrive irrespective of any natural technological progression. That leads to tick-tock releases, where a product revamp stands in for an actual new product, creating a real two-year cycle with the appearance of an annual one.

For example, Apple has launched the 'new' iPhone 6, next year it'll warm it over with a rehashed 6S or whatever, and then in 2016 it'll launch the iPhone 7. This will be the case even if it seems to have almost completely run out of new and interesting things to put in a phone or things it can borrow from other people's designs.

What's concerning, as a tech writer, is that so many products these days have reached an evolutionary plateau, where manufacturers are struggling to refresh them in any meaningful way.

But then maybe as consumers, it is us who are to blame, expecting 'new' in increasingly shorter timescales?

Checking my Ladybird Book of microprocessors, I noted that Intel launched the 8080 in 1974 and 1978 arrived before it released its 16-bit 8086 brother. Another four years gap spanned to the 80286, and then another three to the 80386DX(1985). Then it took five more years for the 486 and an amazing seven years before the Pentium.

But the real significance of Intel's glacial performance through those decades wasn't that it was going as fast as it could. No, it was about it having an effective monopoly. When AMD roared into action with the Opteron in 2003, Intel suddenly accelerated new chip design and production to previously unprecedented levels.

The trouble with doing that is from that point onwards you've created expectation that each year you'll launch something new, even if you'd like a much slower development cycle. So what we've inspired is the appearance of new but, in the reality, older products that have been rehashed and rebranded, repeatedly.

This type of activity is most prevalent in the GPU market, where the sheer expense of engineering new designs has caused the makers to

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rebrand old products or just recreate them with better fabrication technology.

Nvidia makes a GPU called the GF108, available in its current GeForce GT 730, that previously appeared in the GT 620 a year back, which was a rebranded GeForce GT 530, and that was a warmed-over GT 440 from 2011. Back, by popular demand.

Perhaps what the tech industry needs to do is take a leaf out of the Tube network playbook, which a couple of weeks ago unveiled a £16bn upgrade that would include new sleek looking trains. So when will we see these PriestmanGoode designed trains?

The first ones will go into service in 2022, a full eight years from now. Yet, even if they miss those arbitrary deadlines, I can say categorically that they won't be late.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: 7 Benfords Law, 8 Safari, 9 Jekyll, 10 Aphetic, 12 Espew, 14 Evens, 16 Locator, 19 Clinic, 20 No Hope, 22 Observatory.

Down: 1 ABTA, 2 Innate, 3 Bolivia, 4 K-Dojo, 5 Blokus, 6 Twelvemo, 11 Pavilion, 13 Wozniak, 15 Non-IsM, 17 Athlon, 18 Ochre, 21 PAYE.

DISCLAIMER

The views expressed by contributors are not necessarily those of the publishers. Every care is taken to ensure that the contents of the magazine are accurate but the publishers cannot accept responsibility for errors. While reasonable care is taken when accepting advertisements, the publishers cannot accept any responsibility for any resulting unsatisfactory transactions. This week, our editor celebrated yet another birthday, as he turned the ripe old age of 24 (plus maybe another ten years). When we say 'celebrated', though, what we actually mean is he took the day off and stayed in bed a bit longer than usual. He didn't actually have a party or anything. Still, it got us thinking about who we

might invite if we had decided to organise a little shindig in his honour. Bill Gates, perhaps? No, he'd be too busy doing charity work and hanging out with Jerry Seinfeld. Maybe Tim Cook? Well, he'd probably force us to listen to U2 all night, so we'll give him a miss this time. How about Steve Ballmer? He'd be fun, right? We'd just have to make sure we put any Android devices out of sight and make sure no one mentions Linux. Then perhaps we could invite someone who works with traditional film cameras, because we all know how much Steve likes developers. Finally, we'd invite Mark Zuckerberg, and every time he left the room, we'd rearrange all the furniture and get everyone to sit in different places before he came back in, to see how he likes it.

THIS WEEK'S CROSSWORD

Across

7 The only surviving hominid. (4,7)

8 A comment or brief reference which makes an illuminating or entertaining point. (6)

9 Formal inspections of accounting procedures and records by trained accountants. (6)

10 In heraldry an ordinary in the form of a broad inverted V-shape. (7)

12 One hundred lakhs, especially of rupees, units of measurement, or people. (5)

14 A packet sent over a serial link. (5)

16 Prominent Italian fashion designer (1946-1997) (7)

19 XII, 1100 or C even. (6)

20 A speech of violent denunciation. (6)

22 A particle in a highly excited state in which one electron has almost sufficient energy to escape. (7,4)

Down

1 A tiny piece of semi-conductive material, usually based on silicon, used in the manufacture of electronic components. (4)

2 A performance given extempore without planning or preparation. (6)

3 Pretentious or insincere people. (7)

4 Simple but satisfying sound you hear when 'zapping' something in a computer game. (5)

5 The portion of a message, preceding the actual data, containing source and destination address and error-checking fields. (6)

6 Intended for or likely to be understood by only a small number of people with a specialized knowledge or interest. (8)

11 Physical computer equipment such as electrical, electronic, magnetic and mechanical devices. (8)

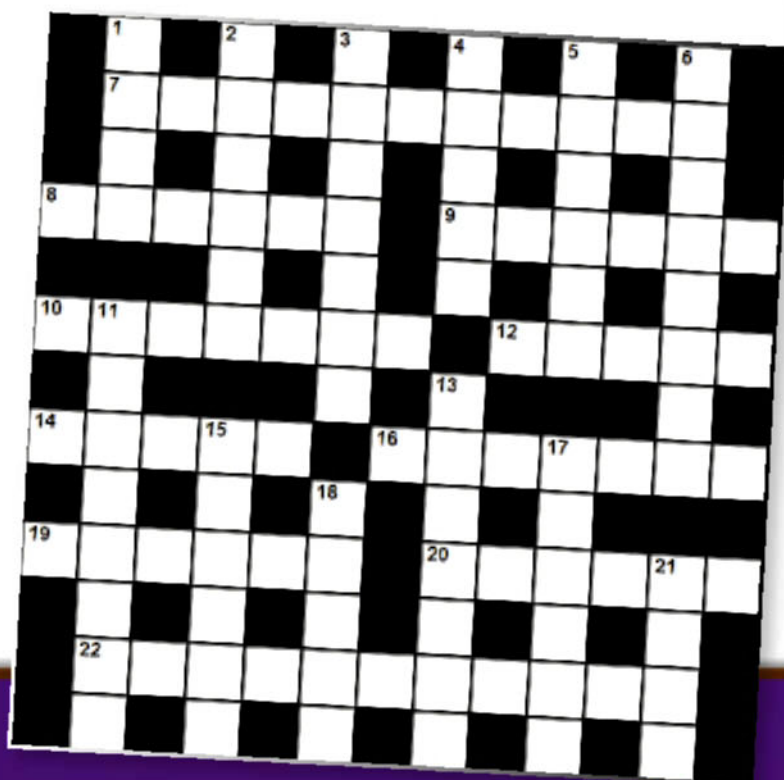
13 A sensation of whirling and loss of balance, associated particularly with looking down from a great height. (7)

15 A succession of musical notes forming a distinctive sequence. (6)

17 A faint flash, typically red, sometimes emitted in the upper atmosphere over a thunderstorm owing to the collision of high-energy electrons with air molecules. (6)

18 Nick from *Countdown* and *The Apprentice*. (5)

21 A printed representation of the contents of a computer storage device, usually main memory, backed-up when a system crash or other failure has occurred. (4)



The Things That Frustrate Us About... Android

Google's mobile platform is great in most ways, but there are just a few things we wish we could change

Google's Android operating system is the most commonly used mobile operating system in the world – as of last year, more Android devices were sold than Windows and iOS devices put together. So, you know, it's a pretty big deal. And rightfully so, because it's a pretty great system that offers flexibility and full customisability, with loads of apps available from third-party developers and support for a huge variety of different devices.

But that's enough cheerleading. There are several things about Android that are really annoying. Here are some of the most irritating quirks of the system...

Go away, Google Now

Google makes lots of very useful products. But it's also very insistent about trying to force you to use some of its newer ideas when you're just trying to get on with your life using the Google products you already like. It's constantly suggesting Google+ and, if you use an Android smartphone, it wants you to use Google Now too.

Google Now is basically like the Google version of Siri, a virtual personal assistant that uses information from your phone to guess where you are and what you're doing

so it can help you out with that. It's either brilliant or a bit creepy, depending on how wary you are of computers that know what you're doing at all times. Google Now has got a nasty habit of popping up when you're just trying to search for something with your browser or getting in the way of your calendar appointments.

Fix it: You can turn Google Now off: go to Google Settings and toggle the switch to Off. Now you'll only have to deal with reminders to switch Google Now back on instead of Google Now's helpful cards. Which is still quite annoying, really.

Ugh! Undeletable apps

Speaking of things you don't want to use on your device, most Android smartphones come with a package of apps preinstalled, either Google ones or ones from your hardware's manufacturer or mobile network provider. Some of these are useful, others less so. But guess what? Although you can choose never to use the useless ones, you can't actually delete them. They just sit there, taking up space. Grrr.

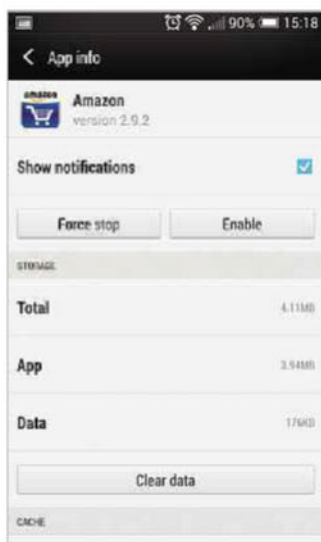
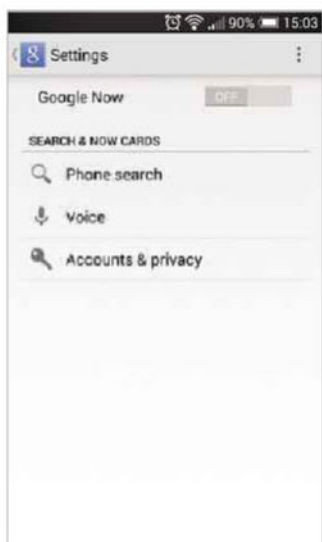
Fix it: Sorry, you can't.

Boo! Feeling Second Best

Like I said, Android is currently the most popular mobile operating system on the market, so you'd think app developers would be all over it, right? Android is the biggest market, after all. Sadly, that turns out not to be the case. Lots and lots of apps, including ones from big name software companies and almost every new trendy new mobile game, are developed for iOS first – and sometimes, for iOS exclusively.

The reason for that is that iOS is an easier platform to develop for – it's only on Apple products, so developers know an app will perform for all users in exactly the same way. Android, though, turns up on all kinds of products, from high-end handsets to much more affordable options, made by a whole slew of different manufacturers, so making an app work reliably on all those possible devices is trickier.

Fix it: This isn't one for us to fix, sadly. All you can do is pester developers to get on the case and make some Android apps. Or since there are more of us than there are iOS users, decide an alternative Android app is way cooler anyway, and harp on about it so much that iOS users are jealous. That'll show 'em.



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