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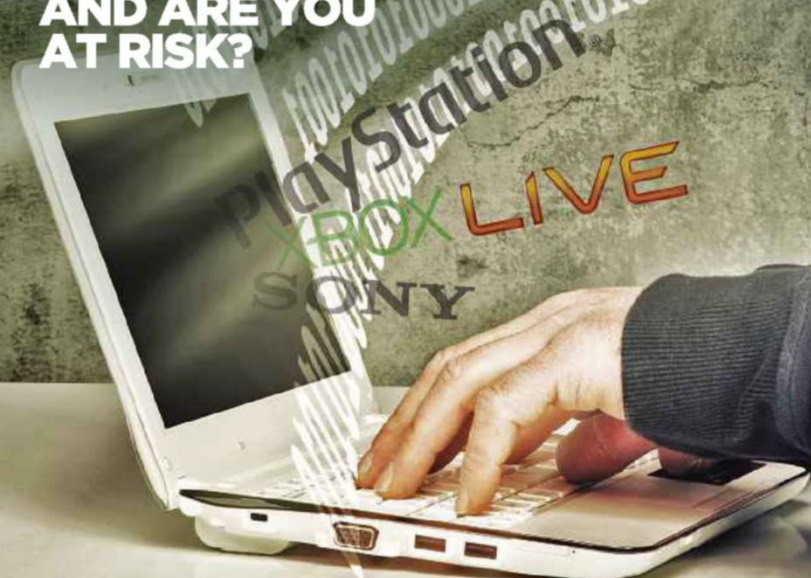
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It seems almost unbelievable that you can get a laptop for less than £200, but there are actually quite a few available. Some, as you'd expect, aren't that great, while others would be perfect for everyday tasks like watching movies and writing documents. This week, we take a look at six candidates and put them to test



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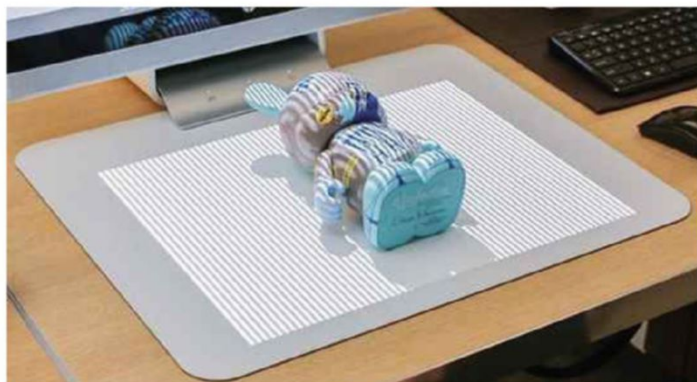
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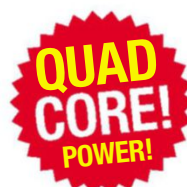
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North Korea Vs Sony

The Unwinnable War

Mark Pickavance examines the recent events surrounding the hacking of Sony and considers the implications for us all

As is usual during the festive season, all the early James Bond movies were shown to remind us how archetypal evil super-villains originated with their plans for world domination.

But in the real world, a story was running that seemed to make those nefarious nemeses of Mr Bond seem positively modest by comparison. Would North Korea really go to war over a Seth Rogan comedy?

What transpired was no laughing matter, for all concerned.

An Act of War

Trouble had been stirring between North Korea and Sony Pictures Entertainment for some time, since it announced the plot of its production *The Interview*.

Based on an idea by Seth Rogan, starring him and James Franco, *The Interview* tells the implausible story of two especially dense journalists who are encouraged by the CIA to assassinate North Korean leader Kim Jong-un.



The trailer presented the usual silliness that one might reasonably associate with a Seth Rogan movie, though it soon became apparent that the political masters of North Korean weren't remotely amused.

In June 2014, the North Korea government issued one of its more strongly worded communiques in which it demanded that the US ban the movie, and failure to do so would evoke a "resolute and merciless" response. They also said that if the movie was distributed, it would be considered an 'act of war'.

Given that North Korea regularly threaten their South Korean neighbours with turning their capital city into a 'sea of fire', most observers filed this outburst along with those that they usually make just before firing a missile in the direction of the Sea of Japan.

However, as the months went by towards the pre-Christmas release of *The Interview*, the rhetoric went up several notches, to an almost hysterical level, calling the filmmakers 'gangsters' and its impending release "reckless US provocative insanity".

Obviously, concepts like 'freedom of speech' and the limits of government censorship aren't ones that North Korea understand, so the US had no intention of banning the film, as they had not done with the previous character assassination of Kim's father in *Team America: World Police* (2004).

What happened next was quite unexpected and elevated the story to an entirely new level.

The Sony Hack

In November 2014, hackers gained access to the internal computer systems of Sony Pictures Entertainment and made off with numerous files and databases, containing personal information about Sony Pictures employees and their families, e-mails between employees, information about executive salaries at the company and copies of unreleased Sony films. According to those involved, they walked off with 100TB of Sony files.

The group behind the hack called themselves (ironically enough) the 'Guardians of Peace', or 'GOP', and demanded that the release of *The Interview* be cancelled, or they'd make much of this information public.

They also planted malware in the systems they attacked that attempted to wipe all the data in the infected system, making many computers in the business entirely inoperable.





In these early days, the hack seemed to be more about embarrassing Sony executives than anything else. But as the release day for *The Interview* got closer and Sony remained intransigent, those behind the hack started to use the sort of language that triggers a different response in the USA.

Winners And Losers

First, a note containing the following phrase raised concern: "Warning[.] We will clearly show it to you at the very time and places 'The Interview' be shown, including the premiere, how bitter fate those who seek fun in terror should be doomed to." This concern was further heightened by the inclusion of "Remember the 11th of September 2001" after more postulating.

It's difficult to imagine saying anything else to America more likely to cause a big response, and it wasn't slow in coming.

With the possibility of people being attacked at US cinema venues, those distributing *The Interview* pulled the plug and refused to carry the movie.

Sony was now under attack from all sides. Not only was it contending with the private emails of top executives being paraded, for which it was being sued by various film production companies, but it also took the brunt of those asking why it wasn't defending free speech.

Even President Obama chimed in, suggesting that he wished it had "phoned me" before making the unilateral decision to withdraw *The Interview*. He also twirled the presidential big stick with, "We will respond proportionally, and we will respond in a place and time and manner that we choose."

Sony tried to explain it they couldn't make cinema chains take the movie, but it also refused to confirm the obvious choice of a digital release. Sony Entertainment's CEO, Michael Lynton, also tried to suggest that President Obama misunderstood events when he spoke, amazingly.

For a curious moment that lasted about a week, it seemed that a small impoverished dictatorship in Asia was the final arbiter of what world cinema audiences could watch.

If those behind the hacks and the threats rejoiced at their apparent victory, it was a very short-lived celebration.

Having at first conceded to the demands, Sony grew a backbone, and on 23rd December it sanctioned 300 independent screens in the US to show *The Interview* on Christmas Day and released the film digitally to Google Play, Xbox Video and YouTube on 24th December.

The floodgates opened, and either by official means or piracy, many people saw *The Interview* over Christmas 2014.

The next communication came from the North Korean National Defence Commission, who thought it appropriate to throw an openly racist jibe at the most powerful man on the planet with, "the chief culprit who forced the Sony Pictures Entertainment to indiscriminately distribute the movie ... Obama always goes reckless in words and deeds like a monkey in a tropical forest."

If only that was the end of it, but it wasn't.



▲ A classic piece of North Korean photoshop work, where considerations like lighting, shadows, the scale of people and the environment are all totally ignored



▲ The DPRK has hovercraft in its armed forces, but not as many as this abysmal attempt at digital image manipulation might suggest

PSN/Xbox Live Hack

Although it's impossible to prove that the same people who initiated the Sony hack were responsible, on Christmas day, both Sony's PlayStation Network (PSN) and Microsoft's Xbox Live services came under a sustained denial-of-service attack.

The group that claimed responsibility were called Lizard Squad, and what communications came from people claiming to represent them didn't mention North Korea at all or even *The Interview*. Instead they talked about demonstrating how poorly both Microsoft and Sony protect their systems and how they were demonstrating these weaknesses.

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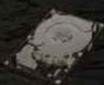
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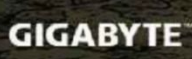


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A person who claimed association and who talked the BBC on Radio 5 Live also bizarrely suggested that what they were doing was a public service of sorts. "Is Christmas really about children playing with their new consoles or playing with their new toys, or is it about them spending time with their families and celebrating Christmas?"

Connected or not, what this did do was make people question just how well prepared the likes of Sony and Microsoft are generally to ride out subversive hacking – which, based on these two scenarios, appears to be not at all.

In the meantime, the FBI positively identified North Korea as the instigator of the Sony hack, and while the US took no responsibility, the internet in North Korea stopped working for about two days for the frighteningly small number of people who have access.

With both sides in this argument suffering a bloody nose, it seems unlikely that this story is entirely done, and it may be just moving into a new, less visible phase.

The Unwinnable War

As long as computers exist in their current form, hackers will gain access to them by unpredictable means and do things that aren't desirable for the majority of people. That's a reality that we'll continue to live with, irrespective of whatever precautions we take personally or are taken globally on our behalf.

In that respect, defending against hackers is an unwinnable war, though the same is very true for those who act to change policy by their criminal actions.

These people set out to have *The Interview* banned and/or cancelled and instead attracted for it a bigger audience than Sony might reasonably have expected for what, according to many reviewers, isn't that wonderful a movie.

If ever the infamous Streisand Effect (named after the singer's attempts to protect her privacy) had a textbook example, this was it. Before threats of war, this movie wasn't on many people's radar, and after the Sony hack and the subsequent events, it was on everyone's. Therefore, those who organised and executed the hack were responsible for making *The Interview* a much bigger media event than Sony might have ever hoped – the diametric opposite of what the hackers had supposedly intended.

Sony managed to get heavily criticised for pulling the release, as did those distributors, and it's had some problems with the private

emails that got released and the wages of its staffers, but it can't complain about the media coverage.

Was It Really North Korea?

While North Korea has repeatedly denied its involvement, the number of groups sympathetic to the regime is remarkably small. A list of those who dislike both Sony and America is a much longer one, and to many in the business of system security, these are the people that the FBI should really be looking for.

A number of people have also pointed out, not unreasonably, that most real hackers don't give themselves a handy headline filling moniker, like the Guardians of Peace.

But there are also many other things about the hack that either don't add up or cast doubt on the notion that North Korea might have mounted the attack.

Hector Xavier Monsegur, a former hacker who previously invaded Sony, eviscerated the claim that 100TB of data had been removed, claiming it would have taken months, possibly years to remove this much data unnoticed.

The only way that data on that scale could have been acquired would have been through a physical storage device, which hints that Sony wasn't electronically hacked, but physically. Or it's a lie.

This is the view of Kurt Stammberge, senior vice president of cybersecurity firm Norse. He believes that "Sony was not just hacked; this is a company that was essentially nuked from the inside." Others in the security sector strongly agree and believe that with inside help this hack was practical, and without any it probably wasn't.

His position is supported by North Korea's track record of claiming to have all manner of high technology that they turn out not to own. Over the past few years, they've launched a number of DPRK (Democratic People's Republic of Korea) branded phones and tablets, all of which appear to have originated in China. They also appear to have no idea that badly photoshopped images aren't accepted as reality outside their own country.

What this activity doesn't negate is the possibility that these hackers were employed by North Korea to act in their interest, even if they didn't think through what might actually happen should they succeed.

Should This Worry Us?

Well, on the face of it, no, because while these large systems (PSN and Xbox Live) were affected for a short period, it isn't like hackers

can take down this sort of infrastructure indefinitely. And each attack reveals more about those behind them and their methods, thus making it harder the next time they try.

As for anyone in the film industry who isn't Sony, they've had a massive wake-up call about how they need to secure their systems and their data against aggressive cyber attacks.

Those who fail to heed these warnings are likely to find their films distributed for them before release, their private thoughts about famous people published and their businesses sued for lack of data protection.

What these businesses need to do is employ services that are designed to handle DOS (denial of service) attacks, provide fail-over solutions for their networks and stop their executives treating company email as if it was a water-cooler conversation.

It's probably unrealistic to find and block every possible entry point to big systems, so at this point their actions must be more about damage mitigation. If a hacker gets in, there should be limits to what they can access and remove that are inherent even for sanctioned employee accounts.

This is now the time for the film industry to stop sneering at file sharers and making up lost sales to piracy and smarten up its own internal network act before Sony becomes just the first of a series of high-profile media targets.

In years to come, we may look back at this as a turning point, where big companies stopped paying lip service to security and actually set about doing it professionally, which they've patently failed to do so far.

Final Thoughts

The more I've educated myself in these events, the greater number of parallels that I'm inclined to draw between this stage of the internet's development and the expansion that happened into the American West in the middle of the 19th century.

That parts of the internet are now referred to as the 'Wild West' seems wholly appropriate, since transiting across its open expanses can expose you to many potential pitfalls. Those unprepared can fall foul in numerous ways, and those living on the periphery of lawless regions can be attacked by bloodthirsty raiding parties.

What, however, is more concerning is that some of the most dangerous bandits are those hired by governments, much in the same way that the cattle barons tried to influence settlements using hired thugs.

The irony of that association is that, as was the case with the real Billy the Kid, hired guns eventually turned on their paymasters, and

10 Implausible Facts About Kim Jong-un

Here are some of the 'facts' that circulate about North Korea's glorious leader, none of which he was prepared to confirm to me personally.

1. He allegedly owns a huge collection of Nike footwear.
2. Before he became leader, only one image of him as a teenager existed. His identity was secret, even taking another name to go to college in Bern, Switzerland.
3. A massive LA Lakers fan, he owns an extensive collection of NBA memorabilia which he keeps in his own NBA museum.
4. Confusingly, even though his true date of birth (or even year) isn't known, 8th January is a national holiday in North Korea and his official birthday.
5. In December 2014, the North Korean regime issued an Administrative Order that public authorities should make a list of anyone in their area with the name Kim Jong-un, and 'train them to voluntarily change their names'.
6. He founded the very first girl band in North Korea, choosing each of the five members himself.
7. His father, Kim Jong-il, had several children, and Jong-un wasn't the first candidate to succeed him. Originally it looked like Kim Jong-nam would take over the job, until he was caught trying to enter Japan on a fake passport in an attempt to visit Disneyland Tokyo.
8. He holds the military rank of daejang or General, although he's never spent a single day in military service or training. He has, however, got a great range of uniforms for various services and a substantial collection of medals.
9. At 28 years of age (approximately), he is by far the youngest head of state in the world.
10. Along with an ability to speak fluent German, Jong-un came back from Switzerland with an obsession for Emmentaler cheese. It has been rumoured the amount he's been eating recently has expanded his waistline dramatically and given him other medical problems.

there is no guarantee that those involved in these actions won't do the same at some point.

Clearly, an invisible cyber-war is underway, where geographical boundaries are almost irrelevant. It's all about what resources can be thrown into the front line and what collateral damage is likely to be caused to those who use this environment for their livelihood. From the perspective of the public, it all seems rather childish and pointless, because regardless of their public relations points being scored, this is a war without end or even a realistic objective.

Whatever the West does, China feels that it doesn't want to be directly bordered by an ally of the USA, and until that changes they'll give North Korea sufficient fiscal oxygen to keep them alive. Their nightmare scenario is a total collapse of the regime, causing a huge refugee problem on their border, and being generally blamed for maintaining a hugely oppressive society that makes even China seem open and human rights friendly.

North Korea's foray into cyber warfare makes perfect sense, because it doesn't require the high tech infrastructure they lack to make the very latest technology; the attacks can be mounted away from their own country. In terms of eliciting a counter strike, since most North Koreans don't actually have electricity or (logically) a computer, a denial of internet services there has





장군님의 여성근위병들이여! 전투마다에서 무적의 용맹을 펼치자!



relatively little impact, other than to annoy the Glorious Leader and his direct circle.

Therefore, it is a zero-sum game, where North Korea has relatively little, if anything, to lose and at least notoriety to gain.

But beyond those living in an analogue alternative reality, what are the implications of all this for the public and other companies that might wish to tweak Kim Jong-un's tail in the future?

What this is undoubtedly leading to, as it did with the Wild West, is a segmentation of the regions into those parts that are policed and those that aren't. Companies and individuals will be increasingly encouraged to operate inside controlled digital space, where hackers can't run riot, rather than take the risks associated with the uncharted territories beyond.

The problem with this is that the safe/unsafe concept is a delusion, in the same way that those who use Apple technology still get hacked and spammed, even if the marketing message is that they don't.

Hackers will always find a way around impenetrable boundaries, because they're all created by humans, and the people who use these systems are too. Until the likes of Sony employ people who don't treat their email systems like they're public record and use internal security that is more than a personal annoyance, these things will happen.

These types of things are likely to get more likely than less, so we should get used to the idea that the digital functionality we enjoy each day isn't a given, and as with any resource that lots of people use, there will always be profit in denying it for someone. [mm](#)

The Politics Of Film

With *The Interview*, Sony took the view that while North Korea certainly talks tough, their actual grasp of the world they live in seems small, as do the collection of countries they're friends with.

However, other production companies have been more diplomatic when presenting certain nations and their nationals in films. Some have even been altered when it was considered appropriate, to protect the various sensibilities of those portrayed.

In 2012, MGM remade the 1984 movie *Red Dawn*, about an underground movement in a post invasion USA. In the original film, America was invaded by the Soviet Union, Cuba and Nicaragua, where in the remake it was originally planned to be the Chinese.

However, after most of the film was complete, it was pointed out to MGM that China was actually becoming a lucrative box office opportunity, so in postproduction the Chinese troops were magically transformed into North Koreans by the application of digital modifications. This reputedly cost in excess of a million dollars to do.

Where changes like this are still rare, what is much more common now is the inclusion of content designed to make a movie more popular in specific regions.

Both *Iron Man 3* and *Transformers: Age of Extinction* both included Chinese actors who are entirely unknown in the West, specifically for the potential Chinese audience.

With China one of the few expanding movie markets in the world, this trend seems likely to continue. However, as there is no market for Western films in North Korea, they seem less likely to be embraced.

Infamously, Jong-un's father, Jong-il, was a big fan of films, had a huge collection of them and even abducted South Korean actress Choi Eun-hee and her film director husband, Shin Sang-ok, in 1978.

They were taken to North Korea to make propaganda movies for Jong-il, who wanted to see an improvement in home-grown film quality. It took eight years for the two to escape, after Shin Sang-ok spent five years in prison and was forced to remarry Choi Eun-hee, who he'd divorced shortly before they were taken.

During their time in captivity, they made eight movies for Jung-il, who acted as executive producer, including the *Godzilla* remake *Pulgasari*.





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VR Apps For Android

You don't need to spend hundreds of pounds to experience virtual reality at home, as James Hunt explains...

The successful Kickstarter campaign of the Oculus Rift may have been a game changer for the computing industry. After years of being relegated to the heap of failed futuristic concepts only realised in overly optimistic sci-fi films, virtual reality was suddenly back on the table as a credible **technology**. And more than that: people were actually interested in it.

Of course, any success breeds imitators, and the Oculus Rift is no different. As well as a succession of high-budget Rift clones that try to do the same sort of thing, other companies are trying to bring out low-cost products that capitalise on the same desire for VR experiences but in a cheaper and more immediate way.

Where the Rift and its high-cost imitators contain a pair of high-resolution screens inside a headset, the likes of Google Cardboard and Durovis Dive provide an empty headset into which a smartphone can be mounted. Software then uses the screen to imitate a pair of VR displays, while the headset separates the output for the user.

Although the technology is rudimentary and far from perfect, large numbers of developers are making use of it to come up with simple VR apps you can use at home. Although small games make up a large percentage of the apps available, we took a look at a few of the more utilitarian candidates to see how they fared.

Go Show By New Fuel Studio (Free / £2.45)

Turning your phone into a device that lets you view 3D video is one of the more interesting uses of a VR headset, and it's also quite a simple one. Go Show is a virtual theatre app, which turns your head-mounted display into a 3D cinema. Quite literally, that is, because some borders and 3D rendering will make it seem like you're watching a movie on a cinema screen, with curtains around the screen and seats in front of you.

As apps go, it's working quite well, although it's debatable whether the experience is improved by a faux-cinema setting. The app is in active development, and a version 2.0 is under way as of 5th November. Although bugs have been experienced with some handsets, the developer has indicated that they're now fixed. Part of the gamble with spending money on apps is that you could potentially be buying abandoned software, so it's good to see Go Show's developer keeping things running smoothly.

Go Show is only available for Android and is compatible with virtually head-mounted display. The free version of the app only runs a sample movie, but for £2.45 you can play 3D movies from many different sources, including those stored on your phone and those stored in your Dropbox. Support for YouTube's 3D video is also being added.

VR AR Cmoar TV By Cmoar (Free / £1.87)

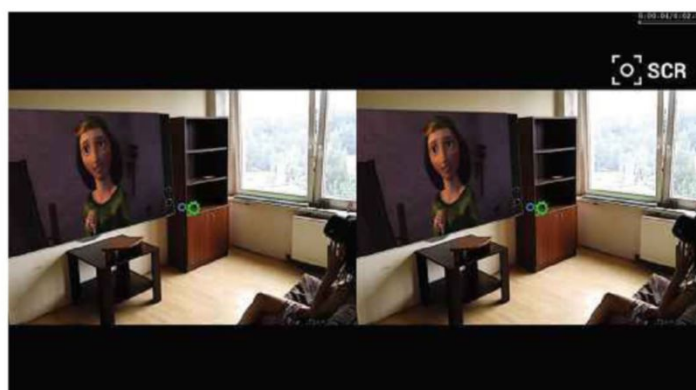
Similar to Go Show, VR AR Cmoar TV allows you to use your headset to watch 3D video. In this case, though, it does so by projecting the image onto a virtual 80" screen, which is added into your living room through the power of augmented reality. A far more futuristic experience than a virtual cinema setting, we're sure you'll agree.

All you have to do to get it working is download the app and then print off a single image for the AR software to recognise. The developers have helpfully made this a fairly discreet picture of some weathered stones, which wouldn't look entirely out of place as a piece of art, so you can place it anywhere in your preferred room, causing the 'screen' to appear whenever the app is activated.

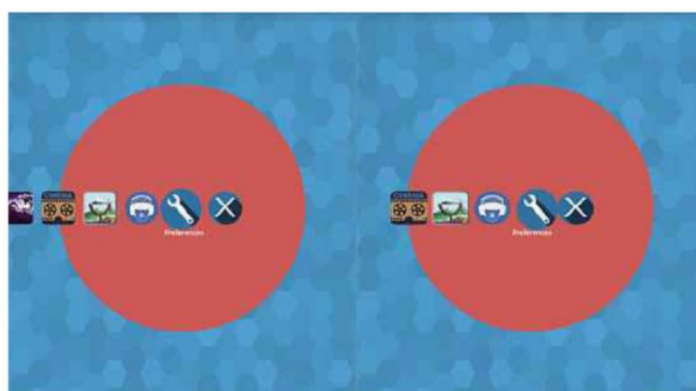
Although it's a nice idea, the recognition of the stones image isn't perfect, which can result in the image juddering up and down on occasion, especially in low light. That said, the idea is sound, and with some refinement it could get very good very quickly. With that in mind, it's a little perplexing that the software hasn't been updated since August, and there's no official site for the developers. Again,



▲ Go Show



▲ VR AR Cmoar TV



▲ Cardboard Home

it's Android-only, and the free version has no side-by-side mode, so you'll need the full version to view 3D video properly.

Cardboard Home By Louis Orleans (Free / £0.60)

Designed specifically for use with Google Cardboard headsets, Cardboard Home is an Android launcher program designed to give your device a 3D interface for launching and switching apps while you're wearing your headset.

The free version of the app is limited in customisability, but buy the full version and you can add new wallpapers and backgrounds and – more excitingly – speech recognition, with more features promised in the future. Both versions include an app blacklist so that you can prevent certain programs from showing up.

The app was last updated in October, suggesting a fairly current release cycle, though there are numerous reports that the software fails to work properly with certain models of phone handset. It's a nice piece of software when it works, but the number of bug reports

What Is Google Cardboard?

Perhaps the simplest VR headset of all, Google Cardboard is so-named, because it's quite literally made of cardboard. Although it's designed by Google, there's no official vendor for the device, and it's not manufactured for sale. Users are instead encouraged to make their own using the instructions and parts lists given on the official website.

Constructing the headset involves buying a number of additional components (such as magnets, lenses and fasteners), none of which are especially expensive or hard to get hold of. The cardboard unit itself is occasionally given away, but the website contains the necessary design files for you to create your own from any large sheet of corrugated cardboard. Once assembled, you can place a smartphone into the 'headset', and as long as you're running compatible stereoscopic software, the lenses will combine two images into a single 3D image.

At present, Cardboard is more popular on Android than iOS, but there are official apps for both platforms, as well as a Chrome plug-in that works with the headset.



and app store reviewers mentioning crashes suggests that it's a little way off being a mature and usable application just yet. Once again, it's an Android-only program, and to use the Pro version of the app you have to install the free one, then buy the paid version, which unlocks it.

Orbulus By VR Craftworks (Free)

As the name suggests, Orbulus was first designed with Oculus Rift users in mind, but the arrival of cheap smartphone-based headsets has opened up a new audience for the software. This version of the app is specifically optimised for the Durovis Dive and Google Cardboard. But enough about that – what does it actually do?

Essentially, it's a 3D photo-viewer, although it's not for viewing stereoscopic 3D images in the basic sense of the word. It's actually based on photo-sphere photography, which is an emerging form of art that creates landscape images, which are then mapped onto spheres, essentially placing you inside the photograph at the centre of the composition, where the photographer was.

The app itself is little more than a tech demo; rather than allowing you to create and view your own photo-spheres, it comes pre-loaded with a library of what its creator describes as the "best examples" of photo-sphere work, reproduced with the photographers' permission.

The app has a high review score (4.0), and while it's compatible with most phones, there is a list of unsupported devices, the most high-profile of which are some iterations of the Samsung Galaxy S3. It's a large download at 216MB, but it's also free, which makes it easy to excuse some of the rougher edges. Development is ongoing,

and although there's no iOS version, the software is also available for PC, Mac and Linux.

TriDef 3D Gallery by DDD Group (Free / £4.16)

More conventionally, the TriDef 3D Gallery app is a video and photo viewer, which you can use to view standard 3D images on any compatible device, in side-by-side or top-and-bottom mode. The former means it should be compatible with the Google Cardboard and Durovis Dive headsets, but be warned – this isn't necessarily the case.

Although the app is free, you can pay £4.16 for an in-app purchase that unlocks it, although it doesn't add a huge amount of value: it simply allows you to put more than 12 items into each of its internal folders.

It's worth pointing out that a lot of its features are designed to link up with 3D TVs, which isn't that useful if you're using a 3D headset and therefore can't see your TV. Still, conventional and well-made 3D viewers are hard to come by, and the fact that this one can work with mobile-based headsets puts it comfortably at the front of the pack.



▲ Orbulus



▲ TriDef 3D Gallery



▲ Volvo Reality

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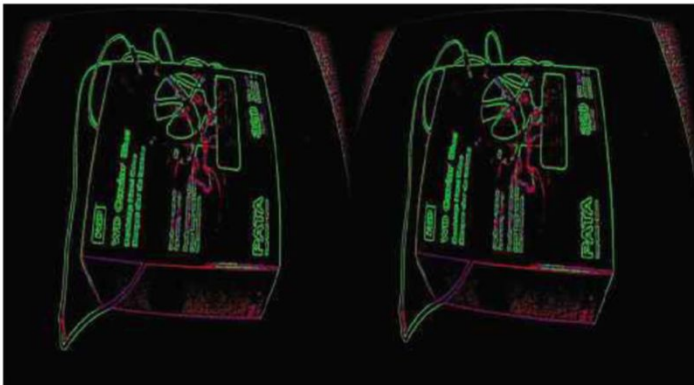
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▲ *Glitcher VR*



▲ *Cyclone 2000*

Volvo Reality By Volvo (Free)

There are loads of VR-based pseudo-games and 3D 'experiences' available that are compatible with the Dive and Cardboard headsets, but only one has the backing of a major car manufacturer, and that's Volvo Reality. Developed by Volvo itself, this gimmicky but gleeful app allows you to test-drive a Volvo XC90 without having to leave your sofa.

Although it's obviously not much use in terms of telling you how the car handles, there's a certain joyful quality to sitting in the car seat (left-hand drive, because it's an American app) and driving around a variety of landscapes. It's a shame there isn't more interactivity, but if nothing else it's a good proof of concept for how VR might be able to help companies interact with potential customers in the future.

The app has space for three 'episodes', with only two released thus far, so if you try it out and like it, take heart in knowing that there's more content to come. If you're not that keen, then good news: the app is free, and there are no in-app purchases, so there's literally nothing to lose by downloading it except the 86MB of space it takes up.

Glitcher VR By Dystopia Zero (Free)

It might be of limited practical value, but Glitcher VR is one of the most fun applications you can get for your wearable headset – especially if you're old enough to have ever played *Battlezone*!

Essentially, Glitcher VR turns the look of the entire world into a VR-enhanced *Battlezone* game. You can't shoot tanks (well, not using the software...), but you can enjoy seeing everything in your life rendered in green and red wireframe. And that's not all: there are loads of other filters, including inverse colours, a selective colour filter, VHS tape and super 8 camera effects, and even an infra red-style 'Predator-vision'.

As apps go, it's also very well designed, with full speech recognition controls and the ability to take in-effect screenshots, photographs and videos. You can even control the phone's flashlight from within the app! It's compatible with a huge number of devices, although the Samsung Galaxy S3 does struggle with a few of the effects, and older hardware will have trouble rendering the more advanced ones too. Still, it's a lot of fun, and what else is VR for if not that?

Cyclone 2000 By NoCrew Mobile (Free / £0.50)

A lot of the VR games you'll find that work with mobile-based headsets have been hacked together out of rudimentary tech demos. The big exception is *Cyclone 2000*, which is a clone of the 1981 Atari classic, *Tempest*, by way of Jeff Minter's *Tempest 2000* on the Atari *Jaguar*. Rather than being a game designed for headsets, this is an existing title, which has added headset support. As a result, it's far more developed, better balanced and generally a lot more entertainment than most.

The free version of the software has the same features as the full one but with in-app adverts, and both versions allow you to purchase power-up packs for 50p each. The game has cloud save, leaderboard functions and 80 levels to start, with more being added later.

You will need some kind of controller to play the game in 3D mode, since the only other option is to use on-screen controls, but that's true of most games you'll find on mobile VR headsets. *Cyclone 2000* is a great fusion of retro and futuristic technologies, and it's one of the few games that you'll definitely want to try once you get a Cardboard or Dive up and running. [mm](#)

What Is The Durovis Dive?

The Durovis Dive is like an upmarket version of the Google Cardboard. Rather than being made of cardboard, it's made of plastic, and rather than building it yourself, you can buy a fully assembled unit for 59.99 (around £48).

Built from flexible nylon plastic, the Durovis Dive is a lightweight Oculus-style unit, which is compatible with a large number of smartphones straight out of the box. Like Cardboard, you can run compatible software, and the headset will convert the split-screen image on your phone into a single 3D image when you view it.

Software developed for the system uses a technology called OpenDive and allows you to play games and stream movies in 3D. Software is available for both Android and iOS, and as long as your phone is the right size and contains both a gyroscope and an accelerometer, you can use it as if it were a VR headset.



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15 Ways To Boost Gmail



There are many ways to enhance Gmail and Roland Waddilove has been busy exploring some of the more interesting options offered by this great service

Gmail is one of the biggest players in the email market; hundreds of millions of people use it on a daily basis – but are they getting the most out of it? There are several pages of settings, some of which are quite complex, and it is quite easy to miss some great ones that can make the service even better. Get it right, and dealing with email can be less time consuming and require less effort.

There are settings to automatically process incoming messages and to apply labels to them. Extra email accounts can be added and the messages sorted for you. You can create multiple signatures to save typing, and reply from different email accounts as if you were logged in to them. .

Change Direction

Do you read your newest emails you receive first or go straight down to the oldest unread one? What would you prefer? Suppose you've got 10 new emails in your inbox, if you manually select each email in turn and delete it, archive it, move it or whatever you can work in the method you prefer (you perhaps don't even think about it), or you could get Gmail to automatically work your way. After processing an email you can dictate whether the service will go to the next newest or the next oldest message in the inbox. Go to Settings and under the General tab in the Auto-advance section, select the direction you want to go.



▲ Set the default font, size and other attributes for new email messages



▲ Mark email messages with more than just stars by selecting the markers to use

Set The Default Formatting

Do you have a favourite font, size and style that you always use when typing a new message? Applying formatting to the text is easy of course, but why bother when you can simply set your favourite as the default? You can then just start typing without needing to format the text. Go to Settings > General > 'Default text style'. Set the sample text just the way you like it and click Save at the bottom of the page. All new messages will use the settings.

View Or Hide Conversations

Conversation view completely changes how messages appear in the inbox. A conversation occurs when you email someone, they reply, you reply to that and so on. All the messages can be combined into one conversation. Some people love it, but others don't. Thankfully, then, it's an option that can be turned on or off without affecting messages in any way apart from how they are displayed. Go to Settings > General > 'Conversation view' and choose the on or off settings.

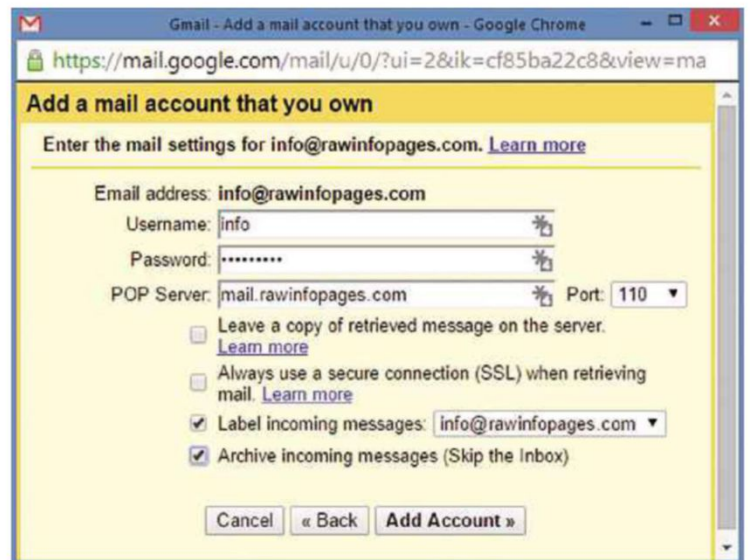
Mail From Google+

If you use Google+ you can choose whether people can email through the social network. Email addresses are not shown on Google+, but it is still possible to email people. Go to Settings > General > 'Email via Google+' and there are four settings. Select 'Anyone on Google+' and anyone, such as someone that follows you, can send you an email by entering your Google+ name into the To box of a new email. This is useful if you run a company, club, website and so on, and want people to be able to contact you.

To prevent the general public from being able to email you, select one of the other three options. 'No-one' prevents people using your Google+ name in the To box. The two circles-related options enable people in your circles to send emails, but no-one else. The setting you choose is up to you. It is a useful way to let people email you, but without publishing your email address on the internet for all to see.

More Than Stars

When viewing the inbox, the first column is a tick box for selecting messages and the second column is a star. The star enables you to mark messages, and this can be for a variety of



▲ See all your email accounts in Gmail by adding them in Settings

purposes, such as to highlight important emails, or ones that you have read, but need your attention later.

More markers are available, though, including an exclamation mark, question mark, i, double arrow and various colours. To see these and configure them, go to Settings > General > 'Stars'. There are two rows of items – in use and not in use. Drag items from the not in use row to the in use row. When you click the

“ Hundreds of millions of people use it on a daily basis – but are they getting the most out of it? ”

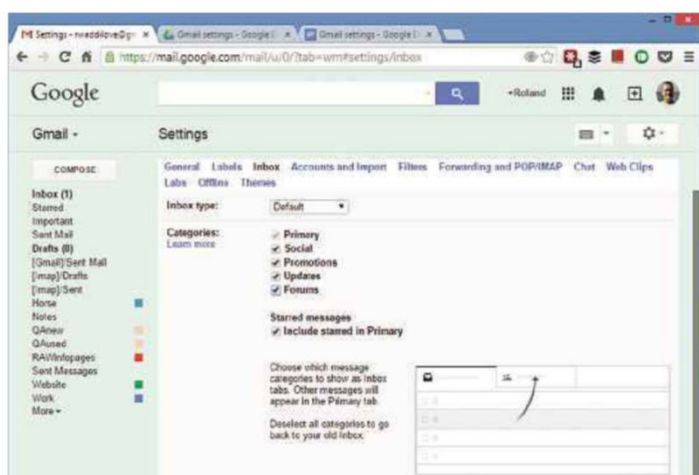
star next to an email in the inbox, the first item is displayed and clicking it again shows the second, third and so on. The symbol cycles through the items and it is a useful way to mark emails.

Configure Notifications

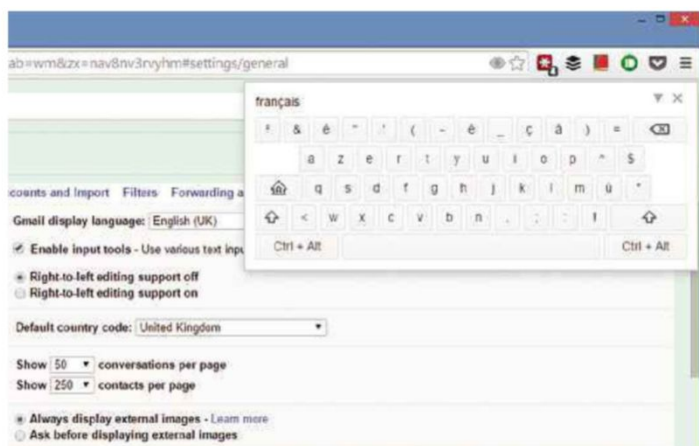
If you use Chrome or Firefox to access Gmail, notifications can be enabled. This means that if you minimise the browser and open another program to do some work, notifications appear on the screen whenever a new email arrives. It saves you having to open the browser window to check for new messages. Go to Settings, General, 'Desktop notifications'. There are options to show notifications for all new mail or just important messages, as judged by Gmail.

Multiple Email Accounts

Gmail is useful on its own, but it is even more useful if you have more than one email account. It is able to fetch email from elsewhere and display it in the inbox along with the rest of the mail. Not only can you fetch email from other accounts, you can also send it too. This means that when you send an email, it appears to come from another account, such as your personal account, sales department, or whatever the second account is used for.



▲ Add tabs to automatically sort incoming email using categories in the Inbox settings



▲ Add foreign languages and display a keyboard with special characters

Go to Settings and select the 'Accounts and Import' tab. Go to the 'Check email from other accounts' section and click 'Add a POP3 email account that you own'. A window opens for you to enter the account details. You need to know the incoming email server address, such as mail.mysite.com and your account password. That is usually sufficient to fetch messages from the account, but if it doesn't work, try ticking the option to use a secure connection, or try one of the other ports.

If you want to send email from that account you need a bit more information, such as the outgoing mail server address. Check your email provider's help pages for email software setup instructions.

When adding another email account there are some useful options. For example, Gmail automatically suggests a label based on the account name or you can select a different one. There is also an option to skip the inbox ('Archive incoming messages'). If you select both of these options then email will be fetched from the other account, but will not be displayed in Gmail's inbox. They can be viewed by clicking the label in the left panel. It is a good way to keep two email accounts separate and to avoid mixing them in the inbox.

Set The Default Email

After adding one or more extra email accounts, return to Settings, Accounts and Import, and there is a 'Send mail as' section. This enables you to set the default account to be used as the From in an email. So even though you have a Gmail account, people could think they are receiving email from

another account. A useful option is to leave the default account as Gmail, but to set 'Reply from the same address to which the message was sent'. This means that if someone sends an email to your Gmail account and you reply, it comes from Gmail, but if you reply to an email from another account you have added, the reply comes from there instead. It is a powerful and very useful feature to get to grips with.

Create Signatures

A signature consists of some text that is placed at the end of an email. It could be your name followed by your favourite quotation, your name, company and position, a disclaimer or terms and conditions. You don't want to have to type this in each time you send a message, so having it automatically added is a great time saver.

If Gmail is set up to handle multiple email accounts, you can have a different signature for each account. This is really useful when you use Gmail for work and personal accounts

“ The traditional Gmail view can be selected by setting the 'Inbox type' to Default ”

for example, because you write to friends in a different way to business contacts and work colleagues. Go to Settings, General, Signature. Select an email account in the list and then create a signature. Select a different email account and enter the signature for that.

Customise The Inbox View

The Inbox tab in Settings enables you to turn on or off tabs and markers. The traditional old style Gmail view can be selected by setting the 'Inbox type' to Default and ticking only the Primary option in Categories. Gmail can analyse incoming messages and automatically place them into categories, though, and some people find this option useful.

Tick all the categories and set the 'Inbox type' to Priority for a completely different view of your email. There are now tabs across the top of the inbox and messages are organised into Social, Promotions, Updates and Forums tabs, and the inbox only shows important messages.

In some ways this is very useful and unimportant messages, such as social networking updates, special offers and other promotions, notifications to forum posts you have made, and so on are kept out of the inbox, letting you focus on what is important. The downside is that you have to click multiple tabs to check all your email. You should try it both ways for a week and see which you prefer.

The new Inbox from Gmail takes this automatic categorisation of messages even further and it appears to be the way Gmail is heading. Hopefully the old traditional inbox view will still be available, though.

Type Foreign Characters

If you write to someone abroad and want to use foreign language characters, there are ways of accessing them using the keyboard. However, special characters such as letters with accents in French for example, are hard to remember. A much



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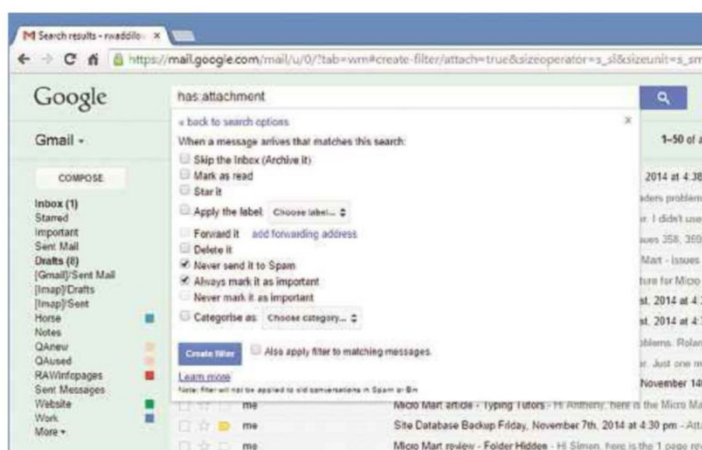
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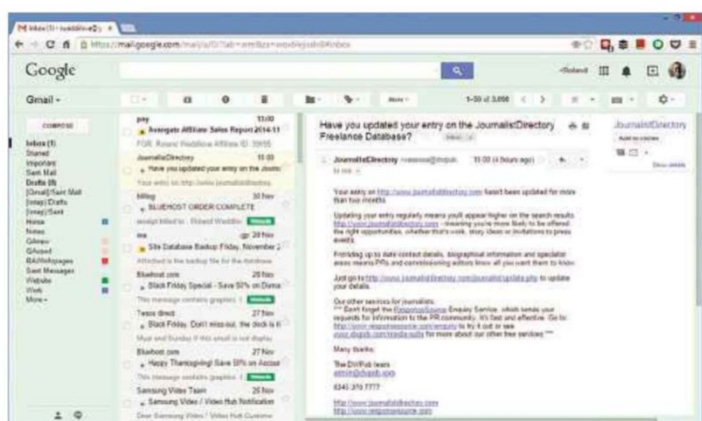
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▲ Perform actions on incoming messages automatically to organise your inbox



▲ The Preview Pane Labs extra reorganises the display to show the inbox and email contents

simpler way of entering foreign characters is to use an onscreen keyboard. Go into Settings, select the General tab and at the top is 'Enable input tools'. Tick the box and click 'Edit tools'. A list of languages is shown on the left and they can be added to a list on the right.

When the settings are saved, a keyboard icon appears in the top left corner of Gmail and clicking the arrow displays a menu from which you can select one of the languages you added. Select a language and an onscreen keyboard appears. When typing an email, just click the foreign character in the on-screen keyboard to enter it.

Create Filters

Filters enable actions to be performed on messages as they arrive in the inbox and they can turn an untidy mess into an organised list that requires much less time and effort to process. Go to the Filters tab in Settings and click 'Create a new filter' to get started. There are five boxes and these are used to identify messages that you want to perform an action on. For example, you could enter a full email address like bob@work.com or just a domain like @somewhere.com into the From box (bob@work.com OR @somewhere.com would match either), or enter a word or phrase into the Subject box and so on. You can match emails that don't have something or messages that have an attachment greater than a certain size.

After setting the selection criteria, click 'Create filter with this search' and you can then choose the action to perform. There are many options, such as adding a star or label, deleting it or

forwarding it, marking it as important and so on. If an email from someone or some company regularly ends up in the spam folder, you could create a filter and tick 'Never send it to Spam', if you never want to see another email from a sender, tick 'Delete it' and so on.

The most useful option is to apply a label and, optionally, skip the inbox. It is a pain having to apply labels to every email that arrives, so automating the process is a significant time saver. Whenever an email arrives in your inbox that is not labeled, select it with the tick box in the inbox, go to the More menu and select 'Filter messages like these', it is a quick way to access the filters in settings.

Enable POP Access

Accessing Gmail through a web browser is okay, but you do have to have an internet connection. If the internet is unreliable or not always available, you might want to access your email from a desktop program like Outlook, Thunderbird or something similar. These let you read and reply to messages offline, and then you can send emails and download new ones the next time you go online. In order to do this, go to Settings > Forwarding > POP/IMAP and enable 'POP download for all mail', or at least for mail that arrives from now on.

If you use multiple devices to access your email, such as a computer at home and another at work, a mobile phone and a tablet, you should not download emails using POP. Use IMAP instead by enabling the option on the Forwarding and POP/IMAP tab.

Disable Web Clips

Web clips is a gadget Google added to Gmail many years ago and the idea is that it could be used to display news headlines, blog posts, adverts and other information in a bar above the inbox. Do you ever use it? Have you even noticed it? Google has already reduced its functionality and you might as well do away with it completely. Go to Settings, Web Clips and clear the tick box 'Show my web clips above the inbox'.

Crazy Experimental Stuff

The Labs tab in Settings is described as 'crazy experimental stuff', but actually much of it is very useful and sensible. There are some great items here that can make Gmail easier to use and you should browse the collection and install your favourites. There are too many to cover here, so here are some of our favourites.

'Authentication icon for verified senders' places a key icon next to known senders like Google, eBay, PayPal and so on. It helps when trying to work out whether an email is real or is a phishing attempt and a key means it is safe. Not all companies and websites support it, so if there isn't a key next to an email, it means nothing and the message could be real or not.

'Preview pane' is an excellent labs tool and it provides the three-pane view that is common in email clients like Outlook. After adding it in the labs, click the arrow next to the new button in the toolbar above the inbox and select No split (the normal display), Horizontal split or Vertical split. It displays the inbox listing and the currently selected email in the browser window at the same time and many people prefer this way of working. Vertical split certainly suits large wide screen displays.

Another excellent Labs feature is 'Canned Responses'. This enables you to send a reply to an email with a click of the mouse. Open an email, click the Reply button, type the reply, then click the arrow button in the bottom right corner. Select 'New canned response' and the reply is saved. The next time you reply to an email, just select the response. **mm**

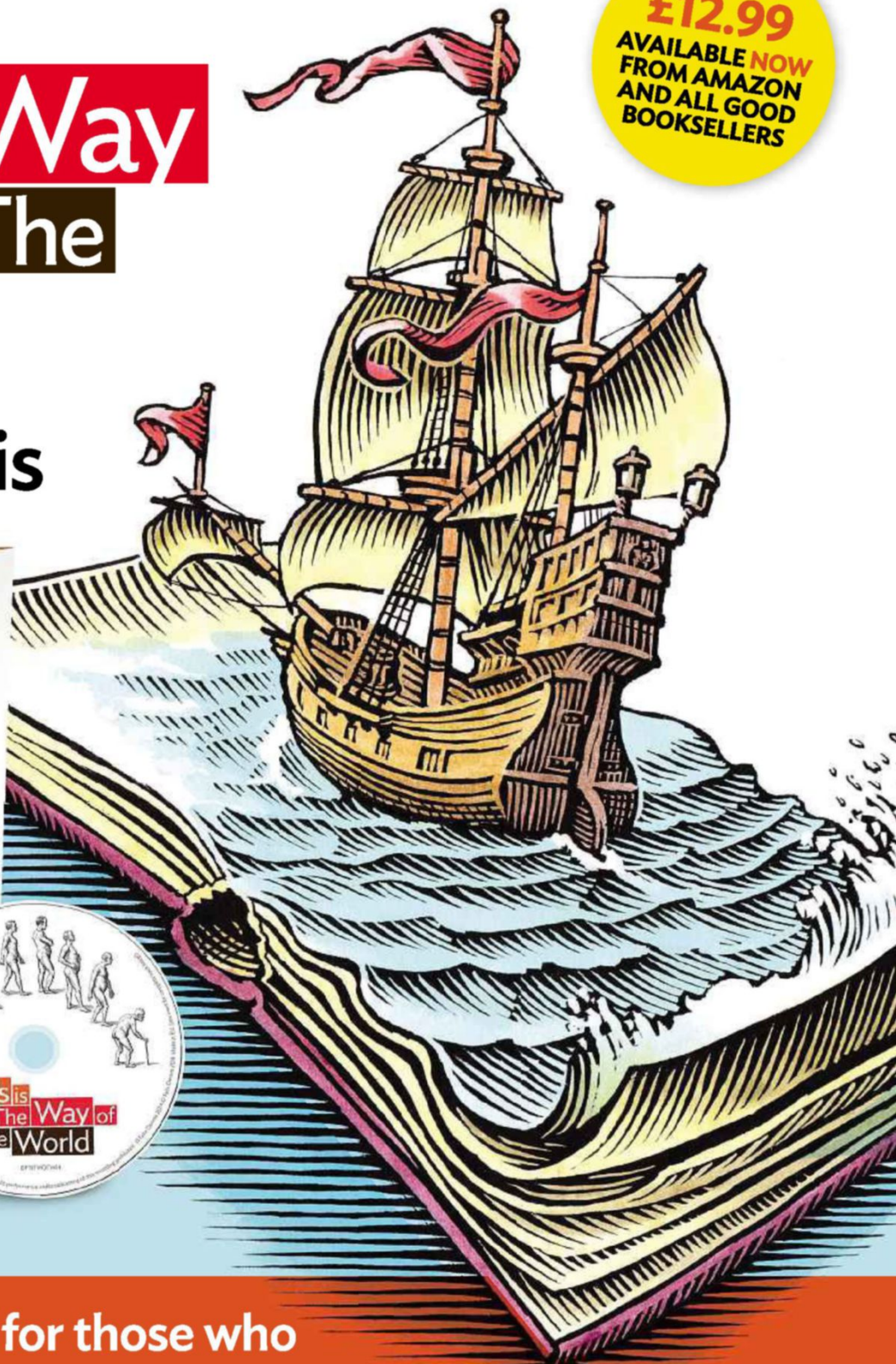
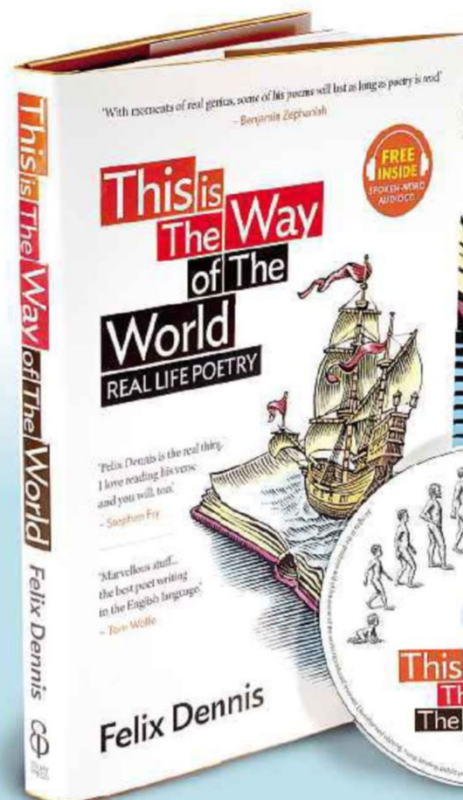
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Your Letters

Old Computers

I was having a tidy up/clear-out at the weekend and came upon something some of you might get a kick out of.

I have attached pictures of what was my brother's Vic 20, which sits in what might be the only carry case left.

I don't remember where the case came from, but I do remember the computer, this arrived on the back of a ZX81 and then a Spectrum.

I had a bit to do with the ZX81, but nothing with the Spectrum. However, when the VIC arrived, I was actually one up on my brother (for about a week), because we had got some at school.

Although there were no actual computer lessons, some of us stayed after school to learn how to code a game called Blue Meanies.

But shortly after that, one of my classmates broke in and stole the computers, so that was the end for me and computer for a long time.

My brother migrated from this to 16+ and Commodore 64, before studying programming at college.

I can remember him nearly setting the room on fire, with his jury rigged cabling, joining multiple devices together, including an electronic organ.

Just for a laugh decided to see if it still worked and, surprise-surprise, as you can see from the pictures, it did.

There were a few games, but the one I always liked the most was Rock-man – hard to play but captivating.

I loaded it up, and it works fine; I had a short go and it's still hard to play!

I don't know how rare all of this together is; it's a long way from mint condition. I think I still have somewhere in the loft a joystick that will work with it.

Is there any market for the 16+ and ZX81 games cassettes?

Eddie

Windows 8.1

I have a confession to make. I like Windows 8.1! It came about like this: I had to think about changing from XP sometime, and then my grandchildren got laptops with Win8 on them, so I had to catch up. So I gave my PC the benefit of a new SSD, and it flies. No longer having to go away for several minutes while waiting for it to boot. So my thoughts turned to my aging laptop: could it run Window 8.1? The Microsoft site wasn't very helpful, at one point saying I needed to buy a new PC. Then I saw Aaron's reference to the TechNet Evaluation Centre in issue 1341, so I was able to trial it – and it worked fine even on a hard drive. So I upgraded the laptop with a bit more memory and an SSD, and my laptop is as good as new. I always read the experts replies and have learnt much from them – thank you.

Paul Oates

Dumb Watches

I'm sorry, but I just don't get the fuss about these smartwatches. I seem to recall watches with calculators in them. Surely that's the very definition of smart.

Okay, I'm joking, but the idea isn't that new, if you think about it. Some years ago, I was a teacher, and I recall the nightmare caused not just by pupils having calculators but also games built into watches and, worst of all, TV remote controls. Oh, the 'joy' that one gave us teachers when some class clown switched the educational video that was playing to the latest episode of *Neighbours* (not that I had anything against it, but I was happy to wait till the later showing, after school had finished for the day).

But here we are, still being told that the future lies in smartwatches, even though

they've been out for a while, and they still haven't really taken off. Ooh, maybe no one actually really wants them? Just a thought.

Am I totally against smartwatches? Well, surprisingly no, but I'd only buy one if it came with some kind of holographic display, so I could have a full-size display with me wherever I go, rather than trying to get things done on something no larger than my wrist. I suppose I could use one in conjunction with another 'wearable', the Google Glass or something similar, but frankly I'd rather not spend my days walking round dressed like a cyborg or Geordi La Forge from *Star Trek*.

Allen Brown

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Component Watch

Give your network a boost with a new wireless router

This week, we're going to look at some of the best routers around and find some of the lowest prices possible. Whether you want a basic Wireless N unit that'll do the minimum amount of work or a super-powered Wireless AC unit that gives you more features than you'll know what to do with, this is the place to look.

Deal 1: Netgear DGN1000

RRP: £32.99 / Deal Price: £28.78

A cheap (but not too cheap)

Wireless N150 router, the

Netgear DGN1000 gives your home an entry-level networking solution, combining a built-in DSL model with router/switch capabilities.

Features include live parental controls, WPS push-button connections and Netgear green features, such as power/wi-fi buttons and an energy saving low-power mode.

Where to get it: Scan – bit.ly/1xJgPK



Deal 2: Belkin Surf N150

RRP: £44.56 / Deal Price: £31.12

Belkin's Surf routers are designed to offer cheap and simple home coverage, and while they're not especially cheap, it is possible to find them at a substantial enough discount that their price becomes attractive. Case in point, this offer from CCL. Features are standard – a four-port switch, ADSL router and WPS support, with Belkin's own 'MultiBeam' technology, which can help enhance the quality of a weak signal offering better, more reliable coverage.

Where to get it: CCL Online – bit.ly/1xUOxIW



Deal 3: Linksys X3500

RRP: £89.99 / Deal Price: £71.98

As Wireless AC becomes established, high-end Wireless N routers are shedding pounds at a rate that makes them



increasingly attractive purchases. For example, the Linksys X3500, a Wireless N750 router with gigabit Ethernet support, dual-band wireless, built-in USB port and a DLNA-certified media server. That range of features will keep any home user satisfied for a few years to come yet, and its speeds even compare favourably with Wireless AC. At £20 off, it's a great bargain.

Where to get it: Scan – bit.ly/145tlyW

Deal 4: TP-Link Archer D5

RRP: £94.99 / Deal Price: £84.99

TP-Link's range of hardware tends towards the lower end of quality and capability (and, to be fair, pricing), but the Archer D5 is a good deal whatever way you look at it. The Wireless AC implementation with dual-band connectivity supports up to 1200Mbps, there are four gigabit LAN ports and dual USB ports to allow for storage and device sharing. As entry-level Wireless AC routers go, it's definitely worth a look.

Where to get it: Maplin – bit.ly/1tQCc3R



Deal 5: Netgear D6200

RRP: £139.99 / Deal Price: £114.99

Another Wireless AC1200 router, the Netgear D6200 is dual-band, supports ADSL2+ and has high-end features such as built-in cloud storage and media sharing. It's also got a gigabit WAN port to complement its gigabit LAN ports, future-proofing the device against faster modems further down the line. It's a strong router at any price, but a discount of this size makes it a fantastic choice for anyone looking to invest in long-term hardware.

Where to get it: Currys – bit.ly/1BLcix7





Trevor Baylis, CBE

Apple Issues First Auto Update

Security patch installed on all Macs

Apple trod bold new ground at the back end of last year as the firm issued its first automatic security update that didn't require user approval to install.

Not even needing a restart, the patch was issued, because the bugs posed such a severe threat to Mac users. The bugs in question were cited in a security bulletin sent out by the Department of Homeland Security, and Apple was among several companies identified as being vulnerable, with the threat identified as affecting the network time protocol.

Presumably, this won't become a habit of Apple, and you can expect to go back to having to approve any updates as and when they're issued. After all, we all remember the furore over Apple's decision to install U2 on users' systems without asking first...



Bitcoin Trader In The Clink

Silk Road user charged

Two years behind bars is a strong punishment, but that's exactly what Charlie Shrem is currently staring at because of his involvement in a money laundering scheme that was found to be helping users of Silk Road.

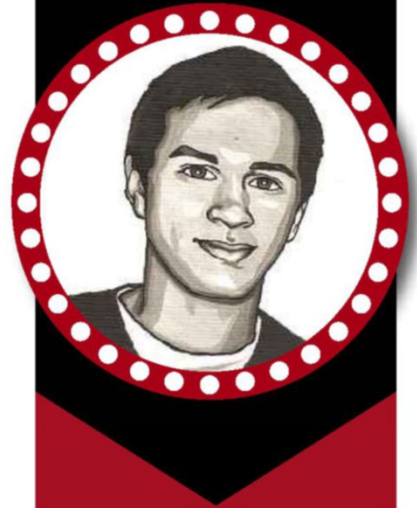
Shrem has been sent to prison for his association with Robert Faiella, a chap that set up a bitcoin exchange allowing Silk Road users swap cash for bitcoins. As for the extent of Shrem's involvement, he was chief executive of BitInstant, a bitcoin exchange that Faiella used for his operation. As far as the prosecution was concerned, Shrem must have known what was going on and knowingly aided Faiella in his work.

As for the judge's words in the case, he described Shrem as not "some kid making a one-time mistake". Faiella's own sentence is due any time soon.

Radio inventor honoured by Queen

Congratulations to Trevor Baylis who was recognised in the New Year Honours list. Probably known best for his Baygen wind-up radio, he was handed the CBE for his services to intellectual property.

Bayliss described the award as a “great surprise”, and if you want to know what he’s up to these days, he’s heading up Trevor Baylis Brands, advising inventors on the best way to develop ideas and to help get them in touch with people to try to get their inventions out there.



Sometime in mid-2014, I ordered a Google cardboard kit from eBay, curious to try out this ultra-cheap form of virtual reality. When it arrived, I spent a good hour or so messing around with it, looking at Google’s own tech demos and downloading VR apps from the Play store. Unfortunately, what was available was quite limited, so the Cardboard headset was soon forgotten and left unused.

However, I tried it again more recently and was pleased to find that in just a few months, developers have produced a lot more content to try. It’s not necessarily all good, but it’s encouraging to see things progressing and to see developers really making use of the technology.

Virtual reality on a smartphone is probably never going to be as good as with a dedicated device, but there’s definitely plenty of potential, and I for one am looking forward to when this really starts to take off. In the meantime, check out some of the VR apps in this week’s issue.

Until next time,

Anthony

Editor

First Stainless Steel Smartwatch

Industry first from BURG

Smartwatch specialist BURG has upped the ante with the release of its BURG 27 model, the world’s first all stainless steel smartwatch.

Available in stainless steel, rose gold stainless steel and black stainless steel, this round-shaped beauty (if that’s your sort of thing) also comes with the new advanced Media Tek chip, Android

4.4 OS with voice activation, full web browsing, streaming music and video, health and sleep apps, GPS and access to the likes of Skype and Facebook.

The watch also works as a stand-alone, phone so the user can make and receive calls and texts without needing to link to a smartphone. Find out more about this if you’d like over at burgsmartwatch.com.



Apple Faced With Another Lawsuit

Not completely up front with memory claims

Apple should be used to having to respond to lawsuits by now, and here’s yet another one that landed on its doorstep.

This latest suit concerns iOS8, specifically the memory it requires. The lawsuit

against it, brought about by a couple of Miami residents, complains that the new iOS takes up so much space on the likes of iPods, iPhones and iPads that the actual data storage left is far, far less than advertised. Indeed, the claim goes that the

operating system can take up to 23% of memory on some Apple devices.

As for what the complainants are looking for, well, not surprisingly, that’s dollars – millions of dollars. We’ll update on this when Apple decides to comment.

Meanwhile... On The Internet...

The online response to the recent killing of 12 people at the offices of French satirical magazine *Charlie Hebdo* has predictably bought out some of the best and some of the worst of the internet. On one hand, the **#JeSuisCharlie** sentiment and all the other declarations of solidarity (alongside the legion calls for calm and understanding) have been a heartwarming moderate response to the whole horrid tale. Indeed, we haven't personally seen anything in the wake of the attack that we would consider to be inflammatory in any way, though we're certainly not going out of our way to find anything, thank you very much.

On the other hand, by 'worse', we're actually making something of a barbed reference to the sheer weight of comment, analysis and viewpoint articles that immediately flood social media in the wake of anything like this. It's a fact of modern life now, we guess; the sheer amount of online media there is will always lead to a barrage of click grabbing op eds. In fact, now we think about it, we should stop right now for fear of adding to that particular mountain.

One thing we would like to applaud before we break this off, is the work of other artists in response to the attack. If nothing else it has served to remind us all of the sheer weight of oft-unappreciated talent there is in the visual arts world and how cartoons, humour and art in general serve an important purpose in our lives – even though we may not appreciate that on a day-to-day basis. That it takes an event like this is sad.

Another interesting point it has raised is the problem of attribution in a world of endless tweets, retweets and shares. I know it seems like a minor issue compared to the atrocities in Paris, but in the daily lives of the kind of people who were the victims of that attack it was probably a major issue.

Nothing highlighted this more than an image posted to an Instagram account, which appeared to be under the control of the artist **Banksy**. Not only is the account not actually associated with the artist in any way (**@banksy** is one of a few fake Banksy Instagrams; other include, ironically, **@therealbanksy** and **@banksyofficial**: tinyurl.com/Motl1345a), the image – widely attributed to him at the time, regrammed over 100,000 times – was not created by the artist. It was an image that was initially widely attributed to him, but was actually created by French artist Lucille Clerc (lucilleclerc.com). The whole thing says a lot about how the internet can chew up and spit out content with little care for those who create it.

Wometimes all you need is a bit of nostalgia to make you feel good and appreciate how good you have it now. With this in mind, we present to you John Cleese flogging Compaq computers from all the way back in the mid-80s (tinyurl.com/Motl1345k). While some of the Team Meanwhile... are actually old enough to remember using Compaq's portable computers, it is not a memory we're particularly misty-eyed about. Indeed, it was noted you could probably have got more done with the fish that features prominently in one of the ads. Compaq is long gone and thankfully so are these monolithic portable machines. The past may well be a different country, but that's not always a bad thing.

While we're getting the bad stuff out of the way, the whole furore around the Sony hack continues to rumble on. While much of the mainstream media – by hook or by crook – has come around to our way of thinking and backed off on reporting some of the details of the information stolen from Sony's computer system, the debate about who was actually responsible continues to rumble on unabated. It's a debate nicely summed up by writer, blogger and IT security expert Bruce Schneier (tinyurl.com/Motl1345b), who succinctly sums up the problems surrounding pointing the finger for cyber attacks and clarifies why – though the FBI seems pretty sure about it (tinyurl.com/Motl1345c) – blaming North Korea for the whole thing may be a little hasty and the sanctions (and, possibly, counter attacks: tinyurl.com/Motl1345d) responses built upon shifting sands.

Backing away from the whole geopolitical thing, while it's a little hard to swallow the official Sony line (from chief exec Kazuo Hirai himself) that the hack won't hurt Sony's financial performance (tinyurl.com/Motl1345e), it's certainly not done the film at the centre of all this as much harm as expected (or hoped, by some). *The Interview's* Christmas Day online/independent cinema release (which appears to have happened after President Obama described pulling the film as a "mistake": tinyurl.com/Motl1345f) has since netted the movie a handy \$31m dollars in money from downloads alone (tinyurl.com/Motl1345g). That doesn't make it a hit (it cost over \$40m to make and \$35m to promote), but it does make it the biggest online release Sony has had so far. I guess this – and the previous story – prove that the Streisand Effect is as relevant as ever to modern online life.

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

If you're feeling a little low at this time of year, it may pay to remember that it's only the depths of winter, not the end of the world. If it were the end of the world, however, it's highly likely that you would be watching something akin to the long-rumoured CNN doomsday video, which recently turned up online courtesy of a former employee (tinyurl.com/Motl1345l). Fear not, UK doom-mongers, the Beeb probably has an alternative – much like the classic *Protect And Survive* from the 70s (tinyurl.com/Motl1345m) maybe?



Aaaaaaaand Finally...

After year-on-year fake 'OMG It's The Year Marty Went To In *Back To The Future II*, Where's My Flying Car?' posts on social media (tinyurl.com/Motl1345h), there can be no better proof that OMG We Are ACTUALLY In The Year That Marty Went Forward To In *Back To The Future II* than the fact that Nike is planning to release the self-lacing shoes from the film as an actual product (tinyurl.com/Motl1345i). Or, you know, you could actually just watch the film and check for yourselves. Now, seriously guys: where the hell is my flying car? And finally, finally: cute animal stuff with cute animals: tinyurl.com/Motl1345j.

Caption Competition



"When they said I had the job in the bag, this is not what I was expecting"

This unhappy fellow was the caption picture back in issue 1343. Here are the best bits of funny stuff you came up with:

- **Thomas Turnbull:** "Bag a bargain on the internet? I just bagged a bag."
- **Half-a-Daily:** "Sony's head of IT decided it would be best if he kept a low profile for a while."
- **Thomas Turnbull:** "There must be easier ways to do anonymous browsing."
- **John Evans:** "Shia LaBeouf is not happy after looking up the meaning of copyright."
- **John Evans:** "Shia LaBeouf finds out that not only is he not famous any more, but no one actually cares."
- **Martin Prince:** "Arthur was sure there was something in the company rulebook preventing management from calling him by the nickname Sad-sack."
- **Tim Deacon:** "Because in the future, no one will understand anything other than emoticons."
- **Will Klein:** "I get the feeling this tech support doesn't really care about my problem."
- **Ondrive:** "It took a while for Alex to realise that a career in IT wasn't really his bag."

Thanks for all your entries, and well done to this week's winner Richard West, who came up with "When they said I had the job in the bag, this is not what I was expecting."

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.



Smartphone For All From Alcatel

New smartwatch series too

Budget smartphone maker Alcatel has unveiled its latest Pixi 3 models.

Other than the slightly odd brand name, the range is particularly noticeable for the fact that all four handset sizes (3.5" 4, 4.5" and 5") can run Android, Windows Phone or Firefox OS.

There isn't too much more information yet, unfortunately,

but for anyone undecided as to which OS to side with, this does alleviate that particular conundrum.

Also from Alcatel comes a new smartwatch range in the form of its Onetouch brand. Pictured here, these monitor daily activity as well as controlling music, taking photos and, shock horror, telling the time.



Facebook Buys Voice Recognition Company

California outfit latest in long line of acquisitions

What is Facebook planning next? If the purchase of voice recognition firm Wit.ai is anything to go by, greater consumer reach.

Wit.ai develops software for wearable devices and appliances within the so-called Internet of Things, making a voice interface that can understand spoken words and written text. It's a relatively young company, so you'd imagine that Facebook didn't pay out an awful lot for its new purchase.

Facebook, as is the way with these things, hasn't said what

it wants with Wit.ai, but it's not hugely surprising, because voice recognition remains an important and much-used technology among consumers.



Snippets!

First Mobile Phone Call 30 Years Ago

On 1st January 1985 the son of Vodafone's first chairman, Michael Harrison, tested the mobile phone system via the company's network, the first call of its kind in the UK. Making the call from a chunky, clunky 5kg Vodafone handset a minute after midnight just after a New Year's Eve party, Michael called his father, saying "Hi Dad. It's Mike. This is the first ever call made on a UK commercial mobile network."

Hardly inspiring stuff, then, and as any father of a teenager will tell you, what's gone on since in the mobile industry hasn't all been positive. Still happy anniversary, and all that.

Apple Accounts For Over Half Of Smartphones At Christmas

Mobile analytics website Flurry has announced that 51% of smartphones activated between 19th and 25th December belonged to Apple devices.

Android claimed second place, while Samsung nabbed the only other double-digit activation share with 18% of the market. So for every Samsung device activated, Apple activated nearly three devices, while it activated nearly nine devices for every Microsoft Lumia device. Now that's market power.

PS4 Bursts Past 18.5 Million Sales

The festive period typically provides consoles with a timely boost, and that was the case last year for Sony, as global sales of its PlayStation 4 console have now reached over 18.5 million.

Of those, the holiday period (defined by Sony as being between the back end of November to early January) accounted for 4.1 million sales alone, leading Sony CEO Kaz Hirai to comment at CES, "I'm liking those numbers."

Fingerprint Reproduced From Photo

Worrying findings from Computer Club

To the Chaos Computer Club now, which saw its convention held in Hamburg in late December.

The latest conference was most notable for a hacker, going by the name of Starbug, having unveiled a reproduction of a fingerprint, developed simply from using commercially available software and various high-resolution photographs of the hand of the German Defence Minister.

Starbug used a close-up photo of the Minister's thumb, taken with a standard camera

at a press conference, plus various others taken from different angles. Using the Verifinger program to recreate the print, this latest development was brought up as an example of proving that fingerprint readers found on some of the latest mobile phones could be hacked.

According to the BBC, Starbug told the assembled audience members at the convention "politicians will presumably wear gloves when talking in public." Not sure about that, but this raises another interesting security debate, nonetheless.

CES: Intel Shows Off Fifth- Gen Broadwell Processors

Power to the people

Intel has used the CES show to proudly boast about its fifth-generation Core processors. Based on Broadwell architecture, this Core shrinks die size by over a third and has over a third more transistors than Haswell chips.

The 14nm processors will be featured in mobile and desktop systems throughout the year, and we're promised more power, longer battery life, better graphics options, 50% faster video conversion – pretty much the

usual kind of improvement a new processor typically brings to the table. Coming in all manner of i3, i5 and i7 chip variants, you should be seeing chip-based systems appearing on the market from the end of the month.

Intel also announced 'Cherry Trail' 14nm processors for the tablet market, which should come to consumer devices by the middle of 2015. Intended for low-end devices, this likewise promises a boost to battery life, graphics and overall performance.

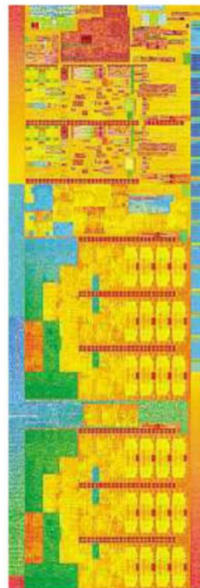
CES: LG Flexes Its Curves

Gives curved smartphone another shot

At the time of writing, CES Las Vegas was just getting underway, and here begins the first of a couple of snippets of product news to come out of the show.

LG has unveiled the LG G Flex 2 smartphone. Promising a smaller device than its predecessor and a display capable of handling hi-def imagery, the phone is most notable for its curved 5.5" P-OLED display and a new version of its self-healing coating on the back, which should repair any annoying scratches within seconds, rather than the minutes previous versions boasted.

With 13.1MP and 2.1MP cameras on board, plus power courtesy of a Qualcomm Snapdragon 810 processor, this could flex its muscles upon its release. No details on that actual release date as yet, but we look forward to seeing it doing the rounds some time soon, no doubt. Oh, and one last thing. You can buy this in Flamenco Red, whatever that is.



Most Valuable Tech Start-up Shows Everyone The Money

Chinese mobile maker is super rich

Named the world's most valuable tech start-up, Chinese handset maker Xiaomi more than doubled its revenue in 2014.

Pre-tax sales amounted to around £7.8bn, and it's the world's third largest smartphone manufacturer behind Samsung and Apple, selling more than 61 million devices in 2014. The company is expected to release a flagship device early this year, and for a company that only started out like life in 2010, this is a heck of a rise up the ranks.

India Monitors Toilet Use

It's actually for a very important reason

The idea of a nationwide initiative to monitor whether people are using the toilet might sound rather preposterous at first glance, but consider that this is taking part in rural India rather than leafy Hampstead, and things start to make a whole lot more sense.

Indian officials are to visit rural parts of the country, armed with smartphones and tablets, to record whether they're being used, with the

recorded data being uploaded in real time. The fact is that the country's toilet shortage is a huge contributor to premature deaths and hygiene-related diseases and, according to a World Bank study, India has a greater cost from the poor collection of human excreta than other Asian countries.

So while this probably isn't a pleasant story to think about, let's hope that this initiative can go some way towards helping the government solve its sanitation problems.

Microsoft To Ditch Internet Explorer?

Reports suggest brand new browser under development

Who knows how true this story is, but according to a writer over at ZDNet, Microsoft's Internet Explorer browser might come to an end at version 11.

By all accounts, Microsoft is working on a whole new browser, with the codename Spartan, to ship with Windows

10. Internet Explorer 11 will be included alongside it for backwards-compatibility purposes, but it's surely Spartan that will raise eyebrows, should the claims, attributed to unnamed Microsoft sources, prove to be true.

Will we see Spartan in this month's full preview of Windows 10?



Canon Powershot SX700 HS

Canon demonstrates its skill in shoehorning great optics into small cameras

DETAILS

- Price: £245
- Manufacturer: Canon
- Website: canon.co.uk

Canon's Powershot SX700 HS sits amongst a range of its cameras made mostly for travellers who want a decent zoom lens. Compared with its cousins in the Canon stable, the Ixus models, the SX700 HS is modestly larger (112.7 x 65.8 x 34.8 mm), though it is made to the same high quality using an attractive mix of metal and plastic. This additional space allows for the mounting of at 30x optical assembly that provides the equivalent of 25-750mm zoom with f/3.2-6.9 on a old-school 35mm.

With the telephoto end of that equation being so big, Canon has thankfully put sophisticated lens-shift image stabilisation in place. Combined with the sensitivity of the back-illuminated high sensitivity CMOS sensor (16MP) and Canon's very latest DIGIC 6 image processor, this makes for a very potent still and moving image capture platform.

Video can be shot at 1080p and 60fps and the SX700 also provides wi-fi, NFC, a pop-up

flash, and a lightning-fast auto focus system.

In many respects its feature set is not unlike a bridge camera, though there are some significant differences if you've tempted to move from one of those 'down' to this. The best continuous shooting speed is only about 1fps, there is no internal GPS or a hot-shoe for attaching a 'proper' flash, and it doesn't support RAW files.

However, it's certainly more pocket friendly than a bridge, easily shoots 250 images on a full battery charge, and the price is far from a deal breaker.

However, what really convinced me that this was worth a punt was the quality of the images. For a compact camera, they're exceptional. At full zoom it produced sharp and well saturated images, even if the light levels weren't optimal.

If I have a complaint it has to do with the very odd selection of creative shot modes, which

seem borrowed from a much lower specification design. For example: why Canon might include such options as tilt-shift (called 'miniature' mode), while leaving out panoramic stitching is beyond this reviewer's comprehension. I'd have also liked to see a proper HDR mode – rather than the watered down Hybrid shooting – and RAW file capture. If it had those things, (and maybe a viewfinder) I think many professionals would consider this as an excellent travelling companion.

These issues aside, the Canon Powershot SX700 HS is remarkably effective. It allows you to get great still and moving images without a degree in photography, at a price suiting those who like a bargain. Browse at bit and it can even be had at a discount that would allow you

to bundle SD cards and a case for the same amount as I've quoted.

The Canon Powershot SX700 HS is by far the best compact zoom I've seen in the past year, and well worth a look if you're after a new holiday shooter.

mm Mark Pickavance

A powerful zoom lens and sensitive sensor combined

Key Features

- Ultra-compact 30x optical zoom (25mm wide-angle lens, 750mm full zoom)
- 16.1 Megapixel CMOS, DIGIC 6 processor
- Intelligent IS plus five-axis dynamic image stabilisation for steady movies
- Connect, backup and share easily using wi-fi and NFC
- Remote shooting and GPS tracking via smartphone
- Full HD (1080p) movies at 60fps in stereo with optical zoom



Dell Inspiron 15 5000 Series

Is the new Dell Inspiron 15 5000 series too good to be true?

DETAILS

- Price: £499
- Manufacturer: Dell
- Website: www.dell.co.uk

If someone in a pub offered you a Core i7 laptop at a knock down price, you'd probably wonder where they got it, wouldn't you? When the new Dell Inspiron 15 5000 series arrived at my door I had a similar feeling, because not many PC manufacturers are packaging an Intel Core i7 CPU, 8GB of DDR3 and a 1TB hard drive in a portable package for less than £500.

Actually, if you're willing to drop your expectations to a Core i5 this machine can be less than £450 – and that includes Windows 8.1 and a 15" screen.

As I'm professionally employed to look gift horses squarely in the mouth, once I had this system booted I started to hunt out the numerous catches that I was confident it contained. There are some, but I'm still rather perplexed by the scope of what you get with this system for the minimal outlay.

Firstly, let me address some of those slight oversells, so they won't shock anyone. First up: the Core i7-4510U processor. While it hums along at 2GHz (3.1GHz Turbo) and supports hyperthreading, it is only a dual core CPU. That makes the hyperthreading critical, because without it, the machine wouldn't be able to handle four simultaneous threads. You could get a Core i5 processor with a higher base clock and get better performance, though.

The HD 4400 video on that chip also isn't amazing, but wonderfully Dell did add an AMD Radeon HD R7 M265 with 2GB DDR3 to make gaming on this system less of a slideshow. That might be a middle-order mobile GPU with limited

If the screen's the best bit, then without doubt the keyboard is the low point. While it's large and even offers a numeric pad area, there is almost no travel on the keys at all – and when the very limited motion ends it does so

HDMI out, Gigabit LAN, AC class wi-fi, Bluetooth, a 720p Webcam, an SD Card slot and the battery is actually replaceable internally.

It all comes down to what you expect for your money, and what compromises you'll accept. This system reminds us that getting a 'real' Core i7 deal for less than £500 is probably unrealistic, though what it does include seems reasonable value for money.

mm Mark Pickavance

“ Getting a 'real' Core i7 deal for less than £500 is probably unrealistic ”

bandwidth, but it's better than the integrated option. Using the native screen resolution (1366 x 768) you can run *World Of Tanks*, for example, in medium settings and not globally 'low'.

Of all the hardware in this I'd say the best bit is the screen, which was very crisp and acceptably saturated. You need to get the right viewing angle set, because it is sensitive to vertical viewing angles, but I found it easy on the eye.

with an indistinct squish rather than any sort of click. This makes typing at higher speeds practically impossible.

Part of the issue here is that it isn't very well supported by the chassis, which has all the rigidity of an old party balloon. The amount of flexing in this system is disturbing, and that hints that it wasn't made to take much, if any abuse.

On plus side, though, it has a couple of USB 3.0 ports ,

A cheap Core i7 laptop that is built to a price



Philips 284E5QHAD

Philips offers its latest MVA technology for some big screen entertainment

DETAILS

- Price: £172
- Manufacturer: Philips
- Website: www.philips.co.uk
- Required Spec: Computer or games console with HDMI or VGA output



Having reviewed the odd monitor before, I've often noted that they usually come with the brightness set to 100% and the colour set to excessively vibrant levels. That's not how you'd ideally want them, unless they're inherently not bright enough and their colour representation is poor. Those aren't criticisms I can level at the Philips 284E5QHAD, because it wasn't set to full brightness by default. Indeed I needed to back it off marginally to achieve the optimal brightness level.

This is one of Philips MVA (Multi-domain Vertical Alignment) LCD designs, delivering 1080p resolution in a 28" form factor. It features a clean 14mm bezel, and anti-glare surface and inbuilt

speakers. Inputs include two HDMI (one being MHL) and a D-Sub VGA input – that DisplayPort and DVI didn't make the cut is annoying, but the available options will be fine for most console gamers and those with older PCs.

This design is designated as 'Full 8-Bit RGB', but on my Nvidia video card I needed to make a driver adjustment to actually get the bit clipping from 0-255 and from the default 16-235 bits. Most monitors don't support 0-255 mode, but the 284E5QHAD does and to achieve the full palette some tweaking was required.

That's worth doing because the end results are exceptionally

good. Even without much adjustment the colour temperature and gamma levels on this panel are top notch. They're great for an IPS panel, never mind one that uses an MVA panel.

If this technology has a weakness it is decoding latency, which at close to 30ms makes the display lag a game by couple of frames at 60fps. Most gamers won't notice, but those that might will probably be in the market for a TN gaming display instead. There are ways to reduce the latency using 'Smart Response' mode, but it does generate peculiar artefacts in the 'Fastest' setting that are probably more off-putting than the lag.

One oddity that I need to mention is directed to those, like me, who like to VESA mount their screens. The 284E5QHAD has the standard VESA 100 mounting, but the back of the panel is raked, so you'll need some tilt adjustment to get the viewing side parallel with the wall.

Another unexpected aspect was the speakers, which on most monitors I dismiss as weak or squeaky. The ones on this are 7 watts each, and can generate much more oomph than I'm used to from a screen. This is a

good thing, unless you give this to a teenager with an allergy to headphone use.

For a screen this large, the price seems more than reasonable, so I've no complaint there. My only real concern is the precise market for this panel, as it isn't really for computing professionals or the hardcore gamer. It seems ideal for someone who very occasionally games, likes to watch a movie or two, and use their computer with an easy to see screen. For Philips sake, I do hope these customers exist, because the 284E5QHAD is actually rather good in many respects, and deserves some success.

mm Mark Pickavance

Specifications

Screen size: 28"

Panel type: CMO M280HKJ-L30 MVA (Multi-domain Vertical Alignment) LCD

Native resolution: 1920 x 1080

Typical maximum brightness: 300cd/m2

Colour support: 16.7 million (8-bits per subpixel without dithering)

Response time (G2G): 4ms

Refresh rate: 60Hz

Weight: 4.73kg (excluding stand)

Contrast ratio: 3,000:1 (20m:1 Dynamic Contrast)

Viewing angle: 176° horizontal, 176° vertical

Power consumption: 23.18W typical

Backlight: WLED (White Light Emitting Diode)

A big, bright and colourful screen for weekend gamers



SteelSeries Sims 4 Collection

SteelSeries creates a Sims themed accessory collection for fans of the franchise

DETAILS

- Price: MousePad: £14, Mouse: £24, Headphones £26 (all from Argos)
- Manufacturer: SteelSeries
- Website: tinyurl.com/na5ccx
- Required Spec: PC or Apple Mac OS that's compatible with SteelSeries Engine3

Long term readers of *Micro Mart* might remember that I always used to review the *Sims* products, until EA realised that I didn't appreciate their blatant attempts to gouge youngsters for tiny game content upgrades. Despite this, I still appreciate that some people love these titles, and would therefore appreciate SteelSeries' new Sims 4 Collection. Consisting of headphones, a mouse and a mouse mat, there is something here for most budgets if you wish to buy your resident *Sims* player something themed.

At just £14, the SteelSeries The Sims 4 QcK Gaming Surface (code 300389) is the cheapest, and provides a high quality cloth surface featuring an official *Sims 4* design by Maxis. A rubberised underside stops it slipping on a desktop, and provides a consistently textured surface for the mouse to smoothly track on.

Obviously you don't specifically need their mouse too, but they're a nice combination. The SteelSeries Sims 4 PC Gaming Mouse (code 300387) is very reminiscent of the classic Microsoft pear drop shape, and provides a comfortable shaping for long term use. It looks like a



modified Sensei RAW design, although I didn't have a detail spec for this mouse to do a direct comparison.

It features no less than six buttons, if you include the clickwheel, and one of them is styled in the ubiquitous glowing green diamond 'Plumbob' motif. Lighting and button functions can be modified using the SteelSeries Engine3 application under Windows and Mac OS X, just like their other mice. A typical street price for this model is about £24, which seems something of a bargain

compared with their more exotic controller offerings.

The only potential downsides to the mouse are that it is wired, not to everyone's liking, and the diamond shaped button looks a little odd when you're not playing the game itself.

The final themed accessory is the headphones, which given how odd they look with green diamonds on each can, I was prepared to entirely dismiss as a purely novelty item. Until I used them, that is. The great thing about the SteelSeries PC

Sims 4 Wired Gaming Headset (code 300394) is that it's really comfortable, and therefore ideal for long gaming sessions. The sound is fine to these old ears, and it also has an unbuilt microphone for online in-game conversations with fellow players.

As with the mouse these are Engine3 modifiable, so if you don't like the green glow you can choose any other colour easily. My only reservation is that its exclusively USB, and so you can't use it with anything other than a PC in practical terms. With a typical street price of £26 they're relatively inexpensive, though, considering how well made they are.

The Steelseries Sims 4 collection is collectively rather good, and not just a thematic means to ship average quality products. While they've all got their Sims 4 branding or features, critically they still manage to deliver a good user experience for those just using the computer. If you know a *Sims* fan, then I'm sure they'll appreciate owning one or all of these products.

mm Mark Pickavance

Amusingly branded accessories from a high quality source



Tesoro Excalibur RGB Edition

A keyboard that would probably draw an envious glance from King Arthur himself

DETAILS

- Price: ~£85
- Manufacturer: Tesoro
- Website: goo.gl/SRMcNO
- Required Spec: Windows Vista+

We reviewed the core Tesoro Excalibur some months back and found it to be an excellent, competitively priced, mechanical gaming keyboard. Indeed, there didn't seem much else that could be added to enhance it, but Tesoro have tried to do just that – and now we have the Excalibur RGB Edition.

As with the previously reviewed Excalibur, the RGB Edition is still named after King Arthur's legendary sword, and still offers full N-Key Rollover and anti-ghosting, with a six-key Rollover for the USB version. The Tesoro preferred Kailh switches this time though come in a choice of four colours: Blue, Brown, Black or Red, with each having a slightly different feel, be that clicky or non-clicky tactile, silent or low actuation force.

We've stated before that one of the advantages of using Kailh switches over a competitor mechanical switch, such as Cherry, is the overall improvement in the number of key actuations, up to 60 million over the official Cherry standard of 50 million. In addition they also tend to be slightly cheaper to implement without any perceivable loss in quality or functionality. In essence, the user will hardly notice the difference between Kailh or Cherry; even the most enthusiastic of keyboard connoisseurs would be probably be hard pushed to readily

identify the switch types in some kind of blindfold test. In short: don't worry too much about the protestations of the 'switch snobs', just enjoy the mechanical feel at a reasonable price instead.

The Excalibur is capable of having every single key programmed across five different profiles, with 300 macro keys, and 2000 macro key presses per profile. To add to that there's 512KB of on-board memory, an incredibly fast 1000Hz polling rate, and an instant game mode function key combination by pressing FN and Pause.

The RGB element involves an intricate backlighting system, which as you can no doubt guess is based on Red, Green and Blue LEDs under each of

the key caps. The backlight setup can be configured to a number of different effects, such as a high brightness, a pulse effect, a colour loop and having only certain keys – like the gaming keys for example – lit up while the rest remain dark. With 16.8 million colours to choose from, we're fairly sure you'll be able to find a pleasing mix between the profiles, animations and illumination choices.

We like the Excalibur. It's a standard setup and a classic looking design that's comfortable, sturdy, tough, easy to setup and a joy to use. Plus it's considerably less expensive than the competition rival multi-backlit mechanical keyboards.

There's a lot to be had from the Excalibur, and the RGB element is certainly a stand-out feature that will enamour it to a wider audience. On the whole though, and taking the backlighting feature out of the equation for the moment, it's actually quite hard to fathom that you can buy a mechanical keyboard of this quality for just £85. With the RGB feature included then, this is certainly a keyboard worth looking in to.

mm David Hayward

A great keyboard with added illumination effects to brighten your lights-down gaming sessions



◀ *Quality mechanical and fully illuminated keys for less than £100? Not bad at all...*

▼ *The RGB Edition of the Excalibur is pretty impressive*



Gigabyte Z97M-DS3H

A Micro-ATX motherboard that packs a decent punch

DETAILS

- Price: £85 from Falcon Computers
- Manufacturer: Gigabyte
- Website: goo.gl/8k7K2W
- Required Spec: 4th or 5th generation Intel CPU, DDR3 RAM, Micro-ATX case or bigger

Gigabyte offers the consumer a wealth of choice when it comes to motherboards. It can deliver low-end/low-price (but relatively high-spec) boards for system builders, all the way up to models offering extreme overclocking, and feature suitable for high-end gaming desktops – at prices to match. However, it has felt like Gigabyte has taken a backseat recently with MSI leading the way in terms of features and component quality.

Its Z97M-DS3H may well change that perception, though. It's a near entry-level, Micro-ATX, Z97 specified motherboard that supports the Intel LGA1150 socket 4th and 5th generation Core processors. The Z97 Express Chipset enables advanced overclocking features for the unlocked versions of the aforementioned CPUs, along with the likes of Intel Smart Response Technology and Device Protection with Boot Guard.

There are four DDR DIMM slots for up to 32Gb of overclocked 3100MHz memory, a single PCI-E x16 slot and a pair of PCI-E x1 slots, and six SATA 6Gb/s connectors make up the drive connectivity with support for a variety of RAID levels.

Other connectivity includes four USB 3.0 ports with a further two USB 2.0 ports, VGA, DVI, HDMI (with support for 4K resolutions),



▲ The Gigabyte Z97M-DS3H is a capable motherboard, for any system builder



▲ For a Micro-ATX board, there's little to fault it on

gigabit Ethernet, PS/2, and the usual HD audio jacks.

In terms of software you'll get the Gigabyte App Centre on optical disk that, when installed will offer you an easy to use interface that allows better control for overclocking, or fine tuning to help boost the system performance. The CPU frequencies, voltages, base clock speeds, power phase,

and memory clock speeds can all be tuned to your particular specifications. In addition to that, the Gigabyte Cloud Station will provide a secure connection to your PC from a phone or tablet so you can control most aspects of its operation remotely.

The components are well designed with solid capacitors throughout, a gold plated CPU socket, ESD protection, anti-

surge, and humidity protection as well. It's the kind of protection and quality components you'd find on the more expensive MSI boards, only this time it's on a slightly cheaper Gigabyte board.

The only issue we had was the distance between the CPU socket and the fourth memory slot. If you have anything other than a stock cooler, and you happen to own the slightly higher than normal HyperX-type memory modules, then you're going to discover that it's rather cramped when you fit the last stick of RAM. A little ingenuity is called for in this situation, but thankfully it's not a huge problem.

Other than that niggle, the board is perfect for both the average system builder as well as catering for many enthusiasts and overclockers. Providing you don't require SLI or more PCI-E slots, then the Z97M-DS3H is ideally suited. It's an excellent, solid Intel-based motherboard – and at around £85 it's reasonably priced, considering the amount of technology you get. It will no doubt tick all the right boxes for someone's next build.

mm David Hayward

An excellent Micro-ATX motherboard, with plenty of potential



JXD S7800b

The ultimate handheld retro gaming tablet?

DETAILS

- Price: £130 via Funstock
- Manufacturer: JXD
- Website: goo.gl/UYdQJJ
- Required Spec: Can connect to Windows XP+ PCs, internet connection for Android Play Store etc

The handheld gaming, console market has exploded in recent times with the slew of Chinese-developed units invading our pockets. In the past these open and unlocked gaming handhelds didn't exactly set the world on fire, but they did fill a gap (certainly in terms of price), underneath the rival Sony Vita and Nintendo DS, as well as allowing unrestricted access to homebrew development.

Now, though, things are a little different. Instead of the likes of the Dingoo OS and underpowered devices, we can enjoy some incredible Android based gaming on a very capable hardware base. The JXD S7800b is a flagship example of this modern handheld gaming boom.

This 7" IPS LCD, five-point capacitive Android 4.2.2-based handheld features an impressive quad-core 1.6GHz Cortex A9 CPU and a Mali400 GPU. There's also 2GB of DDR3 memory, and it comes in both 8GB and 16GB flash storage versions.

It's essentially a tablet, albeit a very elaborate one, and – as with virtually every other tablet available – it has Wi-Fi, three-axis accelerometer, front and rear cameras (0.3 and 2 Mega Pixels respectively), microSD

card slot (with a maximum of 32GB), and a pair of stereo speakers. However, what makes this model different from a standard tablet is the fact that it's laden with buttons and joysticks.

With this number of control buttons you're spoiled for choice when it comes to getting the most out of gaming, but it also leads to another issue: most Android-based games aren't

“ The JXD S7800b is a flagship example of the handheld gaming boom ”

There are two analogue sticks, a single D-pad, Start, Select, Home, control configuration and back buttons are located towards the bottom of the unit with a further four button arrangement conveniently placed at the right-hand thumb level. Two shoulder buttons on either side of the rounded edges of the unit increase the count to fourteen, and there's also a power and volume rocker on the left side of the unit.

designed for stick and button play. The JXD thankfully has an ace up its metaphorical sleeve, though, in the form of its configuration button. When this is pressed, usually in-game, a mask of the controls used by the game you're playing appears on screen, allowing you drag and drop the relevant physical controls to the choices in the game. So up, down, left, right, fire and so on on-screen can be paired with the sticks and buttons on the S7800b's case.

The design and aesthetics of the S7800b are really very good, considering it's a mass-produced Chinese import. Usually these things reek of cheap and nasty plastic, but the S7800b is a well-built device that's solid and comfortable in the hand. Of course there are a few elements that could probably do with a bit of re-modelling, but on the whole it's a good setup.

Where modern Android games are met with a certain lack of enthusiasm in some quarters, the JXD S7800b increases its appeal through being one of the best retro handheld consoles of modern times. As a part of the package you'll find already installed number of emulators, which will allow you play Sega Mega Drive, SNES, NES, PlayStation 1, CPS1/2 arcade coin-ops, and even N64 game ROMs. Through other Google Play Store installations it's also able to accurately emulate a DreamCast, ZX Spectrum, C64 and even DOS games.

Most of the emulators packaged with the JXD work





built-in HDMI port to the TV though, and watching video did take quite a toll out of the battery though, and reduced the life to just over an hour and half, which wasn't great. Saying that though, it's not that often you'll engage in HDMI to TV dual screen gaming, and even then you'll likely have it plugged in while doing so.

The JXD S7800b is an extraordinary gaming tablet. It's unique, and a pleasure to use. The £130 investment is worth every penny for the retro console emulation side of things alone, but when added to the fact that this device is more than capable of playing modern Android games as well as being a tablet, its features outweigh the cost. In short, highly recommended and excellent fun.

mm David Hayward

An amazing tablet with features galore and loads to offer the modern and retro gamer alike

with the controls out of the box, but those have been downloaded and installed by the user will require a bit of work to get up and running. Most of the time it's a fairly easy task of setting up the button configurations then saving the profile, but there are times when the emulator and the physical controls fail to match. Thankfully though this doesn't happen often, and then it's usually when dealing with the CPS1/2 arcade-style emulation.

The quality of the games being emulated are really quite exceptional. The Sega Master System and Mega Drive games were near perfect, and looked amazing on the 1280 x 800

screen; as were the other lesser powered console and computer games emulated. We did at first imagine there'd be some difficulty in delivering an accurate emulation for the more powerful consoles, such as the PlayStation 1 and N64, but we were happily mistaken in this respect as each worked extremely well with at least 80% of the games we had at hand.

The hardware of the JXD S7800b is arguably more than capable of emulating the consoles and computers of the past, any of the problems encountered are purely the fault of the software and how it's designed to emulate the original machine. And there's also the possibility of a faulty

game ROM as well to take into account. Overall though, the retro emulation experience was superb.

This does however bring us on to the grey area of legality when using game ROMs from older machines. We won't go in to the finer details here, but suffice to say it is a minefield we'd rather not stray into, and we'll leave the ethics of using ROMs to you.

In terms of battery life, the JXD S7800b isn't too bad. After charging it for a few hours we managed to get in a decent six or seven hours' worth of gaming and normal tablet duties before it got the point where the device had to shut down. Running it through the



GROUP TEST

Laptops Under £200

There was a time when a laptop was purely for the trendy, the rich and the business professional. These days, though, you can pick one up for an absolute steal.

David Hayward looks at six laptops that cost less than £200, to see which are worth spending on and which aren't.

Laptops Under £200

HP Stream 11-d007na

DETAILS

- Price: £179.99
- Manufacturer: HP
- Website: goo.gl/YRbnj6
- Available from: Currys/PC World, Ebuyer, etc

HP has decided to buck the trend of the budget laptop style with its new Stream range. Hoping to take on the Chromebook market, HP has opted for a more pleasing, happy kind of style that wouldn't look out of place on the lap of a student, for example.

At present there are two types of Stream product: a tablet and a more conventional laptop design. The Stream 11-d007na is the laptop we're looking at here, and it's certainly very pleasing to view with its horizon blue plastic casing with matching interior and trim. There's a certain Apple-like quality to it, in terms of its looks at least, and the rough grip finish on the lid and around the touchpad make it look considerably more expensive than it actually is.

As for its interior, there's a Celeron N2840 2.16GHz CPU (complete with boost to 2.58GHz), 2GB of 1333MHz DDR3L memory and an Intel HD GPU to drive the 11" anti-glare WLED backlit screen to a maximum resolution of 1366 x 768. Storage comes in the form of a 32GB eMMC (Embedded Multi-Media Controller) flash device, the first we've ever had inside a laptop. The eMMC is a combination of both the flash memory itself and the memory controller all built into the same silicon die. You usually find this kind of storage medium inside



▲ The HP Stream 11-d007na is a very trendy looking laptop

tablets, phones and the like, so it's an interesting addition, although to be fair, it's not as capable or as speedy as good SSD.

In addition, there's an SD card reader, HDMI and a pair of USB ports, one of which is 3.0 whereas the other is 2.0. Windows 8.1 comes installed as standard together with a slew of HP-related programs and other such semi-useless applications. The target here, though, is for a student, as this is a laptop that comes with a one-year subscription to Microsoft Office 365, together with a year of 1TB of OneDrive access and cloud space, Netflix, Skype and TripAdvisor – admittedly the last few aren't necessarily student orientated programs, but they are often associated with travel to and from university and such.

Overall, the HP Stream 11-d007na isn't all that bad. It looks decent enough, although on closer inspection it does feel somewhat cheap and a little too plastic. The keyboard is good, though, and the touchpad, despite being a bit too sensitive for our personal

tastes, is more than capable of withstanding the rigours of three or four years' worth of student life.

Beyond being a student machine, it's a reasonable performer. There's just enough power to allow watching HD content, and on a good internet connection Netflix is fine too. However, this isn't the most powerful laptop to ever grace the shelves of the high street electrical store, and therefore it won't be much use if you decide to install Steam and run the likes of the latest gaming titles. And to add to that point, the 32GB eMMC storage option isn't quite as fast as an equivalent machine with an SSD installed, plus once you've factored in the OS, Office and the other programs, there's barely 15GB free available for locally stored content.

It's a kind of a niche product, which will no doubt appeal to a select audience. If you think you'll need a little more power, then you're best off looking elsewhere. Otherwise, for a mere £179.99 it'll do the most basic of laptop-specific jobs.

Lenovo B50-45

DETAILS

- Price: £199.98
- Manufacturer: Lenovo
- Website: goo.gl/0CqLfP
- Available from: Currys/Pc World, Ebuyer, MoreComputers.com



▲ *The Lenovo B50-45 isn't a good laptop, by any stretch of the imagination*



▲ *Fingerprints and dust, assemble!*

Lenovo released a number of different specified laptops under the B50-45 laptop brand toward the latter part of last year. The specs range from an AMD E1-6010/6050 at 1.3/4GHz dual-core with 4GB of memory, through to a more impressive AMD A6-6400 3.9GHz quad-core with up to 16GB of memory installed.

Naturally, the higher end will cost considerably more than the sub-£200 budget limit we've set, so we've settled instead for the entry-level E1-6010/50 version, which only just manages to squeeze in at £199.98.

The Lenovo Essential B50-45 is, on paper at least, a reasonably decent looking machine. The 1.35GHz (average readout) chip manages to chug along with Windows 8.1 installed, while the 4GB of DDR3L memory help to keep up with the more modern apps from the Microsoft Store.

There's a 320GB 5400rpm spinner installed, and the graphics are handled by a Radeon 2 integrated GPU that powers a rather poor 15.6" LED anti-glare screen to a maximum resolution of 1366 x 768. You'll also find a pair of USB 3.0 ports, a 2-in-1 SD/MMC card reader, Bluetooth, HDMI and a DVD writer.

The casing is entirely made up of a low-quality black plastic which, despite looking

good enough from a distance, doesn't match up when you eye it at closer quarters. The entire thing is a dust and fingerprint magnet from hell. As soon as it was out of the plastic, the dust in the air around us leapt toward it like lemmings over a cliff. And to add insult to injury, the amount of creaks, cracks, squeaks and other such noises from opening the case were extremely off-putting, and the slightest bit of pressure on the wrist rest area around the

touchpad resulted in the case warping slightly.

Furthermore, the weak processor didn't cope too well with anything beyond simple browsing and a spot of word processing. Once there were a number of programs open or when the AV decided to kick in a system scan, the laptop slowed to a crawl and was extremely unresponsive for quite some time.

We also had an issue with the battery, in that when running on battery power and

while fully charged, it was drained within an hour. We assume that this isn't normal for the B50-45, so on this occasion we'll put that down to a possible fault on the unit we had to test. However, if you do end up with one of these in front of you, it might be worth just checking before committing to a purchase.

Where the previous HP model may come across as a competitor for the Chromebook, Lenovo has decided to go down the traditional route.

Unfortunately, it's opted for a seriously underpowered processor, which mars the usefulness of the laptop to the point where it's unspectacular at everything. At least with the previously reviewed HP it had enough power to be useful.

This, combined with the overall cheap quality, makes for a laptop that's really not worth looking into. We imagine that if you spend more and go for a higher model, then you'll be getting a more useful product, although the build quality may still be the same.

Overall, then, you're best off keeping your £200 for one of the other laptops on test here.



Laptops Under £200

Asus X200MA Touch

DETAILS

• Price: £199
Manufacturer
Asus
Website
goo.gl/Skct77
Available from
Ebuyer, Currys/PC World

As the title suggests, this is a touch-screen laptop with Windows 8.1 installed as default. It manages to creep in under the £200 mark at just £199, which in itself is a pretty outstanding price for a touch-screen machine.

The Asus X200MA Touch comes with a number of processor options from a quad-core Celeron N2815 at 1.8GHz, through to a more powerful quad-core Pentium N3520 at 2.2GHz. The one we have to review in this instance is the N2815 Celeron version that can achieve a burst clock speed of up to 2.14GHz.

4GB of DDR3 1066Mhz memory and a 5400rpm 500GB hard drive keep things ticking along reasonably well, and the 11.6" HD LED screen is clear enough and responsive to taps, swipes and all other manner of Windows 8.1 gestures.

There's also wi-fi, a 2-in-1 card SD/MMC card reader, a single USB 3.0 and dual USB 2.0 ports, as well as VGA and HDMI output options.

Build quality is surprisingly good, especially as this is one of the cheaper Asus laptops. The black plastic case is well presented, solid and quite sturdy. It's also available in a number of colours, but ours on this occasion was plain black. Thankfully, it wasn't a dust or fingerprint magnet, and the rough

texture to the trim around the touchpad and keyboard, where the wrist rests are, made it look and feel somewhat more expensive than the actual cost.

The keyboard was good too, and nicely spaced apart keys made for a fluid and natural position for the fingers to type, and the touchpad itself was large and well balanced between sensitivity and accuracy.

The performance of the X200MA wasn't too bad either. Naturally you wouldn't expect it to run *Elite: Dangerous* in its full graphical splendour, but it's certainly more than capable of delivering HD media content and basic image and video

editing duties without too much of an issue. And as you would also expect then, the basic duties such as browsing, word processing and so on are all easy enough tasks for the X200MA to handle without getting into the digital equivalent of a fluster.

Battery life was reasonable, and once fully charged it managed to stay awake for about four hours of basic word processing before it needed a recharge. When watching a HD movie, though, it did begin to falter after around two and a half hours. Needless to say, then, you'll probably have to charge this up daily to get anything done, and provided you don't stretch it too much, it

should last the commute to work before giving up on you completely.

While the Asus X200MA is a good little laptop, we're still not overly convinced of the use of a touch-screen on a laptop. For a tablet or hybrid laptop/tablet device, a touch-screen goes without saying, but with a laptop, you're reaching over the keyboard to get to the screen. Okay, so it's not a difficult manoeuvre to accomplish, but it does still feel a little awkward and odd too. Perhaps we're just stuck in our ways?

Nevertheless, it's a perfectly fine laptop that's more than good enough for everyday use and with the added wow-factor of a touch-screen.



▲ The Asus X200MA is a good all-round touch-screen Windows 8.1 laptop



Acer Aspire ES1-111M

DETAILS

- Price: £199.99
- Manufacturer: Acer
- Website: goo.gl/Tr0Quv
- Available from: Currys/PC World, Staples, Laptops Direct

After declaring that we haven't seen an eMMC drive used inside a laptop before, we suddenly have another one land on our laps in the form of the Acer ES1-111M.

Coming with a Celeron N2840 2.16GHz processor, 2GB DDR3 and a 11.6" LED display, this laptop is only a few months old, but it has so far proved to be quite popular with those who have purchased it from the usual high-street electronic retailers.

Although the processor isn't too bad, for basic duties at least, the lack of an extra 2GB of memory may turn a few folk off. However, despite having 2GB, Windows 8.1 manages to skip along at a decent enough rate to be very usable indeed.

Alongside the internal processing and memory, the 32GB eMMC flash storage makes another appearance, as we said earlier, and it offers better performance than a spinner, but not as good as an SSD would, as we mentioned in the HP review.

There's also the usual SD card reader, Bluetooth, a pair of USB ports (one of which is USB 3.0), HDMI output, webcam and so on – essentially the basic stuff that makes for a £200 laptop. Plus there's a gigabit Ethernet port.

Its design is solid and features an elegant curve at the hinge of the screen and the base. There's a rough,

▲ The Acer ES1-111M is another good all-round performer

textured feel to the wrist rest area around the touchpad, and the keyboard, much like the previously reviewed Asus, is well designed and a genuine pleasure to use.

Windows 8.1 runs well, as do the usual browsing and word processing duties. Watching HD content and a spot of video and image editing are generally good enough on the ES1-111M, although it's worth noting that once you start to dig a little deeper into the video or photo editing realm, with several programs open at once to deal with importing images and the like, the 2GB limit begins to show.

All in all, we rather liked the Acer Aspire ES1-111M. It's a good performer, is well presented and reasonably

stylish, and it has a decent enough battery life – one that lasted well over four hours during our basic tests. However, we didn't much like the slew of useless and resource draining extra software that Acer appeared to think was worth pre-installing. The Yahoo Search Provider, Launch Manager, Pokki Start Menu, Solutio Digital Protection and the Yandex.Disk Desktop cloud backup and photo editing solution are but an example of what comes with this laptop. But all of it can be replaced with other software that isn't quite as resource consuming.

After everything sorts itself out on the laptop, the original 32GB of eMMC storage is dwindled down to the 12GB mark, which won't



last very long once you start to add a movie or two and several photos. You do get an account with the Acer cloud service, imaginatively entitled AcerCloud, but unfortunately we couldn't get it working, so we don't have the particulars at hand to say if it's any better or worse than OneDrive, DropBox or Google Drive.

On the whole, though, a good laptop and one that will no doubt keep up with most of the user's needs and wants.



Laptops Under £200

HP 255 G3

DETAILS

- Price: £199.98
- Manufacturer: HP
- Website: goo.gl/PTVnBZ
- Available from: Ebuyer, Morecomputers.com, Debenhams Plus



The 255 G3 laptop proves that HP is quite versatile in its product range. In this example we see a more traditional laptop design and setup, and with the use of a decent enough AMD A4-5000 quad-core CPU and Radeon HD 8330 GPU.

The CPU itself runs at 1.5GHz, which isn't brilliant, but it's generally enough to keep the pre-installed Windows 8.1 moving without too much stuttering or significant slowdowns. This is helped along by the 4GB 1600MHZ DDR3 memory and a reasonably good 500GB 5400rpm hard drive.

You'll also find a DVD writer, a single USB 3.0 port, a pair of USB 2.0 ports, HDMI and VGA outputs, Bluetooth and an SD card reader. The star of the show here, though, is the full-sized keyboard with numeric keypad, which naturally means that the 255 G3 is somewhat bigger than most of the other laptops on test.

Boasting a 15.6" HD anti-glare LED backlit screen is a good advantage for HP to take in the sub-£200 laptop market, and it's driven along well enough by the AMD insides too. To be honest, it's a little primitive when compared to the Intel HD offering. This is apparent when you begin to delve into more intensive graphical, image processing and video-related work, not to mention any kind of gaming.

Having said that, though, the HP 255 G3 is more than capable

▲ *The HP 255 G3 is a fairly good laptop, with enough to satisfy the average user*

► *For the price, there are slightly better laptops available*

of performing basic duties with apparent ease. Web browsing, word processing and so on are well within its limits, and there are no visible problems when watching HD content either. The processor may be a little weak on paper, but in practice it's actually okay, provided you know its limitations.

The design of the 255 G3 is quite basic, although it doesn't look too bad if you're simply after a basic laptop and not a fashion statement. It's a bit of a fingerprint magnet, especially on the wrist rest and around the screen bezel, but that's easily remedied with a quick wipe of your shirt sleeves. It's a decent build at least, and although it may be lacking in the kind of style that we've seen already from HP, it's functional but fairly nondescript.



The battery was okay; it lasted just a little over four hours on basic duties like word processing, web browsing and viewing images. However, it did take a bit of a beating when we watched HD content video, dropping to a tad over two hours before needing a quick power injection.

For £199.98, the HP 255 G3 is a good enough laptop, but

we've seen slightly better in the form of the Asus and Acer models, for roughly the same price. It boils down to whether you prefer HP over Acer or Asus and which will be able to deal with the tasks you're likely to put it through. Either way, though, this is certainly a good enough laptop for most average users' needs.

Lenovo Flex 10

DETAILS

- Price: £189.99
- Manufacturer: Lenovo
- Website: goo.gl/mEgv4e
- Available from: Currys/PC World

This is the second Lenovo entry and one with a slight twist. The Lenovo Flex is the follow-up to the reasonably successful Yoga range of laptops that, as you can probably guess from the title of this model, allow you to rotate the screen around 270 degrees toward the underside of the laptop base and essentially becomes a tablet with a built-in stand.

Hybrid laptop/tablets are far from being a new invention, but most seem to have limited power, performance and functionality. What the Flex 10 attempts to do is bridge that gap and address those issues.

The flex 10 is powered by a Celeron N2807 1.6GHz CPU, with 4GB DDR3 memory and a decent sized 320GB 5400rpm hard drive. It's a 10.1" LED, multi-touch ten-point touch-screen driven by a Baytrail Intel HD GPU that's quite responsive, and when folded in place it certainly looks good enough to pique the interest of the passing public.

Alongside the internal processing power, there's Bluetooth, HDMI, USB 3.0 and USB 2.0 ports and a pretty good keyboard. Unfortunately, we found the casing to be made from another dust- and fingerprint-loving plastic, although nowhere near as bad as the other Lenovo we reviewed earlier.

While we're on the negative qualities of the Flex 10, the screen wasn't quite as good as



the previous examples we've tested so far. It was fine when we looked directly at it, but once we angled it slightly or some natural light fell on it, the screen became very difficult to read. And although it's quite a novelty to bend the screen over onto itself, once you do so, you begin to realise that having it rotate just 270 degrees is a completely useless feature.

This basically leaves the Flex 10 in a kind of *no-man's* land between three different devices. It's a laptop with limited connectivity and a touch-screen, a tablet that you can't really pick up and use as a tablet, and

a hybrid that doesn't do a very good job at being a hybrid. In all honesty, Lenovo should have made the decision to either allow the screen to bend all the way so that it's flat against the base or to not bother at all with the flex feature and instead concentrate on making a far better laptop.

In terms of performance, the Flex 10 didn't really impress. For normal duties it was *okay*, although we did find that HD video content tended to splutter more than with the other laptops on test. And the battery didn't exactly impress us either, lasting a measly one hour and 20 minutes with our basic tests and not even

▲ *The idea behind the Lenovo Flex is essentially a good one*

◀ *But the device itself leaves a lot to be desired*

managing 40 minutes when we tried a video.

Despite the fact that it may look good on the shelf in either 'tent' or 'stand' modes, the Lenovo Flex 10 has ended up being a device that tries to bridge gaps but doesn't a good enough job of it. It's a mediocre performer with a poor screen and a fairly useless hinge mechanism that will become more of an annoyance than anything of any use.

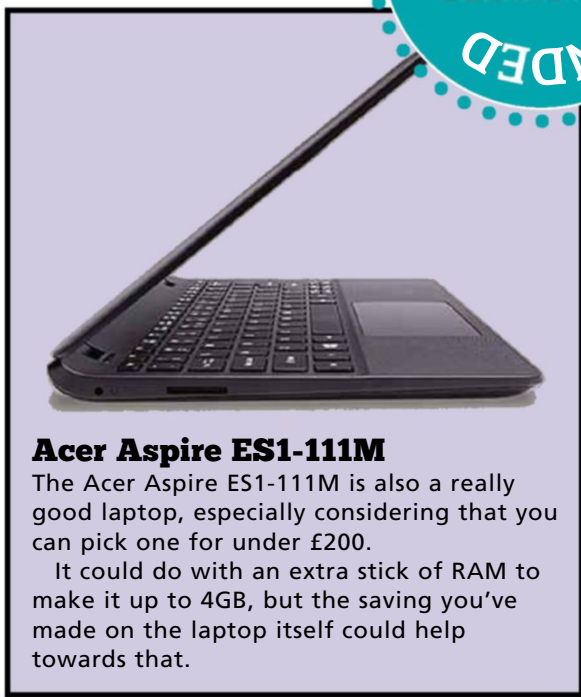




Asus X200MA Touch

The Asus X200MA Touch is a really good sub-£200 laptop, and there's also the added bonus of the touch-screen to throw into the mix.

We may even eventually get over our dislike of having to lean over the keyboard to paw away at the screen.



Acer Aspire ES1-111M

The Acer Aspire ES1-111M is also a really good laptop, especially considering that you can pick one for under £200.

It could do with an extra stick of RAM to make it up to 4GB, but the saving you've made on the laptop itself could help towards that.

How We Tested

Each laptop was tested with basic web browsing, word processing, spreadsheet and photo viewing work. To stretch them further, we watched an HD video and installed OpenShot for video editing and Gimp for photo editing.

	HP Stream 11-d007na	Lenovo Essential B50-45	Asus X200MA Touch	Acer Aspire ES1-111M	HP 255 G3	Lenovo Flex 10
Price	£179.99	£199.98	£199	£199.99	£199.98	£189.99
Screen Size	11.6"	15.6"	11.6"	11.6"	15.6"	10.1"
CPU	Celeron 2.16GHz	AMD E1-6010/50 1.35GHz	Celeron 1.8GHz	Celeron 2.16GHz	AMD A4-5000 1.5GHz	Celeron 1.6GHz
RAM	2GB	4GB	4GB	2GB	4GB	4GB
HDD	32GB eMMC	320GB	500GB	32GB eMMC	500GB	320GB
Weight	1.28kg	2.15kg	1.24kg	1.29kg	2.15kg	1.2kg
Battery Life Basic Tests	4h 15m	58m	4h 5m	4h 40m	4h 10m	1h 22m
Battery Life Extended Tests	2h 5m	25m	2h 25m	3h 45m	2h 2m	38m

Tech Origins

Near Field Communication

David Briddock uncovers this modern wireless standard's historical roots

Near field communication (NFC) is a low-power wireless technology, which operates over very short ranges, typically just a few centimetres. But where did it start?

RFID

NFC's roots originate in Radio Frequency Identification (RFID) technology. Interest in RFID goes back to World War II when the German airforce ground radar crew discovered that if pilots rolled their planes on returning to base, it changed the reflected radio signal and allowed them to distinguish between German and Allied aircraft.

Later, a secret Watson-Watt British project developed an active 'identify friend or foe' (IFF) system by installing transmitters on British planes.

Patents for RFID technology began to appear in the 1970s. Mario Cardullo claimed a US patent for an active RFID tag with rewritable memory in January 1973. In the same year, Californian entrepreneur Charles Walton received a passive RFID transponder patent to unlock doors without a key.

At this time, US departments like the Los Alamos National Laboratory used RFID tags (tiny passive chips with a small data store) to track vehicles carrying nuclear materials.

Standardisation

In 2003, NFC appeared as an extension of the ISO/IEC 14443 proximity card standard, where transmission is performed by magnetic field induction using two looped antennas. A 14Khz bandwidth supports data rates up to 848Kbps, which is lower than Bluetooth and significantly less than wi-fi.

In 2004, Nokia, Philips and Sony formed the NFC Forum to promote NFC and device compliance. The NFC Forum grew quickly and now attracts over 175 member companies, including representatives from the mobile networks, mobile device industry and banking organisations.

Tags And Posters

The NFC Forum released the first set of NFC tag specifications in 2006. Just as with RFID, an NFC tag can be added to

virtually any object – for instance, food packaging or stickers.

Importantly, and unlike other wireless technologies, NFC requires no convoluted handshaking behaviour, no discovery process, and there's no password to enter.

A revised tag specification included support for smart posters. One poster scenario application is museum artwork that contains a short biography of the artist, accessed by an NFC-enabled smartphone.

Mobile NFC

The first NFC-compatible cellular phone was the Nokia 6131, released in 2006. Google launched its first Android NFC phone, the Samsung-built Nexus S, in 2010. And a year later, Nexus S owners could pay using the Google Wallet app.

In July 2004, NTT DoCoMo launched Japan's Mobile FeliCa contactless smart chip technology, used for transit passes, electronic wallets and loyalty programmes.

A few years later, the UK kicked off a six-month O2 Wallet trial involving Transport for London (TfL), Visa and TranSys (which runs the Oyster card system). Nokia provided 500 NFC-enabled handsets to make low-value contactless payments at participating retailers, including Books Etc, Coffee Republic, Threshers and YO! Sushi.

Yet despite favourable responses from over 90% of the trial's participants, NFC took years to take off in the UK.

Nevertheless, today many high street outlets and nationwide coffee chains take NFC payments. And virtually all debit/credit cards contain a contactless payment NFC chip.



▲ Universal contactless symbol

➤ Google's Nexus S



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Building

A HDTV

Media

Centre

Leo Maxwell decides to increase his resolution for the New Year

Many of us are interested in the versatility of a media PC (sometimes called a home theatre PC, or HTPC for short), but is it worth building your own? If you only want a comparatively simple PVR, there are many hardware based solutions, some more accomplished than others. If you just want to watch the odd TV program on your PC, then you just need a simple media player. What we are talking about, though, is a dedicated PC to supply all of your home entertainment requirements.

A media PC can function as a TV, PVR, Blu-ray player, jukebox, streaming server and offer many other functions in one box, which can all be operated from a single remote control. Commercially available HTPC generally command a premium price, for various reasons. They are designed to give adequate video performance without requiring noisy cooling fans, and they usually have a non-standard case, sometimes with an external power supply. Some have custom cooling arrangements such as large heatsinks (sometimes the case itself functions as

“ If you just want to watch the odd TV programme on your PC, then you just need a simple Media player solution ”

a heatsink) and large, slow fans or no fans at all. They may use rubber disk mounts to reduce vibration and noise, and so on.

They often use laptop style hard disks and optical drives. These are smaller, quieter, and less power hungry than the full size items, but this also means that they are more expensive. The software is often Windows with Media Center or other proprietary software although some are Linux based.

The higher price of the top-end hardware and the lack of sophistication of the lower-end models may prompt you to build your own, and that is what we will be looking at in this article.



▲ The case before removal of the Power supply

Out With The Old, In With The New

Processing and recording Digital TV requires fairly little in terms of CPU resources as the stream from the tuner is already encoded and compressed. Decoding, decompressing and displaying the video is where the real work lies. Changes in the way that video is managed by modern chipsets mean that the CPU can offload a high percentage of the processing to the GPU, whereas previously displaying 1080p would require an up to date GPU and a fairly fast CPU. My Kabini setup could quite happily record two HD channels, while simultaneously streaming HD Live TV to a remote system. Unfortunately, I was unable to test the 4K capability.

Original MediaPC

Dual-core Athlon 4850e 2.2GHz processor (45W TDP), Nvidia GeForce 6150LE on-board graphics, 4GB RAM, 1TB Hard drive, Dual DVB-T tuners, DVD drive, mATX MediaPC case.

Roles: Medium power Computing tasks, watch and record multiple channels of SDTV, catchup TV, DVDs, Videos, music, slide-shows etc, DNLA media server, Security camera server.

New MediaPC

Quad-core AM1 Kabini 2.05GHz APU (25W TDP) with on-chip Radeon R3 8400, 4GB RAM, 1TB Hard drive, Dual DVB-T2 tuners, MiniITX case.

Roles: as above, with the addition of HDTV, and desktop use for browsing, recipe database, etc.

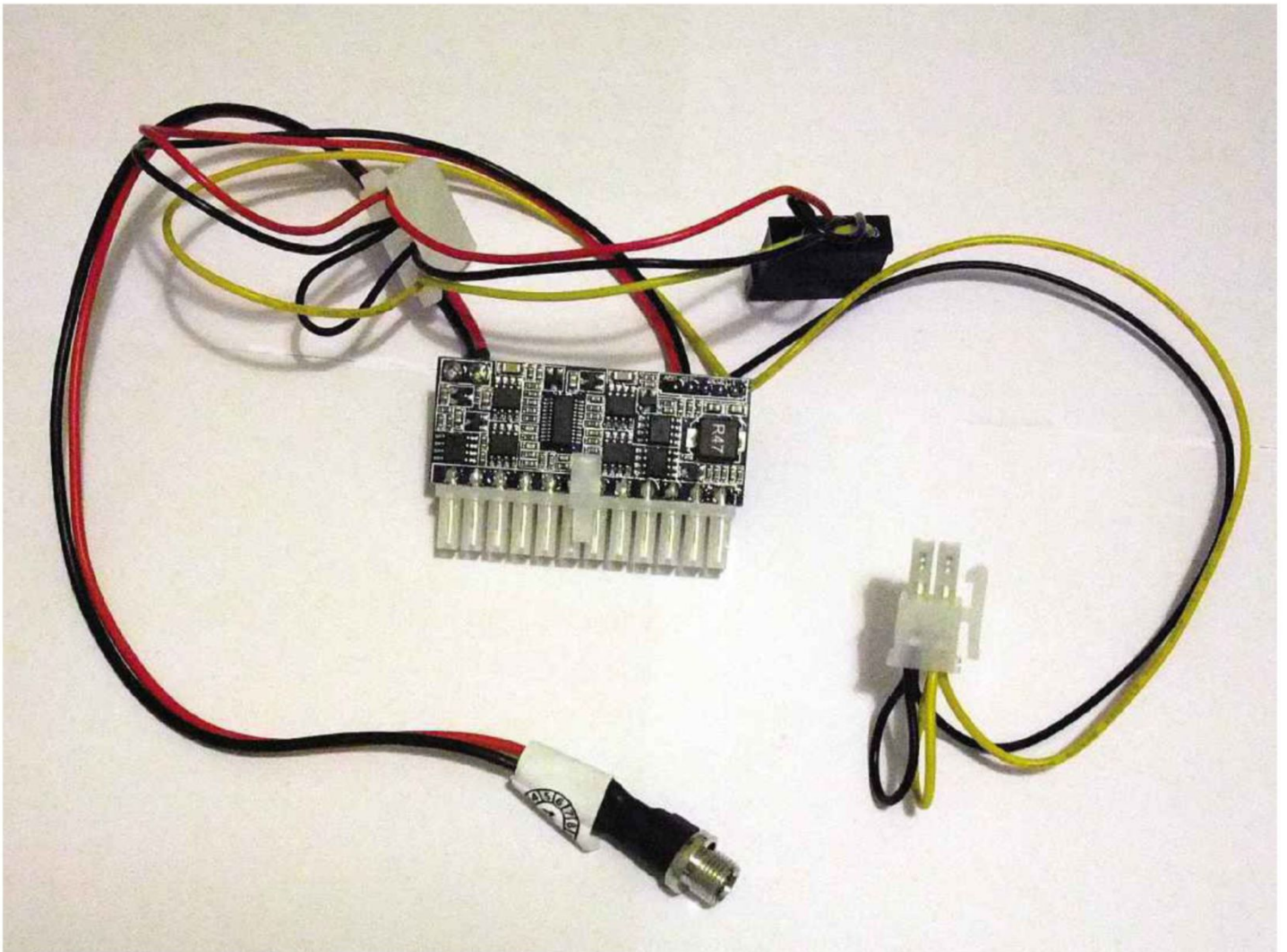
MiniITX Motherboards are often tailored to specific roles. It is fairly obvious that this is meant for media server use. It has VGA,DVI and HDMI outputs along with USB3.0, 7.1 sound and support for 4K video.

The PCI-E slot is only 4X, so not suitable for high end graphics cards.

Motherboard	Asus AM1I-A	£23.96
CPU	Athlon 5350 Kabini quad-core APU SOC	£39.99
Memory	4GB Kingston HyperX DDR3 1600MHz	£29.98
Sound	On-board Realtek ALC887-VD2 7.1surround	----
Video	On-chip Radeon R3 8400 4Kcapable video	----
Hard disk	Seagate Barracuda 1TB SATA 3.5"	£40.00
Mini-ITX case	InWin BP655 with 200W PSU	£45.99
DVBTVcard	TBS 6281 Dual tuner DVB-T2 PCI-E card	£95.00
PicoPSU	160W internal PicoPSU	£17.99
Power brick	12V 10A (120W) external PSU	£21.99
Total		£314.90

Pricing

Here is a breakdown of the build costs; prices are for guidance only, and do not include delivery or an OS. I already had a wall-mounted screen and a wireless keyboard.



▲ A 160W PicoPSU. The 3 leads are: 4pin motherboard plug, SATA and Molex power, and 12V power input.

The DIY Option

Initially, the plan was to upgrade my existing MSI Media Live! unit, which has been providing excellent service for the last five years. Purchased in 2008, this PC has sat in my living room and ran MythTV on Linux. It was intended to be a multi-functional unit for a variety of tasks, but it ended up mainly being used for watching and recording TV.

When I started looking around at options, however, I was quite surprised by the advances in low-power computing since my original build. The previous media PC case was quite large and had various options that I no longer required – including wi-fi, a fluorescent display, an optical drive and a card reader. So, I decided to try something more compact (and hopefully more energy efficient too).

Hardware

When deciding on hardware for a machine that's intended to be switched on 24/7, there are several things to consider. Noise can be an important issue, especially if the device is in the living room under the TV.

The main sources of noise are fans, hard disks and optical drives. Large fans that can spin more slowly, sound insulation and rubber mountings can help a lot, as can passive cooling and careful choice of components. For this sort of application you would previously have needed what was considered a fairly

powerful CPU, but these days a lot of video processing and decoding can be offloaded onto the GPU so that's not so much the case anymore.

With this in mind, I chose one of the recent AMD Kabini series of socketed processors, in the form of a quad-core 2.05GHz APU coupled to a mini-ITX motherboard and 4GB of low-latency memory. Although I could have used a much less powerful processor, I wanted this device to be multi-functional, as I would be making use of this as a replacement for another PC as well, which resides in our Kitchen.

Kitchen PC

Some long term *Micro Mart* readers may remember an article in the January 2009 issue about building a Kitchen PC. This unit has since resided under my kitchen work surface, mainly used as a digital picture frame, recipe database and music player. The Internet is also an excellent resource for researching recipes, cooking techniques and other information. The on-board Intel graphics did not really work very well with newer Linux distros, **however**, so I had decided to incorporate my back-end TV and media server into it.

This PC could sit under your TV, or it could be located anywhere in your house with access to a power supply, TV aerial and a network connection to make media available to PCs, Phones, Tablets and many other devices. The media streamer in my living room, for example, is a MINIX AndroidTV unit with XBMC as the front-end player.

The TV Card

SD DBTV Freeview cards, which can receive all of the unencrypted terrestrial free to air channels, and have two or more tuners, are available quite readily and **cheaply**, in USB, PCI and PCIe formats. The range of available HD DVB2-TV cards is comparatively small at the moment, possibly because of the shrinkage in the traditional PC market. Not all of those that exist support Linux, **either**, which was a requirement of mine. It is important to read the specifications carefully as, like many 'HDready' TVs, some 'HD' TV cards cannot actually receive HDTV signals. Before purchasing, make sure that your chosen unit will fit your PC, and that it supports your chosen Operating system.

It is also important to decide on the number of tuners you require, as a single tuner means that you can watch or record TV, but not both at the same time.

The best known manufacturers of HDTV PCI-E Tuners are TBS, BlackGold and Hauppauge. PCTV Systems also offer the 292e NanoStick HDTV USB tuner, which is a single tuner unit. I decided on a TBS6281 dual tuner card, though, as it supports Linux and has good feedback from the Linux community.

TBS also makes Freesat cards and quad-tuner units. I live in an area with a good Freeview signal, and the software I was intending to use can record multiple channels from a single

“ The main sources of noise are fans, hard disks and optical drives ”

tuner, so I was happy to go with a dual tuner terrestrial unit. In the years that I have used my previous SD Dual tuner card, I have rarely been unable to record any program I want.

Most cards come with an infra-red receiver and a remote control. The cheaper ones are not terribly good, but the TBS one seems okay. Most PCTV remotes will work with the card, as the OS is used to control the media. Windows Media Center remotes are usually quite good, and easy to find online.

TV cards vary in sensitivity, so a good aerial is recommended, especially for HD transmissions.

Disk Space

As an hour of SDTV takes around 2-3GB, and an hour of HDTV can fill up to 8GB, a large hard disk is a necessity. I fitted a 1TB hard disk, which is fine for me, as I rarely store recordings for long. You may want a bigger drive, or even multiple disks. It is surprising how quickly the drive can fill up, especially if you record a series for binge viewing later on.

Standby modes

Energy usage is an important concern, as the device may need to be switched on 24/7, although sleep mode can be used to save power when the PC is not in use. TV server software can be set to switch the PC on to record a program, returning to sleep when the recording is completed. Media front-ends, such as XBMC can be configured to send a wake up signal over the network to a dormant back-end server when wanting to access LiveTV or media files. This is known as “wake on lan” or “WOL”.

If you want to suspend the PC between recordings, you will also need to set up the RTC (Real Time Clock) wakeup. Both

How Many Tuners?

The main reason for wanting multiple tuners is overlap. To account for the vagaries of the broadcast EPG, I add five minutes to each end of a recording, just to make sure that I don't miss the climax of anything I record. While I can watch or record multiple channels from one multiplex, there are times when two programs are on different multiplexes, and if they overlap even by a few minutes, it can lead to losing the end or beginning of a program.

You may also want to stream LiveTV to one or more network clients, which could increase the number of tuners required.

Multiple Channels From A Single Tuner

If a lot of what you just read sounds like gobbledygook, let's illuminate a few things. Digital broadcast TV is transmitted in what are called Multiplexes. Each multiplexed DTV stream can deliver up to 40Mbps. There are seven country-wide multiplexes and some local ones in the UK at the moment, and each carries between eight and twenty-five channels of TV and Radio, with the HD channels split across two of them. For example, BBC1, 2, 3 and 4 are transmitted along with six other TV channels and twelve radio stations on multiplex PSB1. Digital tuners can download the entire multiplex, and software is used to discard any unwanted data.

Digital TV is transmitted as an Mpeg-2 (SD) or Mpeg-4 (HD) stream, and can be recorded almost raw. Unlike converting an analogue TV stream to a digital recording, there is not a lot of CPU-intensive encoding. The really demanding process is decompressing, decoding and playing the video stream. This means that a comparatively low power PC can function as a network TV server, but the client that plays the video needs a decent CPU/GPU.

One advantage to this is that, while splitting your signal between multiple tuners dilutes it, (unless you invest in some quite expensive hardware) with multiple channels from one multiplex, there is no signal degradation. However, you still need a good antenna for the data stream not to suffer errors, which will result in decoding problems, leading to picture breakup, stuttering, etc.

Simultaneous recording from separate multiplexes (for example, ITV and BBC) requires a separate tuner for each – and the more channels you want to record, the more CPU, memory, and disk resources you require.

A dual-core CPU can easily manage four SD streams from one multiplex without stutter, but HD carries more data, and that data is compressed. The required specifications for the TBS6281 card included a 2.6GHz multi-core processor, but that probably says more about its software than any hardware issues, as on test the 2.06GHz Kabini managed to record four HD channels simultaneously without issue.

Streaming To The Network

In terms of local network Bandwidth, one Mpeg-2 SDTV channel takes about 4-6Mbps, whereas an Mpeg-4 HDTV channel takes about 6-10Mbps. A wired connection direct to the router is preferable for a media server. Recent wired networks are at least 100Mbit, or even Gigabit. Speed for wireless clients will be dependent on a number of factors including signal strength. Streaming, even simultaneously to multiple clients, should not present any problems unless the network is slow or crowded.



◀ Inside the Case, with the motherboard in place and the PicoPSU connected. The large space at the top of the picture is where the original PSU was sited

of these settings need to be enabled in the machine's BIOS, and the method will vary depending on the Motherboard and software in use.

Building The Box

While it is not currently possible to build a PC quite as small as most dedicated PVRs you'll come across, you can get somewhere near to that sort of form factor. Indeed, some cases are now small enough to mount on the rear of a monitor or TV. My choice of case was limited by two factors, though: firstly, I wanted a

dual tuner HDTV card (which meant a PCI-E slot), and it had to fit the small space I had available for it, which meant it could be no wider than 100mm.

I had initially intended to use an existing case with a PCI-E riser, in order to fit the tuner card in a horizontal backplane slot. This plan was eventually scuppered however as, in reality, when I fitted the TV card it lay across the top of the CPU fan. This meant that I needed a case with a vertical slot for a half-height card. The In-Win case I finally decided upon was quite roomy, with space for a full size optical disk and two hard drives. The



▲ The rear of the case. There was a convenient punchout to fit the 12V input for the PSU just above the I/O shield

The Science Of Sleep

A little about sleep states; these vary according to the BIOS setup, but they are supposed to be:

S1 (POS) Power-on suspend- shuts down monitor and hard disks

S2 Currently unused

S3 (STR) Suspend to RAM saves system state to RAM and switches off CPU, Fans etc.

S4 (STD) Suspend to disk or Hibernates saves the PC's state to disk, and switches off CPU, Fans etc

S5 (SO) soft-off, lowest power drain without unplugging the PC

Some PCs keep the fans running in S3 mode, and if power is lost during an S3 suspend, the PC may not start up properly.

The PC built for the purposes of this article uses less than 1W when in S5 sleep.

hope that I could also dispense with the case fan. Although I have run this setup without issue on an 80W miniPSU, but ultimately I decided to go for a 160W unit with reserves for possible future expansion should I end up encountering as yet unforeseen applications.

A PicoPSU is basically a small circuit board mounted on a 24-pin plug, which plugs directly into the motherboard. It receives 12V DC from an external power brick, which does the heavy work of reducing 240V AC to 12V DC, and shedding most of the heat involved in that process out into the surrounding

“ I decided to reduce the heat in the enclosure by fitting a PicoPSU, so that I could hopefully dispense with the case fan as well ”

environment. The PicoPSU has voltage regulators to produce 12V, 5V and 3.3V DC, and fly leads to connect the additional four-in plug for the motherboard and so that it can supply power to the drives.

Conclusions

The completed unit is quiet and performs the tasks I've asked of it well, certainly far better than the unit it replaced. I suppose that it is really over-specified for its intended role. Though at least that means it will serve me well for some time to come.

Both Linux and Windows installation were responsive and pleasant in use, and it coped easily with the demands of the media software I installed. So, at the very least, the project can be considered a success – and not all that stressful.

Gaming would probably not be a good idea with a system like this. Having said that, it might well cope with some low level stuff or browser-based games that seem very popular... Certainly enough to pass the time while cooking. [mm](#)



▲ The completed PC in its final home

L shaped cover is held in place by two plastic clips, making for easy access. It came with a pre-fitted 200W power supply and a case fan.

The fan on the stock Kabini cooler was surprisingly loud, though. In the default mode, it was louder than either the case or power supply fans, resonating in the case to an annoying amount, and to the extent that I began to regret not choosing a lower power fanless design. Happily, altering the fan speed settings in the BIOS reduced the sound to an acceptable level without affecting the processor temperature unduly. I could find no AM1 replacement coolers currently on sale in the UK, but Gelid and Noctua have both announced impending models.

The fan in supplied 200W PSU was not loud but I decided to reduce the heat in the enclosure by fitting a PicoPSU, in the



Understanding Media Files

There are many different types of media file, but what's the difference between them? Aaron explains

The world of PC media playback and recording was once a far more simplistic beast than it is today. We were content for the most part with a single AVI video format, and audio files were ruled almost exclusively by the MP3. Sure, there were other files used by those with different needs, but the mainstream had a fairly simplistic selection. It was easy to understand and easy to find a program to handle your media.

However, as time passed, more and more types of file arrived, and the evolution of technology contributed to this. As movies become higher in definition, more file types surfaced. Digital music files grew in popularity, and this resulted in many new types of audio file being created. We now find ourselves swamped in a sea of media files. There's a huge range of these files floating around, with each type being beneficial for certain tasks and many requiring specific hardware in order to be used. Some file types are designed for playback, while others are really

intended for production and media creation. It's a bit of a jungle out there, and it can all be very confusing for the layman and for those who don't know the difference between an AVI and MPG or a MP3 and a WMA.

In order to help alleviate this confusion, we're going to take a look at some of the basics. What are some of these files? What exactly is a codec? And what's the difference between lossless and lossy, and what does that even mean?

So if you're confused, and you'd like to know your AVI from your WMV, read on.

Containers And Codecs

You've likely heard or read about something called a codec. This is often used by people to describe media files, and you'd be forgiven for thinking that the two terms are the same thing. This is almost true, but in actuality, it's separate.

Codec stands for 'compressor-decompresser', and it refers to the program used to actually create and read the media in question. Therefore, codecs and their properties can change, and choosing the codec to use depends on what you want from the media file. Each program that creates a file will do so for specific reasons, which means that some file types are suitable for specific tasks but less suited to others. This means you need to keep each option's properties in mind.

These properties include various different features that determine the overall use of a file, including quality and file size. Popular video codecs include DivX, Xvid, MPEG and H.264, and popular audio codecs include MP3, FLAC and Vorbis.

A container, also called a wrapper, is the file that holds all of this information, as well as other data like subtitles, metadata and so on. Containers are the thing we often call the actual file. That's such formats as MKV, AVI, MPG and MOV. Audio containers include WAV and AIFF. Even images use containers, with TIFF being one example.

So that's the files themselves, but what about the technical details and their uses?

Compression

First up is compression. This is a simple one and governs the overall size of the file. Compression can be used to reduce a file size, making it usable online or for other distribution, but this will usually result in the loss of quality or clarity, as data is stripped out to shrink the final product. In terms of codecs, the main terms of interest are lossless and lossy.

Different codecs produce files that are one of the two, and the one you choose to use when you're encoding depends on the end use of the media you're creating.

Lossless is a format that doesn't lose any information in the compression and encoding process. What you get in the end is the same as you began with, with nothing lost in translation. This would apply to common lossless files like WAV for audio, AVI for video, and TIFF for images. These files aren't really compressed, as they contain all of the information, thus making for better quality. Lossless files are commonly used by media

editors who need to work with high-quality media or those who want the best, HD visual clarity.

Lossy, on the other hand, is a more compressed form of media file. Using various types of compression, depending on the media and codec, lossy discards some information in an intelligent manner in order to preserve the overall content, but at the same time reducing the file size by discarding this data. The result is a file that's far more portable but of a lower quality than the lossless alternative. Files will still be perfectly fine for most users, but those used to working with high-definition audio and video will notice the difference. Common lossy formats include MP3 for audio, MPEG for video, and JPG files for images.

“ What exactly is a codec? And what's the difference between lossless and lossy? ”

This division isn't written in stone however, and it can get a little confusing, as some file formats and codecs have both lossy and lossless variations. For example, Apple's media format, ACC, has both a lossless and lossy version. Sometimes this is clear, as they'll be called ACC for lossy, with the other being labelled as ACC Lossless, but this isn't always the case. You can, of course, tell the difference by looking at file sizes, with the larger one being lossless.

Bitrate

This is another common term you've probably heard a lot, and it relates to the overall bitrate of a file, which means the amount of data in any given stream. This is measured in kilobits per second (Kbps), and the higher the bitrate, the better the quality of a file. Of course, just as with lossy and lossless, the higher quality also means a larger file size.

HD video, for example, has a much higher bitrate than standard definition, and an audio file like WAV will have a higher bitrate than a standard, 320Kbps MP3. Again, lower bitrates are often far more common and are perfectly fine for most, but higher rates are used in editing and storage, preserving the original clarity and quality of the source material. Bitrates don't apply to static image files in the same way, as there isn't really an actual data stream to be processed here. However, they still apply to some degree, and images with lower bitrates will often contain artefacts, which can often be seen in lower resolution JPG files.

Transcoding And Native

Most media players, be they hardware or software, will be designed to play specific types of file. Some programs and





devices may be jacks of all trades, able to play a wealth of content, while others may be more limited. Files a device or program can play by design are often called native. They're loaded up and played easily. WMV is the native format of Windows Media Player, for example.

However, if a device or program doesn't normally play a specific type of file, it may be able to do so using a technique called transcoding. This means that the player decodes the file, and then re-encodes it into a readable format. This is often done in real time, although there are limitations when it comes to playback and functionality. A large, 8GB movie file, for example, would take a lot of resources to transcode, so playback options may be limited, with no seek function being one example. Faster PCs will transcode files better, resulting in smoother playback. The popular open-source media player VLC (www.videolan.org) supports transcoding.

Popular File Types

Now that you know some of the basics, what about the actual media file types? Let's take a look at the most common and most popular, along with their pros and cons.

Video Files

AVI

Audio Video Interleave

Arguably the most widespread and flexible video file format. This was created by Microsoft and is found on almost all devices. It supports virtually all operating systems, including Apple, and is usually a high-quality option that makes use of a wide range of codecs. Because of this, there's no such thing as a standard AVI container file, as they can vary wildly depending on the codec used and the information stored within. As this is one of the larger formats in terms of overall size, it's not all that useful for streaming and sharing, and is more suited for storage and use on larger media devices.

WMV

Windows Media Video

This is another Microsoft file format, but unlike AVI, this is limited to Microsoft's own Media Player (although other players can be used if they support the format), hence the name. Also unlike AVI, WMV files can be compressed to quite a degree, meaning it's a good format for sharing, but the quality takes quite a hit, resulting in some poor video.

FLV

Flash Video

You could argue that it's FLV and not AVI that's the most popular video file around, and there's certainly a good argument here. It's quickly become the de facto standard for streaming video, used on sites like YouTube, and the popularity and saturation of the Adobe Flash Player makes it perfect for getting content to the masses.

The major benefit FLV has over competing formats is its ability to deliver good quality video while remaining small in file size. This ensured it dominated the online video market quickly, pushing out competitors like Microsoft's WMV and Real Media's RealPlayer.

MOV

Apple QuickTime

Apple's QuickTime has been around for a long time, pre-dating the likes of Flash and WMV, and it's obviously the most popular video format for Mac users, but it isn't limited to Apple's devices.

It's a high-quality format but has the drawback of producing large file types, so it isn't all that useful for sharing and is better for personal storage and sharing on portable media. Despite this, some use it for streaming, but this usually requires the QuickTime player.

MP4

Moving Picture Expert Group 4

The shortened name for MPEG-4, this is perhaps the most common format used for sharing high-quality video, both legitimately and illegitimately via services like BitTorrent. It's a useful and hugely popular format, as it has relatively small file sizes compared to other formats but retains good quality, even when compressed. H.264 is probably the most common codec used within this container, accompanied by AAC audio.

MKV

Matroska Video

The rising star of the video sharing world, MKV is rapidly becoming the most popular high-quality video container and is able to hold video, audio and separate data, such as subtitles. The format is often used to share HD video, including Blu-ray quality, and extensively uses the H.264 codec for video and either AAC or MP3 for audio.

Audio Files

Most audio file types used on PCs fall within the PCM (Pulse-Code Modulation) bracket, regardless of their lossless or lossy approach. Therefore, most of the popular audio file types you'll see around are PCM.

WAV

Windows Audio

One of the most popular uncompressed, lossless file types. This is a high-quality format that's useful for storing source files for editing, but due to the large size, it isn't really viable for cataloguing and listening to music. It's also not very flexible in terms of metadata encoding.

AAC

Advanced Audio Coding

This is a fairly high-quality, compressed, lossy format that was intended to be a replacement for MP3 when it was created. Although its success here may not be as global as initially hoped, AAC is still used extensively with HD video encoding, and Apple uses it for iTunes. It continues to grow in popularity.

MP3

Moving Picture Experts Group Layer-3 Audio

Always causing confusion as to whether it's a codec or container (it's a codec, with a rare file type that only holds MP3, not

other formats), the MP3 quickly became the dominant format for digital music and remains so to this day, despite many challengers, such as AAC.

MP3 is one of the most flexible audio codecs around, with great compression and audio quality, and its ability to hold metadata makes it perfect for cataloguing and storing music.

OGG Vorbis

This is an open-source container format that isn't restricted to any software patents, according to its creators. It's a lossy compressed format, and it's a good option for streaming due to this compression. Music streaming service Spotify uses OGG Vorbis files, and the compression levels allow for different quality settings tailored to different users' internet connection speeds.

FLAC

Free Lossless Audio Codec

FLAC is an open-source audio codec that's very popular online. It's widely used to encode music for use with various portable audio players and, like MP3, it can hold metadata, such as tags and cover art. As it's a lossless format, it's high quality, but it loses out to MP3 somewhat as it's just not as flexible, because it's unable to offer various compressions. Still, it's popular for hardware uses.

Image Files

Image files are media files too, and like video and audio, there are a lot of different types around. Here are some of the most common.

JPG/JPEG

Joint Photographic Experts Group

The most common and popular lossy image format on the internet, JPG files offer a good mix of compression and quality. Although JPG files can be compressed into little more than awful, artefact-laden messes, for the most part, web masters are able to use high-quality images and can reduce the space required to host them.

JPG files are 24-bit colour, supporting up to 16 million, so they're very flexible for a number of uses. They don't support transparency, however.

GIF

Graphics Interchange Format

Actually pronounced 'jif', according to its creator, the GIF file is a low-quality image, restricted to 8-bit palettes and 256 colours, so it's not designed for high-end image reproduction. What GIFs do allow, however, is animation in the form of a simple sideshow.

This ability has made them very useful for low-space animations on websites and they've since become a favourite toy of meme creators and popular culture online. And although the image quality isn't great, GIFs are also useful for static images

that don't require high quality, such as small images and logos. Surprisingly, GIFs are lossless in terms of data reproduction, so contain all the original image data, only with less colour.

BMP

Windows Bitmap

The AVI of the image world. BMP files are uncompressed, lossless files and were once one of the most popular formats. They're high quality and support up to 24-bit quality. Like AVI, they're also widely compatible, with both hardware platforms and software packages.

“ The rising star of the video sharing world, MKV is rapidly becoming the most popular high-quality video container ”

Sadly, BMP files don't scale well, with enlargements manifesting blocky artefacts, and the large file size makes them impractical for web use. They're now fairly unpopular and aren't used much, even in storage and editing.

TIFF

Tagged Image File Format

A true desktop publishing image file, which is now owned and controlled by Adobe, TIFF is the major file format used in professional graphic design and high-end editing. It's also the image file of choice for Apple.

TIFF is actually a container, so it supports various compression methods, including JPEG and ZIP. It can also be totally lossless, with no compression. Because of this, TIFF files can be very high quality and offer superior flexibility. TIFF files also support multiple layers, another boon for image editing, and they also support transparency.

Sadly, TIFFs also have among the highest file sizes compared to other formats, so they're not all that useful for online applications.

PNG

Portable Network Graphics

This is one of the more recent file types here and is comparable to the GIF in terms of overall quality. It's also an 8-bit image and, like GIF, is perfect for web use. Unlike GIF, PNG has full colour reproduction, so it can retain all information and colour data, resulting in better quality images with the same small file sizes. It can also handle transparency. PNG's cannot be animated, though.

PNGs are becoming more and more widespread, with many sites using them instead of JPG files. [mm](#)





Touch Mat playing Teslagrad

HP Sprout

The First Smart Desktop?

David Briddock discovers how lateral thinking led to this piece of desktop PC innovation

The desktop computer isn't the first place you'd look for innovation these days. Smartphone and tablet devices? Probably. Smartwatches, fitness bands and other wearables? Absolutely. HP thinks it's about to reinvent the desktop for the smartphone and tablet generation, though.

HP's Concept

HP's ambition is to challenge the traditional consumer view that PCs are for office-centric tasks, web browsing, online communication and hardcore gaming – and the idea behind its latest desktop product line is indeed an interesting one. The plan was originally to design a workstation-style platform that would meet the needs of creative people – whether they be photographers, graphics designers, digital 2D or 3D artists, animators, film makers, musicians or writers – and to achieve this goal HP has created a novel technology mix.



Firstly, there's the high performance hardware components: fast processor, powerful graphics card, large memory and high-resolution multi-touch monitor. Secondly, there's a tablet-like capacitive multi-touch mat, which acts like a secondary screen and a 2D and 3D image/object capture platform. Thirdly, all this is tied together by a suite of new and heavily customised creative software applications.

HP has named this tech fusion 'Blended Reality'. It's a neat marketing phrase, but what does it actually mean? Well, Dion Weisler, its Executive Vice President of Printing and Personal Systems, says, "Blended Reality technologies will reduce the barriers between the digital and physical worlds, enabling us to express ourselves at the speed of thought – without filters, without limitations."

While Ron Coughlin, Senior Vice President of Consumer Personal Systems adds, "Until now, the physical and digital worlds have largely been separated and digital creation has remained in 2D. With Sprout by HP, we introduce the first immersive computing platform, seamlessly merging these two worlds together, enabling people to intuitively bring their creations, work, and projects to life in 3D."

So, with these words in mind, let's look at the HP Sprout specification in more detail.

Tech Melting Pot

At its heart is a fourth-generation Intel Core i7 chip, plus a Nvidia GeForce GT745A graphics card, 8GB of RAM, 1TB of storage and a 23" HD (1,920 x 1,080 pixel) multi-touch monitor. While the all-in-one construction format incorporates four speakers, a 10-watt subwoofer, HDMI out, four USB ports and a memory card reader.

Up to that point it seems rather like a number of other well-specified PC you can pick up from a number of vendors. Then, however, you get to the 'blended reality' elements. Starting at the top there's the Illuminator, which protrudes out over the top of the monitor rather like a roadside street light. Inside the Illuminator cover there's a 1024 x 767 pixel DLP projector, an Intel RealSense camera system, a 14.6MP scanner, a front-facing webcam, digital MEMS microphones plus an LED desk lamp.

Right at the bottom of the unit is a special port to accept the bespoke magnetic-style connector for the touch mat. At the connector point there are three projection-dedicated touch controls.

The touch mat itself is capacitive in nature, for high levels of sensitivity and response, while supporting 20 separate touch points for gesture flexibility. In operation the touch mat acts like a fully independent second display, thanks to the Illuminator's DLP projector. A pressure sensitive digital stylus is also included.

Blended Reality Vision

We've all fallen in love with the touch interaction interfaces on our modern day smartphones and tablets. It's a technology that delivers an easy-to-learn, easy-to-use solution for social communication and web browsing. One where age and inexperience isn't a barrier.

The simplicity of finger-prodding and naturalistic gestures have encouraged millions of consumers to purchase and explore the latest products. HP hopes to capitalise on this momentum with its 'Blended Reality' vision. It thinks similar interface technology will enable anyone to fabricate, manipulate, communicate, collaborate and teach in an intuitive free-flowing manner.

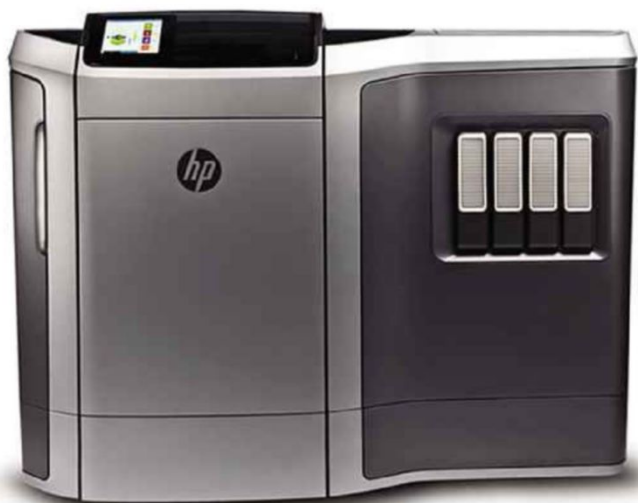
“ HP sees the touch mat as a multi-purpose, activity-specific canvas ”

In essence HP sees the touch mat as a multi-purpose, activity-specific canvas. A canvas that dynamically changes from app to app and from mode to mode. A canvas that can transform into a bespoke keyboard, a video editing toolbox, a game controller, an artist's paintbox or a musical instrument. A canvas that's dynamic, with items on the main screen brought into play using a 'flick down' gesture.

3D Scanning And Printing

The ability to quickly and simply bring everyday objects into the digital world is one of the HP Sprout's key selling points. This feature, HP hopes, will appeal directly to designers, artists, film makers and anyone else with creativity in mind.

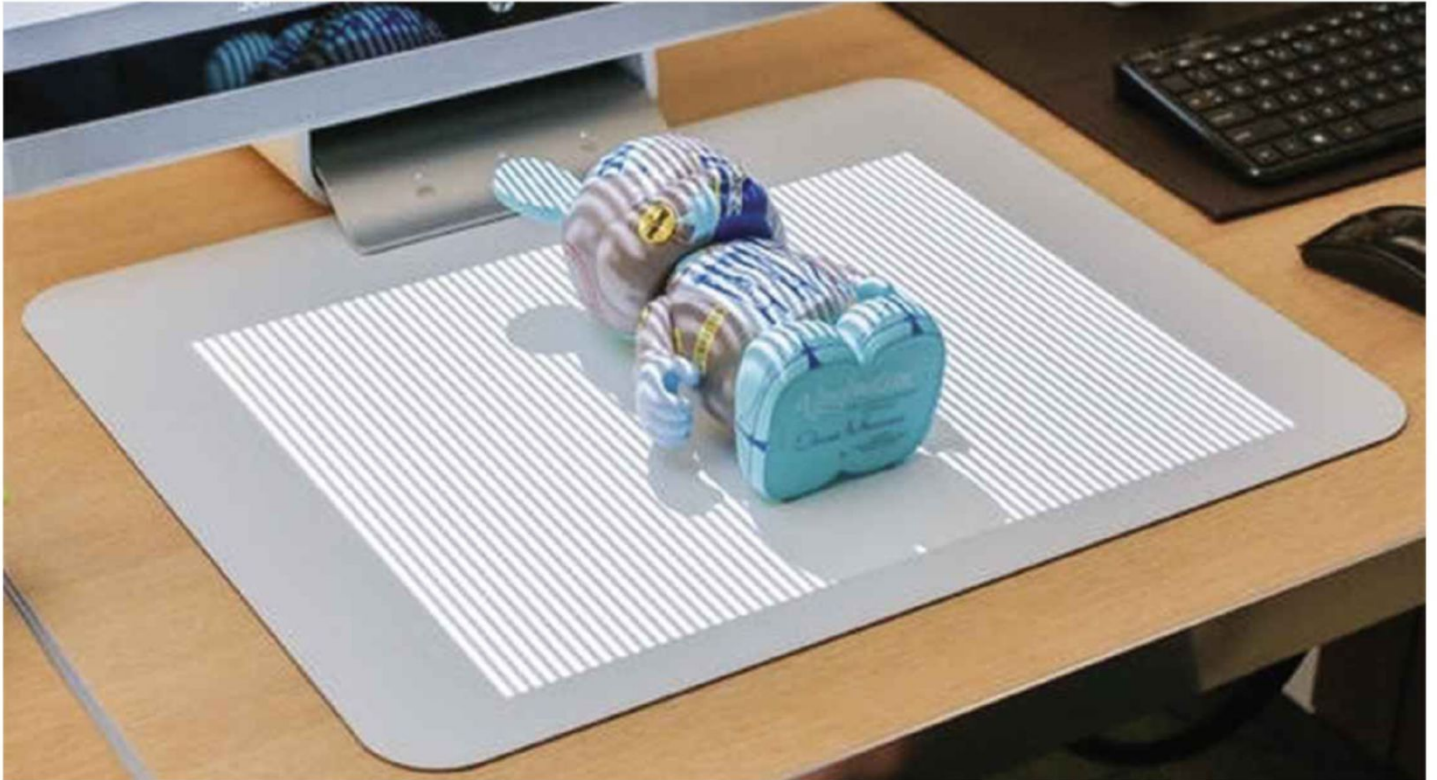
The built-in projector and 3D camera scans any object placed on the touch mat. Once scanned this captured 3D representation can



▲ HP Multi Jet Fusion printer



▲ HP Sprout desktop



▲ 3d scan

be resized, scaled, rotated, edited, re-coloured and textured. The finished artefact can then be imported into images, web pages, documents, presentations or any kind of arty project.

To bolster its creative market aspirations still further, HP has been developing what it believes to be a market-disruptive 3D printer technology (see boxout). While currently too large for home use it's an ideal solution for small- to medium-sized companies – like ShapeWays, for example, which offers 3D printing services.

Apps

Of course, none of these extra hardware elements mean that much unless they're supported by software. So there's a bundle of Sprout-centric apps included too.

Arty types have Crayola Colour Draw and Sing, Fuse Character Generator, Martha Stewart Craft Studio or Pianotime. While budding movie makers can use StoryProducer DreamWorks Edition or Power Director.

Fun titles include *Spruzzle* which constructs puzzle games from an image, photo or 2D/3D scan. While gamers can play *Infinite Scuba*, *Trine 2* and the steampunk platform *Teslagrad*.

US First

It's an impressive technological melting pot, and one that's sure to turn a few heads in the creative domain, which makes one wonder why HP chose such a strange product name. It doesn't exactly project a creative or a high-tech image – and it could be a source of confusion, even ridicule, especially here in the UK.

Still, strange name or not, the HP Sprout went on sale in the US in November 2014 for \$1,899. Initially it was only available at a few locations, namely BestBuy and the Microsoft Store.

HP has indicated it intends to eventually offer Sprout technology to other countries. As of December 2014 there's been no announcement of UK or European rollout plans. Why the delay? Well, it could suggest a modified or updated model for non-US markets; maybe a name change too?

Dell Competition

So far the HP Sprout doesn't have any direct competitor, which should help sales. That situation isn't going to last, though. Dell, for one, is keen to inform the industry of its own plans. Branded the 'Smart Desk', it's likely to use the company's own 5K monitor (the UltraSharp 27) with a resolution of 5120 x 2880. That's over 14 million pixels in total, and seven times the resolution of 1080p. This monitor should be available in December 2014.

Aside from the 5K monitor there's a couple of Harmon Kardon speakers that deliver 16 watts of power. However, with the monitor itself likely to cost around \$2000, it's going to be a very expensive piece of kit. Certainly far more than the HP Sprout.

Rather than using a capacitive multi-touch mat Dell's Smart Desk places a tablet-like touchscreen LCD display in front of the widescreen desktop monitor. Supporting ten-finger touch, along with gestures like pinch and swipe, this LCD acts as a second display, virtual keyboard or specialised app-specific interface – just as with the Sprout.

Once again the bundled digital stylus offers a natural interface for drawing, painting, photo retouching and so on, but there are other intriguing options too. In a video demonstration a hollow ring is placed onto the touchscreen and acts like a control dial to scroll through a photo collection, adjust colours in an art application, alter the orientation of a Google Map or navigate multiple desktop screens.

There's no mention of anything akin to the Sprout's integrated 3D scanning capabilities, but it all sounds pretty interesting nevertheless – even if it's still at the prototype concept stage. Maybe Dell is waiting to see the HP Sprout's sales figures before committing to the concept fully?

Sales Challenges

This hits upon a big problem. Attractive as the smart desktop (or Blended Reality) platform is, at the moment nobody knows if it will have mass market appeal, or just be seen as a niche product. Let's



▲ Projector and Camera

consider the sales challenges: these are expensive products, and thus call into question exactly who constitutes the target audience. Either HP or Dell's offering will set you back a pretty penny – certainly when those prices have been inflated by conversion to sterling, euros and other currencies. So are they aimed at families with cash to spare looking for something different at home, or creative professionals? Rather **unfortunately**, HP seems undecided, or desperate to hedge its bets.

The HP Sprout web pages, marketing videos and initial application suite lends it a fun-for-all-the-family image. How many families will be happy to spend this kind of money is **unclear**, **however**, nor whether they'll decide if the value-added features and capabilities justify the high price tag for a home-based PC.

There's also plenty of marketing references to creative types too, yet if the smart desktop is to be a success with professionals three areas need to be overcome. Is it fit-for-purpose hardware? Will it have industry-standard software? Then there's the Apple problem.

While seen as high-end for home use, the hardware specs fall short of full professional aspirations. For a start, the projection and 2D/3D camera resolutions need to be higher – and as 2015 rolls along 5K pixel resolution monitors, like that the Dell promises, could be a common sight in creative offices.

As with any new system, there's bound to be shortage of software that takes advantage of the new interface and its scanning features. Professionals, however, will be very reluctant to move away from their favourite, tried-and-trusted applications and tools (and the ones they probably learned their trades with in the first place, or took very expensive courses to master). So **far**, there's no indication if these will be enhanced to take advantage of the smart desktop platform.

Today it's Apple that dominates the creative professional arena. Apple products are notoriously expensive, but so is the HP Sprout, even though it doesn't really compete with Apple in aesthetics or build **quality**. Maybe Dell intends to offer an Apple-like experience with its Smart Desktop, but it looks to be even more expensive.

HP's Multi Jet Fusion 3D Printer

HP has high hopes for its new 3D printing technology. Personal Systems Group Head Dion Weisler said, "It's not just a 3D printer, it's a tool to trigger the next industrial revolution."

Dubbed 'HP Multi Jet Fusion' it's a significant departure from existing plastics-based solutions and actually closer to laser sintering where a lasers to heats and fuses powders (goo.gl/XBNZTv).

In operation, fusion works in a similar way to an ink jet printer. An object is built up from successive 'printed' layers. Each layer of material is ejected from 30,000 nozzles spraying up to 350 million drops a second, which is then fused by applying an energy source.

Multi Jet Fusion can apply multiple print materials in a single pass. So a strong, rigid element could be adjacent to bendier, more elastic ones. Multiple materials also means multiple colours, different opacities, varying textures and even specific thermal or electric conductivity properties.

Importantly the technology is said to be over ten times faster than existing strategies, resulting in lower production costs. Yet model accuracy and surface finish is also improved, which HP hopes (with more intricate designs) lead to higher overall customer satisfaction.

HP Troubles

Despite its size and high profile, HP is in trouble. Falling sales have put its senior management and share price under pressure. The desktop marketplace hasn't fared too well in **recently**, indeed 2013 IDC figures say worldwide desktop sales fell significantly during 2012 and 2013. One key reason is the adoption of touch-interface tablets for everyday tasks such as emails, web browsing and social networking, which has pushed outdated PC replacements down the purchasing list.

Tablets are simple to grasp, fun to use and portable, and to meet the challenge they present, HP will have split itself into two separate companies by October 2015. One will take on the PC and Printing business, while the other will be responsible for Enterprise Services. For the **former**, at least, there are some reasons for optimism: 2014 saw the PC sales decline halt, and pundits are betting on a small but steady rise over the next few years as tablet sales level off and PCs need to be replaced. In fact last year HP's PC business did fairly well with a 4% increase, largely due to strong corporate laptop sales.

Now imagine if there was an exciting new range of powerful multi-functional PCs with ultra-high resolution displays, multi-touch interfaces and 3D cameras. PCs that offer exciting new possibilities for work, play and entertainment. With the right kind of marketing, the effect on the PC marketplace as a whole could be more dramatic.

Room For Others?

As we've seen, Smart PCs are definitely high-end, high-price products. **However**, there's bound to be a market for add-ons and accessories that can upgrade and customise existing PCs and offer at least some of the features enjoyed by Smart PC owners. After all, there's nothing revolutionary about a capacitive mat, an LCD screen, a DLP projector or even 3D **camera/scanner**. Does this fact leave the door open for Microsoft to join the smart desktop game? In the past the answer would have been a resounding no, but now Satya Nadella is at the helm you never know. By merging Surface and desktop PC hardware with Windows 10 the Smart Desktop market leader could be in fact end up being Microsoft. **mm**



Health And Fitness Apps For Android

Avoid the gym by getting fit with your Android pal, with five of the most intriguing health and fitness apps

Now that the new year is firmly underway, you might want to continue that resolution to get fitter and healthier, and what better way to do so than to use the technology you have on you at all times? App developers agree, and there are literally hundreds of apps that can assist you in eating better, exercising well and even drinking more of the right kind of fluids.

As usual, all the apps reviewed below are available free of charge in the Google Play store, and all were tested on Android 4.3.

Google Fit

Rather more than a simple app, Fit is Google's attempt to crowbar health and fitness into Android. It comes with a series of APIs that other developers can use to track activity via a device's sensors or via one of the much hyped Android wearable devices.

By itself and without add-ons, the Fit app aims to track your activity. It does this by using the motion sensors and GPS of a device to note when you move around via your own ambulation. You can also tell it when you've done some kind of sport by tapping the menu and then selecting from a comprehensive list, which includes everything from simple walking, running and biking to Australian football and beach volleyball. You also need to tell it

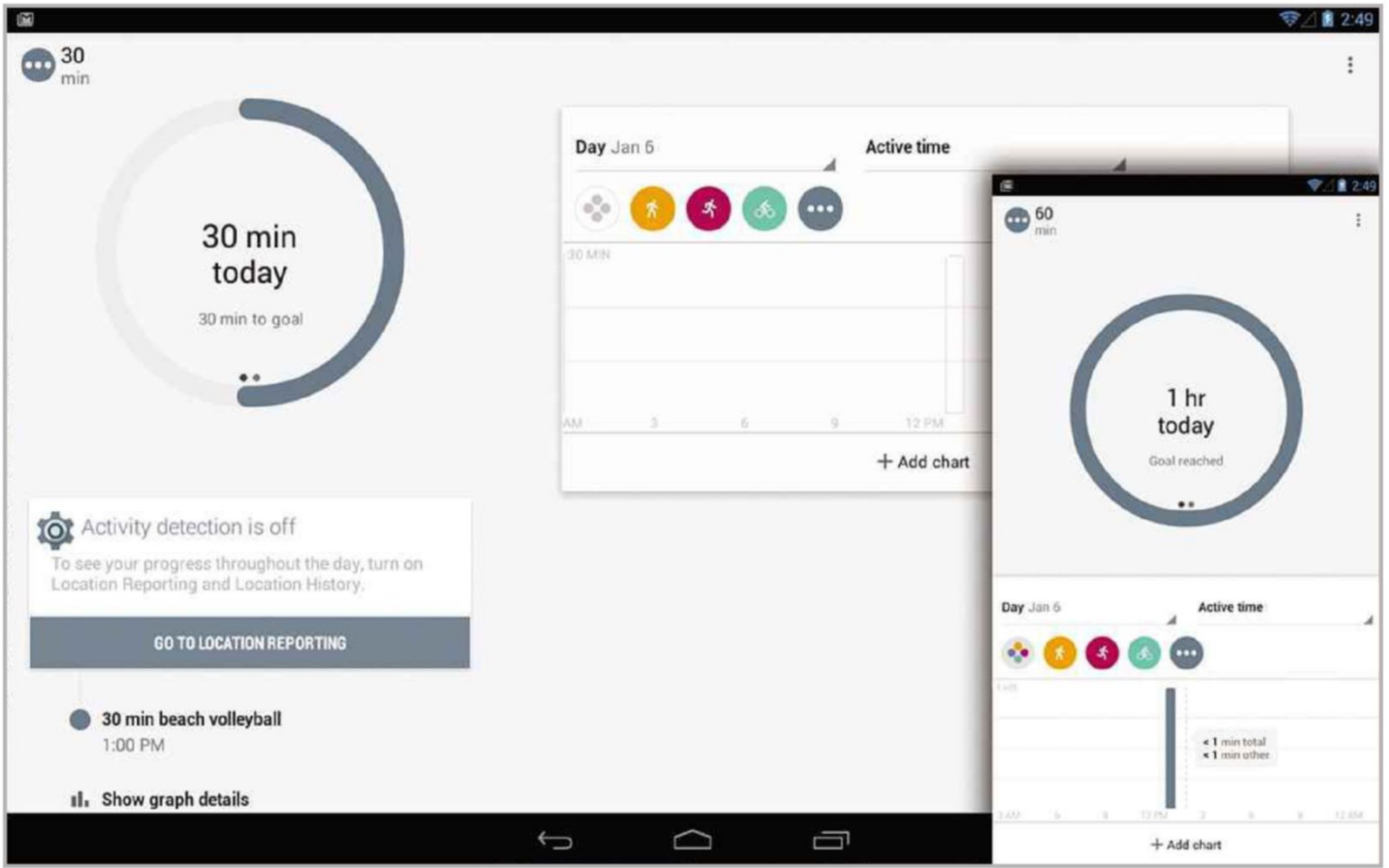
how long you did the activity for – in hours and/or minutes, and at what time of day.

A goal of one hour of activity a day is set by default, but this can be increased or decreased in the Settings component of the app. Once you've achieved your goal, you're rewarded with a nice congratulatory animation in the main window of the app.

On both a phone and (perhaps surprisingly) tablet, the app displays a clock-like circle that's progressively filled in as you progress towards your goal. Alternatively, you can swipe within the circle to switch it to showing the number of steps you've made that day, which are again measured by turning the device's motion sensors into a pedometer that even works when the app isn't in the foreground. Once again, a goal for the number of steps you should take each day is shown.

On a tablet, the information displayed is augmented by a history graph at the right of the screen. On a phone this can be shown by tapping the button at the bottom of the screen. The graph lets you filter via activities you've completed or show all activity and again can be switched to show the number of steps you've taken.

Because Fit is cloud enabled, you can tune in via the fit.google.com website too.



Google Fit looks great and has some useful features but lacks any real innovation

As an app, Fit certainly looks pretty, as do all recent Google apps, but we were left feeling underwhelmed. This is a product clearly designed to make use of wearables, but that doesn't mean the app can't innovate on its own for more regular users whose only foray into Android hardware is to buy a phone.

Fitness - Home & Gym Workouts

Let's face facts: people who work in gyms can be a little annoying. Usually they've no concept of what it's like to be overweight or not fit, which is annoying because these are things many of us live with daily. The opportunity to have a personal fitness trainer in an app is surely inviting and this is what Fitness – Home & Gym Workouts offers, although this is only its name at the Play store, and within the app it's called Virtuagym, which is what we'll call it here.

The core of Virtuagym is timed exercise routines for use at home or in the gym. Each features video clips not only showing what to do but also acting as a exercise partner to pace your workout. In addition to the footage, a voice rather like that of Queeg in *Red Dwarf* occasionally chimes in to tell you when your time for a particular exercise is running out or to offer occasional encouragement.

Even if you're too busy exercising to pay attention to the screen, you can listen to the ticking of the clock counting down (this sounds, oddly, like an old grandfather clock). You also hear a beat of the clock for each repetition you're supposed to do on non-timed routines.

Between each exercise you're given a short cooldown period, usually in the order of 30 seconds, and again Queeg will tell you when you ought to be preparing to continue. During the cooldown, you can opt to skip the upcoming exercise or pause, and tapping the screen during any workout will pause that particular exercise. However, other than returning to the workout list via the main app

menu, there didn't appear to be any way to suspend the session for resuming later. This is odd.

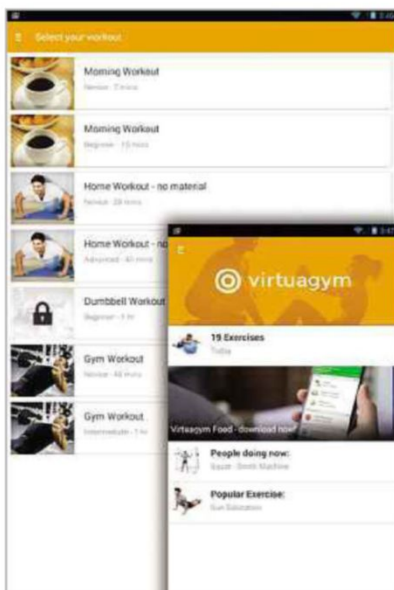
The app's primarily designed for a phone, and it treats a tablet as simply a large phone, but this works pretty well, although it forces

“ A voice rather like that of Queeg in *Red Dwarf* occasionally chimes in ”

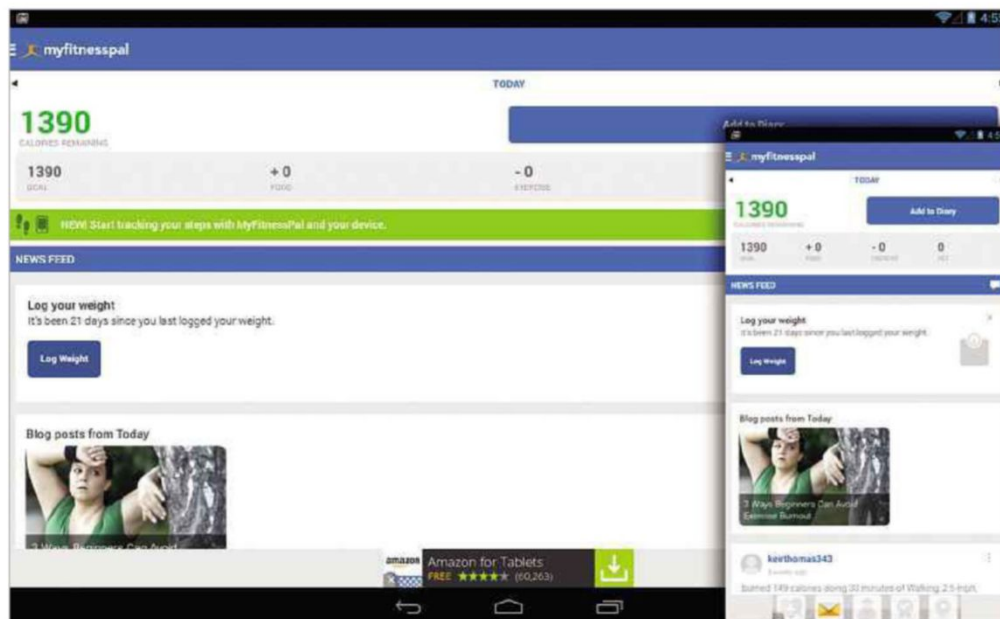
you to hold the device in portrait orientation. For those hoping to use a tablet's case or cover to hook their device over exercise equipment, this insistence on portrait could be annoying.

Without registering, you get a small but useful range of workouts, each consisting of individual exercises, while registering via email or by logging in using Facebook significantly boosts this and opens up other useful features in the app, such as the ability to track your weight or create custom workouts. Even at this stage, some workout plans are hidden behind a Pro banner, which will cost you \$6.99 as an in-app purchase to unlock for four weeks or \$29.99 per year. Logging in via Facebook lets you share your achievements with others, and achievements include earning points for everything you do, as well as for the quantity of virtual miles you cover. Your progress can also be tracked at virtuagym.com.

It all works pretty well, but there were one or two instances where we were left scratching our head wondering how to do what should be basic tasks such as create a new workout. There's little if any context-sensitive help. Additionally, it wasn't hard to encounter bugs;



For those wanting a free of charge gym buddy in their own home, Virtuagym offers a lot of workout video content



MyFitnessPal logs what you eat and what exercise you take to let you monitor progress and how quickly you achieve your goals

on attempting to buy the Pro upgrade, for example, it claimed we had already done so (although we didn't have access to Pro content).

For those new to exercise or who need a little brushing up in a hassle-free environment, Virtuagym offers a lot, much of which is entirely free of charge.

MyFitnessPal

The kind of free app that can restore your faith in the sheer usefulness of mobile devices, MyFitnessPal aims to track not only how you exercise but also what you eat. It does this by acting as a diary in which you can record information, which you can also choose to share with a wide community of other users. You can add exercise (cardiovascular or strength), plus details of your meals and consumption of water. To aid the logging of what you eat, the app can scan product barcodes using your device's camera (assuming it has one) and its database is remarkably good, especially considering this is a US app. Put simply, everything we threw at it from our kitchen cupboards worked fine, providing a full run-down of nutritional information to boot.

When the app first runs, however, you'll need to tell it about yourself. You'll be quizzed on your existing health levels and your plans – how much weight you want to lose and what kind of lifestyle you lead: **Sedentary**, **Lightly Active**, **Active** or **Very Active**. You'll then be set a target calorie count per day, which you'll chip away at each time you eat something.

Inputting any exercise you do is similarly hassle free, and you can again search for your particular activity from an extensive list, making it easy to tell the app you spent your lunchtime kicking around a football for 15 minutes, for example. The app will work out the calories spent and, cleverly, add them to your daily calorie limit to show explicitly the link between exercise and food consumption.

The app hooks into Android's notifications system to remind you to add entries whenever you eat, but perhaps surprisingly these have to be set up manually. This is simply a matter of choosing the option on the main menu and then tapping the relevant button. Default choices of breakfast, lunch, dinner and so on can be selected with a tap.

An option on the menu lets you view your weight loss as a graph spread across a number of months (although, unfortunately, not weeks – such a feature would be useful in the early stages of using the app). You can also track the thickness of your waist and hips,

and even your neck, if you're the kind of person who frets about collar size.

There's lots more to MyFitnessPal, including a way to log recipes, the ability to set specific goals, and the ability to tune into the progress of friends who are also using the app. The folks behind the app really have thought through everything you might want to do and made it entirely accessible.

Although you have no choice but to create an account when setting up the app, this means data syncs automatically between all your devices (including Apple), and you can also access it via the **www.myfitnesspal.com** website.

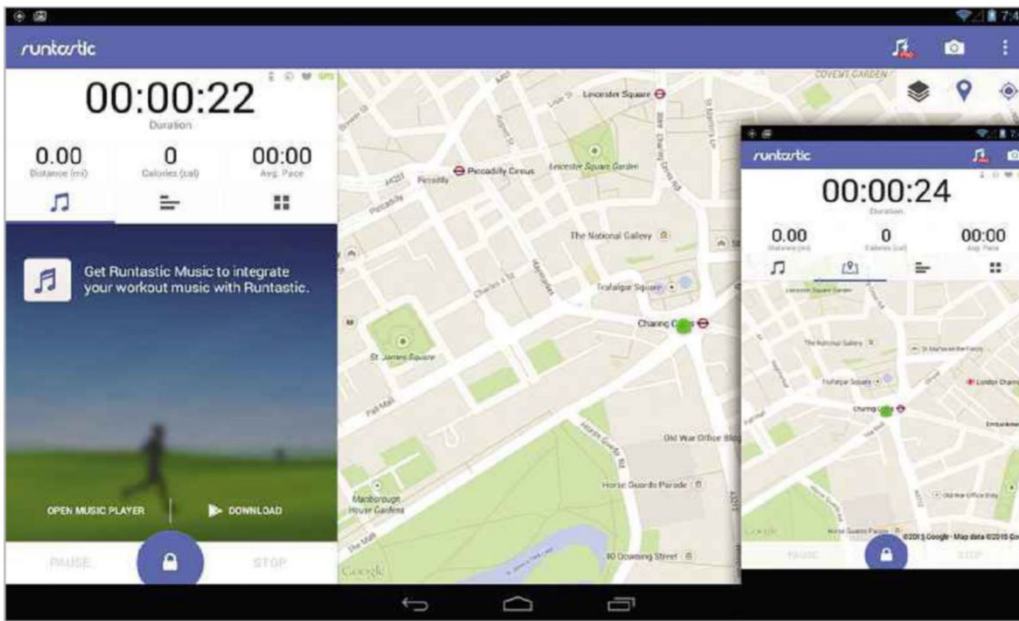
The best news is that MyFitnessPal is entirely free of charge. You'll see some on-screen adverts but this seems a fair trade-off for what is perhaps one of the most useful apps reviewed here.

Runtastic

With running, cycling and walking being among the most popular forms of exercise, it's no surprise that there's quite a handful of apps offering to track, monitor and improve your times and techniques. Runtastic is one of the best and can be used on both tablets and phones, and it caters to all three pursuits. The idea of using Runtastic on a tablet might come as a bit of surprise (who'd want to be clutching a tablet while exercising?), but smaller tablets in particular can be mounted to the handlebars of bikes or even just pocketed by those who are walking.

On a phone, the app opens to show a map of your current location, plus a large green Start button that lets you track your exercise. However, before tapping this, you can also tap the music icon to set up a playlist. Tapping Start then commences a 15-second countdown, and then the timer activates, and your progress is tracked live on the map as a blue line. During initial setup, you're invited to tell the app your weight, height and age, and this enables it to provide a live estimate of how many calories you're burning, which is shown at the top alongside figures showing the distance you've covered and your average pace.

On a tablet in landscape orientation, the app opens to show a calendar, on which will eventually be plotted your various exercise excursions. To begin a run, you must tap the menu button and select **Activity**. For some reason, this calendar view simply isn't available



▲ Runtastic lets you measure and plot your progress as you run, cycle or walk, and includes motivational plans to boot



Water Your Body lets you record your liquid intake across days in order to graph it for reference purposes

on a phone or at least not as far as we could see; when tapping the History entry on the menu you're simply shown a listing of your recent excursions. However, you can tune into the calendar online at www.runtastic.com.

The unique LIVE Tracking feature lets the app post to Facebook as you run and thereby "receive cheers from friends & fans". Hmmm. We're not sure our FB friends would respond in such a positive way...

Runs are ended by tapping the lock button, then tapping Stop, at which point you can add a description, plus a picture and an emoticon (including, *entertainingly*, a sad face indicating injury). You then get the option to share all of this via the usual social media outlets, including Facebook, Twitter and Google Plus. You can even email the details or send them as a message.

“ For many people, the route to getting fit begins with the single step of detoxing ”

Following this, you're shown just about every stat about the run that you might want to know, such as your average speed, max speed and elevation gain/loss (that is, how much you ran up or down hill across the entire run).

Training plans are available if you have a particular goal in mind, although they cost a whopping £16.99 each. The plans are created by personal fitness coaches and include Weight Loss, 10K Run and Bikini Body Prep. Also available for 99p each are Story Running plans, which are dramatic audio tales in which you're the protagonist. The idea is that you can listen to these in order to motivate yourself. Ever wanted to pretend to run away from Alcatraz? Now's your chance!

Upgrading to Runtastic Pro for a further £4.99 brings a voice coach, more advanced statistics, heart rate measurement and much more. Rather *entertainingly*, the Pro upgrade also lets you set a Powersong – the one track of music you know motivates you and that you can use as a last resort when you feel yourself flagging!

While the hard sell and also full-screen adverts can be a bit annoying, at its core Runtastic contains some very useful features for zero cost.

Water Your Body

For many people, the route to getting fit begins with the single step of detoxing, and that usually means drinking lots of water. Unsurprisingly, Water Your Body was created to help with this goal and applies typical fitness app features to the simple task of consuming liquid.

On starting, the app requests your weight, which can be entered in pounds or kilograms (but not, annoyingly, stones). It'll then give you a target for water consumption that it's your duty to fulfil before the day is out. Entering a weight of 200lb provided a rather ambitious target of consuming nearly four litres of water.

You tell the app about drinking by tapping the button at the bottom of the screen. The default measure is 150ml – about the size of a porcelain cup of tea – but by tapping the icon alongside, you can select larger measures, such as 500ml (around a pint). Drinks are shown in the form of cups and glasses that collect at the top of the screen. In case you forget to drink, the app will notify you via a sound, vibrational buzz and flash of the camera LED. By default, these notifications occur 60 minutes after each drink, but this can be customised in the Settings panel.

The app can also monitor your weight but only by you tapping the button at the top right of the screen and entering it. Should you do this frequently enough, you can tap the menu button to see a graph of your weight loss and also tap to see a graph of your water consumption over time (including previous days). Swiping right on the screen also lets you view your previous day's intake.

And that's about all there is to say about this app. If drinking water is really important to your particular diet or exercise regime, then there's probably nothing better, and those who simply don't drink enough and suffer the consequences will probably find it very invaluable. If you have kidney disease, it could be a lifesaver. However, for the rest of us, it's perhaps less vital.

The app's supported by ads, which can be removed via a somewhat stiff £3.99 in-app purchase. The app runs on both tablets and phones, but treats tablets as a large phone, so is a little unwieldy and strange to use on anything other than the smaller confines of a phone screen. [mm](#)

Remembering...

3dfx Voodoo Graphics Cards

David Hayward recalls the beginning of 3D-enabled PC gaming

Back in a time where most of us were struggling with the latest games on an old 486 with a relatively lesser-powered Cirrus Logic graphics card installed, there came along something rather drastic and quite radical: the 3D graphics card.

Game development was moving along at a rate of knots, so both the developers and gamers of the time demanded more power and more ability to visualise the game worlds that were being created. To that end, a more capable 3D rendering piece of hardware was needed. One that was significantly more adept than the current stock available to the users and consequently powerful enough to cope with the many polygons and tessellations that make up the average 3D world.

A number of companies stepped up to take on this new challenge: Orchid Technologies, Diamond **Monster**, Matrox, Magic3D and FX PowerVR were some of the more notable that released PCI boards that connected through a VGA pass-through cable and took over the 3D rendering side of things, with the separate 2D work being handled by the already present standard graphics card. **Incidentally**, they often made a clicking sound when swapping from 2D to 3D – remember that?

All those 3D daughter boards, for want of a better description, had one thing in common. They all used the chips that were initially designed by a small team from Silicon Graphics, which later formed as 3dfx Interactive and gave us the Voodoo graphics cards.

Its History

Launched on November 1996, the Voodoo graphics card was an impressive bit of hardware. The cost of EDO RAM had dropped significantly in the previous months, and as a result, it was possible to construct an affordable graphics card with 4MB of EDO RAM together with the relevant 3dfx chips on board.

Apparently, looking back at the technology involved, the first Voodoo cards consisted of the aforementioned memory – which was also available in 6MB and 8MB versions – a digital-to-analogue converter, a 50MHz frame buffer processor and a texture mapping processor. There were also the mechanical relays, which allowed the 3D chipset to take over the output from the 2D card and which also made the clicking sound.

By the following year, 3dfx had quite the following, and as a result, it released the Voodoo Rush. The Rush was wildly different to anything else around at the time, in that it didn't require the presence of a 2D card. While it was the future, though, it didn't perform quite as well as

the previous Voodoo model, as the RAM was shared with the 2D and 3D functions of the card.

After that came the Voodoo 2, with 8MB and 12MB RAM models, followed by the infamous Voodoo Banshee, which made use of the new AGP slot standard and offered an unmatched graphical performance.

Unfortunately, 3dfx's range started to wane by the late 90s. After being dropped by Sega in favour of the PowerVR chipset, things never really picked up. And by late 2000 3dfx declared bankruptcy and was eventually bought up by Nvidia.

The Good

Amazing 3D rendered graphics and the spiritual birth of the modern GPU.

The Bad

Often clunky drivers, poor Glide3D driver implementation and frequently the relays got stuck and you'd end up with a black, clicking screen.

Conclusion

3dfx Voodoo graphics, thank you for giving us semi-realistic (for the time) aliens, zombies and game worlds. Without you we would have been stuck with boring old consoles, and PC gaming would never have become the awesome spectacle that it is **today**.

Did You Know?

- There were two Sega Dreamcast models being tested, project Katana with the PowerVR chipset, and project Blackbelt, with the 3dfx chipset.
- You could SLI two PCI Voodoo 2 cards with a ribbon cable, which card contributed to half the display's scan lines per frame.
- The 3dfx Spectre 3000, which was never released, was to be the most power card ever with 128MB DDR RAM, AGP4x, 200MHz GPU clock, 400MHz memory and support for DirectX 7.0.
- We recently played GLQuake on a Pentium MMX 225MHz PC with a Voodoo2 installed.



▲ The original 3dfx Voodoo graphics card, with VGA pass-through



▲ The birth of SLI graphics, with the Voodoo 2



▲ The much coveted Voodoo Banshee

The Things That Frustrate Us About... PayPal

PayPal seems to have made sending and receiving money online easier, but we're still annoyed with it

The one thing we're told over and over when it comes to using the internet – apart from the importance of creating strong passwords – is that we should be extra careful who we give our bank or card details to. So being able to use PayPal to shop online or to send money between friends and relatives seems like a no-brainer. You don't need to entrust anyone except PayPal with your details, and all you have to remember is your PayPal password – which, of course, is good and strong, right?

Well, it might be convenient and safe, but that doesn't mean it's perfect. There are plenty of people who've had serious issues with PayPal in the past, and people who've even lost large chunks of money because of some bureaucratic nonsense that locked them out of their accounts. Thankfully, nothing that serious has ever happened to us, but we still have a few gripes with the service ...

Argh! Fees!

PayPay claims that its fees are straightforward and obvious, and there are never any nasty surprises. Sure enough, you can find out how

much PayPal charges for transactions by doing a quick search on its website, and if you're only planning to buy stuff, you'll find you don't get stung. But if you're a seller, PayPal suddenly starts to look quite expensive.

Also, it's not quite as simple as it makes out, because it all depends on how much stuff you sell and where you sell it to – so it could be that you have to pay fees as low as 1.4% + 20p per transaction, but it could also mean you have to pay 3.4% + 20p. If you're an experienced eBay, you'll probably get the hang of it quite easily, but for someone new to the whole idea, it sounds pretty daunting.

Fix it: If you want to use PayPal, you have to pay the fees, so there's no fix, as such. You just have to get on with it. Sorry!

What?! Limits And Verification?!

It's quick and easy to set up a PayPal account. You can do it in minutes. But that account will have all sorts of limits on it, and to get them removed and get the most out of your account, you'll have to go through

a series of checks. You'll need to add and confirm your bank account, for one thing, which involves a 1p deposit going into your account with a code attached; you might also need to add and confirm a credit or debit card, and that involves a £1 charge to your card with a code attached. The process is, admittedly, way quicker than it used to be – it can be sorted within hours, rather than days – but it's still a faff.

Fix it: Yeah, again, you can't – just grit your teeth and get it sorted.

Well... What Else Is There?

Ultimately, the most frustrating thing about PayPal is that if you want to use eBay, you don't really have any choice but to use it. And as it's becoming accepted by more and more real-world retailers too, it's become one of the default payment methods out there. Which is great, unless you do have a legitimate beef with it, or maybe just would like some choice in the payment methods you use – because there isn't really much choice out there.

Fix it: If someone wants to set up a really great alternative to PayPal that's accepted as widely, that'd be great, thanks.

Selling with PayPal.

We help process payments for millions of customers worldwide. Our seller fees are simple and transparent. PayPal charges UK sellers a fee of between 1.4% and 3.4% of the total sale plus 20p per transaction within the UK. The fee depends on how much you sell, so the more you sell, the less you pay. **Check it out:**

Standard transaction fee within the UK:	3.4% + 20p per transaction
Discounted fee for eligible merchants that has the profit organisations (upon application and approval):	As low as 1.4% + 20p per transaction based on volume
Repayments within the UK (upon application and approval):	0% + 10p per transaction
PayPal Invoicing (upon application and approval):	2.75% for payments using Cheque and PFI cards and PayPal checks or 3.4% + 20p for card payments made by skipping the inspection, step or manually entering the card details. Owner fees only apply. (PayPal Business account fees apply to all other payments received)
International sales:	Additional fees apply for currency conversion and cross-border payments.

[Get Started](#)

PayPal Summary Activity Send and Request Wallet

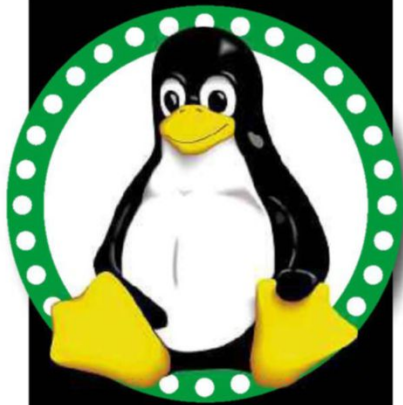
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STUDIO Formobile	supplements online	Vibe Tribe	VoucherCart	wiggle
Wink	Writing for Tilly			

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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

Support From The Forum

It's worth reaching out for help

Just before we parted company for Christmas, with the editor staggering up the street after consuming a bottle of the true water toward the train station, we posted a request for help from Tron Fisher.

Tron was having trouble keeping up with the removal of old, no longer necessary files on a smaller Linux partition. He had already removed as much as he could, but didn't want to get rid of anything else in case he deleted something necessary for the smooth running of his chosen OS.

Thankfully, WyliecoyoteUK, from the Micro Mart forums, got in touch and provided me with a link to a Linux Tips Project page, which goes into detail with regards to cleaning up a copy of Ubuntu.

Wylie also mentions that he currently runs an 8GB SSD on one of his PCs, with / on the SSD and /var, /swap and /home on a separate 1TB spinner. And as he mentions, he needs to keep an active eye on the space being used by unwanted, or rather unnecessary, files.

Easy Linux Tips

The site Wylie provided me with can be found at goo.gl/hXHO9P, and it's really very good.

There are tips to clean up the updates cache, through selecting to delete the downloaded packages after installation when using Synaptic Package Manager, as well as the removal of unused uninstalled software, using Synaptic again to highlight Complete Removal. And there

are tips to help you clear the thumbnail cache, by entering `'rm -f ~/.cache/thumbnails/normal/*'` into the Terminal.

More importantly (and as this is something Tron mentioned in his original email to me), the page also covers the removal of old kernels. By removing an old kernel you're cleaning up

What I'd like to be able to do is list, perhaps on the Micro Mart forum or on this page, a selection of handy tips and tricks sites that you Linux users know to work and that are regularly maintained and monitored.

If we get a significant number, then I'll put them up.

By removing an old kernel you're cleaning up the wasted space

the wasted space used by the previous kernel, and you're also cleaning up the Grub menu – obviously you'll only do this provided you don't want to boot from the previous kernel any more.

Any More Sites Like This?

What I liked most about this site was the opening sentence: "never use cleaning applications like Bleachbit! They are very risky and may damage your system beyond repair". Any site that starts with informing people that the majority of so-called cleaning programs for Linux don't work automatically ranks pretty highly with me.

It got me thinking, though: what other sites like this one are out there? It's easy enough to do a Google search for relevant sites, but they don't always yield the results you would expect, or the information they contain is often wrong to the point of failure.

But the emphasis has to be on a site that's accurate, clear, easy to understand and can help inform Linux users of every level of experience. If you have a selection that you've collected over the year, then please send me the links, either through the usual editorial address or through the Micro Mart forum. And before I forget, thank you WyliecoyoteUK; your advice was gratefully received.

Until next week then, folks.

▼ Can we create the ultimate in Linux help contacts?



News Updates

Sven Harvey returns with more Amiga news

Amiga Remix

After a long gap between updates AmigaRemix.com had been updated, and it's the largest addition of tracks ever brought to the website. Just before Christmas, on 20th December, a whopping 55 tracks were released onto the site, only to be topped up by yet another five on 29th to round the year out. The release on the 20th included the arranger 'pinozulpo's' remix of every single piece of music, originally composed by David Whittaker and Tim Wright from the *Shadow Of The Beast* trilogy by Reflections/Psygnosis.

All these remixes are now resident on my PS Vita, so I'm sure I'll be ushering forth the cream of the crop in future issues as I aurally digest the lot!

A-Eon Acquisitions

Following on from the purchase of Personal Paint from Cloanto to continue its development for PowerPC-based Amiga systems, the first PowerPC native version of the program is already available. Personal Paint 7.3a is available in both AmigaOS 4.1 PPC and Amiga OS 3.x 68K versions either from AmiStore or **ppaint.com** respectively as a download for under £25 (inc. VAT).

Furthermore, to make up for the change in licensing restrictions and thus removal of the older version of Personal Paint from Aminet, you can download a slightly cut-down (i.e. without tutorials and support) version of Personal Paint 7.1 from **ppaint.com** too (for personal use only).

A-Eon has also got the cheque book out once again and acquired the AmigaOS (both classic and PPC) version of highly popular cross-platform

3D modelling, rendering and animation suite Aladdin 4D.

Acquiring the program from DiscreetFX, the American company will continue to develop Aladdin 4D for other platforms while A-Eon heads up the Amiga development, and that includes AmigaOS 3.x for classic machines as well as AmigaOS 4.1 PPC systems, with AROS and MorphOS ports also within A-Eon's purview.

Am I the only one hoping A-Eon buys or merges with Hyperion Entertainment and maybe gets its mits on Commodore and Amiga, Inc. as well? It's about time it was all under one umbrella, and not too far from Bristol where MetaComCo was based, and thus the original AmigaDOS kernal came into being, based on Doctor Tim King's TRIPOS, which he created while at

Cambridge University. Mind you, I also hope that AmigaOS 4.2 will be processor agnostic enough to see a port to 64-bit ARM cores too...



Amiga OS 4.1 Final

My copy of the final release of Amiga OS 4.1 has dropped onto my doormat, thanks to Matt at AmigaKit, just prior to writing this, and thus shall be installed on my soon to be regenerated AmigaOne G4-XE. Look out for the review of the latest version of the AmigaOS soon!

A related development is the release of a screen grab by A-Eon Technology of long-time Amigan and beta-tester Carl Moppet's installation of AmigaOS 4.1 Final on his AmigaOne X5000 beta machine equipped with the Freescale P5000 series 64-bit multi-core processor. I think that pretty much confirms a hardware release in 2015, don't you think? The post is on Facebook at goo.gl/LpL6sk.

Finally, while in the subject, there appears to be an error in the boot floppy sent out with the copies of Amiga OS 4.1 Final for Classic Amigas (with PowerPC boards). This only effects Amiga 3000 users due to the unique way that machine handles the Kickstart part of the operating system, and it's down to an incorrect KickLayout file. A replacement disk image is available as a download from the Hyperion Entertainment downloads section for registered OS 4.1 Final (classic) users as an ADF and, alternatively, a set of manual instructions to correct the error for more advanced users is available on the Hyperion Entertainment support forums at goo.gl/w6crnF.



Sven Harvey has been our Amiga specialist for over 15 years drawing on his 24 years retailing computer and video games (25 Christmases, no less) and even longer writing about them.

Amiga



So Long, 2014

Ian McGurran takes a look back at the mobile year gone by

Ian McGurran 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

Mobile technology moves fast; the first iPad came out ages ago, didn't it? Well, no, not really, it came out in 2010, just before the current government came in (although for some, that will also feel something of a long haul too). In the intervening years, **however**, the mobile landscape has gone from stumbling toddler to confident **teenager**. Sometimes, though, there are lean years, and 2014 was as close to a lean year as the mobile industry has had yet.

Most new technology follows this pattern – the slow burn, the explosion of interest, the exponential growth fuelled by economies of scale and then the saturation plateau. Like Homer Simpson's investment in pumpkins ("They've been going up the whole month of October and I got a feeling they're going to peak right around January!"), the industry can't accept the lull it know is coming, and it tries to make us part with our hard-earned cash even more. The thing was, in 2014, its efforts just weren't enough.

One of the biggest gambits was "higher than high definition" screens – known as qHD, with a mammoth 2560 x 1440 resolution, a resolution currently only employed by desktop monitors. Yes, the pixel density is **higher**, and the screens look beautiful, but unless held side by side and closely examined, most users couldn't see the difference. Coupled with the extra cost of these units and the power required to drive their displays, qHD hasn't had quite the impact the industry wanted. That's not to say it'll stop –

expect 4K screen to possibly appear around Q4 this year.

Part of the problem is many people are still happy with their devices or are locked into a 24-month contract, meaning they'll only get a new device every two years. So if you can't sell them a phone, how about accessories? Not just a case, though; how about something 'wearable'? Yes, long awaited, smartwatches became a reality in 2014 with Android Wear, and the world... well, looked a bit puzzled. Why would you want something on your wrist that does what your phone does? Then Apple announced the Apple Watch and people began to take notice – until they saw the projected price, and remembered that they still don't 'get' them. Wearable tech will come through; watches like the LG G Watch R are finally showing what the technology can offer, and they look extremely cool at the same time, but it'll take time (sorry).

It's not all been a malaise, **however**. Over here in the UK, it seems the mobile industry is starting to understand the way we use the mobile networks is changing. Well, with a prod from Ofcom and the EU. This year I could use my Three handset in

France exactly as I would in the UK, with no fear of racking up a huge bill for data and voice use. Others are beginning to follow suit, though few seem to want to make it quite as clear as Three has. The fact remains, **however**, that moving around the EU with your phone will soon no longer involve playing with SIMS, roaming data and praying when the bill arrives.

Finally, one of the best mobile items of the year came straight out of Blue **Peter**, with Google's make-and-do virtual reality headset, the Google Cardboard. Intriguing to some, laughable to others, the Google Cardboard is one of those things that is pure FUN! You can make it yourself from cardboard, glue, two lenses and an NFC chip using Google's downloadable plans, but the smart money grabbed a pre-cut kit from eBay for around £10. Build it, pop in your smartphone and even with its low-res **display**, Google Cardboard was immersive enough to leave mouths agape and eye wide with excitement.

It seems fitting in a year lean with innovation and smartphones costing nearly £800 that the most fun came from something made from paper and fun. Here's to 2015 and whatever it holds!



A New Beginning

A new year and a new column, provided by none other than Mr Andrew Unsworth

Welcome to Hardware Mart, a new weekly column that'll provide you, our beloved readers, with the latest news, views and helpful how-tos concerning the world of PCs and components, as well as any other interesting technology that catches our eye. Although the number of desktop PCs sold has declined in recent years, we've been told by industry insiders that sales of desktop PCs are now rising, somewhat unexpectedly and despite the continued and much deserved popularity of the tablet computer. This, as well as a healthy PC games market, means that upgrading, modding and simply getting the best performance out of a PC is just as popular.

Indeed, 2014 was an exciting year for computer enthusiasts, with strong, ultra-desirable releases from Intel, AMD and Nvidia, among many other companies. This proved a real tonic after a couple of years of disappointing or incremental increases in performance with only the odd item, such as the mind-shatteringly beautiful and powerful Nvidia GTX Titan, giving us any reason to take an axe to our right arm and list our kidneys on eBay.

Given the timing of this first column, it's worth reflecting on one of my favourite components from 2014 and telling you why it sizzled my silicon. Although I can't resist a

great value product and always balance value and performance when recommending components, I'm unable to resist shameless ostentation, and with the possible exception of the AMD Radeon R9 295 X2, no component was as ostentatious as the Intel Core i7-5960X (tinyurl.com/lpoodal).

“ Why shouldn't computer enthusiasts occasionally spend a large amount? ”

The monster eight-core Haswell Enthusiast (Haswell-E) Core i7-5960X is the flagship chip in a new processor range that's replaced Intel's Ivy Bridge Enthusiast (Ivy Bridge-E) chips, with the Core i7-5960X replacing the Core i7-4960X specifically. I found the Core i7-4960X disappointing because its performance didn't provide the performance boost I'd expected from a £760 six-core chip compared to a Haswell Core i7 processor. For that reason I tried not to get too excited by the Core i7-5960X, even though I'd heard tales of its high performance and extreme overclocking potential. However, within a couple of hours of slotting the Core i7-5960X into a shiny new X99-based motherboard,

attaching an air cooler and installing 16GBs of stupidly high-speed DDR4 RAM, I was bouncing around the office with giddy delight and screaming benchmark results at anyone within ear shot.

At £760, the Core i7-5960X is stupidly expensive and I accept that it isn't good value compared to a £265 Core

i7-4790K, yet I can't stop myself loving and recommending it. Many of us are still labouring with PCs that are three to five years old due to the need to save money after the long-running economic depression. Why shouldn't we treat ourselves and indulge our hobby with exciting, high-end gear? People spend much more than that on cars and football season tickets, so why shouldn't we computer enthusiasts occasionally spend a relatively large amount for something that reignites our love and enthusiasm for computing?

2015 has just started and, as I write this, CES 2015 is about to kick off. Let's hope that 2015 continues 2014's trend for producing thrilling, ultra-desirable components.



Andrew Unsworth has been writing about technology for several years, he's handy with a spanner, and his handshaking skills are second to none

Hardware



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

Love In An Elevator

"What should I do?" a player asked when he found himself stuck in a lift in *The Talos Principle* – a sneaky trick hidden in pirated copies of the game

This week, Ryan looks at a cunning anti-piracy measure hidden in indie puzzler *The Talos Principle*, and checks in on the progress on a spiritual sequel to *S.T.A.L.K.E.R.*...

Plug & Play

Piracy is a problem almost as old as gaming itself, and the techniques used to combat it have been many and varied. Some readers may remember the infamous Lenslok device from the 1980s or the little hardware dongles packaged with games like *RoboCop 3D* in the 90s.

Invariably, anti-piracy techniques, from dongles to always-online DRM, end up punishing the legitimate customer more than pirates, since most pirated games circumvent the copy protection in any case. But some cunning developers have, in recent years, found ways of subtly targeting people who copy their games while leaving their fee-paying users unscathed.

Take, for example, Croteam's superb action puzzle game *The Talos Principle*. Released in late 2014, it was the kind of game you could immerse yourself in for hours, with everything from its taxing environmental problems (which gave those in the mighty *Portal* a run for their money in terms of sheer brain-itching complexity) to its enigmatic storyline producing an engrossing, otherworldly effect.

Some of the puzzles in *The Talos Principle* are so tricky

that, unsurprisingly, many players have headed online to find help. One player took to Steam's forum to enquire about what he thought was either an extremely tricky problem or, worse, an unsolvable bug: he'd found himself trapped in a lift and unable to escape.

"Whenever I want to get somewhere, it just stops in the middle of the way and doesn't do anything," the player – calling himself JK – complained. "Does anyone have the same problem? What should I do?"

As it turns out, pirated versions of *The Talos Principle* trap players in an inescapable lift. "Congratulations," someone replied to JK. "You must be the first one to show the internet what Croteam did this time to punish pirates..."

Croteam really does have a track record with this sort of thing: pirated copies of *Serious Sam: BFE* famously unleashed a gigantic, indestructible pink scorpion that would doggedly hunt the player to the ends of the earth.

Elsewhere, there was the bug Rocksteady deliberately inserted into *Batman: Arkham Asylum*, which saw thieving players fall to the ground

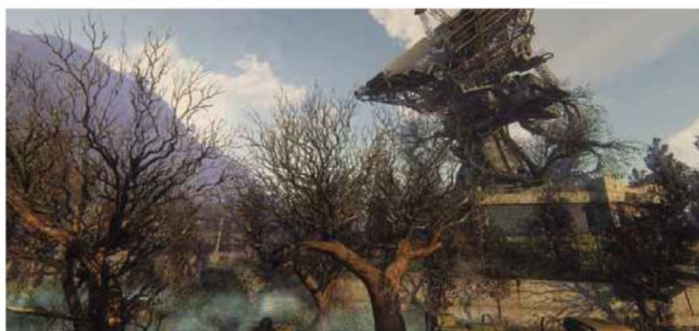
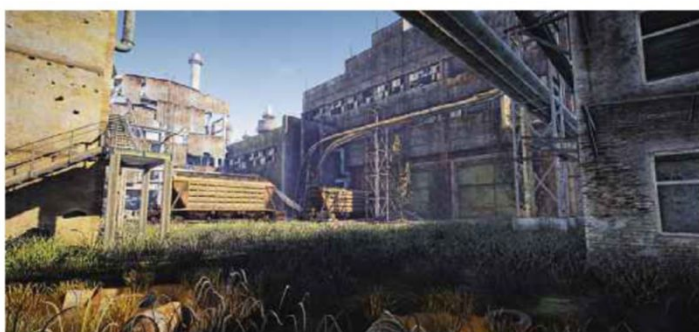
with a painful thud whenever they tried to use the Caped Crusader's gliding ability.

The best pirate-baiting wheeze we've heard of, though, is the one sneaked into *Game Dev Tycoon*. Software made in pirated copies of that game would itself be repeatedly pirated until the player's studio was forced into bankruptcy. Here, the punishment really did fit the crime.

Online

The development of *Survarium* is something we've returned to a number of times in these pages, and for good reason. It's essentially a rebirth of the *S.T.A.L.K.E.R.* series of survival shooters, which appeared to come to an abrupt and disappointing end when the studio behind them, GSC Game World, closed its doors in 2011.

Since that closure, however, Vostock Games – a team formed by some of GSC's staff – has been working on *Survarium*, an online game that carries all the hallmarks of a *S.T.A.L.K.E.R.* title. Like *S.T.A.L.K.E.R.*, *Survarium* is set in a bleak post-apocalyptic world. Nature has reclaimed much of the Russian



▲ Vostock's free-to-play, online successor to S.T.A.L.K.E.R. has launched its open beta in Europe. You can sign up now at survarium.com

landscape, but there are also hideous mutants roaming the undergrowth, as well as mysterious Anomalies, which occasionally spit out valuable artefacts.

The original S.T.A.L.K.E.R. games were rewarding but unrelentingly tough; here, death from starvation, hunger or poisoning could occur at any moment. We'll have to wait and see whether *Survarium* is as punishing to play as its predecessor, but its name certainly suggests that scratching out an existence by scavenging (and killing, if necessary) will take centre stage. The main twist with *Survarium* is, of course, its addition of online gameplay – something that was being developed in the sadly deceased

S.T.A.L.K.E.R. 2, and will finally see the light of day here. Up to 45 players will be able to exist side by side on a single server, and considering how scarce resources were in the old S.T.A.L.K.E.R. games, we can imagine the kind of chaos that will ensue in *Survarium*.

After almost three years of development and a beta phase in the studio's native Ukraine, Vostock has started to roll *Survarium* out into Europe. The European open beta launched on 5th January, and while not all the planned features are available yet – such as freeplay, for example – players can sample such modes as team deathmatch, PvP and Battery Retrieval.

The European beta is part of *Survarium*'s gradual expansion

throughout the year; now available in English, German, Russian and Polish, Vostock plans to roll out other localised versions of the game for the rest of the continent, as well as adding and altering content based on player feedback.

Unlike S.T.A.L.K.E.R., *Survarium* will be free to play, and we're intrigued to see what bearing that will have on the game itself. But if Vostock has managed to retain the original series' chilling atmosphere, then *Survarium* could well be worth a look.

You can find out more at survarium.com.

Incoming

We're still waiting to see exactly what Eidos has in store with its mysterious *Deus Ex Universe* (all we really know is that is emphatically not an MMO, according to its publisher Square Enix), but there's always the promising *Deus Ex: Revision* to tide us over in the meantime. As its name implies, *Revision* is a high-definition remake of Ion Storm's legendary original from 2000 – a game rightly prized for its player choice

and the sheer complexity of its world-building. Indie studio Caustic Creative has been working to bring *Deus Ex* right up to date, improving not only its graphics and sound – which are inevitably looking a bit creaky after about 15 years – but also tweaking and adding to the game's environments. Purists might be a little alarmed at the notion of changing *Deus Ex*'s level design, but Caustic Creative has undeniably made the game look remarkably fresh. *Revision* wouldn't exactly pass for a full-price game released in 2015, but its improved lighting and textures make its dystopian environments look more rich and convincing than ever.

A 9th December update on Caustic's website revealed that the game should be ready "within the next ten weeks", which means *Deus Ex: Revision* should be out by the spring. If all goes to plan, it could provide one of the greatest PC games ever with a new lease of life.

More information about *Deus Ex: Revision* can be found at www.dx-revision.com.



▲ One of the most celebrated PC games of all time is getting an overhaul with *Deus Ex: Revision*. It's due out in the spring

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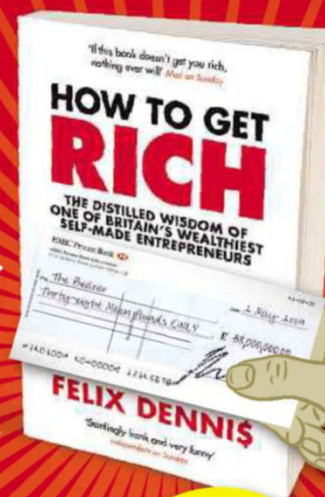
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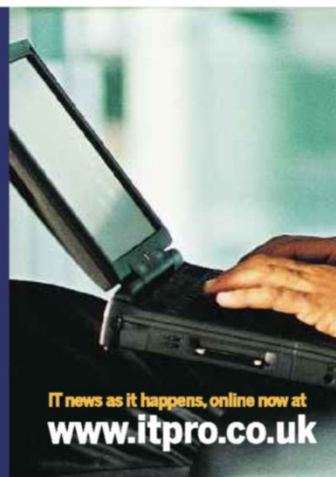
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2 x 512MB PC3200 DDR400. These two sticks were removed from my working system, now redundant. £5, plus £1 p&p. Tel: [Alan\(02084\)202322](mailto:Alan(02084)202322) Email: alan@asandco.co.uk

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Tel: Carole Walker (07551) 293083 Email: omen-data@gmail.com

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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.
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Tel: Carole Walker (07551) 293083 Email: omen-data@gmail.com

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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?

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Tel: (07817) 861011 Email: Johnhavliland73@gmail.com

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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

Asus p8h61-mle motherboard socket 1155. Original box 1/0 cover driver disk manual together with Celeron 91620 dual core CPU and 4 9195 pc1300 memory. Working fine. No fan. £70 + free postage.
Tel: (01619) 501218 Email: jmbest2@sky.com

Toshiba Satellite SA60 laptop. Model PSA60E-092058EN. Windows XP Home Edition with Certificate of Authenticity. For spares or repair - broken power connector on mobo. No power cord. Otherwise very good condition.
£40.00 + p&p
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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.
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SOFTWARE WANTED

Wanted: Windows 98 CD ROM operating system with boot disk instruction manual and serial number.
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Tel: Glen Fremantle (01387) 248976 Email: bldamsys@yahoo.co.uk

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Contact Aaron by email at:
aaron@micromart.co.uk

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

Copycat

I've got a rather strange problem that I hope you can help with. I've begun to notice that my PC seems to occasionally press keys by itself. I first noticed this when I was trying to search for something using Windows' search, and text was entered while I was trying to type into the box myself.

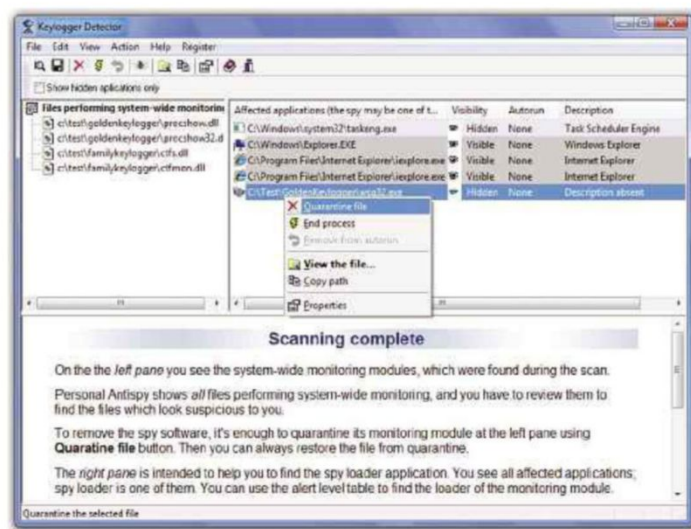
I thought this was a stuck key, so I checked and cleaned the keyboard, but it made no difference. The problem remained. I wanted to find out what was going on, so I opened up a text document and sat there to see what was being entered, and I was shocked to see various pieces of text that I'd previously typed in, such as fragments of emails and internet searches.

Now, I'm not the superstitious type, and I don't think my PC is possessed, but I'm certainly more than a little concerned. I'm not sure what's going on here, and how the PC is repeating things I type. I have tried scanning my PC for viruses, with no threats detected, and I've rebooted several times, and the problem has not gone away. I even connected a new keyboard, as I was hoping it was a fault (a narrow hope, I admit), and the issue remained.

Can you help? I'm totally in the dark here, and have no idea what to check out. I use my PC for a lot of work and to perform things like internet banking, and at the moment, I can't, as I'm too worried about what's going on.

Julian

By the sound of it, it would appear as though you may have some form of keylogger malware on your PC, which is a nasty invasion that can be a major security threat. You've been wise not to use your PC for anything important, especially things like banking, as your security may well be compromised. I'd strongly



▲ Keylogger detectors can help keep your PC secure

advise you refrain from using the PC in this way until this issue is sorted, and I'd also disconnect the PC from the internet right away or at least after you've downloaded some of the below programs.

The first step you may want to take is to run a couple of malware scanners, such as Malwarebytes (www.malwarebytes.org) or Spybot S&D (www.safer-networking.org). These may be able to find and eliminate the threat, and with malware infections, it's often a good idea to use multiple programs to find a problem. It's also a good idea to run your PC in Safe Mode (with networking) while you do all of this, as this should prevent the keylogger from loading.

Malware removal tools can often find and remove such threats as keyloggers, so with a little luck, you should be okay once you run them. However, even if these programs report a removal, I'd be cautious for a while, and be vigilant, just in case. Don't jump straight back on to your online banking, and instead monitor things to make sure all appears okay.

Even with these steps taken, many users remain worried after a problem like this, and for good reason. The fear that someone is monitoring your

keystrokes is something to be very concerned about. For this reason it's no surprise that a total format and reinstall is often the preferred method to cleaning a PC of this threat and delivering peace of mind at the same time. It takes a while, but it's a sure-fire way to ensuring a PC is clear of any infections.

A good firewall can also help greatly with this kind of problem, as it prevents unauthorised access to and from your PC, and if used correctly, you'll know what programs and tools are allowed access, as it's all controlled by you.

Another potentially useful tool to employ, both to check your current problem and to be vigilant in future is a keylogger detector. These specialised programs can be run in order check to see if you have a keylogger on your PC. One example is Blazing Tools' detector (www.blazingtools.com). This free app will analyse activity and let you know of any potential threats.

You could also try using System Restore, and this has worked in some instances. However, many malware infections have safeguards of their own against this kind of solution and can replicate even after a restore session.

Unable To Update

I've got an update problem with my PC. Basically, it won't update, and when I try to install Windows updates, it simply sits there saying 'loading updates', but nothing happens. It never moves from 0%, and this doesn't change if I try to install specific updates or if I try to install everything.

I'm running Windows 8.1 and have installed updates in the past with no problems, but now I cannot. I look forward to any help you can provide.

Kel

By the looks of it, I suspect your Windows Update components have suffered some form of error, and this is preventing the updates from loading onto your PC. This can produce the same problem you're describing and often gives no indication via any error messages.

Luckily, Microsoft is aware of this and has an automated fix, which you can find at support.microsoft.com/kb/971058. If you run this (ensure you run the correct one for your OS), your problems should be solved.

On occasion, it's been known for the automated fixes to fail, and this may require some hands-on work. You can manually perform this task by following the below instructions (which are also provided by Microsoft).

First, open an admin command prompt and type the following commands, pressing Enter after each:

```
net stop bits
```

```
net stop wuauserv
net stop appidsvc
net stop cryptsvc
```

Next, delete the qmgr.dat files. To do this, type the following at the command prompt:*

```
Del "%ALLUSERSPROFILE%\Application
Data\Microsoft\Network\Downloader\qmgr*.
dat"
```

Now type 'cd /d %windir%\system32' and press Enter to change to the Windows, System32 directory. The next step will register all of the BITS files and Windows Update files. Type each of the following, pressing Enter after each:

```
regsvr32.exe atl.dll
regsvr32.exe urlmon.dll
regsvr32.exe mshtml.dll
regsvr32.exe shdocvw.dll
regsvr32.exe browseui.dll
regsvr32.exe jscript.dll
regsvr32.exe vbscript.dll
regsvr32.exe scrrun.dll
regsvr32.exe msxml.dll
regsvr32.exe msxml3.dll
regsvr32.exe msxml6.dll
regsvr32.exe actxprxy.dll
regsvr32.exe softpub.dll
regsvr32.exe wintrust.dll
regsvr32.exe dssenh.dll
regsvr32.exe rsaenh.dll
regsvr32.exe gpkcsp.dll
regsvr32.exe sccbase.dll
regsvr32.exe slbcsp.dll
```

```
regsvr32.exe cryptdlg.dll
regsvr32.exe oleaut32.dll
regsvr32.exe ole32.dll
regsvr32.exe shell32.dll
regsvr32.exe initpki.dll
regsvr32.exe wuapi.dll
regsvr32.exe wuaueng.dll
regsvr32.exe wuaueng1.dll
regsvr32.exe wucltui.dll
regsvr32.exe wups.dll
regsvr32.exe wups2.dll
regsvr32.exe wuweb.dll
regsvr32.exe qmgr.dll
regsvr32.exe qmgrprxy.dll
regsvr32.exe wucltux.dll
regsvr32.exe muweb.dll
regsvr32.exe wuwebv.dll
```

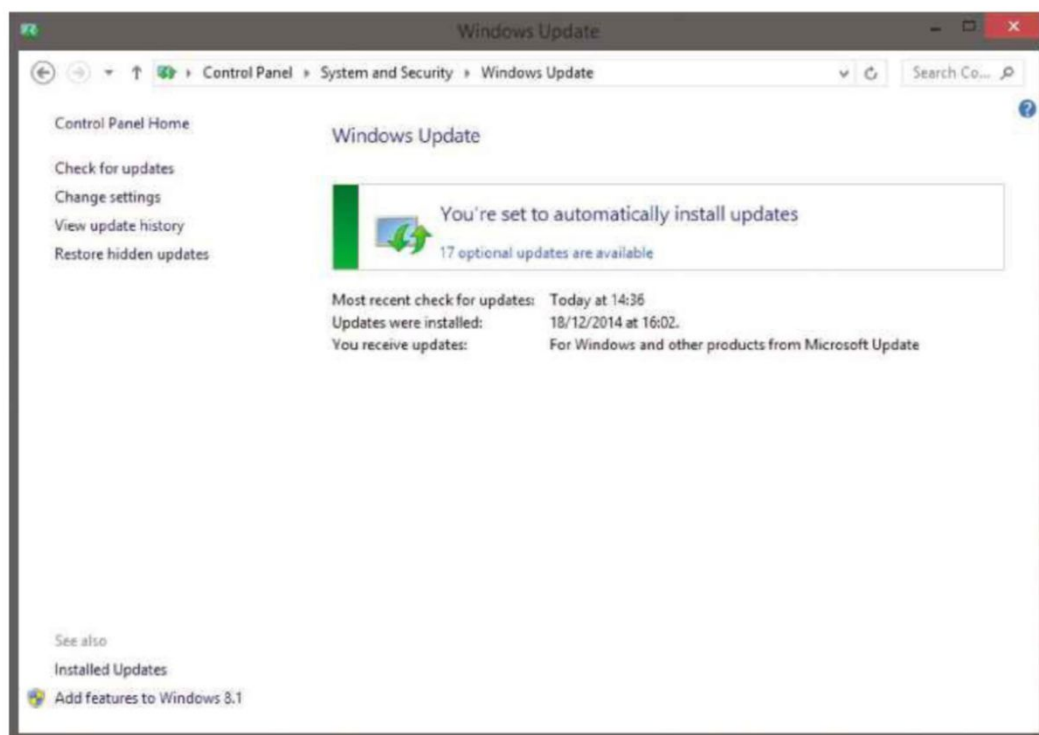
Winsock now needs to be reset; to do this type 'netsh winsock reset' and press Enter, then type 'netsh winhttp reset proxy' and press Enter again.

The BITS and Windows Update services now need to be restarted. Type the following, pressing Enter after each:

```
net start bits
net start wuauserv
net start appidsvc
net start cryptsvc
```

Once this is done, you should install the latest Windows Update Agent, which you can find at support.microsoft.com/kb/949104.

With all of this done, restart the PC, and try the Windows Update service, and you should be able to update as normal.



◀ **Windows Update is very important, but it can suffer problems from time to time**

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

Send your questions to:
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Dennis Publishing
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London
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Contact Jason by email at:
jason@micromart.co.uk

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

Little And Large

I'm a silver surfer and only know a little about PCs. In addition to a desktop system, I have an Acer Aspire 8930G laptop (with an enormous 18.4" screen), and it's this I'd like your advice on. To try to breathe new life into it, I've fitted a 500GB Samsung 840 Evo SSD. This sits alongside the original 320GB HDD (there are two drive bays). I'm trying to clone the HDD to the SSD.

All appears to go well, but as soon as the cloning software finishes the transfer, I get the following error: 'Cloning failed. Target disk has been disconnected.' This has happened several times. I've Googled about it, but I didn't understand the answers. Thinking the problem might be that the target drive (SSD) was bigger than the source drive (HDD), I've also tried a 250GB Samsung 840 Evo instead. Same result.

Can you help? The laptop's running Windows Vista – which I'm stuck with, I think, as my family-history software won't work on anything newer – so I don't know if that's an issue. Any suggestions would be gratefully received, though please try to keep them nice and simple!

Robert Mordue, TalkTalk

I believe we're talking here about Samsung's own Data Migration software, which its SSDs come bundled with. I've never used it, and from what I've read, that's a blessing. By most accounts, it's the work of the devil. Many, many people have come a cropper with it, though I see from the user guide that the source drive – the drive being cloned – can't be more than 80% full. If necessary, Robert, free up some space and try again.

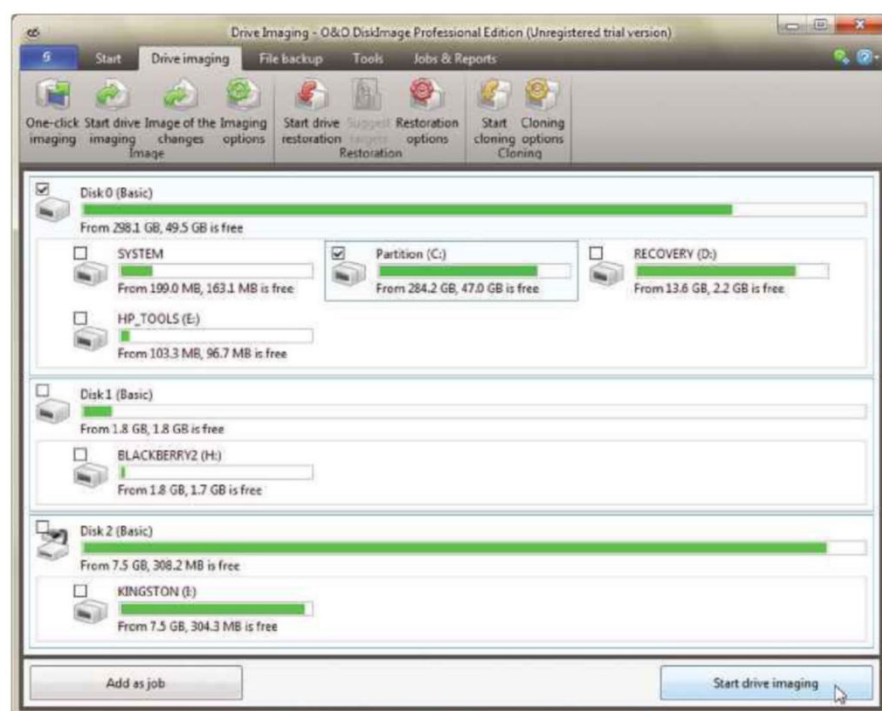
If that doesn't help, give it up. Use different software. Many free cloning tools exist, but most, if not all, won't work unless the source and target have the same capacity. Getting round that requires an opened wallet. Or does it? Take a butcher's at O&O DiskImage: bit.do/VGUa. There's no free version, but the Professional edition has a 30-day trial. And incredibly it's fully functional. No restrictions. As your cloning job is a one-time-only affair, it's a 'bargain'.

But is this the best path? In my view, a new drive calls for a new installation. Why not just reinstall Vista from scratch? Of course, you'll have to set up your programs again and maybe transfer your data, but that

should take half a working day at most. I suspect you've wasted at least that in faffing about with Samsung's Data Migraine.

*Bear in mind that Vista isn't SSD-aware. With either a new installation or a cloned image, you'll probably need to make some tweaks. I've covered this subject a few times in the fairly recent past, so in brief, see bit.do/VG3K (Lifehacker) for information on partition alignment and see bit.do/VG3x (Bit-tech) for information on disabling defragging and SuperFetch (completely ignore the advice about disabling the page file). Vista doesn't support TRIM, but the absolutely vital role of garbage collection should be handled ably by the SSD itself.**

** Not on my Windows 7 daily-driver, unfortunately. Windows 7 supports TRIM right out of the box, but only if the SSD's running in AHCI mode. My old crate of a laptop only has IDE or legacy mode. The 240GB Kingston HyperX 3K SSD has its own garbage-collection routine, but it's not enough to prevent me from having to reinstall every six months. After a certain level of usage, the SSD becomes slower than a 1.44MB floppy.*



◀ A premium, paid-for cloning tool with a 30-day, no-restriction trial? I'll have some of that!

What A Turn-Off (Again)

In issue 1341, Bob McLeod was having trouble with the PC he'd been using for storage and backups. "I've let things lapse," he wrote, "but after several months I've started updating, copying and backing up files again. However, after being powered on for less than a minute, the PC just switches itself off."

He'd reseated the main components and swapped a few out and even had a go with a live Linux disc, all to no avail. "Am I right in assuming the fault lies with either the motherboard or the CPU?" he asked. The PC was packing an Athlon 64 X2 6000+ and a WinFast 6150M2MA.

I doubted the CPU was an issue, but I agreed with the rest of the diagnosis. "Trial-and-error really is the only procedure when troubleshooting problems like this," I wrote. "I've said it before and I'll say it again: the majority of hardware problems boil down to the motherboard. In my view, it's the component to eliminate from the equation first – usually the search ends right there."

I reckoned a replacement board – a second-hand Socket AM2 or AM2+ job, priced no higher than about £25 – would

see Bob right. But one reader believes there might be an *easier*, cheaper solution...

I've experienced similar problems with motherboards of that era. Most of the time, I've got out of jail by simply replacing the CMOS battery. I'm not sure whether this will help in Bob's case, but it's got to be worth a try!

Karen Gill, Outlook.com

Many thanks for taking the time to write in, Karen. In theory, a CMOS battery should have zero bearing on problems such as Bob's, but I'll take experience over theory every time. My experience does differ to yours, however. A CMOS battery's sole purpose is to stop the time, date and user-specified BIOS settings from being lost while the PC's switched off. It makes no sense that a dead battery or even the absence of a battery would cause a PC to shut down at random.

I've found that the absence of a battery can cause the odd board to refuse to boot, it's true. Even there, though, the battery can usually be removed without issue once the PC's up and running (not that there'd be any reason to do such a thing). However, I can't argue with your experience, Karen. If a replacement CMOS

battery has worked wonders for you in the past, that's good enough for me.

The standard battery for motherboards is the CR2032 button cell or coin cell (the name derives from the 20mm diameter and 3.2mm height). They cost peanuts. A pack of ten on eBay, for example, can be trussed for as little as 99p. And that includes delivery. Bob should definitely take a punt. Even if he's no further forward, it's never a bad thing to have a few spare CMOS batteries knocking around.

▼ The ubiquitous CR2032 CMOS battery – about the size of a 10p piece and costing the same



Play The Game

I'm after a gaming laptop, but I'm on a tight budget. I'm eyeing up the Acer Aspire E5-551, which I've seen as a refurb unit for under £300. The main specs are listed below.

- **CPU:** AMD A10-7300 (quad-core, 1.9GHz)
- **RAM:** 8GB DDR3
- **HDD:** 1TB SATA 3.0
- **GPU:** Radeon R6 (integrated)
- **Screen:** 15.6" (1,366 × 768)
- **OS:** Windows 8.1 (64-bit)

Will this be good enough? I've heard good things about the GPU element of AMD's new Kaveri APUs, and the CPU element of the A10-7300 model looks to be the equal of a low-end Core i7. Or am I expecting too much?

Colin, Gmail

I'm afraid the A10-7300's CPU element actually performs similarly to a mobile Core i3 (given the same frequency). It's

probably a touch faster – helped by the 3.2GHz turbo speed (Core i3s don't have a turbo mode) – but it's not fast enough to catch a mobile Core i5.

Those four cores are really two cores with a kind of souped-up Hyper-Threading – a comparable setup to that found on the mentioned i3s and i5s (only desktop i5s are quad-core). The A10-7300 certainly isn't a slouch, but as with all AMD APUs, you'll find it doesn't come even close to the speed of a mobile quad-core Core i7. Sorry about that, Colin.

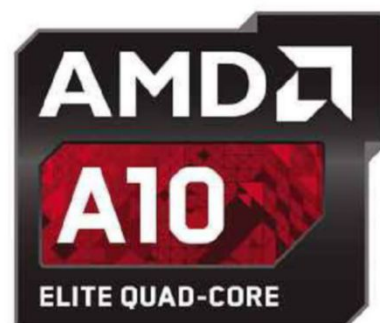
The Radeon R6 element, though, knocks any version of Intel's HD Graphics into the middle of next week.† It's got maybe twice the chops. However, it's still only on a par with, say, the GeForce 820M, Nvidia's entry-level 8-series card.

Even so, while 1,366 × 768 is a perfectly normal resolution for a 15.6" laptop, helpfully it's pretty low for gaming. Most games on the Aspire E5-551 should therefore reach or at least approach the 25fps generally deemed the acceptable minimum, though in many cases you'll need to dial down

the settings to 'low'. Will that be good enough? It depends. The E5-551 doesn't really qualify as a gaming laptop (they start at about £600), but with the right expectations it could just make the grade.

† Gaming benchmarks for the A10-7300's Radeon R6 are scarce, but it's about two-thirds as fast as the flagship FX-7600P's Radeon R7. You'll find benchmarks for that easily enough.

▼ Are the GPUs in AMD's APUs really up to 'proper' gaming?



Crowdfunding Corner

Kickstarter isn't just good for helping games get off the ground. It's also a place where you can find gaming accessories. Here are two that we like the look of

KeyMouse - The Keyboard & Mouse Reinvented!

PC gamers will forever argue whether it makes sense to play with a keyboard or mouse. Well, now you can have both. The KeyMouse is a pair of handheld devices which combine the functionality of a full QWERTY keyboard and mouse, meaning you no longer have to move your hands to type or even get to the mouse – an act which could cost you valuable milliseconds and mean the difference between life or death, victory or defeat.

It's not just designed for gaming, of course – the KeyMouse can also improve efficiency for anyone who uses a PC. Its design helps reduce wrist and shoulder strain, allowing you to position your hands at a more natural angle than with a standard keyboard or mouse.

The bundled software is full of features to help you customise the behaviour of the hardware, and it includes a number of programmable thumb keys so you can add and alter the commands accessible at the touch of a button. The KeyMouse uses Bluetooth, making it compatible with a wide range of devices, and can be powered for six months on a single pair of AA batteries.

Such innovation doesn't come cheap, however. There are 500 units available at an early bird price of \$249, but if you miss that, you'll have to pay the full price of \$299. There's a huge goal to meet – no less than \$100,000 dollars – but at time of writing, there are still four weeks to go, so anything's possible!

URL: kck.st/1BTajIR

Funding Ends: Sunday 1st February 2015

TreadGaming - Exercise While Playing Games

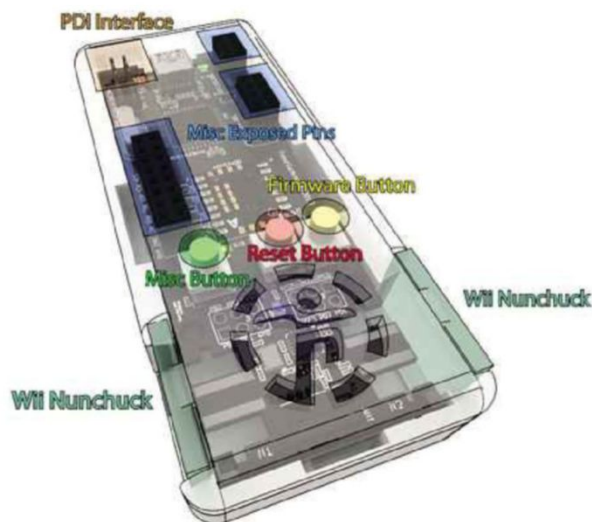
If you're planning a new fitness regime for the new year, then why not buy a treadmill and combine it with the TreadGaming accessory, which turns any treadmill into a full-size, immersive controller for any first-person game? Finally, you can experience the feeling of walking around a virtual world while getting the same amount of exercise in the real one!

The hardware has already been prototyped by the developer and uses existing gaming hardware (such as Wii Nunchucks) in its creation, so it's relatively easy and cheap to produce. Finished units are compatible with any major operating system, and the device itself has 17 virtual buttons to help you interact with any game you play just as you would using a keyboard or game controller.

Supporting the Kickstarter means you get all future software updates free, a cheaper price, access to 3D-printable case files and IO pins to help you expand the functionality using a Raspberry Pi or other hardware. Early bird tiers have run out, but you can still get a unit for SEK380 (£31) with the full price set at SEK456 (£38). You can even back SEK5500 (£452) for a treadmill with the unit pre-installed!

URL: kck.st/14khNsG

Funding Ends: Monday 26th January 2015



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

Easystroke Gesture Recognition for Linux

David Hayward draws all over his screen this week

Gesture recognition software may very well be the bees knees on the likes of a smartphone or tablet, but is it useful for a standard PC? As it happens, it can be.

Easystroke Gesture Recognition for Linux is one of the easiest and more functional gesture applications in the wide world of interactive computing, and the end results can be quite impressive.

Installation

If you're using Ubuntu or one of its many variants, then you'll find Easystroke Gesture Recognition within the folds of the Software Centre, simply by typing in the name of the application. For other distros though, visit goo.gl/5x8U2s and follow the instructions relevant to your specific build.

Alongside the installation of EGR, in the Software Centre, you also have the option to install CellWriter, which is a grid-based handwriting panel, where you can use your mouse to effectively write on the screen. Of course, you don't necessarily need this to use EGR, but the option is there if you fancy giving it a try.

The installation of EGR won't take long, since the actual package is only roughly 1.3MB to download and 5.3MB when installed.

Gesture Away

Once the package is on your system, load it up (depending on your distro) and drop into the 'Preferences' tab.

From here you can select which button or combination of buttons will operate as the Gesture Button and what kind of appearance the gesture will take on, with the choices being XShape, Annotate (compiz), Fire (compiz), Water (compiz) or none. Plus you can add or remove any exceptions to the gesture.

When you've worked out which button will do the talking for you, open up the Advanced tab and make sure that your selection is ticked and enabled in the Devices section.

If everything seems to be okay, open the application you want to create a gesture for, be that Firefox (or a particular page on the internet), LibreOffice Writer or whatever. Keep the application open and drop back into EGR, and open up the 'Actions' tab and click on 'Add Application'. Move the cursor to the application you have already opened and click on it.

This will create a launcher, which will be labelled in the Application window. Click on the 'Add Action' button and type in a relevant name for the trigger, then click on 'Record Stroke', hold down the

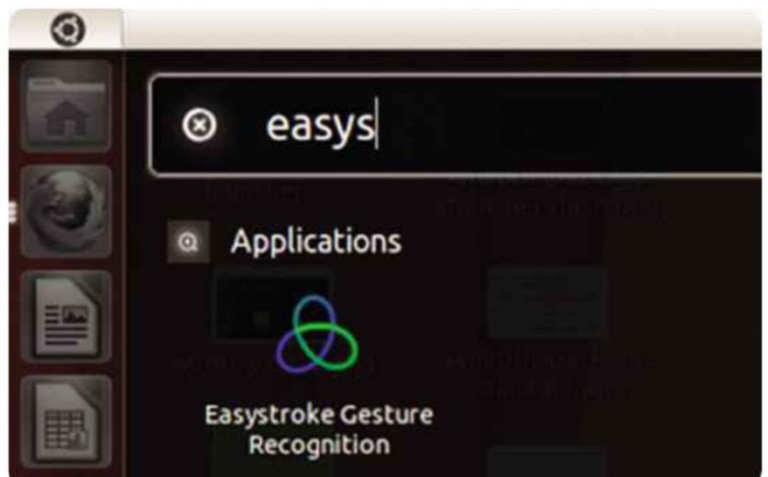
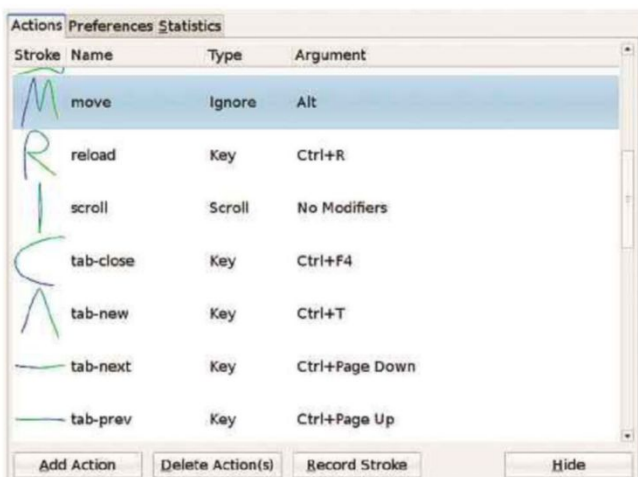
gesture button and draw the gesture on the screen – a letter 'F' for Firefox, for example. When you release the gesture button, EGR will associate the newly created gesture with the trigger, and whenever you draw that gesture on the screen, via the correct gesture button, the application will launch.

Does It Work?

To be honest, most people don't have much luck when it comes to gesture recognition applications; they either come off as being too sensitive and open up a random selection of programs at will, or they fail to recognise the rather poorly drawn figure 8 you've scrawled on the screen.

Granted, the mouse isn't the best tool in the world for precise drawing, at least not for the majority of us; we're quite happy clicking away at icons or aiming the cross-hairs on the game we're playing, but drawing is a different beast altogether.

Easystroke Gesture Recognition lies somewhere in the middle. It's clever enough to discern between gestures (provided they're not too similar) but not overly fussy when it comes to poor drawing skills. So yes, it does work and it does speed up your productivity, albeit only slightly.



▲ Make mouse gestures work for you, with Easystroke Gesture Recognition

▲ Once installed, it's easy enough to load up the app from the likes of Ubuntu

Logging Off

Over the festive season I bought myself with a new TV, as my old Sharp Aquos had developed an odd backlight banding. After much research I went with a Samsung design, and so far I'm quite impressed. How the technology has moved on since 2006, when my LC42XD1EA was launched, is quite dramatic. The Samsung is bigger, brighter, thinner, weighs less, uses less power, is 3D and 'Smart'. Also, critically, it cost half as much even without inflation adjustment. However, as a technology reviewer, I can't help but see the very minor details in this new design that aren't quite as perfect as I'd like them to be.

At the top of this list are the very curious choices that Samsung keeps making, that lead me to conclude it wishes to be the next Apple. For example, if anyone wishes to bounce pictures, music and video from their mobile device to the screen, Samsung tells them to go and get an app for called Samsung Smart Viewer 2.0. However, it fails to mention that this application only works with a remarkably small number of phones and tablets – all of which bear the Samsung logo.

That's the sort of junk that makes the average punter's blood boil, and exactly the same rubbish that makes people walk briskly away from Apple. I'd have been very disappointed, had the reviews of that particular application not clearly indicated that, not only does it not work on the majority of android devices (including some of Samsung's own), when it does install, crashing often follows rapidly.

So, if you're the sort of masochist... sorry, 'person' who prefers the encouragement provided by a stick over that of a carrot, you're actually rewarded with some badly developed and supported software tools for your brand loyalty. Actually, thinking about it, you'll probably love that, too.

What's useful to know, but generally not promoted by Samsung, is that many models in its Smart TV range work inherently with those Android devices that support Screen Casting. Because I assume those in the TV division are on a different planet to those in mobile devices. It doesn't work brilliantly, but at least it works on my Samsung-made Nexus 10. As for the Smart Viewer, that's another bullet I dodged to go with all those half-arsed applications that are removed within five minutes of installation.

I think we're deep enough into the digital era for everyone to generally agree that treating customers like this just isn't good enough. We've all seen apps that are badly designed, conceived

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and coded, and we'd prefer not to see any more. Thank you very much. Samsung should either conspire to do these things properly, have its products join a greater eco-system, or just not bother.

Over the past few months I've seen plenty of hints that Samsung intends to move away from Android, because it doesn't want that busy-body Google steering its good ship Mobile Devices. If it does that, we'll see more of this non-compatibility garbage, and much less playing nicely with others, completing the circle of Apple avarice. *Perversely*, I'd like to see this happen. A massive fall from grace would give the likes of HTC and Motorola elbow room in the oppressive Android market.

It might be that Samsung is angling for more influence over the future of Android, but I can't see – given this software development track record – that it is much of a threat to Google.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: 7 Beat Frequency, 8 Castle, 9 Adonis, 10 Tim Cook, 12 Alloy, 14 Thumb, 16 Homonym, 19 Shinto, 20 Divide, 22 Treasure Trove.

Down: 1 Beta, 2 Static, 3 Praetor, 4 Equal, 5 Recoil, 6 Acrimony, 11 Ishihara, 13 WordWeb, 15 Manual, 17 Obvert, 18 Soyuz, 21 Dave.

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. Many is the time, over the years, that we've attempted to go out and buy a piece of technology, only to come up against a sales person who's put us off the idea. Often that's not their intention; they may just seem so unsure of the details of what they're trying to sell (and yet desperate to make a sale) that they set off some internal alarm in our heads with sheer inadequacy. However, it's the

other times that are really scary, the times that you come up against a salesperson that's so knowledgeable and enthusiastic about any given subject that they bombard you with options and information to the extent that 'blown mind stops play' and you have to head home for a camomile tea and a nice sit down in order to digest the options. While we may expect this over something like a, say, hi-fi system, projector or even a PC, we never thought we'd ever be saying it about a fish. No, that's not an acronym, it's one of those little things that we had swimming around in a bowl as kids. However, we've just got back from Pets At Home, after an aborted attempt to buy a goldfish... Just a goldfish... Because it was all too complicated. Didn't they used to just come in plastic bags from a fair? We're lost... Where's that kettle?

THIS WEEK'S CROSSWORD

Across

- 7 A person legally appointed to manage and dispose of the assets of an insolvent company. (13)
8 The amount added to the cost price of goods to cover overheads and profit. (6)
9 The SI unit of force. (6)
10 Company responsible for designing and producing 'Maptitude' mapping software. (7)
12 Chemically inactive. (5)
14 A light within the field of vision that is brighter than the brightness to which the eyes are adapted. (5)
16 A series of potentially destructive water waves caused by the displacement of a large volume of a body of water. (7)
19 A German device used during World War II to encode and decode strategic messages. (6)
20 United States astronomer (1855-1916) whose studies of Mars led him to conclude that Mars was inhabited. (6)
22 A chart method for simplifying truth functions: Also known as a Karnaugh Map. (6,7)

Down

- 1 A thought or suggestion as to a possible course of action. (4)
2 Tokyo Stock Exchange index. (6)

3 A circuit allowing transmission of signals in one direction only at a time. (7)

4 A free Web-based suite of programs for a comprehensive analysis of the relationship between protein sequence, structure, function, and stability. (Acronym) (5)

5 .tw TLD (6)

6 A graphic symbol consisting of 2 or more letters combined; printed on stationery or embroidered on clothing. (8)

11 A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket. (5,3)

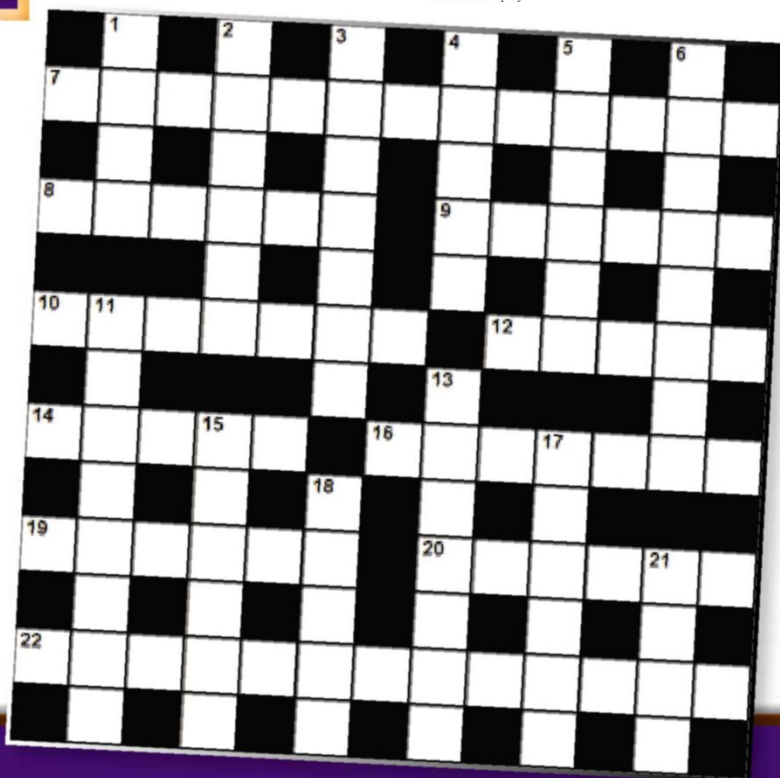
13 Small active cicada-like insect with hind legs adapted for leaping. (7)

15 Legal, social, or ethical principles of freedom or entitlement. (6)

17 A broad movement in late 20th century Western culture, covering a variety of alternative spiritual and philosophical ideas. (3,3)

18 International company best known for its newsreels - they were first shown in France in 1909. (5)

21 The resistance of moving parts to be overcome by an electric motor. (4)



In Next Week's Micro Mart*

- Networking special!
- How to improve your wired and wireless network speeds
- What networking hardware can we expect in future?
- Understanding your router settings
- Plus loads more, including the usual mix of news, reviews and advice



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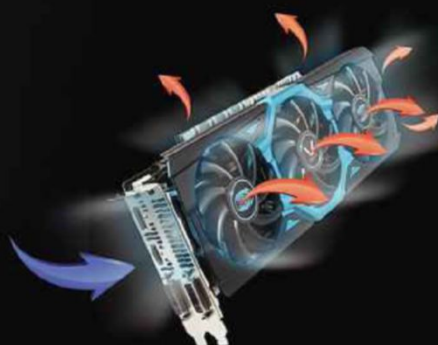
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