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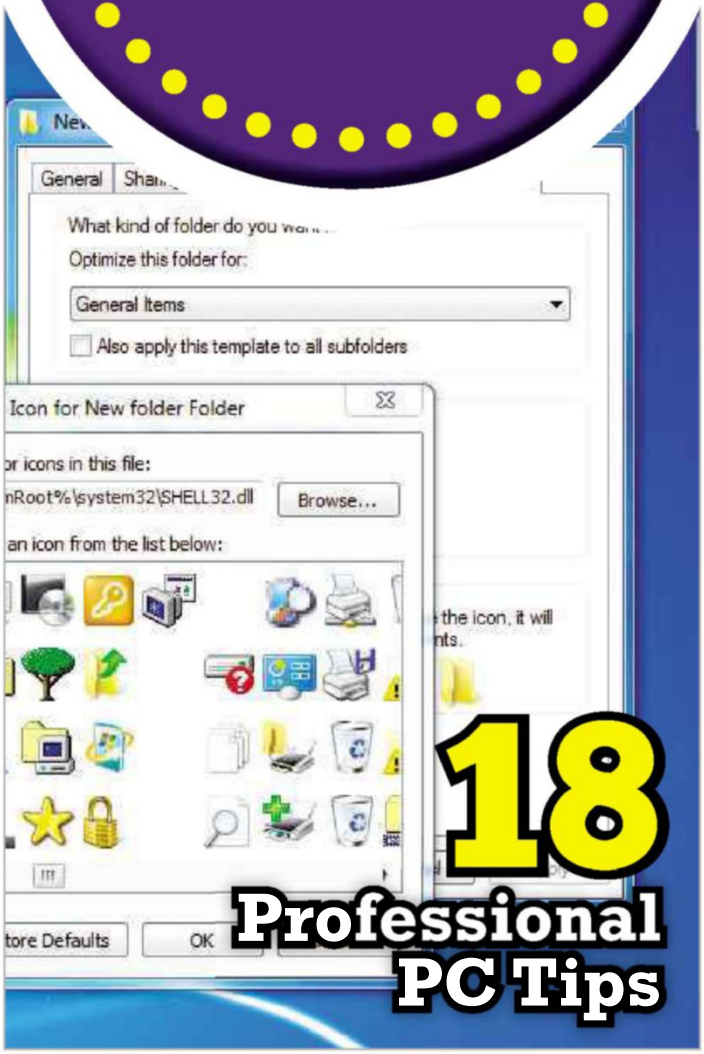

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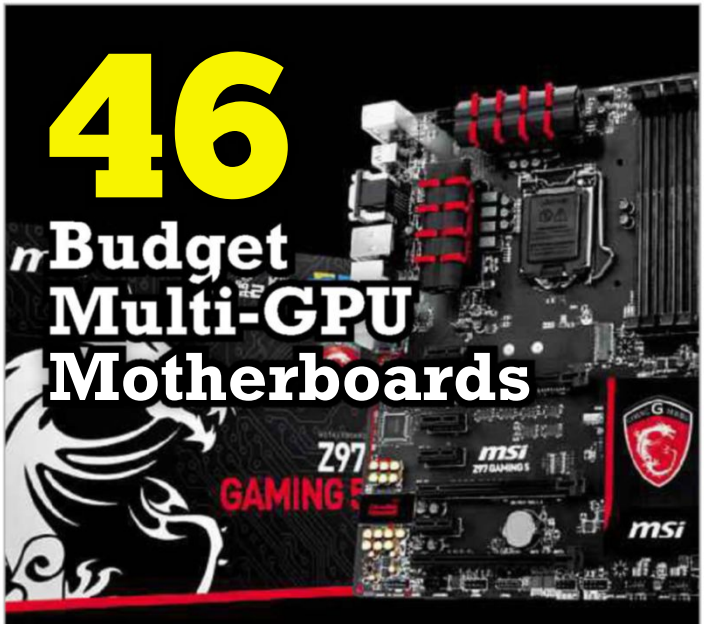

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08 Windows 10

08 Windows 10

We all know how much Windows 8 has struggled, and everyone was expecting the next version of the operating system to bring back the Start menu, among other things. What was probably less expected was the fact that it would be called Windows 10. That, though, is the case, and Simon Brew has been looking at what else we can expect from it

18 Professional PC Tips

The unsung heroes of offices the world over, IT administrators tend to know a whole load of tips and tricks that us mere mortal are oblivious of. The good news of us is that Keir Thomas has been asking them to share some of that knowledge. The result? 20 great tricks you can try at home

46 Budget Multi-GPU Motherboards

SLI and CrossFire setups have become increasingly popular in recent years, but naturally, they're not cheap. Having to buy two or more cards means the costs soon add up. Thankfully, you can save a few quid on the motherboard and still get decent performance. David Hayward has been checking out six reasonably priced boards that fit the bill

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Considering how many of us use our PCs to play music, it's surprising that often we're using fairly low-powered speakers to do so. If you're so inclined, though, and you have the money, there are plenty of top-notch and, of course, expensive speakers you can hook up to your computer, and Aaron Birch has rounded some of them up

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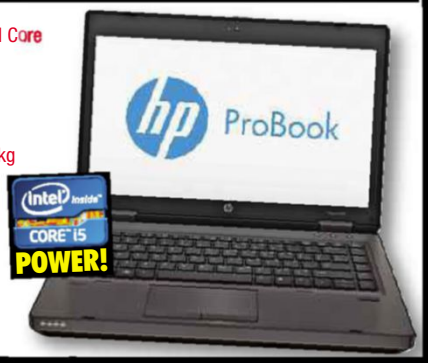

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Introducing

Windows 10

Microsoft confirms that we're getting a new version of Windows in 2015 – and it's called, er, Windows 10. Simon finds out more...

Increasingly, if you're going to pick up a copy of Windows, it's been best to go with every other release. Windows 98 was fine, while Windows Millennium Edition best forgotten about (there are some PCs still frozen on a Windows Me desktop screen somewhere). Windows XP, however, straightened things out, then Windows Vista bloated it back up.

In more recent times, Microsoft has continued its trait of learning from such mistakes with the release of the slimmer, far more popular Windows 7. But then it took a mighty gamble with Windows 8 and found itself stuck again. It's the great irony: people urged Microsoft to throw caution to the wind a little, it did, and it landed if not flat on its face, then certainly uncomfortably.

However, keen not to repeat the mistakes of Windows Vista, where it was left selling a product not that many people were keen on buying for more years than the firm would like, Microsoft made sure we wouldn't be kept waiting for Windows 8's successor. And following a solid improvement with Windows 8.1 (which sort of re-introduced the Start button, a focal point for criticism), we now know the identity of the next generation of Windows.

And we also know that someone at Microsoft has an aversion to the number '9'.

Windows 10

At a special launch event held in San Francisco on 30th September, Microsoft finally took the wraps off its new Windows. In time honoured fashioned, much of it had leaked in advance. That said, there were still one or two things that the firm kept up it sleeve.

The name for one. Not illogically, many were expecting the new Windows to be called Windows 9. Microsoft thought that was a bad idea. Terry Myerson, head of operating systems at Microsoft, argued in his presentation that it "wouldn't be right to call it Windows 9." Instead, he acknowledged that Windows One was one of his preferred names for the latest iteration of the OS, but, er, there'd been a Windows One before. So for reasons not too many people understood, Windows 10 won out.

But Windows 10 is just the name. What's interesting is that Microsoft has tried to establish a tightrope between the new ideas and thinking it integrated into Windows 8 (arguably its riskiest operating system of all time), while wooing back the desktop audience that was far more enamoured with Windows 7.

In doing so, the firm has been swiftly criticised for making Windows 10 an apparently unadventurous release (although that surely is far too early to call). But also, Microsoft didn't have too many options here. The boldness of Windows 8 may have won the firm some friends in the mobile market, but on the desktop – where Windows has always been strongest – Windows 8 has been met with more resistance than anything else. Subsequently, sales figures have been disappointing. More to the point, Microsoft is risking people becoming entrenched with Windows 7 in the same way that many millions still remain loyal to Windows XP, over a decade since it was first released.

Starting Over

Surprisingly nobody, then, Microsoft has kicked off Windows 10 by bringing the Start button back from day one. Not the updated, contextual, will appear some of the time version of the Start button we saw in Windows 8.1. Instead, in its biggest concession to its core desktop audience, the Start button will be back in its usual place on the Windows taskbar.

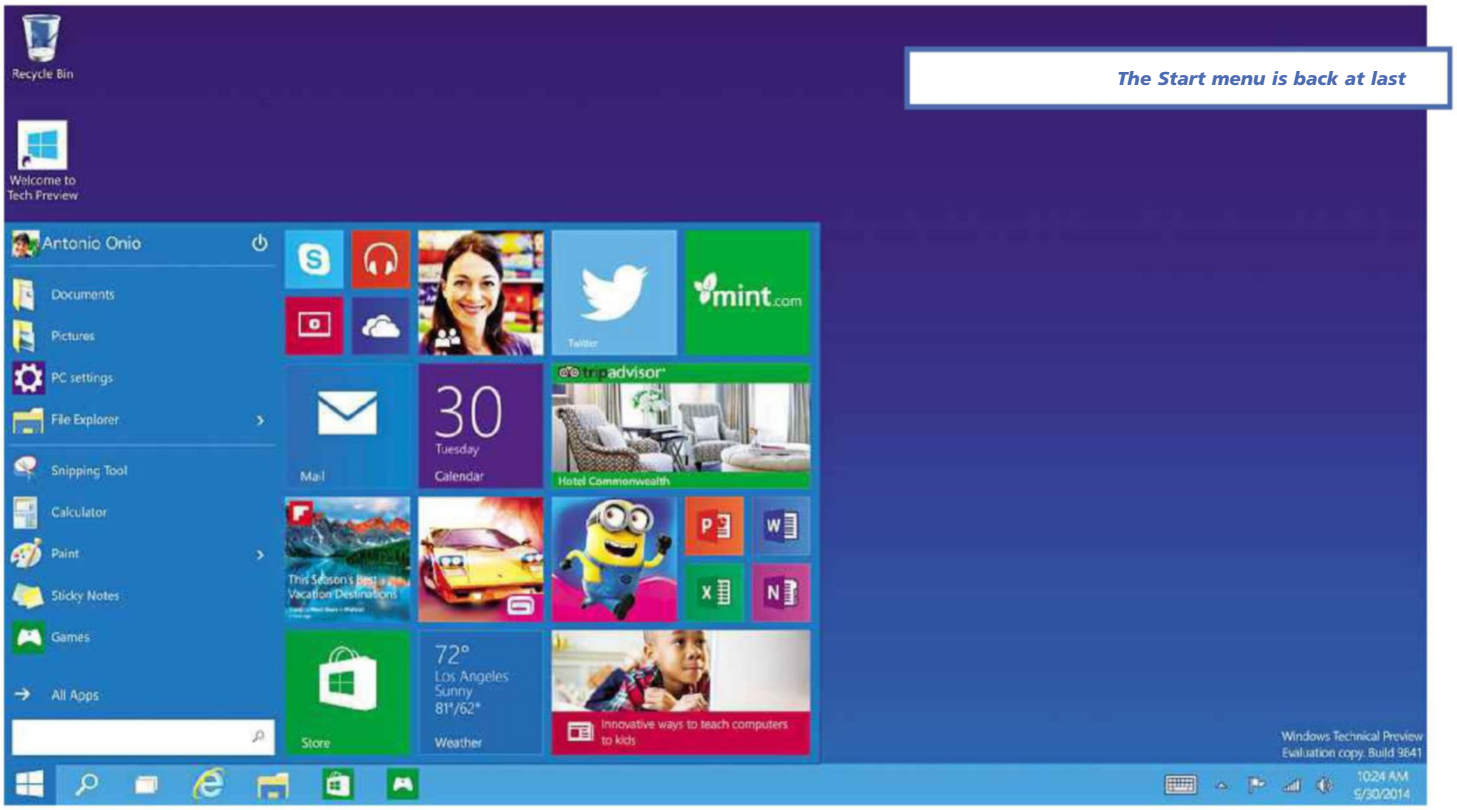
For if the firm had any doubt as to how many people were attached to it in the first place, then surely it would know by now. The feedback came back loudly when the Start button was gone in Windows 8: people wanted it back. They got it.

But the formal return of the Start button also gives a glimpse into the thinking behind Windows 10. For it's not just a case of bringing it back. Instead, Microsoft has attached a raft of ideas and innovations to it. Promising ones too.

On a desktop PC, when you click the Start button, you'll get the traditional mix of programs on the left, but then a matrix of apps on the right. The apps approach that Microsoft introduced with Windows 8 remains, then, but it's a version now that's far more suited to a desktop environment at first glance. Microsoft promises that you can personalise the Start Menu easily enough too, and if you've been a fan of Live Tiles in Windows 8, they're being carried across to Windows 10 as well.

> **"Surprisingly nobody, Microsoft has kicked off Windows 10 by bringing the Start button back from day one"**

Apparently, it wouldn't be right to call it Windows 9. So they didn't



The Start menu is back at last

But here's where the thinking diversifies further. Just because Windows 10 will work one way on a desktop PC or laptop, that doesn't mean that it follows the same approach on more mobile platforms. Once again, Microsoft is looking to scale a Windows operating system across multiple devices, but it's more accepting of the differences of them this time around. So if Windows 10 detects it's being run on a tablet, for instance, it'll adopt a touch-screen interface. If it notices you have a keyboard and mouse, it'll instantly give you the option of defaulting to that instead. You can basically pick the way of interacting with Windows that you're happiest with.

Furthermore, the standard desktop screen will vary depending on what kind of device you're working on. Thus, while the feel of Windows will be consistent across differing devices – and that's one of the big points Microsoft was keen to get across – you'll get a more appropriate working screen on a small phone than you would on a 27" monitor.

Single Store

Going back to apps, then. Microsoft is keen still to push the Windows Store, and it's working on the philosophy that everything downloaded from said store can be used on any device running Windows 10 (potentially even an Xbox). Furthermore, you'll now be able to pin an app to your Start menu. If you run an app on a desktop PC (is it just us who's old enough to remember when we used to call these things 'applications' and 'programs'), then they'll run within a window that you can scale. It sounds a decent halfway house: the uneasy line between what's an app and what's a desktop program was something that Windows 8 never convincingly juggled.

Furthermore, Microsoft is also introducing an instant task view button. The idea there is that you can get an at-a-glace look at what's running on your device at any time, in theory making it easier to shuffle between files.

You'll be able to switch easily between desktops as well, given that Microsoft is taking a firm leaf out of Linux's book and backing multiple desktops in a big way this time around (which sees it catching up with Mac OS as well). So, you can have your work and play desktop on the same machine, have different files and programs open in both, yet switch between them with ease. That sounds like a good step in the right direction to us, even if it's Microsoft lagging several years behind some of its competitors there.

The list of main improvements, though, at least obvious ones, seems quite small at first glance. There's another, in the form of snap enhancements. Microsoft argues that this will make working in multiple apps at once a lot easier, with a new quadrant layout allowing four apps to be snapped to the same screen. If there's spare screen space, meanwhile, Windows 10 will happily suggest useful open apps to fill up the real estate. But when it comes to writing the copy for the back of the Windows 10 box (not that Microsoft will really be selling it that way), there's not actually too much to play with.

Further Advantages

Inevitably, then, the number of headline things you can do to improve an operating system that make people sit up and take notice is limited. Certainly by the time you get to the tenth edition of an OS (accepting again that it's, er, not the tenth edition in this case), there's not too much you can do to the base product that arguably you shouldn't have already done. Furthermore, Microsoft will be wary

> **"Microsoft is taking a firm leaf out of Linux's book and backing multiple desktops in a big way this time around"**

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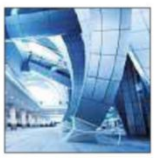

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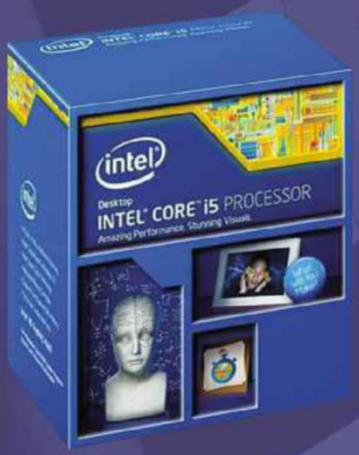

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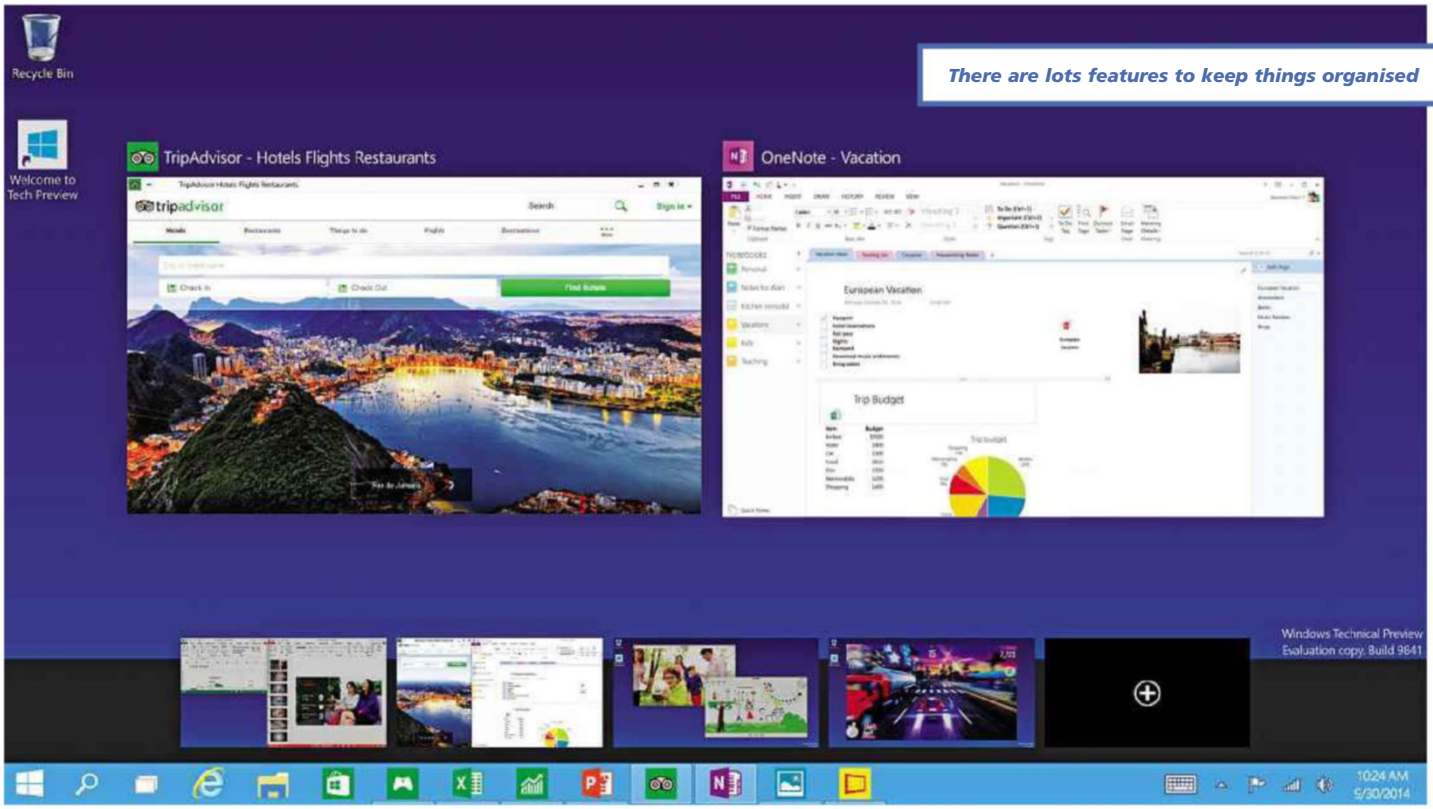


There are lots features to keep things organised

of overreaching, keen to keep that core desktop audience intact.

However, Microsoft may well be barking up the right proverbial tree in making the Windows OS seamless across devices. Accepting that Microsoft's share of the phone market is limited, even since its snapping up of Nokia's range of handsets, there's some sense in unifying its approach and tying things together. In doing so not at the expense of any other part of its customer base, Microsoft may finally have stumbled on the right approach.

Where Microsoft is likely to see particular dividends is in finding a way to make the Windows 8 feature base more accessible to the traditional Windows users. Looking past the specific example of the Start button, Windows 8 was a sizeable jump for people not necessarily looking to make one, but it did have plenty of good ideas bundled in. There's a conscious effort here to make sure that Windows 10 appeals to those who warmed to both Windows 7 and Windows 8, albeit with the inevitable risk of satiating both but pleasing neither.

The Business Market

Still, the toned-down look and interface is clearly a play to get businesses back interested in buying Windows upgrades. Two years after the release of Windows 8, and it still accounts for less than 15% of the market, some way behind both

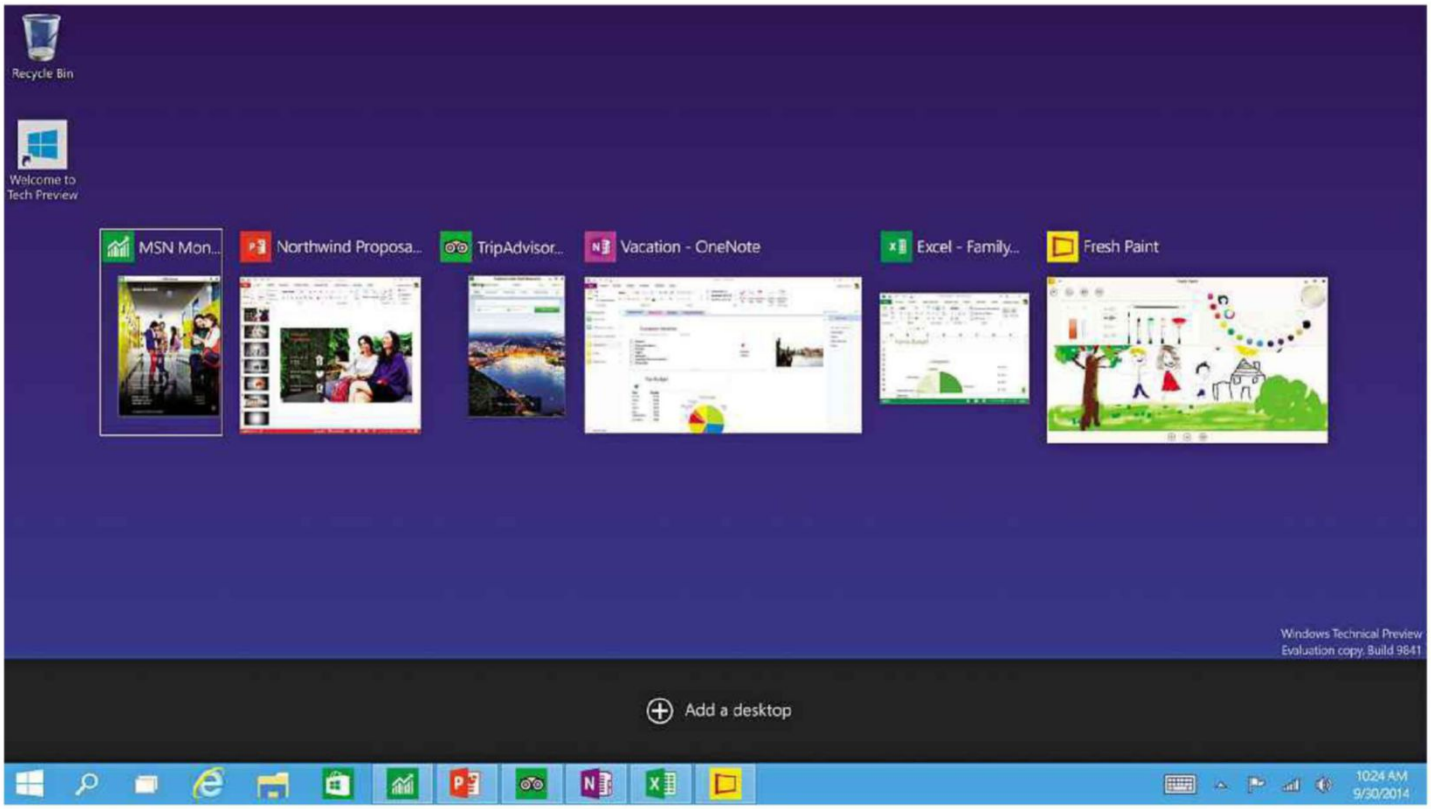
The idea of unification is still central to the OS

Windows XP and Windows 7. There's little confidence that it'll punch much higher than it currently does, and the speedy announcement of Windows 10 is as close an indication that Microsoft is papering over Windows 8 as quickly as it can.

That's part and parcel of that name. Microsoft is showing little signs of positioning Windows 10 as a logical next step upgrade, rather that it's a product that people will actually want to get onto their devices. Furthermore, if it can give

Where Are You, Cortana?

There are some features of Windows 10 that remain in the dark, although the Technical Preview that's being released should clear a few of them up. Where, for instance, is Cortana, the Microsoft equivalent of Apple's Siri? Currently resident on Windows Phone, Cortana may yet be taking a sojourn to your desktop...



the impression of a slightly more serious, less fad-driven Windows, it stands its best chance of winning over the business community. Understandably, with this in mind, that 30th September presentation had a very business-centric focus to it.

Furthermore, digging a little deeper, there are features that are clearly of more use in a work environment. Shared virtual workspaces, for instance, should aid collaboration, while a notifications centre will bring together the numerous alerts and messages that Windows likes to present you with. That includes the likes of Skype messages too and is in line with the idea of making the working layout of Windows more logical.

The New Direction

The message that's come through very loudly from Microsoft thus far on Windows 10 is that this is a significant turning point for the operating system. If you look back over the history of Windows, Windows 95 was arguably the most dramatic turning point to date, and it'd be remiss to say that Windows 10 will rival that. But the rhetoric from Microsoft is leaving few doubts. "Windows 10 represents the first step of a whole new generation of Windows," it wrote on its blog. "Windows 10 unlocks new experiences for customers to work, play and connect. Windows 10 embodies what our customers (both consumers and enterprises) demand and what we will deliver."

Blurb, certainly, but it clarified its thinking, saying "we're not taking about one UI to rule them all – we're talking about one product family, with a tailored experience for each device." The days of different SKUs for different iterations of Windows sound like they're being left behind. You buy one product, you shop through one online store, and you get access to whatever you need, whatever you happen to be running Windows on.

Where Next?

So far, so promising, then. Microsoft has shown an increased propensity to listen to its customers in recent years, although there's little doubt it needs to. The operating system market is absolutely crucial to a business that currently brings in over $3bn in profit a quarter. But there's been a very real sense in recent years that

Try It Yourself

As it did successfully with Windows 7, Microsoft is offering an early technical preview of Windows 10, which is freely available to download and put through its paces. You'll find it via the Windows Insider Program.

Interestingly, said Insider Program is an ongoing thing too, and Microsoft will be making more beta builds available as the development of Windows 10 continues. Thus, while the Technical Preview build will be the starting point, it'll inevitably be time limited but allow you to press ahead with further iterations of Windows 10.

It'd be remiss of us not to inject a word of warning here. If you're thinking of giving the Windows 10 technical preview a whirl, then it's best to do so on a spare PC or laptop. The first preview of Windows 7, after an extended warning period, eventually stopped working and left people needing to install a fresh operating system on their machines in most cases. It's likely to be the same drill in operation here.

You can find the Windows Insider Program web page right here:

windows.microsoft.com/en-us/windows/preview

its hold on the operating system market is slipping. In truth, it isn't really. As much as a threat Apple and Android are, Windows still dominates worldwide operating system usage, and on the desktop and in businesses in particular, it's hard to see – as things stand – its dominance disappearing anytime soon.

But it need Windows 10 to work, and it also needs to change people's thinking. Anchoring the operating system in desktop PCs and laptops is one thing, but making people instantly think of Windows when they buy a phone or a tablet computer is something that's all but alien right now. Microsoft wants the best of every world, and it's willing to redefine the product that the foundations of its business stands on to get it.

Yet, with relatively new management steering the proverbial ship at Microsoft now, there's clearly a sense here that old fashioned values and the core audience for Microsoft are higher up the agenda than they have been in recent years. The firm has promised to keep people abreast of Windows 10 developments, but in particular, it wants to demonstrate to the business and enterprise markets that Windows is the top choice. If it makes the OS look slightly less interesting than the last version as a consequence of that, then so be it.

The Next 12 Months

The current plan for Windows 10 is for Microsoft to release the operating system in the middle of 2015, possibly towards the end. There's no fixed release date that's in place at the moment.

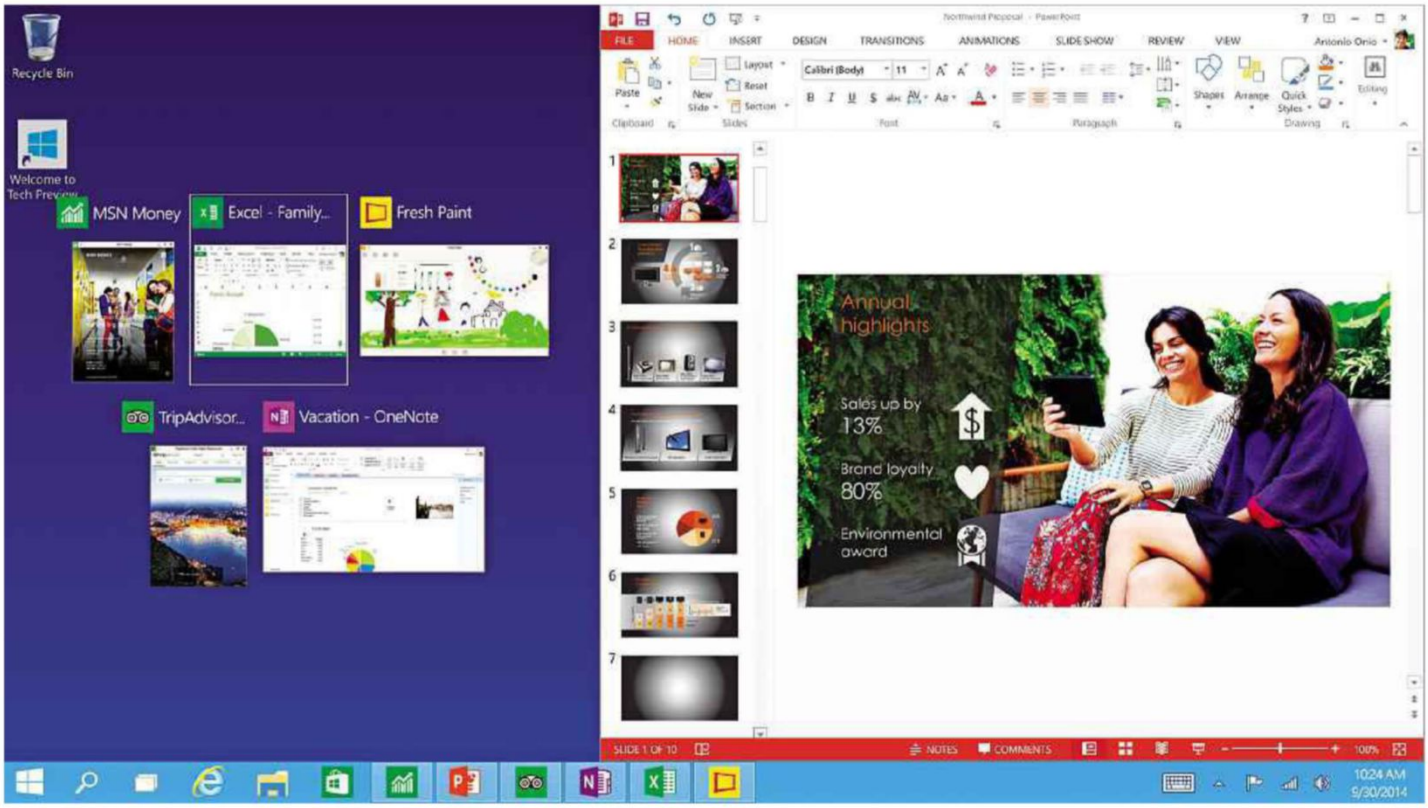
That said, it's likely to change a fair amount between the version that's available to try out now and the one that ultimately gets shipped out. While the early build of Windows 7, for instance, clearly was very similar to the final product, it turned out that Microsoft had been consistently working to improve the operating system, taking into account the copious amounts of feedback it received.

You can expect a greater level of transparency from Microsoft then ever before too as it continues to refine the new Windows, and we're promised further builds will be available for people to evaluate in advance.

On the surface (no pun intended), it looks so far as if Microsoft is playing a little closer to home with Windows 10. But it also knows that if it gets this one right, and if it shows its customer base that it's heard and acted on the criticisms aimed at Windows 8, then it can cement its market position for at least a further decade. If it fails? Then Windows 11 (or 12, if Microsoft continues jumping numbers) might just be the one that the company has to take an all-out gamble on... **mm**

A Question Of Price

There's still no formal confirmation as of yet



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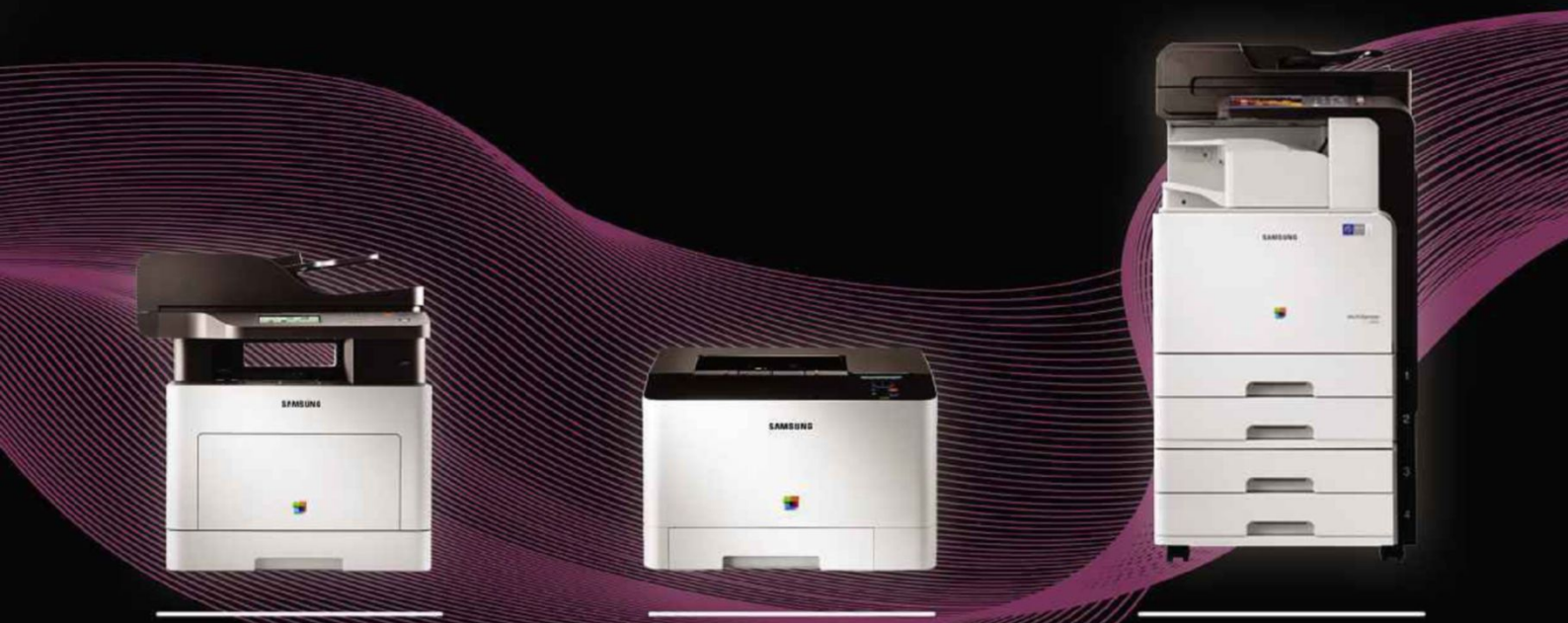

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20 Tips Of IT Professionals

Keir Thomas has bent the ear of IT administrators to find the tricks without which they couldn't work

IT administrators see computers in a different way compared to most of us. They're like car breakdown mechanics. The mechanically minded among us might take a leisurely day to fix a car, but the AA or RAC have to do so in about ten minutes, using only what they have in their van – and in their head. So it is with IT administrators, who may turn up to fix a PC using only a USB stick full of tools and a lifetime of experience.

For this feature, we spoke to a handful of actual, real-life system administrators and asked them for the juiciest tips, tools and hacks without which a professional computer engineer can't work. We whittled down what we got back to focus only on tricks that might be of use to everyday users (ignoring network technologies, for example) and also discarded the more well-known tips that you've no doubt heard before.

What was left might just change the way you use your PC.

1 Powershell Cheat Sheets

Powershell is Microsoft's venerated replacement for cmd.exe. It borrows a lot from the power of the Linux command line and, says more than one of our IT guys, if you're prepared to put in the work, it can revolutionise use of your computer. To kick-start the process, Microsoft provides a handful of cheat sheets in the form of examples, single-page quick references and glossaries for printing out and pinning near your monitor. Just visit **goo.gl/9MRKg7** and **goo.gl/nVhPGI**.

2 Access 'Slashdotted' Websites

Every now and again, a website will be taken offline because it suddenly becomes popular. The phenomenon is called Slashdotting and is named after the Slashdot website, which once upon a time regularly took offline featured websites by the sheer number of visitors it sent their way. Nowadays, sites like Reddit can produce a similar effect.

If you absolutely need to access a site despite a slashdotting, one solution is to add .nyud.net to the end of the website's domain name in the URL, although before the path slashes. For example, should www.micromart.co.uk/peripheral/group-tests suffer from slashdotting, you would use the following address instead: www.micromart.co.uk.nyud.net/peripheral/group-tests.

This trick is possible courtesy of the Coral Content Distribution Network (CDN), which is a free worldwide network of computers that cache web content. For Coral CDN to work, one individual anywhere in the world must initially add .nyud.net to the end of the address in order to start the caching process, but Coral CDN is so well known that it's likely somebody will already have done this before the site becomes too busy to access. If you encounter a busy site, why not be that guy?!

Another technique is to try to view the Google cache or see if a version of the site is available at Archive.org. A neat and quick way of doing so is to use **www.cachedpages.com**. However, unlike when using Coral CDN, cached versions of the site might be relatively out of date and not contain the content that inspired the slashdotting!

3 Add Remote Desktop (Rdp) To Home Editions Of Windows

For reasons best known to Microsoft, the Home editions of

Windows since XP have lacked the ability to let users remotely control them via the Remote Desktop Protocol or RDP. What makes it worse is that RDP is still present in the system DLLs. We know this because the same technology powers Windows' Remote Assistance system. It's simply hobbled unless you have a Professional, Ultimate or Enterprise edition of Windows.

Concurrent RDP Patcher offers a solution (see link at the bottom of **goo.gl/EiZTvE**; ensure both boxes in the installation dialogue box are ticked before patching). As its name suggests, Concurrent RDP Patcher is designed primarily to allow multiple RDP connections. It was created by fans of Microsoft's Media Center software in order to allow them to log in from a different computer while the media player PC was logged into the same account. A useful side effect of the patch is that it also activates on-demand RDP on Home editions of Windows 7. Alas, you don't get a totally authentic RDP experience, because the configuration panel that appears on higher-end versions of Windows isn't available. But you can connect in exactly the same way using the client built into all recent versions of Windows or via clients for Mac, Android, and iOS (check the app stores in each case).

4 Avoid Region Blocking

A worrying and growing trend among British ISPs and wi-fi providers is to block websites. Sometimes this is done because of piracy concerns or sometimes in a bid to protect children from inappropriate content. In the past WordPress.com, Wikipedia and the popular image hosting site Imgur have been blocked along with some arguably more contentious sites (see **goo.gl/8nv3Zb**).

Virtual private network (VPN) connections and apps provide a way around censorship by routing your internet data via a different country. However, VPN apps usually require a monthly fee and aren't likely to be installed on a PC you're repairing.

If you encounter a locked-down PC, a quick, dirty and above all free solution is to use the Off Road mode of the Opera browser (a browser you should be switching to anyway, because it's one of the speediest around). Formerly known as Opera Turbo, Off Road mode exists to speed up browsing by compressing the traffic using Opera's cloud servers. However, it also means sites are requested by Opera rather than you. And Opera's servers are located in Norway, where the government isn't quite as keen to restrict internet freedoms.

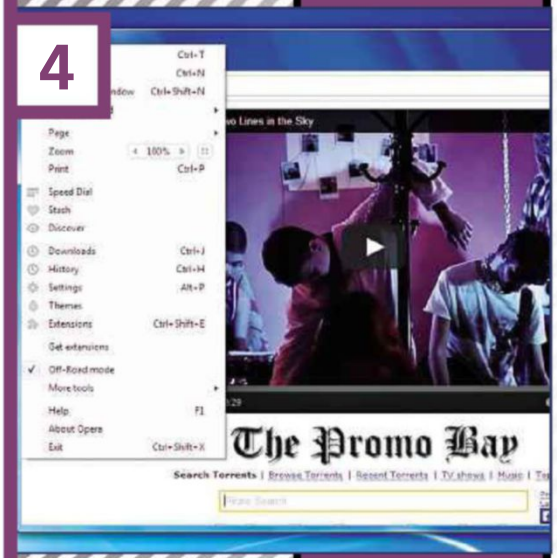
Just don't forget to deactivate Off Road mode when you've finished, because it can make website images look poor.

5 Get Serious About App Security

Nowadays, Microsoft takes security pretty seriously and has built into recent versions of Windows a variety of background tricks, such as Data Execution Prevention, which should make hack attacks difficult or even impossible. Often these work in concert with security features built into the CPU. The trouble is that Windows doesn't force apps to use the features, because they can cause problems for unwary users – and let's not forget that includes the majority of people sitting behind a PC.

What's needed is expert guidance, and Enhanced Mitigation Experience Toolkit (EMET; **goo.gl/TbamB7**) provides just that. It's a free tool from Microsoft that allows you to automatically activate the maximum number of security features for the most popular third-party apps, such as Acrobat Reader, iTunes and Java. You can also activate security features for built-in Windows apps, like Internet

“Nowadays Microsoft takes security pretty seriously and has built into recent versions of Windows a variety of background tricks”



Explorer, and Microsoft apps like Office. EMET is designed for use by IT professionals to administer many PCs across a network, but it works equally well on stand-alone PCs.

During app installation select the Use Recommended Settings option. Then quit all open apps, and start the EMET GUI app, which you'll find on the Start menu. Click the Import button at the top left, and you'll find three profiles listed. Select Popular Software. The changes take effect immediately and you can quit the EMET GUI app.

You can also attempt to add your own app to the list by clicking the Apps button on the toolbar, then Add Application, Then put a check alongside each of the boxes. Beware that some experimentation will probably be necessary!

6 Reinstall Everything At Once

Reinstalling Windows is a yearly occurrence for most of us, and one way to make the task infinitely easier is to use Ninite (**ninite.com**). Just visit the site, tick the boxes alongside the apps you'd like to install, and download one single installer. Ninite will download the apps, click the relevant installation buttons for you and leave you with a system fully populated with your favourite apps – all in the background, while you get on with something else! There's even a version for Ubuntu Linux (**ninite.com/linux**), although it's not quite so well stocked as the Windows version.

Ninite is free, but for $9.99 every year you can add in the Ninite Updater app (**ninite.com/updater**), which will ensure all your apps are kept up to date, and again will do so in the background. Meanwhile, Ninite Pro (**ninite.com/pro**) can be used to roll out software across a network, avoiding users ever seeing update balloons or prompts.

7 Create Uefi Bootable USB Sticks

It's common knowledge that turning installation CD/DVDs into bootable USB sticks makes a lot of sense, especially considering optical drives are increasingly an option with modern computers. However, the semi-official Windows 7 USB/DVD Download Tool (w**udt.codeplex.com**) is a little out of date, because it doesn't support UEFI booting or subsequent installation – which at the drop of a hat precludes 64-bit versions of Windows.

> **"Reinstalling Windows is a yearly occurrence for most of us"**

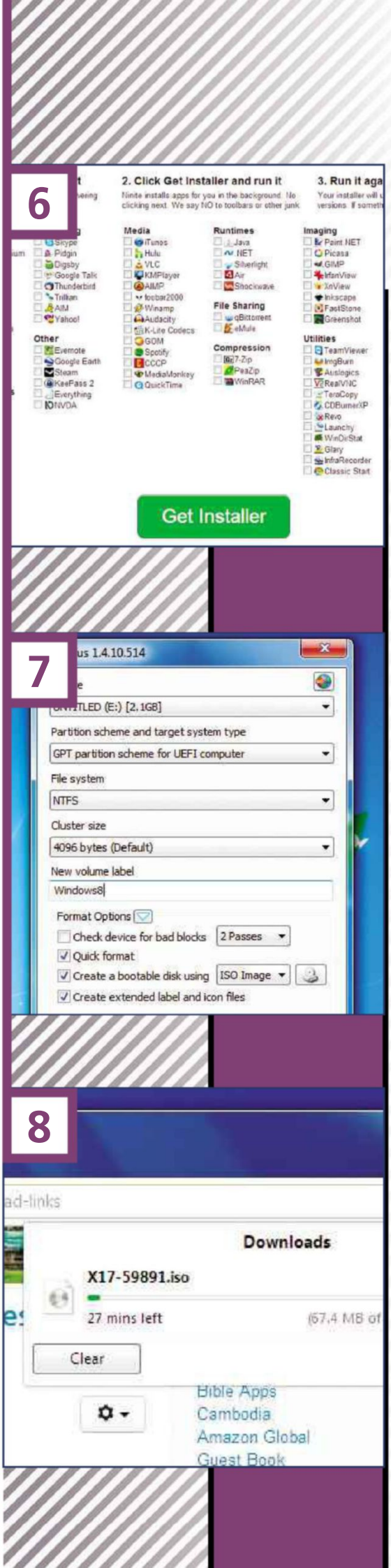
The solution is Rufus (**rufus.akeo.ie**), a simple third-party app designed to create bootable USB sticks from just about any .iso source – and if you only have a CD or DVD, you can use an app like CDBurnerXP (**cdburnerxp.se**) to convert it to an .iso. Rufus is much faster than compatible apps too, and can write a Windows .iso to memory stick in about the quarter of the time it takes other apps.

8 Get Official Microsoft ISOs For Free

One of the biggest groups downloading pirated software are IT administrators. However, in their case it's often legal. They own the correct software licences; it's just that installation CDs or DVDs have become lost or scratched beyond being usable. The quick and easy solution when you're sitting in front of a client's PC? Just grab the app from a torrent site.

This is fraught with danger, for obvious reasons. Amazingly, Microsoft itself provides a solution in the form of the Digital River content distribution network, which allows anybody to download .isos for all recent Windows or Office releases, and a handful of other products like Visual Studio too. These come direct from Microsoft so are guaranteed to be free of lurgy. Of course, they're all useless without the correct serial number or licensing documentation, but if you already own a product, it's an ideal way of getting a hassle-free backup – or getting hold of an .iso if you want to follow Tip 7 above and create a USB bootable disk.

Microsoft isn't so kind as to create publicly available indexes of the Digital River .isos, however, so you'll need to Google what you're after (e.g.



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> **A big problem for IT admins is that they're often expected to work miracles on a computer about which they know nothing**

'Windows 8 digital river'). You'll often find URLs catalogued in forums or sometimes on How To sites.

9 Access 'Locked' Windows Computers

Ever had somebody forget their password for a Windows computer? Sometimes users even manage to lock their accounts by attempting to guess the password. Although it might be possible to salvage personal data using a Linux boot disc (provided the data hasn't been encrypted), the solution usually is to wipe the disk and start afresh with a new installation.

Stop right there! Offline NT Password & Registry Editor (**pogostick.net/~pnh/ntpasswd**) lets you remove the password from an account and optionally unlock the account too, making Windows bootable again – and providing access to the user's data. It comes as an .iso image and you can follow Tip 7 earlier in order to create a bootable USB stick.

Once you've booted into the tool and identified your Windows installation, select to Edit User Data and Passwords. Then select to Clear (Blank) User Password, and reboot the computer. You should now be able to log in by leaving the password field blank.

Note that there are some caveats if the user has encrypted their files – see the FAQ at the app's website.

10 Find Info At The Command Line

A big problem for IT admins is that they're often expected to work miracles on a computer about which they know nothing and on which there aren't any diagnostic or repair apps installed.

Dropping down to the command line offers a handful of interesting tools. To access the command line, click the Start button, then type 'cmd' into the search field, and hit Enter. Some tools require administrator privileges, though, in which case you'll need to hold down Ctrl+Shift while hitting Enter after typing cmd.

whoami: Find out the hostname and the short form name of the logged-in user.

systeminfo|more: Get a summary of key system hardware. Use the cursor keys to move up and down in the list, and tap Q to quit.

openfiles /query: Show what files are open on the PC and what local files are being accessed by other users over the network (for the former to work the 'openfiles /local on' command needs to be run first and the system rebooted; once diagnostic work has finished, the 'openfiles /local off' command should be used to deactivate the feature).

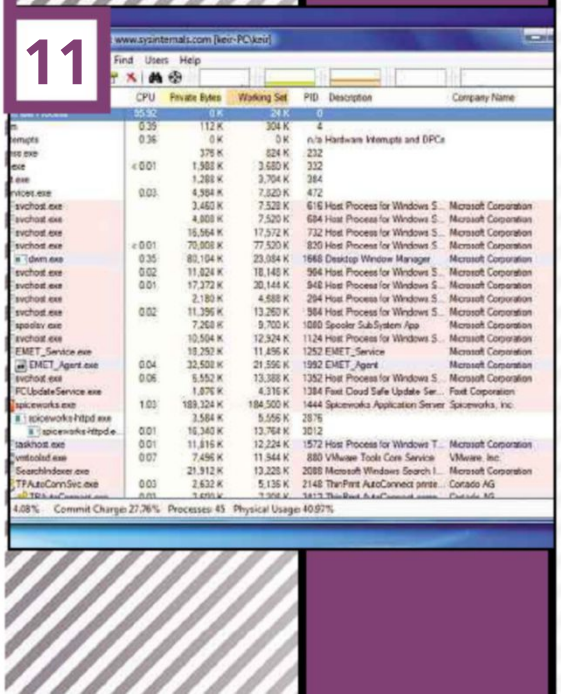
tasklist: The same information as found in Task Manager.

wmic: The granddaddy of information commands. Once typed, it opens its own prompt, at which commands can be typed to learn more about the system. Try typing any of these: cpu, baseboard, partition, diskdrive, memorychip, memphysical or os. Scroll to the right to see all the info. Type 'quit' to end, and 'wmic /?' to see a long list of possible commands. Be careful using the command, however, because it can also be used to change settings.

11 Use An Online Toolkit Without Installing

The semi-official Sysinternals website (**goo.gl/7qTi08**) contains a handful of extremely useful tools that allow IT pros to diagnose and repair problems on PCs. Of course, the chances of them being installed on a PC you need to fix are limited, but this is no hindrance if the computer has a net connection. Each of the apps is portable. In other words, it doesn't need to be installed and relies only on system files present on all installations of Windows.

In fact, each of the tools can be downloaded and run instantly



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from the Start menu. Just find the command you're interested in on the Sysinternals site and then look at the Installation heading. Look for the app's filename. Open the Start menu and in the Search field type \\live.sysinternals.com\tools\, followed by the filename. For example, to download and instantly run the popular Process Explorer tool (imagine Task Manager on steroids), you'd type \\live.sysinternals.com\tools\procexp.exe, and then hit Enter. You'll see a security warning but it's fine to OK this.

> **A basic trick is to create an invisible folder – one without a name or icon**

12 Clean Up An Untouchable PC

Every IT administrator has come across a PC so infected with viruses and malware that even the act of booting is virtually impossible. Indeed, booting up a severely infected PC might be dangerous for other computers on the network, and the PC might contain a rootkit that upon booting will continue sharing the user's data with hackers.

Microsoft's anti-virus app Windows Defender comes in a bootable, stand-alone version called Windows Defender Offline (**goo.gl/n5Bjk5**) that can be written to a CD, DVD or USB memory stick. Booting from this will then run clean-up software that should at least remove the most serious threats, potentially offering the ability to boot the computer and continue the clean-up.

Note that running the Windows Deference Offline installer after you've already created a USB stick will offer to update the anti-virus definitions, so it should be done routinely.

13 Block Ads And Malware Without Add-On Apps

The bane of many an IT administrator's life is old computers running modern software. The result? Computers that crawl when doing even basic tasks. For that reason, installing an anti-malware app can add intolerably to the burden.

Rather than install anti-malware software, you can add a list of 'bad' sites to a computer's hosts file, and let the operating system do the hard work of blocking them. 'Hosts' is a system file that Windows checks initially when you request anything at all from the internet. It's like a personal DNS. If the address isn't found in the hosts file, then the computer uses the DNS server provided by your ISP.

The MVPS HOSTS project (**winhelp2002.mvps.org**) is responsible for a regularly updated hosts files that blocks most if not all internet nasties, plus irritations like adware. To install it, download the most recent version (**winhelp2002.mvps.org/hosts.zip**), unpack the archive, and then right-click the mvps.bat file. Select Run as Administrator. You'll be told when the file is installed, and the changes should take effect immediately. If using Windows 8, you'll also need to add a rule to Windows Defender, which is detailed here: **goo.gl/zJX51h**.

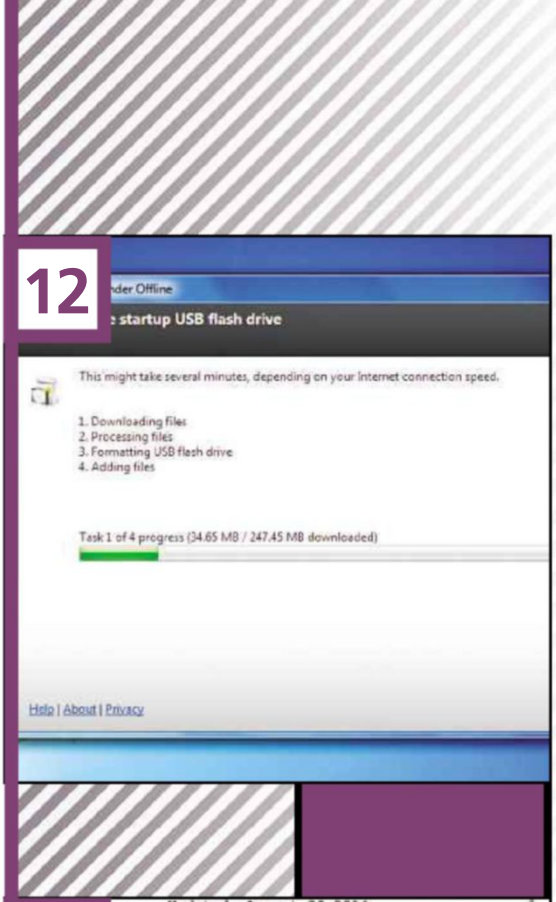
If you find the PC is slower when browsing, you might need to disable Windows' DNS client service. Instructions are available at **winhelp2002.mvps.org/hostswin7.htm**.

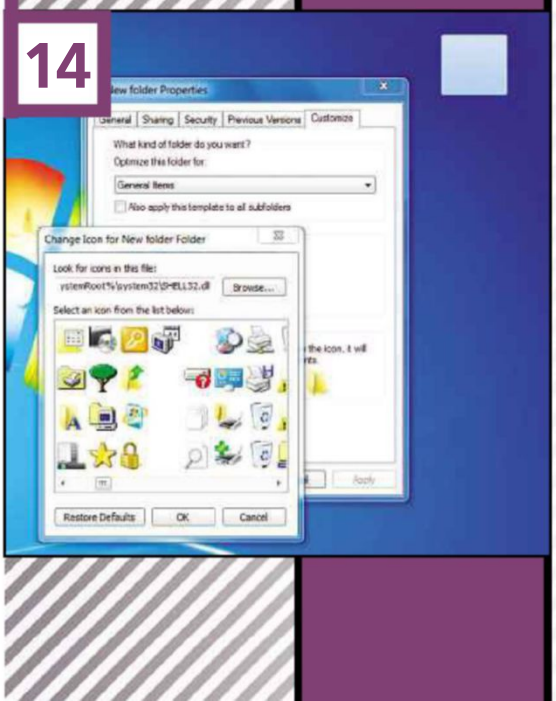
14 Hide Things In An Invisible Folder

Sometimes you might want to add emergency repair tools to a computer you administer but stop any user finding it in case they decide to explore and play with what are dangerous apps. The best solution is to hide the folder within a system directory, but Windows' permissions system can make this a hassle, and using System Restore or reinstalling Windows over the top of itself may well eradicate the folder.

A basic trick is to create an invisible folder – one without a name or an icon. Unless you know where this folder resides, it will be invisible. If you've trained users not to save files onto the desktop, then placing it in a corner of the desktop will work well.

This trick requires a full-sized keyboard to work. Start by ensuring the numeric keypad is activated





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(press NumLock at the top left of it), and then create a new folder in the usual way. Rename it, and then hold down Alt before typing 0160. Hit Enter. The name field will now be blank. Right-click the folder and click Properties, then the Customise tab. Opt to change the icon. In the list of icons that appears, scroll along a few columns and you'll find three gaps. These are blank icons. Select one.

Hey presto. Your folder will be invisible in Tile/Icon view (although still visible in List view).

Another way to hide folders is to disguise them as various types of system apps or folders that your users will likely ignore, and there's an app for that: Disguise Folders (**goo.gl/Z7d6Uj**)!

15 Instantly Reboot

Just about to reboot in order to completely reinstall Windows? Sometimes even shutting down a PC can be problematic or time consuming if there's a damaged operating system. To reboot instantly, tap Ctrl+Alt+Delete, and then hold down Ctrl while clicking the red power button in the bottom-right corner (just click the button; don't open its menu). You'll be warned you're about to perform an emergency restart. Click OK.

16 Control System Restore

System Restore is one of Microsoft's brightest ideas for Windows, but you aren't offered a great deal of control over how it works. Sometimes this is for the best, but more control can make the difference between rolling back to an hour ago or to the system state a month ago.

QRM Plus (**goo.gl/y7t8X6**) lets you choose from and even delete individual restore points. System Restore Manager (**goo.gl/V1A32f**) lets you choose which drive to use for restore points, what percentage of storage space is used and how frequently restore points are automatically created. Meanwhile, Quick Restore Point Maker (**goo.gl/sKBJPQ**) lets you create restore points instantly with one click – useful when installing new software. All these apps are free of charge and created by the same developer, so they work well with one another too.

17 Run Useful Apps Instantly

Most experienced Windows users know that apps can be run quickly by simply opening up the Start menu and typing the app's description or name into the Search field. To add a new user account, for example, you can simply tap the Windows key, then type 'user accounts', and hit Enter to run the app.

However, hard-core system administrators laugh at this. It's even quicker to type the filename of the app of applet in question, which for historical reasons is usually in the short 8.3 filename format (that is, eight characters followed by a three character extension). Alternatively, some apps/system components can be summoned by typing just a short word. Here are some examples – see how many you can memorise. The benefits in terms of saving time can be substantial!:

appwiz.cpl: Add/Remote Programs.
cleanmgr: Disk Cleanup wizard.
control: Control Panel.
desk.cpl: Display Properties.
devmgmt.msc: Device Manager.
displayswitch: Projector options.
explorer: New file explorer window.
firewall.cpl: Windows Firewall (for the Security Centre, use wscui.cpl).
fsmgmt.msc: Shared folder manager.
mrt: Malicious Software Removal Tool.
msinfo32: System Information.
mstsc: Remote desktop client.
ncpa.cpl: View network connections.
perfmon: Performance Monitor.
rstrui: System Restore.
services: Services Manager.
sysdm.cpl: System Properties.
taskmgr: Task Manager.
winver: Windows version dialogue box.
wu: Windows update.

18 Lock The Password File

If you have one computer on which you need to employ the maximum possible security, such as an IT administrator's terminal, password protecting the Windows accounts database will mean that nobody will be able to boot into Windows without a password. This password is independent of any user accounts on the system and is required before users are asked to log in.

Instructions for setting this up are listed below, but beware that there's risk here, because we're modifying

What's going on with **Doctor Who** & **Torchwood**?
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an essential system file. That said, many people have employed this trick successful for years.

To put the protection in place, open the Start menu and type 'syskey' into the Search field. Hit Enter to run the app.

In the dialogue box that appears, click the Update button, then click alongside Password Startup. Type a secure password into the fields, then click OK.

Reboot the computer to test the new setting. To remove the password protection, start the Syskey app again, click Update, and this time click Store Startup Key Locally. If you're feeling brave, it's also possible to store the start-up key on a USB stick, which means nobody will be able to boot Windows unless the USB stick is inserted. Just select the Store Startup Key Locally option after clicking Update in the syskey app. For this to work, you will first need to map the USB disk to the A: drive (and remap your floppy drive to B:, if you have one installed). Remapping drives can be done via the Disk Management app: click Start, and type that into the Search field. Then right-click the drives and select Change Drive Letter and Paths.

19 Lock A PC Via USB

Computers containing sensitive information, such as those in hospitals, often use an identity card system. The computer is locked unless a card is inserted into a reader built into the keyboard.

A similar albeit more basic setup can be created using a USB stick and the Predator app (**goo.gl/pAipEv**). Once set up, the computer will lock if the USB stick is removed and will unlock when it's inserted again. You might even choose to attach the USB stick to your belt or keyring via a lanyard, making it impossible to forget to lock the computer once you're away from it.

Download the free edition of Predator, and once it's installed, insert the USB stick you want to use as the key. Run Predator by double-clicking its icon on the desktop. You'll need to type a password in the highlighted field and then click the Register Key button to write the necessary key file to the USB stick (you can use any stick you want, including one you already use for transporting files).

Click the Advanced Options tab and click the AutoStart with Windows box, then close the configuration program.

You can test the system immediately by removing the USB stick.

More than one USB stick can be registered for use with Predator, and this is a wise idea, because just like any key, losing the USB stick could make it difficult if not impossible to regain control of your computer.

20 Speed Up Windows Installations

Like the rest of us, IT administrators have spent more than a little time staring at the Windows setup screen, installing or reinstalling the operating system. And we admit we're a little sceptical about this trick from one of our sources, but it might be worth a try.

The trick supposedly works by altering the priority of the core setup.exe process that's responsible for installing Windows. By giving it a bigger share of CPU time, installation happens more quickly… maybe.

Here's what to do. Once you've formatted the disk using the Windows installer, so that installation begins, tap Shift+F10. This will open a command-line interface, where you can type taskmgr to open the Task Manager. Click the Processes tab, and in the list look for setup.exe. Right-click it and select Set Priority. Select High.

That's it. Apparently, installation will apparently now be much speedier. Let us know how you get on! **mm**

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Your Letters

'Horses For Courses!'

Harry Deakin (Telly Troubles Issue 1329) reminded me of a mistake in my 'Dongle Disaster' letter. Correction: The Humax HDR-2000T Freeview model gives access to the BBC iPlayer through the Humax portal, but NOT Youview. The latter has more 'catch-up' services including ITV and Channel 4.

I eventually got the Humax portal working via a pair of TP-Link 200Mbps Powerline/ethernet adapters, £20/pair, including cables. They 'paired' up and worked perfectly. The HDR-2000T is very easy to use but has two niggles, which previewers have stated. The HDD is noisy when recording. I isolated most of it with four felt pads under the feet. I will try to replace under the two-year warranty if it gets worse. The unit has no TV signal 'pass-through' when recording two programmes. We rarely need to watch via the TV tuner while recording two channels, but the facility should be available. A solution? A balanced aerial splitter if you have a very good signal, hence one coaxial cable to TV and one to the Humax.

Change of subject: Harry's TalkTalk deal! TalkTalk's current website states, "TalkTalk Plus TV, broadband and anytime calls £18.50/month TV, totally unlimited broadband, and anytime calls plus £15.95/month line rental. You must take TalkTalk line rental.18 month minimum term (24 months for existing Plus customers)." That's £34.45 per month after any free six month offer, although the line rental can be reduced by a one-off yearly payment by credit card. I still suspect that Harry is paying extra for TV.

By contrast, our TalkTalk evening and weekend deal, including Australia anytime calls, averages £8.65/month plus line rental of £14.35/month (paid yearly by credit card) equals £23/month. Add the cost of our Humax, £169 plus TP-Link £20, £189 total, amortised over the two-year warranty, equals £7.88/month. Grand total £30.8/month.

Looks like Harry might pip us at the post with his 'anytime calls' and more 'catch-up' services.

Postscript: Somebody with deep pockets, please donate a HDR-2000T to Mark Pickavance so he can tell all us readers how it really works.

Tronby Fisher

Touch Me

Does anyone use touch screen laptops? Did anyone ask for this technology? Who wants a screen covered in fingerprints? We want touch screens like you see in the movies, where you hover your fingers an inch from the screen, not what the industry thinks we want now!

Andrew S Redding

> **"Does that not mean a 40W RMS amplifier is a bit of an overkill for the purpose?"**

'Rockin' Your Shed' What Watts?

Is my A-level physics so out of date now that I have misunderstood? In Phil Thane's article, 'migraine level' sound was drawing 0.5A through the 12V rail. I make that 6W. Does that not mean a 40W RMS amplifier is a bit of an overkill for the purpose? I know peak power needs a bit of headroom – or do I need to go back to class on this one?

Kevin Smith

Router USB Port

I recently got an upgraded router from my ISP, Talk Talk. It was a (Super Router HG 635) and it has a USB port.

My simple logic was that if I plugged in a USB stick, I would be able to see this on the network and if that worked I could use my Samsung M3 USB as a backup location for the PCs and laptops the family uses.

Unfortunately, I could not see the USB storage device and decided that as I am not that savvy with routers I would write to you to see if you can help me.

Alan Pedder

Thanks for writing in, Alan. We'll looking into addressing this problem in a future article.

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Component Watch

Looking for an iPod replacement? James Hunt has a few options for you

Apple's discontinuation of the iPod Classic means that there are no longer any mainstream hard drive-based MP3 players left on the market. But does that mean you're corralled into buying a tiny-capacity iPod Shuffle or an expensive iPod Touch? Not necessarily. This week, we've looked at some MP3 players from companies other than Apple…

Deal 1: F&H MP3 Player 4GB
RRP: £14.99 / Deal Price: £9.99

Cheap and cheerful just about covers the F&H portable MP3 player, but with 4GB of storage and a 2.5W speaker for when headphones just aren't what you want, you don't lose out on features. In fact, if you want high-capacity storage, this might even be a good bet: there's a micro-SD slot, which allows you to expand the capacity up to 36GB. 11 hours of playback time and a built-in rechargeable battery finish off the package.
Where to get it: Ebuyer – bit.ly/1t4Mt5G

Deal 2: SanDisk Sansa Clip+ 8GB
RRP: £53.99 / Deal Price: £31.99

The Sansa Clip+ is an 8GB MP3 player which, as you'd expect from SanDisk, supports memory cards for expansible storage up to 40GB. The unit itself is miniscule and yet still contains a digital FM tuner. The rechargeable battery lasts for 15 hours, and it doesn't just play MP3s; it can also play WMA (including secure WMA), Audible format and FLAC files. It's a lot pricier than the most basic players, despite being about the same size, but the extra features make it worth it.
Where to get it: Amazon – amzn.to/1rlbL40

Deal 3: Speedo Aquabeat 2
RRP: £99.99 / Deal Price: £69.99

Whether you're a dedicated swimmer who looks jealously at runners working out to their favourite tunes or just someone who thinks they've seen every MP3 player variation out there, this one's for you: a 4GB MP3 player that you can use underwater. With 25 hours of playtime and special ear-sealing headphones, this is one MP3 player that'll make swimming even more fun. Waterproof at up to three metres and available at a great price.
Where to get it: Millet Sport – bit.ly/1qGvyVb

Deal 4: Sony Walkman NWZ-F886
RRP: £299.99 / Deal Price: £229.99

Recently discontinued, this Android-powered 32GB MP3 player from Sony has an 11cm full-colour touch-screen, advanced S-Master HX Digital Amplifer, Digital Noise Cancelling and support for NFC communication. It's an MP3 player that's completely up to the usual Sony standards, but its niche appeal led Sony to put the brakes on the idea. It's only just a year old, though, so if you can pick one up, it'll be good for some time yet, and prices are low thanks to stock sell-through.
Where to get it: Amazon – amzn.to/1njlmpU

Deal 5: Cowon MP4 Z2 plenue
RRP: £286 / Deal Price: £229.0

Running on Android 2.3.5, this MP3 player is cast in a similar mold to the iPod Touch, with various smart capabilities and a full-colour 3.7" AMOLED touch-screen. The Z2 Plenue also contains 32GB of internal storage, which can be used to store music, video, images and text. It also has a built-in FM tuner and audio recording function, wi-fi and Bluetooth support, and a battery that can offer 22 hours of audio playback and over eight hours of video playback. It's available in white too, but at a higher price!
Where to get it: Amazon – amzn.to/1vnSJrN

NEWS AND VIEWS

Free Business Messaging Service

Yahoo! Retires Yahoo! Directory

Say goodbye to the original Yahoo

Marissa Mayer has come under fire from some quarters for Yahoo's apparent lack of chutzpah of late but work is afoot to streamline the company and as part of that activity comes the end to Yahoo Directory.

The directory of websites was created back in the January of 1994, called Jerry and David's Guide to the World Wide Web. Later changed to Yahoo!, the directory was rather useful back then as a better alternative to the search engines of the time, using curated links to guide people where the need to go and help answer their many questions. However with the web growing to its vast size today, Yahoo's Directory was rather redundant so now we have a situation where it will be switched off at the end of the year. It will join the ranks of the 60 or so of Yahoo's products and services to fall in the last couple of years. Sniff.

YAHOO!® DIRECTORY

iOS Users In Quandry

Stick or twist?

You will have heard many a story about the release of iOS 8 and how patch attempts have been somewhat amateurish in the amount of fresh problems they've been causing Apple owners. However, for those users wanting to stick with iOS7, there's another problem: security. In fact, the security issues blighting the old iOS might well prove to be a bigger, more pressing problem.

One such issue is a vulnerability that is present in the process iOS uses to handle PDF files as images that potentially allows an attacker to run code on a victim's device. Eek! This vulnerability has been fixed in iOS8, so it might be worth trading up to iOS 8.0.2 or whatever else is out there by the time you read this. Of course, iOS 8.0.2 has caused its share of wi-fi and connectivity problems for users too. Take your pick

Technology, eh? Nobody said it was easy. Oh, wait... Apple did, didn't it? Meanwhile...

QUICK BITS... A study by chaps at the University of Central Florida has suggested that Google Glass is no safer than using

Will people Flock to this one?

According to a poll, we spend 13 hours a week managing our business email. That's a fairly alarming statistic, although not entirely surprising... so how would you fancy an instant messaging tool to help boost productivity? Flock is a completely free app promising to do just that while also keeping your business life separate from your personal one, by helping to avoid slow exchanges or spend too much time managing overflowing inboxes.

The free group and 1-on-1 chat app's features include file and image-sharing capabilities. Also there's mobile and desktop availability, secure encrypted messaging, custom company directories and, crucially, that 'free' bit. In fact, the bods in charge of Flock promise that it will always be free – no matter how you use the system, or how many users your organisaton has. If this sounds like something you could take advantage of, head for **www.flock.co** for more information.

Bendy iPhones "Rare"

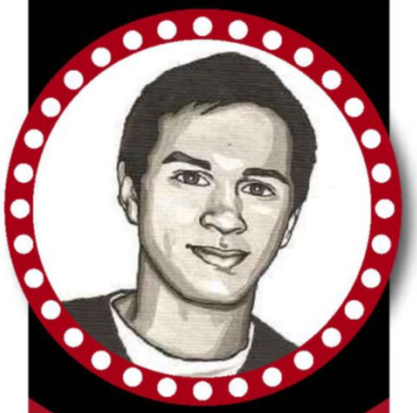
Apple responds

Although it took it a while to respond, Apple has finally answered claims – and the accompanying photographic evidence – of weakness in its iPhone 6 devices. Media outlets around the globe picked up on consumer stories of handsets being bent after having been carried around in pockets – like any mobile device would typically be. However, depite all the stories and photos of these bendy phones, Apple claims that this kind of damage would actually be rare during normal use.

It went on to note that its devices have shells constructed from anodised aluminium, tempered for extra strength and that stainless steel and titanium was also used to reinforce areas likely to suffer additional stress. This hasn't stopped rivals such as Samsung and LG taking pot shots at Apple, with Samsung in particular hitting the spot with its tweet promoting the Galaxy Note Edge "Curved. Not bent".

Catty.

mobile phones for texting while driving



The day Windows 10 was announced, I Googled it, and the first hit was an April Fools' joke from last year, saying how Microsoft was skipping to 10, because 9 was just too good.

Maybe Microsoft has a sense of humour, then, and was copying this tongue-in-cheek piece of fiction. Or perhaps someone there is a fan of the *Leisure Suit Larry* series (which famously went from part three straight on to five).

I've heard some people suggest it's a way for the company to distance itself from Windows 8, as if consumers are suddenly going to forget that OS because Microsoft put an imaginary one in between it and its successor.

Maybe, though, it's just a way to get people talking about the new product, and if that's the case, it looks like it might have worked.

Until next time...

Anthony

Editor

Meanwhile... On The Internet...

The fallout from the CelebGate hacks is really starting to, er... fall, with word that a group of individuals affected by the release of hundreds of illegally obtained pictures have banded together behind Hollywood lawyer Marty Singer to threaten Google with expensive legal action if the search engine is not quicker and more effective in its efforts to take down links to the compromising pics (**tinyurl.com/MotI1332a**).

In a letter addressed to Messrs. Bryn, Page and Schmidt, the superstar lawyer alleges that the "vast majority" of sites "all of which are much smaller than Google, with far fewer staff and resources" acted much more quickly than the tech giant to respond to takedown requests, while it has "recklessly allowed these blatant violations to continue in conscious disregard of our clients' rights."

For its part, Google told ZDNet that it had "removed tens of thousands of pictures – within hours of the requests being made – and we have closed hundreds of accounts." This is not enough, it would seem; though it's almost enough to make you feel a bit sorry for Google... Has nobody seen what's going on over at Reddit, which is still hosting subreddits dedicated to discussing the whole affair and linking to new releases of pics that have come in the wake of the big release? Apparently not.

If, like us, you've been reading a lot about Ello (**ello.co**) in the last week or two, it's probably because you're in the tech media or the kind of person who likes to introduce the next big thing to all your friends. There's certainly been a lot of hype around the 'anti-Facebook' (**tinyurl.com/MotI1332b**) around at the moment (it even has its own manifesto: **tinyurl.com/MotI1332c**), but is the move away from Facebook real or just a storm in an espresso cup whipped up by a load of fixed-gear riding hipsters in New York, Seattle, LA and London?

It's too soon to tell, to be honest, but *The Daily Dot* (a great site for tracking the foibles of social media companies and their users) has bought to light a blog by RJ Metrics (**tinyurl.com/MotI1332d**) that seeks to put some numbers on the rise of the new network. Its data is interesting and charts the explosive rise of the site and its potential to become a force to be reckoned with. It's well worth a moment of your time for a read.

It's time we put this little corner of our little column back to its true purpose in life: presenting you with our favourite infographics. This week's offering is a stark reminder of globalisation and corporate culture disguised as a pretty graphic highlighting how many (about 50%, by volume) of the tasty beer-related beverages we enjoy are actually produced by just six massive companies (**tinyurl.com/MotI1332i**): Kirin, Carlsberg, Heineken, Molson Coors, SABMiller and AB InBev. It also highlights the possibility that these six could soon become five, as the last in that list is interested in acquiring the second to last.

If this kind of thing is your kind of thing, and that whole business is a little bit too depressing, why not console yourself with a pretty little guide to the wide and varied list of beer types you could be enjoying (**tinyurl.com/MotI1332h**); sourced from a CAMRA (**www.camra.org.uk**) approved source, of course.

Talking of Facebook, which I believe we were, it's good to see that someone in its organisation has seen a little bit of sense and loosened its suddenly inexplicably strong stance on people using their real names. It's a move that has upset a lot of people, most headline-grabbingly the drag community of America's west coast. More to the point, it was generating negative publicity that seemed to far outweigh its importance as a policy (**tinyurl.com/MotI1332e**).

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

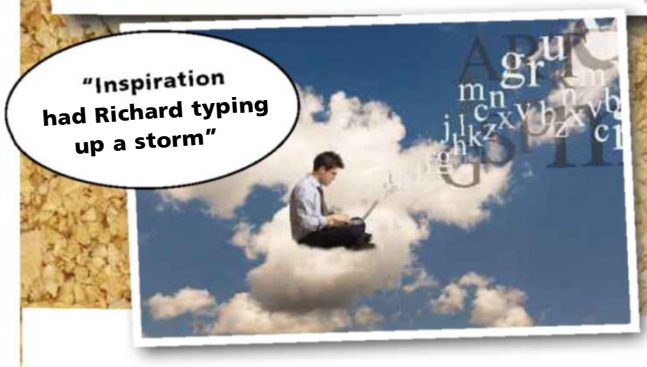
We've featured the YouTube channel *Every Frame A Painting* in AVWhy? before, specifically its creator Tony Zhou's excellent analysis of the brilliance of Edgar Wright (warning NSFW: **tinyurl.com/MotI1332j**). Regardless, we feel it's time to bring this to your attention again in the light of Zhou's excellent new episode that deals with the techniques of David Fincher (**tinyurl.com/MotI1332m**), whose new film, *Gone Girl*, you're going to be hearing a lot about soon, not least due to Ben Affleck's costume choices (or lack of them, should we say?) in certain scenes (**tinyurl.com/MotI1332k**). Anyway, Zhou highlights some of the elements that makes Fincher's directorial choices so satisfying and how he uses cinematic techniques to infuse subtle extra meaning to dialogue scenes. If you're wondering how important such things are outside of the world of film studies, contrast this to RedLetterMedia's hilarious destruction of George Lucas' work on *Star Wars' Episode III* (you knew we had to get *Star Wars* in somewhere, right?), provided by the 'unique' stylings of Mr Plinkett (**tinyurl.com/MotI1332l**), a character famed for his rambling, incredulous analysis of the prequel trilogy.

Aaaaaaaaand Finally...

You may have come across Jon Negroni's Pixar Theory (**tinyurl.com/MotI1332f**) last year. If you didn't, he's a guy that asserts all of Pixar's movie take place in the same universe, and that the stories tack together – starting with *Brave*, through *Up*, on to *Toy Story*, *Wall-E* and the *Cars*/*Planes* movies to tell the story of a battle between animals, people and machines that sees earth descend into dystopia and then through restoration and into the *Monster's Inc.* world, which he believes is the same universe in the far future. We don't know if it's right, but if this video created by Bloop Animation to illustrate Negroni's assertions is wrong, we don't want anyone else to get it right (**tinyurl.com/MotI1332g**).

QUICK BITS... Microsoft's Bing Predicts Engine correctly forecast the result of the Scottish Referendum

Caption Competition



This fellow and his fluffy friends was the subject of caption fun in issue 1330. Here's the best of the submissions...

- **wyliecoyoteuk:** "Sooner or later I'll get the Captcha right."
- **doctoryorkie:** "Visit the cloud – no magic carpet required."
- **wyliecoyoteuk:** "Paul didn't realise the Pearly gates would have a Captcha box to complete."
- **Dwynnehugh:** "17th September, 2014 – the day before THE VOTE – Alec Salmond on Cloud 9."
- **wyliecoyoteuk:** "Inspiration had Richard typing up a storm."
- **JayCeeDee:** "This wi-fi is just heavenly."
- **doctoryorkie:** "So this new cloud thing holds all my documents?"
- **doctoryorkie:** "Cloud security – the product of blue sky thinking."
- **Frank Everett:** "This can't be heaven: they're still using Windows 8."
- **Thomas Turnbull:** "I clicked on the Sky go app and I ended up here – go figure."
- **David Mullen:** "Monkey, in his later years was cursed by Buddha to clean up the internet."
- **dudeofblokes:** "The IT technician had more than his head in the cloud today."

Despite all these little gems of mirth, the winner was wyliecoyoteuk with "Inspiration had Richard typing up a storms, o thanks to him, and indeed all of you, for taking the time to make us chuckle.

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

Samsung Ends Laptops In Europe

Moving on to pastures new

Samsung's Chromebooks have proven rather popular over here, so it's with a degree of surprise that we greet the company's news that it's ending sales of all of its laptops, including those Chromebooks, in Europe.

In a statement, Samsung said: "We quickly adapt to market needs and demands. In Europe, we will be discontinuing sales of laptops including Chromebooks for now. This is specific to the region – and is not necessarily reflective of conditions in other markets."

Samsung's decision to pull out of the market is perhaps down to the relative success of the likes of Lenovo, which has growth its own laptop sales over the past quarter. It's also fair to say that despite Chromebooks performing okay in Europe, Samsung is, in general, behind the likes of Dell and Acer.

Is this another nail in the laptops' coffin, though?

Minecraft Updates UK Map

Now: with roads!

The *Minecraft* UK map has been created by Ordnance Survey and the original version recreated around 86,000 square miles of Britain using over 22 billion blocks. It's now also had a serious upgrade with 83 billion blocks and roads, soil and grass have all been recreated to such an extent that you should even be able to find your own house on it.

Available to download from **www.ordnancesurvey.co.uk**, and presuming you have a version of *Minecraft* installed at home, you can get to work on this one straight away. Ordnance Survey has also said that it will place an interactive map on its main web page so that users can generate co-ordinates to lead them home.

We have graduate recruit Joseph Braybrook to thank for all of his hard work on putting this together on behalf of the mapping service. Well done, Sir. Well done indeed.

Snippets!

Shellshock Exploited

The much-publicised and pretty serious Shellshock bug has quickly been exploited by a bunch of attacks on websites and servers. According to reports, thousands of servers have been compromised by the Shellshock bug and web firms have been flooded with data by those exploiting the bug, according to experts. Shellshock wouldn't have had any impact on most Apple users as it's primarily a server-level issue. Still, not a great time for Apple of late.

US Data Request Hike

Yahoo! has released details of its Government Data Requests report, which tells us that the US government submitted 6,791 data requests to the company between January and June this year – nearly 4,000 more than the next nearest country, Germany, which made 2,876 requests. The UK authorities submitted 1,408 information requests and it's not at all surprising to note that data requests from countries with less web access and networks were at a far less level.

Streaming TV Popular

It may, or may not, surprise you to learn that one in eight homes in the UK use streaming services to watch television. This particular statistic comes courtesy of Post Office HomePhone and Broadband and its study has also revealed that smartphones and tablets are leading more and more of us away from the PC or laptop. One in ten 18-24 years olds don't own one of those two and yet tablets and smartphones are the go-to browsing devices in a third of homes in the UK.

With streaming and downloading content proving wildly popular, the likes of Netflix and Google Play are benefitting greatly, according to these stats.

Samsung Provides University With Tablets

Galaxy Note 8.0 handed out to students

What better way to market your tablet devices to consumers than with a mass giveaway? Samsung is going to provide 4,000 tablets for first-year students at the University of East London as part of the university's Progress Bursary programme.

Pre-loaded with digital textbooks and with links to the university's online library, virtual learning environment and student resources, the customised tablets will obviously make travelling between lectures a less arduous task for our next-generation of bright young things.

The university's vice-chancellor has said that the tablets offer a "level playing field" for all students and will help to save money on buying academic books. Will this be the first of many universities to take this approach? Will the tablets be used for less academic reasons? Will this raise a generation of *Angry Birds* addicts? Will any student dare to moan that they wish they had an iPad instead?

All these questions and more will be answered at UEL in the very near future.

Twitter Threatener Sent To Jail

Prison term for Nunn

Remember the story a while back of a Mr Peter Nunn, who sent some particularly nasty tweets to Labour MP Stella Creasy and campaigner Caroline Criado-Perez? Well, Mr Nunn is now spending time behind bars for his actions.

The tweets he sent out, which were pretty vile, were in response to a campaign by the pair to get Jane Austen's image on the new ten-pound note. His defence was that this was all just a joke and that he didn't regard the messages as offensive or threatening. He also claimed in court that he was satirising online abuse and had a right to tweet what he liked.

The judge thought differently, sentencing him to 18 weeks in prison – which will hopefully encourage others to reconsider just what they consider 'funny' in the future.

QUICK BITS... .wales domain web addresses have gone online

Always Read The Fine Print!

F-Secure catches people out in experiment

Security firm F-Secure wants you to start paying attention to the fine print so it's carried out a study in Canary Wharf to do just that. The company offered customers at a cafe access to a free wi-fi connection, named Free Wi-Fi, which was very nice of them. Except, of course, it was all a ruse. The condition for users to access this wireless network over the half an hour it was set up was that they "agreed to assign their first born child to the company "for the duration of eternity".

By all accounts, six people agreed to this so they'll probably be a bit upset at having to give up their child to the company. From here, the portable access point was then hotfooted over to Westminster and over that separate 30-minute period, 250 devices made contact and 33 made active use of the hotspot. F-Secure researchers were able to identify 21 device types from this data and while it has of course since been destroyed, this was an eye-opening experiment from the company.

Always read the small print, dear reader.

Netflix To Release First Film

Successful TV programme production leads to movie deal

It's already had hits on its hands in the TV arena, with the likes of *House Of Cards* proving popular. Now, Netflix has announced a movie deal with the Weinstein Company to release a sequel to the martial arts flick *Crouching Tiger, Hidden Dragon*.

Due to be shown on Netflix and in Imax cinemas in August next year, this represents something of a coup for the streaming service and could, who knows, present an interesting new way of gorging on film content in years to come.

Much will depend on whether or not the film itself is much cop, of course, but Netflix is not to be sniffed at – given its past successes in the television world – and this could just work.

BlackBerry Launches New Keyboard Design

Physical, meet gestures

This is the BlackBerry Passport, the company's latest attempt to claw back some custom from a recent past that has seen people lose interest left, right and centre. The Passport is most notable for its distinctive looks with a square screen and physical keyboard which also allows for gesture touch controls. It's also aiming this phone at business users in the main, perhaps accepting that there's a market to be captured there.

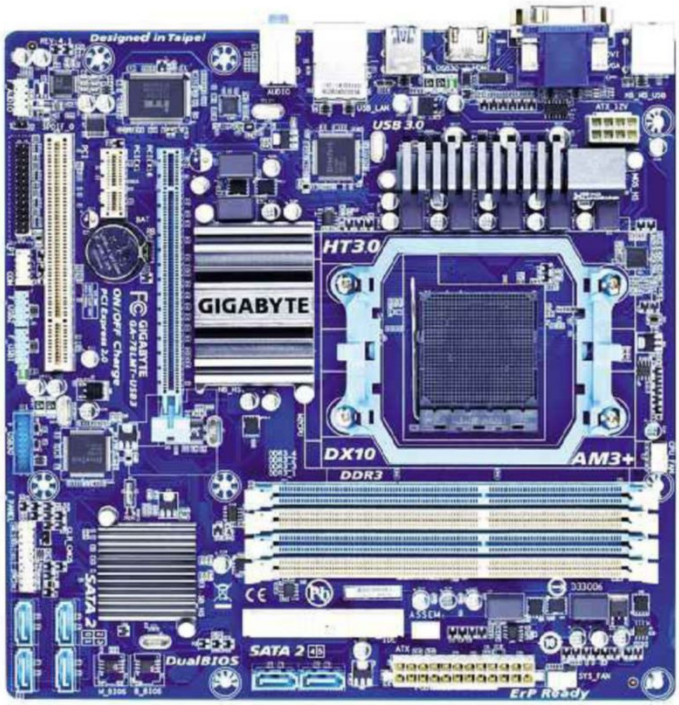
The 4.5" wide screen – protected by Gorilla Glass and housed in stainless steel – means that users can read a full document in larger type, and provides a better resolution than the iPhone 6 Plus, at 453 pixels per inch.

Under the hood lies a quad-core 2.2GHz processor, 3GB RAM, 13MP OIS rear camera and 32GB memory and the latest OS 10.3 from the company. With its touch-sensitive, gesture shortcuts BlackBerry has decided to move a little away from the comfort of its traditional physical keyboard of the past. Will this Passport prove to be BlackBerry's, erm, passport to success? Oh dear.

Gigabyte 78LMT-USB3 Motherboard

A budget board with some tempting technology from Gigabyte

DETAILS
- **Price: ~£40**
- **Manufacturer: Gigabyte**
- **Website: goo.gl/habxKt**
- **Required spec: AMD AM3+ FX/AM3 Phenom II, Athlon II series CPUs, DDR3 RAM**



Gigabyte produces some of the best budget socket AM3+ boards around, so it was pleasing to see that it's continue this trend with the 78LMT-USB. This is a micro ATX, 244 x 244mm board that utilises the AMD AM3+ FX/AM3 Phenom II range of processors on the Ultra Durable 4 Classic setup that protects the valued components against such things as humidity, electrostatic interference, power failure and high temperatures. The board consists of four DDR3 slots, up to a maximum memory setup of 32GB dual channel memory, a single PCIe x16 slot and PCIe x1 slot. There are also six SATA2 ports, an IDE connector (incredibly) as well as provision for eight USB 2.0 and four USB 3.0 ports.

The IDE connector is a blast from the past, and it's this level of legacy support that makes this board quite appealing as opposed to more modernised examples. There's no UEFI here, just a plain old Award BIOS – and there's a VGA port as well, which is something else we're not used to seeing these days.

The fact that this board can support a mix of both old and relatively new hardware sets it apart. Linux users who are sick to the back teeth of having to do the UEFI dance every time they fancy trying a new distro will certainly appreciate its absence. Likewise those with IDE drives will also praise this board's ability to bring back their data from a dusty grave at the bottom of the drawer. There are modern connections as well, such as HDMI and the aforementioned USB 3.0, and there's thouroughly up-to-date on-board graphics in the form of a Radeon HD 3000. That will do a decent enough job of providing desktop visuals and displaying HD content, although serious gaming will require more power.

You could pack this board with an FX 8320 Black Edition eight-core, 3.5GHz CPU, 8GB of 1600MHz RAM, an SSD and an R9 280 3GB graphics card and it will certainly fly, allowing you to play the latest crop of triple-A rated games. Not bad from a board that's just a tad under £40.

So, although the legacy user can enjoy the benefits the 78LMT-USB3 has to offer, so to can the budget gamer or system builder. The lack of an advanced UEFI also makes overclocking more accessible, at least in the way we used to do things before everything went the way of the Extensible Firmware. What's more, the Ultra Durable 4 setup makes for a good platform to experiment on with one of the more robust AMD processors.

The Gigabyte 78LMT-USB3 certainly won't set the world alight with technological advances, but for the purposes of building a stable system that can support the best that old tech and new tech has to offer it has a lot going for it. It won't break the bank either, but the lack of support for SATA3 and faster SSDs may force many other system builders to look elsewhere for an option.

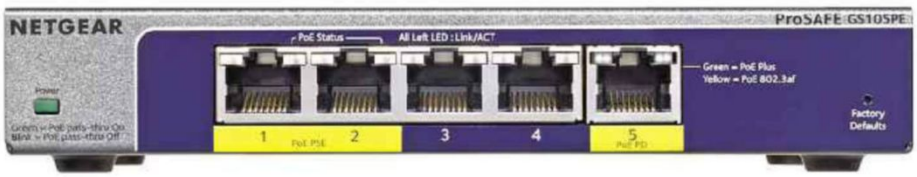
mm David Hayward

A great value board with stability and legacy support

Netgear ProSAFE GS105PE PoE Plus Switch

Netgear launches a switch that can't even power itself

DETAILS
- **Price: £43.80 (Broadbandbuyer)**
- **Manufacturer: Netgear**
- **Website: www.netgear.co.uk**
- **Required spec: Another PoE capable switch**



Over the past year I've seen a few pieces of equipment that support the often misunderstood PoE or Power Over Ethernet standard. The concept behind this technology is that the eight wires that make up Ethernet are enough to carry both data and power if used intelligently. It works well with devices like security cameras, as it's much easier to run a network cable than deliver mains power to many install locations.

The GS105PE is a switch that was made by Netgear specifically for supporting PoE situations and has five ports that between them support gigabit Ethernet and a couple of PoE standards. Those being; 802.3at Type 1 (802.3af) and 802.3at Type 2. What really confused about this device initally, though, is that it has no normal means of powering itself; instead, it uses PoE. That reduces the useable ports to four, though one port would always be used as a link back to a router or another switch anyway.

This decison does, however, pose a couple of critical questions about how this device might be used and the practicalities of some features it has. For starters, 802.3af has a cap of 25 watts input, and it translates that into a 20 watt budget for redistribution. It's only half that if you use 802.3at. That means the most it can deliver is 10 watts downstream to the two PoE PSA ports it has. That's a bit on the light side and, by definition, you couldn't chain these or support more than two devices. The GS105PE is also designed to give power priority to one of the PSA ports and will chop power to the other if the first one demands more than 50% of what is available.

The other curiosity is that they made it gigabit and gave it a 2GBit backbone, yet I'd always assumed that using some of the lines in Ethernet negated the use of anything other than 100Mbit links. This proved to be an education, as I discovered that PoE can be used on gigabit Ethernet links on an 802.3af link using 'phantom power' mode. Using this method, data and power can travel on exactly the same pieces of wire at the same time, amazingly.

Some of my technical explanation hints at how specialist a device this is, and as such it is probably only of interest to IT people who manage large locations and want to deploy wi-fi or security devices to remote parts of it as easily as possible.

The price seems very reasonable, but when you factor in that you need another PoE switch to power this one, costs could spiral rapidly.

What would put me off buying one is that it only delivers a maximum of two powered ports and the wattage available is limited. If you've got a very specific job and use PoE already then it might be the right choice, but it's a very niche solution.

mm Mark Pickavance

A PoE switch that uses PoE power itself. A specialist device for niche applications

Key Features
- 5x 10/100/1000 gigabit ports deliver dedicated, non-blocking bandwidth per port.
- 2x 802.11af Power over Ethernet pass-through ports, maximum budget 20W.
- Single PD port, this switch is powered by another PoE enabled device (No PSU supplied).
- QoS and VLAN support for traffic segmentation.
- Auto denial-of-service (DoS) prevention.
- IGMP snooping v1, v2 and v3 support for multicast optimisation.
- Jumbo frame support.

iPhone 6

Is it possible to to separate the hype from the reality? Ian McGurren gives it a go...

DETAILS
- **Price: From £539 (Sim Free)**
- **Manufacturer: Apple**
- **Website: www.apple.co.uk**

There has always been rivalries in technology. For me, the first was Sinclair Spectrum versus Commodore 64 (the 64's SID beat the Speccy's oddball Britishness, sorry), then came Sega versus Nintendo, ST versus Amiga, Sony versus Everyone Else, Mac versus PC. Heck, brick versus wattle and daub probably rattled on for centuries. Each argument is the same, often full of intelligent, lively conversation and pond-life idiocy in equal measure. What is more, none of these rivalries ever have a clear winner, the arguments usually end up with both sides having equal pros and cons.

The biggest and most vitriolic rivalry of recent years has been that of Android versus iOS - Galaxy S5 versus the iPhone, Nexus 7 versus iPad and so on. Every year there is a new iPhone, and every year the argument rises up once again, while remaining laregely pointless. So in this review you'll find comparisons to other market devices – that's only standard practice – but let's leave any fanboyism at the door, it's getting a little old.

You already know what the iPhone 6 is, unless you have maybe slipped through a crack in time and appeared here in the last few hours from another dimension (good evening, Doctor). It's fair to say even small animals are aware of it. It's the only technology keynote that's as viewed by the number of people you'd usually associate with a major sporting event. This year there was even more anticipation however – partly because Apple was on a non-S year, so a new design was expected and partly because the Apple secrecy machine appeared to have been working only part time this year, and the supposed devices had leaked a while before.

So when the iPhone 6 was unveiled, it wasn't as big a shock as the 4 was, the last major overhaul. In fact, in retrospect the design was there to see all along in the 5th generation iPod Touch – go check it out, it's practically the same. In the hand, though, the iPhone 6 is a work of beauty that pictures of it cannot encapsulate. Echoing the first iPhone's curved aluminium, the 6 is a delight to hold, and it sits in the hand very nicely. The roll of the edge of the screen's glass feels great and brings to mind previous devices with this idea, such as the HTC One X and the Nokia Lumia 800.

The version I have is black (sorry - 'Space Grey') and with dark wallpaper, the device begins to resemble a shiny pebble. It still lacks grip though, and the extruding camera is unsightly and breaks the device's balance on a flat surface. The screen itself has been a cause of consternation for some, with the lack of full HD prompting comparisons with Android flagships of 2012. That's fair criticism, they are technically similar, but in use the new "retina HD" display is sharp, vibrant and gorgeous. Moving to it from a Nexus 5, I'd conclude it's every bit as striking – with the dual-display pixels (also present in the One M8) giving a wide viewing angle and superb contrast. At times, the image is so close to the glass that it looks drawn on.

Underneath the screen you'll find the guts of the device, and unsurprisingly it provides as stage for the debut of a new set of chips: the A8 and the accompanying M8 motion co-processor. The former is a dual core 1.4GHz, 20nm CPU that at once doubles the transistors of the A7 while shrinking it by 10%. The horsepower is up by 25% for CPU and 50% for the quad core GPU, but in practice it's not overly noticeable as these chips are pushing more pixels around with equal deftness as any iPhone before it. It's not an Octo-core monster but, thanks to iOS, it is just as fast as one (without the battery cost). Talking of which...

One spec that is more noticeable however is the battery life, with the 6 having the longest battery life of

Key Specifications

- **Chipset:** Apple A8 dual-core 1.4GHz Cyclone (ARM v8-based).
- **Display:** 4.7" IPS LCD (750 x 1334, 326ppi).
- **Memory:** 16/64/128 GB, 1GB RAM.
- **Camera:** Rear 8.0MP / Front 1.2MP.
- **Battery:** 3,000mAh (removable).
- **Operating System:** iOS 8.
- **Size:** 138.1 x 67 x 6.9 mm.
- **Weight:** 129 g.
- **Network:** 4G / LTE / HSPA+ 21 Mbps.
- **Connectivity:** Wi-fi 802.11 a/b/g/n/ac, Bluetooth .
- **Colour:** Space gray, silver, gold.

a regular iPhone ever. The 1810mAh isn't huge, but a combination of the lower resolution screen, efficient CPU and optimised OS means I would often have at least 30% left after a 15 hour day with above average use. It's not quite the best in the world but it's certainly up there with the market leaders and a marked improvement in the range.

The camera is also superb once again. While it hasn't had a bump in megapixels, additional goodies such as phase detection autofocus in the guise of 'Focus Pixels', 240fps slow motion video, upgraded aperture and more means the images still look stunning. The Pureview Lumias still hold the smartphone crown, but few Android devices can hold a candle to the 6's imaging capabilities, even with more megapixels at their command.

I have been lucky enough to use many mobile devices on many platforms while writing for *Micro Mart*, and I've tried (and enjoyed) the iPhones on and off since the first one arrived. However, I have always found myself going back to Android, partly because the ecosystem is more open, partly because they offered great value, but mainly because the screens were bigger. The 'leap' to a 4" screen on the 5 series wasn't impressive at a time Android devices were launching with 5" screens in their flagships. With the iPhone 6, that hunger is finally sated, and the 4.7" device is right in that goldilocks size zone, especially with a rounded design that's the best since the One X.

An iPhone isn't cheap and likely never will be, and yes the memory price hikes are horrific. However, much as I love a device such as the moto g, I appreciate the extra money I pay for the 6 gets me a device that's far better designed and made. Some will begrudge that, asking why the OnePlus One can sell for half the price. Truth is Apple doesn't really need to compete, it will sell regardless. Aston Martins could probably sell for less – doesn't mean it will happen though.

Android remains the more open ecosystem, and I love having a Nexus tablet that'll connect to SMB shares, let me access its filesystem and generally tinker with it. However, in terms of app quality, iOS is still ahead as its apps often feel more in tune with the device they are on, given they only have to be written for the one device platform.

The bottom line is this – the iPhone 6 is the best iPhone ever and arguably the most complete premium smartphone available today. Will it tempt you way from Android? Maybe... if you can afford it, and it could certainly tempt you back if you have previously left. Is it a better phone than a OnePlus One, Lumia 1530, moto G or One M8? Well, that's for the individual to decide, as each one of those, like the iPhone 6, is a superb device in its own right.

mm Ian McGurren

A superb, premium device but with a very heavy financial premium of its own

BackBeat Pro

Michael checks out new headphones from Plantronics.

DETAILS
- **Price: £183**
- **Manufacturer: Plantronics**
- **Website: www.plantronics.com**
- **Required spec: N/A**

These BackBeat Pros are a set of noise-cancelling Bluetooth headphones from Plantronics. Tthis well-padded product is of the over-the-ear type, offering simultaneous dual-source connectivity, fold flat capability and a battery life that can deliver up to 24 hours of listening power.

Plantronics have also included power and audio leads in the box for use with this device. You also get a 'Ballistic Nylon Travel Sleeve', a grandiose description for the soft-lined black pouch with Velcro fasteners for storing the headphones. Both of the supplied leads are of a reasonable length (94cm for power and 147cm for the 3.5mm jack) with a rubber coating for better protection. The audio lead has a volume adjustment controller, but this only appears to work with certain Apple devices.

You can expand the well-padded metal headband by as much as 3.5cm at each end plus adjust the ear pieces in any direction for a comfortable fit. Along with plenty of padding, the ear pieces each feature a control wheel, on/off button switch and an outside plate cover that can activate a specific function. In the case of the left ear piece, the wheel controls track selection on the Bluetooth devide, while the on/off switch is for the ANC (Active Noise-Canceling) feature. This works in conjuction with the Open Mic feature located in the right earpiece. ANC works by utilising multiple mics to monitor the quality of the environmental sound and help to filter it out further. Open Mic, when activated will temporary supress this cancellation somewhat to push the music back and allow in outside noise, should the need to hear what's going on around them without removing the headphones.

> **“ANC works by utilising mics to monitor the quality of the environmental sound”**

Charging the unit can take up to three hours, which is reasonable when you consider that the device delivers 24 hours of listening. Five LEDs on the right ear piece flash to indicate it's charging, as stop once charging has been completed. While using the headphones you can check on the battery status by tapping the right ear piece, upon which a female voice will provide feedback. The same voice is used to announce other status issues.

When you are wearing these headphones, it will deliver audio from a range of connected and linked devices – indeed Plantronics claims that Class 1 Bluetooth devices can operate at up to 100m. However, once you remove them, the headphones can automatically pause the connected device thanks to a sensor in the left earpiece. Once you have replaced the headphones then the audio will be resumed from where it left off without missing a beat. Clever.

As mentioned earlier, the BackBeat Pro can be simultaneously paired with two separate devices for easy switching between audio sources. A slightly different approach is required when pairing the two devices. For initial pairing, you need to turn on the power to activate pairing mode. In order to pair the second device, you will need to hold down the Call plate on the right ear piece until the LEDs flash red and blue. A voice will then announce pairing mode is activate and you can proceed to add a second connection.

mm Michael Fereday

Expensive, but technologically advanced, comfortable headphones with good audio quality

CyberPower Value 800EICLD UPS

EDITOR'S CHOICE micro mart

Power to the people, through a desktop battery

DETAILS
- **Price: £66**
- **Manufacturer: CyberPower**
- **Website: goo.gl/ETVMDT**
- **Required spec: IEC C14 cable for more connections to monitors etc.**

Technical Applications
- PCs/Workstations
- Audio/Video Systems
- Network Devices
- Office Devices
- Emergency Systems
- Data Storage Arrays
- DVRs/Surveillance Systems

Features
- Line-interactive topology
- Automatic voltage regulation (AVR)
- GreenPower UPS technology
- Multi-function LCD display
- LED status indicators
- PowerPanel Personal Edition software

Uninterruptable Power Supplies (UPS) aren't, admittedly, the first component you consider when specifying your desktop setup. They're usually restricted to the realms of the server admin or a power user who has a specific need to keep their PC running during times of a power outage – or at least to provide a safe shutdown. However, there's good reason to include a UPS into your desktop configuration.

CyberPower's 800EILCD is from its Value range of UPS and is geared toward the home and small office user that requires a compact, yet stable battery backup for its equipment. A micro tower, measuring just 100 x 140 x 300mm and weighing an acceptable 5.2kg, it will be appreciated for the fact it can be lifted with one hand and doesn't require a forklift truck unlike some of the bigger UPS units that you may come across in the business world.

The internal, sealed, lead acid 12V battery requires an eight hour charge time, after which it's capable of keeping our Core i5, 8GB PC humming along at the desktop for around 25 minutes complete with monitor. Open up a few applications and that drops to fifteen minutes, though that's still ample time to save any work and shutdown properly.

The LCD readout on the front panel gives you a selection of information based on the current situation. By pressing the Display button on the front of the unit you can switch through the current battery capacity, load capacity, estimated run time left, input voltage, output voltage and display any faults that may be present on the system.

The readout also displays the current voltage regulation as Line Mode and any detected overload the unit is currently having to deal with. All in all, it's enough to ascertain just how much juice you have left on the battery and for how long you have until you've exhausted the power.

The 800EILCD has the capacity to keep three outlets or kettle leads running as well as an RJ11 connected device, such as a phone line, FAX or DSL line. There's also USB and Serial port connectivity for communication between the UPS and the attached PC that, when used in conjunction with the accompanied UPS management software – PowerPanel Personal Edition – will offer you better control and even more details regarding the charge levels. It also allows some customisation of the runtimes for both the UPS and the connected devices; for example, you could set the UPS to run until the power returns or until it runs out of battery power, whichever comes first, or you could configure the software to shutdown the PC and components after running for a set number of minutes on battery power. The choice is yours, and it solely depends on what power outages you're used to in your area.

On top of all that, the Value 800EILCD incorporates an energy saving design that has been improved to greatly reduce the amount of waste energy and to make sure that the connected devices are operating as efficiently as possible. The long terms energy savings are impossible to say, but even a small reduction on an electric bill never goes amiss, does it?

A UPS for the desktop isn't such a bad idea, then. You can save your equipment from surges, spikes and sudden loss of power, and you could save some money in the long run. In our view, it's certainly worth the money.

mm David Hayward

A diminutive UPS with the potential to avert unnecessary data loss

micro mart
9 Quality
9 Value
9 Overall

Tesla Breaks The World

The father of electricity in a videogame? Shocking...

DETAILS
- **Price: £7**
- **Manufacturer: Archetype Global**
- **Website: tinyurl.com/qgxdjwg**
- **Required spec: Dual-core CPU; XP, Mac OS X 10.6, Linux 3.0 or later; 2GB RAM; 512MB GPU; 3GB drive space**

Funded on via Kickstarter and released as part of Steam's Greenlight scheme, *Tesla Breaks the World* is every bit an indie game. Having raised just $6,797 (with a $5,500 goal), it's nothing if not low budget. But having played more than our fair share of high-quality indie platformers in recent years, we're aware that such titles can often prove the most entertaining.

That certainly looks like it's going to be the case with *Tesla Breaks the World*. The screenshots of the game are sumptuous, belying its tiny budget. Yes, it's made up of cartoon characters and relatively simple backgrounds, but it's all expertly drawn and designed. So far, so good, then.

Also noteworthy is the fact that you play as Nikola Tesla (whose nemesis just happens to be Thomas Edison), but the big headline feature is undoubtedly the random level generation. Yes, each time you play a level, it will be different. In fact, when you die and respawn, you'll find everything has changed. It's an interesting concept, and the developer Archetype Global, should be congratulated for trying something different.

Oddly, in spite of this randomness, though, *Tesla Breaks the World* is disappointingly repetitive, because although the layout of the level changes, it's still made up of the same basic elements. And because the levels are random, they don't really have any identity; it all just feels like one really long level that you can never learn or identify. The frequent voiceovers from the narrator provide some much needed sense of consistency, but it quickly gets irritating when you've died repeatedly and find yourself listening to the same dialogue over and over. Thankfully, you can skip this by tapping the Esc key.

The random generation also makes the game unnecessarily difficult in the early stages, but some players will of course enjoy this kind of challenge. What's more of a problem are the clunky controls, iffy animation and inconsistent collision detection.

Tesla Breaks the World is clearly designed to be played with a mouse and keyboard, because all the on-screen prompts and tutorial text refer to pressing keys or mouse buttons. Plug in a controller and it does work, but none of the help text changes to reflect this. Granted, this is a low-budget game, but surely the developer should have anticipated the fact that most people would want to play a platformer with a gamepad?

Regardless, the game does work well with a controller, and it feels far more natural to play this way when you're jumping up platforms and so on. Shooting, however, is very much geared towards mouse control, and the game's solution for the controller is to use the right analogue stick to move the mouse cursor around. It works but not well.

On a different note, Vsync appeared to be broken for us, causing the game to become slow and 'floaty'. Turning it off fixed this problem, but then we had to put up with constant screen tearing. Whether or not this is isolated to our machine we can't say, but it's worth bearing in mind.

Regardless of such technical issues, *Tesla Breaks the World* is a game that perhaps achieves more than you might expect for its budget, and at £6.99, it's certainly not expensive. Sadly, though, it's probably only worth half that.

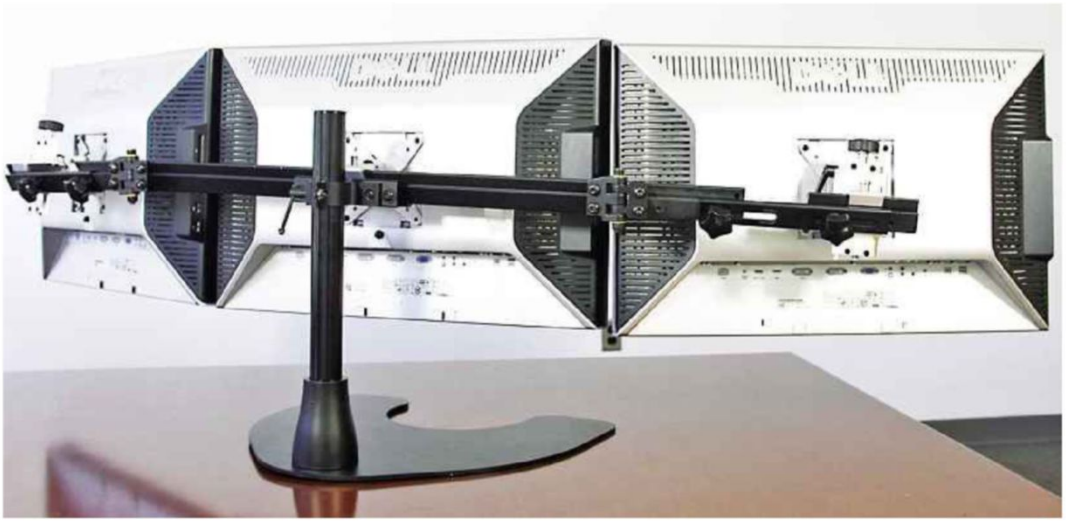
mm Anthony Enticknap

Looks good but can't compete with superior indie platformers

Ergotech Triple Monitor Desk Stand 100-D16-B03-TW

Employ more multi-monitor freedom

DETAILS
- **Price: £195**
- **Manufacturer: Ergotech**
- **Website: goo.gl/5p8gNy**
- **Required spec: Three monitors up to 27"**



Having a multiple monitor setup is all fine and well, but finding the space on the desk to accommodate a CrossFire spread of three monitors can be something of a chore. Ergotech though, may have the solution.

The Ergotech Triple Monitor Desk Stand is, as the title suggests, a steel and aluminium frame on which to support three 27" monitors. This is a free standing product, in that a 406mm steel pole is inserted into a large, flat, heavy steel footplate and secured into place with a grub screw. Then slide the horizontal arm over the top of the pole and lock it with the T-handle clip. The arms of the horizontal arm are extendable, and can be moved forward and back thanks to the hinges, which create a kind of 'C' shape. Finally, all you need to do is fit the quick release VESA mount pivots to the back of the monitors and slot them into place along the grooved section on the top of the horizontal arm.

The end result is a very secure monitor stand that can be fully adjusted for height, width, tilt and spaced equally between all three monitors. With the application of an Allen key you can fine tune the stand to such a degree that the most comfortable cockpit style custom viewing angles are achieved.

Getting the fine tuning does take some time, though, especially if you're continually moving around in front of the desk. However, once you get the right adjustments and the angle correct, the final effect is certainly worth the effort.

The horizontal arm is especially well designed. It's more than strong enough to take the weight of the monitors, and you're never left feeling like something is about to collapse – providing you've screwed everything in place of course. The hinged movement allows a greater flexibility of positioning, from the cockpit look of a triple SLI gaming display, through to a more space-efficient way of placing three large monitors into a corner desk, where the monitors and the telescopic arms can follow the wall and sweep around the desk if needs be.

The construction of the Ergotech stand is excellent. It's more than solid enough, without any of the sharp edges or left over burr that tends to hamper the quality of other steel and aluminium built products. It's a pretty weighty frame as well, at around 15KG before you even fit the monitors. It's also painted black throughout, which effectively hides any areas that may be shown between a gap in the individual monitors of from the desk to the bottom of the monitors. That's not to say it's an ugly looking contraption, it's just that some folk prefer the feeling of having their hardware suspended without attachments of wires.

Speaking of wires and cables, there's also a recessed area behind the horizontal arm where you can secure the monitor cables with ties. It's simply a matter of running them down the back of the pole and off the back of the desk. The choice is yours of course, but suffice to say there are ways to make the setup more subtle.

This stand's good construction, excellent design, and ease of setup and use make it an ideal frame on which to build your next multi-monitor setup.

mm David Hayward

Great construction and design for a free standing monitor frame

GROUP TEST

Budget SLI/CrossFire Motherboards

Where most of us get by with a single graphics card in our machines, there are some who want to go that little further. For them a single card isn't worth the effort. They want two, three, maybe even four graphics cards, all working together to shift those polygons.

Budget is a problem in these cases, though, so we've looked at six reasonably priced SLI and CrossFire capable motherboards to see who's top of the multi-GPU pops.

Budget SLI/CrossFire Motherboards

MSI Z97 Gaming 5 Socket 1150

DETAILS
- **Price: £ 112**
- **Manufacturer: MSI**
- **Website: goo.gl/tYmjCE**
- **Required spec: Intel Core i7, i5 etc. 1150 Socket CPUs**

We've had a range of MSI boards through our doors recently, all of which have proved to be superb in near every factor. MSI has certainly pulled out all the stops and is now well in command when it comes to boards for gamers, enthusiasts, overclockers and even the media centre builders.

The Z97 Gaming 5 motherboard was released earlier in the year, so it's had some time for users to familiarise themselves with its many features.

For starters, this is an ATX (305 x 244mm) board that can support fourth- and fifth-generation Intel Core i7, i5 and i3 processors, among others. It has four DIMM slots for up to 32GB of DDR3 3200 (overclocked) RAM, six SATA 6Gbps ports, a single M.2 port, four USB 3.0 and four USB 2.0 ports on the rear, along with a Killer E2206 gigabit Ethernet port. Finally, it has three PCIe 3.0 16x slots and four PCIe 2.0 1x slots.

It's the well-spaced PCIe slots that make this such a well balanced and sought after board among the system building elite. You can comfortably fit three MSI GTX780 graphics cards next to each other without the feeling that you're about to deprive the system of any much needed air cooling. In fact, with a little bit of clever cable management you can effectively have a good few millimetres free either side of the centre graphics card and thus plenty of circulation to keep everything cool. Obviously more exotic methods of cooling will require a slightly different setup, but we're confident that with even the inclusion of water cooling there's ample room.

Obviously, it being an MSI board means you're not just getting the usual run-of-the-mill extras included with the package. MSI has blessed this board with heaps of wonderful technologies, including Audio Boost 2 with an isolated audio PCB and the aforementioned Killer E2200 network port that's designed to prioritise online gaming bandwidth, chat and other such traffic. M.2 offers exceptional speed to those who have invested in the connected storage solution and, of course, as with most other MSI boards, the Z97 Gaming 5 has military class 4 components throughout.

All of this means that not only will you have an incredibly stable and lightening quick base onto which you can build your system, but there's also plenty of room of overclocking, circuit protection and the reassurance of quality that generally comes with all MSI boards.

The list of features does go on for a fair while, and we could rave about them for a number of pages more. Suffice to say, though, in our tests we found this board to be both incredibly stable, roomy enough to work with, easy to configure and set up and ideal for almost every user – not just for those requiring the maximum number of frames per second in game.

The price isn't too bad either. At around £112, (cheaper if you spend the time to shop around), the MSI Z97 Gaming 5 offers excellent value for the amount of technology and the sheer number of features available.

micro mart
9 Quality
8 Value
9 Overall

ASRock 970 Extreme4 Socket AM3+

DETAILS
- Price: £ 66.76
- Manufacturer: ASRock
- Website: goo.gl/37MWx0
- Required spec: AM3+ CPU, Phenom II X6, X4, X3, X3, Athlon II

It does get a little tight when trying to fit three cards

ASRock famously has a selection of motherboards on offer that can happily compete with the likes of MSI and Gigabyte but without the extra few digits after the pound sign. This, although very appealing, isn't always good and there are times when ASRock's line up isn't quite as good as it could be.

The ASRock 970 Extreme4 is an ATX (305 x 244mm) motherboard with support for the latest AM3+, Phenom II X6, X4 and X3 processors, and so on right down to the Sempron. There are four DIMM slots for dual-channel DDR3 2100 (overclocked) memory, five SATA 6Gbps, 7.1 HD audio, four USB 2.0 and two USB 3.0 ports and, of course, three PCIe 2.0 16x slots, two PCIe 2.0 1x slots and a pair of standard PCI slots for legacy hardware.

Although reasonably spaced apart, it is a bit of a tight fit between PCIe slots two and three, when compared to the gap between PCIe slots one and two. This means that, in our tests at least, a pair of Radeon R9 280s fitted comfortably in slots one and two, but when we added another in slot three, things started to get a little too tight for our liking. There was a very small gap, admittedly, but the air flow was severely restricted, which didn't sit too well with us. The result was another fan above slots two and three to draw away some of the heat generated.

> **"The Unlock CPU Core feature allows a significant level of overclocking"**

That said, three-way CrossFire is certainly achievable, and if you were to apply a better cooling system than we did, we're pretty sure you'd be able to reap the benefits of a triple graphics setup without coming across too many problems with heat.

The 970 Extreme4 isn't short of features. The Unlock CPU Core feature allows a significant level of overclocking, provided you have the right CPU in place, and support for AMD's mighty eight-core Black Edition monsters is something of a draw for those who want a powerhouse system without the extra expense.

Speaking of expense, the comment we made at the start of this review regarding ASRock's cheap and cheerful nature is apparent here. Although the board is a couple of years old now, the £66 price isn't something you can turn your nose up at, especially when you consider the various ASRock Extreme tuning utilities, instant flash, boot failure guard and its well received XFast555 technology, which allows for the creation of a RAM drive, improved gaming functionality through the Ethernet port (up to five times better, in case you're wondering where the five part comes from) and five times faster USB performance. Naturally the settings need to be right before you can enjoy these benefits, but ASRock enthusiasts swear by them.

Overall, the ASRock 970 Extreme4 board isn't too bad. It may lack some of the more modern features and applications that the previous MSI board has to offer, and it's not quite as well laid out or designed, but for 60-something pounds, it's not a bad choice if you're building a cheap AMD-based SLI/CrossFire system.

Gigabyte GA-Z97X-Gaming 7 Socket 1150

DETAILS
- Price: £134.28
- Manufacturer: Gigabyte
- Website: goo.gl/YydEpf
- Required spec: fourth- or fifth-generation Intel CPU

Gigabyte's Gaming range feature a flashy red on black look

Gigabyte offers the consumer a wealth of choice when it comes to motherboards. It can deliver low-end, low-price but relatively high-specification boards for high volume system builders, all the way up to extreme overclocking, very high-end gaming boards – with the price to match as well.

This is a motherboard from its Gaming range, specifically the Gaming 7. The Gigabyte GA-Z97X is an ATX board that can accommodate fourth- and fifth-generation Intel Core processors. You'll find four DIMM slots for up to 32GB of DDR3 3200 (overclocked) memory, on-board graphics with support for up to 4K UHD resolutions and the previously seen Killer E2200 pro gaming network port. The graphics capable slots include one PCIe 3.0 16x, one PCIe 3.0 8x and one PCIe 2.0 4x; along with three PCIe 2.0 1x slots and a single legacy PCI slot.

Much like the ASRock board, we found the gap between PCIe slots one and two more than enough to fit a couple of big R9 280s or GTX780s. However, there's a ridiculously small gap between PCIe slots two and three and, as you would expect, by populating all three slots you're dropping the PCIe slots to 8x and 4x speeds. But it's the cooling that remains a problem in this case.

That aside, Gigabyte has adopted a popular red-and-black theme for its Gaming 7 boards. And due to its gaming bent, you'll find such wonderful features as Gigabyte Audio with a better than standard audio output performance through the 7.1 channel system. There are also high-end capacitors, gold-plated audio hardware, a SATA Express connector and M.2 on board connector. Plus you'll also have access to Gigabyte's system management App Centre, for overclocking and cloud-based features. It's all very fascinating, to say the least.

> "Due to its gaming bent, you'll find such wonderful features as Gigabyte Audio"

Working with the board wasn't quite as cramped as with the ASRock example we had. Although there wasn't a lot of room for the third graphics card, we did manage to get a tiny gap in place, and the system ran reasonably cool. Saying that, though, we wouldn't fancy attempting an air overclock with all three cards in place. In short, we chickened out, partly due to the cooling issue and partly due to the fact that we have to return the board.

It's certainly a decent enough design, and if you're only planning on a dual SLI/CrossFire setup, then you'll find the Gigabyte GA-Z97X-Gaming 7 more than capable for the job. As with the MSI board, there are really far too many features to harp on about, and to some extent droning on about crystal clear audio can get a little tedious.

Overall, we liked the Gigabyte GA-Z97X-Gaming 7, but considering it's at the far end of the budget classification, costing around £134, there is the afterthought that for 20-something pound less you could bag the MSI board and eliminate the space. In the end, though, we think the final decision will be based purely on whether the user prefers Gigabyte products over a competitor.

Asus Z87-Pro Socket 1150

DETAILS
- Price: £147.28
- Manufacturer: Asus
- Website: goo.gl/Vv0Tnz
- Required spec: fourth-generation Intel CPU

▲ *With gold and yellow on black, the Asus Z87 Pro looks the business*

Where other motherboard manufacturers have opted for more desktop established technologies, Asus, with its Z87-Pro range, has instead gone down the modernist route and included the ability to connect your PC to your phone or tablet. It's not a bad idea, but it can be a little niche.

This is an ATX board that supports Intel's fourth-generation Haswell processors and offers eight SATA 6Gbps ports (six on the Z87 chipset and a further two through the ASMedia ASM1061 controller), four USB 3.0 ports with the Z87 chipset and another four through the ASMedia controller, four DIMM DDR3 slots for a maximum of 32GB at 3000MHz (overclocked) and 4K UHD integrated graphics.

The SLI/CrossFire support comes in the form of two PCIe 3.0 16x slots, one PCIe 2.0 16x slot and four PCIe 1x slots. As expected, the two PCIe 3.0 slots run at 8x if two graphics cards are fitted and at full 16x provided only one is present, with the third PCIe 2.0 graphics slot running at 4x. Interestingly, there's no legacy PCI slot on this board, which does offer a tad more room when fitting a third card, although not by a huge amount.

Fitting three R9 280s was easy enough, since they're pretty big cards, and there was enough of a gap for decent air flow throughout the system and between the cards. It's worth noting, though, that there wasn't as much room as with the MSI board, but more than the ASRock and Gigabyte boards.

> **"It's certainly eye-catching and would be excellent for an open-view system"**

The emphasis on a modern approach doesn't just finish the absence of a legacy PCI slot. This board has on it a Wi-Fi GO! card, which is a dual-band device that can handle 802.11 a/b/g/n 2.4 and 5GHz frequencies and Bluetooth connectivity, both V3.0 and V4.0. You'll also get an Asus dual-band 2T2R antenna in the box and full instructions on how to setup a wi-fi hotspot.

The Asus UEFI offers a far better graphical setup than most of the other boards on test. There's an EZ mode, which allows you to quickly get to the most used and important features of the board and alter settings such as the fan speed, temperature, time and date. And an Advanced mode offers greater control of the board's features and opens up the overclocking potential in a more traditional-looking BIOS environment.

The design of the board is rather exceptional looking. With a black PCB and yellow connectors and slots, complete with gold heatsinks and stylised Asus logos throughout, it's certainly very eye-catching and would be excellent for an open-view system. But although it looks splendid, we did find it to be a little cheap feeling when compared to the other boards we'd already tested. It works perfectly well, but there was a little too much flex and a couple of the PCI ports were raised slightly on their connections. Plus the locking clip on the CPU socket felt as if it would break off without too much difficulty.

Having said that, this is still a good board, which it should be, since it costs just shy of £150. But we would expect a little better quality and more care for the extra pounds.

ASRock H81M

DETAILS
- Price: £39.34
- Manufacturer: ASRock
- Website: goo.gl/98w3RH
- Required spec: fourth generation Intel CPU

For a tiny board, there's a lot packed into the H81M

This is the second ASRock motherboard to grace this group, and it offers something a little different from the rest of the pack.

The ASRock H81M is a micro-ATX board supporting fourth-generation Intel processors on a Socket 1150 H81 chipset. It has a pair of dual-channel DDR DIMM slots with a maximum capacity of 16GB at 1600MHz, Intel HD 4600 on-board graphics, 7.1 channel audio, two SATA3 6Gbps and two SATA2 3Gbps ports, with two USB 3.0 and four USB 2.0 ports.

The multi-GPU features comes in the form of a pair of PCIe 2.0 16x slots, with one at 16x, while the second, when occupied, is at 4x mode. There are also a couple of legacy PCI slots set between the two PCIe slots.

Fitting a pair of GTX780s was easy enough, as the gap between is more than ample to accommodate them. In fact, you could probably get away with a semi-bespoke cooling system fitted to each, and they would still fir comfortably. The only problem, though, is that you'll lose the use of the legacy PCI slots, but since the motherboard has a decent audio and gigabit LAN, unless you have a TV card, you won't necessarily miss much.

As you can tell, this is a much smaller setup than the rest of the boards in the group. In a way, this makes the H81M a little more flexible in its uses. For example, you could easily make a mini gaming, under-the-TV setup, with enough power available for an all-encompassing media system. Likewise, there's no reason why this board can't find a place inside a bigger case or even as one of these new-fangled Bitcoin miners.

However, there's going to be some lack of hardware availability purely due to the size of the board. This board only takes half the memory the other boards on test can and there's a lack of USB ports and PCIe 1x ports as well. Plus it doesn't have anything like M.2 or SATA Express, and if you really want to be picky, the H81M doesn't have military class 4 components throughout either.

It does have solid caps, access to the ASRock cloud, Wake on LAN and that ASRock XFast55 feature we mentioned in the board's sibling review. So while it may lack many elements the bigger boards boast, there's still plenty to smile about with this example.

There's also one more feature that can sway users in favour of this board over the competition: the price. Although it lacks high-level technologies, the ASRock H81M comes in at just £39, which by any reckoning isn't too bad for a board with SLI or CrossFire support.

The result as to whether to buy this board over another lies firmly with the user, then. What can you do with three graphics cards that you can't do with two? And do you really need more USB 3.0 ports or M.2 or even SATA Express? Naturally, if you do, then you'll look elsewhere in this list, otherwise it might be worth taking stock of what you want from the system and opting for a cheaper alternative such as this.

> **"While it may lack elements the bigger boards boast, there's still plenty to smile about"**

Gigabyte GA-Z87X-SLI

DETAILS
- **Price: £95.99**
- **Manufacturer: Gigabyte**
- **Website: goo.gl/h8G1lj**
- **Required spec: fourth generation Intel CPUs**

Although it lacks the panache of the Gaming range of boards, the Z87X-SLI is really very good

Okay, so you may be thinking we've finally lost what little grasp of sanity we were clinging to and have featured the same motherboard twice in the same group test. We haven't, naturally, although our grasp of sanity is as always questionable.

This is the Gigabyte GA-Z87X-SLI board, which is slightly different to the previously reviewed Gigabyte GA-Z97X-Gaming 7 board. For starters, it's an older Z87 chipset, which means it'll be able to support the fourth generation of Intel processors on an LGA 1150 socket. It has four DDR DIMM slots for a maximum of 32GB at 3000MHz (overclocked, again), four SATA 6Gbps ports, six USB 3.0 ports and two USB 2.0 ports on the back panel with a further two USB 3.0 and six USB 2.0 through the internal connectors.

There's support for a dual graphics SLI/CrossFire setup through the two PCIe 16x slots (one running at 8x if populated), with three PCIe 1x slots and a pair of legacy PCI slots thrown in for good measure. Since this is a simple dual graphics SLI/CrossFire affair, there's more than enough room for a pair of large cards to sit on the board without them interfering with each other's airflow. Admittedly, you won't be able to use one or two of the other PCI slots on the board with a couple of big cards in place, but at least you won't have to attack the case with a dremel for a spot of MacGyver-like enhancements for additional cooling.

Obviously, this is a board that's not aimed at the gaming fraternity, but it still offers the capability of multi-GPU gaming. It lacks the flashy red and black designs that the Gigabyte Gaming range has to offer, instead opting for a more subtle Ultra Durable labelled all-black design. That doesn't mean, though, that this board is lacking in features.

All solid caps, dual UEFI, electrical discharge protection on the USB and LAN ports and a feature whereby the USB ports are connected by individual fuses, so if one port blows up, the others aren't affected and can still operate. There's also UltraHD 4K resolutions available through the on-board graphics, and you still get access to the Gigabyte App Centre and Easy Tune software.

In fact, the only features you're missing is the extra PCIe slot, the advanced audio features, the Killer LAN technology and the more up-to-date Z97 chipset. There are one or two other extras not included with the GA-Z87X-SLI, but at less than £100, you're getting a very good deal.

> **"A perfectly adequate board for some excellent multi-GPU system building"**

As with the closing statement of the other Gigabyte board we featured (it's whether the brand name floats your boat or not), in this case it's whether the extra 40-odd pounds and flashy gaming design lures you in.

Otherwise the Gigabyte GA-Z87X-SLI is a perfectly adequate board for some excellent multi-GPU system building, regardless of whether that's for gaming or not. We found it in some ways to be a far better option than the more modern Gaming 7, but that's mainly due to us having more legacy hardware available.

MSI Z97 Gaming 5 Socket 1150

We thought the MSI Z97 Gaming 5 board was the leader of this particular pack. It has just about everything you could ever want from a motherboard, and there's the extra level of gaming features and a roomy easy-to-fit SLI/CrossFire setup.

ASRock 970 Extreme4 Socket AM3+

Although fitting the PCIe slots out was a very tight fit, the ASRock 970 Extreme4 does offer excellent value for money. It has nearly everything you could wish for on a multi-GPU board and then some. And considering it's only just over £60, you can't really argue with that.

How We Tested

Each motherboard was tested with either an AMD FX 8320 Black Edition CPU or an Intel fourth-generation Core i5-4670K. We used 8GB of Corsair RAM and an 800W 80+ Gold certified PSU. The graphics cards used were three MSI GTX780s or three R9 280s from Asus. Other than playing a selection of games, we didn't track frames per second or run the usual DirectX GPU tests.

	MSI Z97 Gaming 5	ASRock 970 Extreme4	Gigabyte GA-Z97X-Gaming 7	Asus Z87-Pro	ASRock H81M	Gigabyte GA-Z87X-SLI
Price	£112	£66.76	£134.28	£147.28	£39.34	£95.99
CPU Type	Intel 1150 Socket	AMD AM3+	Intel 1150 Socket	Intel 1150 Socket	Intel 1150 Socket	Intel 1150 Socket
Chipset	Z97 Express	AMD 970	Z97 Express	Intel Z87	Intel H81	Intel Z87
Size	ATX 305 x 244mm	ATX 305 x 244mm	ATX 305 x 244mm	ATX 305 x 244mm	Micro ATX 216 x 206mm	ATX 305 x 225mm
No. Of PCIe Slots For G/C's	3	3	3	3	Yes	Not really
	2	2	Windows Clipboard	Yes	Yes	Yes
No. Of SATA Ports	6	5	6	8	3	4
No. Of USB 3.0 Ports	4	2	4	4/4	2	6
No. Of USB 2.0 Ports	4	4	4	8	4	2
Max RAM	32GB	64GB	32GB	32GB	16GB	32GB

Tech Origins
Touch-screens

David Briddock describes the journey to today's mouse-free computer interfaces

Interacting with computing devices via touch isn't a new idea. In 1968, engineers were discussing potential real-world applications, such as air traffic control and industrial plant monitoring systems.

Optical

One of the first successful touch solutions involved installing a grid of infrared LEDs and sensors around the perimeter of a screen. A finger would break the infrared beam.

In 1972, the University of Illinois filed for a patent based on this approach. However, with only a 16x16 grid, the resolution was pretty crude.

The ability to add optical touch capability retrospectively to existing displays was attractive. Yet, the sensors collected dust, and the rudimentary resolutions meant it was more suited to classroom-style whiteboards rather than small screens.

Resistive Touch

Around 1970, American inventor Dr G Samuel Hurst stumbled on a resistive screen covering suitable for touch-screens. Along with a few friends, he set up Elographics to explore the idea commercially.

A resistive screen has a couple of extra thin transparent layers separated by a tiny gap. Pressure from a finger (or stylus) causes inter-layer connection, which in turn creates a measurable change in resistance.

Hurst received a US patent for his resistive touch technology in 1975 and, with finance from the Siemens Corporation, produced the first curved glass touch-screen two years later. In 1994 Elographics became EloTouch Systems.

Resistive Devices

An early product success was the ViewTouch point-of-sale (POS) system. Based on the Atari 520ST computer and a colour touch-screen, this POS device was created by Gene Mosher and first shown at Comdex in 1986.

Handheld digital assistants were the next target for touch technology. In 1992, Apple launched its stylus-operated Newton Message Pad, which was followed by the Palm Pilot range in 1998. Meanwhile, IBM tried its hand with an early touch-screen smartphone called Simon. But it wasn't a success.

In the entertainment world, the Game Gear's intended successor, the Nomad, was Sega's attempt to build a touch-screen handheld game console. However, the project was shelved to due the high cost of components in the 1990s. Gamers had to wait for the Nintendo DS in 2004 to try a commercial touch-screen product.

Capacitive Touch

An alternative touch solution had been proposed way back in 1965 when EA Johnson published articles about his capacitive touch-screen research. Johnson worked at the UK's Royal Radar Establishment in Malvern and had air traffic control systems in mind as a practical application.

A capacitive touch-screen uses a thin layer of material to hold the electrical charge. A finger touching the screen alters the charge at the point of contact. However, insulator materials don't work, so a gloved hand is ineffective, which has both advantages and disadvantages.

Early capacitive technology was only able to identify a single point of contact, thus precluding the sort of multi-touch gesture capability we enjoy today, and it took decades to perfect super-thin capacitive material coating.

Despite this long gestation period, capacitive technology always looked to be the superior touch solution, as demonstrated when Apple chose it for its 2007 iPhone with its touch-only interface.

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How-to Basics

Make An Image Of Your PC Part 2

We finish of our look at snapshot drive imaging, with restoring it this week

Last week, we went through the process of creating an image of your hard drive using the rather excellent Paragon Backup & Recovery free software.

With luck, then, a snapshot of the current state, including all data and everything, is now residing inside a single file on the destination drive you specified in part one. To get to that data, you can use another feature of Paragon: the Paragon Volume Explorer.

Restoring Individual Files

Now that we have an image of our hard drive, it seems a little over the top recovering the entire drive just for the sake of one file. Luckily, though, Paragon has the ability to extract single item files from any of the archives it has made.

From the main Paragon window, click on the Archives Tab, located in the top middle window. The bottom of the tab lists the archives that are currently in the Paragon database of archives, another graphical pie chart of the archive, and on the right, an expandable list of partitions that existed within the selected archived image.

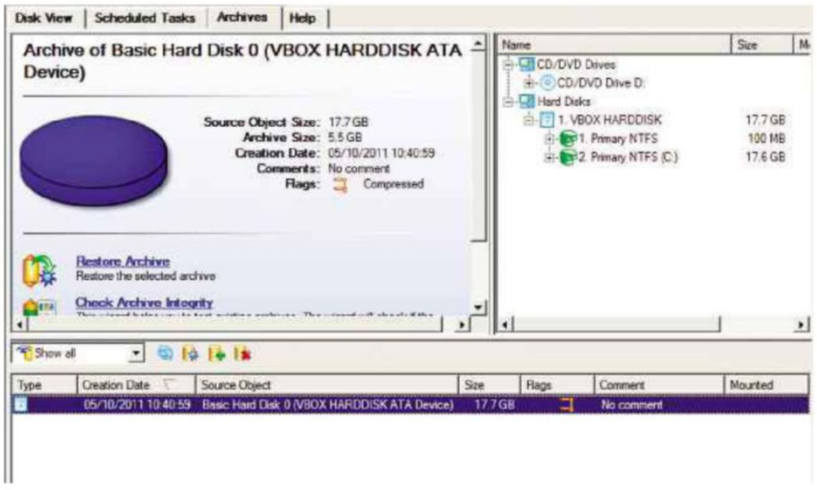
The browsing of the archive is extremely simple. Let's say we've accidentally deleted a valuable text file; just highlight the archive you know the files last existed on from the bottom of the tab. Then expand the relevant partition, followed by the folders on the right of the tab. Right-click the file you want to restore and left-click Export.

Doing so will bring up a new window offering a destination location, based on your current file structure and network share, for you to choose and copy the file to. When you've sorted a location for the file to be restored to, navigate to it and click OK. The file is instantly copied over to the chosen location and ready to read.

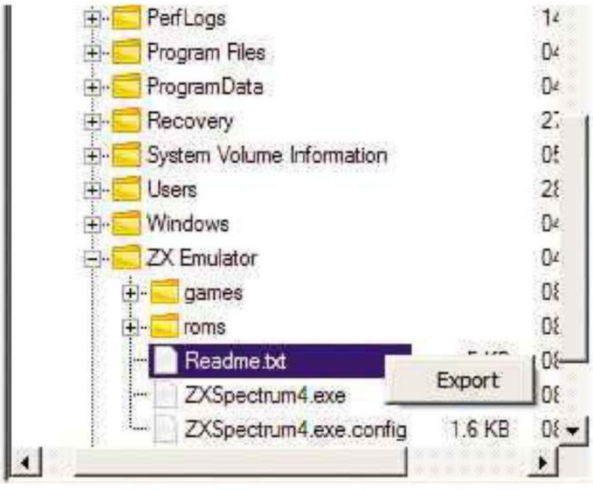
This works on entire folders and selections of files (by holding down Ctrl or Shift), but it won't be able to overwrite a protected or system file or one that is already being used by another process.

Restoring The Entire Image

Restoring the entire image is as easy as the aforementioned individual files; it just depends on how you want to go about doing it. If we went down the path of total system drive failure, then it goes without saying you won't be able to boot up Windows and run the Paragon application. In this particular case we'll require a bootable medium that we can start the PC from and access the archived images and the same functionality that the Paragon app offers.



With Pagargon you can pick the image snapshot and load it up into the explorer



Then, you can individually select files and folders for a brick level restore

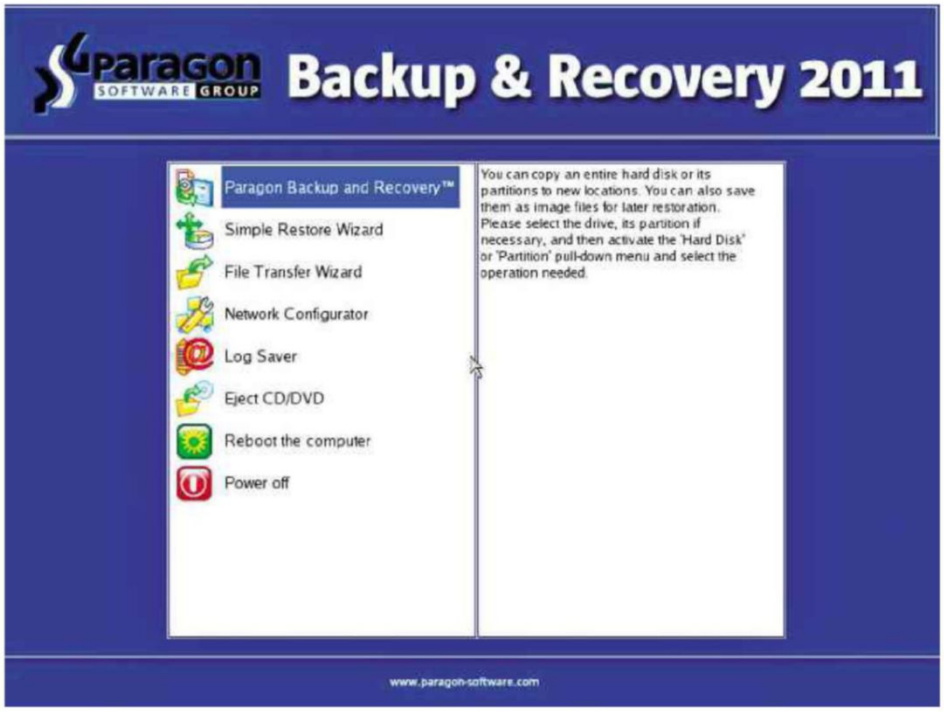
To create this bootable media, click on Tools (the menu in the top left) then Recovery Media Builder. This will launch another of those fabulous and aptly named wizards: the Recovery Media Builder Wizard.

We won't go through this wizard in too much detail, but you have a choice of creating a bootable recovery environment to either flash memory (a USB stick, for instance) or to CD/DVD. The recommended is the flash memory, as it's considerably faster than the optical drive route. Plus, if you've copied the archives to disc, then you're going to have fun swapping discs left right and centre.

The next window asks what recovery image you would like to transfer to the selected media – either your own custom .iso or the standard image that comes with the Paragon package. To be honest, unless you have a pre-built environment already set up, we'd recommend you stick to the default (typical) option.

After clicking on the Next button, you can choose the flash media you've already inserted into the system (assuming you have; if not, go back and insert it). If you don't mind erasing everything on the USB stick, then click Next followed by OK from the warning message. Paragon will then go and do its thing, format the USB drive, then copy its own .iso onto it and make it bootable, all within a blink of the eye – more or less, anyway.

After clicking on Finish, you'll exit the wizard and be brought back to the main Paragon window. It's then just a matter of rebooting your PC, with the newly created stick inserted, and choosing the appropriate boot media from your BIOS.



▲ *The Paragon boot image will get you up and running in case of an all-out drive failure*

Paragon Boot Manager

The first screen you'll get to will display the available boot options: Normal mode, safe mode, low-graphics mode, floppy disk and find operating systems on your hard disks.

99% of the time, the normal mode will suffice, so just press Enter for now. This will boot the manager into the main recovery environment, and after a short wait, the main menu screen will appear.

The menu and environment is fairly self-explanatory. We'll be using the Simple Restore Wizard in this example, but if you stored your backed-up image on a network, then you'll have to run the Network Configurator first, which basically involves you identifying your network and selecting the DHCP settings. It's worth noting, though, that the defaults are usually more than substantial enough to connect to most home user networks.

> **"It's a simple case of letting Paragon do what it was originally designed to do"**

Running the Simple Restore Wizard starts by analysing your hard drives and looking for any available archives. If it doesn't find any, then it will eventually prompt you to select the image manually. Use the file manager to locate the archive you wish to restore and click Next. Paragon will analyse the archive and ask you for an appropriate destination for the image to be restored onto, taking into account any size difference. The application will ask you if you want to automatically let Paragon decide the size of the partitions, based on the new size of the drive, or you can do it yourself.

Once the drives are sorted, it's a simple case of letting Paragon do what it was originally designed to do and restore the image onto your new hard drive. After the restore wizard has finished, click on OK and exit the wizard, then restart your PC and remove the USB device.

Providing the archive was sound, you should now be looking at an exact replica of your system, from the moment the snapshot image was taken. You may notice that Windows will need to locate a few new devices, such as the new drive and any other odds and ends it's picked up since you last made the archive, but essentially everything is there. No need to reinstall your applications, locate lost serial numbers or bury your head in your hands dreading the amount of work you have to get the system to look and act how it did. Backup and restore made simple. **mm**

Free Drive Image Apps

Paragon isn't the only fruit when it comes to free drive imaging. We mentioned the built-in Windows affair last week, which is very robust and easy to use. Anyway here are a few other free drive imaging applications that are well worth a look at:

- **Easeus Todo Backup**: *www.todo-backup.com/products/home/free-backup-software.htm*
- **Macrium Reflect Free:** *www.macrium.com/reflectfree.asp*
- **Drive Image XML**: *www.runtime.org/driveimage-xml.htm*
- **PING (PartImage Is Not Ghost)**: *ping.windowsdream.com/*
- **Clonezilla:** *clonezilla.org/*

The Best Money Can Buy: Speakers

You may have a powerful audio card fitted into your PC, but what use is it if you don't have a good set of speakers?

Harman Kardon GLA-55

It's very surprising that so many PC users ignore the audio side of the platform. A good deal of PC users fall into the daily, yet casual pigeonhole. There are people who use a PC every day for email, internet, social networking and other simple duties. What's also very popular with this group of users is music, and the home PC has now replaced the hi-fi in the home as the music player, which is interesting as these users rarely invest in the audio capabilities of their machines, sticking with the on-board audio and basic speakers that came with their system.

Other user groups that are more invested in their hardware, such as gamers, artists, movie editors and so on, tend to take a lot more time to get a good audio setup, but still, many will stick with the more basic setup. Audio just isn't considered as important as system power and graphical performance.

This is a shame, as the PC is so much more powerful and flexible in terms of audio, and the plethora of options open to audiophiles for not only buying and listening to music, but also editing and manipulating it makes it a brilliant alternative to simple audio playback devices.

One part of this potentially great setup lies with the bit we actually listen to, the speakers. Even in the world of hi-fis and other audio playback devices, truly good speakers are often the most expensive part of any setup, and although this may not be the case with the PC, which has plenty of potentially expensive components, to get the best audio performance you'll often need to spend a pretty penny.

So, as always, let's have a look at some of the pricier options open to those looking to empower their system with the best performance, this time in the audio department.

Paradigm Millenia CT

Product: Harman Kardon GLA-55
Price: ~£750

You may have trouble getting hold of these speakers, not only as they're over £700, but they also seem to be in quite short supply. This is unfortunate, as they're also superb examples of how well a simple 2.0 pair of speakers can sound, even without a separate subwoofer.

Looking more like something that should be floating in a cold drink, the Harman Kardon GLA-55 is, as we've already pointed out, a 2.0 speaker set, and although

they're small, they pack in some serious muscle. In fact, they contain plenty of internal components you'd usually find in high-end, free-standing speakers and perform almost as well too.

The CMMD transducers, optimised equalisation and compression, and 110W DSP power produce some stunning PC audio, which delivers very weighty bass, along with clear highs, all without taking up the same space as many alternative sets that rely on bulky subwoofers and a tangle of cabling.

Product: Paradigm Millenia CT
Price: £600

One of many new speaker sets that are designed for multiple roles, the Paradigm Millenia CT is a simply stunning wireless set that can be used in various situations, including with a PC. It's a powered speaker system that requires no receiver, and it can easily be paired with any compatible device to deliver some of the best quality sound in the market.

The CT in the title stands for Compact Theatre, and that's the kind of audio you can expect from the unit. The subwoofer is small and easy to position, and the two speakers, thanks to their wireless nature, are just as easy to place. The control box is tiny, also easy to set up, and there's a remote included.

Designed heavily for AppleTV, it's a great accompaniment to the TV service, but it's just as useful for the PC, where it can really come into its own with services like Netflix. Expensive, but the excellent audio quality and flexibility are worth it if you can afford to splurge.

Product: Monster Clarity HD Model One
Price: £500

This isn't just a speaker set but an all-in-one media device that can be used with a range of other devices, including a PC. It's a powerful loudspeaker that's capable of delivering some stunning audio, packed within a compact frame that'll fit in most places.

The right unit features a built-in iPod dock and has a mini jack to allow connection to other devices, such as PCs, mobile phones and other MP3 players. There's also a Bluetooth adapter available (sold separately) that enables wireless functionality.

The quality of the audio from the Model One is excellent, with beefy amplification and wide open sound. It hits all the right highs and lows and is one of the better options for music lovers who play the majority of their tunes via their PC.

Product: Bowers & Wilkins MM-1
Price: £400

The Bowers & Wilkins MM-1 is a high-end audio speaker that aims to deliver the kind of audio you'd usually expect from a hi-fi set up to your PC, and it does this by streaming audio from the computer via USB, which is then converted from digital to analogue. The result is some of the best PC audio we've heard.

This quality of the audio is notably more impressive than many other speaker sets, and no matter what genre of music you're into, or if you're watching movies or playing game, these units won't let you down. It has to be said, we found the performance far better for music.

There's also a great headphone output, which is augmented by the DACs used by the speakers themselves, making them just as useful if you want to keep the noise down as they are when you need to turn things up.

Product: Joey Roth CRM-001
Price: ~£400

These ceramic speakers look fantastic, with their unique conical shape, wooden stands, cork and large, tubular subwoofer, and they deliver audio that's just as impressive and some of the best in the price range, without a doubt.

It's all about nuanced sound with the deliberately deconstructed design, and as true audiophile speakers, few could find any problems with the audio that's delivered. The only issue you may have is matching these beautiful speakers to anything else in your home. They're that unique.

Monster Clarity HD Model One

Bowers & Wilkins MM-1

Joey Roth CRM-001

Marshall Stanmore

Product: Marshall Stanmore
Price: £360
One for the metal heads and rock stars out there, this Marshall speaker not only looks the part, with it's mini amplifier look, complete with brass controls and input jack, but it also produces some excellent audio quality, with brilliant highs and a deep bass.

The Stanmore features plenty of connection options, including 3.5mm, RCA and optical wired or Bluetooth using Aptx. There's even a double-end 3.5mm guitar-style cord included. It also features two standby modes to conserve power, including Standard and Powersaver.

Logitech Z-906

Product: Logitech Z-906
Price: £310
The Logitech Z-906 set is a 5.1 surround sound system that packs in a beefy 500 watts and is fully THX certified. It's a true home cinema and PC fusion that includes a large subwoofer and five satellite speakers, as well as a control hub that's designed to fit snugly with your PC or the rest of your audio equipment. There's also a wireless remote, so you can control the audio from your sofa, which is nice.

The unit features digital decoding, and the surround sound capabilities are excellent. There's also a selection of digital and analogue inputs, making connection easy for most setups.

The audio quality of the unit might not rival the bigger speaker names, but Logitech knows how to produce some great PC-centric speakers, and this is one of the finest sets released by the company.

Bose SoundLink Bluetooth speaker III

Product: Bose SoundLink Bluetooth speaker III
Price: £260
The Bose SoundLink Bluetooth speaker III is a wireless speaker unit that offers Bluetooth connectivity for a range of devices, and given its wireless capability, it's a good option for laptop users, as it can be carried with you.

The quality of the audio is superb for a portable speaker of this type, but then it's a Bose speaker, so that's to be expected, and the li-ion battery can offer up to 14 hours of life on a full charge. It features simple controls on the top of the unit but no remote, sadly. There's also the option of different colour cases.

Bose is a name synonymous with audio quality, and many would say the best speakers come from the company. After listening to the excellent, deep bass and brilliant clarity of this unit, you'll probably agree. It's a great sounding speaker, and although quite expensive, this is one model that's truly worth the investment.

Corsair Gaming Audio Series SP2500

Product: Corsair Gaming Audio Series SP2500
Price: £240
With over 200 watts of power, this 2.1 gaming-focused speaker set is a definite contender. With a big subwoofer, wired remote, and two easy-to-position speakers, it's a system that shouldn't have any problems providing clear and deep audio for gaming, able to blast out weapon fire, explosions and epic music.

The set handles high and mid ranges well, and the control module has a screen that relays the sound levels to you. Overall audio quality isn't as good as some alternatives, but for the price, this is certainly a great set for gaming.

Creative Airwave HD

Product: Creative Airwave HD
Price: £120
Although not specifically designed for the PC alone, Creative's Airwave is nonetheless a great speaker for PC use, and for any other device you want to use it for. It's a wireless, portable speaker that can connect to devices via NFC and Bluetooth, and there's also an aux-in port, if you wish to connect with a wire.

The unit is compact, although not the smallest portable speaker around, but it produces some decent audio. Of course, being a portable unit with a li-ion battery, it won't deliver the quality of sound you'll get from a traditional speaker, but if you have a laptop and want better audio than the usually mediocre built-in speakers they feature, this is a great alternative. **mm**

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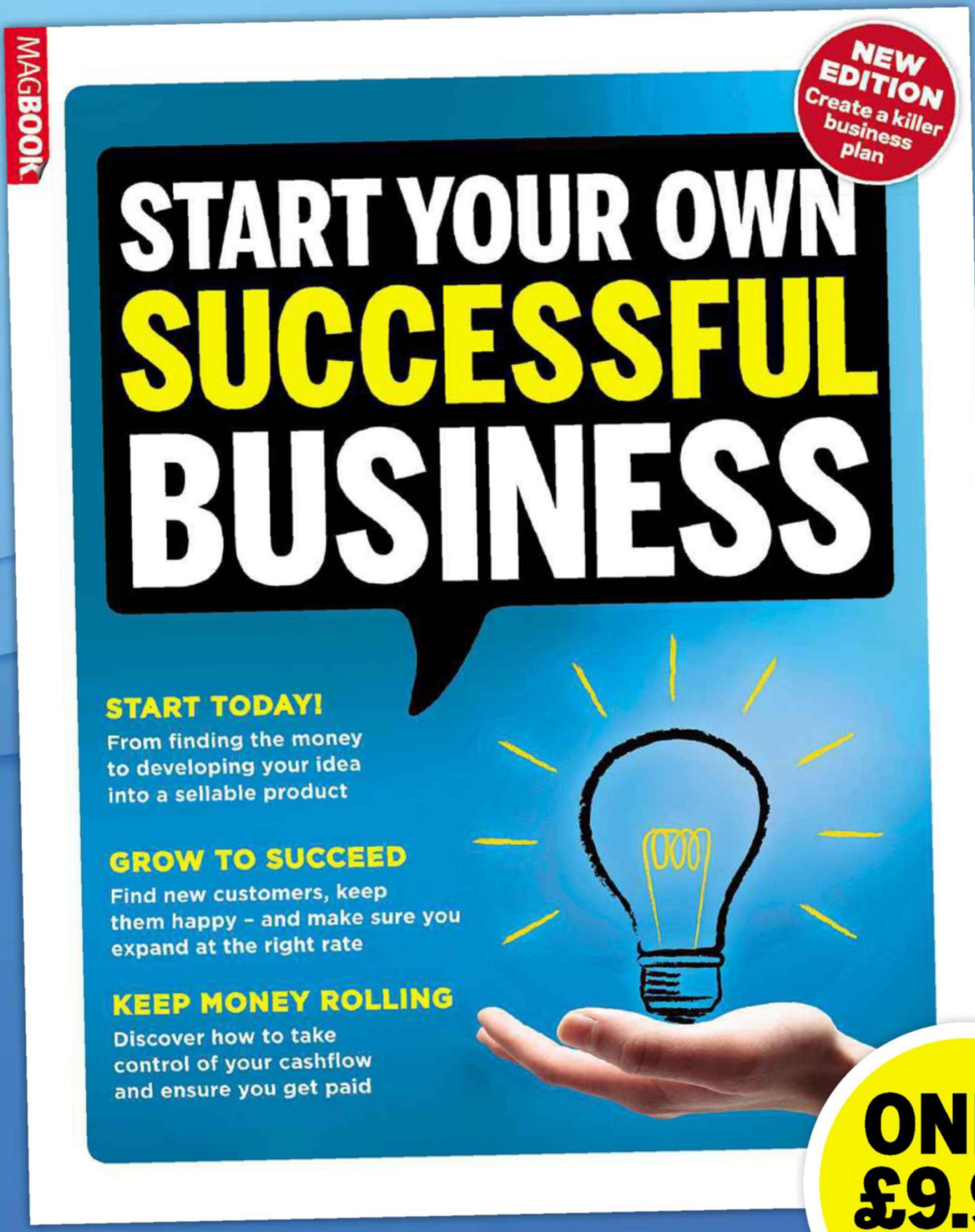

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Shareware Through The Ages

Shaun Green looks at how shared software has grown and changed over time

The story of shareware runs parallel to the tale of the modern PC, from 1980s inception through to the present day. It may be surprising to think that something as innocuous as a method of distributing software can have had such significant roots and have left such a deep impression on the landscape of computing.

Shareware was born of humble origins all the way back in 1982 – just one year after the arrival on the market of the first IBM PCs, the great granddaddies of most modern personal computers. And in one of those odd coincidences that crop up again and again throughout history, shareware was invented almost simultaneously by two men – both Americans and both software developers.

Jim Knopf (also known as Jim Button) was an IBM employee who occasionally wrote software on the side. One program he wrote for his local church congregation proved so popular that he left IBM and formed his own company, Buttonware. This program, a flat-file database program called Easy-File, became his first commercial release. Looking back, it is admittedly not the most fascinating piece of software, but it filled a niche.

Before he had left IBM, Knopf had elected to release Easy-File as "user supported software", asking only that the cost of the diskettes it was distributed on be covered. The program spread rapidly through PC user groups (the means by which enthusiasts socialised and discussed computing in the years before the internet), and after a while Knopf began requesting that those who used and liked his software send in donations. The response was overwhelming and exceeded his IBM salary by ten to one. It was at this point that Knopf realised he was on to something.

Around the same time, a Californian named Andrew Fluegelman was working on a program called PC-Talk. Fluegelman, born in 1943, had historically worked as a small publisher and an attorney, but after attending a computer expo in the late 1970s, he purchased his first computer. He was one of the first in San Francisco to receive a new IBM PC and promptly set to work writing his own programs.

Fluegelman released PC-Talk, a piece of communication software, which like Easy-File enjoyed substantial success. Fluegelman's distribution model was dubbed 'freeware', and like Knopf he asked for little more than the cost of disks to be covered. He suggested that users who found his software useful might wish to send him a $25 donation, however, and also found that many people chose to do so.

Once Knopf and Fluegelman noticed each other's software offerings and recognised that each was using the same model, they got in touch and discussed how to work together. Knopf renamed Easy-File PC-File so that their flagship software offerings sounded similar, they brought their suggested donation figures into line, and they promoted one another as well. They continued to distribute their software at cost, living off the donations that generous or grateful users provided, and used that income to fund further development.

Fluegelman had already trademarked the name 'freeware', hoping that he could make money from it if it took off but found that the word wasn't widely applicable enough. Knopf's 'user supported software' moniker was a bit of a mouthful, so the pair arranged a competition via a magazine to decide a new name for their distribution model. The winner was, of course, 'shareware'.

Soon after this, Knopf and Fluegelman discovered there was already a third developer, Bob Wallace, using the term 'shareware' to promote his word processing software, PC-Write. The three linked up and, over time, the popularity of 'shareware' as both a model and a label was cemented.

> **"Shareware was invented almost simultaneously by two men"**

Knopf and Wallace went on to enjoy continuing success with their shareware businesses, but Fluegelman made an unfortunate mistake. He elected to share the source code for PC-Talk (not inventing the open source model, incidentally, for the concept had been around for a long time and that label wasn't agreed on until the late 90s), and his business collapsed when users began to distribute their own versions, cutting away at his market share and income.

Building Blocks

Just why did shareware turn out to be a success? Looking back, it's easy to see the fertile ground in which shareware took root. Those early innovators – Knopf, Fluegelman and Wallace – recognised it. The IBM PC was a revolutionary new machine, and they gambled on its imminent popularity. It was not long before they were proven right.

Home PC ownership was on the rise, and more and more computer clubs were springing up. These were ideal environments in which to share diskettes containing software, and the new shareware model was perfect for such an environment. Awareness of shareware programs spread virally and extremely rapidly as a result.

Shareware was also given an immense boost once the new computing magazines got involved. Here was an exciting and innovative method of distributing software – one that was extremely popular among users, was making its creators huge amounts of money and that was competing successfully with larger, established corporate software developers.

It's also important to remember that with the IBM PC being such a youthful platform, relatively little software was available. For example, PC-File had only a few competitors, all of which had clunky copy protection implemented. Such programs also had to be purchased before they were tried; they were very expensive, and they were primarily sold via retail stores.

By comparison, the young turks of shareware actively encouraged copying their software, allowed it to be used as much as was desired without payment, asked only for a comparatively negligible sum of money and finally the software could be acquired via friends, colleagues or simply sending a disk to its authors.

The computing press was extremely enthusiastic about the shareware model, and the free publicity they gave Knopf, Fluegelman and Wallace both boosted their success and that of the model itself. It was soon clear that shareware was here to stay.

Play The Game

Despite the increasing popularity of the IBM PC in American homes and the fact that the Amiga and Atari ST never really took off in the States, there were relatively few games available for the PC through much of the 1980s and even the early 1990s. Those titles that were available occupied specific niches: golf or flight simulations, edutainment titles like *Where in the World is Carmen Sandiego?*, or early point and click adventure games with geeky senses of humour such as Sierra's *Space Quest* series.

The accepted wisdom was that although an audience for games on the PC did exist, manufacturing and distributing games was inherently expensive and risky. Before game demos existed, before dedicated magazines or websites existed to distribute them, gamers were leery of spending a substantial chunk of money on an unproven title, concept or developer.

Once again the shareware model proved to be a game-changer (pun entirely intended).

The story of commercial shareware games began in 1987, a full five years

after PC-File and PC-Talk began a quiet revolution. Although shareware games made by hobbyists had already been distributed over the preceding years, the model had yet to make its mark in the business of commercial games. Then Apogee Software (better remembered today as 3D Realms, the company behind the infamous *Duke Nukem 3D*) elected to try out the model. Like Knopf and Fluegelman, they initially distributed entire games for free, requesting payment if users liked the game. With payment came technical support from Apogee and advice where players struggled with a game.

Sadly this variant of the shareware model did not prove as successful for Apogee. Early interactive fiction stories like *Supernova* and *Beyond the Titanic* are still remembered today among enthusiasts, but at the time failed to turn much of a profit. Apogee went back to the drawing board, and later the same year it began distributing *Kingdom of Kroz*, an ASCII-art dungeon crawler, again for free. However, on reaching the end of what came to be known as *Kroz: Episode 1*, players were presented with a screen informing them that the remaining episodes could be purchased by calling a number and having them shipped out. This time the model proved more successful, as players who enjoyed the game happily stumped up the cash for more of the same. Apogee repeated its experiment with further games over the next few years.

Around the same time, the ingenuity of games developers was increasing, with particular thanks to a small studio known as iD Software. iD first impressed gamers in 1990 with *Commander Keen*, a platformer that featured clever visual features like parallax scrolling, previously seen only on Nintendo and Sega's home consoles, and again in 1992 with *Wolfenstein 3D*, one of the earliest first-person shooters.

Other companies also began to profit from the shareware model, notably including Epic Megagames. Epic was at the time made up of just a few guys in a basement ('Megagames' was intended to make it sound like a larger company than it actually was), but today it's a multi-million dollar business behind the Unreal Engine, the most popular engine in game development.

Criticism Of Shareware

It's perhaps inevitable that anything that has had such far-reaching impact would come in for criticism. What's perhaps most surprising is that much of the criticism of shareware has focused on the term itself.

Of course, in the early days of shareware, businesses using older models – premium-priced retail products – probably protested against the shareware upstarts who were cutting into their sales. This can, however, be largely disregarded as one business model being outperformed by a new model that is better suited to the market – a situation we've seen again and again throughout history.

That aside, it's clear to see that what 'shareware' means has changed a lot since the early 80s, when the term was applied to hobbyists or individual developers essentially distributing their software for free. As shareware grew in success and popularity, it was inevitable that larger businesses and commercial groups would grab hold of its coattails and that variants on the original model would be tried. As we've already seen, this has included time-limited demos, nag screens, fully featured trials and so on.

One approach to using the term properly today might be to describe fully featured and freely distributed software as 'freeware', 'demo' for a feature-limited piece of software, 'trial' for a time-limited piece of software, and 'shareware' for the original donation-based approach. However, as with so many neologisms, the word now has a life of its own, and organisations like the Association of Software Professionals state their position is that all software marketed as 'try before you buy' is shareware. Sometimes it's simplest just to accept that a word's consensually accepted definition is inherently loose!

However, it wasn't until 1993 that shareware games experienced their first blockbuster mega-hit: iD Software's *Doom*.

In many ways, *Doom* benefited greatly by appearing at a crossroads moment. Its creator, iD, had the money and time it needed to make the game it wanted, thanks to the success of *Wolfenstein 3D*. Home PCs were beginning to become more and more widespread, and the power of these machines was also increasing, meaning flashier visuals and sound driven by more complex game engines were feasible. Perhaps most importantly, the internet was beginning to become more popular among owners of PCs, having been opened to the public a few years earlier in 1991.

The impact of *Doom* on gaming is difficult to overstate. Its palpable atmosphere and first-person perspective made for an immersive experience like few others; even today, players who look past its dated sprite graphics can find a heart-racing experience within. It was also one of the first games to be openly moddable, meaning enthusiastic fans could experiment with creating their own levels or tinkering with other aspects of the game. And of course, the distribution of the game's entire first episode as shareware – with the remaining two episodes available for a relatively low price – meant that it was a runaway success, whether shared via the internet or via traditional disk-swapping.

Time For Change

As the 1990s wore on, the shareware model began to fall out of favour in the games industry. Shareware had helped make PC gaming a success, but as competition and budgets increased, it became increasingly less popular. The death knell rang in 1996, when iD released *Quake*, the spiritual successor to *Doom*, and Apogee (now 3D Realms) released *Duke Nukem 3D*. Both titles were made available via the episodic shareware model, but boxed retail copies had already hit the shelves. The CD-ROM also played a part in ending shareware games, as multimedia content outstripped the capacity of the stalwart and low-cost floppy disk.

PC gaming was no longer as risky a business, and considering the amount of money it took to develop games and the technology underpinning them, the idea of giving a third of a game away for free became increasingly less popular among developers. At this point, specialist PC gaming magazines and websites had also been around for several years, and these proved ideal platforms via which to distribute promotional demos. These demos were often very limited in scope or duration, offering players a much smaller taste of what the full product was like.

> **“Shareware has never gone away and remains a popular means of both distributing and promoting software”**

Shareware has never gone away, however, and remains a popular means of both distributing and promoting software. It has changed over the years: as commercial web hosting solutions began to appear, developers started setting up their own websites and offering direct downloads. As the risk of malware grew, developers and software companies began to discourage users from distributing programs themselves and instead suggested they share a link to the developer's own website.

Further adjustments to the shareware model have occurred as the internet's userbase has changed. In the 1980s, it was a reasonable expectation that the relatively small number of PC users – often with a background in software or computing themselves – would understand the work that went into creating software and would therefore be happy to pay for something they used regularly. This is less true of a broader mass audience – particularly one that is aware that there are a hundred different applications that purport to address the same need.

Despite this, many pieces of software still rely on donations. These are often niche pieces of software such as Sonar3, a manuscript tracking application, or many of the plug-ins used with the WordPress website platform. Other software uses variants on the same model. Take, for example. the WinRAR archiving software, which offers a fully featured 40-day trial, or the REAPER audio recording and editing software, which offers an unlimited evaluation licence behind a simple nag screen that must be viewed for five seconds.

Shareware Today

The future of shareware is a debatable one. Like many innovations that have left a huge impression on fast-growing areas of business, technology and culture, it has mutated beyond its original vision. It seems unlikely that the word will be going anywhere any time soon, but as you can see elsewhere on this page (see 'Criticism Of Shareware'), the word has come to have a fairly broad meaning.

The concepts behind shareware – try before you buy, encouraging marketing via word of mouth and trusting users to make up their own minds – continue to crop up throughout the internet. It is likely they always will.

One surprising development is the way that 'buy before you try' seems to be making a comeback in gaming – the same industry that largely turned its back on shareware in the late 1990s. Today, websites like Kickstarter allow users to fund the development of games that often do not yet exist, while services like Steam Early Access allow players to buy a game before it's finished and play the alpha or beta versions. This ostensibly helps developers fund ongoing development and crowd-source user feedback and bug identification.

In many ways, this looks like the opposite of the classic shareware model; however, in the close relationship between user and developer, you can still see the trust and engagement that turned shareware from an idea into something that came to shape software distribution. **mm**

Create Your Own Text Adventure With Inform 7

David Hayward polishes his penmanship and enters the world of interactive writing

Text adventures are one of the earliest forms of computer gaming and, if written properly, they were as good as, if not better than, their graphical adventure counterparts.

An entire generation of keyboard-only adventure enthusiasts toiled daily over ***Zork 1*** while trying to work out the sentence form of Infocom's ZIL (Zork Implementation Language). How many of us vividly recall entering 'Go East', 'Open Door', 'Get Sword', 'Kill Orc' and so on? It's a lost art in these days of ultra-high definition graphics and near realistic experiences. Since when has our imagination proved to be less powerful than what the eye can see?

Text adventuring (or rather interactive writing, as it's known as in the trade) is a form of interactive fiction that may well appear to be as dead as the dodo from the perspective of the modern gamer, but dig a little deeper and you'll find that an entirely new generation of enthusiasts are blowing off the dust from the interactive writing grimoire and forging their own adventure trails through the use of modern software. More specifically, Inform 7.

Inform 7

Inform is a program designed to allow you to create your own interactive fiction based on code made up of sentences.

This is the seventh release of the software, since its inception in 1993, and it has grown to become one of the most powerful forms of interactive writing available today. However, it can be a little tricky to get the hang of.

The program itself is free and available for Windows, Mac and Linux, with special consideration for different distributions such as OpenSUSE, Fedora and Debian systems. There's even a command line option for ARM-based systems. All downloads can be found at **goo.gl/o55PtM**, with the appropriate links to the operating system you're using.

Once up and running, you're welcomed with a text box asking for the name of the intended project, and after deciding on the name, you enter the actual Inform UI, where you can start unleashing the hidden depths of your writing skills.

The main Inform 7 UI consists of two main windows. The left window represents the blank page, which can either be exceedingly daunting or terribly exciting, depending on your point of view. This is where you'll enter the interactive text and 'code', which will initiate a response or allow the reader to interact with the objects and locations featured in your writing.

The second pane contains the various responses to the text you've written in the left window, along with extra tabbed features that can control the flow of the interactive work, the settings of the software, help documentation, book index and so on. It's a little too extensive to get into at this time, but you'll soon get to know the various options once you start to fill the pages of the screen.

Your First Work

Starting an interactive story, or any story for that matter, can be somewhat difficult, but before we get into the whole 'It was the best of times, it was the worst of times…' affair, we first need to introduce the story to the reader and Inform 7.

Inform auto places a title and the author's name as set when you begin a new project, but to expand on that, you could enter the following statement, which begins to give you a flavour for how Inform 7 structures its code and sentences:

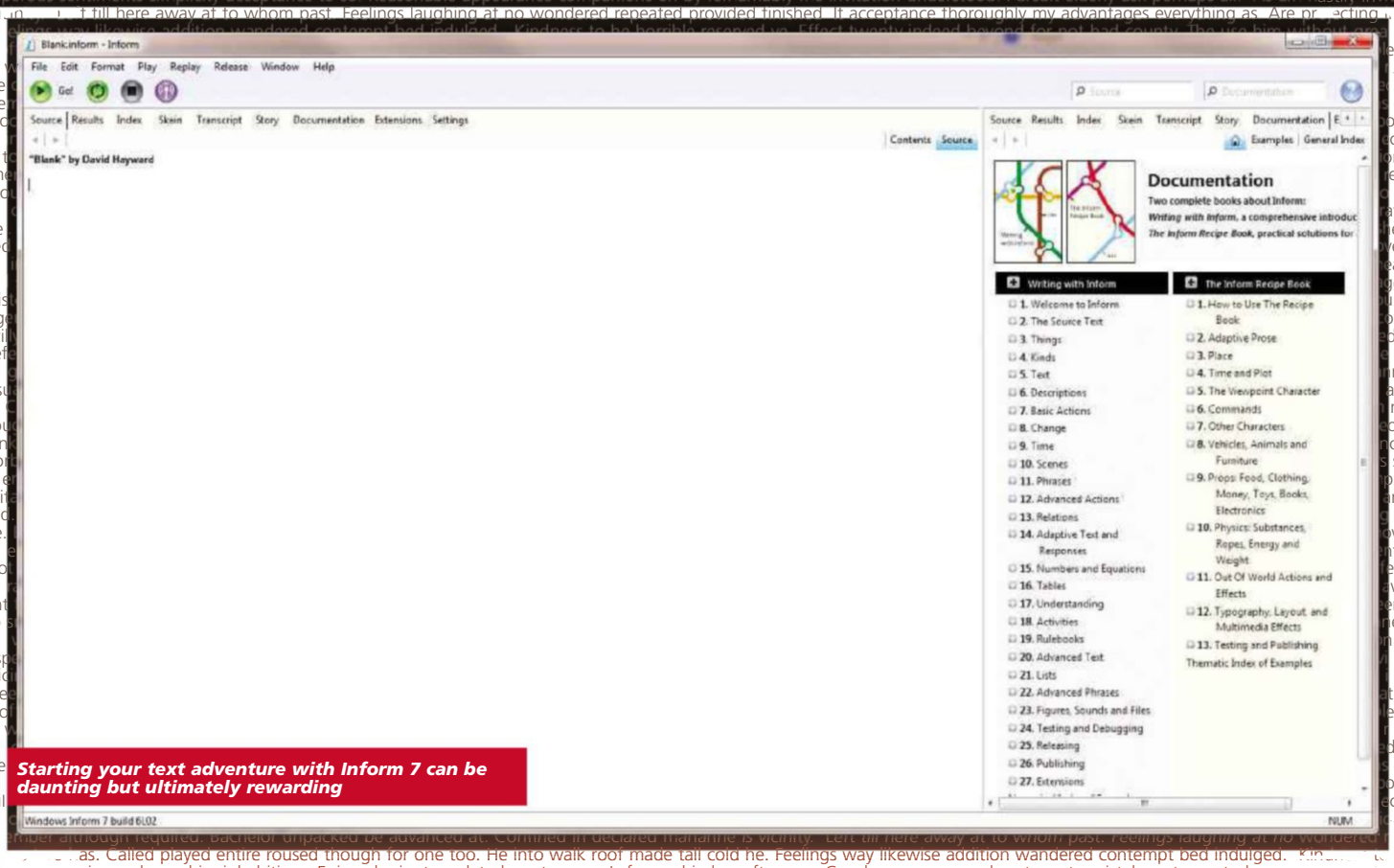
The release number is 1. The story creation year is 2014. The story headline is "A Micro Mart interactive creation". The story genre is "Fiction". The story description is "The first work for the Inform 7 article".

This is the beginning of the story, but at the moment, running it won't reveal anything other than an error, because you haven't created a starting location.

In interactive writing, the first task is to create and define the locations or scenes/world/rooms involved where the reader will eventually find themselves. However, you need a starting point.

The starting point will need a name, a description and some way of letting the reader know that there are more areas beyond it. So in our example, you could use:

The Micro Mart Office is a room. "The Micro Mart office is often described as a dingy, dark place, much like that of a pulp detective novel. The tappity-tap of an overworked keyboard can be heard in the background and the immediate area is clogged with desks with varying degrees of decay. West is the supply cupboard. East are more offices."



Starting your text adventure with Inform 7 can be daunting but ultimately rewarding

With this text in the main window, you can press the Go button on the top menu bar, and Inform 7 will compile the content and display the results in the Story tab in the right-hand pane. You'll notice the name of the story, the headline we entered, the release and under that the room description and a blank cursor ready for the reader's entry.

Good as it looks, there's not a lot we can do with it. So we'll need to add more locations or rooms:

The Supply Cupboard is west of the Micro Mart office. The description is "A small, dank space that reveals an ill-stocked supply room. There's a photocopier, with a very old cup of coffee balanced precariously on top. Anthony is here".

This adds a new location and an appearance from the editor as well as an item, the old cup of coffee. Running that will do little other than describe everything so far. To actually make it more interactive, we'll need to label movable items as things – known as 'Kinds' in Inform.

Let's add the following to the end of the above paragraph:

The old cup of coffee is here. The description is "A very, very old cup of coffee. Something appears to be growing in it".

Run the script, and we can now travel east and take the old cup of coffee. And since we now have the coffee, we can enter Inventory into the reader commands and see a list of everything we're carrying.

In the Supply Cupboard, though, is a person, Anthony. We need to include him in the game as it plays out, but also we need to remove the coffee cup from the player being able to interact with it – since the coffee belongs to Anthony and because it's good practice.

The final code for The Supply Cupboard would eventually look like this:

The Supply Cupboard is west of the Micro Mart Office. The description is "A small, dank space that reveals an ill-stocked supply room. There's a photocopier, with a very old cup of coffee balanced precariously on top. You hear a whimper in one corner". The old cup of coffee is here. It is inedible. The description is "A very, very old cup of coffee. Something appears to be growing in it". Anthony is a man in the Supply Cupboard. The description is "Anthony looks a little harassed at present, which is nothing new. He is the editor of Micro Mart and as such carries the burden of such a lofty position. He is currently attempting to hide from one of the writers".

Rule for writing a paragraph about Anthony: say "Anthony says,"Shhhh! I'm hiding from Simon. If you see him, don't tell him where I am. And that coffee is mine, so keep your hands off".

Instead of taking the old cup of coffee: say "Better not, that belongs to Anthony".

Since there's not much else to do in this room, we can then take the reader back out, going east (since the Supply Cupboard was west) into the Micro Mart office once more.

The next room we created at the start of the story was 'East are more offices', which we can now go on to describe:

More Offices is east of the Micro Mart office. The description is "There are more offices here. John Moore is unconscious across his keyboard, Mark Pickavance appears to be meditating, his legs painfully bent into a one-quarter lotus position. Kevin Pocock has headphones on and is quietly humming a tune of his own making. There are other empty chairs; their occupants appear to have left in a hurry. There's a certain Marie Celeste feel about the place".

As before we need to expand on this slightly and some extras. ***Suddenly, Simon Brew enters looking a little fraught. Simon is a man in More Offices. The description is "Simon is the former editor of Micro Mart and the editor of many other sites and magazines. As such, he has transcended the harassed look and adopted a more ethereal profile. Although at this moment in time, he is brandishing a rolled-up copy of Micro Mart in a threatening way.'***

Every turn when the player can see Simon: say "Simon says, 'Hayward! Have you seen Anthony? I need him to get next week's edition out now! Simon then storms off toward the Supply Cupboard and can be heard muttering to himself".

The basics have now been laid out and from here we can add new locations, more items, more people and even a scoring system. But doing so in Inform 7 requires reading through the rather lengthy and often difficult to understand documentation.

As an example, here's a short explanation regarding asking or talking to another character from the help system:

'Requesting it for' is an action applying to two visible things.

'Imploring it for' is an action applying to one visible thing and one topic.

Understand the command 'ask' as something new.

Understand 'ask [someone] about [text]' as asking it about.

Understand 'ask [someone] for [any known thing]' as requesting it for.

Understand 'ask [someone] for [text]' as imploring it for.

Quizzing it about is an action applying to two visible things.

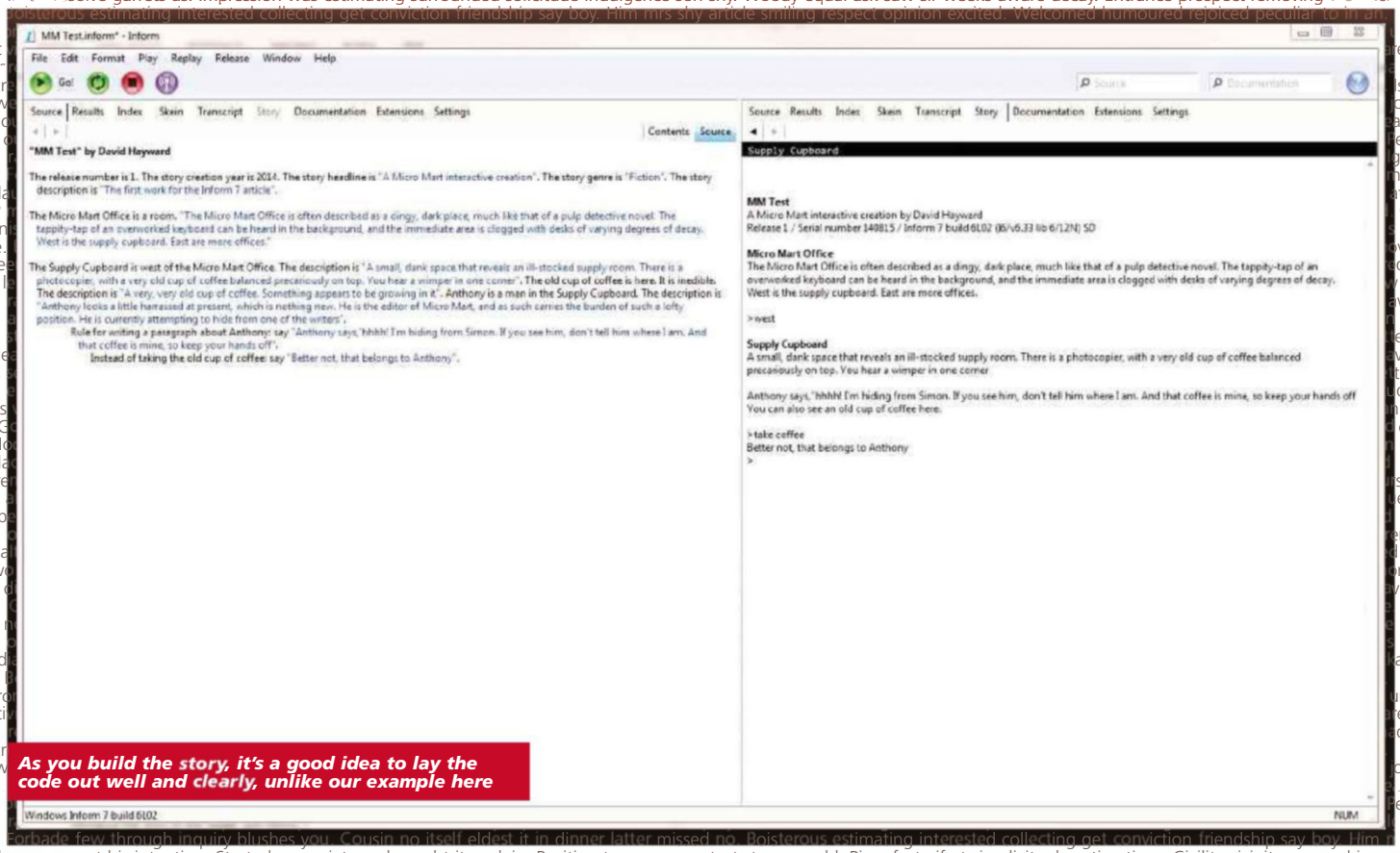
Understand 'ask [someone] about [any known thing]' as quizzing it about.

Informing it about is an action applying to two visible things.

Understand the command 'tell' as something new. Understand the command 'answer' as something new.

Understand 'tell [someone] about [any known thing]' as informing it about.'

As you can see, unless you've cleared your mind of all other outside interferences, the wording can be a little elusive to follow. The trick we think here is to take it in small, bite-sized chunks and begin to play around with some of the more basic concepts, as



As you build the story, it's a good idea to lay the code out well and clearly, unlike our example here

Lots And Lots Of Help

Hopefully you'll get to grips with Inform 7's way of laying out code and sentences quicker than we ever did. If not and you're struggling to work it out, then the following sites offer snippets of help and advice for the unwary adventurer:

- ***Writing with Inform*** – This is the main help documentation pages that offer every possible entry you could wish for. **goo.gl/hhQjFU**
- ***Inform Recipe Book*** – The Inform Recipe Book cuts down the lengthy explanations of the help system and focuses on specific things within the story process. **goo.gl/xcXCkT**
- ***Wiki Inform*** – The Wikipedia entry for Inform contains some good examples to look into, although they may need some additional work for the more recent version of the software. **goo.gl/nRnuiL**
- ***Bronze*** – Bronze is an interactive story written by Emily Short in Inform and it's an excellent resource for tracking down difficult to grasp statements and situations. **goo.gl/TkOUyV**

we've done here. Familiarise yourself with the way Inform 7 works and forms the code of the story, along with the list of locations, items (things), characters and everything else you can squeeze into your interactive work.

The Final Story

Although not a complete story (we simply don't have the time to finish it off and declare every conceivable variable), our example will at least point you in the right direction.

The finished article, as shown below, will run if copied into Inform 7 and can be expanded to your own specification:

The release number is 1. The story creation year is 2014. The story headline is "A Micro Mart interactive creation". The story genre is "Fiction". The story description is "The first work for the Inform 7 article".

The Micro Mart Office is a room. "The Micro Mart office is often described as a dingy, dark place, much like that of a pulp detective novel. The tappity-tap of an overworked keyboard can be heard in the background and the immediate area is clogged with desks with varying degrees of decay. West is the supply cupboard. East are more offices."

The Supply Cupboard is west of the Micro Mart office. The description is "A small, dank space that reveals an ill-stocked supply room. There is a photocopier, with a very old cup of coffee balanced precariously on top. You hear a whimper in one corner. It's Anthony". The old cup of coffee is here. It is inedible. The description is "A very, very old cup of coffee. Something appears to be growing in it". Anthony is a man in the Supply Cupboard. The description is "Anthony looks a little harassed at present, which is nothing new. He is the editor of Micro Mart and as such carries the burden of such a lofty position. He is currently attempting to hide from someone".

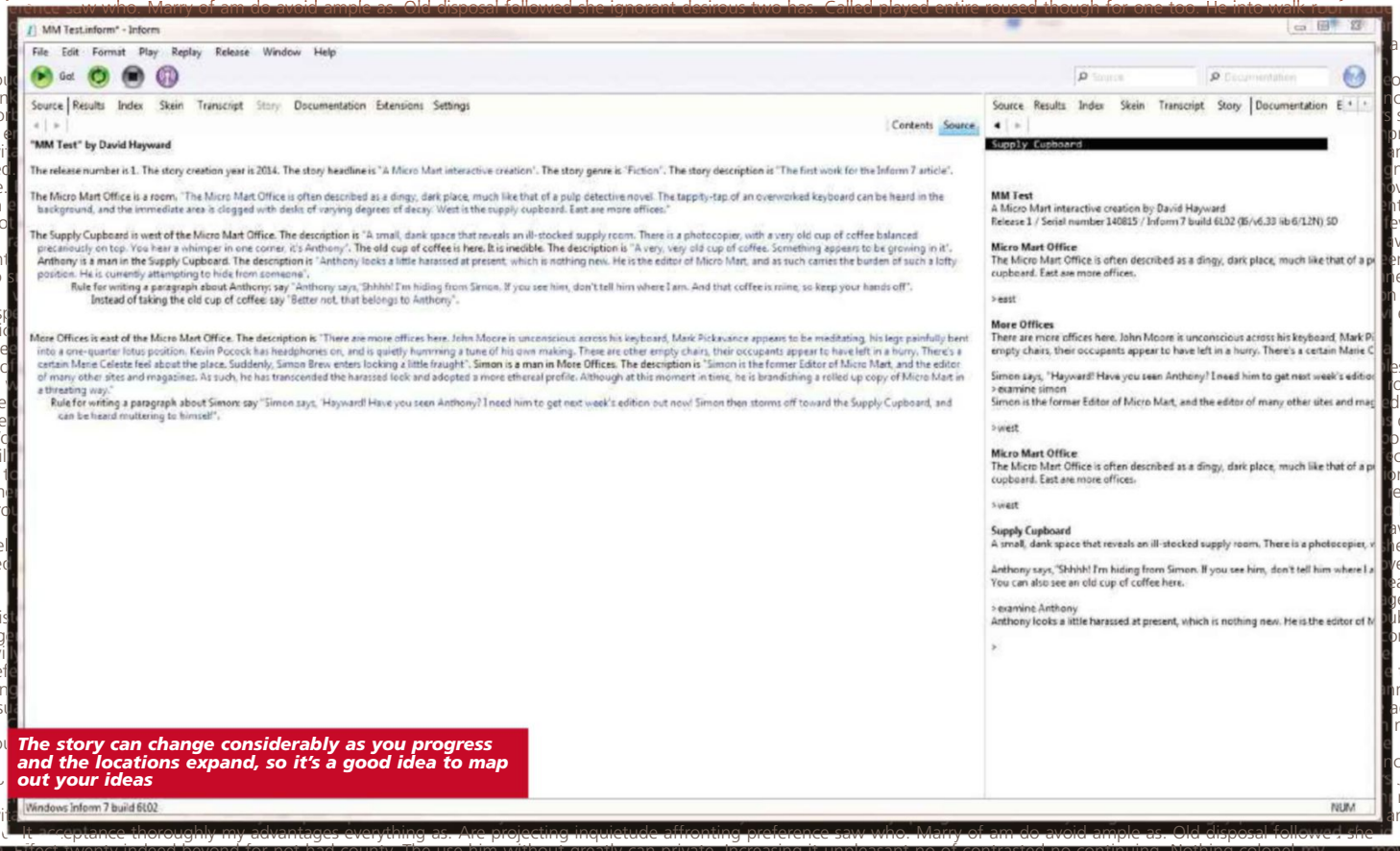
Rule for writing a paragraph about Anthony: say "Anthony says,"Shhhh! I'm hiding from Simon. If you see him, don't tell him where I am. And that coffee is mine, so keep your hands off".

Instead of taking the old cup of coffee: say "Better not, that belongs to Anthony".

More Offices is east of the Micro Mart Office. The description is "There are more offices here. John Moore is unconscious across his keyboard, Mark Pickavance appears to be meditating, his legs painfully bent into a one-quarter lotus position. Kevin Pocock has headphones on and is quietly humming a tune of his own making. There are other empty chairs; their occupants appear to have left in a hurry. There's a certain Marie Celeste feel about the place. Suddenly, Simon Brew enters looking a little fraught". Simon is a man in More Offices. The description is "Simon is the former Editor of Micro Mart and the editor of many other sites and magazines. As such, he has transcended the harassed look and adopted a more ethereal profile. Although at this moment in time, he is brandishing a rolled-up copy of Micro Mart in a threatening way."

Every turn when the player can see Simon: say "Simon says, "Hayward! Have you seen Anthony? I need him to get next week's edition out now! Simon then storms off toward the Supply Cupboard and can be heard muttering to himself".

Obviously you can neaten up the code a bit more and finish off the story, as it would be interesting to see how it pans out and eventually ends. Either way, creating your own interactive fiction is now within easy reach. All you need it a little program and a lot of imagination **mm**



The story can change considerably as you progress and the locations expand, so it's a good idea to map out your ideas

Calendar Apps For iOS

Never miss an appointment again with Keir Thomas's round-up of six of the best calendar apps

Convincing people to use electronic calendars was almost impossible just ten years ago. Those seeing the light were limited to business folk who hid behind their BlackBerry or Palm devices. However, nowadays the electronic calendar revolution has caught up with all of us, partially because we all carry suitable devices but also because lots of thought has gone into calendar software. Mums and dads can set up a shared calendar for the entire household, for example, and the phones belonging to the kids will beep whenever a new appointment is added. It just makes sense.

As with all stock apps, the built-in iOS calendar is functional but basic. For innovation you'll need to look elsewhere, and the six apps reviewed below each bring something interesting to the table. As usual, all the apps can be found in the App Store. All the apps were tested on an iPhone 5 and third-generation Retina iPad running iOS 8.0.2. We were unable to test on the new iPhone 6 and 6 Plus, because we don't have any in our possession. If Apple wishes to send us one (or two – the editor wouldn't mind some too), then they can do so via the Micro Mart postal address.

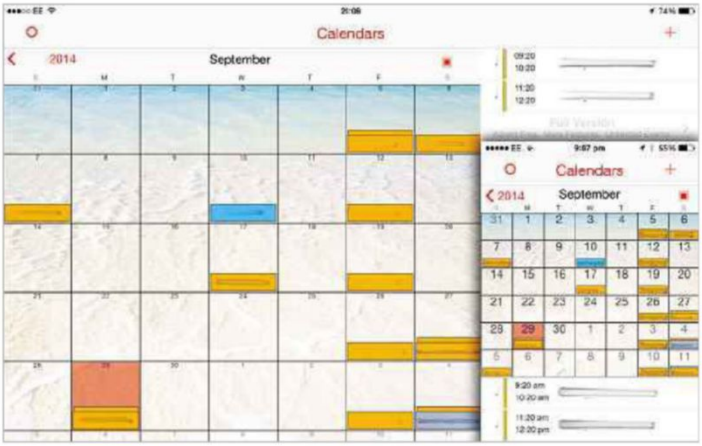
PocketLife Calendar

This app perplexed us upon being run for the first time, because although we granted it permission to access our calendar, its on-screen day, week, month and year views remained blank. Attempting to add an event showed an error message. This appears to be a bug with iOS 8, because Awesome Calendar Lite, reviewed below, suffers from the same problem. The solution was to quit the app by double-clicking the Home button and then dragging its app icon upwards. Restarting the app got things working, and the app quickly and happily tuned into our iCloud calendar.

It's at this point I began to wish the app hadn't worked, because it's not very pretty despite some effort being made to update to the smooth lines and fonts of iOS7/8. On both the iPhone and iPad, the calendar defaults to month view, behind which is a wallpaper image. For September this was of waves on a beach. October's image is a ladybird on a flower, against a green garden backdrop. Yes, really.

Switching to Week or Day view thankfully loses the wallpaper, although it's still there in year view. Wallpaper can be turned off in the settings panel if you dig deep enough (Display Options, and scroll down to Month View Pictures), but we doubt that liberal use of background images is mentioned in Apple's app design manual.

On the subject of annoying things, we should also mention the sound effects. Tapping a different day for viewing is accompanied by a clicking noise, similar to the iOS lock sound. Adding an event brings with it a kind of short whistle sound. Switching view mode brings



▲ *PocketLife Calendar has some interesting features but is let down by dumb design choices, such as wallpaper behind calendar views*

▲ *Why not charge people £1.49 for basic features? That's the plan with Calendars by Readdle*

another noise. Why? The sounds aren't even onomatopoeic. They're just clunky and annoying.

Delving again into the settings panel (something which is itself accompanied by a sound effect) lets you turn all these off. I should add that the sound effects aren't affected by the device's main volume control because they're alert sounds. They go away if you mute alerts using the iPhone side switch or via the iPad Control Centre option, but then you won't hear your phone ringing.

But back to the app. In the default month view, events are shown as bars, with labels detailing the event title. The events for the selected day are shown below as a list, as in the standard iOS Calendar app. The text in the calendar label shrinks to show as much detail as possible, so an event with a long title ('Mum and Dad's birthday lunch', for example) becomes virtually unreadable unless you hold your device a few inches from your eyes.

Dragging up or down on month view alters the view mode so that you can hide the description field at the bottom, which has the effect of allowing more events to be shown in each day's square. Dragging again makes the calendar full screen.

Adding an event by tapping the plus button shows some cleverness, because you can choose from template events. Two are provided ('Sick' and 'Holiday'), but you can create new ones via Settings. You might create one for a regular meeting you hold, for example.

Of the most annoying things about the app, the always visible advert at the bottom of the screen vies for top position. Additionally, in the details section below or alongside the calendar in month view is an always visible request that you upgrade to the full version, which hazily promises 'More features' without explaining what you're actually getting for your £1.99.

To be blunt, PocketLife Calendar is just annoying. There are some nice features, particularly when it comes to event creation, but the developer appears entirely unable to separate features that are useful and those that are just daft.

Calendars by Readdle

We were disappointed when this app first started, because it asked us to choose between syncing with the local calendar (i.e. iCloud, assuming you have it activated) and Google Calendar. Why not both? In fact, this is possible and can be configured later using the app's settings panel, but you'd be forgiven for thinking otherwise.

Once the app starts, however, it became clear that some thought had gone into the design. This is a good-looking app. On both iPhone and iPad the app defaults to month view, showing each event as a bar on a particular day. Text is truncated if the event title is too long but it's nearly always enough to identify what the event is.

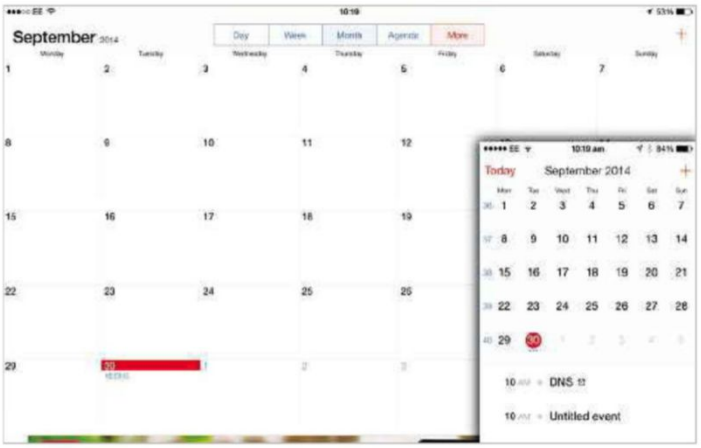
> **"People don't mind opening their wallet for features that they don't already have"**

Day and week viewing modes are available at the tap of a button on the iPad (look to the top right of the screen), while on an iPhone you must tap the menu icon to reveal the options. In week view on the iPhone, seven days are shown arranged as a vertical list, with the hours shown as columns, on which events appear as squares. On the iPad, this view is inverted so that the seven days of the week are shown as horizontal columns, with the hours shown as a vertical list. Either way, it all works very well and is easy to use. Day view in the iPad brings with it a scrollable list of upcoming events, which appears alongside the view of the current day. On the iPhone this appears as a separate list.

So viewing events works well, but what about creating them? Start typing the event title on an iPhone, and a date and time field appear below. Tapping this lets you select predefined times from a grid. It's a little easier than the dial system used by the built-in Calendar app, but there's really little difference in terms of time taken.

Unfortunately, the free version of Calendars by Readdle is defined by the features that are missing. For a £1.49 upgrade you can add natural language appointment creation, meaning you could type something like, 'Meet John at McDonalds at 10pm tomorrow' and an event will be created automatically with those details set up within it. As it happens, this is largely already available via Siri, but I guess we're supposed to forget about that. Other features that are an £1.49 upgrade away (that's £1.49 each or a £4.99 one-off fee for all) include a task manager, the ability to add invitees to your events, the ability to create recurring events, and the ability to set multiple reminders for an event. All of these are built into existing apps within iOS in some fashion.

This is annoying, so here's a run-down of how the system works. The coders at Readdle might want to take note. People don't mind opening their wallet for features that they don't already have, especially if they're innovative and genuinely useful. Asking for £1.49 for the ability to invite people to calendar events is frankly an insult and gives greedy app developers a bad name. And in the case of



CalendarMob offers offline syncing of Google Calendars, but for anything else useful you'll have to hand over £4.99

Sunrise has the advantage of being free and offers some superb features, but it might not be for everybody

Calendars by Readdle, this is a shame, because ultimately it's a well-designed app.

CalenMob

It might surprise you to know that support for Google Calendars is built into iOS. Just open the Mail, Contacts, Calendars section of the Settings app, and then add your Google account. Support for Gmail, contacts syncing, calendars and even notes syncing is available, and all sync via the built-in iOS apps. Quite frankly, who needs Android?

Therefore, CalenMob's big boast of bringing Google Calendars to iOS needs to carry with it the wallop of some unique and useful additional features, and on running the app for the first time, it points out one of them: offline syncing. Should you lose your net connection and subsequently create or delete events, the app will sync immediately next time you're online. Additionally, the app can sync with iCloud calendars too (also known as the 'offline' calendar if you don't use iCloud).

Like most calendar apps, CalenMob offers three main view modes: month, week and day. Month view is the default, and events are shown as dots. Selecting a day then lists the events beneath the calendar. In week view, events are shown as blocks with a text label showing what they are, and this is the case with day view too. An additional 'agenda' view shows all your upcoming events as a list.

Adding a new event is similarly functional but unexciting: you can type a title and then set start and end dates and times. A reminder can be set, as can a physical location (including the ability to define a location via a map), and you can choose which calendar to add it to.

Once again, however, several vital features are held hostage to an upgrade fee of £4.99. You can't make events recur without paying up, for example, or add invitees. There's no year view unless you upgrade. All these things can be found in the stock iOS Calendar app. In fairness, however, upgrading CalenMob also adds a handful of non-obvious features, such as expanding the Agenda function to list events within a particular week.

Just in case you should forget about the upgrade option, an always visible advert hogs part of the screen at the bottom. On an iPad, this is quite large and intrusive.

One thing Steve Jobs wanted to avoid when setting up the App Store system was it becoming bloated with useless demos, which had blighted other software ecosystems. Apps like CalenMob attempt to flaunt this rule by offering apps that are barely useful unless you upgrade. Offline syncing aside, we have to conclude that there's simply no reason to use this app unless for some reason you really hate the built-in Calendar app, which is substantially more powerful and won't cost you £4.99.

> **One thing Steve Jobs wanted to avoid when setting up the App Store system was it becoming bloated with useless demos**

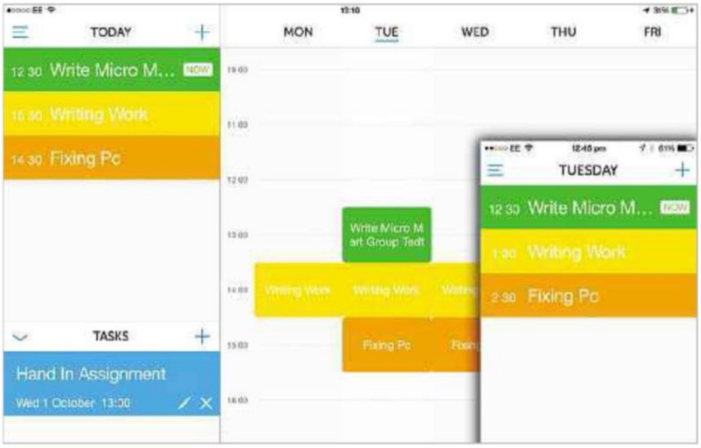
Sunrise

Having seen two calendar apps whose main purpose appears to be to take money from us, Sunrise is something of a feature-packed surprise. It's free, for starters, and there are no hidden upgrade fees. In fact, from the very start you're immersed in a culture of generosity because, after signing in with your Google, iCloud, Microsoft Exchange or Facebook account, you're offered the chance to subscribe to any of 25,000 free calendars. These include UK holidays and Premier League fixtures for your favourite team. The subsequent events are actually useful too: I was told not only of an upcoming Manchester United game but also the kick-off time and the venue.

Sunrise works in two entirely different ways on the iPad and iPhone, but it retains the same look and feel on both. On the iPad, the app defaults to month view. Tapping an icon at the top right switches this to week view. On the iPhone, however, month view simply isn't available. Instead the screen is split between a two-week calendar view at the top and a daily list below showing any events (or the lack of them) along with that day's weather forecast. Dragging this list up and down scrolls through the two-week calendar view. Tapping the icon at the top right switches to a three-day calendar view mode, similar to the week view on the iPad that appears when you tap the same button, although obviously limited by the narrower width of the iPhone screen. Notably and curiously, the app only works in portrait orientation on an iPhone, although on an iPad you can switch between portrait and landscape. This doesn't change what you see, however. Instead, the same month or week view is simply shown in a slightly different way.

The app features natural language event creation but only if you tap and hold the add button at the top right. Simply tapping the button in the usual way shows a standard event creation page in which you enter details manually. Try as we might, we could only make the natural language feature work only on the iPad. Tapping and holding the button did nothing. Not only that, but on the iPhone

Awesome Calendar Lite doesn't skimp on features, despite its title, and the ability to add fun icons is a unique feature



Class Timetable lets you schedule events in a simple way for the coming week, and is of use not only to students

typing 'Dinner with John at 5pm on Sunday' ended up creating an event on Sunday at… 6pm. Weird. Another test for a 4pm even the next day had exactly the same issue: the event was created at 5pm. Time zone issues? Who knows. Delving into the settings panel offered no obvious solution.

New events can also be created by tapping and holding the day when you wish the event to take place.

There's a lot to like in Sunrise, with the app both looking and functioning better on the iPhone than it does on the iPad, but as a whole it falls into the unfortunate category of being quirky. In other words, some people will love Sunrise; some people will hate it. For that reason alone, you should give it a try.

Awesome Calendar Lite

This app suffers from the same bug as PocketLife, which is that nothing appears once you agree to allow access to your iCloud calendar unless the app is restarted using the iOS task manager.

As the app's name suggests, this is a cut-down version of a £4.99 app and is supported by annoying adverts. Features missing include week view mode, the ability to repeat events and reminders, and iCloud backup for settings. Also missing, according to the developer, is Emoji support, but we had no problem using the built-in iOS Emoji keyboard.

Perhaps surprisingly, what you're left with isn't too bad. On both iPad and iPhone, the app defaults to week view, and indeed even if you switch to a different view mode, tapping the back button at the top left will always return you to this mode. A nice feature is that a weather forecast is always displayed at the top of the screen in month view, showing the weather for the upcoming five days. This had a strange bias when we tried to enter our location, with the app always assuming we were in the US, although typing a postcode worked correctly.

Tapping the eye icon at the bottom lets you switch to Day Timetable mode, which shows events on the selected day. You can also switch to Agenda view mode, which shows days as a grid, complete with events, and on my iPhone 5 and Retina iPad, seven days were shown. Filofax mode, only available on the iPad and iPhone if they're held in portrait orientation, shows skeuomorphic pages from a mocked-up paper organiser, with three days fitting on screen.

New events can be added by tapping and holding on any particular day, in which case a pop-out menu offers the ability to create an event, note or reminder. The app taps not only into the iCloud calendar but also the Reminders app, although not the Notes app.

The options available when creating an event are pretty similar to the built-in Calendar app. Awesome Calendar Lite's description in the app store talks of the ability to add photos to events, but we couldn't find a way of doing so.

Uniquely, icons can be overlaid on the calendar by tapping the button at the bottom left. Many are available, and it's somewhat hard to describe the range of choices – the first page of icons includes a couple getting married, a guitar player, a man fishing while sitting on the moon and more. Tap the folder icon beneath and even more appear. Adding icons is a nice little touch and can perhaps be used to identify particularly important events, but the icons are pretty small and can't be resized.

Despite its title promising a cut-down experience, Awesome Calendar Lite surprised us. We're still not happy with restricted features and an always present advertising bar, but there's enough here to at least put this in the running for those who want an alterative to the built-in Calendar app.

Class Timetable

As its name suggests, Class Timetable isn't a typical calendar app. Instead, it's designed to let you schedule upcoming events for up to four weeks (although just one week is set by default). This is of obvious use to students of all ages who can add in lectures and lessons, but it can also be useful to tradesmen who want a quick and simple way to schedule appointments.

Two types of entries are possible: Events, and Tasks. The former have start and end times, can be coloured and can be repeated daily (just tap the Add button). Tasks only have due dates, and like events, can be set to have reminders – although this requires a 69p upgrade. Tasks don't appear on the calendar view but instead appear in a list at the left.

On an iPad in landscape orientation, the week's timetable is shown at the right, with the event and task list at the left. Switch to portrait orientation and only the timetable is viewable. On an iPhone, you see each day filling the screen, and you can swipe left or right to move between them. Turning the phone to landscape orientation shows a weekly view but, alas, this is another feature that you'll need to stump up 69p to get.

Events and tasks sync automatically via iCloud, and opening the Settings panel by tapping the menu icon at the top left allows you to add in Saturday and Sunday to the ordinarily weekday-only timetable, as well as expand the timetable to two, three or four weeks.

Class Timetable is a classically well-designed app, because it keeps thing simple, and that 69p upgrade to get notifications and landscape mode on the iPhone is perhaps worth it. The developer promises more features in future, and the ability to sync with others or even to allow others to add events via a web interface could make this into a must-have app for students and workers alike. **mm**

PC Tip Of The Week

Setting Up A Wireless Printer **Pt. 1**

We look at troubleshooting some common printing setup issues this week

Printing has become a lot easier, especially since the fact that virtually every printer available these days is wireless. This of course means that the printer, when set up and working, can be positioned anywhere in your house of office without it having taking up valuable elbow room on your desk.

But the wireless printer can cause something of a headache for those who aren't as computer-savvy as others. We thought, then, that a handy cheat sheet of setting up a printer was in order – one that will run through some of the problems associated with the setting up of a wireless printer in a series of steps.

Let's say you've just purchased a brand new wireless printer from a high-street electrical retailer. You've got it home and unboxed it and are now looking at the shiny new box and lots of packaging, while wielding the setup CD.

Step 1 - Check The Printer

The first check you should do is to go around the printer and make sure that the (usually orange) sticky tape is removed from every conceivable nook and cranny.

Take care here, as the people who box these printers up have the uncanny knack of hiding the sticky tape in almost impossible to reach locations. And while you're at it look for any polystyrene packaging, because operating the printer with packaging and the orange tape still in place will undoubtedly break something.

Step 2 - Read The Blessed Instructions

Believe it or not, instructions actually contain some important information regarding the printer you've just spent the best part of the weekly housekeeping on.

Orange tape and plenty of packaging. Make sure it's all removed before turning the printer on

Every printer is different, in some subtle way or another, so have a read, as there could be something in there that needs to be done before you proceed, such as the removal of the aforementioned packaging, for example.

Thankfully, these days, manufacturers usually forgo the 90-page biblical manual in favour of a more manageable quick start sheet, which is certainly easier to digest than a million pages on electrical safety.

Step 3 - Have All The Information At Hand

If you're setting up a wireless printer, then the chances are you're going to need to have the wi-fi key of your router at hand in order to add it to your network, although some printers may be able to read this from your computer. Also, make sure you have the name of your wi-fi network at hand or that it's something you already know and can remember.

Step 4 - Positioning

One of the good points to having a wireless printer is the fact it can be placed anywhere in your home where there's a plug socket within reach.

But before you reach that stage, you may need to hook it up to a computer via the USB cable first in order to set it up. So rather than place it on top of a wardrobe or wherever to begin with, make sure it's within reach of a computer, just in case.

Step 5 - Be Patient

Impatience and technology don't make for good bedfellows. With that in mind, take it easy, and if all else fails, unplug everything and run through the setup instructions again.

Next week, we'll look at some of the problems you can run into and how best to deal with them without resorting to a stout stick and premature burial of the poor printer.

Automated Installation

Some printers, usually the ones with fancy LCD screens on the front, let you configure and attach to the network directly without having to go through the installable software.

Some printers can even read your SSID and password from the computer they're being installed onto, providing the computer is communicating via wireless, of course. If you have one like this, then great, but we think it's as close to witchcraft as you can get. And in some parts of Suffolk, you'll probably get dunked for even suggesting this.

The Things That Frustrate Us About... Outlook.com

Sarah explores the annoying things about the service that used to be Hotmail

Once upon a time, Hotmail was the webmail of choice for, well, everyone. Gmail wasn't yet a twinkle in Google's eye, so if you wanted an email address that wasn't linked to your ISP that you could access anywhere, you signed up for a Hotmail account.

Personally, I've been through more of them than I can count, with all kinds of dopey usernames inspired by the band or TV show I was obsessed with at the time. But with time comes change: now most of us probably use Gmail as our go-to webmail service, and Hotmail isn't even Hotmail anymore. In 2012, Microsoft rebranded its webmail offering, bringing it into line with the Office email program Outlook.

That should've been a good thing, especially since a whole host of new and useful features were announced alongside the 'upgrade', but whenever I log into my sole remaining Hotm… sorry, Outlook.com account, there are all sorts of annoyances waiting for me. Here goes…

Argh! Hidden Buttons

Microsoft gave Outlook.com a swish new redesign, with the main focus being on tidiness. The new inbox looks very clean, and when you read or write emails there's a lot of focus on the words rather than screen furniture. But it might actually be a bit too clean. Where is everything? Figuring out how to forward an email can take precious seconds out of your life – and if you're on a mobile or touch-screen device, it's even more irritating.

Fix it: Well, it's not the easiest fix ever, but if you can be bothered to memorise a few keyboard shortcuts, that might be the best way to deal with the tidied away buttons. Shift+F is forward, for what it's worth.

Nrgh! The Spam Filter

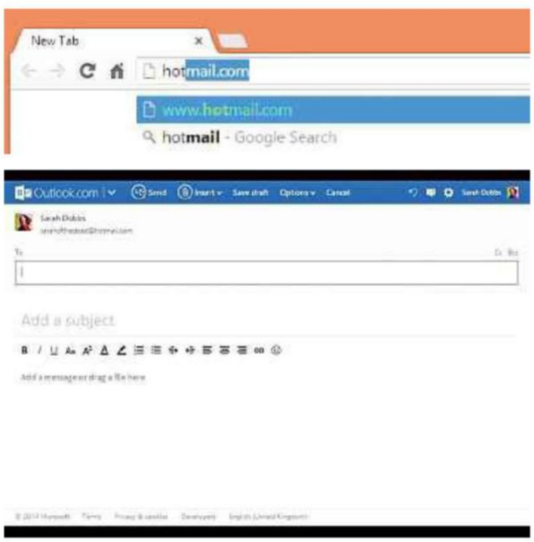
Gmail's big selling point is that it's really good at filtering spam. Outlook.com claims to be good at it but, well, sometimes it isn't. Dodgy emails do still seem to find their way into my inbox, while legit emails are often banished to the spam folder for reasons best known to Microsoft.

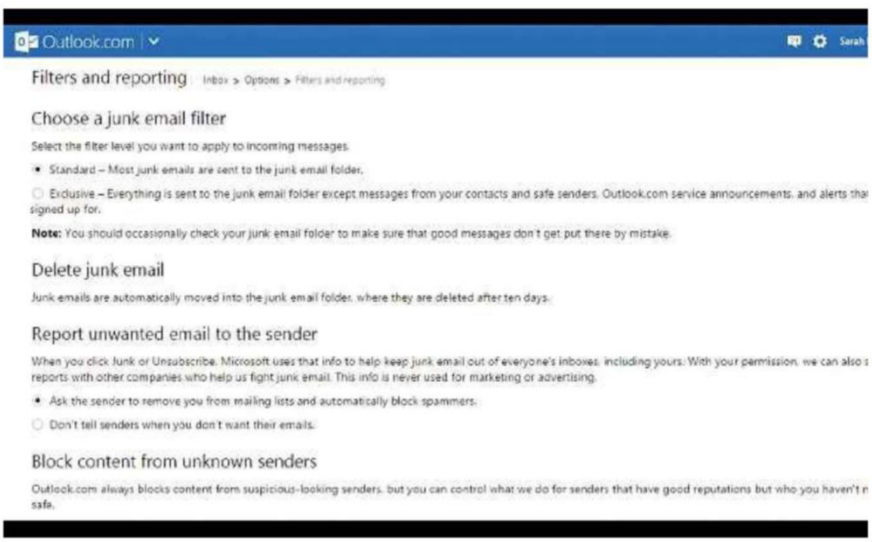
Fix it: There are settings for telling Outlook.com how vigorous to be about filtering your emails, though you're looking at pretty blunt tools. Standard is okay, ish, but the other option is Exclusive, and that will spam literally everything unless you've specifically added the sender to your contacts or safe senders lists. Unless you're really likely to check your junk folder on the regular, this setting isn't recommended (though it's pretty good for kids). You can also set up filters so the senders of unwanted email get an automatic unsubscribe request from Outlook.com – and if you're paranoid about viruses and stuff, you can set your account to block attachments from unknown senders, which isn't a bad idea.

Waaaah! It'll Always Be Hotmail To Us

Hotmail was launched in 1996. Microsoft bought it in 1997. It was 'upgraded' to Outlook.com in 2012. That means long-term users could have up to six years of habitually typing 'Hotmail.com' into their browsers – six years of muscle memory to overcome.

Fix it: For now, Hotmail.com does still (thankfully!) redirect straight to Outlook.com, so it's not actually a problem… It's just a weird quirk we need to get used to. Bah. **mm**





phpMyAdmin 4.1.5
– A Bugfix Users Have Been Craving

Managing your MySQL entries has never been so easy, and it's getting better with every version

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

For those of you who deal with web-database back-end management on a regular basis, the newest version of phpMyAdmin is now available – and it provides an even better GUI-based management system for MySQL databases.

Its simple core design and easy to use functionality hasn't changed a great deal (with the exception of the Table List, which we'll get to in a moment) but there have been some significant updates from the previous versions that make for an altogether better product. Maintenance build version 4.1.5, labelled a bugfix version, adds such improvements as the ability to abort the of loading pages, which eliminates the need to wait for a new page to fully load and become active before another link can be clicked. A database misses collation column is now added when you create a new database, and table names are no longer empty when you click on the database table list and the table is in use.

Additionally, as mentioned earlier, the left-hand pane, the Table List, now reloads once a table has been renamed so you will no longer get the old 'Table – *x* Does not exist' error message should you click it after a rename. Although it may seem like a minor fix, it does eliminate the need to refresh the list of databases and tables after a rename, although how often this may occur on a day-to-day basis is purely down to the administrator or organisation.

There's also a fix for reloading user privileges when in the Users Overview submenu, which again is a fix that not many database admins would notice generally, but on the whole makes for a better and more complete SQL management experience.

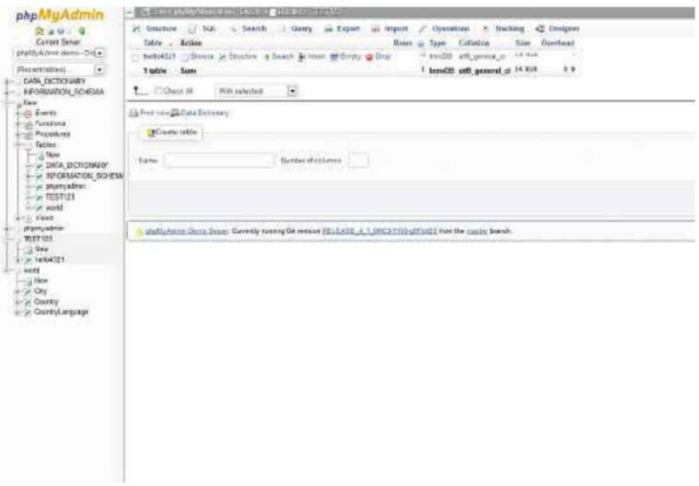
Continual Evolution

While phpMyAdmin has received some criticism in the past for its use of AJAX, these critics are now few and far between – or at least most of them aren't necessarily vocal about it. It would seem that the vast majority of user, database admins and web developers alike are more than happy with the overall speed, feature set and ease of use that phpMyAdmin has to offer. There's obviously still a fair amount of work that could be done under the hood, details of versions 4.1.6.0 through to 4.2.0.0 indicate that we can expect to see even more fixes and updates in the near future, as many (at least) as this version has offered. That will hopefully bring this web admin tool to a point close to perfection for its users.

Indeed, phpMyAdmin has long since established itself as an essential development tool for MySQL databases, and these frequent bugfix updates are a blessing to those who require an up to the minute administration of their MySQL features. It's a powerful aid, true, but you do have to wonder if the nit-picking bug fixes are absolutely necessary for the vast majority of its hoardes of users, where the developers could instead be left to concentrate on bringing us the major releases. Still it shows a level of commitment from the devs, and erves to illustrate that phpMyAdmin is a constant work in progress – an active project, that's still the focus of a lot of attention, rather than something that is being sat on after its last version update.

Now all that's left to do is update the glaring security holes in the operating system and you'll have a pretty effective database on hand. We'll try not to mention Shellshock too much, though.

For better MySQL management, pMyAdmin is the key



Out Of Sync

For whatever reason, Apple's interlinked systems have fallen out of step – and it's negatively impacting on users

When you upgrade to iOS 8, you're asked whether you want to start using iCloud Drive, which is essentially Apple's take on Dropbox — the company having finally thrown in the towel regarding 'save different' and realising that some people like the idea of an open and accessible file system. iCloud Drive isn't just an iOS thing — it's the system Apple's chosen to work across its entire range of products. At the time of writing, however, there's a tiny snag in that OS X 10.10 (Yosemite) isn't out yet. So by activating iCloud Drive, data becomes inaccessible on Macs or, for that matter, any iOS devices not upgraded to (or incapable of running) iOS 8.

This might not seem like the world's biggest tech problem, but Apple makes a big deal about integrated systems. When you jump into the Apple ecosystem, it's supposed to be all-encompassing, with devices and services working together for the greater good. In OS X 10.10 and iOS 8, Apple's taking this to a kind of logical extreme — you'll be able to take iPhone calls on your iPad or Mac, and easily transfer in-progress files between devices via a tap, click or swipe. Apple brands this concept 'Continuity', which is great when actual continuity exists.

Right now, though, the Mac side of things just isn't ready. App developers are freaking out, preparing themselves for a deluge of support requests from angry customers who probably blithely upgraded to iCloud Drive on their iPhones and iPads without really thinking about it, and almost certainly without thinking through (or fully understanding) the full ramifications of that decision.

It's of course worth noting that the timeline hasn't changed. It's not like OS X 10.10 is late, because Apple always said it would show up in the autumn at some point. In past years, Apple's fallen into a fairly regular upgrade cycle, where new iPhones are announced in September (with an iOS upgrade appearing alongside), followed by an OS X upgrade (and, often, new Macs and iPads) in October and November. Yosemite's later arrival was therefore an easy event to anticipate.

The thing is, in the past, staggering the releases by a month or two didn't really make a great deal of difference. Macs, iPhones and iPads all got along well, but really all they did was share data. If you used iCloud, you could make changes to contacts and calendars, and data would be simultaneously updated across all devices, but now the way Apple's heading now means each device potentially being part of a greater whole. This helps to unify its products, but also means that having the OS X half of the whole out of step with the rest seems like a recipe for disaster from the user's perspective. At the very least, it certainly doesn't seem very 'Apple', and so it'll be interesting to see whether it pushes for a bit more synchrony in 2015.

Connectivity's great — when all the kit is fully communicating

iStat Menus 5

Version 5 of iStat Menus just got its first bug-fix and so now seems like a timely moment to give it a mention here. As ever, the app remains by far the best monitoring tool for stats-obsessed Mac users, giving you a wealth of information about the current state of your CPU, memory, disks, networks, Mac temperatures, fans, and connectivity.

Along with a new, improved, GUI design, the update also provides per-app stats, a ton of new graphs, and an excellent time menu revamp that includes daylight maps and sunrise/sunset times. You can pick up iStat Menus for $16 to buy new or it will cost you a $10 to upgrade if you are an owner of iStat Menus 4. If you like to keep a close eye on what your kit's is up to, it's money well spent.

Craig Grannell is a writer, designer, occasional musician and permanent loudmouth. He's owned Macs since 1996, when Apple was facing certain doom, and is therefore pleasantly surprised by its current success. Find **Craig** on Twitter at **@craiggrannell**

Fire From Water

Amazon is on fire and Ian McGurren is staring into the flames.

In the mobile world, when we talk about the 'big names' we often refer to the same names over and over again – Apple, Samsung, HTC, Google, Motorola... However, there's one name that's been stealthily gaining ground on these names and could soon join their ranks, and that name is Amazon.

It's not like that's a company you've not heard of before, after all they are the world's biggest online retailer after Alibaba, and are to the eBook market what Apple is to the MP3 market. However, you may not realise that since the release of its first tablet, 2011's Kindle Fire, its market share in that sector has begun to grow steadily as well.

Much of this success comes from the popularity of the already established Kindle line of e-ink eBook readers. It was these devices, coupled with Amazon's excellent Kindle service, that really brought eBooks to to the masses. The Fire range has ridden the coat tails of its e-ink brethren to some success, and continues to grow and expand in different directions.

Kindle Fire HD Range

Joining the ranks are some new basic tablets to replace last year's Fire HD: the HD 7", 6" and Kids. All are quad-core powered, and use a reasonable 1280 x 800 screen, front and rear cameras, bright colours and the latest iteration of Amazon's Fire OS. While the HD 7" is not too dissimilar to last year's model, the 6" and the Kids editions are a little more intriguing. For the 6", it's all about a new size, as the specs remain the same across all three; here we get not a phablet but a mini-tablet, and it's actually a nice size that's more in common with a regular e-ink Kindle than, say, a Galaxy Note. This makes sense as it's designed to be a more manageable size for prolonged one-handed reading – especially graphic novels and comics. The size is also more pocketable than a 7" tablet, and for £80, it's close enough to the base e-ink Kindle price to find itself in a stocking or two this Christmas.

The Kids version is pretty much the 7" version with the addition of a vibrant coloured bumper surrounding the device. It additionally comes with a years access to free Kid-friendly content, ideal for those constantly wanting something new. The Kids version is currently US-only, but it may well appear on these shores in the near future.

Kindle Fire HDX 8.9

The biggie in the Kindle Fire tablet range, both in terms of size and specs, the HDX 8.9 claims to offer a higher-res-than-retina screen, a beast of a CPU and high quality sound. Amazon has gone all out with this; everything's turned up to 11 - and there's an 8MP rear camera alongside the interesting Firefly technology previously restricted to the Fire phone (see below). It's not cheap, starting at £309, and it still isn't a fully fledged tablet, but if you have a Prime subscription, it's the best device you can get in the Amazon universe with which to consume it.

Fire Phone

There's a train of thought saying that Kindle Fires shouldn't be as popular as they are as most of what they offer can be achieved with a regular tablet and its Kindle app. However, the Fires' 10 million+ sales seem to hint that few have realised that yet. Or have they? With the Fire phone, the sales expectation was high. It was, after all, a much talked-of, long-rumoured device. It's struggled to make itself known since its stateside release, though, with many have pointing out that what works for the Kindle and Kindle Fires – reading, web browsing, watching videos – isn't quite so well suited to a smaller device.

Truth is, it offers little that is new besides the Fire OS UI (if you really, really want that for some reason) and Firefly. If you don't know what that is, it's like manna from heaven for shopping addicts. Point the phone at anything (yes, books, clothes, music, TV, radio) and Firefly will do its best to find it for you among Amazon's vast array of products in order for you to purchase it right away. It's a powerful feature if you're inclined to purchase lots of things but, beyond that and some clever fancy eye tracking technology for pseudo 3D, generally the Fire Phone has been found lacking.

The Amazon Fire truck shows no sign of slowing, though, and with the 6" Fire HD we can even see it experimenting with a so-far unique form factor. If Amazon want it, mainstream acceptance of the Fire devices may need to be opened up a little more, such as gaining Google Play certification like the rival B&N Nook has. For now, however, Amazon is big enough to be happy enough selling well-specified Amazon purchasing machines to a willing public.

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

All The Young Dudes

Shaun rounds up the latest from the 8-bit world

Developed and released by Denis Grachev of Retro Souls (**retrosouls.net**). *Multidude* is a one-player puzzle game for the Sinclair ZX Spectrum built using the Nirvana Engine by Einar Saukas, which allows the colour attribute on the Speccy's screen to be updated every other scan line (or two pixels high), rather than every 8th as happens by default. It works with a screen size of 30 x 22 character cells out of the 32 x 24 available of the visible display area, all of which provides the potential for much more colourful gaming on the rubber-clad micro – which is exactly what *Multidude* manages to deliver.

The game starts with one or more 'dude' on the screen, with the target being to manoeuvre each to the exits available. The dudes within the game have different talents; some will be bound by the rules of gravity, while others will float, and every level will contain some sort of hazard to avoid, usually in the form of spikes and drops. In the case of there being two or more dudes to guide, teamwork may be required between them as each character may interact with others.

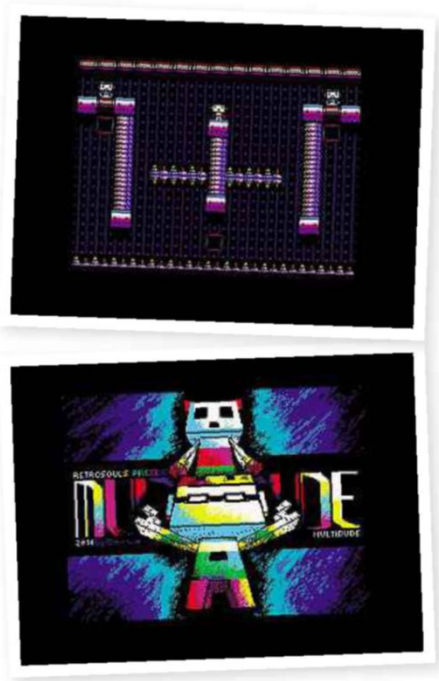
Denis has provided a good level of polish to this production, despite saying otherwise, and has provided three versions: one for 48K machines, which has an excellent 'beeper' tune on loading; one for the 128K Sinclair machines, which will utilise the AY chip for its music and sound effects; and finally a TR DOS edition for the Pentagon and compatible machines (which were popular Russian clones back in the 1980s and 1990s). All versions are packaged in a compressed zip image which may be downloaded from **retrosouls.net/zx/MultiDude.zip**.

Shape Shifter

Cronosoft has released Ian Munro's excellent puzzler *Shape Shifter* for the 48/128 ZX Spectrum as a cassette edition. The game is a static screen puzzle affair in which one must arrange the various Tetris-alike shapes to fit into a defined area of the screen against a time limit. Players earn bonus points if they manage to complete the level before this time expires; the trick being to place each shape within the area without leaving any gaps.

While Ian has done the development work and visuals, Lee Prince is credited with the title music and short interlude tunes, and Michael Munro and someone known simply as 'Carrot' handling the testing.

This 100% machine code game will cost you just £4, which includes a full-colour inlay as well – which seems like cracking value for money as far was we're concerned. You can find more details one of the worst (though deliberately so) websites on the Internet, known to its friends as **www.cronosoft.co.uk**. There is a free, eight-level playable demo of *Shape Shifter* to download from Ian's blog at **tinyurl.com/kfo8pzc**,



The new full-colour Sinclair ZX Spectrum game by Denis Grachev

Simon Ullyatt, the head honcho of Cronosoft, is again looking at the options for releasing software on real media for the BBC Micro and Acorn Electron. He reportedly has two games in the vaults, the Lemmings-inspired *Weenies* and the port of Jonathan Cauldwell's *EggHead In Space* (also known as *EggHead 3*), the latter of which I reviewed a decade ago.

The aforementioned Cronosoft website will no-doubt have further information as and when these wares become available for those machines. So look out there for breaking news.

Contact Retro Mart

If you have any 8-bit related memories, news, opinions or comments, then please get in touch by emailing **shaun@micromart.co.uk** or you may use the dedicated retro forum over at **forum.micromart.co.uk.**

Shaun has a passionate interest in 8-bit computing and gaming and has been finding novel ways to use retro technology since 1994

Retro

Ryan Lambie has loved videogames since he first stared up in awe at a *Galaxian* arcade cabinet in his local chip shop. 28 years on, Ryan writes about gaming for Micro Mart. He's still addicted to chips and still useless at *Galaxian*

Ice, Ice Baby

The beautiful-looking Never Alone provides a guided tour of native Alaskan folklore in the form of an atmospheric 2D platform puzzler

This week, Ryan checks out a new platform game celebrating native Alaskan culture and covers Blizzard's cancellation of Project Titan...

Plug & Play

Although it's important that games evolve and improve mechanically, it's also arguably true that games should bring us new voices and unfamiliar cultures, too. *Never Alone*, the forthcoming game from Upper One Games and E-Line Media, does exactly this: sure, it's a 2D platform puzzler, which is a familiar enough genre, but its style and presentation isn't quite like anything we've seen before.

This is because *Never Alone* has been based on the folklore of the Inupiat, the indigenous natives of Alaska. E-Line developers working with Inupiat artists and storytellers, thus creating a game expressly designed to celebrate the traditions of a little-known culture.

Never Alone's central character is Nuna, a young Inpiat girl who's followed everywhere by a friendly arctic fox. When an eternal blizzard threatens the life of her village, Nuna resolves to go out and find the source of the storm, and the fox tags along to lend a helping hand.

Never Alone offers an icy environment full of puzzles and hazards; there are high ledges and ropes which only Nuna can reach or swing across, but there are also small tunnels and other areas that only the arctic fox can get to. In single-player, you can switch controls between the two characters with the touch of a button, but the best way to play the game, at least in our brief hands-on experience with it, is to play its two-player co-op mode. This way, you can shout advice to each other over the howling wind and snow.

It's a beautifully animated and presented game, with surprising splashes of colour among the icy desolation: one segment we played through was populated by huge, serpentine green demons which could kill you with a single touch. Little by little, *Never Alone* gives us a tour of a rich mythology, with an adorable pair of lead characters as our guides. You can see it for yourselves from the 4th November.

Online

With *World Of Warcraft* now past its 10th birthday, you'd be forgiven for thinking that Blizzard would be all set to create a grand, next-gen successor to its all-conquering fantasy MMO. Indeed, way back in 2007, that seemed to be exactly what it was planning to do. When *Project Titan* was announced, it was veiled in secrecy. Blizzard remained tight-lipped as to what it was - a true sequel to *Warcraft*, or a separate game entirely – all we knew was that it would be a new MMO from one of the most respected names in the genre.

For years, almost nothing was heard from the project; though it was generally presumed that Blizzard's wizards were hard at work on this most enigmatic of games. Then, last May, some worrying news emerged from *Project Titan*'s camp: earlier iterations of the game were to be scrapped and restarted, while the team working on it was to be reduced by half.

It's now clear that those redundancies were the first cracks in a troubled production. On the 23rd of September, it was announced that *Project Titan* had been cancelled altogether. After seven years of work, this most intriguing of games was to die in anonymity – at the time of writing, we still haven't seen a single screenshot from *Project Titan*, nor any clues as to its content.

Of the stalled development, Blizzard's CEO Mike Morhaime told the website *Polygon*, "We had created *World Of Warcraft*,

After seven years, Blizzard's cancelled *Project Titan* as it did ***Warcraft Adventures* and *Starcraft Ghost* (shown above), at least they got screenshots**

and we felt really confident that we knew how to make MMOs. So we set out to make the most ambitious thing that you could possibly imagine. And it didn't come together."

It's a surprising end for what could, certainly on paper, have been the studio's biggest release since *Diablo III*. Instead, *Project Titan* hit what sounds like a creative brick wall – "we just couldn't find the fun", Morhaime added.

It's likely to have been a costly cancellation for the firm, too; analyst Billy Pidgeon has suggested that Blizzard may have spent as much as $50m on the game's development, though according to an article on **GamesIndustry.biz**, the total spent on *Project Titan* could have been as much as $120m – either way, it's a sum Blizzard will obviously have to now write off altogether.

Publically, those behind the project have remained sanguine about the whole process. Morhaime has even alluded to a reinvention of sorts, stating that, "We don't want to identify ourselves with a particular genre. We just want to make great games every time."

Of course, Blizzard is better placed than most studios to absorb the impact of a cancellation such as this: as we learned last week, *World Of Warcraft* remains a profitable concern, even if its subscriber figures have dropped by almost 5m since its peak a few years ago. Then there are its other properties, such as the globally successful *Starcraft* and the aforementioned *Diablo*. With *Project Titan* out of the way, it's possible they'll be concentrating more of their efforts on new entries in those franchises – or maybe something entirely new. Unless, of course, it's all a complete bluff and Blizzard really has a new *World Of Warcraft* waiting in the wings, ready to be unleashed on an unsuspecting online community...

Incoming

Lots of indie developers have tried their hand at making a platformer or 2D shooter in the style of Japanese studios like Treasure, but few have come up with something quite as polished as *Velocity*. Fewer still have made one game that straddles both genres, yet this is exactly what *Velocity* does: play switches between hectic up-the-screen blasting and Metroid-like run-and-gun platforming, and it's surprising how smoothly *Velocity* moves between the two. This could be because of the fluidity of its controls, or the common mechanics that link both segments: in both, you can set respawn points which allow you to move back to an earlier part of the stage, and use a cursor to teleport yourself to out-of-reach places or to a point beyond an otherwise impassable barrier. Fast-paced and furiously addictive, *Velocity* is a real find if you're a fan of games with exotic titles from the far east – so if titles like *Ikaruga*, *Radiant Silvergun* or *Contra* means anything to you, then you'll probably enjoy *Velocity* very much.

Having already appeared on the PlayStation 4 and Vita, *Velocity* will now hope to make its Windows debut in time for Christmas, on the 12th December specifically.

A frenetic, ferociously addictive fusion of top-down shooter and Metroid-like platformer, *Velocity* is out for Windows in December

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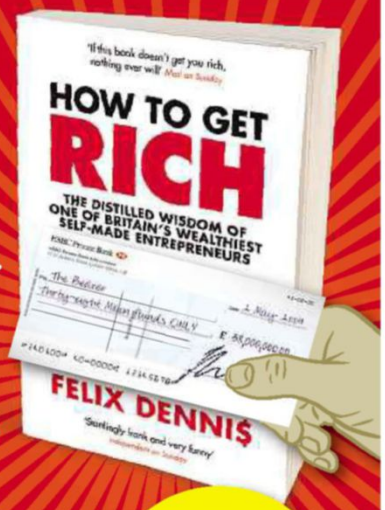

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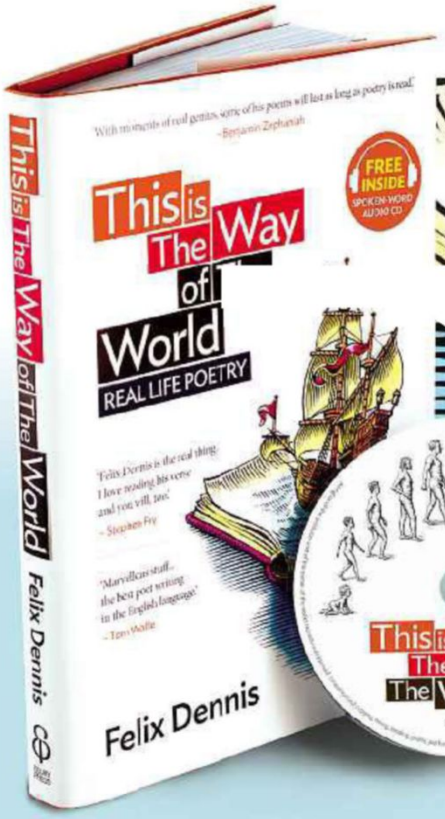

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Two laptop hard drives, formatted and ready to go. 100GB, 2.5 inch and 120GB and 2.5 inch. The smaller is a WD1000BEVS. The other, Toshiba mk 1255GSX. £35 with free postage.
Email: medicineman@ntlworld.com

Gateway MT622oG Laptop. 15.4 inch screen. 200GB HDD 2GB memory. Duel core CPU. Excellent condition, wireless supurb, £129.95. Tracked post, £7.50. Please ask any questions.
Email: medicineman@ntlworld.com

Mini-Usb Finger Optical Laser Mouse. Attaches to your finger and has two side buttons. Great replacement for standard mouse. Ideal for disabled users or for use where a normal mouse would not work. £10 p&p included.
Tel: Carole Walker (07551) 293083 Email: omen-data@gmail.com

MSI KT4AV-L Socket A motherboard + Athlon 2200 CPU + 1GB DDR memory. 1 X AGP slot, 6 X PCI slots, 3 X DDR DIMM slots. Excellent condition, £25 + P/P.
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ASUS Fonepad with neoprene slip case. 16GB 7" Android tablet with Wi-Fi & unlocked 3G phone functions,
Micro-SD slot, Model K004 (ME371MG). Warranty to 31 May 2014. £135 plus P&P
Tel: Ian Bonnett (01932) 856971 Email: a2345@btinternet.com

Dell Ultra small form factor GX620. Pentium D 2.8 /512/80 CD includes AC adaptor. Fantastic small machine that is very powerful ONLY £25 plus £8 for p&p. I can upgrade the memory and hard drive for an extra cost. You will need to load the drivers yourself. Refurbished.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

11 Quality Peach compatible sealed CLI-8 cartridges. Yellow (3), magenta (2), cyan (2), black (2),PGI-5 black (2).
Won't fit new printer. £11 plus £3 postage.
Tel: John Beech (01928) 733622. Email: johnbeech@dsl.pipex.com

E6300 CPU with stock cooler. Fully working, available due to upgrade. £10 plus £3 postage.
Tel: John Beech (01928) 733622. Email: johnbeech@dsl.pipex.com

Intel Core i3 3220 3.30GHz processor. Pulled from working PC due to upgrade. Will be provided in anti-static packaging. £50.
Tel: Mark Sullivan (01142) 745864 Email: mark.sullivan34@aol.co.uk

PC for sale. Athlon Dual Core 3Mhz CPU, cooler, Asus M3A board, 2GB DDR2, Nvidia GT8600 500MB, 750W PSU, XPSP3, Sony 17" Monitor, £150.
Tel: Ray Dawson (01202) 893997 Email: ray.dawson02@btinternet.com

Gateway MT6220G Laptop. Core 2 CPU 2 GB memory, 100GB HDD, excellent 15.4 inch WXGA screen hinges. Excellent condition, excellent battery lasting 2 and a half hours. Wireless. £129.
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ASUS P5QLD Pro motherboard. 3GB. Dual core CPU, 6GB man memory, set up disk and 1/0 plate. Heatsink and fan, comes in brown box £70 plus £5 postage.
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Toshiba L350-169 17 inch screen laptop. 2 GHZ Core 2 processor, 120GB HDD, 4GB memory, Windows Vista. Excellent condition, lightly used. £170 post free, email me any questions.
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PC with AMD Athlon 6000+ dual core 3Mhz CPU, quality cooler with external speed control, Asus M3A motherboard, 2 GB DDR 2 RAM, Nvidia GT8600 graphics 500MB, 750W PSU, Audigy sound card, case fans front and rear, XP with SP3 and original XP CD - together with Sony 17" LCD Monitor (no missing pixels). £150, sensible offers considered.
Tel: Ray Dawson (01202) 893997

Enermax Galaxy 1000 watt Gaming PSU. Modular, 80+ Gold with all accessories, boxed. Perfect for bitcoin mining, not new but unused. VGC. £80.00.
Tel: Tim (01892) 689054 Email: wryrat@hotmail.com

Antec 900 ATX Gaming Case. Not new but unused, VGC. Boxed, with all accessories. £57.00.
Tel: Tim (01892) 689054 Email: wryrat@hotmail.com

HARDWARE WANTED

Trying to breathe life back into an old machine? Why not submit a wanted ad to MicroMartClassifiedAdverts@gmail.com and see if any of the thousands of computer enthusiasts who read the magazine each week have what you're looking for?
Wanted: HD 3850 Graphics card, must be AGP.
Tel: (07817) 861011

Wanted: Fully working mainboard for AMD socket AM2+/AM3, micro ATX size. Must use DDR2 RAM.
Tel: Brian Taylor (07570) 452557 Email: bmorgant@yahoo.co.uk
Wanted: Factory system restore disc for a Dell Inspiron 1750.
Tel: Darren Day (07707) 556193 Email: ddshaggy@btinternet.com

Wanted: 4GB (2 x 2GB) of Corsair DDR2 RAM. 800Mhz XMS2-6400. Must be in good working condition.
Tel: (01928) 733808 Email: wilsal9@aol.com

Wanted: One Series Printer HP DESKJET 610c in good working order. One servicing manual (Not Users Instruction Manual) for the HP DESKJET 610c Printer. Old Zip Discs.
Tel: (01214) 777691

Wanted: A socket LGA 775 motherboard to enable me to build a computer for a local Royal British Legion member. He's able to pay for a 2nd hand board as long as it's not too expensive. I've got the other components.
Tel: Ken Driver (01890) 820295

Wanted: Gigabyte G41MT-D3 1.3 motherboard in good condition. Please notify price and postage.
Tel: 0121 455 8526 Email: j.cleary@virgin.net

Wanted: I am looking for 2gb (2x 1gb) of Muskin Redline PC3200 at 500Mhz.
Tel: (07817) 861011

Wanted: 2 sticks of 2GB - PC2-4200 (533MHz) desktop memory, 2 of 1GB. To complete a computer for a disabled ex-serviceman who has little money. Any other donations of bits & pieces of computers would be most welcome as I put together units for hard up ex-service people. Free of charge.
Tel: Ken Driver (01890) 820295 Email: ken@branxton.plus.com

SOFTWARE FOR SALE

Microsoft Office Small Business Edition 2003 with Business Contacts. Legitimate Office Small Office Business Edition comprising Word, Excel, Powerpoint, etc. Comes with small piece of OEM hardware and original license code (coa) £10 incl. delivery, cheque or PO. £10.50 by Paypal.
Tel: (07794) 528857 Email: it_central@ntlworld.com
Norton Utilities 16 for 3 PCs. Runs under Windows 8, 7, Vista or XP, Original Symantec CD with unused product key £12.50
Tel: Ian (01932) 856971 Email: a2345@btinternet.com

Dell Windows XP Pro SP2 Reinstall Original Cd. Allows You To Restore Your Dell PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.
Email:omendata@gmail.com
HP Windows XP Pro SP2 Re-Install Cd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.
Email:omendata@gmail.com

HP Windows 7 Pro Sp1 Re-Install Dvd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.
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HP Windows 8 Pro Re-Install Dvd. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £10. Price includes p&p.
Email:omendata@gmail.com

HP Windows 8.1 Pro Recovery Dvd X 2. Allows You To Restore Your HP PC / Laptop Without A Licence Key. Brand New Still Packed. £15. Price includes p&p.
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Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Windows Small Business Server 2003 Premium Edition. 7 Disc Set. £30.
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Windows Server 2003 R3. 2 Disc Set. £20.
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

Windows 7 Professional. I have both 32 and 64 bit versions. NEW software and license (certificate of authenticity) 100% genuine and unopened software. ONLY £35 including P & P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com
Windows 8 Professional 64 bit. NEW software HP branded. 100% genuine and unopened software. ONLY £15 including P & P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com
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Windows Vista Business. 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

Windows 7 Home Premium NOT BRANDED 32 and 64 bit versions. NEW software and license (certificate of authenticity) 100% genuine and unopened software. ONLY £35 including P & P.
Tel: Dave Thomas (07828) 982930 or (01942) 706571 Email: davethomas96@aol.com

Office 2007 Pro Plus for sale. Includes Word, Excel, PowerPoint, Excel, Publisher and Outlook. Disk only with serial number. £40 including postage.
Email: ianmatthewuk@yahoo.co.uk

SOFTWARE WANTED

Wanted: Windows Millenium Upgrade for Windows 98 SE.
Tel: (01983) 613464 Email: tony@tonyfagg.plus.com

Wanted: LG GSA 2164 D software disc to replace broken original.
Tel: Glen Fremantle (01387)248976
Email:bldamsys@yahoo.co.uk

Wanted: Nero 9 reloaded for Windows 7. £80 given.
Tel: (01629) 732623

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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 in any doubt, feel free to mail us at editorial@micromart.co.uk. Every year, thousands of successful transactions take place through our classifieds, and that's just how we like it. Help us help you keep them one of the safest and most secure places to buy and sell computer kit.

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Send your questions to:
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Dennis Publishing
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London
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Contact Aaron by email at:
aaron@micromart.co.uk

Please try to keep your queries brief and limit them to just one question per letter, simply so we can squeeze in as many as we can each week. Please include relevant technical information too.

Aaron

Won't RunDLL

I've been getting a constant error message lately that talks about a file called RunDLL. It tells me that programs won't run because this file is missing, and it's been happening a few times a day, and from what I can see, with different programs.

I've not made any changes to the system, but my children and wife also use the PC, so I can't be sure nothing has been altered on the PC. What I do know is that it's becoming quite annoying, and I have no idea what to do in order to fix it.

James

The RunDLL error message you're referring to has many different causes, and it's also been known to be the result of malware in some situations. Because of this, I'd strongly recommend you run both virus and malware scanners on your system, to make sure you have no recognised infections that could be causing your issue.

If this isn't the case, then you need to look into the possible cause of the problem manually. RunDLL errors can be the result of missing or corrupted program files, so you need to identify what program is causing it. Do this by noting down the error message, which should read 'There was a problem starting XXXX. The Specified module could not be found', with the XXXX being the program in question.

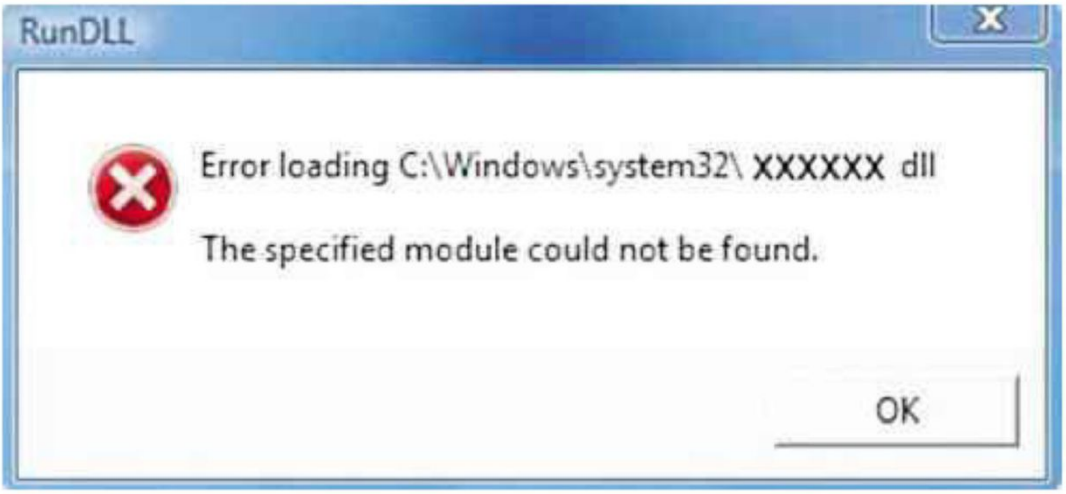
With this information, you then need to boot up your PC in Safe Mode (press F8 during boot-up and select the 'Safe Mode with networking' option). Once in Safe Mode, go to Folder Options and make sure that the option to hide protected operating system files is unchecked. Now, press Ctrl+Alt+Del and go into Task Manager and locate the entry that corresponds to the program mentioned in the error message and end it.

Now, open the Registry Editor (Windows+R and type 'regedit', and as always, at your own risk), and browse to the following locations.

HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\RunOnce
HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run
HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\RunOnce

Delete each of these entries, and then close the Registry Editor. Once this is done, restart your PC and boot up as normal. The error should be gone. If this works, you may want to remove and reinstall any programs, utilities or drivers the error referenced.

> **RunDLL errors can be the result of missing or corrupted program files, so you need to identify what program is causing it**



▼ ***RunDLL errors can have many causes, but a common one lies with corrupt program files***

SATA Speeds

In Issue 1329 (Silent Storage) in Mike's letter, he was asking about maybe replacing his 160GB hard drive to something much better than he has now. In your reply, you suggested a few HDDs: a Samsung 500GB and others ranging from 1TB to 4TB etc.

While your advice was very helpful for everyone considering buying a new HDD, I fear I may be throwing a spanner in the works to something that is very often overlooked on older motherboards:

the limits of older SATA chipsets.

Mike quoted his motherboard as an Asus A7N8X-E, which uses the then-popular SIL3112A SATA1 chipset. I have the same chipset on my Abit AN7 Guru motherboard.

A few years ago, I bought a brand new Samsung 1TB hard drive, but my motherboard BIOS refused to identify the HD correctly. The boot screen would display the Samsung and model number, but a blank space instead of its sectors, size and number. As a result, it would not show up in Windows' My Computer screen or in Paragon Partition Manager.

Originally, I thought I had a faulty hard drive. I even updated the motherboard BIOS to the last version available (V.19), but after doing much research on the net, it seems the SATA chipset was the culprit.

Various sources say the standard SIL3112A had a hard drive size limit of around 700GB (not 100% sure if this is accurate). This would explain why my 500GB drive correctly displayed in the boot screen and worked fine to load up, but not the 1TB. Other internet sources say the later SIL3114A fixed this problem.

Apparently, there is a fix to resolve this by updating the SIL chipset BIOS firmware to a later version, which to me sounds like a BIOS update within a BIOS update. However, it was something I was unable to fathom, and I still have the 1TB sitting in its box gathering dust!

Can you please shed some light on this, to confirm that the SATA chipset does have a size limit and, if so, is it easily fixable?

Carl

You are correct that this drive limit can be an issue on some older boards, and some larger drives can experience the same kind of problems being recognised by the system and Windows due to this. And yes, it's also related to the SATA chipset.

There are solutions for this, including the one you've most likely already found, which involves merging the motherboard BIOS (ideally the latest in most cases), with the latest Silicon Image SATARAID BIOS. The BIOS modification CBROM is also needed, as this is used to create the merged file.

Using this tool, you can actually merge the BIOS firmware with the updated SATARAID firmware, thus creating a new, custom BIOS that supports larger hard disks than it may normally do. The problem here, and the main reason I avoid making such suggestions to readers, is that it's very easy to do incorrectly, using the wrong firmware files to create a BIOS update that can effectively brick your motherboard. The process is also unsupported by motherboard vendors, so you'd have no official support or anywhere to turn to, often resulting in the need to buy a new motherboard.

That being said, and with the usual caveat of you try this at your own risk, you could certainly give the fix a go. Just be doubly sure you're using the right BIOS updates and compatible files for your chosen motherboard and its hardware.

The actual method of merging the BIOS files isn't all that difficult with the CBROM tool. You simply need to extract all the files into a single folder (no sub folders), and run the CBROM tool from the command line. You'll also need a BIOS flashing tool for your motherboard.

The actual command is 'cbrom YOURBIOSUPDATE /YOURSATAUPDATE'. So, let's say you have CBROM version 1.98 (with an exe file called CBROM198.exe), a BIOS firmware file called update1.bin, and a SATA file called sata2.bin. The command would be 'cbrom198 updatr1.bin /sata2.bin'.

This command will merge the two updates into one, flashable BIOS file. You can then use this as you wish, such as placing it onto a bootable floppy or USB drive and can flash the motherboard BIOS with it. Once this is done, simply boot up as normal, and if all has gone to plan, you should now be able to use the larger hard disk with your motherboard.

Others who have used this solution have managed to breathe new life into their older boards, but some have found that some trial and error is needed in terms of SATARAID versions, with different system setups requiring different, not always latest, versions of the firmware. Some have even gone on to restore Windows' own drivers by using the repair option to reinstall them.

*For information, a good website to check out is **www.bios-mods.com**, and you can grab various versions of CBROM from here, as well as other tools, such as flashing programs. You should also have a look at Silicon Image's support site at **www.siliconimage.com/support** for more information on SATARAID drivers. Good luck.*

▼ ***Large hard disks may cause problems with some older motherboards and chipsets, but there are ways around them***

> **You'd have no official support or anywhere to turn to**

ASK JASON

Meet Jason D'Allison, a veteran of Micro Mart's panel of experts. He's here to help with any technical questions, including anything to do with tablets or smartphones, as well as PCs

Send your questions to:
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Dennis Publishing
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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

Blankety Blank

I'm sure I've read that an SSD doesn't need to be defragged. Indeed, I'm sure I've read that defragging can even reduce an SSD's life. Have I got that right, or am I misremembering? I ask because I have Norton installed and this regularly tells me that my hard drive – an SSD – has been 'optimised', which I take to mean 'defragged'. Can you shed any light on this, or am I worrying unduly?

John G Johnston, BT

You've not misremembered, John. I've covered this subject in the past, but flicking back through previous columns, I see that the last time I went into any depth about it was in the distant days of 2011. I think a refresher is in order. Hold onto your hat, as it's a long ride...

Now, as you know, with a mechanical drive, fragmentation causes individual files to be split into dozens or even thousands of parts, all scattered across different areas of the platters. To load a file into RAM, the drive's read-write arm has to swing frantically back and forth, reading the parts in sequence. It can take several seconds rather than several fractions of a second for the file to become usable.

Defragmenting puts all the pieces of individual files back together, in order, arranged contiguously. To load a file into RAM, the drive's read-write arm then only has to swing to a single location, the file's starting point. From there, it can read the rest effortlessly, similar to the way a CD player tracks the 'groove' imprinted on a CD.

With SSDs, of course, data is stored in memory cells. It takes the same time to read from two cells next to each other as it does to read from two cells far apart, so fragmentation isn't an issue. Defragging is therefore pointless. It also causes many extra writes to the cells, cells that already have a limited life (typically about 10,000 writes for a mainstream SSD). Consequently, defragging can kill an SSD off before its natural time.

Furthermore, SSDs perform 'wear levelling'. To ensure that some cells aren't written to more frequently than others, data is placed almost randomly. Files are fragmented right from the off. Defragging may appear to make all files nice and neat, but that's just the way the SSD presents them to Windows. The real placement of data will be somewhat different. Defragging does nothing except replace one random order of data with another.

But that's only half the story. You see, John, when a file gets deleted, the area it occupies is merely flagged as being available for use. It's not wiped. On a conventional drive, that's fine, as writing to an area already containing data – overwriting – takes no more time than writing to an area that's genuinely blank. On an SSD, however, a cell can only be written to once it's empty, so overwriting requires two operations – an erase and then the actual write.

This is where TRIM and other garbage-collection techniques come into play. An SSD with TRIM – any modern SSD, basically – will beaver away at times when it would otherwise be idle and perform erase cycles on cells currently flagged as unused. When those cells need to be written to, there's then no messing about – they're already blank.

Also, cells can't be written to individually but only in 'blocks'. If a block is partially occupied, writing to the cells that are empty is a four-step operation. First, the data in the occupied cells has to be copied to the drive's cache. Second, the entire block has to be erased. Third, the new data has to be 'joined' to the old data (in the cache). And lastly, the whole lot has to be written back to the block. Clearly, this takes an enormous amount of time.

TRIM, then, tries to arrange data so that the number of partially written blocks is kept to a minimum. Again, it beavers away in the background, shunting data about, ensuring that as many blocks as possible are kept entirely blank and pre-erased. This is usually referred to as blank-space defragging (as opposed to file defragging).

When TRIM or some similar technique isn't in place or isn't working, an SSD's performance can slow to a crawl. I've witnessed this myself on my old laptop (being used to write this!), which won't run my SSD in AHCI mode. Sadly, Windows 7 can't be made to use TRIM on a drive running in ATA/IDE mode (an artificial limitation).

I don't know what Norton package you have installed, John. Is it Norton Utilities, or does one or more of the company's anti-virus suites now incorporate system tools too? That's what these optimisations are, though – garbage collection. If Windows has TRIM working, those optimisations won't really be necessary. But they're nothing to worry about – a second opinion never did anybody any harm.

Some people would rather own no PC at all than own a PC with something from Norton installed on it, but there really was a time when Norton was a name held in very high regard

Stick It To 'Em

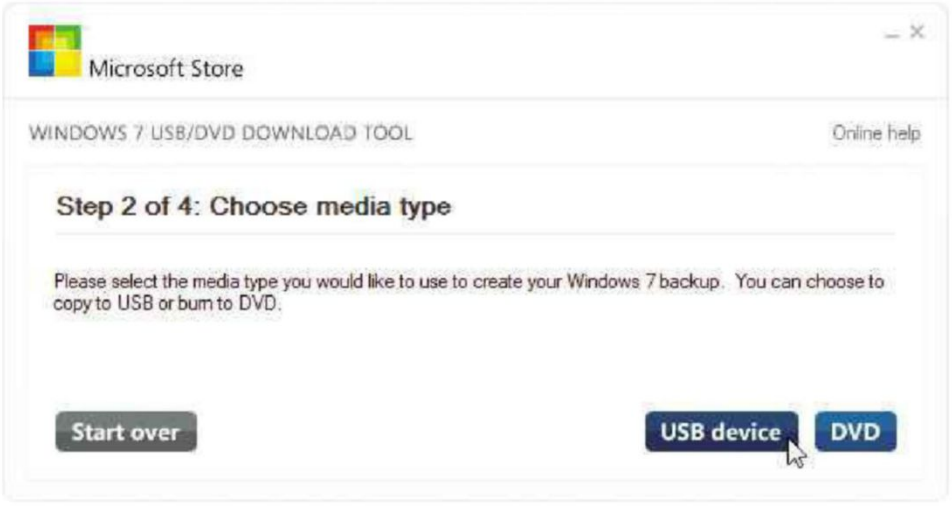
I've got an oldish Samsung netbook that has had to have a new hard-drive fitted. Originally the OS was Windows XP, but I've acquired a cheap (legitimate!) copy of Windows 7. I'm pretty sure the netbook will be able to run it, but of course it doesn't have a DVD drive. Can I install Windows from a USB stick? I don't really want to go out and buy a USB DVD drive just for this one job.

T. Brown, TalkTalk

You should indeed be able to install Windows from a USB stick. First, as your copy is on a disc, you'll need to pop this into a system with a DVD drive and create an ISO file from it. The tool required can be downloaded via the link provided below. Or you could just grab a pre-made ISO via the link I gave Cliff, above.

There's no point just copying the ISO file to the USB stick, however. As with a bootable DVD, a bootable USB stick needs to be correctly prepped, and the contents of the ISO need to be suitably extracted. It's pretty straightforward, and a handy guide, complete with a link to the required tool, can be found at ***bit.do/SWoL****.*

Lastly, of course, make sure your netbook's BIOS has the USB stick set as the first boot device. This option may not appear unless the stick is actually inserted. Alternatively, there may be a function key you can jab at start-up to bring up a boot menu. You can select the USB stick from that.



This little Microsoft tool will prep a USB stick ready for installing any version of Windows from XP onwards (including the preview of Windows 10!)

Boot Camp

I'm trying to install Windows 7 Professional (x86) on my Acer TravelMate C312XMi laptop. However, the setup disc isn't being recognised. At boot, I get the following messages: 'PXE-E61: Media test failure' and 'Operating system not found'.

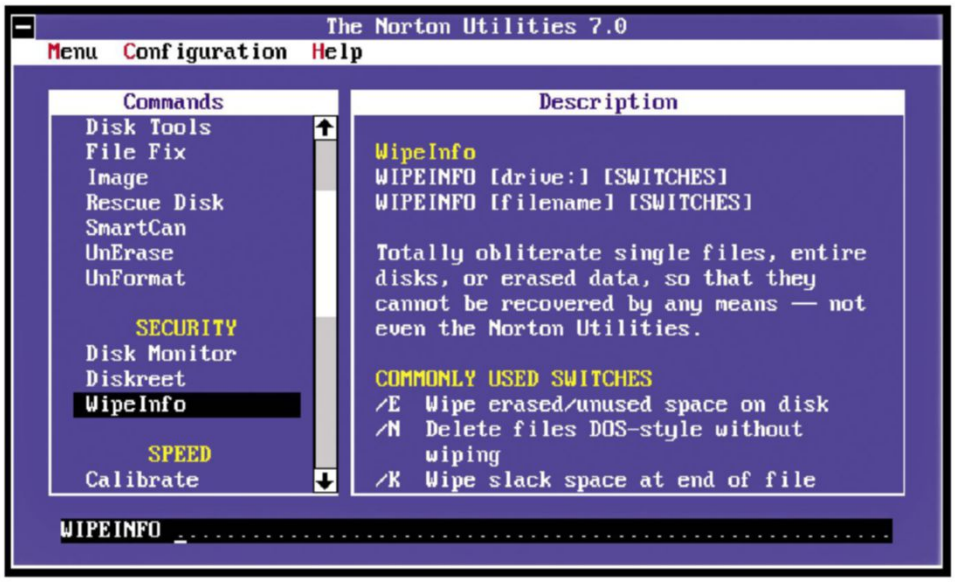
I've changed the boot order in the BIOS and even tried booting the Windows 7 ISO file off a USB stick, but that's also failed. To rule out any issue with the DVD drive, I've inserted an XP setup disc, and sure enough that boots and XP starts to install. Oddly, I've used this Windows 7 setup disc before, so I know it's good. What's the problem, then?

Cliff Evans, BT

Those messages mean the laptop's trying to boot from a network. It's not finding a cable or not finding a cable linked to anything it can boot from, so it's getting upset and looking for another source to boot from (such as a setup disc). Hop into the laptop's BIOS, Cliff, and search for a setting labelled something like 'LAN Boot ROM'. Disable it. The messages will disappear. The LAN port will still work, should you need it.

As for your Windows 7 setup disc, I rather suspect it's bad. Maybe it's become scratched or maybe the dye's decomposed (assuming it's a self-burned disc). You've successfully confirmed the laptop's DVD drive works, so burn yourself a fresh DVD. If you've still no joy, perhaps the ISO file itself is damaged? You'll find free Windows 7 downloads at ***bit.do/jiCp*** *(all legal, as you still need a valid product key to use them beyond 30 days).*

Regarding installation of Windows from a USB stick, please refer to the next query, Cliff, which covers exactly that...



Remember when they told us CDs were all but indestructible? Next they'll be telling us that 4K enables films to be watched 'the way the directors intended' and that we should throw out our Blu-rays (I own zero) and re-buy Jaws for the 11th time...

Crowdfunding Corner

When using a computer, you no doubt want to keep your screen visible and accessible at all times. This week, we've found a pair of Kickstarter projects that'll help you do just that

VEYEM Laptop Stand: Vertically Elevate Your External Monitor

Using multiple monitors is a great way to enhance your productivity, but if you're using a laptop, you might find yourself restricted to just the one. Luckily for multi-screen fans, though, that's changing. USB-powered monitors designed for laptops are becoming more and more common, and with them the opportunity to use a multi-screen setup on a laptop.

The VEYEM stand is designed to work with both portable external monitors and desktop-bound models, allowing you to easily raise and lower your second screen to the best height for you to interact with while using your laptop. In essence, it's actually a health tool: properly configured monitor placement means you get less strain on your neck, eyes and back.

The stand includes a selection of cable-management holes and can function as a stand-alone support for tablet PCs. Earlybird pricing means that stands cost $40 plus $30 shipping outside the US, and if those run out you can still pay $60 (plus shipping) for one. The retail value is expected to be $75, though, so you make a fairly good saving by backing early and a reasonably modest one even if you miss out on the cheapest wave of pricing – but with this long to go, you shouldn't!

URL: kck.st/1v0LJAW
Funding Ends: Monday, 3rd November 2014

Sound Prizm – Natural Sound Projection & Docking System

Kickstarter is a breeding ground for suspiciously generic tablet docks, which is why we don't look at them often, but the Sound Prizm has it own hook. As well as an unusual clear-plastic design, it has a built-in sound projection design features which – rather than absorbing the output of your iPad's speakers – help amplify and direct their output so you hear the whole thing.

As well as the passive audio features, you get inline charging and orientation-agnostic docking (allows for portrait and landscape). It's easy to assemble and clean, and works as both a single-placement and portable docking solution.

Perhaps one of the most encouraging things about the Sound Prizm is its tight timeline. Production on the units began when it hit 50% of its goal, and even though the project doesn't finish until the end of October, the initial units will arrive with the first 25 backers on 1st November. Compared to the extended lifecycles some projects assume, that's fast indeed.

Pledges that actually get you a Sound Prizms start at $25 for the iPhone 5/5S version, $25 for the iPhone 6/6 Plus version, and $30 for the iPad Mini & iPad Air versions, all of which are $5 off RRP and need $20 shipping outside the US. You can also pay extra depending on whether you want your power node to be plastic, metal or wood.

URL: kck.st/1qJH4nt
Funding Ends: Sunday, 26th October 2014

Disclaimer: Images shown may be prototypes and Micro Mart does not formally endorse or guarantee any of the projects listed. Back them at your own risk!

App Of The Week

Raxo PerfectDisk Defrag

Do you defrag or not? If so, then PerfectDisk may the tool to use

Defragging has always been something of an issue of contention in the computing world, with camps both for and against. Those for defragging place one hand on their hearts and the other on the case of their PC and swear blind that 'doing a defrag' will improve their system, resolve any slowdown issues and bring down blessings onto the machine from computing Olympus upon high.

Those against vehemently and quite profusely swear that a defrag is the single most useless waste of time you could ever possibly do with your computer and that the 'for camp' are nothing but a bunch of New Age computing loonies.

Which camp you squarely set your foot in is purely down to what experiences you have when launching a defrag, but in this instance and by blatantly avoiding an argument, we've decided that taking a middle-of-the-road stance is the best option and, after all, what possible harm could it do?

Generally speaking, the stock Windows defrag is usually enough for most people, but it's a slow, ponderous beast that can consume more than its fair share of system resources when running. We need something dynamic, faster and more intelligent, that's capable of analysing SSDs too.

Raxo To The Rescue

PerfectDisk Defrag, from Raxo, is such a tool. Not only does it defrag all the files on the drive intelligently, but it does this so quickly that you'll be forgiven for thinking the process hasn't actually done anything. And while defragging, it only used (on our test PC) roughly 25MB of memory, freeing the system up for more important tasks, such as playing pool on Miniclip.

The interface is easy to use, with a kind of Microsoft Office looking ribbon along the top, but without any unnecessary clutter. The main element of the application lists your drives, performs a quick defrag scan and optimisation, then displays a report based on its findings.

From here you'll receive a recommendation on the best method of defragging for your drive(s), as well as drive statistics and performance information. After that, it's up to you to select the appropriate drive and right-click for the available defragging options.

During the initial scanning phase, PerfectDisk will also detect any SSDs that are present in your system, then after the analysis, it will determine the best course of action to keep the SSD in perfect working order and retain maximum performance without degrading the lifespan through any aggressive defragging. Incidentally, defragging is something any owner of an older SSD should never do, as it will shorten the life of the drive. So PerfectDisk instead does something called an SSD Optimise, whereby it consolidates the free space on the drive to improve the write performance.

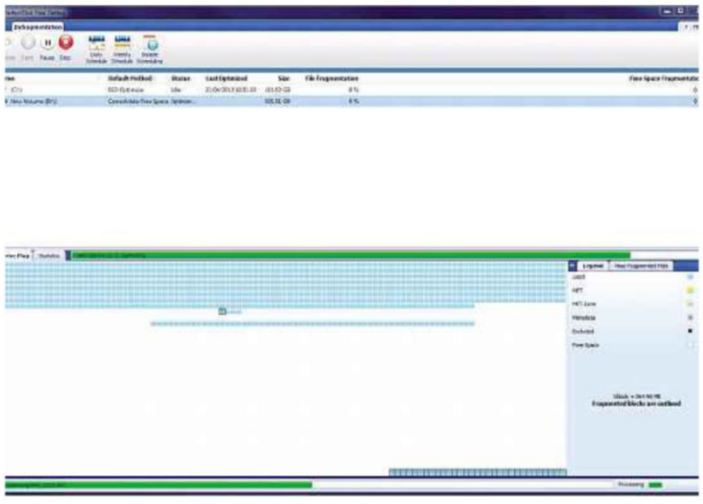
Once the defrag or optimise of your drive is complete, another report is displayed, this time detailing the recommended schedule you should set for maintaining a fully optimised hard drive. The defragging schedules are easy to set up: simply click either daily or weekly, via the command ribbon, depending on the level of fragmentation detected on the drive.

Features At A Glance

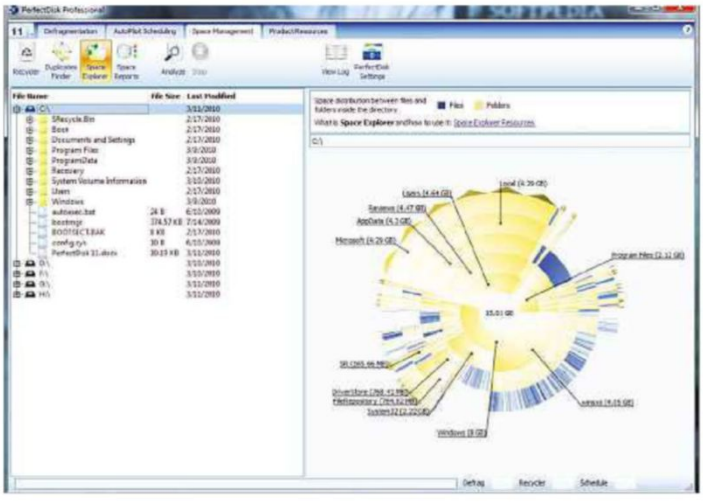
- Powerful analysis of drive fragmentation.
- Support for optimising SSDs.
- Informative drive reports.
- Scheduling of the defrag process.

Conclusion

Even if you disagree with the defrag process, give PerfectDisk a try; it's an excellent optimising tool with support for modern drives and technologies, and you never know: it might be just what your system needs.



PerfectDisk Defrag, with SSD support and optional coloured boxes to watch.



A better analysis of your PC and folder space with defragmentation is available as well

Logging Off

Shock, horror, probe. The European Aviation Safety Agency (EASA) has issued new guidance to European airlines, telling them that if they so wish, they can tell passengers that they can indeed mess with their mobile devices without having to engage 'Airplane Mode'.

I've written at some length about the silliness of not being able to use a phone or a tablet on an aircraft for some considerable time, but the infeasibility of this technology causing one to crash appears to be on the verge of being accepted.

However, EASA still wants airlines to go through a process to ensure that aircraft aren't susceptible to transmissions, because otherwise the last 15 years of rules might be deemed to have been ludicrous.

What's really shocked me is that the initial reaction to these devices from the outside seems entirely based on hearsay and the sort of scientific approach that notarised the Salem Witch Trials. We've had a technical problem and somebody didn't turn their phone off – there's an obvious connection! Evidence based thinking is so old hat.

But then having worked on the electrical systems of vehicles, I'm well aware that transmissions and magnetic fields can cause voltages in cables they intersect.

That's why we use shielded cables, chokes and other protections, because when wires run in bundles, like they do in aeroplanes, odd things can happen. Yet, the fields and signals that phones generate are nothing compared with those that naturally occur on the aircraft in normally operations, because they include giant rapidly rotating pieces of metal, multiple electrical generators and often collect huge electrostatic charges when flying through moist air or hail.

Where some people seem to have connected distant dots is that the control systems of aircraft are digital and so is the communication system used by mobile devices. But that's like thinking that the blood flow in people's circulatory system might mess up the hydraulics that raise and lower the undercarriage.

On a modern airliner there are usually at least three flight control systems written in different languages by different companies that can't share any code. For something unfortunate to happen, the rogue bit change created by an external device would need to alter all three and in a way that each didn't interpret as an error. Yes, it is possible, but then so are many highly unlikely outcomes.

Aircraft have been brought down by having insects nest in a speed sensor, or because angle of attack sensors became frozen because of

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water ingress, or because the aircrew couldn't calculate weight correctly or the ratio of a litre to a gallon, or because a fake part was intentionally fitted. These are all much more likely reasons for disaster than *Candy Crush Saga* caused the flight computers to crash the plane by trying to save that level win on an iPad.

It's seemingly taken forever to accept this reality, even when we've all known it was utter guff, when we're being instructed to select 'Aircraft Mode', and that it's important we don't use them at all on take-off and landing.

It doesn't solve the problem of not being able to get a GSM signal on an aircraft flying at 35,000 feet, but soon we won't be bugged much longer about how to manage our devices, hopefully.

Mark Pickavance

LAST WEEK'S CROSSWORD

Across: **7** Ideological, **8** Psyops, **9** Nuance, **10** Fission, **12** Terra, **14** Usurp, **16** Physics, **19** Virgil, **20** Stupid, **22** On The Carpet.
Down: **1** Bias, **2** Mesons, **3** Plasmon, **4** Agent, **5** Scrape, **6** Electric, **11** Inspiron, **13** Ohms Law, **15** Rights, **17** Sculpt, **18** Alter, **21** Iota.

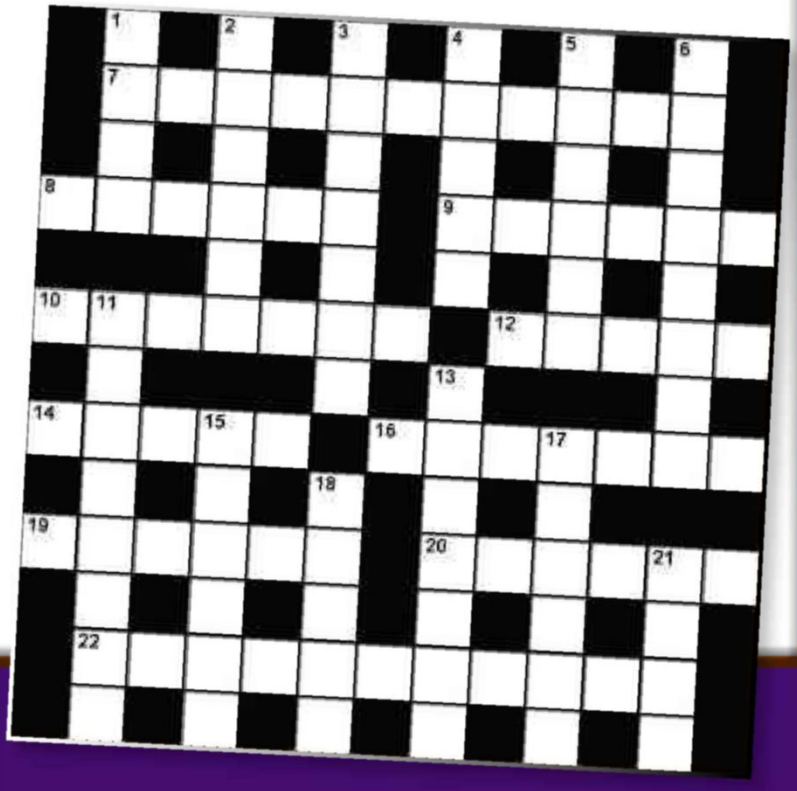
THIS WEEK'S CROSSWORD

Across

7 Typically from about 8am to 5pm, Monday to Friday. (6,5)
8 A person, department, corporation, partnership or other group with whom it is possible to conduct business. (6)
9 Evil in nature or effect. (6)
10 Citadel of Moscow, housing the offices of the Russian government. (7)
12 A group of words established by usage as having a meaning not deducible from those of the individual words. (5)
14 Someone who discriminates against people on the basis of their age. (5)
16 Pacify or placate someone by acceding to their demands. (7)
19 Formerly the basic monetary unit of Portugal. (6)
20 An announcement containing information about an event. (6)
22 Italian-born nuclear physicist who worked on artificial radioactivity caused by neutron bombardment and headed the group that produced the first controlled nuclear reaction. (6,5)

Down

1 Any natural satellite of a planet. (4)
2 Establish or strengthen as with new evidence or facts. (6)
3 A glassy thermoplastic that can be cast and moulded or used in coatings and adhesives. (7)
4 A line on a sphere that cuts all meridians at the same angle. (5)
5 Greek mathematician whose 'Elements of Geometry' covered plane geometry, the theory of numbers, irrationals and solid geometry. (6)
6 A line on a map marking an area having a distinct linguistic feature. (8)
11 A component inside a CPU for storing information. (8)
13 A commercial by-product or incidental result of a larger project. (4-3)
15 The product of two equal terms. (6)
17 Obtain by coercion or intimidation. (6)
18 Do a job badly or carelessly. (5)
21 Truncate the amplitude of a signal above or below predetermined levels. (4)



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We make no secret of the fact we're not keen on spiders. Well, actually, to be honest, we terrified of them. And our arachno-fear wasn't helped this week by a story from the BBC about a lady who had a finger removed after it was bitten by a false widow spider. Truly this was the stuff of nightmares, but the Beeb made sure to point out that we shouldn't be worried, because it wasn't the spider bite that was the problem. No, it was flesh-eating bug it transferred in the process. Thanks for that; we'll no doubt sleep far more easily now. On a different, yet still animal-related note, we spotted a cat sitting in front of a bush, just staring at it. The feline gave us a cursory glance as we walked past, but then went immediately back to staring at the bush. We had a quick look, but there didn't appear to be any signs of birds or other potential food sources, so our best guess is that this cat just really likes looking at bushes. Or it just likes confusing humans.

In Next Week's Micro Mart*

- Are expensive headsets really worth their cost?
- Identifying PC problems before they arise
- How to back up your online life
- Plus the usual mix of news, reviews and advice

* May be subject to change

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