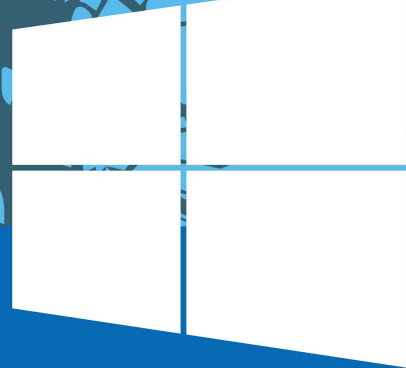


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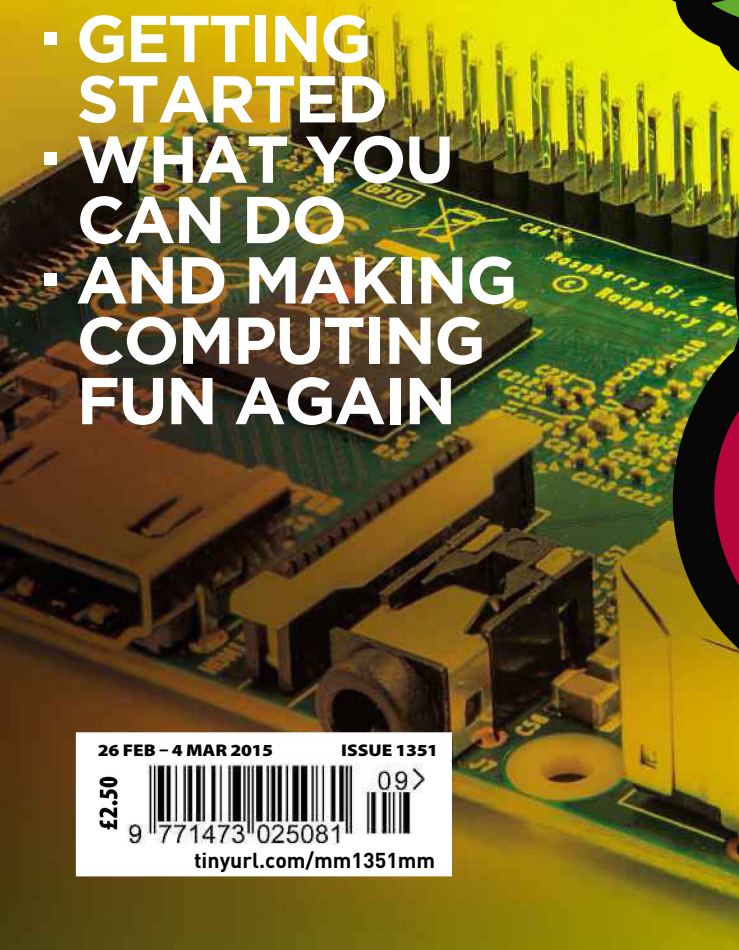
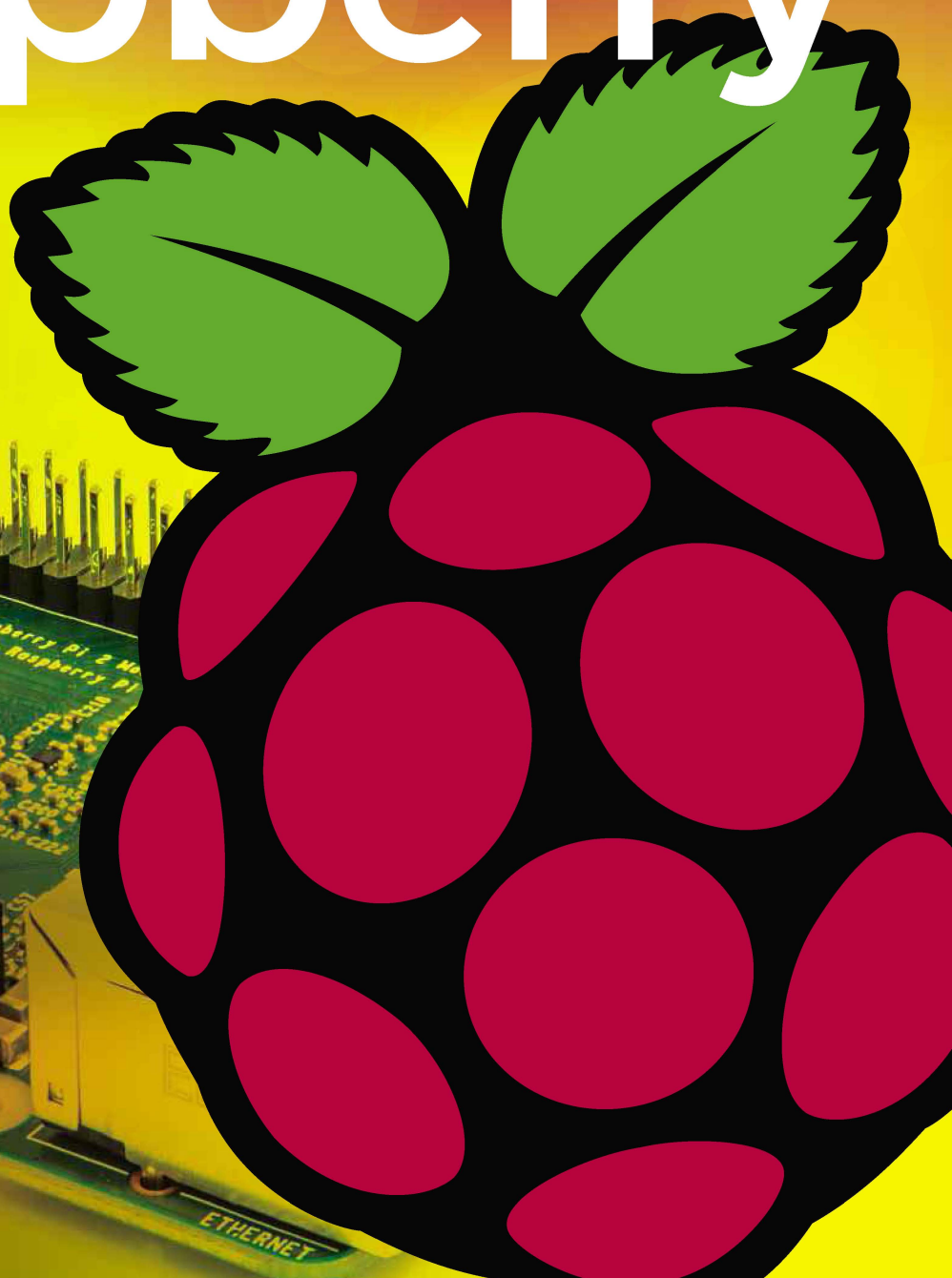
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- GETTING STARTED
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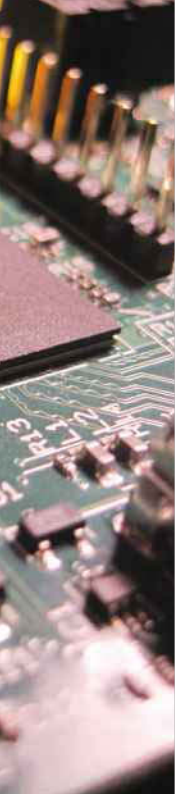
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# Raspberry Pi

## Making computing fun again

**James Hunt** looks at what this new edition brings to the party

In 1982, the ZX Spectrum put a low-power, low-cost PC within reach of millions of casual enthusiasts and effectively created the UK's modern computing industry. It was simple, cheap, and yet powerful enough to allow anyone to create a game from little more than tinkering and prodding. Although the technical capabilities of the hardware weren't hugely impressive by the standards of, say, the Commodore 64 (released the same year), the Spectrum was successful because it was fun. People wanted to play with it.

Flash forward a few decades and computers are in every home. They're more powerful than the owners of the ZX Spectrum might ever have conceived. But they're also stagnant. Laptops and tablets are great for playing on, but not much good for playing with, sealed and resistant to modification as they are. Most desktop systems are either grey and businesslike or so finely engineered that if you try to get your hands dirty, you can incinerate hundreds of pounds at the click of a button.

The problem isn't necessarily that modern systems are expensive, though. If anything, the average desktop is as cheap as it's ever been. Certainly the power you can get for £100 doesn't even compare to the power £100 got you in 1982. The problem is that just as modern systems are several orders of magnitude more powerful, they're also several orders of magnitude more complicated. Like the citizens of the future in Arthur C Clarke's *3001: The Final Odyssey*, people no longer understand how their computers work – they merely trust that they do.

It was this set of circumstances that helped make the Raspberry Pi not just possible but necessary. A low-cost, low-price system that could be used for teaching, tinkering, experimenting – and yes, playing. It's made computing fun again. And if you don't believe us, maybe we can convince you.

### What Is The Raspberry Pi?

Developed in the UK by the Raspberry Pi foundation, the

Raspberry Pi is a single-board computer about the same size as a credit card, which was intended to promote the teaching of computer science. Having shifted almost five million units worldwide, it has more than met its original intended goal (and poetically, is close to surpassing the ZX Spectrum's total sales).

Although the Raspberry Pi is maintained by the eponymous foundation, the hardware itself is developed by a number of different companies. Although models are broadly identical, there are different versions of the hardware that can be found at different prices.

The original Raspberry Pi (the Model A) had a target price of \$25 and has since been followed by the Model A+, the Model B, the Model B+ and most recently, the Generation 2 Model B. The hardware is broadly interoperable across all versions, and unless stated, the hardware presumed to be at the centre of most projects is the Model B+. That said, this month saw the release of the Generation 2 Model B, which has a slightly faster processor, more RAM,



and a micro-SD slot not found in earlier versions.

A variety of interfaces and extensibility options on the Raspberry Pi's main board means the system can be used to power almost any simple computing system. Buy the right components, and you can build everything, from practical products like routers and tablets to unlikely creations such as car dashboard computers and tabletop arcade cabinets.

The Foundation provides two versions of Linux (Debian and Arch) designed for use with the Raspberry Pi, and the Generation 2 Model B will be able to run Windows 10 alongside Ubuntu and Android. As well as hardware extensibility, it also supports custom software; you can write programs using everything from Python to BBC Basic.

## How Powerful Is The Raspberry Pi's Hardware?

Although the Raspberry Pi seems like a stripped-down, relatively basic piece of hardware, there's actually a surprising amount going on underneath.

The CPU in the first generation models is a Broadcom BCM2835 system-on-chip, which contains a 700MHz ARM1176JZF-S, VideoCore IV GPU and 512MB of RAM. The real-world CPU and GPU performance was about the level of an original Xbox, which isn't bad considering that it's a fraction of the size. The latest

Raspberry Pi (the Generation 2 Model B) contains a Broadcom BCM2836, which is a quad-core Cortex A7 clocked 200MHz faster and with double the RAM, but the same GPU. The firmware contains options for overclocking, but the lack of any active cooling means it's not a great idea to overclock the hardware without accounting for temperature increases!

All models have some level of connectivity with other devices. Model A/A+ Raspberry Pi's lack on-board Ethernet support but can be connected to a network using an adaptor in their USB port, which is built in on Model B and B+ systems. The USB port can (of course) host keyboards and mice, though there are no dedicated input ports. The model A and A+ only have a single USB interface, while Model B has two, and the Model B+ and Generation 2 Model B both have four in total.

The video output is HDMI at resolutions from 640 x 350 up to 1920 x 1200, and audio can go through the HDMI port or a 3.5mm audio-out jack. On-board storage is presently micro-SD only (in the Model A+, Model B+ and Generation 2 Model B), but the original Models A and B support SD and MMC instead.

In terms of extensibility, there are a number of extra connectors, which support hardware not included with the Raspberry Pi by default. A 15-pin MIPI interface allows all models to support a

camera or other visioning input, and all models contain at least eight and as many as 17 general purpose IO pins for connecting other hardware.

As hardware goes, it's fairly basic, but the potential is huge – and that's what matters. The basic system has the capabilities of a low-end tablet, and unless your plan is to make a modern-looking 3D game or run 4K video, it's powerful enough to do almost anything you'd want to use a computer for. Indeed, some people have even made supercomputers by linking Raspberry Pi models. It's a modest piece of kit, but that doesn't stop you from enjoying it.

## How Did It Succeed?

The Pi was conceived by Eben Upton and some friends in a computer laboratory in Cambridge University as a deliberate response to the decline in the number (and capabilities) of computer science applicants. Noticing that it was becoming more and more common for students to have no prior experience programming computers, having grown up with Windows rather than BASIC-powered systems, they wanted to find a way to put easily programmable machines back on the market.

The idea was first mooted in 2006, but it took until 2011 for them to find a version of the hardware that they wanted to put into production. By February 2012, after a huge response to a YouTube demonstration pushed them into production, the first shipment of just under 2,000 units arrived.

These days, several companies manufacture the Raspberry Pi, paying the foundation a royalty for each one they sell. The US buys the biggest proportion of systems (around 30% of Raspberry Pi units created are shipped there), but it's popular everywhere. The UK buys 20%, and the rest of Europe a further 30%, leaving 20% spread out over the rest of the globe.

Although aimed at school-age children, the Raspberry Pi has found a lot of success with adult enthusiasts. While this might sound like a failure of the original



plan, it's actually worked in the organisation's favour, with the foundation using profits to seek partnerships and fund grants for educational purposes. Thousands of Raspberry Pi units have been given to schools to encourage the next generation of programmers.

Clearly, the developers are pleased with its success. Last year, Upton told the Guardian that they planned to sell maybe 1,000 units, a number they surpassed a hundredfold on the first day of trading, and the number of units shifted now stretches into the millions.

But while the Raspberry Pi's success is easy to see, it's harder to explain. Certainly, you can argue that the low price is a big part of the reason for it. The most recent and most expensive Raspberry Pi model costs £35, while the cheapest costs just £25. When a computer costs the same as a meal out or a computer game instead of several hundred pounds, it feels like less of a risk to experiment

## 5 Raspberry Pi Projects To Try

The possibilities of the Raspberry Pi are limitless, but sometimes having infinite choices makes it hard to pick just one. If you want to try a project out but don't know where to even start, how about picking one of these suggestions?

### 1 Create An XMBC Media Centre – [bit.ly/1DRxt1](http://bit.ly/1DRxt1)

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### 2 Create A WhatsApp Messenger Client – [bit.ly/1KWM9ze](http://bit.ly/1KWM9ze)

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### 3 Set Up A Cloud Server – [bit.ly/17y3wdk](http://bit.ly/17y3wdk)

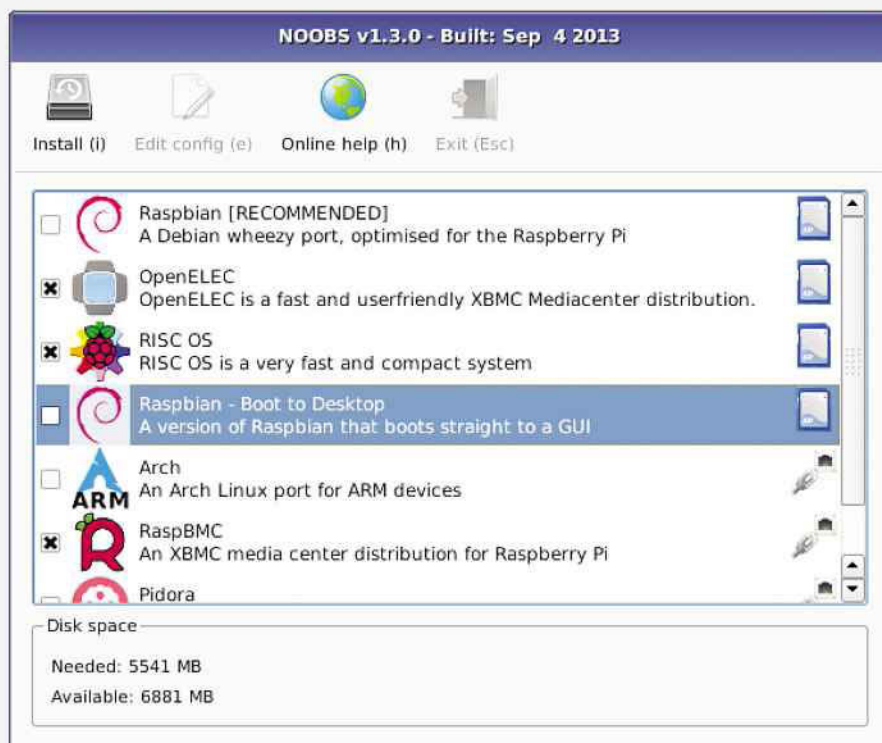
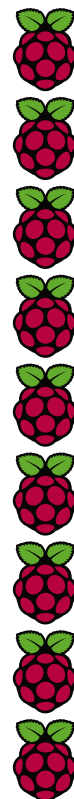
It's a monster of a project, but follow this 30-step guide, and you'll find yourself with Pi-based storage that you can plug into your router to access from anywhere on the internet.

### 4 Improve Your Wireless Network – [bit.ly/1zf0zoP](http://bit.ly/1zf0zoP)

Whether you want to extend the range of your network coverage or create a secondary guest network, your Raspberry Pi can serve as the means to do this. Just follow the steps in the link above.

### 5 Create A Retro Gaming Console – [bit.ly/1cUSOMH](http://bit.ly/1cUSOMH)

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Bryan Water, OC3D.net

- Overclocked Intel® Core™ i5-4690K Quad Core
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- 3 Year Standard Warranty

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## Vortex 440

"a true winner of a system; offering great value for money, epic all-round performance and superior build quality."

Ryan Martin, eTeknix.com

- Intel® Core™ Six Core i7-5820K CPU
- Windows 8.1**
- 16GB HyperX DDR4 Predator 2400MHz
- 240GB HyperX 3K SSD
- 2TB 7,200RPM HDD
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## Predator X99

"The Predator X99 is built to very high standards and designed for a myriad of duties including 4K."

Zardon, KitGuru.net

- Intel® Core™ Six Core i7-5820K CPU
- Windows 8.1**
- 16GB HyperX DDR4 PREDATOR 2400MHz
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- 2TB Seagate SSHD
- 8GB AMD Radeon™ R9 295X2
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## Ultranote II

"what you do get with the UltraNote II is more than just alright. It gets the job done, and does so at a reasonable price."

TechRadar.com

- 15.6" Full HD IPS Display (1920 x 1080)
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- Windows 8.1**
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- 500GB 5,400 HDD
- Intel® HD Graphics 4600
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## Optimus V X13

"Need a powerful 13 inch laptop? The Optimus V X13 packs a serious punch!"

Zardon, KitGuru.net

- 13.3" Full HD IPS Display (1920 x 1080)
- Intel® Core™ Quad Core i7-4710MQ CPU
- Windows 8.1**
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Designed for high end gaming, the 17.3" Vortex IV is an extremely powerful Haswell ready notebook PC with the choice of several extremely powerful graphics cards.

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- Corsair 650W RM Series PSU
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with it. You can buy one in addition to, rather than instead of a normal system.

But in truth, perhaps the Raspberry Pi was just the right idea at the right time. Whether it's being bought by hobbyists who want to get back the spirit of the machines they used as children, adults who want to teach their kids programming or children who saw a cool YouTube video about how it can run *Minecraft*, there's no question that it has captured people's imagination. And maybe that's the most important quality of all.

## How To Start With Raspberry Pi

You can buy a Raspberry Pi from a number of online retailers, including Amazon, although if you don't mind paying a little extra, it's available from high street retailers like Maplin, which makes it easier to get hold of at short notice. The most expensive model is the Raspberry Pi Generation 2 Model B, which should cost at most £39.99 and is normally found closer to £35. If you're asked to spend any more than that, someone's taking you for a ride.

Once you have the system, the next step is to install the operating system. If you head to [www.raspberrypi.org/downloads](http://www.raspberrypi.org/downloads), you'll be able to get hold of NOOBS (the 'New out of the box software' package) or a selection of operating system images including Raspian (based on Debian Linux), OpenElec and RaspBMC (based on XBMC), Pidora (based on Fedora Linux), Snappy Ubuntu (based on Ubuntu Core Linux) and Raspberry Pi-native RiscOS.

If you download NOOBS (which is the easiest way to get started), you can install it over a network cable using the provided software. If you want to install a specific operating system or use an offline installer, you need to write the OS image (or NOOBS package) you downloaded to a micro-SD card with at least 2GB of storage.

Note that you can't just drag and drop the image onto an SD card, because the file system has

to be tailored for the Raspberry Pi. You need a tool such as Win32 Disk Imager ([sourceforge.net/projects/win32diskimager](http://sourceforge.net/projects/win32diskimager)) to write the image to an SD card. If you're comfortable doing this, then you shouldn't have any trouble with the process, but if you're unsure about how to manage disk images, then you should perform a network installation using NOOBS first. The results aren't any different, and it's much easier than figuring out disk images at the same time as learning about your new hardware!

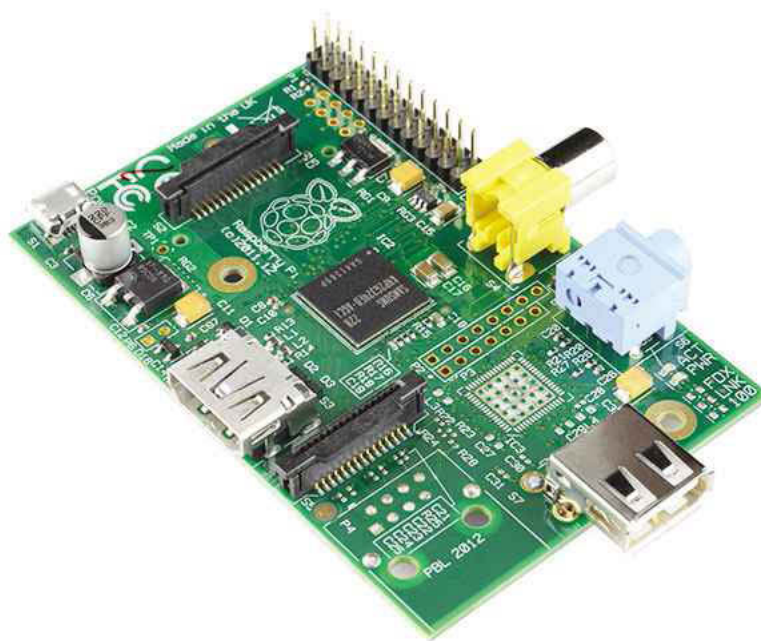
Once the OS has been successfully transferred to the Raspberry Pi, you can plug in a mouse, keyboard and monitor to the appropriate USB ports and boot it up. Remember that you

supply power using the micro-USB port! The initial boot takes a while, because it has to configure the installation, but subsequent boots should be much quicker.

Once this is complete, you should effectively have a working system. Depending on the type of software you used you may have to perform additional configuration, but all that's left is to hook it up to the internet, start downloading the software you want and look online for hardware accessories to buy. And if you're not sure where to start, why not look at one of our project boxouts to get some ideas?

## Additional Hardware

While the default Raspberry Pi is effectively a pocket-sized desktop

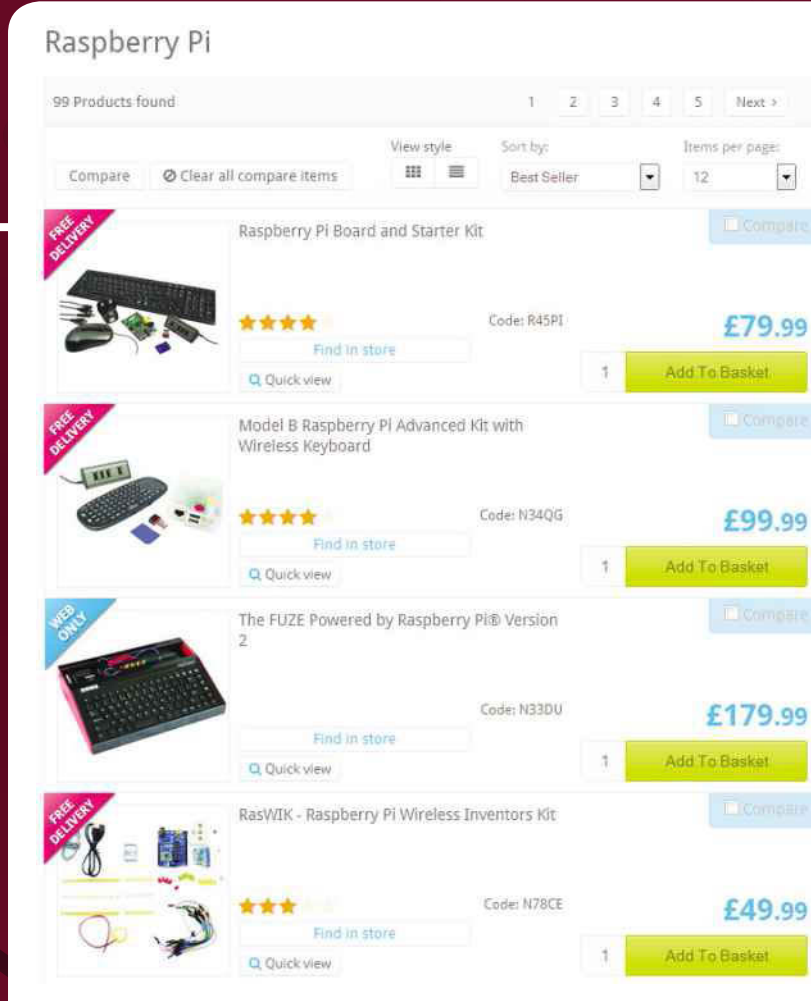


Model A



The latest model





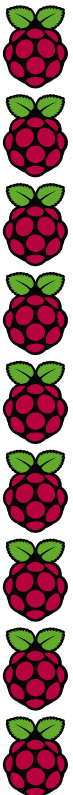
machine, you can expand and modify the hardware to transform it into any number of alternative systems. Your additions can be as simple as plugging in a new USB device or as complicated as soldering bespoke hardware onto some of the contact points.

Accessories can be bought from a huge number of online stores, though again it's possible to buy expansion kits on the high street in any branch of Maplin. Although the pricing of the Raspberry Pi itself is kept fairly low, the accessories are under no such restriction, so it can get increasingly expensive to build more complex devices.

To give you an idea of pricing, a simple camera board (standard or infrared) costs just £25, while a 2.8" touchscreen costs £32. At the opposite end of the spectrum, you can buy a Fuze robotic arm for £229. Although the Pi is supplied without a case, you can pick one up for £5-£10, though many people like to create their own. Some robotics kits include ultrasonic sensors and mobile bases with tracks instead of wheels.

It's hard to overstate the availability of accessories, and to prove it we'll list just some of the hardware you can buy at retailers like the UK-based ModMyPi.com, Maplin and thepihut.com: IR receivers, heatsinks, Bluetooth dongles, hard drives, wi-fi dongles, USB speakers, mouse, keyboard, LED lighting, LCD keypad, LED scoreboard signs, LED matrix lights, switches and buttons, breadboards, motorised bases and motion sensors. And that's at the simple retail end. Once you delve into the world of bespoke hardware, there are virtually no limits.

In a sense, the capabilities of the Raspberry Pi are only limited by your imagination and abilities. The whole point of the Raspberry Pi is that if the hardware or software you want to use doesn't exist, you're supposed to try to make it yourself. If that doesn't seem like a fun challenge, maybe you're not the target market, but if it intrigues you, it's a safe bet you'll be coming up with something great before long.



## 4 Most Amazing Uses For Raspberry Pi

Not every Raspberry Pi project has to be thrown together in a bedroom over a single weekend. If you have the will, the imagination and a lot of money to spend, here are some of the more outlandish projects that have a humble Raspberry Pi at the centre.

### Car Dashboard PC – [bit.ly/1AbN0Ju](http://bit.ly/1AbN0Ju)

It's one thing to sacrifice components or home electronics on a Raspberry Pi project, but are you daring enough to risk your car? Adding a touchscreen media system to a car's dash is a popular use of the Raspberry Pi, but not a task for the faint-hearted.

### Wiimote-Controlled Robot Butler – [bit.ly/1uo1LqG](http://bit.ly/1uo1LqG)

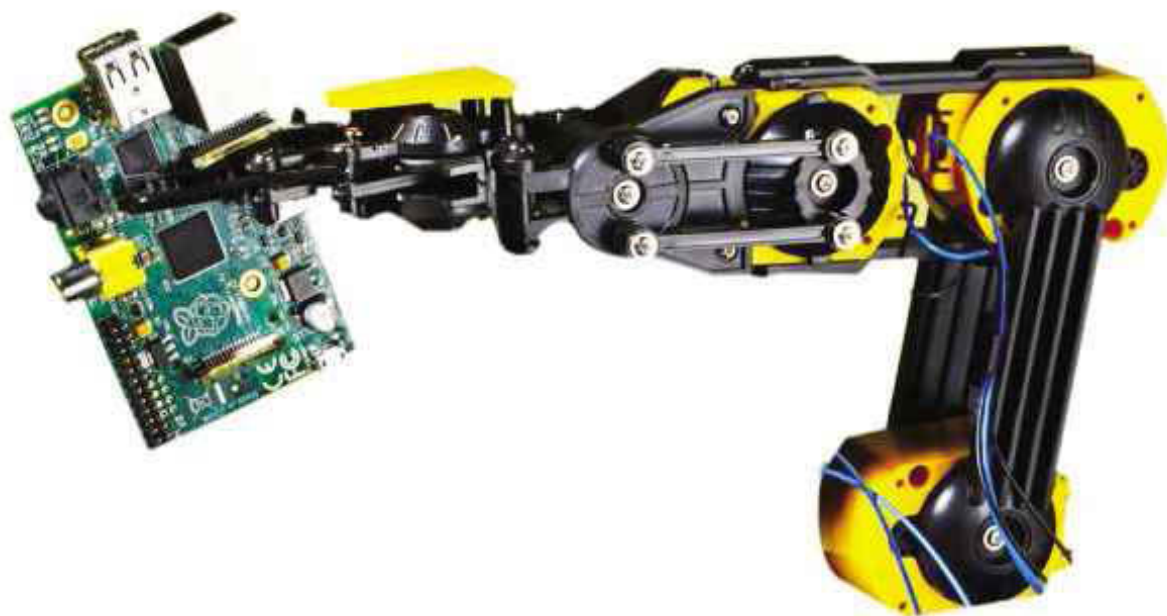
If you have a Nintendo Wii gathering dust in a cupboard somewhere, you might want to put one of its controllers to use the same way these guys did: by building a robot controlled by the WiiMote's Bluetooth connection. Johnny 5 personality not included.

### High-Altitude Camera – [bit.ly/1Adq64r](http://bit.ly/1Adq64r)

The Raspberry Pi isn't exactly designed for extreme conditions, but with a little coaxing you can get it to the very fringes of space. The link above has a set of resources that show how a simple Raspberry Pi can be turned into a high-altitude camera that can see the curvature of the earth.

### Voice Activated Coffee Machine – [bit.ly/17FMvOx](http://bit.ly/17FMvOx)

It's not quite a *Star Trek*-style replicator, but by modifying technology intended for use in voice-activated garage doors, it's possible to create a voice-activated coffee machine. Perfect for those early mornings where pressing a button seems slightly too complicated for your pre-cafeinated state.



A Fuze robotic arm

## What Next For Raspberry Pi?

Although the Generation 2 Model B was released just weeks ago, it's fair to wonder where the platform might be going in the future. Certainly, there's no indication of them saying 'mission accomplished' and shutting down anytime soon.

There are two main ways the platform can be evolved. The first is to continue to develop new software for existing hardware. The developers behind Raspberry Pi have pledged to continue this for the foreseeable future, with plans to improve 3D graphics optimisations and keep supporting the latest HTML5 features. With the existing models expected to remain on sale until 2020, it's safe to say that official support – and that of the community – will go on for years to come.

The second way to improve is, of course, to keep issuing upgrades. Whether we'll ever see a significantly more expensive version of the Pi remains to be seen, but it's likely refreshes will continue every few years. Eben Upton spoke last year about plans to reduce the price of the current boards within two to three years, with a projected minimum spend of \$20.

Whatever happens, it's likely that the Raspberry Pi will remain part of the computing ecosystem for years to come. Whether it

## What Is Arduino?

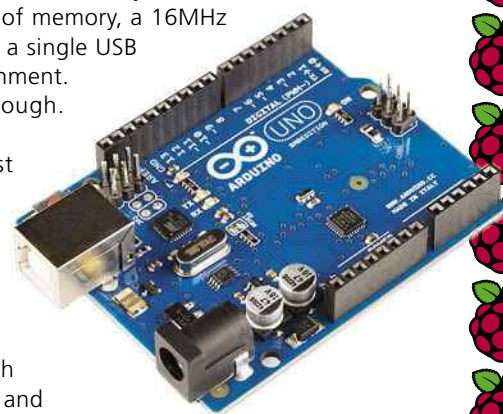
Similar in scope and spirit to the Raspberry Pi Foundation, Arduino is a company that produces open-source hardware and software aimed at helping people assemble and control their own devices. The original version of the hardware was conceived as a hardware thesis in Italy in 2005 and soon went into production, priced just \$30.

Arduino boards are similar to the Raspberry Pi in containing a number of components and IO interfaces, which can be used to expand the hardware and place it at the centre of any number of projects. Unlike the Raspberry Pi, it's possible for users to build a mainboard from scratch by buying the relevant components and soldering them together – although Arduino does sell prefabricated mainboards too.

Although similar in philosophy to one another, the main difference between the Arduino boards and the Raspberry Pi is that the latter is vastly more powerful. A standard Arduino Uno has just 2KB of memory, a 16MHz CPU, 32KB of flash memory, no networking and a single USB port. It also uses a bespoke development environment.

The Arduino does have some advantages, though. It has better support for low-level 'analogue' inputs, which means it's easier to attach almost any kind of sensors or chip. The underlying code is also much simpler because it's designed to operate directly with the hardware, whereas on a Raspberry Pi you have to install drivers and libraries to access non-standard hardware functions.

Of course, there's no reason you can't use both together. The Arduino is good at driving motors and reading sensors, where the Raspberry Pi is good at networking and running software. A number of tutorials exist for hooking the two boards up together. Why not give it a shot?



succeeds in doing what it wanted – inspiring a new generation of computer scientists – might not be clear for another ten years. But its short-term goals have been wildly surpassed, so there's a good chance the long-term ones will be as well.

If nothing else, it has at least proven it's possible to make computing fun again – and if you don't believe us, thanks to the Raspberry Pi all you need to get started is £25 and an idea. That's evidence enough that it's working. [mm](#)





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# Build A Website With 1&1 MyWebsite

Kenny Hemphill shows how to get a site up and running

**B**uilding a website for a new business venture or just for your own personal use can be a daunting task. Traditional web design applications aren't the easiest tools in the world to get to grips with. And even when you've done what you thought was the hard part, you have to then upload it to your web host and configure your domain.

If you choose a CMS like Wordpress, you spend hours in the rabbit hole of theme choices and updates.

There is, however, another option. Web hosts, keen to provide as much value to customers as possible in return for their annual or monthly fees, are adding tools to allow you to build your site in a web browser while you're logged into your hosting account. 1&1's MyWebsite is one such tool, and we spent some time with it so see if it's as easy to build a site as 1&1 claims.

## Getting Started

First impressions on logging into our account and clicking on the MyWebsite button are good. The tools are well laid out, not the slightest bit intimidating and follow a logical structure. For example, the top button on the menu on the right of the screen is labelled 'Getting Started,' which immediately answers the first question. Click on it and you're invited to add basic information like the name of your business (MyWebsite is very much aimed at business rather than personal use) and its contact details.

## Choose A Theme

Next up, you'll want to choose a template and layout for your site. There are 65 available, accessed by clicking the Layout button on the right of the screen. And it's important to note that they are all responsive, so your site will look good whether you view it on a 30" monitor or a 4" smartphone. You can browse through them all or filter them to narrow your search. The filters, however, seem rather arbitrary – Clearly Arranged versus Playful, for example. Once you've found a template you like, you can add it as a Favourite or select it for your site straight away. Most templates allow you to customise the fonts, title image, background and colour scheme. And you can add your own company logo.

If you want greater control and are comfortable with HTML and CSS, MyWebsite gives you access to the source code for each layout so you can edit it. There's also a file

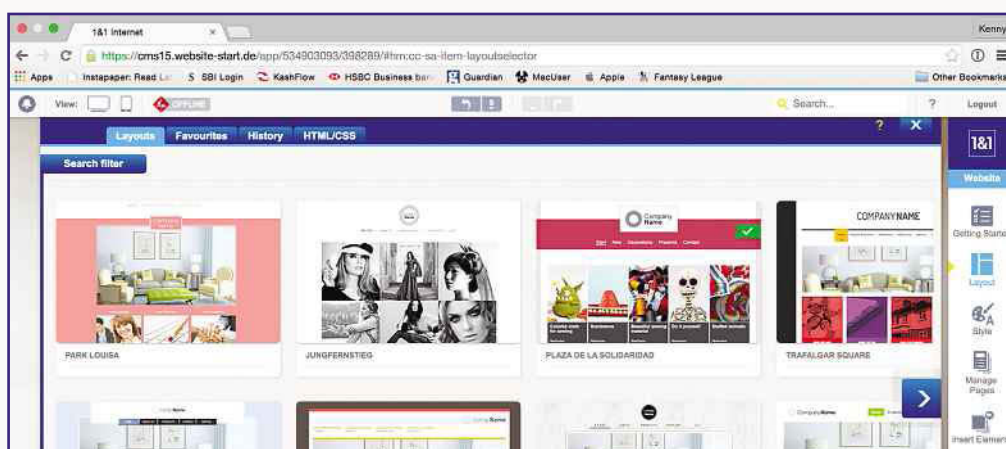
uploader to enable you to upload your own images or JavaScript files.

Unless there's something very specific you want to do, however, editing code isn't necessary; there's plenty of control within the point and click selections. For example, if you want to change the colours of a template, you can choose from one of a handful of recommended colour schemes or with another click specify precisely the colour you want from a picker or by typing in its hex code, for each element of your site.

The same is true of fonts; choose from pre-configured collections or choose from all the available fonts for each text element of your site.

We like the collections idea; it provides a neat compromise between allowing you a degree of customisation while nudging you in the direction of combinations that work from a design point of view.

Templates are pre-populated with images and placeholder text and have several pages already in place.





To edit a page, just click on it in the menu bar and then click on the element you want to edit first. This is true WYSIWYG, so changes are updated immediately in the preview window. Well, almost immediately; this is a browser app, so it's constantly communicating with the server, meaning that changes sometimes take a few seconds to take effect.

## Managing Pages

To add a new page to your site, click Manage Pages on the right of the screen, click on the type of page you want to add, and drag it to the menu on the left, dropping it in the position you want it to appear in the site's menu bar. To create a sub-page, drag the new page slightly to the right under the page you want to act as its master. You can nest pages and create sub-pages of sub-pages, by dropping a page under a sub-page and dragging it to the right. To push it back up a tier, drag it to the left.

Once you've added the page, click on it in the left hand menu to configure it. Here you can decide

whether or not you want it to have a sidebar, whether it's including in your navigation menu and whether it's password protected. With that done, click Edit Page at the bottom of the window to edit its content.

If you, for example, add a Directions page and click on Edit, you'll see that it's already populated with a Google Map snippet showing the business address you specified during setup.

## Add Elements

Once you've selected a theme for your site and are happy with the style, it's time to add your content. Here you can either replace the dummy text and default images and retain the existing layout of the page or you can add new images and text above, below or to either side of the existing content. If you like the template, however, it's best to start by replacing the default content, then add new text or image containers if necessary.

You do this on a page-by-page basis, so before you start, make sure the page you want to edit is

displayed on screen. If not, select it in Manage Pages.

To replace a default image, click on Insert Element in the right-hand toolbar, and then click on the image. Click on Select Image on the box that appears next to the image you've clicked, and choose to either upload your own image or select from the library of stock images that are included with MyWebsite. Click on the image you want and then click Insert Image. Be aware of the size and shape of the space into which the image will fit, and choose one which matches the shape. You can make some basic adjustments to the image, as well add text and effects by clicking Edit Image.

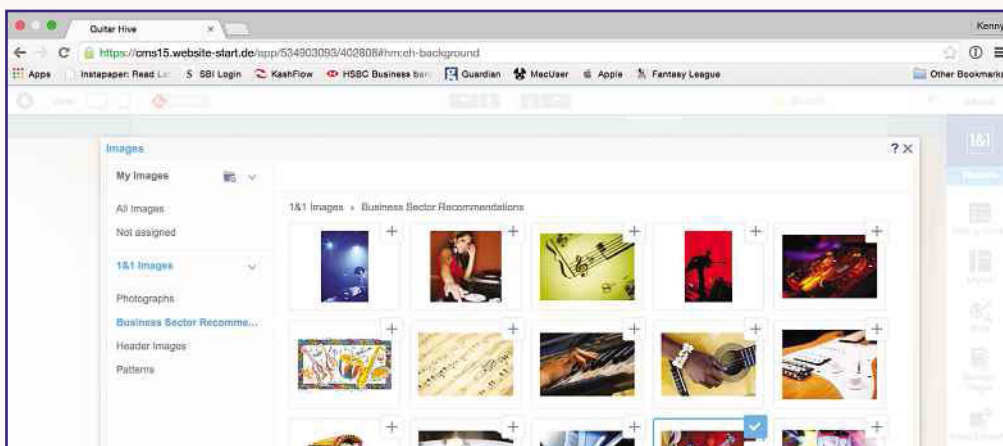
To add rather than replace an image or any other content, click on Insert Element and, under the Basics section, click on the type of element you want to add, and drag it onto your page in the position you want it. In the same way, you can add tables, HTML snippets, buttons and lots of other elements to your page.

Explore the other headings in this section and you'll see you can add videos from YouTube, SlideShare presentations, document viewers and newsletter sign-up forms, among many other types of content. They're all added in the same way, by dragging and dropping onto the page.

## Previewing Pages

The fact that pages are previewed in MyWebsite exactly as they will look when you're ready to publish makes changes very easy to see and the whole process very intuitive. It does also mean, however, that there's a lot of movement and animation on screen. Each time your mouse moves and hovers over a different element, something slides in or out of view or pops up on screen. It makes sense once you get used to it, but can be disconcerting initially.

Adding new pages is straightforward too, though this isn't a blogging tool, so if you plan to add regular posts and want them to display in the style of a blog, you might be better with a dedicated blogging tool. You could, however, add the Blogger app from the Add Web Apps button and then set up a blog on Blogger and add its URL to the app. That would allow you to



display a specified number of posts from your Blogger blog on your site.

The Blogger app is one of dozens of apps that you can 'plug in' to your website to add extra features. Other apps allow you to add a Shopify store, display products from Amazon, include a contact form from Constant Contact or allow your customers to track a FedEx delivery directly from your site.

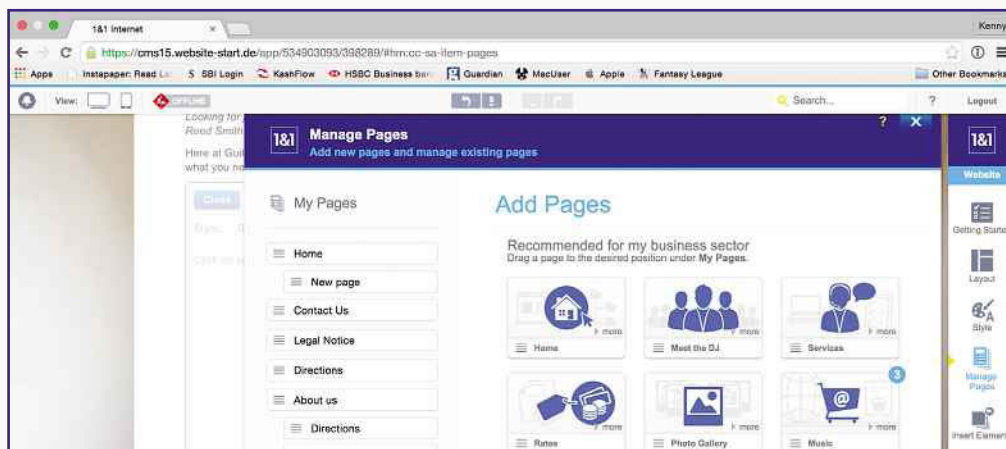
## Social Media Hub

The content you post off-site, on social media platforms like Twitter and Facebook is almost as important, in some cases more important, than what's on your website. In recognition of that, MyWebsite has a Social Media Hub. The hub allows you to link your Facebook and Twitter account to your website so you can create a Facebook page for your business, as well as schedule tweets and Facebook posts and respond to comments from followers.

To start using it, click on the Social Media button at the bottom of the menu on the right of the screen. The first step is to create a Facebook page or link your existing Facebook page to your website. The page you make will pull images and text from your site and place it on the Facebook page so it reflects the branding of your site. Click Go next to Connect your MyWebsite to your Facebook page. On the next screen, click Create your page. You'll need to click the box in the bottom right of the window to agree to Facebook's terms and conditions, then click Set Up Your Facebook Page. The next window will ask you to log into your Facebook account. Facebook pages are linked to a personal account, but once you've set it up you can nominate anyone you like as an admin, as long as they have a Facebook account. You'll then need to agree to allow MyWebsite to post to Facebook on your behalf and to manage your apps and pages. Now choose whether to manage an existing page (if you've already set one up for your business) or create a new one.

## Shopping Features

MyWebsite has several options for adding shopping features to your site. If you sell on Amazon, you can use the Amazon app to add your Amazon listings to your site. Or if



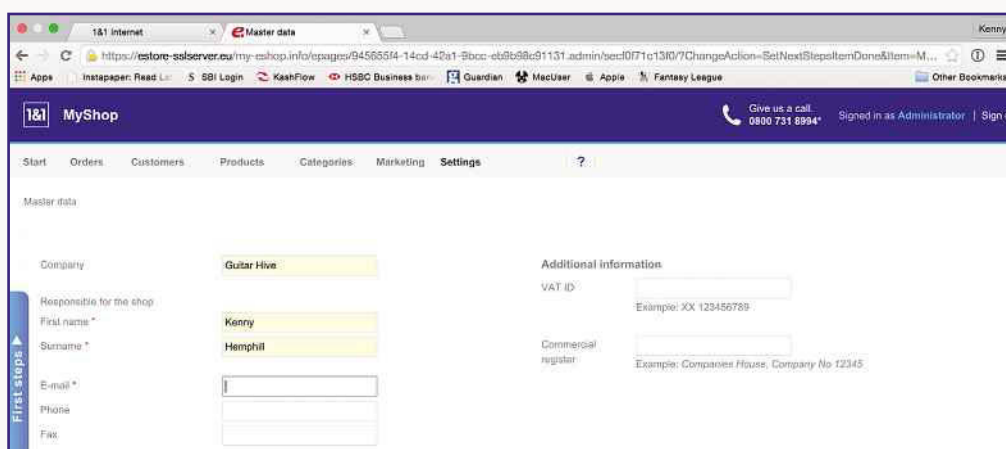
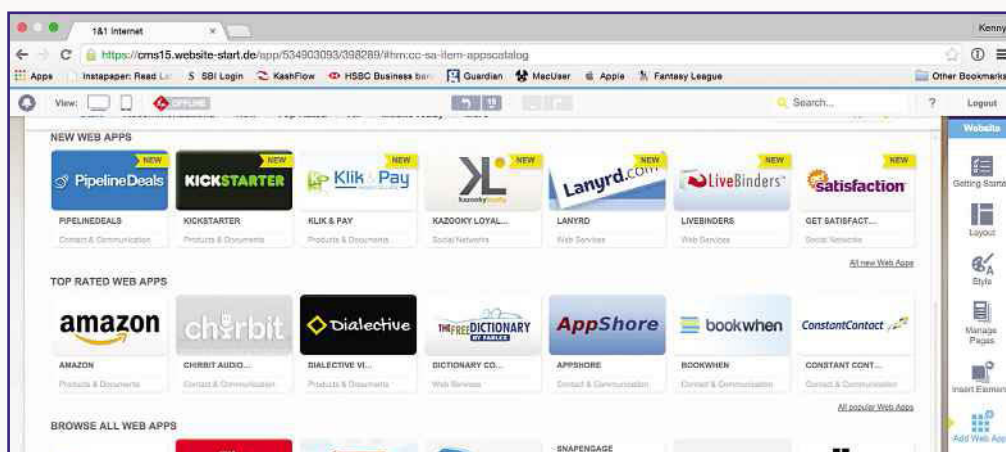
you have a Shopify store, you can add a Shopify app. But look at the toolbar on the right-hand side of the screen and you'll see a third option, 1&1's MyShop.

MyShop allows you to add your product inventory within MyWebsite, display it to your visitors and allow them to buy and pay for products directly on your site. You can choose to accept payments by PayPal or by credit card.

Importantly, MyShop, like the rest of MyWebsite, is responsive so works well on mobile devices.

To set up your shop, click on the MyShop button. You now have the choice whether to set up a PayPal Mini Shop, which allows you to sell individual items if you have a PayPal account but doesn't support shopping baskets or a 1&1 MyShop. Choose MyShop if you want your customers to be able to order multiple items in one visit and checkout using a shopping basket.

Click Set Up 1&1 MyShop and then click Open MyShop Administration. You'll be taken to the administration page and scroll





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down to the bottom of the page. You'll see a list of steps, which start with Master Data. Click on that and type in the details of your business. You'll need its Companies House registration number if it's a limited company, and its VAT registration.

Once you've added company information, the next step is to add products your inventory. You'll need to add the name of each product, an ID code, a price and a description. This will create an inventory database.

MyShop takes you step by step through the remainder of the process, as you add delivery information and set the price for each weight category, payment methods and legal texts.

In addition to displaying your products on your own website, MyShop allows you to manage listings on Amazon and eBay, so you can sell them there and keep track of orders and inventory in one place. The MyShop dashboard allows to view details of all orders and customers, as well as manage emails sent to confirm orders and promote the store.

Once you've set up your store, you can add it to any page on your site. Click on Insert Elements in the toolbar on the right and click on Products & Documents then MyShop. Drag the shopping trolley onto the page and drop it at the point you want to display your store. You can now configure how products are displayed on your site.

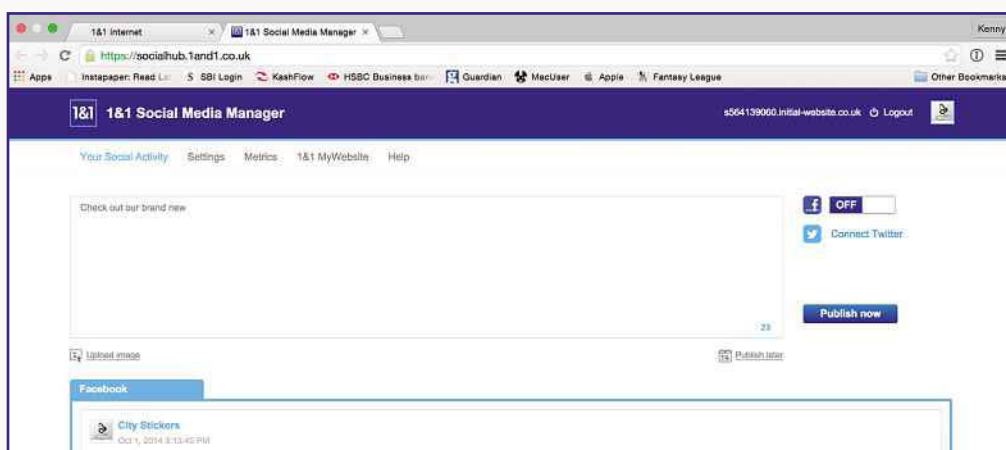
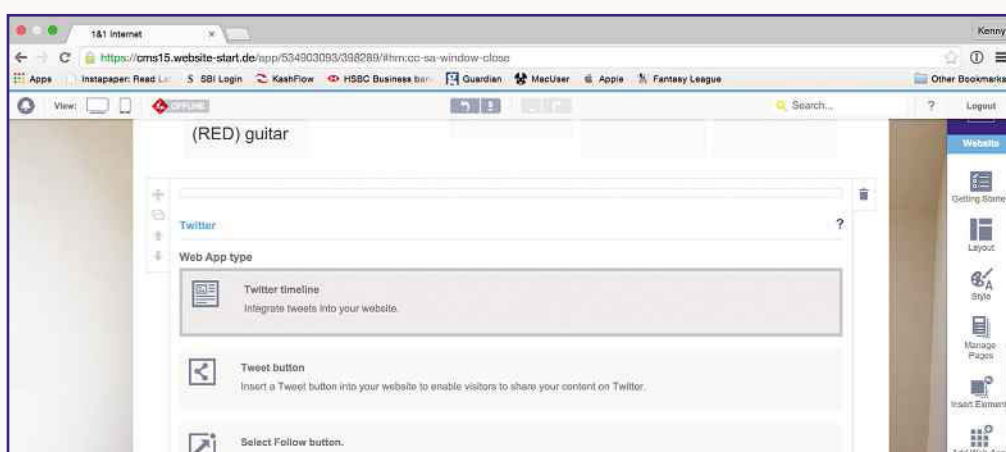
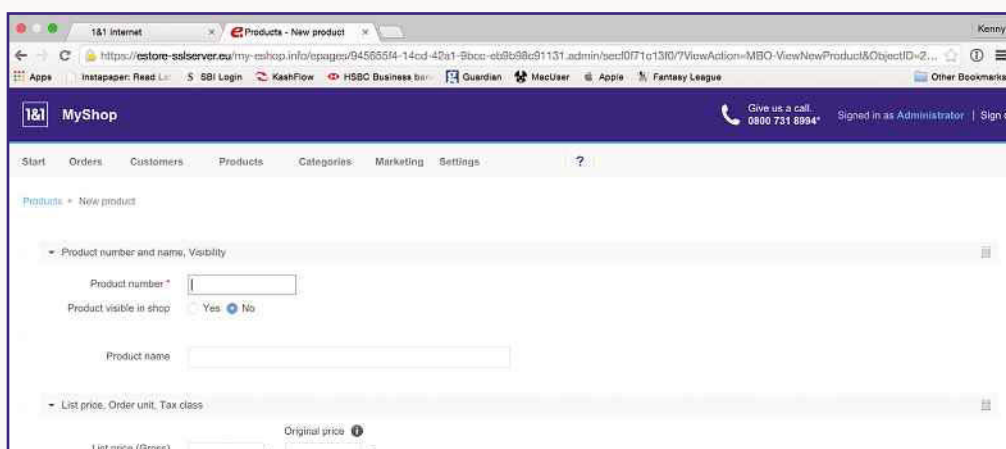
## Final Tuning

Once you've got your website and shop set up the way you want it, there are a few things you'll want to tweak before you launch it. The place to do that is the Settings section.

Here you can add your own favicon (the little icon that sits to the left of the address bar in a web browser). It's a small detail but important for branding and identity.

You can also modify the text that goes in the footer of every page, set up an email address where visitors can contact you and add password-protected section to your site.

Settings also allows you to make some basic search engine optimisation tweaks. Nothing here will catapult you to the top of Google's search results, but taking time to get page titles and descriptions right will mean



that when you do show up, the listing tells potential visitors exactly what you have to offer.

Finally, if you have lots of images you want to upload at once, click the Images section in Settings, then Upload images and select multiple images from your computer, before clicking Open to upload them and add them to the library. Once they're uploaded, you can access them from anywhere in MyWebsite.

MyWebsite isn't a tool for everyone. If you want absolute

control over the precise layout of your site, however, or if you have very specific requirements, you'll still need to look to a traditional web design tool or hire a web designer. And if you want a blog rather than a commerce site, a platform like WordPress is more appropriate. But for a small business that needs a website with social media and shopping features, and which can be managed and updated without calling in a consultant or designer, it's a very useful tool. **mm**



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# HP CHROMEBOX

**David Briddock** investigates the potential of a Google Chrome OS desktop

**T**here's no doubt hardware based on Google's Chrome operating system (OS) has caused a mini revolution in the PC arena.

One reason is the easy-to-use nature of Chrome OS, perfect for consumers who spend their time using cloud-based social communication, games or just web surfing.

Chromebooks, essentially lightweight, Intel-powered laptops running Chrome OS, have carved out a market

all of their own. With an ultra-lightweight design, complete with full keyboard and trackpad, a Chromebook is an ideal solution for email communication, web surfing or taking full advantage of today's powerful web-centric, cloud-based apps.

And the latest range of Chromebooks are fantastic value for money. For example, you can buy a number of entry-level Chromebooks, with a 12" or 13" screen, for

under \$200 from HP, Asus and other companies.

## The Chromebox Format

But now there's an alternative to the laptop Chromebook format. Called the Chromebox, it's a desktop PC option that's small enough to go almost unnoticed when placed on a table or behind a TV, and it's easy to stow away in a drawer. Yet paired with a large screen (or an HD TV), mouse and full-sized keyboard, it provides a

flexible and productive computing experience.

It's a far more affordable alternative to other desk-cube products, such as the Apple Mac Mini (which is also larger than a typical Chromebox).

Companies like HP, Samsung and Asus were quick to add Chromebox products to their inventory. Now there's a growing range Chromebox models to choose from. In this article we'll take a closer look at HP's Chromebox range.



from: Smoke Silver, Snow White and Ocean Turquoise.

Kit options bundle the Chromebox with a wireless keyboard and mouse. The keyboard is of the compact variety and almost identical in size to an Apple Bluetooth keyboard. Both keyboard and mouse are pre-paired (via a dedicated Bluetooth dongle included in the kit) to ensure owners enjoy an instant plug-and-play experience.

### HP Chromebox Features

So what's actually inside this diminutive box? In some regards, the core Chromebox elements aren't much different from a typical 2014 Chromebook. However, there's a dual-core Intel Haswell processor inside.

An Intel processor offers two key advantages. It generally delivers superior computational grunt and graphics performance to an ARM-based Chromebook. And it offers the freedom to install an alternative operating system, such as Linux or Windows.

HP's CB1 is a low-end model with an Intel Haswell Celeron 2955U 64-bit 1.4GHz dual-core processor, plus 2GB of RAM and 16GB of solid-state drive storage. In addition to the local storage, owners receive 100GB of space on Google Drive.

Despite its size, the HP Chromebox isn't short of ports. There are four USB 3.0 ports (two front, two back), both HDMI and DisplayPort out for video (including dual monitor support), analogue audio out, an SD card slot, Ethernet port and a security lock slot. Wireless communication options include 802.11b/g/n wi-fi and Bluetooth 4.0.

It copes fine with a 1920 x 1200 resolution monitor, scaling appropriately and outputting the sound over HDMI, so it's more than large enough for multitasking via multiple windows. And it plays 1080p YouTube videos with ease.

That said, when more than a dozen browser tabs are open on



## “ There's a dual-core Intel Haswell processor inside ”

a 2GB RAM model it can start to slow down. However, 4GB models are available, and do-it-yourself RAM upgrades are also possible (as we'll see later).

As you'd expect, there's a full suite of pre-installed Google apps: Drive, Gmail, Calendar, Maps, Play, Google+, Hangouts and YouTube.

All this means a HP Chromebox has, unsurprisingly, the same sort of performance as a Chromebook with similar specs. While obviously nothing extra special, it's more than enough to meet the needs of a web-focused desktop user. And with prices that start at \$170 (or \$160 in a recent sale), it's certainly a bargain.

### Chrome OS Updates

Chrome OS has an active development group, which delivers frequent updates. These aren't just security measures, bug fixes and minor improvements but often include major new features.

In particular, 2014 has seen a raft of powerful features, some that improve the user experience, and others that make Chrome OS look and feel more like a fully fledged computer.

One notable example is the support for multi-user login (a standard feature on Windows, OS X and Linux computers). Previously with Chrome OS you had to log out to switch accounts. But now multiple

users can now sign onto a Chrome OS machine and remain logged in simultaneously.

Another welcome change is that 'Settings' now appears in a window rather than as browser tab. This is a much more flexible option, as this window can be minimised, expanded, moved around or closed as required. Although a minor update, yet again it contributes to a more realistic desktop experience.

Bookmarks have also received some developer attention. With the new Bookmarks Manager menu option, it's much easier to add, organise and browse your bookmarks, while the improved bookmark search now looks beyond the title and snippet to take into account the bookmarked page's content.

Bookmarks are automatically organised by topic as well as the existing folder collections. Both new and existing bookmarks will be automatically updated with images and descriptions where appropriate. Once signed into Google, all your bookmarks and folders are available, regardless of the device you're currently using, and they can be shared either publicly or selectively to specific individuals.

Language translation flexibility has been improved by an update to the Google Translate Chrome extension. Now you can translate just a text selection, rather than the whole page. Simply highlight

### HP Chromebox Appearance

At under 126mm (under five inches) square and just 39mm (1.5 inches) high, the HP Chromebox is a pretty unassuming piece of hardware. Yes, it does need a separate AC power brick, but this is also quite small, around the size of a typical laptop one.

Its square form is softened by rounded edges with subtle design flourishes, and there are a number of case colours to choose

the text that you want to translate, then click the 'Translate' icon or right-click and choose 'Google Translate'.

## Chrome OS Android Compatibility

Chromebook owners have already witnessed some subtle moves to consolidate the Chrome OS and Android user experience. Redesigning the Chrome on-screen keyboard to match the look of the Android keyboard is one example. However, there's much more to come.

At the 2014 Google I/O conference Google's Android and Chrome chief, Sundar Pichai, announced an array of new features designed to consolidate the Android and Chrome OS user experiences.

For example 'Easy Unlock' automatically unlocks the device when your Android phone is nearby, so just having your Android smartphone in

your pocket means you'll be able to immediately start using a Chromebox or Chromebook without a tedious manual sign-on. It might seem like magic, but behind the scenes it uses Bluetooth to access your smartphone's Google account credentials.

It's also possible to have communication events from your Android phone appear in real-time on your Chromebook desktop. When activated,

## “ 2014 has seen a raft of powerful Chrome OS features ”

this facility means you'll see incoming call notifications, skim text message contents or even take calls without having to break away from the PC and dig out your smartphone.

This kind of tightly bound device pairing offers further possibilities, such as seeing a notification pop up on the Chromebook screen to say that your phone's battery is about to expire.

Another cool feature is the ability to set up an Android device to act as a remote control. It's particularly useful when a Chrome OS device is operating in audio or video media player mode.

## Cross-Platform Apps

The Android app runtime for Chrome is another new piece of functionality, albeit one with a few rough edges. However, the ability to run Android apps, even if it's only a sample subset for now, is a very useful capability, and the app compatibility is improving all the time.

During the I/O 2014 conference, Pichai stated that Google had started to port Android apps to run natively on Chrome OS. A little later, Google released Chrome versions of Evernote (the popular note-based organiser), Duolingo (a foreign language

coach), Sight Words (a visual reading coach) and Vine (a video production app).

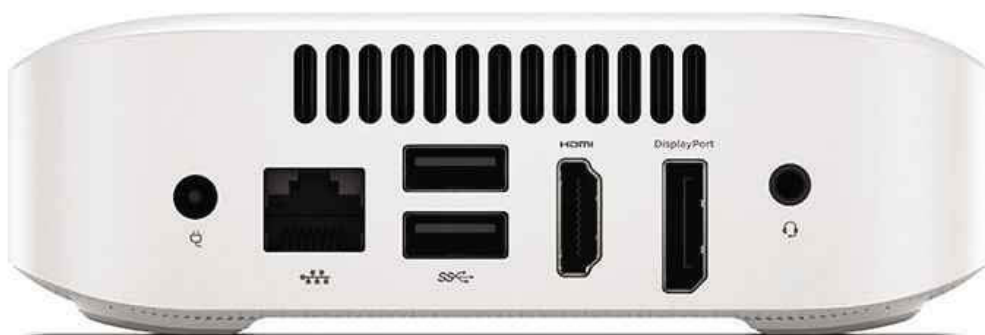
What started out as a token effort is now gaining steam. More and more converted Android apps are beginning to appear on the Chrome Web Store for quick and simple installation.

But what if you can't wait for your favourite apps to appear on the Chrome store?

Well, you could try a hack-it-yourself solution. If you've already installed a ported app, like the ones mentioned above, you'll also receive a Google created runtime module that allows an Android app to run on Chrome OS. Once installed, you can 'sideload' other Android apps and see if they'll run on your Chromebox or Chromebook. Unfortunately, not all apps will run successfully, so it's a bit hit and miss.

For advanced hackers there's the 'chromeos-apk' tool, which runs on Mac OS X and Linux (or even directly on Chrome OS itself if you've decided to install Linux in developer mode).

To extend compatibility even more, Google is keen to see Chrome apps run on Android, so Chrome OS developers now have a tool that wraps up a Chrome web app into an Android app package.



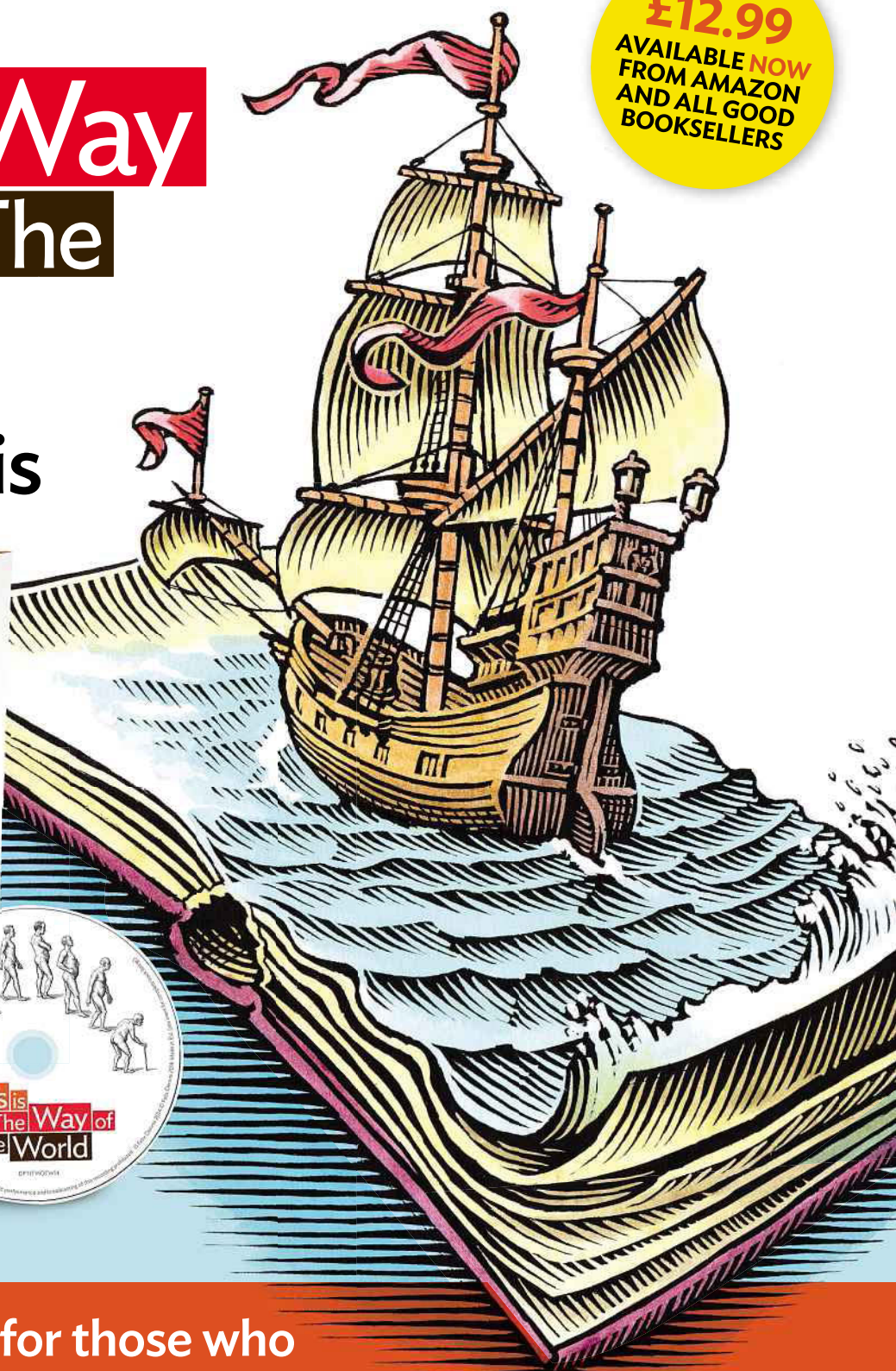
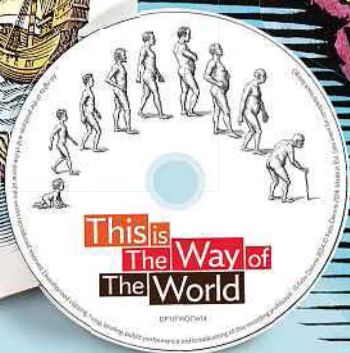
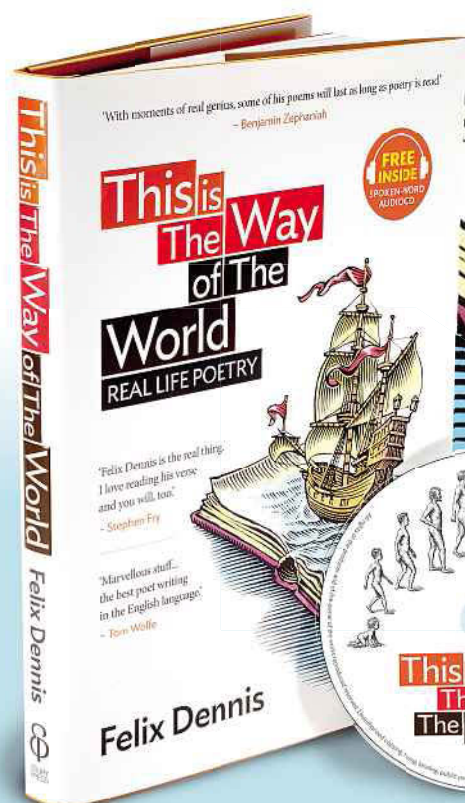


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## New Interface Soon?

As you might already know, Android 5.0, also called Lollipop, ushers in a radically new 'Material Design' user interface. Could a future Chrome OS see a similar upgrade?

Well, it looks like the answer is yes. Project Athena is all about delivering a similar user experience for Chrome OS, which will also integrate the Material Design ethos.

However, it's still early days in the life of this project, so it will be some time before we'll see a single interface design implemented on both Android and Chrome OS.

## Software Hacks

Software modding is a fun way to create a computing experience customised to your own needs and interests. However, before you start to play, it's best to ensure there's a path back to a fully working system.

Fortunately, an official Google tool can create a recovery USB stick or SD card (4GB or larger) to restore a Chrome device to a factory-issued software status. Google has posted full instructions on using the tool online.

Did you know Chrome OS has a substantial list of 'experimental' settings? Some are rather fragile in nature. Some will punch holes in your system's security. But others might improve your Chromebox experience. To play around with these settings, simply enter the text 'chrome://flags' into the URL bar and then hit enter.

More experienced hackers might like to install multiple operating systems. With an Intel processor at its heart a Chromebox can run a wide range of free and commercial operating systems, including a full Linux distribution and Microsoft Windows.

Each OS can be installed alongside the existing Chrome OS by creating separate partitions. This means you'll be able to boot

into, say, Linux to play a few open-source games, then reboot into Windows to use its Office software suite, before returning back to your original Chrome OS environment.

As for Linux, just about any distribution will run, especially if you own a 4GB model. But with a basic 2GB Chromebox, it's best to use the optimised ChrUbuntu ([chromeos-cr48.blogspot.co.uk](http://chromeos-cr48.blogspot.co.uk)) or another low-RAM-optimised distribution like Puppy ([puppylinux.org](http://puppylinux.org)).

Some intrepid hackers have found a way of installing Windows, version 7 or 8.1, onto a Chromebox. Some tutorials use the free WinToUSB tool ([easyuefi.com/wintousb](http://easyuefi.com/wintousb)) to access a Windows .iso image.

For the ultimate challenge why not build a custom version of Chromium from the source code. Anyone familiar with building a big software project

should feel at home, although it can be a rather daunting process for the first timer. Everything you need to know is at the Chromium OS project website ([chromium.org/chromium-os](http://chromium.org/chromium-os)).

## Hardware Hacks

Typically, it's a straightforward job to open up a Chromebox, which means plenty of fun with low-cost, do-it-yourself upgrades.

Applying any kind of hardware mod will, of course, invalidate your warranty. Nevertheless, certain mods can transform a Chromebox into a far more powerful and flexible computing platform.

One easy option is to upgrade the memory from 2GB to 4GB of RAM. All you'll need is a screwdriver, a DDR3L PC3-12800 RAM stick (the 'L' stands for low power) and a few

minutes of free time (as shown here: [goo.gl/AMgVhp](http://goo.gl/AMgVhp)).

Chrome OS can manage up to a maximum RAM of 4GB. But that's not true of other operating systems. With Linux or Windows installed, you could expand the RAM to 16GB. Once again, it's easy to find step-by-step tutorials on the web that describe the upgrade process and the type of memory modules to buy.

The location of the solid-state drive (SSD) means replacement requires a little more fiddling around with the core components, but it's still a reasonably straightforward process, one that should only take around 15 minutes.

With a larger hard drive – say, a Kingston mS100 64GB SSD – connected to the mSATA port, you'll have much more storage capacity for audio, video and image files, and it's easier to experiment with multiple operating systems.

Some Chromebox models have an additional and unused mSATA port. In this case you could add a second SSD or a cool USB 3.0 peripheral. [mm](#)

“ More experienced hackers might like to install multiple operating systems ”





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# Component Watch

**This week, we take a look at a range of GTX 970 graphics cards...**

**L**ast week, we revisited AMD's Radeon R9 290 cards to see how their pricing had fared a year on from their release, and explore whether now was the optimum time to grab one. This week, we're looking at Nvidia's equivalent – the high-end GeForce 970 cards – so that you can see how they compare. Formerly priced around (if not well above) £300, what has six months on the shelves done to the pricing of these still cutting-edge cards?

**Deal 1: Zotac GTX 970 4GB**  
**RRP: £275 / Deal Price: £259**

The Zotac GTX 970 has 4GB of GDDR5 RAM, a clock speed of 1076 MHz, 4K max resolution and Dual DVI/HDMI/DisplayPort interfaces, making it one of the most powerful cards on the market and a stinging upgrade to virtually any gaming PC you care to point it towards.

Zotac's version of the GTX 970 is also one of the cheapest takes on the technology, but don't let that put you off – in performance stakes, it's virtually indistinguishable from the reference version!

**Where to get it:** Dabs ([bit.ly/1AF7de1](http://bit.ly/1AF7de1))



**Deal 2: EVGA GeForce GTX 970 Superclocked 4GB**  
**RRP: £290 / Deal Price: £280**

EVGA has a couple of different takes on the GTX 970, but the best of the lot is this Superclocked one, which has a base speed of 1140MHz – a handy boost of around 10% on what the reference design can manage. Again, you get the dual DVI/HDMI/DisplayPort interfaces, support for 4K graphics (with hardware downscaling for smaller monitors) and a dual-fan cooler as standard. The price increase just about tallies up with the performance increase it offers over the standard Zotac version, so it makes sense to pay more for this little beauty if you can afford it! Though the tenner off that Novatech is offering doesn't make it a steal, every little helps.

**Where to get it:** Novatech ([bit.ly/1AS5DUD](http://bit.ly/1AS5DUD))



**Deal 3: MSI GTX 970 GAMING Twin Frozr V 4GB**  
**RRP: £300 / Deal Price: £280**

MSI's name is attached to high quality components, and the Twin Frozr name is respected when it comes to graphics hardware. This version of the card is also factory overclocked to a base speed of 1140MHz (while turbo speeds reach up to 1279MHz) with a standard set of inputs. The only notable feature is a slightly reduced TDP – 148 watts instead of the standard 150 watts. Because of that, and MSI's reputation, we'd choose this over the EVGA.

**Where to get it:** Ebuyer ([bit.ly/10yI7Nz](http://bit.ly/10yI7Nz))



**Deal 4: Asus GTX 970 Strix DirectCU II OC 4GB**  
**RRP: £303 / Deal Price: £285**

This version of the GTX 970 is apparently named after the 'Roman' (do they mean Latin?) word for owl. Whatever, it's overclocked to 1114MHz (base) and 1253MHz (turbo) and packed with Asus's excellent proprietary technology: DirectCU II coolers that are quieter at high speeds, and a 0dB fan that shuts off during light use and Blu-ray playback. It's not quite as fast as some of the cards here, but the cooling makes it reliably stable.

**Where to get it:** Dabs ([bit.ly/1znAp3f](http://bit.ly/1znAp3f))



**Deal 5: Gigabyte GTX 970 G1 Gaming 4GB**  
**RRP: £320 / Deal Price: £304**

It's the most expensive GTX 970 here, but with good reason. Overclocked to a base rate of 1178MHz, with a turbo speed of 1329MHz, Gigabyte's G1 leaves the competition in the dust. This is thanks to its Windforce 3x cooling system, which uses direct-contact copper pipes and three fans to aid heat dissipation. It also uses Gigabyte's Flex technology to automatically detect up to four simultaneous displays. So good, it's still a bargain at £304.

**Where to get it:** CCL ([bit.ly/1vWoA8o](http://bit.ly/1vWoA8o))





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## BAFTA Games Gong Noms Now Known

**The list is out and *Alien: Isolation* leads the pack**

**B**AFTA, the British Academy of Film and Television Arts, also oversees the British Academy Games Awards, due to take place on March 12th, and recently announced the list of nominations. In total, 51 games have been recognised across the 17 categories on offer; game that, according to BAFTA itself, represent the very best games of the past 12 months and highlight an outstanding level of creative excellence.

Among the list of games recognised is *Alien: Isolation*, which has no fewer than six nominations including Best Game and Game Design. Just behind in terms of number of awards is *Far Cry 4* and *Monument Valley* with five nominations each. The likes of *80 Days*, *Destiny* and *Mario Kart 8* have been handed four nominations each.

TV personality Rufus Hound will present the awards next month. Good luck to all.



## Twitter's CFO Has His Account Hacked

**Well that's #awkward...**

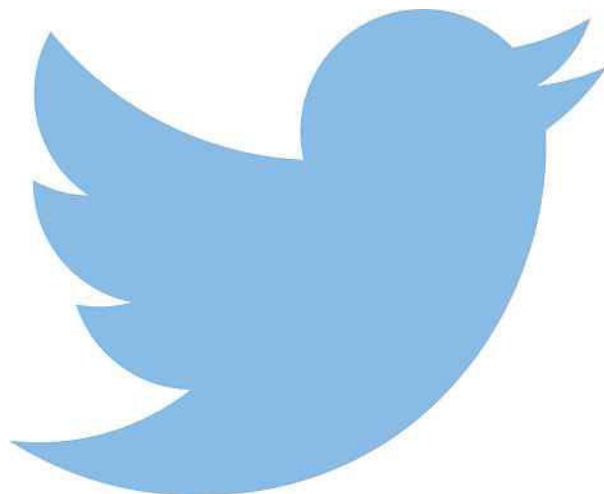
**I**f anyone should try their best to avoid being hacked on Twitter, it's the top-level executives that work at the company.

Anthony Noto is Twitter's CFO, yet he fell for one such hack and therefore lost access to his account; a mistake that lead to him spamming followers aplenty. The account, as you would expect, was duly

suspended by Twitter to stop any more unnecessary embarrassment.

Noto doesn't have great form using his company's platform. Last year he was guilty of tweeting a public message, that we presume was intended as a private one, appearing to relate to an intended acquisition.

More internal training for Noto?





**H**yperX, part of Kingston Technology, has happily announced its latest headset, news of which we're now happily bringing to you.

The HyperX Cloud II headset – available in red, gun metal and limited edition pink – features a newly designed USB control box housing an on-board sound card, which supports lovely 7.1 virtual surround sound as well as standard stereo audio. This audio goodness comes on top of a bunch of great features including volume control, noise cancellation, auto gain control and echo cancellation, again accessible via the USB sound card.

There's a 3.5mm stereo port for compatibility for PS4 and Xbox One consoles and the

headset provides clearer voice quality, game sounds and reduced background noise, while the ear cups and headband are constructed from memory foam for maximum comfort.

As well as this headset announcement is news of a



durable FURY Pro Gaming Mouse Pad that's got soft padding under its cloth material and it comes in four sizes for your particular gaming environment. For information on these products and more, head over to [www.kingston.com/en/hyperx](http://www.kingston.com/en/hyperx).

# Royal Rumble For Call Of Duty Championships

**European gaming contest to be held at the Royal Opera House**

**I**f you needed further proof that e-sports are being taken ever more seriously, this should help: the Royal Opera House is going to play host to this year's European Call of Duty championships.

Taking place over the weekend starting 28th February, participant are ultimately battling for

the ultimate prize of getting to the world finals, which take place in Los Angeles on 27th March. The grand prize there will be a whopping \$1m, to be shared between the top three squads. As for the European Championships, the prize fund is a mere \$10,000. Cheapskates.



This week's look at old computers that are still being used reminds us that if a system is still reliably doing the job it was designed for, then it doesn't need to be replaced.

It's this notion, clearly, that motivates businesses to keep hold of PCs running Windows XP. We've all seen it, in banks, in shops, at train stations: computers from the 90s, running an OS that isn't even supported any more. It's a little disconcerting when they're dealing with your financial information, but clearly it must be working or they'd have upgraded by now.

But, of course, they haven't, and that doesn't bode well for any future editions of Windows, including the very latest, Windows 10. As our feature on this upcoming OS asserts, Microsoft is going to have a hard time convincing businesses to switch. And if businesses are happy to use a tape-based system from the 1970s, then the lure of shiny new buttons and touchscreens is hardly likely to sway them now.

See you next time...

*Anthony*

Editor

**QUICK BITS...** The UK's Official Albums Chart is going to take into account audio streams from March

# Meanwhile... On The Internet...

**Y**ou may remember a much-quoted report from last year claiming that something like 80% of visits to the so-called 'Dark Web' (interesting choice of label, that) are related to paedophile activities (if you don't, *Wired's* report on it is here: [tinyurl.com/Motl1351a](http://tinyurl.com/Motl1351a)). It was a verdict that seemed to imply that it was time to clamp down on the Tor network, as it was little more than a tool to facilitate such activity (along with the kind of laissez faire marketplaces exemplified by the Silk Road: [tinyurl.com/Motl1351b](http://tinyurl.com/Motl1351b)). However, a new study puts a whole new spin on that particular narrative ([tinyurl.com/Motl1351c](http://tinyurl.com/Motl1351c)).

While it doesn't refute the figures in last year's report, what it does say is that visits to these so-called 'hidden services' account for a little less than 1% of the total traffic on Tor. This means, essentially, that while some people are using the network specifically to get to these .onion sites, the vast majority appear to be using it simply to avoid having their activities online tracked by companies or governments, or simply because they want to.

You can read the full report at [tinyurl.com/Motl1351d](http://tinyurl.com/Motl1351d), but we will leave the last word to Tor's development director, Karen Reilly, who took to Twitter ([tinyurl.com/Motl1351e](http://tinyurl.com/Motl1351e)) to opine that "When a politician comes for your freedom for the sake of children, ask them about school, counseling, health and social services funding."

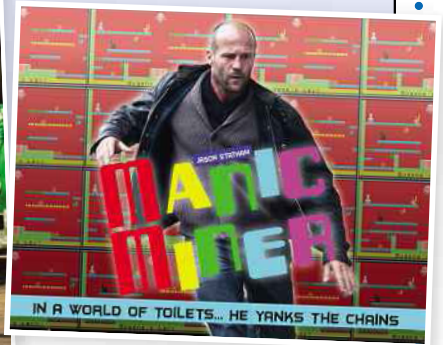
**I**n this week's 'numbers almost so mind-boggling big they seem irrelevant' news, Kaspersky reckons a ring of criminals has been using malware and phishing attacks to steal from banks for the last year or so. This 'Carbanak' ring, it reckons, may have bagged as much as \$1bn ([tinyurl.com/Motl1351f](http://tinyurl.com/Motl1351f)).

We should be shocked, outraged in fact, but instead we'll refer you to our opening sentence and mumble some comment about the modern financial system being a scam or something.

**A**s the UK steps up to the plate with its own 'Revenge Porn' law ([tinyurl.com/Motl1351g](http://tinyurl.com/Motl1351g)), echoing moves now made by various states across the US, the man many credit for fanning the flames of the distasteful phenomenon is apparently facing justice for some of the underhand tactics he used to obtain such material. Hunter Moore – the former main man at *IsAnyoneUp?*, a site that plied a healthy trade in candid pictures of various young women (usually taken with digital cameras and cellphones) – has pleaded guilty to hacking charges in the US and could be facing a decent time in jail ([tinyurl.com/Motl1351h](http://tinyurl.com/Motl1351h)).

**S**eriously, I don't know what you think we do all day but it's certainly not messing about on Photoshop creating fictional posters based on 8-bit games, so we can make Twitter jokes based on to the **#IfThe80sNeverEnded** hashtag that did the rounds last week ([tinyurl.com/Motl1351j](http://tinyurl.com/Motl1351j)) or that there's going to be a *Space Invaders* movie ([tinyurl.com/Motl1351k](http://tinyurl.com/Motl1351k)).

Well, actually, maybe it is just a little bit. Basically, don't follow us @micro\_mart, if you don't want childish humour from time to time.



It would appear that while the site was initially fuelled by user-submitted images (as is the standard definition of 'Revenge Porn'), Moore then struck a deal with a guy called Charles Evens, who began to hack phone and cloud storage accounts in order to obtain more salacious content.

Now, however, having made a pretty penny or two from his nefarious work and cultivating a reputation for his callous and unsympathetic attitude to those whose lives he effected through his business model, Moore now faces two-to-seven in prison. We will play a very tiny violin in his honour. Miniscule, in fact.

## Aaaaaaaaand Finally...

French photographer François Dourlen has created a unique oeuvre all of his own ([tinyurl.com/Motl1351i](http://tinyurl.com/Motl1351i)); his simple trick is to use his iPhone to bring scenes from movies into the real world. While some will no doubt point out that his pictures say something about the mobile information age, the changing nature of how we consume media and the way portable digital devices inherently extend the spaces we occupy in the physical world while simultaneously enclosing us in a virtual bubble, we're more likely to say "Cool! John McClane in a microwave..."

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

If you've heard Noel Gallagher talk about making videos ([tinyurl.com/Motl1351l](http://tinyurl.com/Motl1351l)), you will be under no illusion that it's a fun experience. What better way, then, to avoid having to do that chore than to get a great animator to make a video for you using some of their most beloved characters? Over the years, it's an idea that's proved a rich vein of pop video inspiration – and it's being tapped once again by the back-from-your-youth all-girl skate punkers Sleater Kinney for their latest single 'A New Wave'. Holding the pen this time is Loren Bouchard, whose anim-fam, the Belchers, are the stars of the quite wonderful *Bob's Burgers* ([tinyurl.com/Motl1351m](http://tinyurl.com/Motl1351m)).





## Caption Competition



We're not sure what's tickling this young lad, but here's what you made of his mirth:

- JayCeeDee: "The new Stocks'r'us chairman sees the latest quarterly forecast for Tesco."
- JayCeeDee: "They hadn't got the timing right for the brushes on the Self-Cleaning Potty."
- tighthead: "PMSL."
- wyliecoyoteuk: "The new UKIP manifesto was trying to appeal to the younger generation."
- wyliecoyoteuk: "The SDP have a cunning plan for the next referendum: lowering the voting age to zero."
- The Duke: "Who buys a propaganda sheet in the 21st century. Get that kid an iPad!"
- phantom9: "That's funny... reading this rubbish with smelly vision."
- Thomas Turnbull: "I'm laughing all the way to the bank: my Apple Shares have gone up again."
- Thomas Turnbull: "I knew this paperless office idea would never work – they must be potty."
- Geordie: "'How I made my millions!' From the potty to the page. The life story of the worlds youngest vlogger."

To us, you're winners, but that's particularly true of our actual winner, wyliecoyoteuk, who suggested, "The job isn't finished until the paper work is done."

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



# Magix To Run Fastcut Video Comp

**Copies of new editing software up for grabs**

Our friends over at Magix have contacted us to let you good people know about a little contest it's running to win a copy of its latest video editing software.

Fastcut is its name, and in collaboration with Intel, Asus and Nilox, any person who

enters the contest will receive a free copy of the software, while the overall winner will get an Asus Zenbook UX301LA laptop.

By all accounts, more details will be made available on this via the firm's online magazine so take a look over at [magazine.magix.com/en](http://magazine.magix.com/en) if you fancy it.

# Smartphone Thefts Down Following Kill Switch Drive

**London and US cities benefit from move**

Boris Johnson will be happy to hear that the adoption of kill switches on smartphones, allowing the remote deactivation of handsets should they be stolen, is having an impact.

Apple, Google and Samsung have all included kill switch functionality to handsets over the past few years, and in London the number of smartphones stolen has since fallen by a massive 50%.

Boris himself has weighed in on the matter, commenting "We have made real progress in tackling the smartphone theft epidemic that was affecting many major cities just two years

ago", which is a bit odd as it's the companies behind the phones rather than Boris that have made the difference. Still, he and many attorneys in the US called for new laws, so little wonder why he'd like to take some of the credit.



## Snippets!

### **Driverless Beats Driver**

For the first time ever, a driverless car has taken on a real-life racing car driver... and won! The experiment took place thanks to engineers at Stanford University in California, who pitted 'Shelley', a driverless Audi TT, against an actual racer, an amateur touring class champion no less, and beat him (just) when times were compared around a racing track.

Giddy with excitement over this achievement, the researchers have now gone as far as to suggest that over the next 15 years a car could be driving around with all the skills of Michael Schumacher.

Big Claim, Guys.

### **Dutch Gov Site Attack**

Most of the Dutch government's websites were attacked during a hack in February. The DDoS assault caused multiple websites to fail, and investigators are, understandably, going to be looking into the matter, if for no other reason than to calm fears over the vulnerability of increasingly important public websites.

### **Auslogics' Green Seal**

Australian outfit Auslogics Software has introduced its Green Seal badge, offering a guarantee that the software to which it gives its name is free from all types of add-ons.

As most people are aware, many free software products are bundled with adware or third-party application as a way of generating cash for developers; some even install add-ons without you realising it. Auslogics, however, has taken it upon itself to address that with this Green Seal notice, and it's come at a good time too as the firm has updated its line of freeware products, including Disk Defrag Free, Registry Cleaner and Duplicate File Finder. Find them, and more, at [www.auslogics.com](http://www.auslogics.com).

## Free Wi-fi On Trains!

### **It's coming from 2017**

**D**avid Cameron was, it would seem, all too happy to announce the rollout of free wi-fi on trains from 2017. He made the comments to MPs as a former culture secretary

made the statement that rail passengers were frustrated by underserved wi-fi on trains. The Prime Minister said that the rollout of free wi-fi was due from 2017, and that the government would invest around £50m on the rollout.

That large investment is going to be funded from fines on Network Rail for services running late and passengers of Southeastern, Chiltern, Arriva Train Wales, and TSGN are going to benefit from this initiative first.

## Fitness Bands Probably Not Very Accurate

### **Was that Christmas gift a waste of money?**

**A**ccording to a study in America, headed by someone over at the University of Pennsylvania, fitness bands might actually not be all that useful when it comes to recording your fitness regime. That kind of defeats the point really, doesn't it?

The research looked at how accurate the steps were that smartphones and wearable

devices recorded, with fourteen volunteers walking on treadmills for a designated number of steps. They wore various fitness wristbands, accelerometers, and smartphones running various fitness-related apps.

The researchers involved in the study counted steps and compared the figures recorded by the wearables and smartphone apps and it turns

out that the pedometers and accelerometers were the most accurate devices. As for the smartphones and fitness trackers, the trackers were more inaccurate with the range sometimes up to 20% wide of the mark.

So, technology created to measure your fitness regimen isn't actually very accurate at all. Not a great story for the wearables manufacturers.

## Twitter Confused Over UAE Flag

### **Blunder over Cricket World Cup coverage**

**I**f we asked you to describe the flag of the United Arab Emirates, could you do so? No? Well, until we came across this story, we couldn't have either if we're honest. However, we're not a globally recognised social media platform used by the world and its dog.

To acknowledge the Cricket World Cup, Twitter has

adopted 'hashflags' with an image of a country's flag appearing within tweets using said country's hashtag. So, when someone tweeted #UAE, a graphic of the country's flag should have appeared. However, it seems that whoever was in charge of sourcing the flag colours over at Twitter HQ is similarly in the dark over the UAE's

flag, as they got it wrong. A mistake that, as is always the way on the web, was quickly seized upon. Turns out that while the colours were correct, the configuration was all wrong.

Some Twitter users, particularly those local to the UAE, were not best pleased. You would think that Twitter would have looked into this before putting the hashflags in place?



# Virgin Media Stumps Up Big Money

## Big boost for fibre broadband

**B**roadband provider Virgin Media has announced a big investment of £3bn to improve its fibre optic broadband network.

The massive amount of cash that it's putting up is, according to the company, the biggest investment in broadband infrastructure in the UK for over a decade. It also is expected to provide the added bonus of helping the UK economy create 6,000 fresh jobs, with Virgin essentially stating that the total worth of its investment to the economy is nearer to £8bn.

Unfortunately, there's a flipside to all this positivity: the plan has brought some harsh words from supporters of rural broadband initiatives, as the money is going to be spent on improving Virgin's existing networks rather than extending them and bringing superfast broadband to such areas.

Industry commentators are seeing this as part of Virgin's attempt to take on BT, and while the company is entitled to do what it wants with its megabucks, it does seem rather a missed opportunity to provide a service for our much-neglected rural areas.



# Apple Adds Two-Step Verification

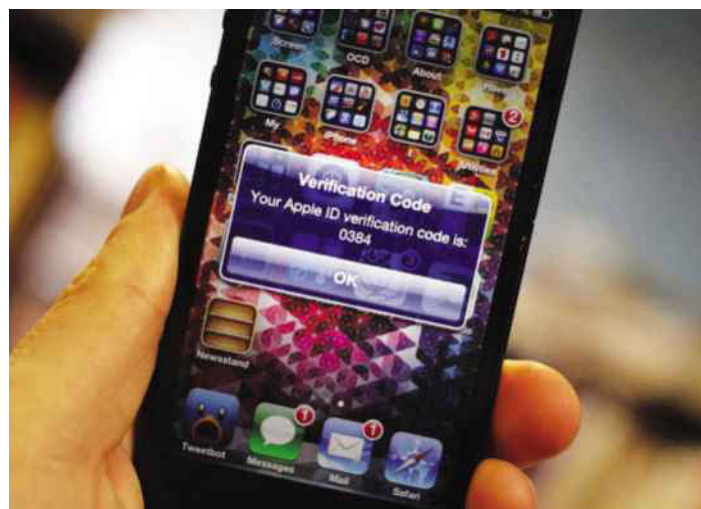
## FaceTime and iMessage up security

**A**pple iPhone, iPad and Mac users now have access to an additional security feature (if they want it) when using iMessage or FaceTime.

Apple's two-step verification process generates a password that has to be entered to shore things up that little bit more on the security front. Users can

disable the feature under the AppleID settings if they like, but the overall idea is obviously to give consumers complete confidence in using the messaging services.

The two-step verification system is already in place on iTunes and iCloud accounts so the rollout is a natural extension of that.



# YouTube Is Ten!

## Video-sharing site celebrates anniversary

**W**hat did you get up to on Valentine's Day? Perhaps you visited the cinema, dined out at a restaurant, or had a quiet night in with some chocolates and a large glass of wine.

If you had anything to do with the global bohemeth that is YouTube, though, you may have spent it celebrating as the website turned 10 on February

14th 2015. Yes, back on that date ten years ago the domain name **www.youtube.com** was registered and while it would take a couple of months for the first ever YouTube video – *Me At The Zoo* – to appear, the site can still lay claim to having started up on that romantic February day.

We've all spent far too much time looking at video clips on the site so it would seem churlish to dismiss it as nothing more than

an excuse for making stars out of seemingly uninteresting people... it does feel like that at

times though, right? Anywho, Happy Birthday YouTube, may all your comments be kind!



## Edifier Prisma Encore

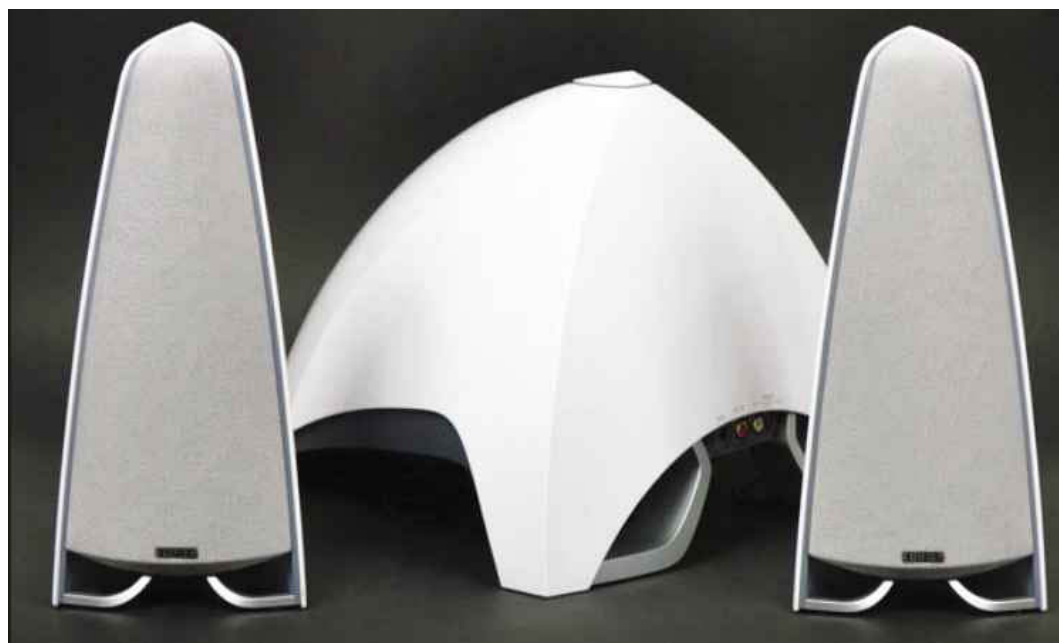
Michael sits back to listen to his music delivered by an Edifier speaker system

### DETAILS

- Price: £129.99
- Manufacturer: Edifier
- Website: [www.edifier.com](http://www.edifier.com)

The Prisma Encore is a 2.1 speaker system from Edifier. As you would expect, it consists of a subwoofer and a pair of satellite speakers. Not surprisingly, as this is an Edifier speaker system, the appearance of the subwoofer and satellite speakers show a degree of imagination. In the case of the Prisma Encore subwoofer, Edifier has come up with a design based on a battle helmet as used many centuries ago. In complete contrast, the satellite speakers are modelled on a triangular tower such as Cleopatra's Needle.

Several other items are included in the box with the main elements. You get a two-piece mains power lead with an appropriate three-pin plug. There are further leads for connecting to single or double socket audio devices. Providing remote control is a curved unit powered by a supplied CR2025 lithium button battery. A user manual and small cleaning cloth complete the package. All the various audio plugs that come with this speaker system are gold plated for better performance.



Capable of delivering an output of 40W from its down-facing 5" driver, the subwoofer has a lacquered black front plate, which partially explains the presence of the cleaning cloth with this kit. All the various connection points on the subwoofer are tucked away out of sight at the rear of the unit. There are connections for the left and right satellite speakers, aux device and mains power.

The two satellite speakers, with their permanently attached leads, combine a material-covered front face with lacquered black side plates that can be brought back into pristine condition with the small cleaning cloth. Each speaker

makes use of a 3" mid-range driver and 0.75" silk-dome tweeters. Both the satellite speakers and the subwoofer feature decorative metal feet positioned at their base.

Setting up this speaker system is just a matter of linking the subwoofer to a power source and attaching the satellite speaker units. Depending on your needs, you can pair the Edifier kit to a Bluetooth source, such as a tablet or smartphone or use the aux option for connecting to an MP3 player or computer. In fact, there's nothing to stop you having both types of connection, but only one will be active at a time. Pairing with Bluetooth devices was quick and trouble-free, with a light on top of the subwoofer glowing blue to indicate input was from Bluetooth. This light changes colour to green when the audio is received from a non-Bluetooth source.

As mentioned earlier, a remote control unit forms part of this kit. This curved device allows you to turn the power on/off,

activate Bluetooth pairing plus adjust the volume level among other options. Performing similar tasks are various touch sensitive buttons positioned at the top of the subwoofer. I feel that many users will opt for the greater convenience of the remote option when controlling this speaker system, although you do need to ensure you have line of sight with the subwoofer for the signal to get through.

**mm Michael Fereday**

**A stylish speaker system with reasonable output quality**

### Features:

- **Power Output:** RMS 12W x 2 + 40W
- **Signal To Noise Ratio:** >85dBA
- **Frequency Response:** 65Hz~20KHz (+/-6dB)
- **Input Type:** Bluetooth / aux
- **Input Sensitivity:** R/L:500mV+50mV
- **Bass Unit:** 5 inch
- **Mid-range Unit:** 3" (78mm)
- **Treble Unit:** 0.75" silk dome





# Divoom Airbeat-10

Divoom widens the choice for those who like their music broadcasted

## DETAILS

- Price: £29.50 (Amazon)
- Manufacturer: Divoom
- Website: [www.divoom.com/product/airbeat-10.html](http://www.divoom.com/product/airbeat-10.html)
- Required spec: Bluetooth audio device or 3.5" jack output

**L**ike London Buses, once a Bluetooth speaker appears, another half dozen seem to follow in quick succession.

The Airbeat-10 slots into the well-populated category of battery-powered speakers designed to be taken on holiday or at least down to the local beach.

It carries an IPX44 water resistance rating that doesn't protect it from full submersion, but it can handle water spray from all directions.

Most of this protection comes from a rubber outer coating that encases the 2" audio driver and under which the control buttons are mounted. That also protects it from knocks, should you

accidentally drop it onto a hard surface.

The Airbeat-10 has three mounting options, the most obvious being the alloy hook on the top that you could easily lash with a karabiner. Along with speaker, Divoom also provides a handle-bar mounting and a suction cup.

That latter device is designed to cause the surface to which the Airbeat-10 is attached to vibrate, enhancing the bass effect. How well this works is very dependent on what surface you pick.

I achieved good results on my metal-sided fridge, but hardly any on my office desk. It's worth

noting that the surface needs to be really clean and smooth for the sucker to adhere, otherwise the vibrations are as likely to quickly detach as create any audio enhancement.

Being battery powered, the operating time is very dependent on how you use it, but according to Divoom, you should expect a maximum six hours of use out of the 500mAh battery. It takes 2.5 hours to recharge, using a standard phone charger (not included).

Having used this device for a few days, I can clearly see some aspects that I really like and others that are less compelling.

The best feature is how really simple and accessible the device generally is, especially in respect of the sucker option. The sound isn't hi-fi quality by any stretch, though

equally Divoom does seem able to make a 2" driver create nicer noises than those that speaker manufacturers insist on installing.

What could have been better was the presentation of the control buttons, which on the black review model were almost invisible. There are probably easier to see on the white, blue or red version, but the amount of relief on the markings needs to be increased so you can find them more easily.

My only other moan is that both of the cables included, one for charging and another for audio jack connection, are excessively short.

Those minor points aside, I really liked the well-made Divoom Airbeat-10, and it's very attractively priced compared with some similar products I've covered recently.

**mm Mark Pickavance**

*A simple but effective Bluetooth travel speaker*



## Specifications:

- **Dimensions:** 87Lx78Wx45h mm
- **Driver Size:** 2" (53mm)
- **Output Power:** 3.5W
- **Signal To Noise Ratio:** ≥75dB
- **Battery Capacity:** 500 mAh
- **Battery Voltage:** 3.7 V
- **Battery Charge Time:** 2.5 hours
- **Wireless Range:** Up to ten meters
- **Bluetooth Compliant:** Bluetooth V3.0
- **Bluetooth Profile Support:** A2DP Stereo
- **Talk Time:** Up to six hours
- **Microphone Sensitivity:** -40 db



# XMG P705 17.3 Pro Gaming Laptop

XMG brings the latest GeForce 900 series GPUs to its gaming laptops

## DETAILS

- Price: From £1,038  
£1,449 as reviewed
- Manufacturer: Schenker
- Website: [mysn.co.uk/shop/xmg-p705-gaminglaptop.html](http://mysn.co.uk/shop/xmg-p705-gaminglaptop.html)

Gaming laptops are generally something of a compromise, because if they weren't, then there wouldn't be a market for desktop PCs.

It all comes down to how much making them easily transportable undermines their gaming capability. In respect of the XMG P705, that's remarkably little.

Schenker, the company behind the XMG brand cherry picks good mobile PC technology and repackages them. The P705 was therefore a Clevo P670SA, though it exhibits some subtle changes from that core design.

The P705 review model had an Intel i7-420HQ 2.6-3.6GHz quad-core CPU, 8GB of SO-DIMM DDR3, a 256GB Samsung SSD and 1TB HGST Travelstar drive.

But there are two other features that put all that in the shade, one being the GPU and the other being a very sharp 17.3" screen.

Often, gaming laptops need the resolution and details

declared for the best titles, but the P705 negates that smartly by utilising the GeForce GTX 970M.

I tested this GPU using the latest Futuremark 3DMark tool, and it's very striking when compared to what most laptop users get for graphics. The Firestrike performance benchmark score was P6614, a number that's close to what I'd expect from discrete Nvidia GTX 770 or AMD HD 7970 on a good desktop rig. That's enough pixel juice for high settings at 1080p, though the fan does kick in the moment the computer enters 3D rendering mode.

What's beyond doubt is how much better it is than the Kepler-based GTX 870M, in both raw performance and by having a lower power consumption. This is a timely warning to those who might be tempted to buy an older design using the 860M and miss out on something far superior.

Presenting that GPU, unless you use the DisplayPort output, is the Chi Mei N173HGE panel, similar to the ones that MSI uses in its 17.3" gaming systems. For gaming this is a good screen, having almost no bleed on black and exceptionally good contrast. Graphics professionals would probably laugh at its colour representation, but that's not an issue when gaming.

While this large display does make the 3.3kg P705 slightly less lap friendly, the extra space it provides in the chassis is well utilised. The keyboard is

spacious as mobile computers go, isn't cramped to the edge and is even backlit.

But where it really shows is when you remove the access panel underneath and see the wonderful splendour of upgrade possibilities. To do that requires you remove no less than 20 screws. Past that tactical hurdle you can get to the four memory slots, a potentially replaceable battery, and numerous M.2 and SATA storage options.

In terms of external ports, this is undoubtedly a strong point of the P705. There are no less than four USB 3.0 ports (one of which is doubles as eSATA), an SD card slot, a full-sized LAN socket, dual mini-DisplayPort and HDMI.

Sound is also, somewhat unexpectedly good. The P705 has its own subwoofer, and combined with Creative Sound Blaster X-Fi MB3 software



“ While £1,500 might seem somewhat steep, this system is well made ”



**Features:**

- High performance GeForce GTX 970M GPU.
- Intel Core i7-4720HQ processor (22nm, 2.60GHz, DDR3L-1600MHz, 6MB L3 cache, TDP: 47W).
- 8GB of RAM, upgradable to 32GB.
- Intel dual-band wireless-AC 7265, 2x2 AC +BT M.2 2230.
- one 2.5" 7mm HDD/SSD and one 7mm/9.5mm HDD/SSD.
- 2x NGFF(M.2 2280) SATA SSD or one PCIe x2/x4 SSD.
- Sound Blaster X-Fi MB3.
- 17.3" 1080p display.
- 4x USB 3.0 ports.
- 2x mini-DisplayPort and HDMI.
- Onkyo speakers with subwoofer.
- Backlit keyboard with coloured WADS gaming keys.
- Large touchpad with fingerprint sensor.
- 3D sound technology on headphone output.
- Powered USB port can charge your device without boot up system (AC/DC).



technology, this machine can make enough noise to fill a good-sized room.

Anyone expecting long battery life with this sort of specification is kidding themselves, because this system isn't really made to operate that way. A realistic prospect would be 90 minutes on battery in 3D mode, but it will last closer to four hours if you're not gaming.

This is a solid piece of equipment that plays games rather nicely. So what's the catch? There is only one substantial one, and that's the price.

As Schenker's product web page proclaims, you can get this machine from £1,039, although that hardware will have only 4GB of RAM, no SSD or hard drives or OS, and the GTX 965 GPU. To get a fully configured system, you're looking at least £1,250, and for the full effect nearly £1,500, and you can go bonkers with a GTX 980M variant, dual SSDs and 32GB of RAM and blow through £2,000 or more.

While £1,500 might seem somewhat steep, this system is well made, specified and at least £200 cheaper than the equivalent MSI GS70 253UK.

So the XMG P705 represents good value for money, even at this price.

**mm Mark Pickavance**

***A mobile gaming powerhouse for those who can afford it***



# Hannspree Micro PC

The future of tiny PC technology is here, and we love it!

## DETAILS

- Price: ~£160
- Manufacturer: Hannspree
- Website: [goo.gl/JpbHT5](http://goo.gl/JpbHT5)
- Required spec: HDMI port, spare plug socket

The Intel Compute Stick got everyone excited at this year's CES, but while all that was going on, Hannspree launched its own version of the PC on a stick, the Micro PC.

This is an extraordinary palm-sized device, complete with a quad-core 1.83GHz Intel Atom Z3735F, 2GB of DDR RAM, Intel HD Bay Trail graphics and 32GB of Samsung eMMC NAND storage. Furthermore, there's Bluetooth 4.0, 802.11 b/g/n wi-fi, a micro-USB port for power, a full-sized USB 2.0 port, and a micro-SD card reader to further expand the storage. Ingeniously, all this manages to fit into a shell measuring just 110 x 38 x 9.8mm and weighing 38 grams.

The Micro PC consists of a hard, piano-black glassy shell, with the aforementioned ports dotted either side, in between some slight heat exhaust vents. It terminates at one end with a protruding HDMI connector,

next to which is located the tiny power button.

The Micro PC comes with a copy of Windows 8.1 Bing Edition pre-installed. All you need to do is simply plug the HDMI section of the device into a relevant socket in your TV or monitor (there's even a HDMI extension cable provided in the box if you're struggling to fit the wider than normal Micro PC) and provide power through the micro-USB port with the supplied 5V 2A power adapter and, to begin with, a

## Features:

- Quad-core Intel processor up to 1.83 GHz.
- Pocket-sized Micro PC experience.
- Transform any HDMI display into a computer.
- 2GB RAM and 32GB storage.
- Super sim design.
- Windows 8.1 pre-installed.
- Preloaded languages: English, German, French, Spanish and Italian.-

USB keyboard and mouse. Once connected, you press the power button, and you can begin the initial setup of Windows 8.1.

Due to the processor inside the Micro PC being of the x86 variety, everything you would normally install on a standard desktop PC can be installed on this device without any perceivable problems. That means you'll be on familiar

ground to begin with and can happily install VLC, Office and even the likes of Steam. There's also the potential for more niche project work, perhaps in the form of a retro emulator machine or some kind of presentation or game server.

The Micro PC is also surprisingly quick, considering its diminutive dimensions. Booting the OS takes a tad less



“ Surprisingly quick, considering its diminutive dimensions ”





than 16 seconds, and once in the desktop, the UI is extremely smooth and perfectly operable. Furthermore, when connected to our network, browsing our video collection on the NAS drive worked a treat, as did normal internet duties.

We tested the Hannspree Micro PC with a selection of HD content films, all of which played perfectly well, thanks to the good hardware h.264 video decoding built into the Atom processor. At full 1080p there wasn't any hint of a struggle from the tiny PC, and thanks to the HD audio through the HDMI port, a connected soundbar to the TV provided the ultimate in ultra-small home theatre PCs.

Gaming was reasonably good too. Although the Micro PC

“ Browsing our video collection on the NAS drive worked a treat ”

won't be able to play the likes of *Evolve* or *Elite: Dangerous* at the highest possible graphical detail, some older titles from the last couple of years (we're taking about *Bioshock: Infinite*, *Assassin's Creed Black Flag* and even *Tomb Raider*) managed to play at slightly lower detail level well enough. There's even the possibility of streaming games from Steam across your network; we actually managed to connect a couple of Bluetooth game controllers and

play some multiplayer Steam choices easily enough.

The Micro PC did get a little warm to the touch after we had finished putting it through its paces. Obviously there isn't a fan hidden somewhere in the case, so all heat has to be pushed through the tiny ventilation holes on the sides of the device. This isn't too much of a problem, though, despite how it sounds. Although it was warm to the touch, the Micro PC never overheated, even

when left dangling around the generally poorly ventilated back of the TV.

Naturally the appeal here is the fact that this is a PC on a stick, and more accurately an x86 PC on a stick. We've tested lots of Android and ARM-based tiny PCs in the past, from the Raspberry Pi onward, and although good, they've often left us wanting something more familiar in the form of a true Windows PC.

At £160 or thereabouts depending on where you shop, the Micro PC may seem a little expensive; especially when compared to the recently announced Raspberry Pi 2. But there's a lot more power here with the Micro PC, and ultimately a lot more potential from the point of view of familiarity. As a result, the Micro PC stands out from the crowd and delivers a better PC experience to all types of user, which makes it worth every penny.

To conclude, if you're thinking of setting up a new HTPC or you have a need for an ultra-small PC that can cope with nearly anything you would normally throw at a desktop, then the Hannspree Micro PC is certainly the right tool for the job. It's an excellent performer that's well designed and more than capable of a multiplicity of tasks and potential projects. [mm](#)

**David Hayward**



**A superb tiny PC, with more than enough performance**



# Evolve

The hunt is on...

## DETAILS

- Price: £34.99
- Manufacturer: Turtle Rock Studios/2K
- Website: [goo.gl/cF0cr5](http://goo.gl/cF0cr5)
- Required spec: Windows 7 64-bit, Core 2 Duo 2.5GHz+, 4GB+ RAM, GeForce GTX560/ Radeon HD 5770+



After playing several hours of *Evolve* we came to the conclusion that should any of its content ever become a reality, then we're going to hope and pray that the other team members we're stuck with are actually half decent at their jobs.

The reason behind that statement is this: *Evolve* is an online multiplayer shooter, where you can opt to be one of four hunters, whose only task is to track down and kill a monster. It certainly sound simple enough. After all, on paper at least, there's going to be four players from around the world joining up to engage in combat with another player on his own. The reality, though, isn't quite as simple.

The hunters take on the usual roles of tank, healer, support and range support. The tanks provide the heavy grunt duties and will naturally end up facing off against the monster toe to toe. The healer's role goes without saying, and although they won't cause as much damage to the monster, they are without doubt one of the most important people on the team. The support role is there to provide operational benefits to the team, such as invisibility in times of need and airstrikes to help cause massive amounts of damage. Finally, the ranger in this instance is the tracker, the one that has the ability to locate and contain the monster.

The person who ends up

playing as the monster has quite the task on their hands. Not only must they avoid the four other players who are solely out to get them, but they have to evolve themselves through hunting the local wildlife and feeding on it. When enough red meat has been ingested, you can evolve and improve the monster's abilities. Should you reach a level three stage of evolution, then you pose a threat to the main installation inherent to the particular map you're playing on.

The problem, though, is getting into the right group, to begin with at least. A new player is expertly matched thanks to the 2K servers, with other players of their rank and abilities, but you never know who you're going to get until the four of you parachute from the dropship and you're on the ground. A good team will near on automatically assign the roles according to who they are: the tracker will hunt and locate, then fall back to allow the tank and support to go in and deal the damage. The healer will stay back and make sure the health of the team is kept topped up and so on.

Often, though, other team members will wander off and take on the local wildlife instead, causing harm to themselves and others as the NPC beasts on the map turn on the hunters instead of simply ignoring them, as most usually do. In the end, you'll find yourself the only member actually

tracking the monster and in the impossible position of taking on the thing on your lonesome, which is a sure-fire recipe for an untimely death.

However, when you find yourself in a team of likeminded individuals, the effect is sheer poetry in motion. Each member knows their role, each member knows the limits of the weapons at their disposal and the environment in which they find themselves. It truly is a beautiful thing to be a part of, and virtual high-fives are the order of the day as you all take down the monster in a heady mix of a jetpack fuelled *Danse Macabre*.

The same can be said for the lonely player who takes on the duty of being the bullet sponge monster. Should you end up facing a group of incompetents, then your job is easy, all you need to do is feed, evolve and take great pleasure in pinning down the healer first and steadily wiping out the other players with a combination of rock throws, fire breathing and thundering leaping ground punches. Similarly, if you're up against a well-oiled group, then you'll have your work cut out, and the challenge is a pleasurable experience indeed.

Needless to say, with each character you opt to play as can be levelled up through experience points earned. How much damage you caused the monster or the hunters and which special

moves you used in doing so are all taken into account, and your score summarised at the end of a match.

With that, there are then special abilities and other characters unlocked, including different monsters. While it's not necessary, this gives you more of a compulsion to carry on playing, to increase your abilities and improve your playing powers.

Communication is vital in a good game, and there's nothing better than bringing other people together for a single goal. This is where *Evolve* shines. It's tense, exciting, and plenty of mayhem is guaranteed when you finally corner the monster. But it's also cunning, and there are just enough extras thrown into the maps to make the game addictive as hell.

*Evolve* is an extraordinary game. It's the first in a long, long time that has us shouting down the headset and cheering with every win. There are ups and downs and some superb moments, with even the downs being worthwhile.

The one criticism we have is the amount of content that has to be purchased separately through DLC. It's cosmetic stuff, yes, but when you're paying full price, it really should be included.

**mm David Hayward**

An interesting and extremely immersive game





# Booq Taipan Shock

All laptops deserve to travel in luxury, according to Booq

## DETAILS

- Price: £80
- Manufacturer: Booq
- Website: [www.booqeuropa.com/eu/home](http://www.booqeuropa.com/eu/home)
- Required spec: 13-15" Mac Book or 16.4" PC laptop

I've reviewed Booq equipment before, so the real surprise in its Taipan Shock was the price, as it's less than £100.

For those not familiar with Booq, it makes a selection of high-quality cases, sleeves, backpacks and bags, all designed to protect your precious IT hardware in transit.

It markets mostly to Apple users, so the Taipan Shock is made specifically to fit a Mac Book, though not exclusively. My Dell Ultrabook fit just as snugly into it, even if the backpack secretly felt abused at the drop in standards it was enduring.

Compared with other Booq backpack designs, the Taipan Shock is deceptively simple, having a single main zipped enclosure for the PC and two flanking zipped pockets for the power supply, maybe a drinks bottle and other larger accessories.

Inside there are additional narrow pockets, and there's



also an additional zipped location on the back panel that looks perfect for personal items like your phone or small headphones.

The outer surfaces are all made of tough 1680D polyester that's been treated with a water-repellent coating, making it both stylish and protective. Internally, Booq used 210D Nylon, which is less abrasive and therefore kinder to equipment.

Anyone who's been caught in a downpour will have worked out that often the zip is the weak point in a backpack for allowing water through. But the Taipan Shock uses a specially designed YKK zipper that resists water ingress.

As with all Booq bags these days, it's also included a Terrling tag that uniquely identifies the bag and could theoretically allow some remarkably nice person to return your property should you inadvertently misplace it. There's a degree of optimism there that we should all be encouraged to adopt, even if experience tells us to be hopelessly realistic.

As laptop backpack go, this is one of the best I've tried, and the padding between the main pocket and the back wall makes it very comfortable to wear when travelling by public transport for long periods. There's an additional strap you can engage across the chest that also makes it ideal for those who cycle.



If I've got a reservation, it's the colour. The overwhelming noire motif seems destined to obscure anyone foolish enough to cycle or walk on unlit roads. Booq did add tiny reflective strips to the back and straps, but not enough for me to think that it couldn't try harder in making the owner even more visible.

That point aside, this is an exceptionally classy accessory that costs less than most other Booq options. You can buy cheaper backpacks made to transport laptops, but very few that come anywhere near the elegance and inherent quality of Taipan Shock.

**mm Mark Pickavance**

## Clip specifications:

- **SKU:** TSH-BLK
- **Fits:** 13-15" Mac, 16.4" PC
- **Exterior:** 460 x 330 x 210 mm
- **Interior:** 440 x 330 x 25 mm
- **Weight:** 0.96 kg
- **Lining:** 210D nylon
- **Exterior:** 1680D Polyester



*Beautifully made backpack that isn't just for Apple Mac owners*



# GROUP TEST

## 4GB Graphics Cards

An extra few gigabytes on a graphics card can make all the difference to how well it performs when under the considerable loads that modern games put on it.

David Hayward has six 4GB cards on test, and he's been selflessly sacrificing his time playing games to find out which stand out from the crowd.

## 4GB Graphics Cards

### MSI GTX970 Gaming 4G

#### DETAILS

- Price: £279.99
- Manufacturer: MSI
- Website: [goo.gl/DpBfRI](http://goo.gl/DpBfRI)
- Required spec: Windows 7 or later, available PCIe x16 3.0 slot, 450W PSU

**M**SI certainly knows how to make a lump of plastic metal and silicon look dazzling.

Okay, so it's just a graphics card, but to us, they're impressive-looking objects.

The MSI GTX970 4G certainly stands out from the crowd, with two elaborately designed, 100mm downdraft fans positioned atop a huge nickel-plated copper heatsink, with four heatpipes winding through the aluminium fins.

Beyond the design, we have 4GB of GDDR5 memory, a default core clock speed of 1114MHz, memory clock speed of 7GHz and HDMI, DisplayPort, DVI-I and DVI-D outputs. The Nvidia Maxwell architecture delivers 16 streaming multiprocessors, 2,048 CUDA cores and drinks up a healthy 145W of power. This alone should be enough to pique the interests of the gaming fraternity. However, through the use of the MSI Gaming App, you're able to overclock this card to a mouth-watering 1140MHz or underclock it to a more sedate, but silent, 1051MHz core speed. You could probably go even higher should you so wish, as MSI has included overclocking through the Gaming App in the warranty. Experimentation is certainly on the cards, then.

The twin Frozr V fans work independently of each other and are remarkably quiet in



their operation – even when the Overclock mode button was clicked in the Gaming App. The temperature too never ventured much beyond the 65°C mark, and the design of the card makes for a better airflow through and around the fans and components.

To add to that, the GTX970 is slightly slimmer than the average dual-slot card. This enforces better airflow and helps keep the card cooler when set up in an SLI mode. When seated on the motherboard, it looks quite sleek, and there's also an LED-lit dragon and MSI logo on the top corner of the fan mounts.

Not only does this card look the business, but it also performs magnificently, and the 3DMark 11 score of 15,610 is testament to that. Furthermore, *Battlefield 4* at 1920 x 1080 in Ultra settings managed an average frame-rate of 76. *Skyrim* at 1080, 8x AA and with the Ultra settings and high resolution texture pack installed averaged out at 150fps. And *Watch Dogs* at 1080 with everything at the maximum graphical level scored an average of 71fps.

Suffice to say, this is a graphics card that can play

anything you want to throw at it in the highest resolutions without even breaking into the digital equivalent of a sweat. So imagine having three of these teamed up in an SLI setup.

MSI has pulled out all the stops with the GTX970 Gaming 4G. Not only is it a hugely impressive card, but it's also asking to be tweaked with, and doing so is exceptionally easy through the MSI management software. And for around £270, we think it's also reasonably priced considering the massive impact it will have on your system.

This is a solid weapon of choice for any gamer, which offers superb performance, features and stability, as well as overclocking potential. Certainly one to consider when upgrade time approaches.





# Sapphire R7 240 4GB

## DETAILS

- Price: £72.59
- Manufacturer: Sapphire
- Website: [goo.gl/l87p2g](http://goo.gl/l87p2g)
- Required spec: Windows XP or later, PCIe x16 3.0, 400W PSU

**S**apphire is a company whose history in the development of the graphics card can be traced back to the turn of the millennium. 2001 saw many an enthusiast drooling over the latest Sapphire release, so we were looking forward to getting into this Radeon R7 240.

The R7 240 from Sapphire features an Oland Pro GPU variant running at a 730MHz core clock speed, with a boost up to 780MHz. The DDR3 4GB memory runs at 900MHz, with the card having a TDP of 30W.

It's a relatively compact single slot card, measuring 145 x 95 x 15mm, with the design looking rather like an old Voodoo Banshee from some years ago. It's effective enough and offers VGA, HDMI and single-link DVI outputs. The lack of a huge amount of fans

or a larger heatsink doesn't appear to affect the card too much or create any major overheating problems. However, it did get a little hot to touch after we ran the benchmarks – hotter than the MSI GTX970 at least.

*Battlefield 4* at 1920 x 1080 in Ultra settings, managed an average frame-rate of 29. *Skyrim* as before with ultra-settings and 8x AA scored 31fps. And *Watch Dogs* at 1080 with the maximum graphical settings scored just 27fps. Moving on to FutureMark's 3DMark 11, the

score of 2,650 isn't really much to get excited about, especially when compared to the previous graphics card.

While the numbers may not elicit much of a response from the hardcore benchmark fanatic, the cost of the Sapphire R7 240 has to be taken into account. This is a card that costs just £72 – over £200 cheaper than the far more powerful GTX970. For that cost you could potentially get a few of these cards in a triple CrossFire setup.

As a single card, although you'll be able to play the latest

games, you won't be able to enjoy the highest possible settings without some form of graphical problem. In some ways it all depends on what you want. The GTX970, for example, is more future proof, for quite some time, whereas the R7 240 will find itself unable to cope relatively soon.

On the other hand. For £70, this is a perfectly fine single slot 4GB card. It plays Blu-ray content, streaming HD content and manages higher-end video editing without any hint of a problem.

The only issues we had were the heat build-up during the benchmarks (which could be a concern if the system isn't well ventilated) and the Catalyst Control Centre drivers that refused to be installed a couple of times on our test system. Eventually they installed correctly and everything worked a treat, but someone with lesser computing experience may have trouble.

The Sapphire R7 240 4GB graphics card is therefore good enough for a power user system, and for £72 it's reasonably priced too. For high-end gaming, though, you're going to be a little disappointed, and you'll need to consider spending more for future proofing technologies.



## 4GB Graphics Cards

# EVGA GT 740 Superclocked 4GB

### DETAILS

- Price: £85
- Manufacturer: EVGA
- Website: [goo.gl/5jjkdL](http://goo.gl/5jjkdL)
- Required spec: Windows XP or later, PCIe x16 3.0, 400W PSU

**E**VGA has been producing graphics cards since the late 90s and has doing a pretty good of it too. It not be quite as prominent these days as it once was, but its hardware is still up to scratch and can stand toe to toe with the more popular manufacturers.

The EVGA GT 740 Superclocked graphics card uses the GK107-425-A2 GPU variant of the popular mid-level GK107 GPU that was released last year by Nvidia. The original GPU clock speed of the GT 740 was around 990MHz, but EVGA has given this version of the GPU an turbo boost of 9%

to 1085MHz, although oddly the memory clock speed was left at the original 1250MHz.

This is a dual-slot card that measures 111 x 152 x 38mm, with a mini-HDMI and a pair of DVI ports. There's a large heatsink casing that houses a 100mm fan, which keeps

the card relatively cool during operation. There's also another edition of this card, which is single slot and features a smaller heatsink and fan casing over the back quarter of the card. Either way, both cards appear, on paper at least, to perform the same.

Speaking of performance, the benchmarks were marginally better than the R7 240. *Battlefield 4* at 1080 scored 31fps, *Skyrim* with the same Ultra settings and 8x AA scored 32fps, and *Watch Dogs* squeezed out a more reasonable 30fps. The 3DMark 11 benchmark score was 2,840 – was better than the 2,650 of the R7 240.

The reason we're comparing the two is because they stand at pretty much the same price level. The R7 is £72, whereas the EVGA GT 740 costs in the region of £85, depending on where you shop. For just over a tenner more, you therefore get a slight improvement on the GPU power and a few more frames per second.

As with the R7, though, the GT 740 performs extremely

well as a non-gaming, power user graphics card. HD video content, streamed or via Blu-ray, performs without any flaw. And picture or video editing seems to be without issue as well.

This isn't a bad graphics card, by our reckoning. It's still under £100, and it can play modern games with a reasonable amount of frames. As before, though, it's beginning to look its age, in terms of graphical gaming performance, and it will probably reach the end of its shelf life very soon. Otherwise, an okay card.





## Asus R9 270X DirectCU II TOP 4GB

### DETAILS

- Price: £180.96
- Manufacturer: Asus
- Website: [goo.gl/CK5aXS](http://goo.gl/CK5aXS)
- Required spec: Windows XP or later, PCIe x16 3.0, 550W PSU

**W**e reviewed the Asus R9 280 DirectCU II TOP 3GB model some months ago, and we were suitably impressed with such a powerful card taking pride and place in our system.

Now is the turn of its predecessor, the R9 270X. The GPU is based on the Curacao, this one in particular being the XT variant. It has a core GPU clock speed of 1120MHz, with a memory clock of 1400MHz for its 4GB of GDDR.

This is a dual-slot card, with HDMI, dual DVI and a single DisplayPort output. The design is remarkably similar to that of the MSI GTX970, with the pair of fans connected to the main board via a large, plastic, red-and-black casing. Furthermore, there's a large nickel-plated metal heatsink with two S-shaped pipes and a single U-shaped pipe to maximise heat transfer. The



“ It’s a clever setup and one that’s extremely effective in its operation ”

area where the pipes cross each other in the centre of the cooling setup is directly over the GPU, so any excess heat is immediately dissipated through the heatsink and blown out by the sound-dampened fans.

It’s a clever setup and one that’s extremely effective in its operation. Needless to say, there wasn’t any hint of overheating

or of the system itself getting hot under the old collar as the graphical intensity was beefed up in our benchmarks.

Speaking of which, the 3DMark 11 score for the Asus R9 270X was a decent enough 8,690, which despite not being as good as the more modern GTX970 (which is a little obvious really), is still more than enough

to cope with the demands of a modern game.

The *Battlefield 4* test was a very good 38fps, *Skyrim* with all the settings on high scored 39fps and *Watch Dogs* managed 35fps. All in all, not too bad and enough for each game to be perfectly playable.

As you may expect, then, when we tried out the more normal duties of image and video editing, the Asus R9 270X didn’t have any problems. The same can be said for streaming HD content and watching Blu-ray video. There’s no reason why this wouldn’t make for an excellent and exceptionally powerful media PC – provided the case space and the 180W TDP is met.

This was also a remarkably quiet card. The sound dampening on the fans obviously works, and even during intense graphical moments when either gaming or running through the benchmarks, the card was never really any louder than the high-performance system fan we had in place.

The Asus R9 270X DirectCU II TOP 4GB graphics card is a great choice for those of you who want decent graphical power from a quiet and cool setup. It costs roughly in the region of £180, but you may find one going cheaper if you shop around.

Although the R9 270X isn’t the latest model in the AMD arsenal, or Asus’s for that matter, it’s still a card that can hold its own and deliver the goods when needed.



## 4GB Graphics Cards

# Zotac GTX980 AMP! Edition 4GB

### DETAILS

- Price: £449.99
- Manufacturer: Zotac
- Website: [goo.gl/iNUmFj](http://goo.gl/iNUmFj)
- Required spec: Windows XP or later, PCIe x16 3.0, 550W PSU

This next graphics card is enough to make the gamers among you drool. The Zotac GTX980 AMP! Edition is, at the time of writing at least, regarded as the most powerful graphics card in the world. As we all know, though, technology marches onward at a pace, so by the time you read this, that claim may belong to another model.

For now, though, this immensely impressive looking monster of a card has been given the Zotac treatment, a company that prides itself in aggressively overclocking already super-fast cards and has come out with a GPU core clock speed of 1165MHz, with a potential boost speed of up to 1266MHz – a good 4% faster than the stock GTX980.

The 4GB of 256-bit GDDR5 memory runs along at a startling 1753MHz, and the entire card is cooled by a triple-fan IceStorm LED-laden arrangement in a gunmetal-grey casing over the large heatsink. The effect is quite stunning and, despite the amount of cooling going on, also remarkably quiet even when under the pressure of benchmarks. Video outputs come in the form of HDMI, three DisplayPorts – all capable of up to 4K resolutions at 60Hz – and lastly a DVI port.

As you would expect, the 3DMark 11 benchmark was certainly a big number; to be exact, the GTX980 scored 18,890, which is by far the biggest number we've had so far. While we're on the subject of performance, the *Battlefield 4* benchmark scored an average frame-rate of 165; *Skyrim*, as before with Ultra settings and so on, scored 165fps. And finally, *Watch Dogs* with everything set to high scored 105fps. There's not much this card can't do. It'll happily play everything you throw at it, and it'll do it to the

maximum resolutions and with every graphical setting turned as high as possible.

Interestingly, while this version of the card is splendid, Zotac has since launched another two versions of the GTX980. There's an Omega Edition that has upped the core clock speed to 1202MHz, with a boost of 1304MHz, and there's an Extreme Edition, which boasts a core clock speed of 1291MHz and turbo boost of 1393MHz. Unfortunately, we didn't get hold of the Extreme Edition to test, and in all honesty there's little chance that Zotac would have got it back after having a room full of reviewers salivating all over it.

While amazing, outstanding and looking pretty terrific, the Zotac GTX980 AMP! Edition does come at a heavy price. Unless you're willing to part with the princely sum of around £450, you're better off dipping into one of the lesser-powered cards on test until the price has come down to something a little more reasonable.

Needless to say, the Zotac GTX980 is an incredibly powerful and very impressive graphics card. It'll blow anything else currently available out of the water, but it's also hugely expensive and therefore a little out of the budget range for us mere mortals. Still, one can dream.





## Asus R9 290X DirectCU II 4GB

### DETAILS

- Price: £323
- Manufacturer: Asus
- Website: [goo.gl/PvqFvp](http://goo.gl/PvqFvp)
- Required spec: Windows XP or later, PCIe x16 3.0, 600W PSU

The design of the Asus R9 290X DirectCU II follows the same aesthetics as the R9 270X. The same 100mm fans are in use, and the colour scheme on the plastic fan chassis is identical too. The cooling solution is slightly different, though, with direct contact with a 10mm copper pipe over the GPU spreading through the large aluminium heatsink.

Aside from the looks, the R9 290X is very different. This is a high-end AMD card that's extremely capable and with a 50MHz overclock on the GPU to 1050MHz from the stock 1000MHz. The memory clock too has seen an increase thanks to Asus, bringing it to 1350MHz over the stock R9 290's 1250MHz.

This is of course a dual-slot card, with video output



“There’s nothing much it won’t be able to play at the highest possible resolutions”

being taken care of by a pair of DVI ports, HDMI and a single DisplayPort. Triple-monitor setups are therefore possible using just a single card, and the R9 290X certainly has enough power under the hood, as it were, to accommodate multiple displays in this way.

Our benchmarks were solid enough, with some decent numbers attached. The 3DMark 11 score has the Asus R9 290X at 16,295, which places it in second place above the MSI GTX970 but below the singularly impressive Zotac GTX980. The *Battlefield 4* frames-per-second benchmark score was 76fps (the same as the MSI GTX970), and the *Skyrim* benchmark score 144fps. Finally, the *Watch Dogs* benchmark score was 70fps.

The numbers are roughly the same as the MSI GTX970, and there's always the potential to overclock the R9 290X to a higher rate of performance above the stock clock speeds that the MSI GTX970 offer. We didn't in this case overclock the R9 290X, since we have to give it back, but we're informed that you can gain a few more

percent in terms of speeds over the already overclocked numbers that Asus has applied out of the box.

The Asus R9 290X DirectCU II is a very capable card. As with the other higher-end performance cards we've already looked at, there's nothing much it won't be able to play at the highest possible resolutions and settings. And as you would expect, the more normal duties of image and video editing, as well as playing HD and 4K content, aren't a problem.

However, the average price of the Asus R9 290X is around £320, which makes it 40 to 50 pounds more expensive than the equivalent powered card, the MSI GTX970. In the end, then, it appears that it all comes down to whether you prefer Nvidia cards over AMD and if you're happy to pay slightly more, of course.

We liked the Asus R9 290X DirectCU II; it's a quiet, good-performance graphics card that will keep you gaming for a number of years to come. It's just a pity it's a little more expensive than the Nvidia counterpart. If the R9 290X dropped 50 quid off its price, there's a good chance it would shift more units. Still, definitely worth a look.





### MSI GTX970 Gaming 4G

We think the MSI GTX970 Gaming 4G has the best overall power, performance and cost of the group, although it was a pretty tight decision.

The Zotac GTX980 is obviously the most powerful card in existence, but its cost is just too much for the average user. Therefore the MSI manages to hit the nail on the head and subsequently win this week.



### Asus R9 290X DirectCU II 4GB

We rather liked the Asus R9 290X DirectCU II. Although it's a tad more expensive than the MSI GTX970, the performance levels are virtually identical.

If it dropped in price a little more, then there's a good chance it would have come out as the overall winner. As we said, though, in the end it all depends on whether you prefer Nvidia or AMD.

## How We Tested

Each card was fitted into a PC with the following specs: Core i7-4790K quad-core 4GHz CPU, Gigabyte Z97M-DS3H motherboard, Samsung 120GB EVO SSD, 16GB Kingston HyperX Fury Red RAM, 750W PSU and an Aerocool Dead Silence Cube.

For testing we used 3DMark 11 for benchmarking, OpenShot with a three-minute video complete with transitions and a 3D animated intro, basic desktop stuff (Word, Excel), Gimp for image editing, and for gaming, we used *Battlefield 4*, *Skyrim* and *Watch Dogs*, all with the maximum resolutions and highest possible settings.

	MSI GTX970 4G	Sapphire R7 240 4GB	EVGA GT 740 Superclocked 4GB	Asus R9 270X DirectCU II TOP	Zotac GTX980 AMP! Edition	Asus R9 290X DirectCU II 4GB
<b>Price</b>	£279.99	£72.59	£85	£180.96	£449.99	£323
<b>Dimensions</b>	269 x 141 x 35mm	145 x 95 x 15mm	111 x 152 x 38mm	271 x 133 x 40mm	267 x 140 x 38mm	287 x 147 x 40mm
<b>GPU Speed</b>	1114MHz	730MHz	1085MHz	1120MHz	1165MHz	1050MHz
<b>Memory Speed</b>	1750MHz	900MHz	1250MHz	1400MHz	1753MHz	1350MHz
<b>TDP</b>	148W	30W	64W	180W	165W	290w
<b>Outputs</b>	2X DVI, HDMI, DisplayPort	VGA, HDMI, DVI	Mini HDMI, 2X DVI	HDMI, 2X DVI, DisplayPort	DVI, HDMI, 3X DisplayPort	2X DVI, HDMI, DisplayPort
<b>Slot Type</b>	Dual	Single	Dual	Dual	Dual	Dual
<b>3DMark 11 Score</b>	15610	2650	2840	8690	18890	16295
<b>Battlefield 4 FPS</b>	76	29	31	38	165	76
<b>Skyrim FPS</b>	150	31	32	39	165	144
<b>Watch Dogs FPS</b>	71	27	30	35	105	70



# Your Letters

## Ready To ROMble

When it comes to gaming, I'm not into the latest titles, with their flashy graphics and so on. I like the older stuff – Commodore 64, Super Nintendo, whatever. I think the last console to really interest me in any way was the original PlayStation.

Of course, that means I can emulate all of the systems I'm interested in using my home PC. It's a gaming powerhouse by any means, but it runs all of these things at full speed. In fact, I've found even my Android tablet and smartphone can do the same thing too, so I can even play classic games when I'm out and about. It's amazing how much power we have in our pockets these days.

The only problem, of course, is getting hold of games. Don't get me wrong: it's easy – but you're not meant to download them where you usually end up downloading them from, because they're still under copyright, and ROM sites aren't actually allowed to host the files they do. Is there any alternative to these illegal

sites, though? Not really. I know there are still plenty of new games being made for old machines, but I want to play classic games, not new ones.

You can also pay for some of these games on new machines, but the prices are so ridiculous, it's not even worth considering. Yes, I'm talking about the Nintendo store and the Xbox store and so on. You can buy old games, but the prices are plain unrealistic, considering how old these titles are. There's no doubt these games have all made their money a very long time ago, and all the owners of them have to do is put up a tiny ROM file with a built-in emulator. It's five minutes' work, but they reckon it's fair to then charge £5 a download or whatever for that work. For that amount of money, I'd expect 20 old games, not one.

It's about time these companies started realising that their old titles just aren't worth as much as they think, especially when it's so easy to acquire them through so many other means.

**Martin Penn**



## I've Ad Enough!

Is anyone else sick of adverts in YouTube? It seems like every single thing you want to look at, whether it's a tutorial of some sort or a video of a cat falling off a table, makes you wait for a few seconds before you can skip the ad – and you always skip the ad.

In fact, have you ever just sat there and let the advert play? Or do you just wait for the timer to tick down, cursing under your breath, before finally clicking to get rid of it? Sometimes, I even mute my PC so I don't have to hear whatever 'sponsored message' Google wishes to throw at me. Occasionally, though, I've just clicked away, because I simply can't be bothered to wait.

I've grown accustomed to blocking out adverts, even when they're playing, and I don't think I'm alone in this. I bet most people have never bought anything they've seen in a YouTube video. These adverts are just an annoyance,

but this is what brands are associating themselves with.

If you are going to have advertisements on a website, then what's wrong with plain old banner ads? It's most likely that I'd continue to ignore them, but I could do so without them getting in the way all the time.

**Dave Burgess**

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“ The prices are unrealistic, considering how old some of these titles are ”

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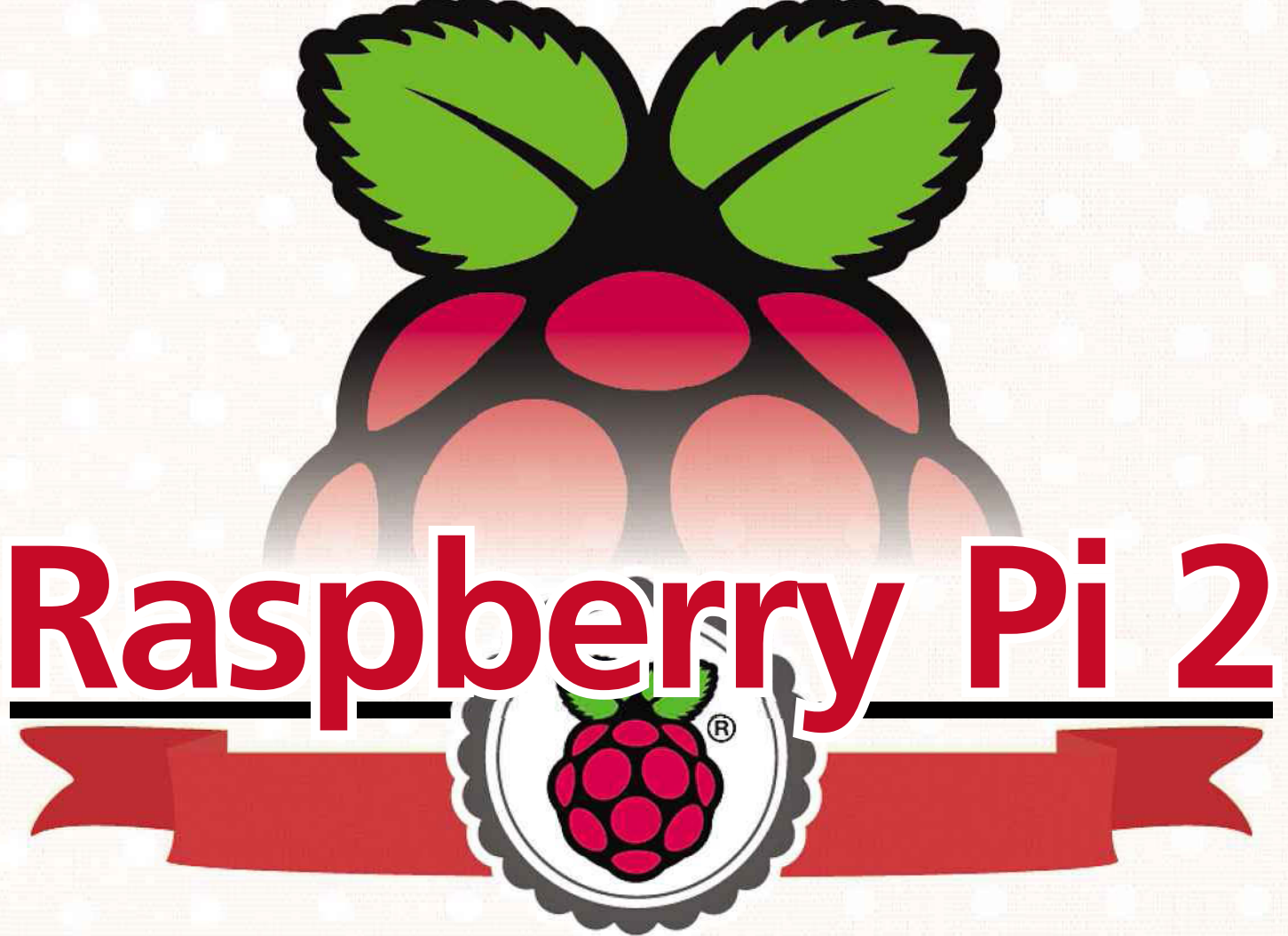
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**David Briddock** gives his own assessment on the latest family member

**T**he Raspberry Pi (RPI) has proved a popular piece of kit. Board sales have now topped the four million mark (it will soon supersede the Sinclair Spectrum as the biggest selling British-made computer), the add-on and accessory market is buoyant and still growing, and the huge Pi community has enthusiastic members in virtually every country on the planet.

Not everyone was completely happy, however. The board design, with its relatively low power CPU and only 512MB of memory, was starting to look a little dated. This was especially true when you started to compare it to some of its new competitors. What's more, as a result, it was beginning to struggle to run some of today's Linux distributions and other popular operating systems.

We've seen a few revisions, namely the Model B+ followed by the Model A+, but they were really little more than incremental tweaks to the base specification (a larger GPIO port, improved power consumption and so on) rather than major updates. Now, however, there is something very new...

### Launch

On Monday 2nd February, Raspberry Pi Founder and CEO Eben Upton posted a blog ([goo.gl/dJYQ8T](http://goo.gl/dJYQ8T)) announcing that the Raspberry Pi 2 was now available to buy. It

was an announcement that took many by surprise. Those who had been afforded prior knowledge of the details, and the significant number of people who must have been involved in designing and building it, had obviously managed to keep tight lipped.

The RPi 2 really is a major update, so let's have a look at what's new.

### Much Faster Processor

The new BCM2836 System-on-a-Chip (SoC) retains all the features of the previous BCM2835, but the single-core 700MHz ARM11 is replaced with a quad-core ARM Cortex-A7 running at 900MHz. Everything else remains the same to avoid any hardware transition pain. This includes the excellent price-to-performance champ that is Broadcom's VideoCore IV graphics processor (GPU). Most importantly, all those previously Pi-optimised open-source libraries and applications (WebKit, LibreOffice, Scratch, Pixman, XBMC/Kodi, libav, PyPy and so on) will work just fine – only now even faster.

In a BBC interview Eben Upton said, "We think it's about six times more powerful for most applications. You can do most of the things with this that you can do with a PC. You can surf the web, you can watch videos, you can play games."

Early single-threaded CPU benchmarks show at least a 50% increase in speed,

while other tests run at least four times faster. Some multicore video codecs manage to operate 20-times faster.

### Twice As Much Memory

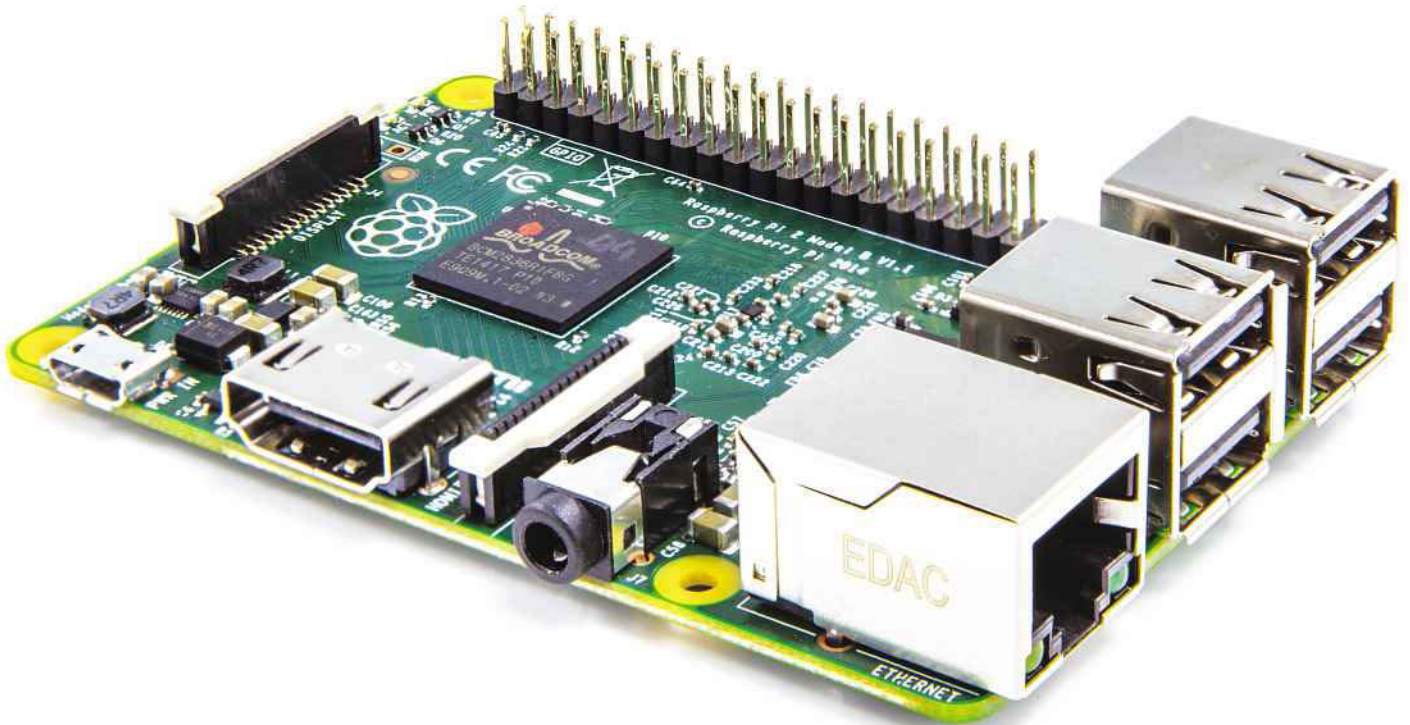
The Raspberry Pi 2 has 1GB of LPDDR2 SDRAM. This is twice as much as a Model B+, and four times more than the very first Model B. With that amount of RAM you can install a much wider range of Linux distributions, and access a greater choice of operating systems in total. Also, of course, more memory typically results in better real-world performance.

To help reduce costs the RPi 2 has abandoned the BCM2835's package on package (PoP) format. Consequently the single 1GB RAM chip is now located on the underside of the board.

### Full Specification

- 900MHz quad-core ARM Cortex-A7
- Broadcom VideoCore IV GPU
- 1GB LPDDR2 SDRAM
- 4x USB 2.0 ports
- HDMI port
- 10/100 Ethernet port
- 40-pin GPIO port
- MicroSD card socket
- Stereo audio and composite video
- Low power consumption





### What's Not Changed

Critically some things haven't changed with the upgrade, the most important of these being the price: still just \$35 (or £22.85 excluding VAT). That's identical to the Model B+ (and the original Model B for that matter). Considering the increase in power, memory and capability, it's a bargain – especially when compared to the competition.

The RPi 2 also has an identical form-factor to the Model B+. All of the connectors are in exactly the same place and they exhibit the same functionality. The larger Model B+ style 40-pin GPIO port is retained, and everything still runs from a 5V micro-USB power adapter.

All the current Model B+ cases, HATs, add-on boards and other peripherals are still useable. Makers could potentially just drop a Raspberry Pi 2 straight into to their media-centre, games-console, robot, rover, drone, or other Pi-centric project and carry on much the same as before.

So... it's the same price, the same form, and has identical software and hardware compatibility, yet it comes with more power and improved flexibility. Whether you're after your first Raspberry Pi, or thinking about an upgrade, the new Raspberry Pi 2 is an obvious choice.

### Microsoft Windows 10

As we said earlier the Raspberry Pi 2 runs a wide range of operating systems. This includes Windows 10, or more specifically



# Windows 10



Microsoft's Internet-of-Things (IoT) version of its latest operating system.

At a special news conference on January 21st, Microsoft detailed presentation about the new OS outlined its ability to run on a wide range of platforms including desktops, laptops, tablets, phones and development boards. Indeed, over the last six months, and in complete secrecy, key members of the Raspberry Pi Foundation and trusted associates have worked closely with Microsoft's IoT project team to bring its latest operating system to the Raspberry Pi 2.

Then, on February 2nd to coincide with the launch, a new Raspberry Pi 2 post appeared on Microsoft's News blog site ([goo.gl/RIwCFr](http://goo.gl/RIwCFr)), confirming the compatibility – and that we can expect to see a growing number of RPi2-centric Microsoft announcements over the coming months as the Windows 10 platform matures towards its full release later in the year.

To read the latest news and developments visit [windowsondevices.com](http://windowsondevices.com) or join the Windows Developer Program for IoT. Also, you should remember that Windows 10 will be free to download and install for the first 12 months after launch day.

### And There's More...

In regard to other hardware updates, Eben Upton's blog post also mentioned a new BCM2836-based Compute Module in the not too distant future. Although, somewhat surprisingly, he dismissed the notion of a BCM2836-based Model A. Then there's the persistent rumour of a Raspberry Pi laptop (maybe with touchscreen); with a Raspberry Pi 2 at its heart, that intriguing idea suddenly makes a lot more sense.

As for software, we can expect a revised and optimised Raspbian distribution build, namely one configured around ARMv7 Debian, rather than the existing ARMv6 Raspbian release. This would deliver a further boost in performance to Raspbian distro devotees. Meanwhile the Linux community will be keen to show what's possible on this latest board.

And what about *Minecraft*? Mojang's original Raspberry Pi version was ideal for Python or Java hacking, but severely restricted in terms of gameplay. However, utilising the RPi2, Microsoft could release a full and unrestricted version of *Minecraft*, complete with a hacker-friendly multi-language mod kit based around its .NET development platform and toolset. [mm](#)

# 10 THINGS WINDOWS 10 WON'T FIX

**Mark Pickavance** finds ten elephants that the Microsoft won't address with its new version of Windows

**T**here's an expression in poker that sums up well where Microsoft finds itself with Windows 10: 'all in'. Another failure on the scale of Windows 8 could seriously undermine investor confidence in the company and those senior people it relies on to keep the company relevant in a rapidly changing technological world.

With its future riding on it, Microsoft is keen to point out how Windows 10 addresses many of the problems that its customers experienced with the previous release.

But, there are many very obvious problems with and around Windows that this new version won't address, some through circumstance but mostly through choice.



1

## Windows RT

We've all become tuned to how politicians will very carefully choose their words, avoiding saying anything that they might be forced to back up at any point with action or policy.

Therefore, when at the recent Windows 10 presentation, a question was asked about Surface hardware and specifically Windows RT devices, the answer immediately caused reaction among those journalists and pundits who pick up nuances.

The answer Microsoft gave was that Windows RT (and by association Surface and Surface 2 systems) would be getting an 'update'. A few people at that presentation assumed, wrongly it turns out, that Windows 10 would be coming to those devices. It won't be.

Subsequent questioning has revealed what Microsoft didn't

want to directly mention at the time, specifically that some bits of Windows 10 will be rolled up into a service pack for Windows RT 8.1, but that it won't be coming to the full Windows 10 party.

That's very telling indeed, because since CEO Satya Nadella pulled the rug from under the Surface Mini, any talk of subsequent ARM-based Microsoft hardware has all but vaporised.

However, Windows 10 will be supporting ARM-based hardware in respect of IoT, specifically a much promoted release for the Raspberry Pi 2, curiously.

When Microsoft launched the Surface and Surface 2, many pundits questioned why it had gone with ARM instead of using a low-power Intel Atom derivative. That would have given it x86 compatibility, at least.



The argument put forward then was the purpose of those devices was to run universal Metro apps and not anything desktop based. Therefore the decision to give this platform a desktop that you can't install apps on seems even more confusing in hindsight.

Windows 10 won't be seen on Surface or Surface 2. Those with them might get be able to trade them in around release time for either a cost reduction on an Intel Surface or Windows 10 licence, but that's just a highly optimistic guess.

2

## Limited Metro App Selection

Microsoft's strategy with Windows 8 to move us all to its new touch-based paradigm hasn't lit many fires across the technological world. There are many critical apps missing from the Microsoft Store, very little quality control, and the usage levels have encouraged many developers to vote with their feet.

What didn't help was that while being very similar, the store for Windows 8, Windows Phone and the Xbox One are entirely independent, and developing an app for one doesn't automatically spawn those for the other platforms.

What Microsoft is holding out hope for is that a switch to a universal app model that covers Windows 10, Windows 10 desktop, Windows Phone 10 and Xbox One might swing the balance of power in its direction.

It's put some tool creation effort into allowing developers to craft apps in a more homogenous way, although the idea of designing an app and

### Top free 99 apps



then having it become multi-platform is still a pipe-dream. These problems are almost all related to Microsoft allowing each of the platforms to have its own API, with only modest amounts of overlap.

Convincing developers back is one concern, but there's also the problem that the public hasn't embraced these apps either. On the desktop, they like desktop apps that make good use of screen space and work well with a keyboard and mouse.

But as Windows 10 is again embracing the desktop, there isn't any great momentum to move to Metro-style apps, unless you're one of a small number of people who own Surface or similar hardware.

However, there is a problem with this notion, especially in respect

of the mobile app selection. The apps that Windows Phone and the Windows 8 Store are missing (which includes Snapchat, SoundCloud, *Clash of Clans*, Pinterest and all the Google apps) aren't available as PC desktop apps either. If they are available on the PC, it's as a web version that doesn't require an installation or an app store.

Therefore what's wrong with the app store and selection generally won't be fixed by Windows 10 or any supporting software development tools.

Unless Windows 10 can be a success on tablets and phone, in a way that Windows 8.x has so far failed to be, then it won't attract app developers or the high-quality apps that it so badly needs.

## Microsoft Exclusive Access

Going back as far as Office 4.3, many people have accused Microsoft of creating features and functionality that only its apps division is aware of and can exploit. It was one of the reasons put forward for breaking the company up when it got done for anti-trust, but it managed to wriggle out of that.

If you think that sort of activity ended then, you'd be wrong, because in Windows 8, Microsoft allocated exclusive powers specifically in respect of Metro (Modern, whatever...) applications.

Specifically it made up a bunch of rules about browsers and specifically those that operate on the Metro side of the UI fence. Metro browsers aren't allowed to have plug-ins, though IE has one for Flash, and if you do use an alternative browser, it must be the 'default' – something

the system seems less than keen to change from IE.

On Windows RT, running on Surface and Surface 2 machines, the restrictions are even greater, because no Metro browser other than IE is allowed on those machines at all.

If this seem strange, it's worth realising that originally Microsoft wanted only IE to exist on Windows 8 to the exclusion of all others, but a fine by the EU on browser availability convinced it otherwise.

The software development team behind Firefox did develop a Metro version of its browser and continued work on it until May 2014, when it pulled the plug on the project. The two reasons it had for doing this were the silly rules that Microsoft

had created about browsers under Windows 8, but also that almost nobody was using the beta version. According to Mozilla, the numbers of people using the desktop Firefox on this platform outnumbered the Metro users by a factor in excess of a thousand to one.

Microsoft still hasn't given up the browser bone on Windows 10, promising to offer an additional browser codenamed 'Spartan' alongside IE. Perhaps the idea is to give the appearance of choice, without actually offering any that aren't home grown.

Microsoft still uses its insider knowledge and arbitrary restrictions from the OS division to advantage its own apps, and Windows 10 is unlikely to change that policy.



## Windows Segmentation

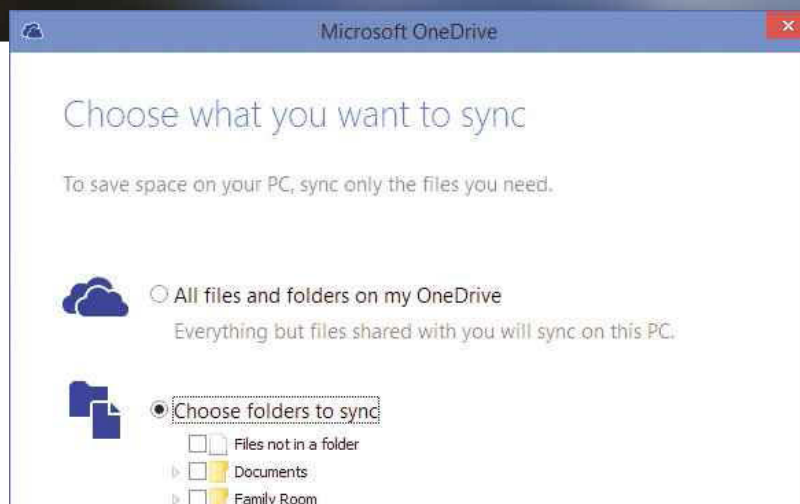
I've talked about this before several times; possibly more than 25 years ago was the first time.

When I talk about segmentation what I'm actually referring to is Microsoft's bold idea to have the OS (Windows), the apps and the user data all reside on the same disk structure. This might have seemed like the simple thing to do when it organised Windows 3.x, but from a user perspective, security and securing data, it's a veritable nightmare.

The classic example of the mess it's made is that Windows apps are allowed to add their own DLLs (dynamic link libraries) to the System32 folder and potentially overwrite early versions, on which other apps relied.

If this had been considered at all, you should have been able to make a user data backup and an apps backup, and then apply them to a fresh OS and get yourself back to where your system had previously been.

Instead everything is junked together, like Windows is an



international aircrew living out of a briefcase.

Interestingly the way that OneDrive was being developed under Windows 8.x looked like a potential start in hiving off the personal data constructs and settings as a transportable item, but recent changes seemed to have dashed those hopes.

In a similar vein, the way that Metro apps could be installed on a new PC as per another computer you own hinted that might also be finally

segmented. But it doesn't work on desktop apps, and it doesn't work that well with Metro ones either.

Some of the changes it made with Windows 8 did suggest that some of the software team in Microsoft is well aware of the structural disaster it made with Windows long ago and is slowly trying to turn things around.

But as things stand, it doesn't look like Windows 10 is the critical point where it finally stops being a complete slob and gets properly organised.

5

## Crapware

Have you bought a branded PC recently? For those that have there's now a ritual exercise to go through where you remove all the utter rubbish that PC makers fill their computers with before shipping them to us.

This started a long time ago, and the classic excuse that used to be rolled out was that it was included to subsidise the cost of including Windows. Well, Windows 8.1 with Bing costs the PC makers almost nothing, and they still put all this junk on.

What's really annoying is that sometimes getting various pre-installed applications and tools off is quite difficult, and if you use the recovery partition to reinstall your system, often it makes a miraculous comeback.

The reason that you have a recovery partition is that it makes you buy a bigger drive, because so little of it is left for your use, and because Microsoft and the PC seller doesn't want you blitzing their systems with

a fresh install and getting rid of all those apps.

What's useful to know is that there are some simple software tools on the internet that can extract your Microsoft licence codes (if you've lost your label) and save them handy for a reinstall. And there are also the .iso files for all the recent Windows releases (7 and 8.x) that you can write to either a DVD or USB key using a Microsoft-built tool.

Microsoft is well aware of the problem, to the extent that it actually sells versions of popular computers on its own store under the label of 'Signature PC'. It proudly declares that these computers are "without junk and test software", and that they come with "an anti-virus software that never expires".

A quick trip there today revealed that it will sell you a Lenovo IdeaPad Yoga 2 PC for £629.99, whereas Lenovo will sell you identical

hardware pre-filled with garbage for just £499. That the Signature PC range even exist is a massive insult, but that they cost substantially more than those impaired intentionally is outrageous.

There's a simple solution: make all computers 'Signature' by only allowing OEMs to install a pure version of Windows and forcing them to include whatever junk they'd like on a disk or USB key for the user to ignore at their leisure.

The chance of this happening with Windows 10 is probably marginally less than nil, because after upsetting them with Surface and the news that Windows 10 would be a free upgrade for many users, Microsoft probably wouldn't want to upset PC makers any more than they've already been enraged.

Crapware could be formally banished by Microsoft, but it's simply not motivated to do it.

Get Microsoft *Signature* with your new PC

Laptops for every budget

Shop now >

MICROSOFT SIGNATURE WINDOWS 7 TRAINING  
Get the most out of your Windows 7 PC  
Shop now >

OFFICE HOME AND BUSINESS 2010  
Need the power of Outlook? It's included in Office Home and Business 2010.  
Shop now >

“ Having people use their Windows OS to run the Chrome desktop browser and access Google's services is a pretty hollow victory. ”

6

## A Proper Backup

How do you back up your Windows installation? That's a very good question for most Windows 8.1 users, since Microsoft removed 'Windows 7 File Recovery' when it moved from Windows 8 to 8.1.

There is still a means to do a 'system image' in Windows 8.1, but it is now very well hidden under 'File History'. It is also very limited in that

any destination you pick to place the backup, like a USB drive, can only ever contain one backup. The creation of subsequent images overwrites any previous ones automatically, providing an easy means to obliterate a solid restoration opportunity with a corrupted one.

The suspicion is that Windows 10 will rely on a working recovery partition and the limited OneDrive

functionality, or you need to have the technical knowledge to have an installation .iso handy and all the licence keys you need to use it. Or buy a copy of Acronis, like most experienced IT people do.

That Windows 8.1 doesn't have a well-designed and easily accessible tool to back up the system is stunning, and at this point Windows 10 won't have one either.



## Windows Phone

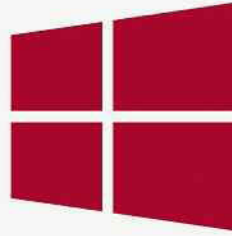
A whole part of the Windows 10 presentation centred on Windows Phone and how that is a critical part of the strategy in creating a whole new personal ecosystem.

However, as important as the phone is, given that Microsoft spent billions to own Nokia to entirely guarantee it, the appearance of Windows 10 on these devices won't actually secure its future.

The track record of this platform isn't one that Microsoft likes to explore, as it's so far not managed to make even a modest dent in the huge segment of the market controlled by Apple and Android phone makers.

At the last count, its actual share was declining, even after launching a whole slew of entry-level designs and bringing the platform to a new Windows Phone 8.1 level.

There's a noticeable lack of any flagship phone replacements, and the most popular phones on this platform are all inexpensive devices selling mostly on the Nokia name



## Windows Phone 8.1

Redesigned around you

in parts of the world where feature phones are still popular.

As a reviewer of these devices, I've noticed that when Microsoft was keen to get them on the PAYG and contract options of the various network providers, it agreed to all manner of restrictions on how updates would be managed.

In short, the updates are created by the networks using builds that Microsoft provides, with no implicit necessity on the part of the network to pass them on.

It's true that this is basically the same as Android phones, where unless they're Google editions, the updates are generally controlled either by the phone makers or the networks.

Where Android wins this battle is that with it being the most popular OS, even not that popular designs

sell in the hundreds of thousands, which is plenty of people complaining if they don't pass the updates on.

Apple entirely controls its own updates irrespective of the network and promises to pick up the pieces if its updates, as they have done, break things.

Where does this all leave Microsoft? It probably doesn't bode well for any Windows phone bought before Windows 10 launches, as the networks will resist updating them to the new OS, because part of their business is selling new phones.

Whatever the strategy was for Windows Phone, it seems in tatters, because Microsoft hasn't convinced app writers to support its platform or anyone else that it rivals either Apple or Google's solutions.

## Businesses Dislike Of Change

Ever since Microsoft created its software empire, there has been a schism at the heart of its business that it's been unable or unwilling to resolve.

Most of the money the company makes is from other companies, which standardise their products and buy numerous licences for their computers and staff. We're talking billions in revenue, but mostly for companies to install old operating systems and older applications, because what corporate giants and small business ventures agree on is that they don't like change, and they don't like updates, and they don't like variation.

That's because each PC has a hidden cost in training people to use them and their software tools,

and that dwarfs the price of licences by some considerable amount.

That's why businesses still use Windows XP and Windows 7, and many like Office 2003 or 2007, and not the latest releases.

That's one of the reasons they rejected Windows 8 wholesale, and it won't be much easier convincing them to move to Windows 10. Another aspect to the problem is that, according to Microsoft, this will be the last major release of Windows in the way we've become accustomed.

From this point onwards, Windows 10 will simply morph into the next through an evolutionary progression. That might sound good for those who will get it free, but it's an absolute nightmare for business IT people.

When they get a support call, they need to be prepared for what version they'll be supporting, and not whatever crazy change Microsoft has decided to flush in their direction.

It has generally been presumed that Microsoft will have some sort of mechanism for corporate IT to hold back changes for a while, so they can adapt to them before passing them to their users. If this sounds like a terrible idea, then I explained it well.

Businesses don't like change, and even if Microsoft puts the Start menu back, they're probably not going to be clamouring to switch their businesses to it.

As an aside to this subject, Microsoft's much welcomed news about Windows 10 being free doesn't translate to the Enterprise edition, unsurprisingly.

“ Microsoft’s strategy with Windows 8 to move us all to its new touch-based paradigm hasn’t lit many fires across the technological world ”

9

### A Sizeable Hole In Microsoft Accounts

It’s a good gauge of how wrong things went with Windows 8 that the headline announcement about Windows 10 was that it would be free for Windows 7 and 8.x users.

The view of most financial experts is that this could stabilise the Windows part of Microsoft, but it doesn’t actually return the company to growth mode. Windows generally contributes close to \$20bn a year to Microsoft’s revenue, of which almost 50% is profit. And 65% of that money comes from OEM installations, mostly by PC builders.

Microsoft has already made Windows 8 for tablets free for less than 9” screen devices, and Windows 8 with Bing is also free to those PCs that cost less than \$250.

It has also been reported that for straight OEM cost on any PC, Microsoft has dropped the price to \$10 and offers a “configuration discount” for Windows 8.1 with Bing, thus making it almost free.

Based on that information, the Windows division will probably have a very poor revenue year in 2015, and the majority of Windows 10 installations will be free in 2016, scrapping that year also.

Unless this encourages a huge take-up of Office 365, then the profitability of Microsoft will be impacted, and the future prospects for anyone in Wall Street will probably cause the stock value to be reduced.

Expect CEO Satya Nadella to sell the ‘jam tomorrow’ line hard at Microsoft’s next SEC filing and probably for some considerable time afterwards.

What analysts will want to hear is not how Windows 10 has addressed the slide, but how it is going to bring Microsoft back to past glories.

10

### Microsoft As A Secondary OS

It has been a meteoric rise, and it could end with a dramatic fall, but when Apple launched the iPad in 2010, it really put the skates under both Microsoft and, by association, Intel.

In the five proceeding years, Microsoft had gone from dominating the OS space to not having the most popular operating system on computing devices. And ARM is now the most popular CPU, rather than anything that runs x86 code by AMD or Intel.

What could be argued is that those global numbers are massively skewed by the number of phones and tablets, where Apple’s iOS and Google’s Android are entirely dominant. But the fall in desktop and laptop sales demonstrate that people are buying phones and tablets instead of Intel-based computers, so the change from one model to an alternate one is real.

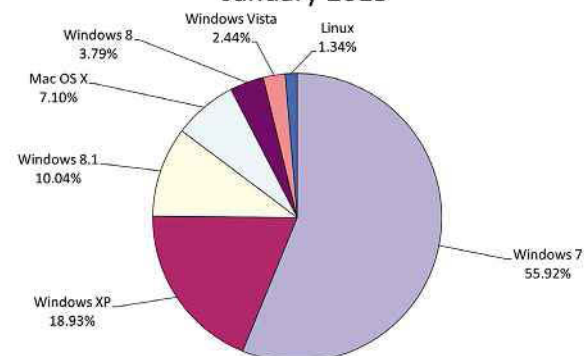
In 2014, according to figures published by statistics company

Gartner, the PC market shrunk by 3.2% from roughly 318 million sold to 308 million, while the mobile market grew from 4.2% from 2,334 million to 2,433 million devices shipped.

If you break down those numbers, PCs actually grew in the ultramobile segment, but traditional desktop and notebook devices declined. Even more worrying for Microsoft, sales of Chromebooks in the USA exploded in 2014, especially in the educational sector.

US market-watcher NPD reported that from January to November 2014 the share of the computing platform market allocated to Chromebooks went from just 0.2% in the previous year to a whopping 9.6%. Isolating laptops, Chromebooks now represent 21% of them sold, whereas Apple has just 4% and Windows 75%.

Total Market Share Desktop OS  
January 2015



With this trend likely to continue, even if Windows 10 is a success, Microsoft should probably expect that it will be the third OS in the mobile space and only just the leader in the laptop sector.

While it still dominates the desktop space, having people use its Windows OS to run the Chrome desktop browser and access Google’s services is a pretty hollow victory.

Windows 10 probably won’t address the declining sales of PCs or the movement to OS agnosticism we’ve seen in recent years.

# CONTROL YOUR PC WITH XPADDER

## Aaron shows you how to use any gamepad with any program or game using Xpadder

**G**amepads for the PC have been around for years. There's even a version of the Xbox controller that allows you to play most modern PC games as if you're sat on the sofa in front of a console. This may sound sacrilegious to the self-appointed 'PC master race', but for some games and genres, gamepads are just better than a mouse and keyboard, especially emulations and ports.

If you've got a decent PC gamepad, you'll be ready to control most games using it, including the many console ports that are clearly designed with non-PC platforms in mind, but if you don't own an up to date pad, and have an older model, or your chosen game simply doesn't support gamepad control, you may be stuck. With no gamepad input options, you'll be left having to cope with keyboard and mouse, even if the game doesn't quite feel right. That is, unless you use some special software to remedy this issue. This software is Xpadder.

### X Marks The Spot

Xpadder is a tool that allows PC users to set up and configure any gamepad or input device, even if a game or program doesn't offer gamepad support. It does this by mapping your controller's buttons, sticks, and triggers to specified keyboard and mouse inputs. Once this is done, it essentially fools the program you're using (including Windows), into thinking you're using the keyboard and mouse, but in actual fact, you're using your gamepad. It's a clever trick, and one that means you can use any controller that works with your copy of Windows with any program or game. As long as the controller is detected in Windows, you're set.

Xpadder supports Windows XP and above (including 8) in both 32- and 64-bit guises. It can handle up to 16 different controllers at the same time, which can be useful for multi-player, and uses a profile system, so you can even use one controller for multiple games that require different control setups.

While Xpadder is designed to be used with gamepads, it also supports joysticks, wheels, and even music controllers. Indeed, with a little ingenuity, there are few devices you can't use with it.

### To Begin

To get started, you'll first need to grab Xpadder from [www.xpadder.com](http://www.xpadder.com). It's not free, but £6 is well worth it if you really want to make full use of your gamepad(s).

Next you'll need your Windows-compatible gamepad, which must be detected and listed in the game controller list in Control Panel. If not, Xpadder just won't see it. If this is causing you a problem, check the manufacturer's website for any updated drivers, and double-check that it's compatible with your version of Windows. Once the unit is listed in Control Panel you should be ready to go. Open up the program and click the gamepad icon in the top-left and select New. You'll see the blank controller screen appear.

### Laying Out

The first step you need to take when using Xpadder is to create a new controller layout. This is a visual representation of how your controller works – complete with buttons, analogue sticks and triggers. To help make this step easier, you can opt to use an image of your controller as the background. You can create your own, or you can use the program's Controller Images forums ([xpadder.com/forum4/index.php](http://xpadder.com/forum4/index.php)) to find a pre-made one. It holds a large collection of images, including some older and more obscure models, but if you can't find your pad listed, don't worry as the image is just for reference and won't actually affect functionality. In the example here, there's no image for the pad we used (a Saitek SP550) so we created our own and used that instead.

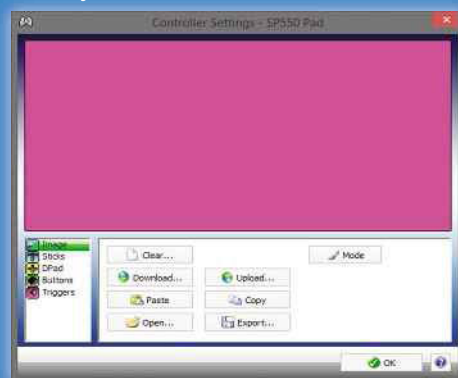
To create this image we saved our picture as a 512 x 256 BMP and used the 'open an image' option, which loaded it into the program. This makes setting up the controller layout and profile much easier.



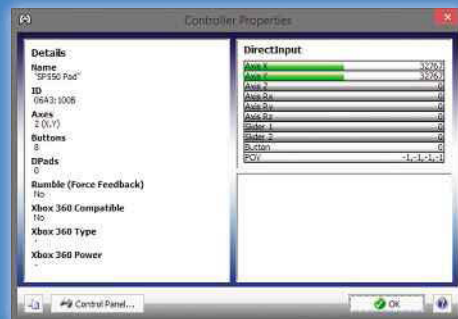
▲ If you don't have a working gamepad connected, you'll see this screen when opening Xpadder



▲ If your gamepad is connected and working, this is what you'll see

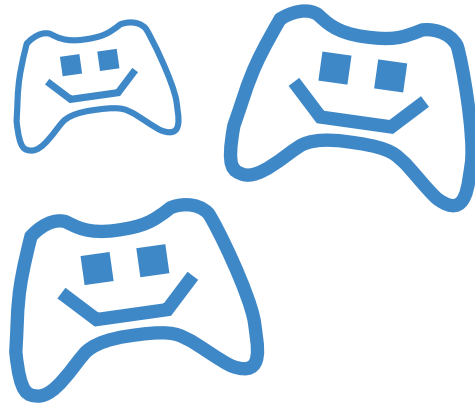


▲ This is the new controller screen where you can add an image and place controls



▲ If you're not sure what abilities your pad has, Xpadder can shed some light on things





With the image is ready, you need to step down the list so you can add the actual controls, this includes sticks, Dpad, buttons, and triggers. On the pad we're using, there are no sticks, so we skip to Dpad, but the method is the same: press (or move) the control that corresponds to the selected type, or enable a component and drag it into place.

So, to add buttons, press the buttons on the pad; once you do this, they'll appear on the image, and you can click and drag them into place over their matching button on the image. To add the Dpad, enable the option, press the directions as prompted, and then move the Dpad into place.

If your pad has analogue triggers, use that option to enable the full analogue functionality. If the triggers are actually digital buttons, you'll need to map them as buttons instead. Don't worry, though, as the program will tell you if you make this mistake. In fact, it also helps by providing properties of your pad. To see this, click the gamepad and select Properties. Here you'll see the specs, including any analogue controls, the number of buttons, and Xbox compatibility. Once you're done, click OK.

You'll now see a screen showing the mapped buttons, and if you press them they'll highlight. Give them a test run to make sure all is well. Once you're happy, click the gamepad icon and save the new layout. Next you'll need to map actual controls to the various inputs on your pad.

## Mapping

To map keyboard and mouse controls, click a button on the diagram and a new window showing the keyboard and mouse controls will appear. To assign a key or mouse input to a gamepad input, simply select it. Once you click on the corresponding control, it's set.

When the necessary buttons are mapped, save your profile by clicking on the profile icon top-centre (it looks like a piece of paper with writing) and select Save As. This completes the basic set up of your gamepad, which should now be ready for use in whatever game or app you plan to use for. Just ensure Xpadder remains open and minimised – though it has to be closed via the task bar, so even if you click the close icon, it'll stay open.

You can repeat the above process for any other controllers you have, and save them out as separate profiles, which we'll look at now.

## Profiles

As you can set up multiple controllers, each with their own profiles, you can have a number of controllers ready to go. Simply load up the profile for the pad you wish to use, and it'll be ready. You do this by clicking the profile button to the top-right, where you can select from your previously created profiles.

However, the flexibility of profiles doesn't end there. You may have noticed the numerical buttons at the bottom of the screen. Each of these is a separate sub-profile, meaning you can actually set up multiple key configurations for a single pad, and switch to them instantly. This is very useful for specific games which may require different layouts. To do this, simply press the number and set up the controller again. To use a scheme, simply press the button it's mapped to. Simple.

## Advanced

Although the steps we've gone through here will suit the majority of users, there are some advanced tricks you can use. Within the keyboard and mouse assignment screen, at the bottom, you'll see some more options, including an Advanced section. Here you can assign multiple buttons to a single gamepad input (such as CTRL+P), and you can also set up sequences, which can essentially function as macros.

This could be useful in some games, and even used as a controller aid. For example, you could use your game pad as a separate macro input controller for games, letting you perform certain actions quickly, complementing the existing controls.

They're easy enough to use. For example, in the top box, you can assign multiple keys to an input, and below are the various options for advanced controls that let you insert pauses, and wait times. If you experiment with these, you can add a lot of functionality to even the most basic gamepad. **mm**



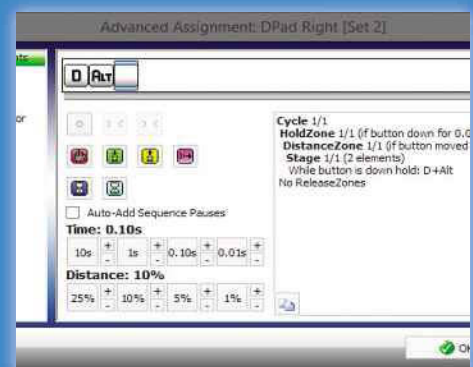
▲ Once the buttons are laid out, you can test them instantly



▲ Once you're done, all of your gamepad input should have assigned keyboard or mouse controls



▲ You can set up multiple layouts for a gamepad, and switch between them instantly



▲ The advanced options of Xpadder allow even greater control over apps and games, and can be used to create a lot of automated inputs





# 10 ANCIENT COMPUTERS THAT ARE STILL IN USE TODAY

**David Hayward** finds that if it ain't broke, some people don't want to fix it

**W**e're quite guilty of looking back through rose-tinted glasses at the computers we remember from our youth. Playing on a ZX Spectrum, Commodore 64, Atari consoles and so on is like being a child again, and recalling the sounds, feel and smell of overheating electronics is a joy.

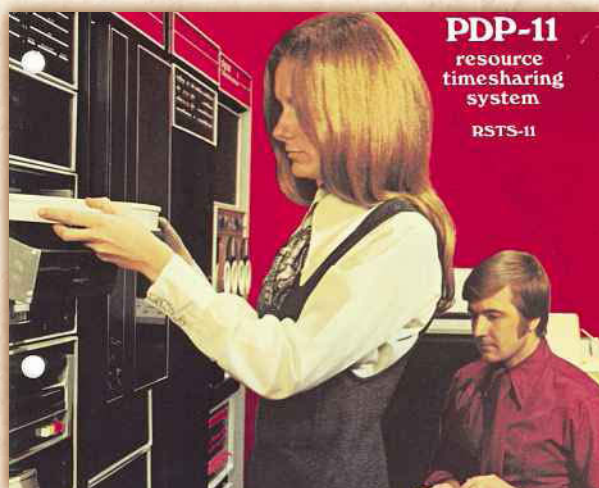
Those were the home computers, though, the entertainment side of computing if you will. It's often easy to forget that during the 70s and 80s, there was also a serious business side to computing. The Apple IIe, for example,

was a fine and well-used business machine, as well as being a powerful home computer, which saw many years of service. Moving up through the ranks, many of you may have got to tinker with behemoth mainframes or those strange punch hole card things.

Those were the real computers of the time – all radio-like valves, pulsing and expanding like a vertical crop of transparent onions, little pops and crackles and a thin blueish mist together with an acrid smell. At least that's how the author Robert Rankin once spoke of them.

The truth was that these were excellent, hard-wearing machines. Designed to work continuously for many years, they were constructed in an age before this disposable society of ours, where every conceivable part of the machine could be repaired by a skilled engineer.

That skill is still alive and well today, as it happens. We took to investigating these old machines, and to our surprise we discovered that there are still a fair few being used right now. Let's check some of them out right now and look at what they're being used for.



## PDP11 Minicomputer

The PDP (Programmed Data Processor) range of minicomputers, although mini in comparison to the monstrous mainframes made by the Digital Equipment Corporation (DEC), were some of the most successful machines of their age.

The PDP11 started life in 1970 and was one of the world's first 16-bit word-addressed machines and proved to be blisteringly fast in its operation and remarkably stable. It used an Orthogonal Instruction Set that directly addressed areas of the computer's memory and featured

hardware interrupts on several priority levels, which when triggered could fire off different software routines on magnetic tape (the old 270mm reels), depending on what caused the trigger in the first place.

All in all, it was an extremely capable machine, which is probably why it's still in use today as a part of the US navy's ship radar systems, and it's rumoured to be used within the British Atomic Weapons Establishment. It's also said to be still in use at Airbus SAS and was part of the designing of the A320 family of planes.



## DEC VAX11/780

The descendent of the PDP11 was the DEC VAX (Virtual Address eXtension), a much improved 32-bit complex instruction set computer that was faster and more powerful than anything previously in the minicomputer world.

For a short time, the VAX11/780 was used as the processor standard benchmark, but what really mattered was the fact that this system, much like its predecessor, was rock solid and rarely failed.

This may explain why a VAX11/780 is still in operation in part of the F-15 and F-18 fighter jet Hawk missile systems, and can be found throughout some of the older US navy submarine fleet and on board aircraft carriers.

Furthermore, if you're an engineer working for the Minuteman ICBM system, then there's a pretty good chance that you'll come across a VAX11/780 as part of the control and test systems.





## IBM 402

The IBM 402 and 403 weren't strictly speaking computers. They were actually tabulating machines, which to quote Wikipedia is "an electromechanical machine designed to assist in summarising information". In a sense, then, it's a computing machine, and for the sake of argument we'll call it a computer in this instance.

Anyway, the IBM 402 first appeared in the late 40s and consisted of a kind of breadboard setup to which you would wire up to perform certain operations. And by wire up, we don't just programming. We actually mean

that you need to plug wires into it to make the blessed thing operate the way you want it to. It's quite extraordinary really.

Sparkler Filters, based in Texas, manufactures and sells water filtration equipment. It's apparently very good at it too, since it's doing it since 1928. And should you decide to purchase anything from it, then your payment and your account will be put through the same IBM 402 that the company bought way back in 1949. It even uses an IBM 029 punchcard machine to enter the data into the IBM 402. And it's still going to this day.



## DEC MicroVAX 3100

The DEC MicroVAX range of minicomputers were the lower end and more affordable of the minicomputer series. They saw service from 1984 to, unbelievably, December 2000.

They were and still are considered very capable machines and a huge improvement from the more monolithic PDP and previous VAX computers.

The DEC MicroVAX 3100 in question has been busy working in the Hecla Mining Company since it was purchased in 1987. Somewhere

in deepest darkest Alaska, this ancient minicomputer is attached to a scale that automatically inputs weights into calculation tables, calculates silver and gold ounce per ton values for raw ore sample with flux corrections (yeah, we have no idea what that means either), creates work lists for sample sets and inserts a replicate every 50 samples, and it prints sticky labels onto an equally aged printer.

As the user of the system, YouCantOutrunABear, states on his Reddit account "there's no need for me to play *Fallout*, I apparently work in it."



## IBM XT

The IBM Personal Computer XT was released in 1983 and featured the ability to access the legendary IBM 3340 Winchester hard drive cluster or Data Access Storage Facility, as it was known as back then.

It also had 128KB of RAM, a 360KB double-sided 5.25" floppy disk, a 10MB hard drive and an Intel 8088 processor running at a blistering 4.77MHz.

It was awesome stuff, back in the day – so much so, that the

National Weather Service in the US bought several, complete with the Winchester Storage Facility, when it started to interpret weather patterns based on the data sent from weather balloons.

The result was extremely successful and as accurate as you can get. These days, the NWS utilises the supercomputing power of some of the fastest machines ever created, but it still owns and uses several old IBM XTs and inputs the data from the existing weather balloons into the Winchester array.





## Magnetic Tape

The old 270mm reels of tape we often see spinning around in old movies were the only long-term and speedy storage mechanisms for many years.

Magnetic tape was first used to store data in 1951 and was capable of storing 128 characters per inch on eight tracks. Naturally the amount of data used back then was very little compared to today, but even still there were entire rooms, warehouses even, dedicated purely to tape drives.

The most recently developed tape drive can squeeze a modest 185TB

of data on to its layer of superfine crystal particles, and it's said to last for at least 60 years. Longevity is the key here, which is probably why the US government's IRS still uses it.

Amazingly, it wasn't until recently that a flat file database of every US citizen's tax was replaced by a modern system. What they used to have was a bank of magnetic tapes, storing a single database, which needed to be accessed via a COBOL-created interface. The new system is as modern as you can get, but the old magnetic tape, with the single database, still exists as a backup and is still maintained by IRS staff.



## Apple IIe

The Apple IIe was the third generation series of Apple personal computers that was launched in 1983.

It ran Apple DOS, had a 1MHz 6502 CPU, 64KB of RAM and several auxiliary slots into which you could fit extra RAM cards, printer cards, connection cards and an improved video card. It was quite the bee's knees.

Kevin Huffman, who owns the Huffman Industrial Warehouse in the US, purchased a couple

of Apple IIe's back in the day and has never looked back since. One of his Apples is and has been all this time running the company's accounts and has never failed him yet. The other is in storage and will be used in case the main Apple ever becomes faulty.

All of his accounts, dating back many years now, are stored on 5.25" floppy disks, and it prints invoices, cheques and inventory forms, as well as being used as the business's spreadsheet machine.



## HAM Radio Computer Interface

Amateur radio, or Ham radio, users share a common spirit with computer enthusiasts. They're often seen tinkering with mind-boggling electronics, they generally operate in a room that's far too small for all the kit they own, and they are often regarded by outsiders as a bit of a strange breed.

Ham radio has been around since 1909, apparently, when the First annual Official Wireless Blue Book of the Wireless Association of America listed a collection of amateur radio stations. In fact, many of the great ham radio enthusiasts moved into computing in the 70s and 80s thanks to their electronics genius.

It's little wonder, then, that ham radio computer interfaces are still being produced today and are in

use in many a home across the world as well as some notable military bases.

Allegedly, the likes of NORAD in the Cheyenne Mountain Complex, the Raven rock Alternate Command Centre (Site R), Area 51, Mount Weather and many other places of a black ops nature have a doomsday scenario backup ham computer interface up and running.

Presumably this is in case of some form of armageddon, be that nuclear, alien invasion, zombie apocalypse or any other Hollywood scenario you can think of. The point is they can still coordinate and contact other surviving bases while keeping a chain of command.

You'll also find it alive and well in the International Space Station. We wonder what the reception up there is like.





## HP 3000

The HP 3000 series of minicomputers were released in 1972 and featured such revolutionary concepts as an operating system and RISC processors, and you could easily interface with the mainframes of the time and large storage arrays.

They were exceptional workhorses, with support lasting well into 2010. This then is probably why the Department of Defence used them as test machines for the HARM missiles that were fitted in aircraft carriers in the mid-80s.

Apparently, according to those who used these systems in their military setting, there were two

ways in which you could boot the machine. One was by using paper tape, and the other was by flipping a sequence of switches that emulated the sequence that would be on the tape.

Memory boards were often created, with different test scenarios laid out to help try to improve the effectiveness of the system when aiming, launching and doing whatever else you do with a missile system.

These systems are still in use today; in fact, there's even a company, which the US military hires, which specialises in using modern hardware to emulate the HP 3000 missile system.

**“ If you're in control of something that can wipe all life other than cockroaches off the face of the planet, then even a small chance of failure is something you really don't want ”**



## Commodore 64

This final entry is certainly an interesting use of old technology in a modern setting. The Commodore 64, which needs no introduction, is still alive and being used in the 21st century outside of the retro computing scene.

A bus company in Brisbane, the MYER Centre Bus Terminal to be exact, used up until 2010, a C64 as

its main monitor display for the bus timetable.

According to the company, the old C64 isn't in use as the main display unit anymore, as it has been replaced by something of a more modern nature. However, it's still being kept as the backup unit for those times when the current model fails.

Now, if we can only find a company that still uses a ZX Spectrum...

## But Why?

You may be asking yourself why all these organisations, especially the ones that look after an arsenal of scary weaponry, are using such antiquated technology? Well, in most instances the answer is simple: it just works.

These systems are designed in such a way that they rarely fail. They have very basic mechanical interfaces in place that are made to work and last for a very long time. And as we said earlier, they were made in a time where repairing a system was the norm instead of scrapping it and buying a newer model.

The minute you start to include a more sophisticated system, with a higher software level other than on

## Even More Old Kit And Technology In Use

Here are a few more instances where the modern world is being controlled by something that was designed and built 30 years ago or more:

- Some traffic signs in the US still use TRS-80 100 laptops to control their displays.
- The US Secret Services allegedly still uses an IBM mainframe from the 70s.
- The New York subway Metro Card system still uses OS/2.
- The Expo and Millennium SkyTrains in Vancouver runs off three IBM XTs.
- Apparently, some 70% to 80% of UK plc business transactions are based on Cobol.
- There are apparently 36 million pagers/beepers still in use today.
- Part of the US nuclear weapons facilities, spread across the country, uses 5.25" floppy disk.
- UCLA still has and uses an IBM System/360 mainframe.

or off, yes or no, then there's more room for failure. And if you're in control of something that can wipe all life other than cockroaches off the face of the planet, then even a small chance of failure is something you really don't want.

It does make you think, though, why we need such powerful and expensive machines, when all most folks do is browse the internet and maybe write an email or two. Even a 20-year-old computer can manage that. [mm](#)





# Puzzle Apps For Android

**Keir Thomas** takes a look at six of the most intriguing puzzle apps for your Android phone or tablet

**W**hen we started the apps group test series a year or so ago, we thought not to review games. Our plan was to deal only with apps related to productivity or other kinds of leisure activities.

So why this week are puzzle apps being allowed through the net? Our definition of puzzle apps (or certainly the one we're discussing here!) is that they lower rather than raise the pulse rate, as with arcade games. They're designed to let you zone out between important tasks. As such, we reckon puzzle games occupy a unique shelf in the app storeroom and are therefore worth visiting in our group test.

As usual, all the apps reviewed below are available for free in the Google Play store, and all were tested on a phone and tablet running Android Jelly Bean. In many cases the apps ran on tablets but only by treating them as a large phone, magnifying details, and in such cases, we've included only a screenshot of the phone version.

## **Unblock Me**

The name of this app is the biggest clue as to the challenge it sets users, and you may have seen similar-style games elsewhere involving attempting to move a vehicle out of a car park by shunting everything else

out of the way. The goal of *Unblock Me* is to get the red wooden block out of a grid containing other wooden blocks. All you have to do is move the blocks to open an exit gap but, as you might suspect, that can be pretty tricky. For starters, blocks that are vertical can only move up and down, while those that are horizontal can only move left and right. You move each by simply tapping and dragging.

There are two play modes: Relax Mode and Challenge Mode. The only difference is that Challenge counts the number of moves you make to free the red block and also keeps a record of your best score. There's no timer, however, so no need for the pulse rate to rise unnecessarily.

*Unblock Me* isn't a game you'll race through. Depending on your inherent spatial ability (and experience with the game), you'll be chewing over each level for minutes and probably for hours. You can choose various skill levels from Beginner to Expert, with some of the latter proving harder than diamond.

The game attempts to make money by selling hints. You get three of these free of

**“ Unblock Me is a classic hardcore have-another-go puzzler and worth a try if you dislike the tendency towards somewhat easy modern puzzle apps ”**



▲ *Unblock Me* is a classic difficult puzzler built on the ultra-simple concept of shifting around wooden blocks

charge after installation, and the cheapest package is to buy 30 more for 59p, or you can watch sponsored ads (although in our tests watching a 30-second advertising video got us zero free hints). Unfortunately, hints are somewhat poorly named, because they don't just tell you the ideal next move. They walk you through completing the level. This is a little annoying. However, for free you can tap to reverse your most recent move or reset the entire level.

The game doesn't force you to play through in a linear fashion, and if you want to jump straight to a higher skill level, then you can do so easily by tapping the Puzzles button on the menu.

In addition to buying hints, you can also pay 60p to remove ads, but we didn't see any while playing the game. Four themed looks are available for free, but they're all essentially the same – faux wood effect – and you'll have to look closely to see any difference.

*Unblock Me* is a classic hardcore have-another-go puzzler and worth a try if you dislike the tendency towards somewhat easy modern puzzle apps.

## Can You Escape

Although our screenshot this game might look like a 3D arcade game, that is in fact

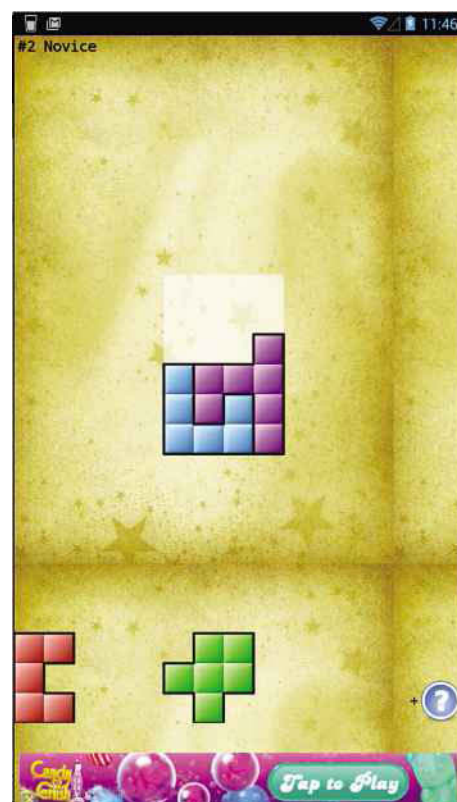


▲ Looking like a 3D arcade game, in fact *Can You Escape* is a simple point-and-tap affair involving solving puzzles

➤ *Block Puzzle* gives you exactly what it says and is both simple and fun

an illusion. This is pure point-and-click adventure gaming – or point-and-tap, we guess. In a genre referred to sometimes as *Escape the Room*, *Can You Escape* sees you attempting to gain access to a lift in order to move from floor to floor. Alas, the lift requires a code to call it, and to figure out that code you'll need to have a good look around the room – in boxes, on shelves, behind sofas, etc. Tapping each shows a new image, typically involving a clue, puzzle or hidden detail. Puzzles can be as simple as rotating pieces in a visual puzzle in order to form an image, to inputting codes that you discover elsewhere. Often several items must be collected that are then combined to create further puzzles. To be blunt, none of the puzzles are in any way challenging if you're over the age of 12, but there are many of them, and it's lots of fun and also rewarding working your way through. There are ten rooms to escape from in total, and we reckon it'll take you a few hours of playing to work your way through. Two sequels are available.

The game insists on running in portrait orientation on both phone and tablet and looks exactly the same on each. There are two unfortunate factors evident during play, however. The first is that a banner ad is shown at the bottom of the screen at all times. There's no in-app purchase to turn this off. The second factor is that the developer thought to play twangy music at all times. Sound effects are fairly primitive



and limited to clicks and thunks here and there. Luckily, the sound can be muted, although this also loses the sound effects too.

A gotcha that caught us out early on is that switching to the main menu resets your progress on a level without any warning. Opening the Settings menu within a level seemed to do no damage, though.

And that's all we can say about what is a very simple game. *Can You Escape* is like chewing gum for the mind – there's practically no effort involved in consuming it, and it'll keep you occupied and relaxed for however long you want.



## Block Puzzle

There's a lot to be said for the plain-talking approach of many app developers using Google Play, and *Block Puzzle* is, as its name suggests, a puzzle involving blocks. You're not getting *Tetris*, however. Instead you must tap and drag Tetris-like block shapes onto a grid so that they all fit snugly – a bit like making complicated patterns fit while tiling the bathroom, except here the pieces can't be rotated. Early levels are fairly easy, but later levels alter the shape of the grid and increase the number of the blocks, making it significantly more difficult. Perhaps surprisingly, working with simple rather than complex-shaped blocks can be tougher.

Like most puzzle game apps, *Block Puzzle* treats tablets as large phones, so there's really no difference in layout between devices: the blocks are shown at

until your fingers fall off. We guess these levels are computer generated, which is perhaps why so many are available on the official levels.

Ads can be turned off for £1.98 (again, around twice what you'd expect to pay in most other apps), and the advertisements are really the only annoyance in an otherwise simple and fun game.

## Matches Puzzle Game

Fans of barroom games will be in their element with this app that skeuomorphically transfers the traditional match-arranging game to Android. The goal is to make requested shapes – usually rectangles or triangles – by either adding, moving or removing matches from those already present. Should you get the level correct, the matches catch fire, and you get a literal thumbs-up via an icon, before

“As with most other apps here, a tablet is treated like a large phone, so must be held in portrait orientation. There's no visual difference”

the bottom, and you must drag them up to the square in the middle of the screen.

The game attempts to make money from adverts, which are on the screen at the bottom at all times and by selling hints. Ten of these cost a whopping £1.72 – a little greedy, we reckon, and we often wonder why app developers don't realise that avoiding paying up can be a game in itself. We know of somebody who played one level of *Candy Crush* for a whole year before finally beating it, rather than pay the 99p required to cheat!

No hints are provided free with *Block Puzzle*, so we couldn't even discover the nature of the hints – whether they're simple pointers to get you out of a scrape or whether you get a complete level walkthrough.

Perhaps the biggest boast the game makes is the number of levels, which is in the thousands. You can skip between skill levels (Novice, Normal, Expert, Exceptional, Hardest and several variations therein), but you can only work through each level sequentially; you can't skip grid 33 to jump to 34 if you find it a bit tricky, for example.

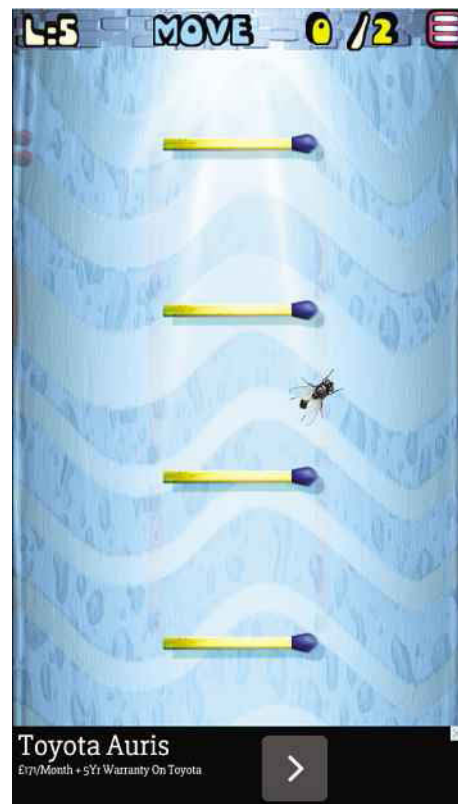
Interestingly, an 'infinite' play mode is also available, wherein you choose a grid size and are simply fed new boards

moving onto the next level – of which there are 1,000, spread across various episodes. The game adds to the traditional game formula by using matches to represent numbers and mathematical symbols arranged into sums, which you're invited to solve by adding, moving or removing matches.

As with most other apps here, a tablet is treated like a large phone, so must be held in portrait orientation. There's no visual difference between running the app on a phone and tablet, however.

The game has a shaky definition of the word square, in that it becomes apparent any contiguous area is a square – a request to make four squares was completed by creating three actual squares and one area that was shaped like a Tetris piece. Another slight irritation is that the task disappears from the screen once you've been shown it, and it can be easy to forget more complicated instructions (did I have to remove two or three matches?). You can bring it back by tapping a button at the top left, but there's no real reason why it couldn't remain listed on screen at all times.

The game has a fine sense of sarcasm. If you take too long to complete a level, the letters 'Zzzz' appear at the bottom of



▲ Straight out of your favourite snug comes *Matches Puzzle Game*, which makes you rearrange matches to create shapes and solve sums

the screen, and a fly also starts to buzz around – just like in a real-life barroom, we guess!

Should you get utterly stuck, you can get a solution by tapping the menu button at the top right and then the lightbulb icon. The solution appears as a screenshot of the completed level, and you must memorise it before tapping to restart the level. However, only ten solutions are provided out of the box. Rather unusually, it appears you can't actually buy any more. Instead, further solutions are earned by liking the app on Facebook. Indeed, there don't appear to be any in-app purchases for the game itself, and the sole source of revenue appears to be constant, on-screen banner ads at the bottom of the screen. We're not sure if we like this or not. We suspect the app developer took the pragmatic view that ad revenue is far more steady and also fairer. If so, we salute him!

*Matches Puzzle Game* isn't going to set the world alight (ho ho!), but it's a lot of silly fun and addictive too.

## Word Search

If the shelves of newsagents are anything to go by, word search puzzles remain supremely popular. Unsurprisingly, *Word*



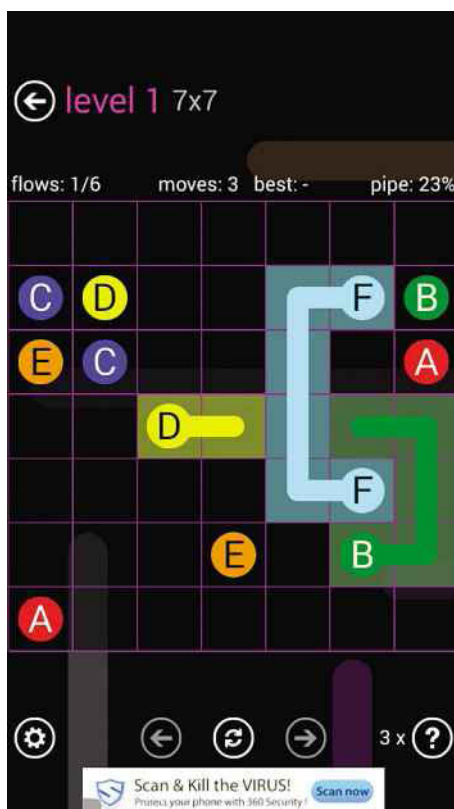
▲ **Why bother paying for word search mags when an app like Word Search can satiate your puzzling needs for free?**

Search brings this right up to date via an app that automatically generates new word search puzzles each time.

The game forces tablets into portrait orientation, and although it looks superficially similar to the phone version, the extra space is used on higher difficulty settings to cram in a larger grid.

The first task is to tell the app what kind of game you want. Ten topic categories are available (Animals, Countries, Historical Figures, Cities, Presidents, Kids, Trademark, Astronomy, Chemical Elements, and Fruits, Vegetables & Mushrooms), with words randomly drawn from any you choose. The Difficult setting controls the size of the board, and the density of words can be controlled by the Number of Words setting; you can opt to be limited by the size of the board or to have all words included. The Help option switches on or hides the display of possible words at the bottom of the screen. If the word list is hidden, then a timer takes its place (counting up, rather than down).

Tapping and dragging with a fingertip is used to highlight words in the grid, and once they've been found they're deducted from the list of words at the bottom of the screen. The game is clever enough to throw in a handful of red herrings and false words to keep things interesting – a boar may be a type of animal, but if it's



▲ **Flow Free is lots of fun and involves little more than joining colour dots to their partners elsewhere on the board**

not on the list, then it's not part of the game!

An advertising banner is visible on screen at all times, which is unfortunate, and there's no way of turning it off, because the game apparently eschews in-app purchases. Full-screen ads sometimes appear between games too.

Although *Word Search* is lots of fun and is clever enough not to vary the formula for these type of games, one thing did annoy us: when tapping and dragging to highlight a word, the highlight colour changes if you're dragging on a word that's correct. This means you can cheat, in theory, by simply putting your finger on any letter and dragging in any direction to see if the highlight changes. It'd be much better if the highlight changed only when your finger was lifted after reaching the final letter.

We also have concerns about the longevity of the game, bearing in mind the limited word categories and the inability to purchase more.

However, for a little innocent fun every now and again, we reckon *Word Search* is well worth installing on your device – and on the larger screen of a tablet it can create some pretty tough puzzles.

## Flow Free

It took us some time to realise that the title of this app isn't referring to a free version of an otherwise costly app. The title refers to something flowing freely, which is a key feature of the game, and although there are hundreds of clones of *Flow Free*, there isn't one by the same author for which you'll have to pay. Revenue is generated by selling hints that help complete levels (five can be had for a 79p in-app purchase, while 20 can be had for £2.29) and by charging for further levels above and beyond the hundreds you get for free (further levels can be bought for 79p, or you can buy them all for £2.99).

At its most basic, *Flow Free* is a join-the-dots game in which you're invited to make circuit links between two points. Each level opens to a grid of varying sizes with coloured dots on it, but always two dots of each colour. Your task is to draw lines between these dots, just like joining components on a circuit board. The more dots you join, the trickier everything becomes, because all available squares get used up with existing lines. Frequently you have to simply give up and start again with a new approach after finding four out of five of the dots combos connect, but the sixth simply can't.

Two game modes are available: Free Play, in which you simply work through the levels (you can jump straight away to higher levels if you wish), and Time Trial. The latter imposes a time limit of 30 seconds or one, two or four minutes (the choice is yours).

Tapping Settings lets you add letters to the colour dots, which will help those who have problems with colour perception. You can also alter the colour scheme, but here again it's going to cost you 79p to unlock anything other than three basic efforts or £1.59 to buy them all. You'd have to be a pretty hard-core fan of the game to hand over cash for such trivial things, we reckon.

A banner ad at the bottom of the screen is visible at all times, even while playing, and occasional full-screen ads appear too. Combined with the constant sell of additional bits and pieces via in-app purchases, we're left with a slightly bad taste in the mouth when considering this game. On the other hand, you get hundreds of levels free of charge, and ultimately *Flow Free* is a fun and somewhat addictive game that's perfect for winding down after a busy day. Note that the tablet and phone versions are essentially identical, with no use made of the larger dimensions of a tablet. [mm](#)



# Remembering...

## The BBS

### David Hayward worryingly enjoys the sound of a modem a little too much

Long before Facebook or Twitter or any other social media, the limited internet population communicated through bulletin board systems.

Each BBS was really just a server sat somewhere, usually in a university, that ran a front-end for users to dial into. Once connected, the user would be able to upload and download any stored programs, catch up on news through the various message boards and send each other private or public messages.

It all depended on the system in place and what modules were loaded in to the server. For example, the BBS I recall fondly was the Airedale BBS at Trinity and All Saints University just outside of Leeds. It was a small, locally run BBS with a Teletext-like front-end and access to various university resources, as well as local information and more mainstream PC-related downloads.

There was also a chat function, where the students could sit around in the computer labs dotted throughout the uni and engage in a spot of public and private chatting. On the whole, it was a fairly efficient system and, looking back now, a pretty good resource.

Of course, there were more BBSs available. Not just locally but across the world. You could effectively have a conversation with someone in Australia or the US and exchange files. It was a simple system that worked and used very little resources on the server.

### Its History

The first BBSs appeared in the 70s, where different organisations, universities and colleges dialled up each other in the same kind of way that Matthew Broderick hacked into the military computer in the classic film *Wargames*.

As modems and access to the wider communication giant that was the beginning of the internet began to evolve, the BBS took on a new role and became a more central repository for resources.

Dial-up was the boom the BBS needed to increase its popularity. Suddenly home users could dial into a BBS, as opposed to computers directly linked to the institute's network. And with dial-up came many privately owned bulletin boards, with some users even taking advantage of free evening calls to make their own BBS accessible.

As time and technology marched on, the BBS began to introduce better GUIs and improve the user's experience when they logged in. Rather than simply using Telnet to access the BBS, Netscape introduced a web-based terminal access, which greatly improved the experience and utilised better HTML and more modern extensions.

### Did You Know...

- Most early BBSs could be hacked by hitting escape when logging in, to get access to the login scripts and files.
- Autocomplete first appeared on a BBS, long before becoming part of the internet.
- There are still thousands of active BBSs alive today.
- All SysOps had beards (that may not be totally true, but it's plausible).

Unfortunately, that same advancement of technology rapidly brought about the demise of the popular BBS. With far more functional websites now available and the ability to chat through separate programs, the BBS eventually faded into obscurity.

There is a happy ending, though: the BBS is still alive – and in incredible numbers too. Check out [www.synchro.net/sbbslist.html](http://www.synchro.net/sbbslist.html) for a current list.

### The Good

A well-designed BBS was an amazing resource, long before we could visit a site and download its contents.

Games, work, utilities and tools could all be had with a few simple commands. Glorious days, indeed.

### The Bad

If you think modern trolls are bad, the old BBS trolls made the current lot seem positively tame. Plus getting carried away in a conversation on dial-up could be expensive.

### Conclusion And Confession

The BBS was a great place to hang out back in the day, so thank you SysOps for all your hard work.

I have a confession. I was the one who hacked the Airedale BBS and added words like 'it', 'the' and 'but' to the swear list. For that, I am very sorry.

Games External Programs:

Num	Name
1	TradeWars 2002 - Game 1
2	TradeWars 2002 - Game 2
3	Legend of the Red Dragon
4	LORD 2
5	Operation Overkill II
6	Global War v2.7
7	Food Fight!
8	PimpWars v1.53w
9	King Of The Board Trivia
10	Synchronet Blackjack!
11	The Pit v4.17
12	The Beast's Domain

Which or Quit: █

▲ BBSs were vital for getting hold of the latest games  
▼ Dialling into a modern BBS, 2015 on a Windows 7 PC

Telnet wastelands-bbs.net

Synchronet BBS for Linux Version 3.16 Copyright 1990-2015 Synchronet

CLIENT CONNM: Telnet  
ADDR: host86-182-284-61.range86-182.htcentralplus.com [86.182.284.61]  
SERVER NAME: The Wastelands BBS  
ADDR: wastelands-bbs.net  
MODE: 1 (of 8)  
TIME: Thu Feb 12 2015 03:07:00 UTC  
ADDR: thumper

If you are a new user in the system, type "New" now.  
Otherwise, enter your user name or number now.

Enter User Name or Number or 'New' or 'Guest':  
Login: New

# The Things That Frustrate Us About... Digital Magazines

If you're anything like us, you've got way too many magazines to store. So, are digital magazines the answer? Well...

**M**agazines are great. They just are. The thing is, when you read a lot of them, you have to store them somewhere – and they stack up fast don't they? There are other minor problems, too, like the possibility of your newsagent of choice selling out of the new issue before you get there.

Digital magazines should be a great alternative. You can subscribe to get them delivered straight to your tablet or phone, you don't have to put them anywhere when you've read them, and there are all sorts of added bonuses, like being able to follow links straight off the page and have animated features and stuff. But, and it's a big but, there are some times when paper just can't be beaten. Because digital magazines can be pretty annoying...

## Argh! Too Slow!

Reading a magazine usually isn't linear like reading a book. You don't necessarily read every single page; you tend to browse, flicking through the pages until something catches

your attention. What you don't generally do is start at the beginning and read every page in order. Digital magazines make this tricky, since you'll need to wait for each page to load fully before you can even skim it to see if you want to read it. Trying to skip ahead results in you staring at a bunch of blank placeholders before the content loads. Irritating.

**Fix it:** The problem is generally caused by your data connection not being quick enough to load all the content – so, arguably the problem is caused by publishers making file sizes too large, but that's splitting hairs. It can help to download the entire magazine to your device before reading, but even then, there's often a bit of a lag.

## Bah. Annoying Advertising

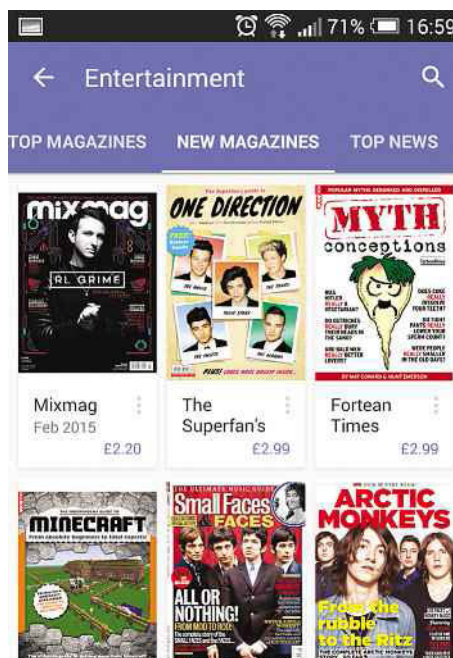
Waiting for your content to load is annoying. Waiting for a page to load only to find it's an ad is infuriating. And when that ad then autoplays music or a video, it's enough to make anyone swear off digital content forever.

**Fix it:** Take a deep breath and remember that advertising funds content. Without that advert, you couldn't have the article you were reading. If this actually helps, you are a scarily reasonable human being.

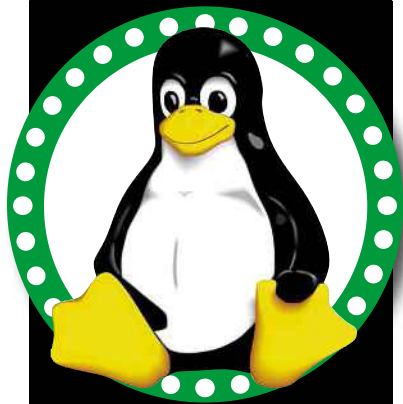
## Doh. Data Limits

Digital magazines don't take up physical space in the same way paper ones do, but they do take up the sometimes valuable storage space on whatever device you're planing to read them on – and downloading them in the first place can use up your data allowance. Finding that you no longer have space on your phone to take more photos because you've got too many back issues of your favourite mag is more than a bit aggravating.

**Fix it:** Be careful about when you download magazines – and use a wi-fi connection if you can. Delete back issues when you're done, too. If you've subscribed, you should be able to access them later if you need to, even if they're not saved to your device. **mm**







David Hayward has been using Linux since Red Hat 2.0 in schools, businesses and at home, which either makes him very knowledgeable or a glutton for extreme punishment

# Linux

# Games Galore!

## Who needs triple-A titles?

**A**lthough Valve has paid some respect to Linux gaming over the last couple of years, there still seems to be a distinct lack of triple-A gaming for the platform. It's hardly the fault of Valve or the developers of the games either. You could point the finger of blame at the Linux developers or the driver developers, but it's ground that has been tread and worn thin many times before.

So instead of droning on about the lack of mega blockbuster games for Linux, I decided to take a look at some older classics, and by that I mean games that are still reasonably recent – within the last few years, at least – and not the usual retro collection.

I therefore headed off to Good Old Games (GOG), where the stock of Linux-compatible games numbers around 200 and is still growing. With 200 titles to choose from, I was as happy as a piggy in the sort of stuff they usually roll around in, and I was fairly surprised at what it had available.

### Baldur's Gate 2

*Baldur's Gate!* The pinnacle of the PC RPG. GOG has packaged *Baldur's Gate 2: Shadows of Amn*

and the expansion pack *Baldur's Gate 2: Throne of Bhaal* into the single title, along with both manuals, 15 HD wallpapers, the soundtrack, 13 avatars, 87 unique examples of the game's artwork, a map and the reference guide to the *Throne of Bhaal*. How utterly amazing is that, and it's only £6.69 too.

### FTL: Advanced Edition

*FTL* was a game I reviewed some months ago. It was strangely addictive and a very entertaining title. Through GOG, though, you get five soundtracks, 12 avatars and extra artwork to view.

This is also the Advanced Edition, which means new systems, aliens, weapons, drones, music and new events to keep you playing.

All in all, a good buy at £6.69.

### Witcher 2

*The Witcher* series is about, sometime in May I think, to have the third title released, so until then, how about getting to grips with the second instalment of the Gertalt of Rivia.

*Witcher 2* comes with an armful of goodies much like *Baldur's Gate 2*. There's the

soundtrack, 19 HD wallpapers, 46 minutes of bonus videos, a 50-page comic book, seven papercraft dolls and modding tools. There's also the decidedly dodgy Triss Playboy Session, which is best left unmentioned unless of course you enjoy looking at a nude pixel lady. Each to their own. Anyway, *Witcher 2* is available for £13.29.

### Uplink: Hacker Elite

*Uplink: Hacker Elite* is one of the most compelling and interesting games I've played in a long time. It was originally launched in 2001 and takes a lot of its source material from the old ZX Spectrum game *Hacker*, as well as every Hollywood hacker-related movie going.

You get to hack into systems, change identities, sabotage organisations and create the ultimate virus, all while being traced by the security forces. It's thrilling stuff if you submerge yourself into the game's atmosphere.

For just £3.99, then, enjoy some clever old-school hacking.

▼ *Baldur's Gate 2. Classic PC gaming here on Linux*



# Hyperion Down?

**Sven Harvey looks into a bit worrying news for AmigaOS 4**

**H**yperion Entertainment Cvba appears to be being forced into bankruptcy, according to court documents filed on 27th January (see [goo.gl/juUSre](http://goo.gl/juUSre)). Could AmigaOS 4.1 Final Edition have been just that from the software house?

Hyperion Entertainment ([www.hyperion-entertainment.biz](http://www.hyperion-entertainment.biz)) started off in 1999 as a gaming software house (hence the name) porting PC titles not only to PowerPC-equipped Amiga hardware but also Linux and the PPC Mac, with *Heretic II* being its first release. A handful of games followed in the first couple of years (with *Freespace – The Great War* being ported to PPC AmigaOS 3 machines in 2000/1 and then ported to AmigaOS 4 by Peter Gordon in 2010).

From 2001, Hyperion Entertainment was under contract from Amiga, Inc. to develop the new AmigaOS 4 as a PowerPC-based version of the operating system, but with it being a gargantuan task to free the OS of its proprietary Amiga hardware reliance, and limited contractor resources to work on the project, there was a huge legal disagreement between Amiga, Inc. (in more than one form, as the company repositioned itself legally) and Hyperion over completion and release dates. In the end, Amiga, Inc. had to agree to hand over key IP in a perpetual licence to allow AmigaOS 4 development to continue (to put it in a very simplified form).

A hearing and full procedure regarding the bankruptcy filing has yet to take place, and according to Hyperion's own account on [Amigaworld.net](http://Amigaworld.net), which is administered by the companies director(s), "This is the result of an unfortunate

administrative mishap by a third party and is in the process of being addressed/cleared up."

This has, as you would imagine, opened up a lot of speculation as to who owns what – though it's quite clearly Hyperion Entertainment Cvba that holds the "exclusive, perpetual, worldwide and royalty-free, transferable right and Object Code and Source Code licence to the Software (AmigaOS) in order to use, develop, modify, commercialise, distribute and market the software in any form (including through sub-licensing), on any medium (now known or otherwise), through any means (including but not limited to making AmigaOS 4 available to the public via the internet) and for any current or future hardware platform."

It's the transferable right that is of interest, as clearly that means that the main party with interest in further development, A-Eon Technology, can be the recipient of the transfer (one can hope) if the worst has or

does happen, though purchasing Hyperion lock, stock and two smoking barrels and thus grabbing the various game licences for title compatible with AmigaOS 4.x makes more sense, perhaps?

I personally would hope that with both the Commodore and Amiga, Inc. brands/trademarks seemingly inert and near worthless, the chicken-head, boing ball and all Amiga (and C64) related IP could hopefully end up under one roof in Cardiff. Interesting times ahead for AmigaOS at least, but for the moment the future can only be speculative until things are locked down.



## **A-Eon Technology Buys OctaMED**

After lengthy talks (first mentioned in a press release last October) all the rights, source code and IP for MED, OctaMED and OctaMED Soundstudio now come under the A-Eon umbrella from RBF Software (Ray Burt Frost.) Originally released as MED or Music Editor in 1989, the program expanded and was released commercially for the first time in 1991 as OctaMED, as it used a bit of clever programming to allow eight tracks of sound to be squeezed out of the Amiga's four sound channels and became a major player in the music creation scene on the Amiga platform.

The agreement allows A-Eon Technology, of Cardiff, to develop and distribute the music creation tool in all its forms on AmigaOS, including under emulation, MorphOS and AROS while development and distribution of the program on other formats such as Windows appears to still reside with RBF. A-Eon will also be able to use the trademarks associated with MED and OctaMED/OctaMED Soundstudio in marketing materials pertaining to the platforms it holds development and distribution rights for.



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





Ian is a professional IT analyst, a semi-professional writer and a pretty amateur electronic musician. He likes gadgetry and loves making gadgets do things they were never designed to do

# Mobile

## Revolution Number Ten

Ian McGurran takes a look at the Windows Phone 10 preview

**M**icrosoft is in a strange place at the moment. No more is it the world's biggest technology company (even combined with Google, its market cap is less than Apple's), its current OS has been a comparative failure, the Xbox One's gestation has veered from bad to even worse before righting itself a little, and Windows Mobile hasn't troubled iOS, much less Android, even after MS took up the manufacturing mantle. It's odd, then, that in critical terms, Microsoft is entering a much more favourable phase. Windows 8.1 was warmly welcomed by many and praised for its under-appreciated innovation. The flood of exceptionally cheap Atom-based Windows tablets has become hard to ignore, and Windows Phone is finally being seen as its own unique platform and not just Redmond's way of not towing the line. Coupled with Android and iOS becoming a little stale in many eyes after five years, the time for Windows Phone 10 could be just right.

The Windows Phone 10 preview is available for many Lumia devices, though oddly it's not on the flagships yet. If you have a Lumia 630, though (currently the lowest-end device that can run it), you're all set, and the preview can be accessed by signing up to the Windows Insider program, which many of you will have signed up to in order to get Cortana voice assistance ahead of time. Don't forget, though, like the desktop Windows 10 Preview, it's a preview and isn't meant for daily use. Therefore use it on your daily handset at your own peril...

So what does the Windows Phone 10 Technical Preview actually offer?

### Settings

Eh? Why are the settings the subhead here? Well, firstly it's really good, or at least not the swipeslog the previous one was, with MS finally categorising the elements into groups, similar to er, Control Panel, only some decades later. Either way, they are laid out in a far more intuitive fashion, albeit in a design language not yet present anywhere else in the rest of the build. It's absence that also means Settings is first up, as this build doesn't include any new versions of any headline apps – no new browser, messaging, maps, mail and calendar – but there's every chance later builds will give a glimpse of these.

### Keyboard

Nubbins. Remember them? Those odd grey nipple things found in the middle of laptop keyboards as an alternative to trackballs in the late 1990s? Well, they're making a comeback – not only on the right-hand side of Nintendo's 'new' 3DS as a kind-of-joystick and also in the Windows Phone 10 keyboard. Nestling down by the Z and Shift keys, holding on it allows you to move the cursor around text easier than the hit-and-miss stabbing at the screen method.

### Action Centre and Notifications

It's crazy to remember that Windows Phone has only got proper notifications in its past couple of revisions, and even

then they've lagged behind the rest. Finally things are on par, with more toggle switches at the top of the Action Centre and the ability to swipe away individual notifications, even within a batch from the same application. Small, but very welcome.

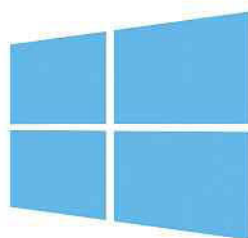
### Home screen

So far, it's not that different, but there is improved transparency in the tiles, letting your home screen image shine through better – something sorely ignored initially with WP7.

### Sharing

With iOS and Android, deep integration with cloud services is a given, so photos in either will often show not only what is on the device, but also what is stored on iCloud or Google too. What's more, they'll automatically upload new images to them too. With Windows 10's push for integration across platforms, the same is being pushed here too, with OneDrive integration out of the box from phone to desktop. Useful, if that's your thing, though if you store your images in, say, Google, it's not clear if you'll be able to nominate an alternative cloud source.

Windows Phone 10 shows promise and builds on the good groundwork laid by version 8.1. It's difficult to judge just yet, with major apps currently missing. However, it does show that this is quite likely to be the most interesting mobile platform in 2015 and one well worth keeping an eye on.



Windows 10

# Pi Eyed For Fun

**Andrew Unsworth eyes up the Raspberry Pi 2 and admits he can no longer ignore its charms**

I have a terrible confession to make. I've never really used a Raspberry Pi. I know, I know, as a computer enthusiast, especially one who grew up during the 8-bit revolution of the 1980s and who yearns for the naive innocence of that time, not only should I have done more than get one out of the packet, I should have bought every single edition from the first release to the latest – the Raspberry Pi 2. However, it's only now that I have a bit more free time on my hands and a rekindled love of back-to-basics computing that I've come to covet and desire the Pi.

I even bought my beloved a Pi, which she insisted she really did want, for Christmas, along with a Babbage Bear and a how-to book, but she hasn't had a chance to play with it either, and I can't touch it until she has. Otherwise it'll look like I only got it for me. However, given the Raspberry Pi 2's bargain price, I really have no excuse not to get one for myself.

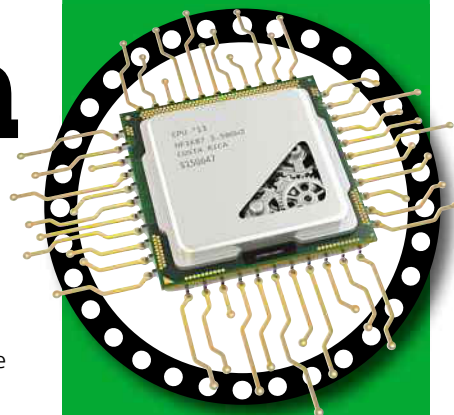
Indeed, the Raspberry Pi 2 is available to buy from around £33 to £40, which is nothing considering the fun you can have it. So I'm told.

To be honest, the new Pi isn't much different to the model B+ that's still sat on top of the bookshelf in front of me. It still has four USB ports, a HDMI port and a 3.5mm audio port. It also uses the same ARM Cortex A7-based CPU, but its operating frequency has been jacked up to 900MHz from 700MHz, and the RAM has increased to 1GB from the B+'s 512MB.

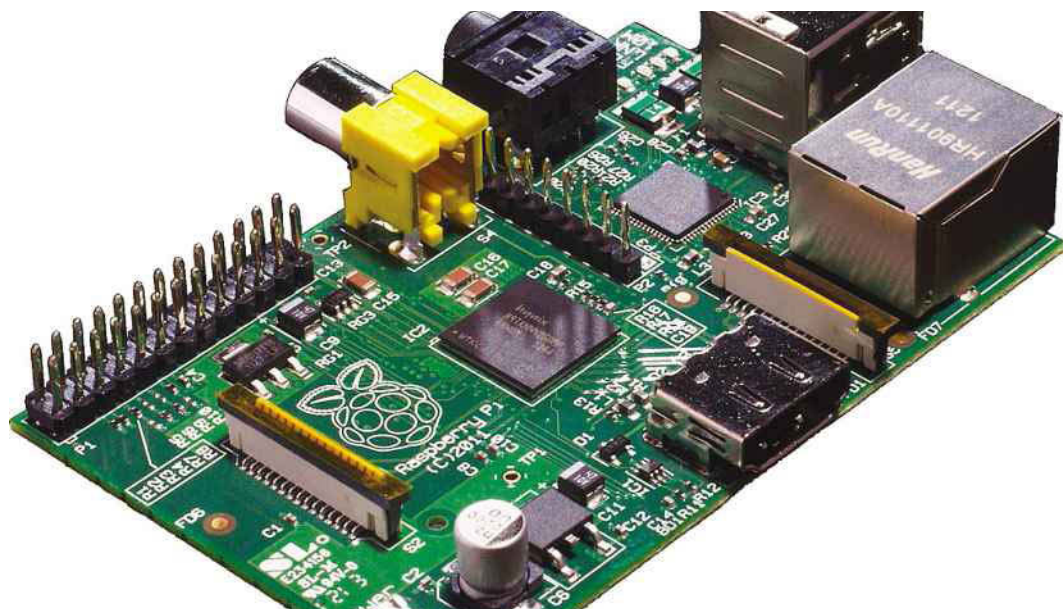
According to The Guardian ([tinyurl.com/o46vjgz](http://tinyurl.com/o46vjgz)), the Raspberry Pi is the biggest selling British computer of all time, even outstripping sales of the venerable ZX Spectrum. The Guardian reports that over five million Raspberry Pis have been sold, which is a phenomenal amount of tech shifted for the short period of time for which it's been on sale. Of course, you could argue that it's not really that much to get excited about in this new tech age where everyone has

a smartphone and even your TV has a bigger colour palette and more processing power than the 16-bit computers of old, but that would be missing the point. The purpose of the Raspberry Pi is to get the general public to engage with the basics of computing and programming so that they understand how the closed systems of their smart TVs and phones work. That five million people have benefitted from a better understanding of computers and the way in which hardware and software work together to make something happen can only be a good thing.

When not dodging the repeated common assaults of other commuters, I've often thought about the projects you could pull off with a Raspberry Pi, and one of them has been to create a touchscreen system that apes the self-service checkouts at supermarkets. Whether or not this is possible I have no idea, but I'll certainly give it a shot if, or most likely when, I order the Raspberry Pi 2.



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

## Dead Space

Games Workshop's sci-fi board game *Space Hulk* is set to become a tactical first-person shooter with *Deathwing*, out this year

This week, Ryan checks out a new shooter based on Games Workshop's *Space Hulk*, and takes a look at the sorry state of Peter Molyneux's *Godus*...

### Plug & Play

Games Workshop's Warhammer 40,000 universe has been inspiring game designers for years, from the adaptation of hit board game *Space Crusade* in 1992 to Relic's *Dawn Of War* series. While such strategy titles seem the most obvious fit given the series' table-top origins, we've also seen first-person shooters, MMOs and third-person action adventures set in its dark, dystopian universe.

There's a clutch of 40K-set games on the horizon, too – one of the most promising being *Space Hulk: Deathwing*. As it sounds, it's another title based on Games Workshop's *Space Hulk* – a board game that sees armoured space marines trudging through derelict ships infested with an alien species called Genestealers.

While we've seen games based on *Space Hulk* before, they've all been strategy games; the last title in the series was developed by Full Control and released in 2013. *Deathwing*, on the other hand, promises to be a full-blooded and chaotic first-person shooter – and looking at the game's latest trailer ([youtu.be/WGmmXd8r4YQ](#)), it's clear

that the genre fits perfectly with *Space Hulk*'s gun-heavy premise. The derelict space ships are cavernous, dark places straight out of the classic *Doom*, teeming with Genestealers that are alternately fast and vicious – all claws and lolling tongues – or, in the case of a hybrid breed of alien, armed with guns and blessed with quasi-human intelligence.

The space marines are, as any Warhammer 40,000 fan knows, like walking tanks: covered from head to toe in thick armour and armed with a variety of colossal cannons, swords and guns. The new *Deathwing* trailer takes the time to show some of those weapons off; the Storm Bolter, Plasma Cannon and Heavy Flamer are all glimpsed, and all straight out of the table top version of the game. Action-focused though *Deathwing* is, we've heard that tactics will still play a part; the player takes on the role of a Librarian – a type of space marine with psychic powers. The Librarian's the leader of a squad of Terminators, which can be equipped and bossed around as you see fit.

Storming each space hulk will require a certain amount of tactical cunning,

too. With the Genestealers capable of overwhelming you through sheer weight of numbers, positioning of your squad members and securing potential points of entry are vital to success.

*Deathwing*'s finer details have yet to be unveiled, but with developer Streum having made an RPG-shooter hybrid before – their previous game was *E.Y.E: Divine Cybermancy* – this latest *Space Hulk* incarnation could be well worth looking forward to.

*Space Hulk: Deathwing* is due out this year.

### Online

When *Godus* was announced in 2012, it sparked a wave of interest from press and gamers alike – and with good reason, since it's a god game headed up by Peter Molyneux, the designer who popularised the genre with the classic *Populus*. Developed through Molyneux's indie studio 22Cans, *Godus* appeared on Kickstarter that year, and buoyed by its pedigree, soon exceeded its goal of £450,000.

Three years later, and *Godus*, once hyped by Molyneux as "the ultimate god game" is mired in controversy. While





Three years on, and the PC version of *Godus* still isn't complete. Fixing it will take "months and months and months," creator Peter Molyneux says



a mobile version appeared last year, the long-promised desktop edition is nowhere near finished, with functions outlined as stretch goals on Kickstarter – multiplayer, a Linux-compatible version – still notable by their absence.

Behind the scenes, original staff members left, and a designer named Konrad Naszynski (who was originally one of *Godus*' Kickstarter backers) was hired to try to whip the game into some sort of shape. With these comings and going, the mood at the studio doesn't appear to have been particularly sunny, as an unusually candid forum post from Naszynski revealed.

"I simply can't see us delivering all the features promised on the Kickstarter page," he wrote; "a lot of the multiplayer stuff is looking seriously shaky right now, especially the persistent stuff like hubworld."

Given that the promise of a multiplayer, modern version of *Populous*, with rival gods battling one another online, was one of the most exciting features listed for *Godus*, it's not difficult to see why questions are now being asked. In an attempt to answer them, Molyneux put out a video update on the 9th February, which is possibly one of the most awkward and tense posts of its kind yet made.

While Molyneux tried to remain upbeat about the likelihood of *Godus* being finished, he also admitted that several members of his small team were now working on a new game called *The Trail*. He cited his inexperience with Kickstarter and Steam Early Access as being behind the game's delays, and conceded that he probably should have started on the PC version of *Godus* before the mobile one.

A round of increasingly hostile interviews with the press followed, hastened by the revelation that a competition

winner – who was supposed to receive a percentage of *Godus*' revenue – had barely been contacted by Molyneux's studio in months. Even now, beneath all the justified anger that promises haven't been met, a lack of clarity still remains. The Linux port looks as though it may never happen, and as for the PC version, Molyneux will only say that the task of fixing it will take "months and months and months."

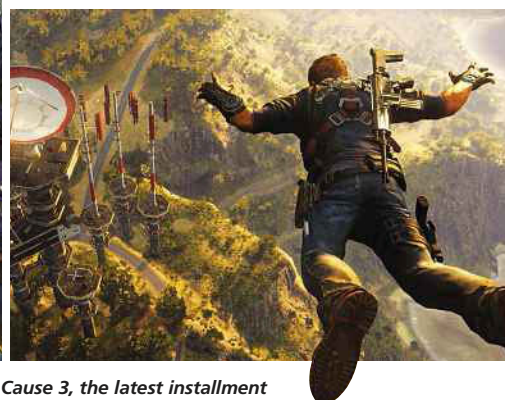
Only time will tell whether *Godus* will ever become the game it was supposed to be; for now, it's a sad story of

unfulfilled promises, social media fury and – for Molyneux and his team – a severely battered reputation.

## Incoming

With the kind of destruction that would make *Transformers* director Michael Bay blush, the *Just Cause* games are like a box of digital fireworks. Offering up an entire island to destroy, the series has made a name for itself thanks to the explosive possibilities of its weapons and over-the-top physics – this is the kind of game where you hitch a ride on the back of a fighter jet while holding onto a grappling hook, or surf on the roof of a car, gun in hand. *Just Cause 3* aims to be bigger and louder, with its latest trailer ([youtu.be/8juHcw1Vbvw](https://www.youtube.com/watch?v=8juHcw1Vbvw)) serving as a

fiery statement of intent: series hero Rico Rodriguez is back to topple another island dictator, and the results are going to be messy. Right now, little else has been revealed from Avalanche Studios' latest, but we do know that the terrain will be more varied (Rodriguez will now be able to explore underground caves and scale tall buildings). Better yet, we even have a tentative release date: *Just Cause 3* should be with us in time for Christmas.



▲ Series hero Rico Rodriguez flies back in a wing suit for *Just Cause 3*, the latest installment in Avalanche Studios' loveably chaotic sandbox action series



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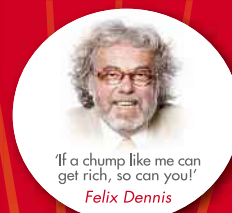
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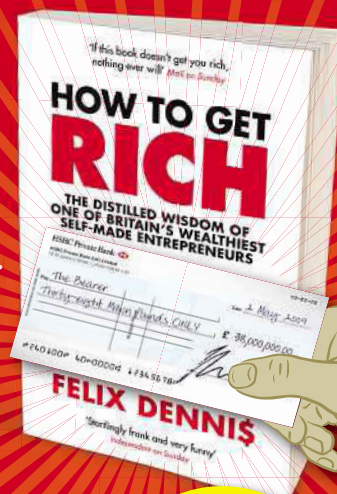
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Email: pcmadnessltd@yahoo.co.uk

6 P3/4 PC bases for sale. £100 the lot. All with XP. Must be collected.

Tel: (02387) 333212

Email: zen96403@zen.co.uk

MAC BOOK PRO A1151. Spares and repairs 17" screen 2.16GHz Intel CPU looks in good condition screen appears to work. Please email or call me for a price and more information.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

Six p3/p4 PC with XP. £100 the lot. Buyer collects. Get in touch for more information.

Tel: (02380) 733312

Email: zen96403@zen.co.uk

Socket 775 System. Coolermaster Case, audio + USB. Asus P5KPL-AM EPU E6600 CPU. 250 GB Hdd. DVDRW, ATI 5450. Boxes, drivers. Samsung 19" Monitor HDMI USB. Keyboard mouse. Windows 7 Professional SP1. £100 collect from Louth, Lincolnshire.

Tel: (01507) 602914

Email: flipinek@hotmail.co.uk

500GB SATA drive. 3.5" formatted ready for use. Software can be installed for an extra charge. Windows 7 extra £35 includes disk and certificate of authenticity. Only £23 including P&P.

Tel: Dave Thomas (01942) 706572

Email: davethomas96@aol.com

Vintage Apple Macintosh Classic II PC for sale. Complete with keyboard, mouse and microphone. Offers.

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Email: 576924@tiscali.co.uk

AGP, PCI and PCI-e graphics cards. Please email or call me for a price.

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Email: pcmadnessltd@yahoo.co.uk

2 x 2GB Samsung DDR3 pc3-8500 1066 SODIMM. 204 pin as new laptop memory. £15 inc postage to inland UK.

Email: jvital@mail2web.com

Dell OptiPlex 755 (80 GB, Intel Core 2 Duo, 2.33 GHz E6550, 1GB memory, DVD/CDRW)

Ultra small form factor. Fantastic small and very fast computer.

You will need to load the drivers. XP Pro or Vista Business can be loaded for an extra £10. The hard drive and memory can be upgraded for an extra cost. £70 plus £10 for delivery.

Tel: Dave Thomas (01942) 706572

Email: davethomas96@aol.com

Motherboard Bundle. 3Ghz AMD 64bit CPU 512MB Ram 5xpci 2xSATA 2IDE 1Gb LAN 6 channel sound firewire. Comes with driver CD and manual.

Good for gaming, office work, surfing the net, watching movies, generally a good all round system. Spec can slightly be changed if required. Please email or call me for a price.

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Desktop cases. AT and ATX types and tower and flatbed form factor different sizes and colours can be posted or picked up from Manchester please email or call me with your requirements.

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Email: pcmadnessltd@yahoo.co.uk

PC gaming hardware. I have 1x force feedback steering wheel, 1x force feedback joystick, 1x normal joystick, lots of game pads. Please email or call me for a price.

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Email: pcmadnessltd@yahoo.co.uk

6x P314 PC bases for sale, £100 the lot, all with XP, must be collected.

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Email: zen96403@zen.co.uk

Laptop RAM. 2x1GB PC3-8500 DDR3 1067MHz pulled from a working mac book pro but can be used in other laptops this is the quickest way to boost your laptop's speed. Please email or call for a price.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

Internal 3 1/4 floppy drives. Choice of white/black/silver/no face plate. Please email or call me for a price.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

Brand new Laptop bag. Still sealed in the plastic bag and never used (it came as part of a bundle). Please email or call me for a price.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

Brand new flatbed scanner. Still boxed and never used (it came as part of a bundle) Please email or call for a price.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

Internal Card Reader. Compatible with most memory cards. Also has a USB port. Colour: black or silver. Please email or call me for a price.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

CISCO CONSOLE CABLES. I have a lot of Cisco console cables all new let me know how many you would like please email or call me for a price and more information.

Tel: David (01616) 888119

Email: pcmadnessltd@yahoo.co.uk

2 x 2GB DDR3 1600 MHz RAM from a 2012 mac mini. As new £25.

Email: amstereofan@gmail.com

160GB 31/2" desktop Hard drive IDE. Clean pull (little to no use) no bad sectors tested all you need to do is plug in and go. £20 +p&p  
 Tel: David (01616) 888119 Email: pcmadnessltd@yahoo.co.uk

Computer Monitor. HP s2231a. 1080p, 22 inch display, 1920x1080 resolution. 60 Hz, contrast 15,000:1. Price £40 ONO  
 Tel: Matthew Taylor (01842 813630)  
 Email: chackpobly12@hushmail.com

Two Apple G4 iBook Laptops. 12" screen, 800 MGHZ CPU 640MB RAM. OSX (Tiger) 30GB HDD batteries ok M/Chargers, nice machines. £105 each or £200 for the two.  
 Tel: Matthew Taylor (01842 813630)  
 Email: chackpobly12@hushmail.com

## HARDWARE WANTED

**Trying to breathe life back into an old machine? Why not submit a wanted ad to MicroMart-ClassifiedAdverts@gmail.com and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?**

WANTED: Bluetooth dongle and driver for Philips Crystal 650.  
 Telephone: (01994) 231112  
 Email: alancox2823@gmail.com

WANTED: Working Dot Matrix Printer in Good Condition. Thanks!  
 Email: printer.20.odayly@spamgourmet.com

WANTED: Acorn computer either an A5000 or A7000. Also book on teaching yourself binary.  
 Tel: (07817) 861011  
 Email: Johnhaviland73@gmail.com

WANTED: Corsair PSU cable bag. Please email me if you can.  
 Email: Paul@planetvoodoo.co.uk

Wanted: HD 3850 Graphics card, must be AGP.  
 Tel: (07817) 861011

Wanted: Fully working mainboard for AMD socket AM2+/AM3, micro ATX size.

Must use DDR2 RAM.  
 Tel: Brian Taylor (07570) 452557  
 Email: bmorgant@yahoo.co.uk

Wanted: Factory system restore disc for a Dell Inspiron 1750.  
 Tel: Darren Day (07707) 556193  
 Email: ddshaggy@btinternet.com

## SOFTWARE FOR SALE

**Do you have any old software that you simply don't use? Why not advertise is with us and see if anyone else can make use of it – you may well be surprised to find that someone is looking for exactly what you don't need!**

Cyberlink PowerDVD 12 Standard. Runs under Windows 8, 7, Vista or XP. Original CD with unused product key £7.50  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

Nuance Omnipage 18. OCR Runs under Windows 8, 7, Vista or XP, Original CD with unused product key £25.  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

Acronis True Image Home 2012. Bootable CD. Application runs under Windows 8, 7, Vista or XP. Original Acronis CD with unused product key £5.  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

Windows 7 ULTIMATE 32 Bit and 64Bit DVD disks incl. SP1 This is my "Get Genuine Kit" from Microsoft not OEM. New install or legalise your copy with full Product Key. only £50 incl. reg. post  
 Email: Dave ochdgh@aol.com

Norton Family Premier 2.0. Runs under Windows 8, 7, Vista or XP, Original Symantec unused product key £15.  
 Tel: Ian (01932) 856971 Email: a2345@btinternet.com

Microsoft Office 97 Professional. Original disc with key £18 inc postage.  
 Tel: Andrew (01376) 512118

Windows XP Professional. New and sealed. Book, software and license (certificate of authenticity) 100% genuine and unopened. (Dell branded but will install on any machine) ONLY £15 including P&P.  
 Tel: Dave Thomas (07828) 982930 or (01942) 706571  
 Email: davethomas96@aol.com

Cyberlink PowerDVD 12 Standard. Runs under Windows 8, 7, Vista or XP. Original CD with unused product key £7.50  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

Nuance Omnipage 18. OCR for Windows 8, 7, Vista or XP, Original CD with unused product key £25.  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

Acronis True Image Home 2012. Bootable CD. Application runs under Windows 8, 7, Vista or XP. Original Acronis CD with unused product key £5.  
 Tel: Ian (01932) 856971  
 Email: a2345@btinternet.com

HP Windows XP Pro SP2 Re-Install Cd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New, Packed. £10. Price includes p&p.  
 Email: omendata@gmail.com

Windows Vista 32bit for sale. Genuine item with genuine product key. £35 including P&P.  
 Tel: Ian (01132) 629028 Email: ianmatthewuk@yahoo.co.uk

## SOFTWARE WANTED

Wanted: Windows 98 CD ROM operating system with boot disk, instruction manual and serial number. Tel: Craig (07867) 930265 or 01912093677  
 Email: craigtin44@hotmail.com

Wanted: LG GSA 2164 D software disc to replace broken original.  
 Tel: Glen Fremantle (01387)248976  
 Email: bldamsys@yahoo.co.uk

## IMPORTANT BUYING ADVICE

**We work very hard to police our classified ads, and make them as secure as possible. However, please do your bit too and use the following guidelines:**

- **Never - NEVER** - pay by bank transfer or post out cash, unless you know the trader already, or are sure it is okay to do so. Pay by cheque, Paypal, Nochex etc wherever possible.
  - Be wary of anyone who insists on you paying by the above methods if in doubt, get us to check them out by mailing editorial@micromart.co.uk
  - Keep copies of all correspondence
  - When sending out goods, at the least obtain a certificate of posting from the Post Office
- If you are in any doubt, feel free to send us a mail via editorial@micromart.co.uk.**

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# ASK AARON



**Meet Aaron Birch. He's here to help you with any general upgrading, software and system building issues. He's got advice aplenty, and you're very much welcome to it!**

Send your questions to:  
Aaron Birch  
Micro Mart  
Dennis Publishing  
30 Cleveland Street  
London  
W1T 4JD

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*

## Multi-SSID

I have a situation where I have two TP-Link TL-WPA4220 wi-fi extenders set up, with one at each end of my bungalow. Each has the same SSID and password as my Virgin Media Superhub. However, each one gives a stronger signal if I connect to them using their TP-Link designations, i.e. FFEE0A and 378C74, each with the appropriate password.

I used the TP management utility to change the SSID shown in the wireless section of the details of each extender to the same as the router, but it made no difference.

How can the extenders be using two different SSIDs?

I have noticed that although my desktop, which is wired into the router, gives the full speed of 50Mbps, my phone, when held only a foot away from the router, shows only half the speed. Could the router be part of the problem?

**Jim**

*There's actually nothing to worry about here, Jim. It's common practice for wi-fi extenders and access points (APs) to have different SSIDs to each other and the router. This is to avoid confusion and to avoid problems with roaming. If all points had the same SSID, your devices may not properly attach to the closest AP, which would defy the point*

*of having the extenders in the first place. With multiple SSIDs, your devices can easily detect and attach to the closest different point, thus giving you the best coverage and performance. As long as your points are set up and attached to the router themselves, you're fine.*

*As you're getting 50Mbps with your connection when wired, I'd say your broadband is fine, and I also believe your Superhub is too. Wi-fi connections, especially mobile phone connection to routers, are usually slower than most, and you'll rarely get the full download performance you may get from a wired or even wi-fi PC connection.*

*Of course, if you're still concerned, you can perform the usual checks, such as restarting the router or resetting it to factory default and then configuring it. If there are any firmware updates for the Superhub, also apply these to ensure you're up to date and reattach your phone to the network.*

*Also ensure there's no interference with your wi-fi signal nearby, such as cordless phone, microwaves and other appliances that can cause problems. Try changing your wi-fi channel to another, less common selection to avoid any conflicts with neighbouring networks too.*

▼ **AP SSIDs can often be different, such as this Asus example, which uses different SSIDs for the router and AP**

Livingroom



Bedroom



SSID: ASUS

SSID: ASUS\_RPT

## Pop-up Provider

Since the December Windows updates, I have been plagued by a pop-up every time I open Internet Explorer. This pop-up has the heading 'Manage Add-ons'.

Under the sub-heading of 'Add-on Types/Search Providers', it tells me to select the search provider you want to view or change.

This wouldn't be a problem if I was wanting to use a search provider, but most of the time, I am not using IE for accessing a search provider. Nine times out of ten, I'm heading to one of my regular daily websites, such as BBC News, Gmail, BBC Weather, etc. If I want to use Google to search for something, I use Google Chrome, not Bing.

As you will gather by my plea for help, I have tried everything I can to remove this pop-up but have failed miserably. I even tried selecting a search provider but cannot see how.

Clearly, this arrived on my PC as an update with the December updates, as it appeared the day after I downloaded the updates. The problem is, I don't know which one it was.

My OS is Windows 7 Pro, and I'm using IE10, with the Menu, Command and Status Bars visible.

Any help you can give will be very much appreciated.

Great mag. Keep up the good work.

**Russ**

*I've seen quite a few different instances of this problem and a number of fixes. By far the most common resolution for this appears to lie with some form of corrupted search provider entry. This causes the add-on manager to keep prompting you for a*

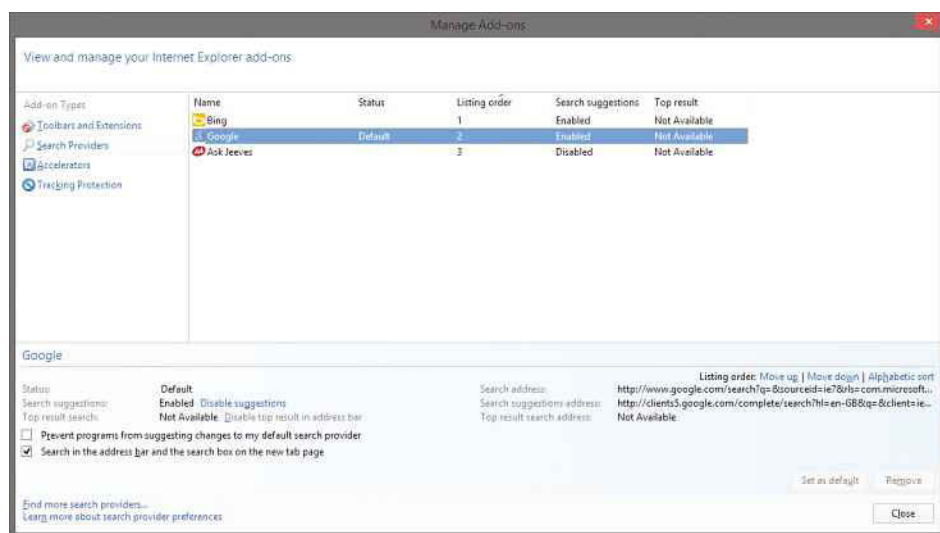
*selection. To fix this, you need to re-add the offending entry.*

*So from the pop-up, where you should see the search providers currently set up, remove the offending search provider, which will likely be the current default option. Before you can do this, you'll need to select a different default, as the current one can't be deleted. If, however, you only have one search provider, you'll need to first add another, so you can change defaults.*

*If you click the link at the bottom that says 'Find more search providers', you'll see a list of possible options. Choose any for the purposes of this fix and click it, then click the button to add it to Internet Explorer. Close the new window and return to the add-on manager. Now highlight the new search provider and set it to default. Once this is done, highlight to previous default and click the Remove button.*

*Next, for good measure, close and reopen IE. You'll likely no longer get the pop-up, as the offending search provider was deleted. To restore it, if you need to (which you may not need to as you don't use them), go back to the add-on manager and add the search provider back and set it back to default.*

◀ **It's possible for search provider add-on entries to experience problems, and removing and re-adding them can fix these**



## Non-Default Text

I am currently using the Xubuntu 14.10 operating system on my desktop at home. It's the AMD 64 architecture version. I have two user accounts on my OS, Administrator and Desktop User.

The problem that I have with my OS is that whenever I double-click on a plain/text file, within the Administrator or Desktop User account, it always opens it with AbiWord instead of Mousepad. Can you explain why it does that in those accounts with a plain/text file, when the default application to open it with is set to Mousepad and not to AbiWord?

**S Fox**

*After researching this particular issue, it would appear as though it's a common problem with the 14.10 release of Xubuntu, as well as other Linux distros. It's caused by a problem in the mimeinfo.cache file, with entries for opening certain file types specifying the wrong program, even when another is set to default.*

*For example, 'application/pdf=gimp.desktop;kde4-okularApplication.pdf.desktop;evince.desktop;' would open PDF files with Gimp on double-click, even if you don't want it to.*

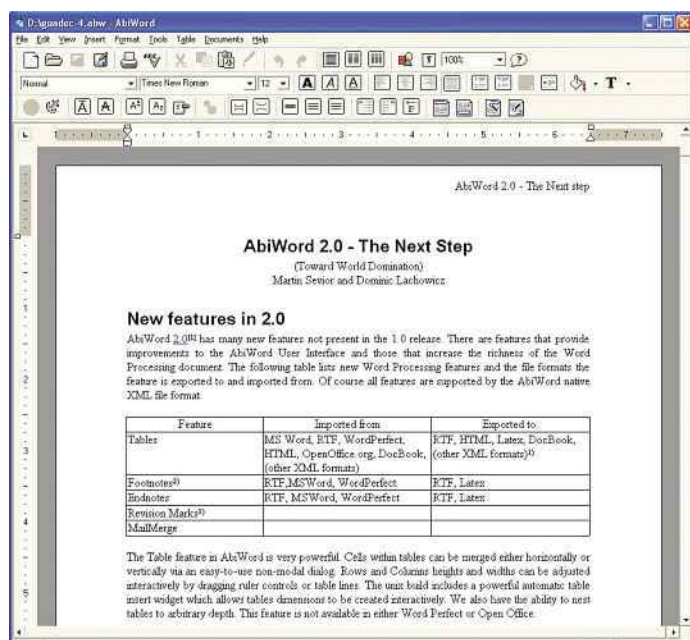
*Luckily, this is easy enough to fix, at least until a proper update fixes the problem for good. To do this, you need to edit the mimeinfo.cache file, which can be found in /usr/share/applications. Browse this file and find the entry for the text file format(s) you're having problems with and remove the reference to Abiword.*

*So let's say you had a problem with PDF, as in the example above; you'd edit the example to read, 'application/pdf=kde4-okularApplication.pdf.desktop;evince.desktop;gimp.desktop;'. Here, we've moved Gimp to the end, so other applications towards the beginning of the list will be used instead.*

*Just to be sure, I'd also check the defaults for the file types in question. Right-click these and*

*select 'Open With' and ensure the correct application is set to default, and make sure it's not Abiword.*

▼ **Abiword is a good text editor, but you may not want it as your default in Linux, and a bug may prevent changes**





# 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:  
Jason D'Allison  
Micro Mart  
Dennis Publishing  
30 Cleveland Street  
London  
W1T 4JD

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

## Stick Or Twist?

My PC has had so many parts replaced that I'm not sure it actually qualifies as the same PC. (Remember Trigger's broom in *Only Fools and Horses*?)

The current core components are an Asus P5Q, Core 2 Duo E8600 (3.33GHz), and 4GB of Patriot DDR2, which have all given sterling service since 2008. Frankly, they still cope well with my modest needs (I've not played games since completing *Doom 3*!), but I've hit some trouble.

A while back, my two SATA hard drives started intermittently going AWOL during the boot process. Recently they stopped showing up altogether (oddly, the SATA optical drive has never gone AWOL once). Swapping cables and ports made no difference, and neither did a new PSU.

I dug out an old IDE drive and transferred my Windows installation to that, and everything's now working. The SATA drives show up once the PC's running, and for a while they were visible even during the boot process, but today they've vanished again.

Is there some feature on the motherboard that's causing this? Replacement LGA 775 boards on eBay are generally listed as 'for parts or not working', as nobody wants to guarantee their functionality. Spending £30 or so could be money down the drain, but on the other hand, replacing the board, CPU, and RAM all at once for up-to-date parts will cost a fortune. What are your thoughts?

**Ryland Perrin,**  
Gmail

*This sort of carry-on was common in SATA's early days. Cables never seemed to mate tightly with board headers, working themselves out of contact if a PC was even breathed on heavily. Matters have improved, but I still urge you to try a batch of new cables,*

*Ryland, preferably ones with locking springs.*

*Also, are both drives the same model, bought together? Maybe they've fallen prey to the same age-related issue. Most likely, though, the SATA connectors on the back have developed solder breaks, probably the result of years of lateral cable force. This can happen if cables are routed too vigorously through a PC's case. The board's SATA headers could have become similarly damaged.*

*Experiment by applying various angles of gentle pressure to both the drive connectors and the board headers, determining if there are magic positions that coax everything back into life. If there are, a blob of glue here and there might do the trick (just be careful with glue that could eat away at circuitry).*

*There's usually a healthy selection of 'used' LGA 775 boards on eBay. If you end up with a duffer, getting your money back shouldn't be difficult. eBay works very much in the buyer's favour these days. Sticking with the Asus P5Q range is a good bet – well-built and employing Intel's top P45 chipset – but you'll need to drop £50 or more, not £30. And there's no telling how much life a board of that vintage has left in it.*

*If it were me, I'd hobble along with what I'd got, using an ATA/*

*IDE boot drive, until the PC dropped off its perch altogether. And then I'd open my wallet and undertake a wholesale upgrade, throwing items such as the following into my basket.*

• **Celeron G1840** (2.8GHz, dual-core, LGA 1150) = £31.67 (CCL, <http://bit.do/ZqwV>)

• **Gigabyte GA-H81M-H** = £37 (Ebuyer, <http://bit.do/Zqxu>)

• **Crucial 2GB DDR3-1600** × 2 = £14.22 × 2 (Ebuyer, <http://bit.do/Zqxxk>)

*On my abacus, that rings up to £97.11 (including delivery). The Celeron might sound like it'd struggle to blow the sprinkles off a Krispy Kreme doughnut, but it's actually faster than your Core 2 Duo E8600. It'd also grant you built-in graphics, so you could ditch whatever card you're currently using. The motherboard would provide HDMI, SATA III, USB 3.0, and a rake of other new goodies, too.*

*Now, on eBay, you should clear £20 for your old P5Q (just be honest about its faults), another £20 for the DDR2, and about £25 for the E8600. For a balance of just £32.11, then, you could have pretty much a new PC, one with upgrade potential. In 18 months, if desired, you could shove a Core i7 in there. What do you think about that? Go on, Ryland – run your hands down the sides of the sofa (here be treasure!) and whip out that screwdriver. You know it makes sense!*

*PS – I'd be remiss not to suggest fitting a new CR2032 CMOS battery. I don't believe this will make any difference, but there's an outside chance it could be all your old Asus needs, and I'll only get shouted at if I don't mention it.*

◀ **The Celeron G1840 may well be one of the slowest Intel CPUs currently available, but it's actually faster than the E8600, the flagship Core 2 Duo**



## Dirty Fuel

And on a similar note...

Help! My little media PC, mentioned in these pages previously, has packed up! On startup, I receive the following message: 'the boot selection failed because a required device is inaccessible'. The data spinner is found okay, but the SSD boot drive, an OCZ unit, is nowhere to be seen. I've reset the BIOS, switched cables, ports, and power leads, but all to no avail. Surely it's not possible for an SSD to be working perfectly one day and to be stone dead the next, with absolutely no warning?

**Francis Kinsler, Gmail**

*I'm afraid it is indeed possible, Francis. In fact, that's exactly how an SSD usually does fail. With a spinner, there are typically warning signs – sluggish performance, I/O errors, noises like a derailed freight train. With an SSD, failure can occur in a heartbeat. SSDs are great, but spinners, even with all those moving parts and tiny mechanical tolerances, are probably more reliable.*

*Sometimes, the point of failure on an SSD is merely the physical connector. Follow the advice offered to Ryland, above – wiggle the cable about and see if you can find the magic position. You could then at least save any important data. If the controller*

*chip's burned out, however, you'd need the help of a recovery specialist such as Kroll Ontrack ([www.krollontrack.co.uk](http://www.krollontrack.co.uk)). And several hundred pounds.*

*Often, faulty NAND chips are the problem, and usually not even a recovery specialist can come to the rescue there. The data's gone forever. With a spinner, it's rare for data to be unrecoverable, but with an SSD, it's sadly quite common. A solid backup regime is just as crucial with an SSD as it is with a spinner – probably more so.*

*I note that your SSD was made by OCZ, Francis. I expect that's the main issue right there. OCZ went bust in 2013, and in the*

*months leading up to that, the company had a fire sale, selling many of its SSD lines on the cheap. Quality and reliability had been on the slide for some time, with failure rates on some models being over 40%. One source claims the SATA II variant of the 128GB Octane had a failure rate of over 50% (see [bit.do/ZrTG](http://bit.do/ZrTG)). Toshiba's in charge of OCZ now, and quality and reliability appear to be beyond reproach, but no doubt there's still old stock out there. Caveat emptor and all that.*

▼ *If you're using one of these, you may want to double-check your backups are working...*



## Run VT!

I'd like to try out the preview of Windows 10 via the free pre-built VirtualBox VM you mentioned in issue 1349 (see [bit.do/YPv7](http://bit.do/YPv7)). However, when it attempts to run, it throws up an error about missing VT-x or AMD-V technology. Is this something to do with the fact it's 64-bit? The VM for 32-bit Windows 7 works fine, but there's no 32-bit VM for Windows 10. Maybe my laptop's just too old? It's an HP Pavilion dv7, running a Turion II M520 (2.3GHz, dual-core, 64-bit).

**S. Bowler, TalkTalk**

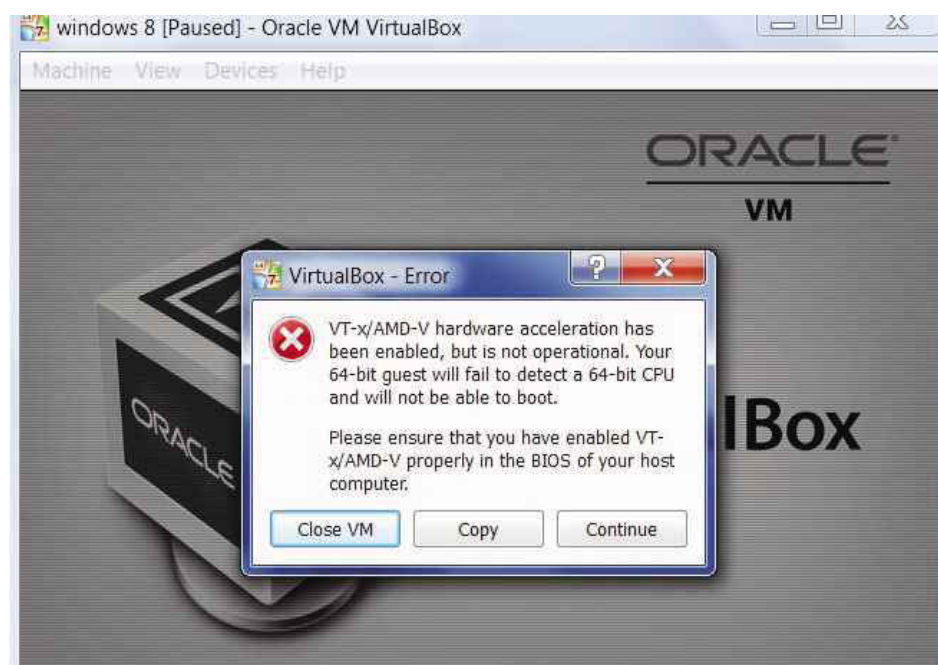
*VT-x (Intel) and AMD-V (AMD) are hardware extensions that take up much of the strain that virtualisation brings. VirtualBox won't run any 64-bit VM, not even a Linux variant, unless the host CPU supports one or the other. Without them, the performance of 64-bit VMs is deemed too slow. As far as I know, it's the same story these days for all hypervisors, not just for VirtualBox.*

*Most modern CPUs do support these technologies, and your Turion II M520 is actually no exception. AMD-V is baked right*

*in. My guess is it's been disabled in your laptop's BIOS, probably by default. Restart the laptop, press F10 to enter the BIOS, scroll to the System Configuration menu, and enable Virtualization Technology. Try*

*Windows 10 again. Pound to a penny chew (a Fruit Salad, if you please), it'll work.*

▼ *Thankfully, virtualisation errors like this can usually be solved with a few seconds in the BIOS*





# Crowdfunding Corner

**This week, we're checking out two Android-based smart components that fit in your home. The Internet of Things is here, and this is what it looks like**

## ZRRO

The Ouya might not have revolutionised gaming in the way it promised it would, but it did prove that Android gaming on a TV wasn't an entirely bad idea. Now, following in its Kickstarter-funded footsteps comes a similar concept called ZRRO – a stand-alone, Android-based console that can connect to any TV to allow it to run apps and games. So far, so Ouya, but the ZRRO has one big difference: a touch-based controller that mimics the touchscreens that are commonly the input medium for Android games.

This means that, unlike the Ouya (or other android set-top boxes), you're not limited to software that's been engineered to accept keyboard or game controller input. You can simply touch the control pad as if it's a touchscreen, and the ZRRO translates it accordingly. This means you get access to virtually every Android app and game that currently exists – and that was well over a million the last time we took a good look. With support for resolutions up to 4K, it's plenty future-proof as well.

Backers will receive a ZRRO Pad hover and touch controller and a ZRRO box console. All you need is a HDMI-capable screen to hook it up to. The project is aiming to make \$200,000 and with well over a month to go they've made \$60,000 already. Backers must pledge at least \$199 to get a console and controller, though higher payment tiers will get you extra controllers and a limited edition carry-case. Estimated delivery is in October 2015, so if all goes well there won't be that long to wait!

**URL:** [kck.st/1CHD3UR](http://kck.st/1CHD3UR)

**Funding Ends:** Tuesday, March 31st 2015

## Beam Smart Projector

Whether as a tool for making presentations, a way to make gaming fill your room or the apex addition to any home cinema, a data projector can give you a screen that'll make everyone jealous. But they're often bulky, heavy and hard to set up or position, which makes them impractical. The Beam smart projector is an attempt to solve that problem.

The projector is housed inside a closed unit about the size of a tennis ball. Its main innovation is that it takes its power from any standard light fitting, so you can combine it with a lamp or overhead fixture to create an instant screen out of any flat surface.

Inside, a smart computer runs Android with support for thousands of apps. Watch Netflix, play games, or cast your screen from your PC or tablet so that you can take advantage of bigger visuals. Beam's control app also has a built-in conditional scheduler, so that you can teach it to automatically respond to your needs. It can display the weather every morning when your alarm goes off, or start playing the news when you get back home, or resume your Netflix viewing if you switch on your Bluetooth speakers.

The price starts at \$399 plus shipping, although if you get to the project in time for earlybird pricing you can pay just \$369. The goal is, again, \$200,000, and they're also about \$50,000 in with a month to go, so there's a good chance it's getting made. And it'll ship in October 2015, so that could be a fun month if you back both of these projects!

**URL:** [kck.st/1vhfYZq](http://kck.st/1vhfYZq)

**Funding Ends:** Tuesday, March 24th 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

# Google Earth Pro

## An old favourite is now free to download and use

**G**oogle Earth has been around for years, and practically everyone is familiar with its inner workings. Recently the professional version of software became free, having used to cost something like £300 a year.

The desktop program has seen a lot of changes over the years and some excellent additions such as the incorporation of Street View, the Luna surface and even the mapped surface of Mars.

Indeed, the stalker's friend and companion to nosey neighbours, where you can compare the size of your garden to that of the person down the road, has a wealth of features beyond that of the standard Google Earth that most of us were previously used to.

### Go Pro

The main features that set the pro version apart may not at first grab the attention of the average user, but we feel that over time they may come to use them.

For starters, there's an advanced measurement feature that allows you to get real-world dimensions for straight lines, 3D buildings and polygon area measurements for land developments. Furthermore, you can print in resolutions up to 4,800 pixels, as opposed to the standard 1,000 pixels.

Google Earth Pro also allows you to import GIS data from tools like Esri and MapInfo, and you can import geolocation data for up to 2,500 different addresses at a time. Interestingly, you can even get data on US demographics, parcel data and daily traffic counts, should you so wish.

Finally, one of the main advantages to going pro is the fact that you can create full HD movies of your Google Earth exploits. So if you're creating a virtual tour through the Grand Canyon or simply making a movie of your local street to send to friends and relations abroad, then Google Earth Pro has you covered.

So while Google Earth itself may not be a new program to look at, the features that Google Earth Pro offer may reignite your

interest in this rather excellent tool and entice you to take the opportunity to grab a free copy before the executives at Google change their minds.

### Conclusion

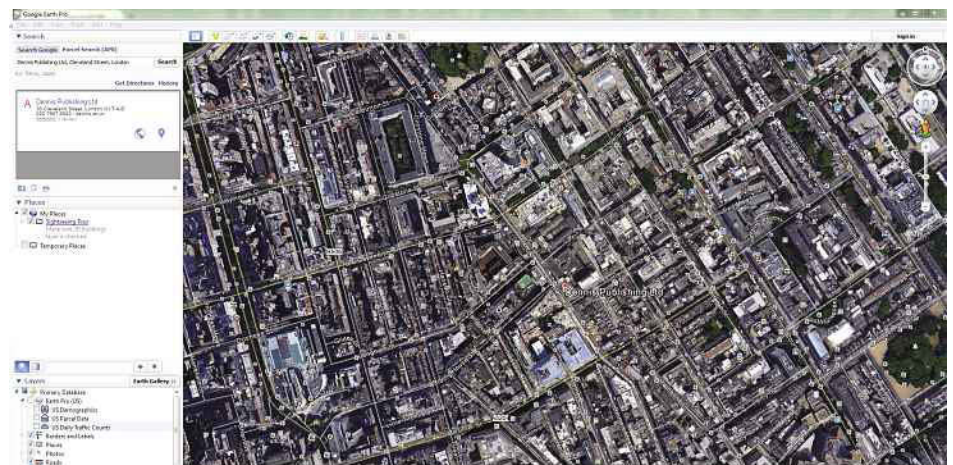
The extra features aren't for everyone, but they do offer some things that may come in handy. For example, Google Earth Pro has helped with geography homework in my household, where measuring and getting some hi-res images of the great pyramid at Giza were the order of the day.

Similarly, measuring a collection of the world's most notable buildings was easy

thanks to the added features of Google Earth Pro. To put it simply, even if you're not planning on using the extra features right away, they are least in place for the future.

### Features At A Glance

- Now free to download.
- Import GIS data from various sources.
- Super image overlays.
- HD movies and tours can be created.



▲ Google Earth Pro still lets us be nosey parkers from the comfort of our homes



▲ There are a number of interesting extras in the pro version



# Logging Off

**S**urfing around the internet this morning, I've come to the conclusion that some website designers just don't get how surfing habits have changed. Or more specifically, how our browsers are configured these days.

By default my browser has cookies turned off, and while I have the Flash plug-in installed, it must be sanctioned on a per-site basis. It doesn't take long operating in this mode to realise that it really annoys web admins, as they've all become entirely reliant on these technologies being active by default.

As I move around the internet, I'm confronted by banners, asking for permission to use cookies or allow Flash so they can better help me! Really?

If you wanted to truly help me, then surely they'd provide a second option alongside 'OK' like 'We accept you won't take cookies, so we won't ask again'. But oddly that one never appears.

And in the same vein, the reason I have Flash limited are those super-annoying news sites that launch a video news or advert feed without any user intervention whatsoever. Typically I might have 30 or more tabs open, so when one starts spontaneously spouting audio about how for some sad person the Microsoft Surface Pro has streamlined their life, it can take minutes to locate that page and purge it.

If you add to this activity the recently revealed financial relationship between Google, Microsoft and Amazon, and the creators of Adblock Plus (not Adblock) to allow their adverts through, it all adds up to an undercurrent of advertisers' frustration.

"Why won't people just let us market to them any way we want to," I presume they're wondering. Well, guys, it's because none of you know where the line is, or if you do it's just so you can make sure that you go well past that marker.

As the population of the browsing public has matured, we've become all too familiar with the stunts various web locations pull, so we're becoming more elusive prey.

Like other examples I've talked about in this magazine, when you abuse a freedom, it often gets taken away.

Those that spam over Bluetooth will find people turn this feature off, and if you give surfers an option not to go along with you, they'll probably take it.

The last 25 years is a litany of opportunities exploited to the point that they became unworkable, and yet this stupidity still goes on. Some websites have even gone to extremes where they won't deliver pages

## EDITORIAL

**Editor:** Anthony Enticknap  
[theeditor@micromart.co.uk](mailto:theeditor@micromart.co.uk)

**Designer:** Kevin Kamal

**Bonus John:** John Moore

**Contributors:** Mark Pickavance, Shaun Green, Jason D'Allison, Joe Lavery, Sven Harvey, Simon Brew, Shaun Bebbington, Ryan Lambie, James Hunt, Mark Oakley, Ian Jackson, Roland Waddilove, Pizza, Sarah Dobbs, David Hayward, Leo Waldoock, Ian McGurren, Aaron Birch, David Briddock, Ian Marks, Craig Grannell, Kevin Pocock

**Caricatures:** Cheryl Lillie

## ADVERTISING

**Group Ad Manager:**

Andrea Mason

Tel: 020 7907 6662

[andrea\\_mason@dennis.co.uk](mailto:andrea_mason@dennis.co.uk)

## Sales Executive:

Finan Tesfay

Tel: 0207 907 6898

[finan\\_tesfay@dennis.co.uk](mailto:finan_tesfay@dennis.co.uk)

## Sales Executive:

Karl Taylor

Tel: 0207 907 6706

[karl\\_taylor@dennis.co.uk](mailto:karl_taylor@dennis.co.uk)

## US Advertising Manager

Matthew Sullivan-Pond

[matthew\\_sullivan@dennis.co.uk](mailto:matthew_sullivan@dennis.co.uk)

## MARKETING

### Marketing Manager:

Paul Goodhead

Tel: 0207 907 6393

## PRODUCTION

### Production Assistant:

Maaya Mistry

0207 907 6079

[maaya\\_mistry@dennis.co.uk](mailto:maaya_mistry@dennis.co.uk)

### Digital Production Manager:

Nicky Baker

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## NEWSTRADE SALES

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David Barker

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### Group Publisher:

Paul Rayner

[paul\\_rayner@dennis.co.uk](mailto:paul_rayner@dennis.co.uk)

### Managing Director:

John Garewal

### Group Managing Director:

Ian Westwood

**COO:** Brett Reynolds

**CEO:** James Tye

**Company Founder:** Felix Dennis

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at all if you're using an ad blocker, like that will make them a more popular site to visit.

And a group of French publishers even considered legal action against Adblock Plus, as they believed that it was damaging their businesses.

There is quite obviously a lack of common ground, as the advertisers want free range, and the likes of Adblock Plus want to make money out of people's hatred of widespread ad abuse.

Going after ad blocking software writers is attempting to shoot the messenger, as the marketing industry doesn't want to really have a conversation with those who aren't happy with their activities: the surfing public.

Without that conversation, this can only go one way, because the public's patience with pop-ups, unstoppable video streams and other abuses is quite reasonably exhausted.

*Mark Pickavance*

## LAST WEEK'S CROSSWORD

**Across:** 7 Roentgenogram, 8 Adorno, 9 Edison, 10 Doppler, 12 Gyron, 14 Adopt, 16 Profits, 19 Insert, 20 Shrewd, 22 Class Interval  
**Down:** 1 Word, 2 Entrap, 3 Agnomen, 4 Index, 5 Uglify, 6 Nanovolt, 11 Ordinals, 13 Presets, 15 Please, 17 Furore, 18 Strip, 21 Wear

### 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. Housework sucks. Let there be no mistake about this: we absolutely hate it, and we'll go to great lengths to shirk our domestic duties. Considering our aversion to such things, it made sense for us to get a dishwasher. For years we've been struggling with the chore of washing dishes by hand in a sink, so this was sure to change our life and help us keep our kitchen

spotless. And, indeed, it did. For about a week. Then we found our laziness growing in size, as if it knew there was suddenly more space for it to lie back and stretch its legs (we imagine it sleeps in a hammock and has a long piece of straw hanging from its mouth). Now, rather than fretting about having to tackle a sink full of dirty plates and mugs, we dread the time when it comes to emptying the dishwasher and then putting the next load on. Clearly what we really need is a robot butler, one that can do all this hard work for us. That should solve all our problems. Yes, the more we think about this, the better it seems. Just one problem: who's going to tell it what to do? That will involve speaking. Okay, what we really need is a mind-reading robot butler. If anyone has one we could borrow, let us know.

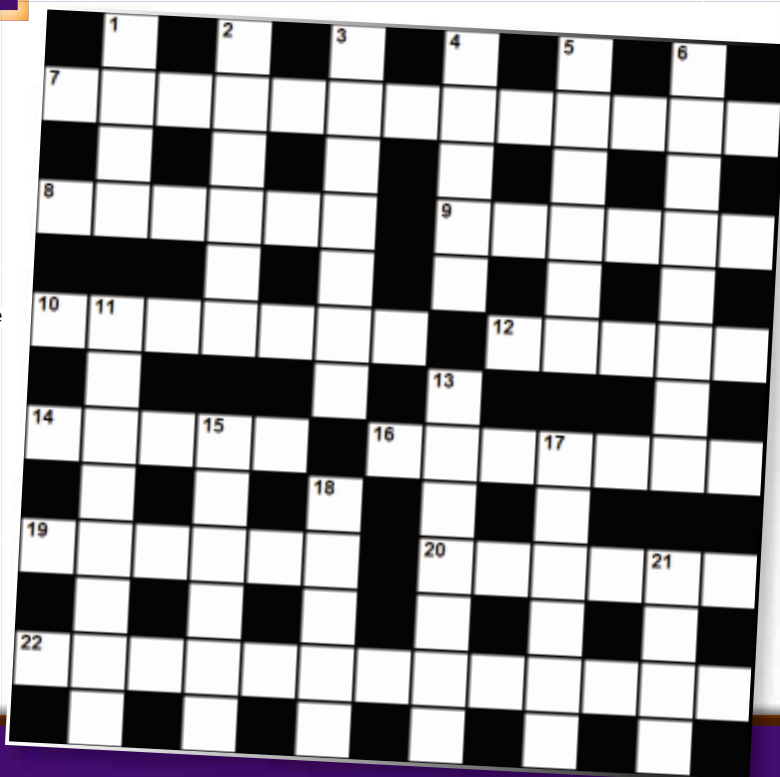
## THIS WEEK'S CROSSWORD

### Across

- 7 Someone who makes illegal copies of things for commercial gain. (13)  
 8 A city in western Saudi Arabia; site of the tomb of Muhammad. (6)  
 9 A futures contract traded on the Chicago Mercantile Exchange's Globex electronic trading platform, which represents an even smaller fraction of the value of the normal futures contracts than the corresponding E-mini. (1-5)  
 10 An internet service that lets users send and receive files and information over the internet without fear of being monitored or logged. (7)  
 12 Software version with added muscle! (5)  
 14 A meta object system for Lua, based on Perl's Moose. (5)  
 16 A short reusable piece of computer source code. (7)  
 19 Having a hole or empty space inside. (6)  
 20 In 1980, this Japanese peripherals company became the first major developer and supplier of memory enhancement products for Sharp personal computers. (1-1,4)  
 22 Computational and statistical techniques for biological data processing and analysis. (13)

### Down

- 1 In BASIC, the command to set the contents of a memory cell. (4)  
 2 Paid for on credit or in instalments. (2,4)  
 3 Shots or scenes in movies that have to be filmed repeatedly to achieve the desired effect. (7)  
 4 Present for acceptance or rejection. (5)  
 5 A person's social environment. (6)  
 6 Technology that is small or light enough to be embedded into clothing or carried on one's body. (8)  
 11 A formal written defence of one's opinions or conduct. (8)  
 13 Graphic design technique composed with ASCII compliant character sets. (7)  
 15 A photograph of oneself, especially one taken with a mobile phone or tablet camera held at arm's length. (6)  
 17 An elevated or underground footway built for pedestrians in an urban area. (6)  
 18 A framework enabling financial institutions worldwide to send and receive information about financial transactions in a secure environment. (Abbreviation) (5)  
 21 This command allows the OS to inform an SSD which blocks of data are no longer in use and can be wiped internally. (4)





# In Next Week's Micro Mart\*

- Budget Windows tablets:  
are they enough to save  
Microsoft?
- Why your smart gadgets  
might be spying  
on you
- Using your PC  
for home science  
projects
- Plus the usual mix  
of news, reviews  
and advice



\* May be subject to change

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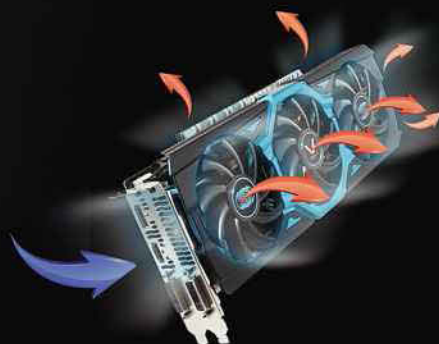
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