PC & TECH AUTHORITY

TECH ADVICE YOU CAN TRUST

IPHONE 6
AUTHORITATIVE REVIEW

NEW NVIDIA
GTX 970 and 980 are the new speed demons

THE VERY BEST
Premium tablets

LABS GROUP TEST

AND WHAT TO LOOK FOR WHEN YOU BUY YOURS
PLUS MUST-HAVE POWER APPS FOR ANDROID & IOS

REVIEWS
AORUS X3, SHADOWS OF MORDOR , KRAKEN X61 AIO, COOLER MASTER MIZER, GIGABYTE FORCE H3X, LG MINI BEAMER AND **MORE**

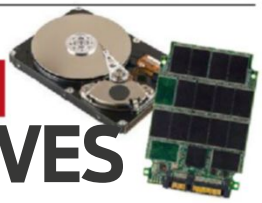
HOW TO:
GET ORGANISED
TAKE CONTROL OF YOUR LIFE WITH TO-DO APPS

BE A BETTER BUILDER
YOUR NEXT PC PROJECT

RUN YOUR BUSINESS FOR **FREE IN THE CLOUD**

DON'T TRUST GOOGLE
HOW IT BETRAYS YOUR PRIVACY AND HOW TO PROTECT YOURSELF

FUTURE LOOK:
NEXT GEN HARD DRIVES



GAINWARD

ACHIEVA
GROUP OF COMPANIES

NVIDIA GEFORCE GTX

Removable
Easily clean dust by removing the fan from the cooler

3
Quiet and Removable Fans

Stylish
Contemporary Industrial Design

8mm
Copper heatpipes x 5 + Copper Base

Huge
98mm x 273mm die-casting heatsink

PHANTOM

Extreme Silent

Extreme Cool

16% Performance upgrade

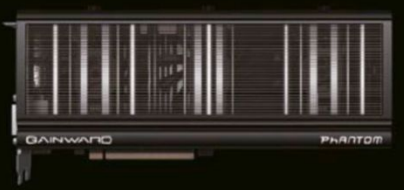
GEFORCE® GTX™ 980

New Phantom cooler design

Gainward GeForce GTX 980 Phantom, continue the elegant design of the Phantom cooler. The new Phantom comes with brand new fans design (patent M456684/ZL201320139962.6) that includes

1) Removable fan design – each fan body can be removed to clean if necessary
2) 5 pieces of 8mm copper heat-pipe and copper base - better thermal performance
3) solid structure

With this new outstanding innovated thermal design and optimized product design Gainward GeForce GTX 980 Phantom delivers an extreme gaming performance for enthusiast gamers



VIC

MSY	PC Case Gear	Scorpion
(03) 9700 9771	(03) 9560 2122	1300-726-770
clayton@msy.com.au	www.pccasegear.com	www.scorptec.com.au

SA

MSY
(08) 8212 1656
adelaide@msy.com.au

QLD

MSY
(07) 3290 1908
slackscreek@msy.com.au

NSW

MSY	DCOMP PTY LTD	PC MEAL	IJK
(02) 9726 1997	(02) 4721 3457	1300-366-866	(02) 9745 0877
ultimo@msy.com.au	www.dcomponline.com.au	www.pcmeal.com.au	www.ijk.com.au

WA

MSY
(08) 9344 1002
balcatta@msy.com.au

NSW

NetPlus Micro Computers
(08) 9242 7288

A fine year

It's a good time to be a tech lover

I really don't want to say "I can't believe it's almost Christmas", so instead how about "phew, what a year!" It's been a big one. Personally, taking on this lovely magazine is a sweet ride, and I'm only just warming up. It's semi-incredible that PC & Tech Authority continues to power on in the face of those who would say that if it's not online, it's not relevant. Bollocks to that. We won our third consecutive Magazine of the Year award this year, by the way...

It all comes, and I trust that you sense this, from having a rigorous methodology in place for product reviews. When we go to town on a review it's subject to a set of procedures that have been fine-tuned over many years. It's about generating an opinion based in fact, and that you can take away and genuinely use.

The other critical half of the equation is having top people in place to do it all. If you've been a long-time reader then you have become familiar with the names within. They are experts, and have developed a deep feel for what ticks, and what doesn't. One day, too, Mr Honeyball will be happy about everything. In this magazine it's people like Jon who have been with us from the very beginning. I love reading his words, and those of all our other writers. You would be hard-pressed to find similar depth on a reviews site. It just doesn't work without having a commercial model that's able to support these celebrity tech stars. You buy the mag, companies buy ads, the money pot enabled us to hire the very best.

Site's struggle to make this work, not all, and there are many tech sites we're all huge fans of, but it is a lovely feeling to know that we can continue giving you the best.

So as the year begins its end-stage, I like to think that a positive change I've brought to the magazine in this first chapter of my tenure is bringing it back to a greater focus on the PC. When, a few years ago, the branding was tweaked a little to include the '& Tech' in the title, it was in recognition of emerging form factors and generally related products. They're all still relevant, but do let me know if you think more or less actual PC belongs here.

Ben Mansill
Editor
bmansill@nextmedia.com.au

Get exclusive content with the *PC&TA* iPad app

If you prefer to enjoy *PC & Tech Authority* via your iPad (sorry, no Android...), then by all means please do so! Each issue is just $6.49 and has all the content that you'll find in the magazine.

▶ **Get the app:** *PC & Tech Authority* for iPad
http://tinyurl.com/iPADPCTA

REAL TECH ADVICE YOU CAN TRUST!

- Our tests are performed by experienced reviewers in our Labs in accordance with strict benchtesting procedures
- Our brand new benchmarks have been tailor-made to reflect real-world computing needs
- We put tech through its paces – seriously. From processing power to battery life, from usability to screen brightness, our tests are exhaustive
- We will always offer an honest and unbiased opinion for every review

THE TEAM...

Managing Editor
David Hollingworth
E dhollingworth@nextmedia.com.au
T @atomicmpc

How can you review something that is designed to elicit an emotion, a personal response, while adhering to the demands of 'objective journalism'?

Advertising Manager
Jo Ross
E jross@nextmedia.com.au

"I've tweaked the package."

Art Director
Tim Frawley
E tfrawley@nextmedia.com.au

Dear Santa. I would like an iPhone 6 and an iPad Air 2 for Christmas please... My 1st Gen iPad and iPhone 4s are in need of updating!

CONTACT US...

Call us
(02) 9901 6100

E-mail us
inbox@pcandtechauthority.com.au

Facebook
www.facebook.com/pcandtechauthority

Twitter
@pctechauthority

STRIX
ASUS
UNLEASH YOUR GAMING INSTINCTS
STRIX GAMING GRAPHICS CARD - 30% cooler. Silent gaming
STRIX PRO GAMING HEADSET - Thunderous 60mm drivers - 90% environmental-noise cancellation
ASUS®
IN SEARCH OF INCREDIBLE
join us facebook.com/ausrog • asus.com.au

Inbox

if you have a story or point to make, send it in!
tell us your anecdotes, opinions & tales of woe

SURFACE TENSION

You are kidding, aren't you? You've put the Microsoft Surface 3 Pro as an ultrabook on your A list. Why, is this a joke? Because for the price quoted it doesn't have a keyboard. Because it has never, ever been tested in comparison with any other laptop (and as far as I'm aware this holds true for its two predecessors). And because for a lot less money you can buy a fully featured ultrabook.

I'm not a Microsoft hater, or a fanboi of anything. But these days, an "ultrabook" for over $1500 that doesn't even come with a keyboard, just when Windows 10 appears to be recognising that Windows is a keyboard system first and a touch system second? Not even Apple has that much chutzpah.

It's like telling me that a phone is good because of its beautiful cast aluminium case, when that would prevent me replacing the battery, and anyone with any sense would be throwing it in an Otterbox protector before you could say "cracked screen".

Bob Quiggin

Ben Mansill replies:
Spec-for-spec and within each price band, you'll find that each of the Surface 3 Pro variants (which start at $979) sit side-by-side with all but the cheapest ultrabooks. The critical keyboard aspect is a non-issue, as the Touch 2 is up to the job of extended typing sessions – it really is as good as all but the nicest chiclet keyboards, and even then the Touch 2 suffers little from its dimensions.

An 'ultrabook' is actually a set of size and component specifications from Intel, but that's been largely ignored, with so many slim laptops being touted as 'ultrabooks', when in fact, technically, they're not.

Ironically the Surface Pro 3 comes closer to the ultrabook spec than many 'real' ultrabooks. So! It's similar in price to an ultrabook, is as-good-as an ultrabook in spec, and is, we think, nicer to use and far more versatile.

BUT THAT'S NOT ALL!

Hi guys, regarding your slogan on the cover "The tech advice you can trust".

I've always trusted your reviews and advice, now this logo has got me worried.

It sounds really used car salesmen.

Looking forward to the knife set promo any day now.

Mitchell Hall

PLUG THEM ALL IN

Hi I was reading your tablet comparison, over all well done.

But you said that Windows tablets are the only one that can connect monitor, keyboard and mouse, well sorry to say so can android, I connected my Samsung 10.1 to a monitor (with the adaptor) and used a blue tooth keyboard and mouse to played Myst (old windows game) One can use a usb hub to connect USB keyboard and mouse. And if they have HDMI out put well you get the point?
Regards

Neil Bedford, Yarraman QLD

Ben Mansill replies:
Did not say :) We did talk about attaching a keyboard/mouse/screen to a Windows tablet in one part of the feature, but that is wasn't a Windows exclusive feature, and elsewhere we talked about adding these to Android tablets.

CRUCIAL
WINNERS
This month's letter of the month as well as best site comment will receive a Crucial 512GB MX100 SSD!
www.crucial.com.au

Want to get in touch?

MAIL: Inbox, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065

WEB: pcandtechauthority.com.au

EMAIL: inbox@pcandtechauthority.com.au
Please limit letters to 200 words, where possible. Letters may be edited for style and to a more suitable length.

TOP SITE COMMENTS

LETTER OF THE MONTH
Something I miss from then was meaningful upgrading, it was so significant. Going from a Pentium, to a Pentium 2, to an AMD something, all gave massive improvements. After the awesome Core 2 Duo arrived in 2006 CPU upgrades became less important, it was such an amazing architecture on release and it hit AMD so hard they've never recovered.
FourEyedGeek on the pleasure of nostalgia.

I remember thinking I was above the other PC nerds painting my cases metallic blue and adding a side vent for the old Pentium fan to pull air in from.
Yep, it was terrible. I don't even like blue that much lol.
Arkayn on the more dubious pleasures of nostalgia.

Should we pay to play games before they're done? No.
j876 on Early Access games.

So they have finally made the change. I hope the new CEO will be able to perform as well as expected. Good luck!
Henry Chow on the change of leadership at AMD.

In all honesty. It kinda sounds like Dora the Explorer. Talking maps, I mean books. Exploring locations. With puzzles at odd places.
David Aked's views on the classic Myst.

This is an awesome project though.
Ashleigh Clark is very excited

Want to read more? Go to **www.pcandtechauthority.com.au** and join in the conversation. Also check out the Atomic forums: **http://forums.atomicmpc.com.au**

Contents

Issue 205, December 2014

18 CHRISTMAS GIFT GUIDE

You won't find any fine bottles of wine or RC toys in our recommendations, but you will see a collection of tech goodies that we think would make ideal Christmas gifts.

35 IPHONE 6

It's sleek, powerful and just a little on the expensive side. Is the iPhone 6 worth it?

REGULARS

FEATURES

CHRISTMAS GIFT GUIDE
Techy pressies for everyone!. **18**

NVIDIA 900 SERIES
With the new GTX 970 and GTX 980 Nvidia deliver a new GPU hero. **30**

GROUP TEST: PREMIUM TABLETS
If you want a tablet that includes the very latest-spec tech, and doesn't cut corners, look no further. **48**

TECHDESK

INBOX
Your letters answered **5**

PRODUCTS & TRENDS
All the technology and gaming news that's fit to print **8**

CHIP NEWS
All the lastest CPU and GPU news and the hottest rumors **12**

INVESTIGATOR
Our consumer rights watchgirl **16**

HOW TO

ORGANISE YOUR WORK AND LIFE
Don't give in to information overload, says Tim Danton. Use clever online to-do lists and apps to take control **91**

RUN YOUR BUSINESS FOR FREE IN THE CLOUD
Can a business be run on free software and services? **94**

FUTURES

BATTERIES
Why does battery technology appear to be standing still? **82**

STORAGE
Does the faithful hard drive have a future in our PCs?, plus where we are at with USB standards **84**

REAL WORLD COMPUTING

IO
Dan Rutter and his famously good advice **100**

WINDOWS 11,12,13...
Windows going risk-free, GPS updating, big storage, RF wireless, My Tiles **102**

PEAK TECHNOLOGY
Is our current level of technology sufficient, PLUS, quadcopters. **105**

TRUSTING GOOGLE
Morality and niche networks. **108**

THE A-LIST

The best of the best in *PC & Tech Authority's* A-List **76**

KITLOG

Great ideas from a pro-builder for getting it right the first time **88**

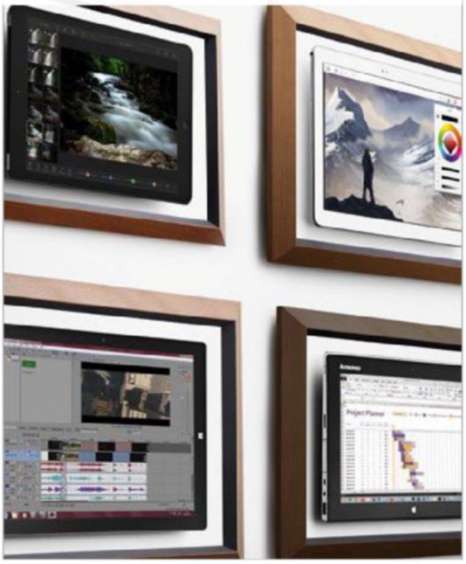
DVD CONTENTS

This month's DVD guide **98**

EPILOG

Jon Honeyball opines. **114**

GROUP TEST
PREMIUM TABLETS 48

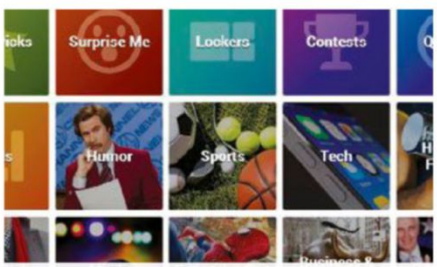


REVIEW F1 2014 72

REVIEW ACER SWITCH 10 41

REVIEW
900 SERIES
VIDEO CARDS 30

HOW TO
ORGANISE YOUR
WORK AND LIFE 91



RWC IS TRUSTING GOOGLE
WISE IN THIS NEW ERA? 102

Subscribe & SAVE!

Get *PC & Tech Authority* delivered! For details on the latest subscription off see page 80.

SYSTEM BUILDER BUILD A
BETTER PC 88

REVIEWS

PCS & LAPTOPS

Aorus X3 39
Acer Switch 10 41

HANDHELDS

Apple iPhone 6 35
Sony Experia X3 Compact 46
Apple iPad Air 56
Microsoft Surface Pro 3 58
Samsung Galaxy Tab S 10.5in 60
Sony Xperia Z2 61
Amazon Kindle Fire HDX 8.9in 62
Asus Transformer Pad TF103C 62
Samsung Galaxy Note Pro 12.2 63

PERIPHERALS

AOC U3477PQU 34inch 41
Seagate 2Bay NAS 39
Gigabyte Force H3X 46
LG Mini Beamer 47

COMPONENTS

Kraken X61 AIO 42
Antec Kühler H2O 1250 42
Cooler Master Mizer 46
Cooler Master Novatouch TKL 46
Cooler Master Storm Quickfire Rapid 47
Asus Gladius Mouse 47

GAMES

Defense Grid 2 72
Shadows of Mordor 74

WEARABLES

Jabra Sport Pulse 47

Tech News

The latest trends and products in the world of technology

VOICE AND VIDEO CALLING COMING TO FIREFOX

MOZILLA AND TELEFÓNICA BUDDY UP FOR FREE, IN-BROWSER SKYPE RIVAL.

People using Firefox Beta will soon be able to make free voice and video calls through their browser, even to people who aren't using Firefox themselves.

Firefox Hello is powered by OpenTok, a WebRTC platform created by a company named TokBox, which was acquired by Telefónica in 2012.

Unlike most rival services, such as Skype, Google Hangouts or FaceTime, users don't have to create or sign into an account to use Hello. In "Guest Mode", a callback link is sent via email to the person they want to speak to and when they click the link, the call begins.

While the person initiating the call has to be using Firefox Beta, the person they want to talk to only needs to have a WebRTC-enabled browser, such as Firefox, Chrome or Opera.

Although Mozilla is promoting the "no sign-up" feature of Hello, Firefox product manager Chad Weiner said if someone is using Hello to call friends and family regularly they should create a Firefox account "for even easier one-click calling".

"After signing in, you can initiate or receive direct calls with other Firefox Account users, without having to share a callback link first," Weiner said.

"You can sign into your Firefox Account on every computer you use, so you can be reached at home or at work," he added.

Hello will be rolling out to Firefox Beta in the coming weeks and will eventually progress to the main release channel at an undetermined later date.

MICROSOFT DEVELOPS 3D-PRINTED MINI-OBSERVATORY

ULTRASCOPE WILL LET YOU TAKE PICTURES OF OUTER SPACE... EVENTUALLY.

Microsoft and the Open Space Agency (OSA) have developed a 3D printed mini-observatory named Ultrascope, which will let users take photos of outer space using just their smartphone – assuming they have a Lumia 1020, of course.

The device is robotically controlled, meaning users don't have to manually adjust the angle of the Ultrascope at all.

It does this through a relay system of data, where ISS orbital location data is received by a Windows laptop (yes, you need one of those too), which then forwards the information to the scope. Ultrascope moves to locate its target and the smartphone takes the relevant pictures.

Finally, those images are sent forward to the cloud, where the data is the processed into scientifically usable forms of data.

Ultrascope is the brainchild of OSA founder, James Parr, who has claimed the project "opens up opportunities for people who have been gazing at the stars their whole lives, but haven't, until now, been able to get involved".

The device measures 1m tall when fully vertical and 65cm wide at the base. Nevertheless, the organisations hope that "hundreds" of Ultrascopes will be built by these enthusiastic amateurs.

If the sound of the Ultrascope has you excited, you'll first need to sign up and be accepted to the beta programme. You'll also need access to a 3D printer and laser cutter in order to download and cut the parts to assemble.

The companies said blueprints for "increasingly sophisticated models" will be released over the next 12-18 months and a final consumer version will be available in the coming years.

NEWS BITES

GOOGLE NEXUS 6

Google's on again/off again relationship with Motorola has yielded fresh fruit, with the announcement of the Nexus 6 Android smartphone. Unlike previous Nexii, which slotted into the mid-range for price, and punched just above its weight for performance, the new Nexus is a premium device through and through. The 6 inch 'Quad HD' screen is coupled with a monster 3220 mAh battery, which also includes a 'Turbo Charger' for speedy battery topping up.

WD MY PASSPORT WIRELESS

WD has added Wi-Fi connectivity to its venerable My Passport line of portable hard drives. The new 1TB and 2TB devices can handle up to eight simultaneous connections. There's also a built-in battery which enables the device to be used as a portable media streamer, with WD claiming up to six hours of continuous streaming, and 20 hours on standby.

AORUS THUNDER K7

Last issue we reviewed the new Aorus Thunder K7 keyboard, criticising it for feet that won't stay stood up. Company reps were quick to let us know that what we were actually sent was a pre-production sample (despite it arriving in full packaging, and Aorus inviting us to review its new product), and that this flaw has now been fixed for on-sale boards. A new K7 is on the way to us to confirm the fix.

CORRECTION

In the last issue we wrote in our X99 motherboard roundup that Asus Rampage V Extreme and Asus X99-Deluxe boards were incompatible with Intel Xeon CPUs. That is incorrect, Xeon CPUs may be used with these boards. We apologise to Asus and to any affected readers for this technical error.

GOOGLE TO SUGGEST LEGAL ALTERNATIVES
TO DODGY DOWNLOADS

GOOGLE WILL ALTER ITS SEARCH RESULTS TO HIGHLIGHT LEGAL CONTENT OVER ILLEGAL DOWNLOADS.

Searching for film or music downloads? Google will now highlight legal alternatives, stepping up its fight against piracy by suggesting Netflix and Amazon over dodgy downloads.

Google has long been targeted by anti-piracy groups, which have pressured the search engine to do more to discourage illegal downloads. The company two years ago said rights holders and governments should "follow the money" and target advertising networks rather than "imposing blocks or filters that might damage fundamental freedoms".

Since then, the number of URLs it blocks following piracy takedown notices has skyrocked, and Google has stopped suggesting search terms that will likely lead to dodgy downloads in the autocomplete field in the search bar.

And now, Google's latest anti-piracy tweak means that when search terms such as "download" or "free" are entered alongside a film title, for example, Google's results will highlight legal ways to access the content, such as Amazon, Netflix and its own Google Play store. Searching for musicians, for example, will show legal ways to listen to their music.

Google said it is also improving how it uses the Digital Millennium Copyright Act (DMCA) takedown notices to push dodgy downloads further down its results ranking, and removing more terms from the autocomplete function, so it's not suggesting searches that may come up with illegal results.

At the moment, the new search results system has only rolled out the US, but "we plan to continue investing in this area and plan to expand internationally," Katherine Oyama, senior copyright policy counsel, said in a blog post.

Google said in a piracy report that it recieved 224 million DMCA requests last year, removing 222 million links - stressing that its average turnaround time was fewer than six hours. That's up from three million in 2011, it added.

The highest number of takedown notifications came via a British organisation, with 43.3 million reports coming from the BPI.

APPLE AND FACEBOOK WANT TO PAY WOMEN TO NOT HAVE KIDS

FEMALE EMPLOYEES OF TOP TECH FIRMS GIVEN UP TO $20,000 TO FREEZE EGGS.

How much is delaying a family worth? For female employees at Facebook and Apple, the answer is around US$20,000 according to NBC news.

The two tech giants are apparently prepared to shell out to pay for egg freezing procedures, with the idea that women can progress their careers without having to worry about declining fertility.

Facebook has already begun offering the "perk", according to NBC, while Apple will be making it available from the new year.

"We want to empower women at Apple to do the best work of their lives as they care for loved ones and raise their families," the company told the BBC.

HOT... OR NOT

HOT

STAR CITIZEN

The game, which is still several months away from completion, is about to smash through US$60 million in crowd funding. That makes it the most successful crowd-funded project ever. For perspective, the second place project is a smartwatch at around US$14 million. Not bad for flogging pretend spaceships...

NOT

GAMERGATE

The less you know about this, the saner you will be. What started as a bit of public spite between an ex-couple quickly became at attck on mysogyny, then a right to defend mysogyny, then an attack on gaming journalism, and now, death threats. It's an embarassment to all involved and is now just an excuse to run with the lynchmob wolves.

MICROSOFT SAYS WINDOWS 9 "CAME AND WENT"

MICROSOFT EXEC HINTS "WINDOWS 10" MAY BE MORE THAN A MARKETING STRATEGY, PLUS TECH PREVIEW DOWNLOADS HIT ONE MILLION.

When Windows 10 was revealed, a lot of people were surprised the company had skipped straight over "Windows 9".

Now Tony Prophet, corporate VP for Windows marketing, suggested Microsoft was working on an OS dubbed Windows 9, but ditched it to step even further from Windows 10.

According to Business Insider, Mr Prophet told an audience at Salesforce's recent Dreamforce conference: "It came and it went."

Could it be not only that the Windows 9 name was not only too close to 8.1 numerically, but that the concept they originally had in mind didn't fit in with new CEO Satya Nadella's "one Microsoft" vision?

Prophet didn't explain his comment any further, but went on to echo what Joe Belfiore, corporate VP of Microsoft's Operating Systems Group and Terry Myerson, head of operating systems at Microsoft, said at the launch of Windows 10. "Windows 10 is not going to be an incremental step from Window 8.1," said Prophet.

"Windows 10 is going to be a material step. We're trying to create one platform, one eco-system that unites as many of the devices from the small embedded Internet of Things, through tablets, through phones, through PCs and, ultimately, into the Xbox," he concluded. We just hope that desktop PC users aren't neglected again.

Gaming News

All the news that's fit to print from the gaming world

SOL CONTINGENCY PROJECT SHUTTERED BY INTERPLAY

UDK PROJECT TO RESURRECT CLASSIC GAME DESCENT FORCED TO CHANGE DIRECTION.

Sol Contingency was a very promising looking mod project, recreating the tension and 6-degrees-of-freedom gameplay of the classic shooter, Descent. It was actually all set to launch later this year, bringing claustraphobic mines, angry mining robots, and stomach churning flight physics back to life using the Unreal Development Kit.

Only, one thing has gone wrong - a Cease and Desist letter from rights holder Interplay has scuppered the project.

The Sol Contingency's Project lead, Max Schultz, posted on the site today that they'd recently received the C&D, despite working with a subsidiary of Interplay on getting the completed. "We were in talks trying to work out whether we could make Sol Contingency an officially sanctioned Descent game," he said in a blog post. "I want to emphasize here that *they* contacted *me* about this. They even asked for and received a working copy of a functional internal build of SolC."

But, despite Interplay seeming to have no plans in regards to Descent, they've called for a halt. One of the more annoying parts of trademark law is that it's possible to lose a trademark if you do not challenge anything you see as an infringement upon it, so this could be little more than that.

The Sol Contingency crew isn't quite giving up however.

"we have decided to reface Sol Contingency and remove the Descent assets - the Pyro will be replaced by another ship, the robots from Descent won't make a return, and PTMC is no longer part of our single-player story."

So good will come out of this, and it will be based of the same physics, but with a new story and setting.

MIGHT & MAGIC HEROES ONLINE AVAILABLE NOW

DO YOU LIKE YOUR GAMES MASSIVE, AND FREE? WOOT!

Ubisoft announced yesterday that its massively multiplayer RPG Might & Magic Heroes Online is now available in all English speaking territories.

The game combines classic gameplay, two factions to choose from, guilds, co-op play, and the ability to recruit armies full of fantastic creature for your cannon fodder.

I mean, loyal soldiers. Yess...

A MYST TV SERIES DEAL HAS JUST BEEN SIGNED

ONE OF THE MOST POPULAR GAMES FRANCHISES IN HISTORY IS COMING TO THE TELEVISION THOUGH THE JURY'S STILL OUT ABOUT ITS SUCCESS.

Myst is a game franchise that you'll either love or hate. It's basically just exploring strange locales, unlocking books, travelling to more special locales and your reward is... being able to keep exploring. Before The Sims came along, Myst was the best-selling game of the 20th century but tastes have changed and nothing quite like the game has since been replicated.

Cyan Worlds has signed a deal with production company Legendary Television and Digital Media to create a series based on the game. We are yet be convinced this is a workable project at all, as we're not entirely sure how you're going to build a show around a game where you play as the nameless Stranger and you spend all of the game basically just... wandering.

Videogame franchises haven't exactly transferred well outside the medium though there are people who think the original Mortal Kombat film is an underrated classic. Well, they still haven't made a decent Mario film and we're still waiting for a Final Fantasy film that doesn't come across as a really long music video.

Still, Myst and its sequel Riven are among the most popular videogames ever made so there's a guaranteed audience of at least a few million. What's interesting is that just last week, the Myst film rights were optioned off so the question here is which will happen first? The TV series or the film?

TV might have a better chance of succeeding due to the flexibility given to shows as compared to the tendency of Hollywood to meddle with fantasy-themed films to point they no longer resemble the source material.

REPUBLIC OF GAMERS

THE CHOICE OF CHAMPIONS

ASUS recommends Windows.

ROG G20 COMPACT GAMING DESKTOP PC

DECEPTIVELY POWERFUL

The World's Most Powerful Compact Gaming Desktop PC

Space-saving and compact size with up to a 4th-gen Intel® Core™ i7 processor gives you unprecedented levels of gaming and multitasking performance

Ready for Marathon Gaming Sessions

Effective heat management for ultimate stability
Ultra-quiet: 25dB at idle
Eco Energy Mode: draws just 10W at idle

Optimsed Utilities Designed for Gamers

Customisable lighting effects showcases up to 8 million colours
ASUS-exclusive Aegis application provides a gamer-themed interface to monitor system performance

intel inside™ CORE™ i7

ASUS desktops - Most recommended Windows desktop brand
Based on 2014 Readers' Choice*

*Reprint from www.pcmag.com with permission © 2014 Ziff Davis, Inc. All Rights Reserved.
** Intel, the Intel Logo, Intel Inside, Intel Core and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.

ASUS® IN SEARCH OF INCREDIBLE

Chip News

Excavators loom as AMD Su's its CEO and teams up with Samsung. Meanwhile Nvidia launches its 900M series while shunning new DisplayPorts. Read on as **Mark Williams** explains the latest in chip news.

CPU

AMD'S NEW CEO

As part of their restructuring plan, Rory Reed has now stepped down from the top spot at AMD giving way to Lisa Su. This was a planned switchover as Reed has now completed his task of cutting waste out of AMDs structure (operational expenditures are apparently down 30%) and helped steer the company towards its future goals and even helped stabilise their immediate financial future with the success of its Xbox One and PlayStation 4 design wins, assisting them in keeping "near an optimal [cash reserve] level of $1 billion" and making "significant progress in financial and operational performance".

Lisa Su was groomed for the job by Reed who, with her product-centric background, is best suited to lead the company forward as their future Excavator, Zen and K12 products come on line.

Reed will stay on in an advisory capacity until the end of the year to assist Su into her new role. Su will also keep her current

roles as SVP and GM of AMDs embedded, enterprise and semi-custom units meaning AMDs current management structure remains essentially intact.

AMD TEAM WITH SAMSUNG

In a recent report talking about Apple chip suppliers, it was mentioned that Samsung will start producing 14nm application processors for AMD (along with Apple and Qualcomm) by the end of this year.

While it was known that GlobalFoundries was working with Samsung to build 16nm capabilities, this is the first time we've seen AMD mentioned as working with Samsung directly as a foundry partner.

CARRIZO

AMDs upcoming Excavator architecture that improves upon its current Pile Driver one is due to debut by December this year or January 2015. It'll appear in an APU designed for low-power notebooks and tablets. The chip will be dubbed Carrizo-L which will replace AMDs current Beema- and Mullins-powered designs and is aimed at taking on Intel's low-end Pentium and Celeron processors.

A more fully fleshed out Carrizo that will supersede AMD's Kaveri products in the mainstream laptop and desktop segments is currently slated for a March 2015 appearance. Carrizo will have a quad core design, be paired with DRR3-2133 and be manufactured on the venerable 28nm fab process.

GPU

NVIDIA'S 900M SERIES

Nvidia has launched its new laptop GPU line-up based on its Maxwell architecture. The two models hitting the market immediately are the GeForce GTX 980M and GTX 970M. The GTX 980M sports 1536 shader processors at a base clock of 1038MHz paired with 4GB of GDDR5 via a 256bit bus, while the GTX 970 has 1280 shaders at 924MHz base and 3GB of GDDR5 via a 192bit bus.

Due to the lower TDPs of its recent desktop GTX 980 part and the efficiency gains from the Maxwell architecture, Nvidia is claiming that the GTX 980M achieves on average 75% the performance of its similarly named desktop counterpart. Impressive!

Laptop manufacturers should already have new products out with these in them by the time you read this. Check them out.

R9 285 KEEPS 384BIT

Information has surfaced regarding AMD's next performance segment graphics chip, the R9 285X. It will essentially have the same configuration as the outgoing 280X core, with 2048 shaders and 128 TMUs, along with at least 32 ROPs with some theories pointing to 48.

The juicy part though is that it will also retain the 384bit wide memory bus from the 280X, unlike the R9 285 which was paired down to 256bit. This lends credence to the theory that the two cores are in fact the same chip. The 285 non-X model is simply placed on a package that has less pins for

the memory interface and has a few things disabled (shaders and maybe ROPs).

Given the extra bandwidth over the R9 285 and Tongas new innate memory compression techniques, expect the 285X to have plenty of memory bandwidth for stronger 4K and multi monitor results.

NVIDIA SHUNNING FREESYNC?

After Nvidias GTX 980 launched, there has been some speculation as to why DisplayPort 1.2a (required to operate Freesync compatible monitors) was not included on the card as opposed to its 1.2 non-a specced ports. Despite DisplayPort being a freely licensed interconnect maintained by the industries VESA standards body, Nvidia's cards are yet to support it despite AMD having included 1.2a ports on its cards for over a year.

Could Nvidia be actively ignoring newer DisplayPort standards simply to advance its own G-sync solution at the cost of an industry wide standard?

AOC

www.aoc.com
facebook.com/aoc.anz
email: au@aocmonitor-anz.com

See More

4K ULTRA HD

U2868PQU 28"

3840 x 2160 Resolution
10-Bit Deep Colour
1ms Response Time
4-Way Adjustable Stand
DP, Dual Link DVI, HDMI+MHL

PC PowerPlay SMART BUY

Most Wanted

Electrical things that look interesting but aren't necessarily PCs.

SAMSUNG GEAR VR

Recently, at a typically completely-over-the-top Samsung launch party, I tried the Gear VR.

As one who has some capital and a great deal of emotion invested in Oculus Rift - specifically my DK1, and now, a DK2, I was keen to give it a whirl. Well, it's better than DK1 or DK2. Yep. Said it. Because, the display is a Galaxy Note 4 (which was also launched at the event), and with that, comes a resolution of 2560x1440 on a fantastic 5.7inch Super AMOLED screen.

So, the worlds I was in - and I do mean IN - were crisp. Objects were solid. Distant things were sharply defined. That makes the biggest difference, and highlights that yes, latency and 3D are very important, but resolution is the deal-maker. The actual latency in the Gear VR is not detectable, anyway, at least in terms of perception. I just couldn't imagine it being improved upon what was experienced last night, so any incremental latency tweaks are mathematical and academic, as far as that's concerned it's good enough right now.

Incidentally, I also attended an Nvidia Editor's briefing on the same day for the new 900-series cards, and with that comes a few interesting tweaks for VR support, the funkiest being that in an SLI rig each card renders each half of the view.

The 96 degree FOV was just enough. Peripheral vision was almost nothing but screen, but there were still black edges if you chose to direct your eyes outwards. Keep looking straight ahead, though, and it's all fine. There's a touch pad on one side, too, handy dandy and a great idea.

I was also expecting the unit to be a bit forward-heavy, but it was all very comfortable and no real sense of lopsided weight distribution interrupting the virtual experience.

When this thing comes onsale "within months" it'll sell as many as Samsung can make. This is no 'mainstream' alternative to Oculus, it's a better experience than either dev kit, as a real consumer product, available, probably, well before the first consumer Rift.

Samsung has a business relationship with Oculus, and is licensing Oculus technology, that means compatibility with all Oculus apps and games.

www.samsung.com

DOES YOUR TOOTHBRUSH HAVE BLUETOOTH & AN APP?

We price-checked a 6-pack of 'Family Toothbrushes' at Aldi, which were a quite reasonable $3.99. That represents a potential 498 Oliver Twist toothbrushes instead of a single Geoffrey Edelsten Oral-B SmartSeries 7000. What possible advantage could the SmartSeries 7000 have? And over a regular $60 or so normal electric toothbrush, if we're going to be semi-sensible about it? And why on Earth, for that matter, is there a toothbrush in your PC & Tech Authority?

Bluetooth wireless connectivity, and an app for your smartphone, my dental friends. The whole idea is that you pair it with your smartphone, then while you're going about the important business of brushing your teeth, you'll have your smartphone (better get a waterproof one) resting nearby. How modern! Upon the smartphone's screen all manner of almost magical informations appear. There's a timer for each quadrant of your mouth, which saves your brushing style, for further use, of something. A pressure sensor in the toothbrush talks to the smartphone, telling you to ease up, or go harder. And the bottom half of the screen shows news headlines to make brushing teeth an entertainment option up there with a Michael Bay movie on Blu-ray. Incredible.

www.oralb.com.au

ViewSonic
See the difference™

Stylish Design | Eye-Care | Supreme Colour

VX63 Series – Your Own State-of-the-Art Multimedia Hub!

Create exceptional entertainment experiences with ViewSonic's all-new VX63 series! Featuring a pearly white, frameless design, the sleek VX63 series is the ultimate ideal in entertainment multimedia displays. Utilizing ViewSonic's exclusive SuperClear® Image Enhancement Technology, the VX63 series enables users to enjoy content in stunning Full HD 1920x1080 resolution and enhanced wide-viewing angles for consistent, accurate colors – from virtually any angle. Two HDMI and D-sub input interfaces also increases connectivity options, while mobile device linking and charging is made easy with MHL supported connections. Boasting a newly developed ViewMode function, users can now select one of five visual-enhancing modes (Game Mode, Movie Mode, Web Mode, Text Mode, and Mono Mode) for optimized viewing experiences. The VX63 series also features ClearMotiv® II technology and dual integrated stereo speakers, enabling blazing-fast 2ms response times for ultra-smooth graphic movement and high-quality audio capabilities, ensuring all-encompassing multimedia experiences are always achieved. In order to deliver increasingly enhanced and comfortable user experiences, ViewSonic also offers the best in eye-care benefits with its Flicker-Free and Blue Light Filter technologies. Set up your own state-of-the-art entertainment hub now with ViewSonic's VX63 series!

1080p Full HD | SuperClear | ViewMode | Flicker Free | Blue Light Filter | MHL

www.viewsonic.com.au

Shopping abroad

What are your rights when shopping on overseas sites?

Shopping on overseas websites is appealing because the prices are often cheaper than local outlets, but consumers don't get the same warranty protection. Sites like eBay are convenient and there are some protections, but only if you can lodge your complaint within the specified time and even then you can't be guaranteed of getting a refund or replacement if something goes wrong.

Stephen wrote to Investigator about a Yamakasi monitor he bought from eBay seller green-sum. While it was a beautiful monitor when it was working properly, it developed a fault. The light at the bottom-right on the monitor flashed when on and Stephen could hear a ticking noise. If it was turned off and unplugged, it would work normally.

Stephen says the problems developed within the warranty period. He contacted the seller but they didn't respond to his emails. He eventually went to eBay and PayPal for help.

"When I finally got onto eBay support for help they said they would contact green-sum about contacting me but could not help as far as the warranty because it was past the number of days after sale they set and it was between myself and green-sum as for warranty. Paypal also said it was outside the time limit that they could not help."

"I connected another monitor to the computer and put the Yamakasi away hoping to get it repaired by a local technician, but everyone I asked about repairs said that it would have to go back to where I got it. Green-sum do not seem to want to help."

"Recently I thought I would try and get it fixed. No electronics place could help me so I again contacted green-sum. This time they answered my email and after sending photos and responses I finally got a response."

'Unfortunately, the manufacturer says that they cannot ensure when the boards will be available.

It seems like they have manufacturing issue about the board. If you can give us notification later on, we will inquire the manufacturer once again. Please let us know if you have any question.'

Stephen naturally is unhappy because the problem developed during the warranty period but by the time he got a response, too much time had elapsed. It was the same problem with eBay and PayPal buyer protection. He wrote to the manufacturer directly seeking advice on the faulty board, but received no response.

He passed it on to Investigator to see if anything could be done. Investigator contacted eBay but it didn't respond. Investigator also contacted the Australian Competition and Consumer Commission (ACCC) with a series of questions relating to eBay's responsibility to ensure warranty protection in providing the selling platform.

Investigator asked the ACCC if eBay is liable to provide any warranty protection for buyers and what advice it has for consumers who buy a product that develops a fault and then find that the seller and/or manufacturer won't help. It said it was unable to answer legal question regarding eBay and referred Stephen to the Complaints and Problems page on the ACCC website for general advice and to lodge a complaint.

Investigator sent a demand for a refund or replacement to green-sum via Stephen with a warning that we were planning to write about the problems but so far there's been no response.

"The light flashed and Stephen could hear a ticking noise."

Stephen has exhausted most of his options but still has a faulty monitor that's now two years old gathering dust while he's using a replacement that isn't nearly as good as the Yamakasi.

As Stephen and many others have found, there are risks in buying from overseas sellers and it's probably a worthwhile exercise to weigh up the potential savings against the lack of legal remedies, especially when buying expensive technology where small problems can cause the thing to malfunction.

eBay seems safer because it has some buyer protection so it's essential to contact eBay and PayPal as soon as there's a problem because of the cut-off. The thing to remember is that you're still buying from overseas sellers that don't have to adhere to Australian consumer guarantees for refunds and replacements. You're left hoping that they'll do the right thing if something goes wrong. It might be useful to try and take eBay out of the picture and ask yourself if you'd buy directly from a certain seller if it wasn't on the shopping platform.

ROSALYN PAGE has been a journalist for over 10 years specialising in the areas of consumer issues, technology and lifestyle. Rosalyn is the 2008 winner of the Best Consumer Technology Journalist at the IT Journalism awards. Her work is published in a range of newspapers and magazines

HAD AN ISSUE AS A CONSUMER? INVESTIGATOR CAN HELP.

Email: investigator@pcandtechauthority.com.au

RE-Charge

Just because you're on holiday doesn't mean your devices need to be!

The Verbatim Power Pack range has a portable power solution than can give you from 100% Smart Phone Charge up to a 100% Tablet charge, with dual USB chargers available!

Perfect Christmas Gift

up to **100 % Smartphone Charge!**

Perfect for the Kids!
With a 2,200mAh lithium-ion battery, this tiny USB Power Pack supports charging a wide range of devices such as iPhone, iPod, and micro-USB charged Smartphones, or wireless Bluetooth headsets and portable speakers. Now the kids have no excuse to have their phone turned off!

Power on the go!
The Lightweight and slim form factor makes it convenient to carry in case of the need for emergency power making them ideal for business or leisure travel, road trips, outdoor excursions and more - and with the LED power indicator lights you know how much charge you've used.

www.verbatim.com.au

Verbatim.
Technology you can trust

Christmas Gift Guide

YOU WON'T FIND ANY BOTTLES OF VINTAGE WINE HERE, BUT WHEN IT COMES TO TECH WE'RE READY WITH RECOMMENDATIONS!

As the year rounds-out, we look back at the best gear we've seen, as well as choice recommendations from our sponsors, all to bring you a delectable selection of goodies that may warrant consideration for your present giving – whether the present is for a loved one, or for your own good self!

In an effort to bring order to what could just be a mega mixed Christmas bag, we've grouped the goodies into categories. Some arguments ensued here when paring down the list. "Is this a luxury product, or an enthusiast product?" was a typical conundrum. The resulting blurred lines are near enough, for the mission is to present you with good ideas, and here they all are.

Luxury

BY DEFINITION, THESE ARE THINGS YOU DO NOT NEED, BUT MAY COVET HIGHLY. COST ISN'T A PARAMETER, BUT ULTIMATE QUALITY CERTAINLY IS.

Seiko Astron GPS Solar

$3900 ■ www.seiko.com.au

We love this because it uses GPS technology not to display your location, but to sync the watch with the GPS satellite's signal to ensure absolute precision. It will know where you are, too, of course, and display the time for the time zone you're in, all automatically.

Best of all, this Seiko uses a patented low-energy GPS chip that runs off a solar collector on the watch So, in one, you have a watch that's atomic-clock-accurate, updates itself automatically for different time zones, and won't impose any battery hassles. It's also devilishly smart and a luxury piece that will last as long as you do.

WHO WOULD LOVE IT: It's a big man-sized watch, so not one for the ladies, though we're not ones to impose gender roles with anything this nice. So, it's for someone who appreciates quality and clever engineering.

Asus Republic of Gamers ROG G20

$1599-$2899 ■ www.asus.com

Asus occasionally make forays into complete integrated PC systems, and when the company does it's executed with style and a serious eye for engineering quality. The ROG G20 is a good choice for someone who wants a high-end gaming PC but isn't inclined to build it themselves, or to settle for a clone that looks like any other PC. The G20 is a good looking box, yet is very compact.

You can specify a CPU up to a Core i7 4890, up to two GTX 79 graphics cards as well as a range of memory and storage options. Take care, though, because the highly integrated design means that upgrading generally isn't possible. On the flipside, the integrated design makes for a cool and quiet box, part of which comes from having the power supplies external.

WHO WOULD LOVE IT: A hardcore gamer with a sense of style. You could also 'gift' this to your living room, and use it as a game machine for playing on your big screen TV – a present for the whole family!

Samsung S9C OLED TV

$9999 ■ www.samsung.com

At an imposing ten grand, this TV is truly one that inhabits the expensive end of town, but that's what you need to pay to enjoy a very large (55in) OLED. One day, soon we hope, OLED screens will fall in price, but for now this new technology isn't cheap. It isn't a question of whether or not it's worth ten big ones, because it isn't, but if you're the luxury-type with a bit of cash to burn what you get is the best screen image available today. OLED, unlike LCD, requires no backlighting so contrast and colour depth is exceptional, furthermore OLED is essentially 'printed' onto a plastic sheet so the screens themselves are delectably thin, works of art in themselves.

WHO WOULD LOVE IT: This is a gift for the whole family.

THE CHOICE OF CHAMPIONS
ROG G20 COMPACT GAMING DESKTOP PC
DECEPTIVELY POWERFUL
ASUS IN SEARCH OF INCREDIBLE
intel Inside CORE i7

Gamer

PC GAMING IS A WONDERFUL PASTIME, AND WE'RE SURE MANY OF YOU WILL BE GAMING AWAY THE CHRISTMAS HOLIDAYS. HERE, THEN, ARE A FEW CHOICES FOR THE GAMER YOU LOVE.

Asus ROG Swift PG278Q

$999 ■ **www.asus.com.au**

At the top of the gaming monitor tree sits the Asus ROG Swift line. We reviewed the Swift PG289Q in the October issue and were left highly impressed by its combination of G-Sync frame rate smoothing and large 27-inch size.

It's the largest monitor currently available that includes G-Sync, so brings together both important gamer needs of smooth action and big size. The LCD panel is a gem, too. This is one of the only monitors ever made that's designed specifically for gamers.

WHO WOULD LOVE IT: Gamers who want the very best.

Fanatec Clubsport wheel base plus wheels

$687 ■ **www.fanatec.com/au**

One could argue that this belongs in the 'Luxury' category, but we know many of our readers are fanatical about their gear, and for them, this is the gift they'll thank you for, for a thousand years. Short of buying a force feedback device that's been engineered by a specialist racing company, and intended for sale to a real racing team for training, this is the best of the regular consumer gear.

It's German designed and made and every cliché about quality rings true. The base has an immensely strong main force motor, plus extra motors for effects. The smooth belt drive eliminates and rough knottiness you may have experienced with a Logitech G25 or G27 wheel and driving with one of these is pleasure on a track.

The $687 only gets you the base - you still have to choose which wheel to attach via the racing-style quick-release hub, and there are many, with more added somewhat frequently. We use the $239 Formula Wheel and the $329 BMW M3 GT2 wheel. Somewhat rationalising the cost, is that you can use it with PC, Xbox or PlayStation 3.

WHO WOULD LOVE IT: Anyone who loves racing games.

Corsair K70

$159 ■ **www.corsair.com**

We're sorry, but regular keyboards, the $25 kind, just can't cut it these days for gaming. Not when there are mechanical boards designed just for gaming. Like the excellent Corsair K70. Mechanical switches give a better response both in their key press action, and for precision. Well, that's the official line - and it's true - but the truth of the matter is that a good mechanical keyboard just feels a whole lot nicer to use. Gamers like premium gear, get one a premium keyboard.

WHO WOULD LOVE IT: Gamers who play for hours, and hours, and hours...

ViewSonic
See the difference™
VX63 Display Series –
Your Own State-of-the-Art Multimedia Hub!

Viewsonic VX2363mhl-W

PRICE: $249 ■ www.viewsonic.com

What are the chances your gaming loved one is using the same monitor as they were years ago? Technology has marched on, and with a newer screen, gamer's win. At just $250 (probably less 'on the street') this ViewSonic 23incher has a flicker-free screen so the long hours won't hurt their eyes. Dual HDMI inputs allow a PC plus a console to stay connected, and the Full HD resolution is a good balance for the size for a quality image yet with smooth framerates.

WHO WOULD LOVE IT: PC gamers who also love to get it on with a console, having it all together in one hot games-station.

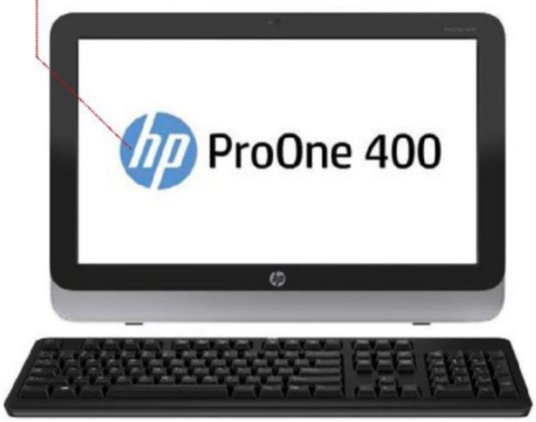
HP ProOne 400 AIO

$1299 ■ www.hp.com.au

Now, gamers aren't all of the super hardcore variety. Nor are the games themselves, with thousands of 'casual' and arcade games to choose from on Steam. Most of these don't demand a particularly high-end PC, and we know from bearing witness to actual families doing actual real-world gaming, that a good all-rounder than anyone can use is perfect for most families.

The HP ProOne was reviewed in the last issue of PC&TA, and we liked what we saw. This machine will do double-duty as the general 'family PC', too. It has a ten-point touch screen, which may not be particularly useful for Windows tasks, but it is fantastic for some casual games.

WHO WOULD LOVE IT: Families who like a bit of casual gaming on a machine everyone can share.



Aorus Thunder M7 gaming mouse

$99 ■ www.aorus.com

A lot of mice pass beneath our gaming hands each year, and the all-new Aorus M7 is a favourite. Despite initial driver issue it's now shaped up to be a real gaming gem. It feels fantastic, looks the part, too, and the 'feel' on-screen as you move around is exquisite.

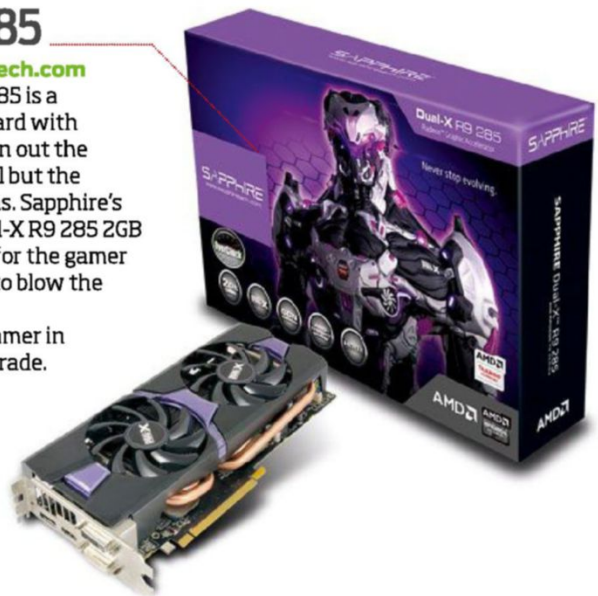
WHO WOULD LOVE IT: FPS and MMO gamers, but really anyone.

Radeon R9 285

$319 ■ www.sapphitetech.com

At around $300, the R9 285 is a very well-priced gamer card with performance able to churn out the frames in high detail in all but the highest screen resolutions. Sapphire's economically named Dual-X R9 285 2GB GDDR5 OC is a top choice for the gamer you love, but don't want to blow the budget on.

WHO WOULD LOVE IT: A gamer in desperate need of an upgrade.



2ms
Super CLEAR
Image Enhancement Technology
www.viewsonic.com.au

Enthusiast

WE'RE ALL ENTHUSIASTS, HERE AT *PC & TECH AUTHORITY.* AT LEAST IN TERMS OF PASSION AND APPRECIATING THE FINER PC COMPONENTS AND PERIPHERALS. LET'S SHARE SOME OF THAT.

A new NAS

Gone are the days when a NAS was a dumb device. A box'o'storage and nothing more is an outdated concept, these days. Now, a modern NAS will have a powerful CPU and enough system memory to run a virtual machine. And for apps, there's usually one for everything.

This year we've enjoyed testing NAS products from the likes of Synology, Qnap and Thecus, which tend to give your enough software and apps to run the NAS as an environment for managing your personal cloud.

Two that impressed us especially this year, and which we think would make outstanding gifts, are the Qnap Turbonas TS-853 Pro, which is a high end NAS ($1852), and the baby Synology DS411 Slim ($349), a wee thing that takes 2.5in drives - so is a perfect little speed demon for those of you lucky enough to have a few spare SSDS lying around (or just use boring old 2.5in hard drives, if you must).

WHO WOULD LOVE IT: An enthusiast-level PC needs enthusiast-level storage!

Venom BlackBook 15

$1899 - $2149 ■ www.mln.com.au/venom

The Venom range from MLN doesn't hold back in any area. Its specifications are essentially a collection of the best of the best, so for road warriors who appreciate pure power and beautifully excessive engineering, this is a gift that will earn you a lifetime of gratitude. We hope.

With a 3.4GHz i7-4700MQ, up to 32GB of DDR3 and M.2 PCIE SSD storage it's a blazer, but there are many high-end power laptops. This one is special. A proper Sound Blaster X-Fi audio processor is able to deliver the extremely good audio, and we especially like being able to switch the GPU currently being used between the discrete (GeForce GTX 970M or GTX 980M) depending on how much processing power your game needs.

WHO WOULD LOVE IT: Anyone who loves their laptop - or doesn't, but deserves to.

AN SSD

Any SSD will do, even a budget model like Crucial's MX100 series will bring a new level of performance to your PC that will leave you amazed. For the converts who have already discovered the joys of SSDs, now is the time to add more. Back in the day when SSDs first appeared, a small capacity (60-120GB) drive was the go for your OS and a few favourite apps, but now falling prices have made it feasible to include a larger drive of around 500GB to use as an install drive for almost everything.

Speed demons like the Samsung 850 Evo and Sandisk Extreme Pro offer a slight boost in performance over the cheaper models, but it's marginal at best so give your PC an SSD array that's within budget and you'll never look at a hard drive again.

WHO WOULD LOVE IT: Any PC dragging its archor.

ASUS
IN SEARCH OF INCREDIBLE
Strix Tactic Pro
Mechanical Gaming Keyboard
Strix Glide Control

A better mouse and keyboard

A lot of gear that's pitched at gamers is just as awesome for general use. It's just that the lucky gamers get their gear all buffed out with extra functions, premium components and high-style. You could do a lot worse than to look at gamer gear as a gift for someone who just loves being at their beloved PC.

Like the Asus Gladius mouse, which is also reviewed in this very issue in Labs Briefs. Within this little beasty is a set of swappable Omron switches and a 2000Hz polling rate so it's silky smooth to use.

The ROG Gladius pairs beautifully with the STRIX Tactic Pro mechanical keyboard, featuring Cherry MX switches (Blue, Brown, Black or Red switch options available).

WHO WOULD LOVE IT: Gamers with a sense of style.

A NEW CASE

$80 - $200

If that someone special in your life has scored a few new PC components this Christmas and is now contemplating building a new PC, then a new case to put it all in makes good sense.

We've seen many this year that are worthy, both from a style perspective, and for clever design that makes the building part less troublesome.

For a simple and affordable Fractal Design make some excellent cases. The Core series is all about simplicity, and not for a moment do we suggest that to be an 'enthusiast' means doing things the expensive or over-complicated way.

Or, if you want to give a case as a pressie to someone with a bit of style, Corsair's Air 240 case looks very cool indeed (much nicer 'in the flesh' than the already-nice pictures show).

WHO WOULD LOVE IT: You would. Give your PC a new set of clothes for the new fashion season and make it all feel fresh again.

AOC G-SYNC G2460PG

$549 ▪ www.aoc.com

Another great choice for the more hardcore gamer is a screen that uses Nvidia's G-Sync technology. Compatible with only Nvidia cards (sorry AMD), G-Sync overcomes the limitations of the LCD's refresh rate, with the video card's rendered frames being displayed as soon as they're ready, instead of having to wait for the monitor to 'catch up'.

The end result is silky-smooth gaming even if your system is delivering frame rates well under the target 60fps we have always aimed for. This 24-incher has a Full HD resolution, which, while just enough for gaming, ensures that your PC won't ever struggle to keep up.

WHO WOULD LOVE IT: Gamers who love to crank up the detail settings to maximum, but not suffer from frame rate degradation.

Home

GIFTS FOR THE HOME ARE AN EXCELLENT WAU TO GIVE THE ENTIRE FAMILY SOMETHING SPECIAL. IT'S NOT CHEATING!

Billion BiPAC 7800NXL

$130 ■ www.au.billion.com

Now that you have a bunch of happy family members all saturating your home network's bandwidth with their Christmas devices, could it be time to gift the lot of them (via a gift to the 'house') with a new modem router?

We think the The BiPAC 7800NXL is an excellent solution for that. It's a fibre-ready triple-WAN ADSL2+ modem router which operates as an all-in-one advanced device including Wireless-N 300Mbps, Gigabit Ethernet, 3G/4G LTE, and NAS (Network Attached Storage) in one unit.

WHO WOULD LOVE IT: All of your devices.

Music, music, everywhere

A few years ago Sonos had it all figured out. You could stream your music – whether from a networked collection, or streaming from digital radio – throughout the home wirelessly, and with the added convenience of a central remote control.

Now it's hard to find a company that doesn't have a Sonos clone, or to be more respectful, their own take on this wonderful tech.

Samsung has its Shape wireless streaming audio system, for example. There's the M5 with three speaker drivers within, or the chunkier M7 with five drivers. The Shape app does the controlling, and also means that any guest smartphone can contribute to the mix.

Meanwhile the good people at Sonos keep on refining the technology they started. There are a great many Sonos products available, and we're not recommending one over another because it all comes down to your home, its layout and your musical needs.

Bottom line, though, is that these devices are a wonderful way to set the music free.

WHO WOULD LOVE IT: Your ears, your friends, the good times.

Multiband 802.11ac router

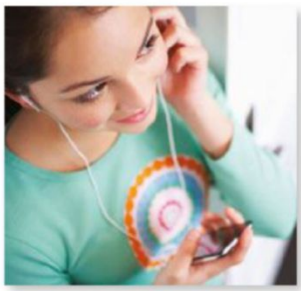
If your home network is reaching saturation point, what with everyone in the house expecting a fat pipe at all hours to stream, or play, or download, last year's router just won't cut it. Gift the whole family with a beastly router like Netgear's Nighthawk X6. It's tri-band, has six antennas and supports the fastest 802.11ac networking. Plus, you can strap it to your chest and win at your next fancy dress party as a space robot.

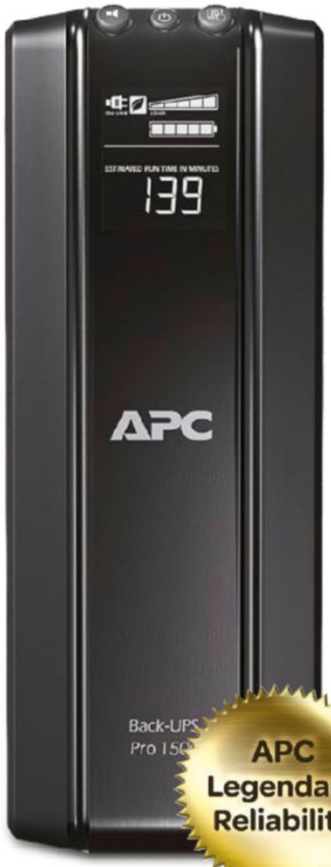
WHO WOULD LOVE IT: The whole house, and you.

THE CHOICE OF CHAMPIONS
ROG G20 COMPACT GAMING DESKTOP PC
DECEPTIVELY POWERFUL
ASUS IN SEARCH OF INCREDIBLE
intel Inside CORE i7

With APC Back-UPS, your digital life goes on...

even when the power goes off.





Preserve what's most important to you.

Reliable power backup for 24/7 availability

Whether DVRing your favorite show, updating your Facebook status, or playing a live networked game, you depend on your home electronics every day, all day. That's why APC by Schneider Electric has designed battery backup solutions that protect the constant availability and connectivity you expect… and depend on.

Peace-of-mind protection on two levels

When the power goes out, our popular Back-UPS units go to work. They instantly switch your home technologies to emergency power, allowing you to work through brief power outages or safely shut down your systems so you won't lose valuable files—such as digital photos and media libraries. They also feature surge outlets to guard your electronics and data from "dirty" power and damaging power surges—even lightning. So you get two levels of protection in every APC Back-UPS unit!

Energy-saving insurance for what matters most

Our Back-UPS units protect your home office, digital living and home media applications, notebook computers, DVRs, and gaming application. And since we now offer energy-efficient models that reduce electricity costs through unique power-saving outlets, you can realise true energy savings regardless of the applications you're backing up. Throughout your home, the APC Back-UPS is the cost-saving insurance you need to stay up and running and reliably safeguarded from both unpredictable power and wasteful energy drains.

Keep your electronics up and your energy use down!

ES Series

The ever-popular ES models are priced affordably yet provide enough extended runtime to allow you to work through short and medium power outages. Some power-saving models have been designed to actively reduce energy costs.

The energy-efficient ES 700G

The ES 700G boasts innovative power-saving outlets, which automatically shut off power to unused devices when your electronics are turned off or asleep, eliminating wasteful electricity drains.

- 8 Outlets • 405 Watts / 700 VA
- 68 Minutes Maximum Runtime**
- Telephone/Network Protection

The best-value ES 550G

The ES 550 uses an ultra-efficient design that consumes less power during normal operation than any other battery backup in its class, saving you money on your electricity bill.

- 8 Outlets • 330 Watts / 550 VA
- 51 minutes Maximum Runtime**
- Telephone/Network Protection

Power up to WIN 1 of 3 APC ES700G Battery Back-UPS units!*
Visit www.apc.com/promo Key Code 54087K

APC by Schneider Electric

©2014 Schneider Electric. All Rights Reserved. Schneider Electric, APC, Back-UPS, and Legendary Reliability are owned by Schneider Electric Industries SAS or its affiliated companies.
e-mail:esupport@apc.com • 78 Waterloo Road, Macquarie Park, NSW 2113 AUSTRALIA • 998-2508_AU-half • Tel: 1800 652 725
*Authorised under NSW Permit No. LTPM/14/00469, ACT Permit No. TP 14/01580. Promotion commences 1st July 2014 to 31st December 2014. Full Terms and Conditions available online.
**Runtimes may vary depending on load.

Mobile

GIVE YOUR GIFT-GIVING A LITTLE EXTRA MILEAGE THIS YEAR, BUT GIVING SOMEONE SOMETHING THEY'LL TAKE EVERYWHERE.

Surface Pro 3

$979 – 2279 ■ www.microsoft.com.au

It's such a good-looking, well-designed tablet that we can't image it not being well received as a gift. The base i3/64GB SSD option is a relatively economical PC-on-the-go, while the top end i7 version is all the mobile desktop a road warrior needs. Add a detachable keyboard and it's a gift that will be appreciated daily.

WHO WOULD LOVE IT: Road warriors after a bit of real power.

Apple iPhone 6

$869 - $1259 ■ www.apple.com.au

The gift of a smartphone will certainly be well appreciated by the lucky recipient, but it's at a time like Christmas that the undeniable power of Apple's allure bags the prize for Most Wanted. We take a close look at the iPhone 6 in this issue, but we're quite sure you've already heard the buzz, and perhaps envied a friend who has one. No other smartphone elicits such intense emotion, so give some of that excitement to a loved one, and they will be forever yours.

WHO WOULD LOVE IT: Just about anyone.

KEF M500

$399 ■ www.kef.com

We reviewed these at the start of the year and have not, before or since, enjoyed music more. The M500's work spectacularly well with smartphones or tablets, able to pump out sonic quality that will have you thinking, for just a moment, that you're at home plugged into a serious bit of amplification.

WHO WOULD LOVE IT: Music lovers who get around.

With APC Back-UPS, your digital life goes on...
even when the power goes off.

Verbatim Power Packs

From $29 ■ www.verbatim.com.au

Now there's no excuse for the kids, grandparents or YOU to run out of phone charge while out and about. Verbatim's 2,200mAh range of Portable Power Packs charge a wide range of devices such as iPhones, iPods, eReaders and micro-USB charged smart phones or wireless Bluetooth headsets. Talk longer, listen to more music, play more games, watch more videos without worrying about running out of battery! The lightweight and slim form factor makes it convenient to carry in case of the need for emergency power making them ideal for business or leisure travel, road trips, outdoor excursions and more.

WHO WOULD LOVE IT: A choice little gift that will be appreciated by anyone. Anyone at all!

Fujifilm X-T1

From $1300 (body only) ■ www.fujifilm.com

Of all the cameras we tested this year, this one stands head and shoulders above the rest. For advanced photographers it's a viable alternative to a DSLR, but for the rest of us shooting mostly on auto mode this is the camera that will make your shots look professional.

It's delightfully straightforward to use, and has none of the intimidation many other cameras tend to throw at their users. It's a beautiful object, so when your loved one unwraps this they really will feel special.

WHO WOULD LOVE IT: Anyone who likes taking amazing photos.

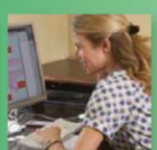
APC M10BK

www.apc.com

Out and about knows no bounds with an APC 10,000mAh power pack. With this much spare juice in your bag or pocket even the most power-hungry devices like laptops can tap into this handy portable energy reserve.

The M10BK model features a push-button activated LED battery charge indicator. Its efficient charging extends the battery life by automatically shutting down when the connected devices have completely charged. The mobile power pack recharges all devices that connect to power using a USB cable, including your mobile phone, tablet, audio player, handheld gaming console, and e-reader.

WHO WOULD LOVE IT: That special someone who never, ever, gets off their mobile device.



Power up to WIN 1 of 3 APC ES700G Battery Back-UPS units!*
Visit www.apc.com/promo Key Code 54090K
APC by Schneider Electric
Remember

IN THE LABS

YOU WON'T FIND BETTER REVIEWS ANYWHERE IN AUSTRALIA!

Under the Surface

BEN MANSILL WONDERS IF EVOLUTION HAS GOTTEN AHEAD OF ITSELF.

Sometimes when we do a group test we think we've got it all covered, but then something comes along late in the game that throws a semi-spanner in the works. I'm referring to this issue's Premium Tablets group test. I write this a couple of days after we called it a wrap, but then today, good job, Apple announces the new iPad Air 2. Thanks Apple. So obviously we didn't have time to include it, and I'm writing this mainly to head off at least some of the letters I know I'm going to get asking why we left it out. Now you know. A group test takes several weeks to plan and execute, and what we have in this issue is, I think, a pretty fantastic roundup of the best tablets out there. We'll do a review of the new iPad 2 very soon, hopefully next issue!

A TABLET ULTRABOOK?

Last month we gave the best Ultra Portable product in our somewhat legendary A-List to the Microsoft Surface Pro 3. It replaced a traditional laptop (the Lenovo Carbon X1, a lovely $2499 machine that had held the spot for almost a year). Scandal! It seems that not every reader agrees with this decision, and I've printed a letter we received in our Inbox page with a bit of a response.

We absolutely stand by it, but I'd love to hear from anyone with strong feelings either way, so do please share your thoughts with us via inbox@pcandtechauthority.com.au. It would be especially nice to hear from anyone that have bought one of these machines (or, perhaps, had one supplied via their job), and uses it on a daily basis for work – both deskbound and out and about.

As I explained, spec-for-spec, and tangent to that, in pricing, the Surface Pro 3 matches any Ultrabook out there, and that includes encompassing the price range covered through the three CPU options and three SSD capacity options within those. The Type Cover 2 – being the oh so important component that will make or break its utility as a serious work machine, passes with flying colours. I took a Surface Pro 3 along to the recent Intel Developer Forum in San Francisco, and worked it hard for a week. During that time I saw a few Surface Pro 3's being used by attendees, not many, around a dozen or so out of the hundreds of delegates there -- and for I knew they could have been Microfoft employees. In any case, for a machine just-launched it was half a surprise to see that people had chosen to commit to a serious week of writing on a 'hybrid'. My own experience was marvellous, it is light to carry, has full ultrabook power, the full suite of Windows apps, and it rests just so nicely on your lap.

Anecdotally, I'm also seeing these machines used by several fellow tech journalists at press event, mostly the news guys who need to write and upload on the fly. Are we wrong? Have you taken the plunge? Do write and let us know, I'd love to hear your stories!

GIGABYTE FORCE H3X
46

AOC U3477PQU 34" MONITOR
41

AORUS X3 GAMING LAPTOP
39

EDITORIAL & PRODUCT SUBMISSION: *PC & Tech Authority* welcomes all information on new and upgraded products and services for possible coverage within the news or reviews pages. However, we respectfully point out that the magazine is not obliged to either review or return unsolicited products. Products not picked up within six months of submission will be used or donated to charity. The Editor is always pleased to receive ideas for articles, preferably sent in outline form, with details of author's background, and – where available – samples of previously published work. We cannot, however, accept responsibility for unsolicited copy and would like to stress that it may take time for a reply to be sent out.

WHAT OUR A-LIST MEANS

Our A-List award is reserved for the best products in each category we review. With a winner and an alternative pick in each, that's 92 products you know are first class.

WHAT OUR AWARDS MEAN

PC & Tech Authority's comprehensive Real World testing sorts out the best products from the pack. Any product recommended by *PC & Tech Authority* is well above average for features, value for money and performance.

WHAT OUR RATINGS MEAN

OUTSTANDING
VERY GOOD
ORDINARY
POOR
VERY POOR

HOW WE TEST

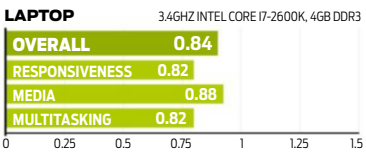
OUR BENCHMARKING TESTS ARE THE BEST IN THE BUSINESS. READ ON TO FIND HOW THEY WORK...

2D TESTS

We test desktop PCs, netbooks and laptops with our own, custom-built, 2011 Real World Benchmarks.

We split the results into three categories: Responsiveness, Media and Multitasking, with the Overall score an average of the three sub-scores.

For instance, responsiveness replicates light browser and productivity workloads. The Media test involves running iTunes for audio conversion, Photoshop CS5 to crunch large images and Sony Vegas 10 to edit home video. This then gets run simultaneously alongside Cinebench 11 in order to get a handle on the multitasking ability of the system.



3D TESTS

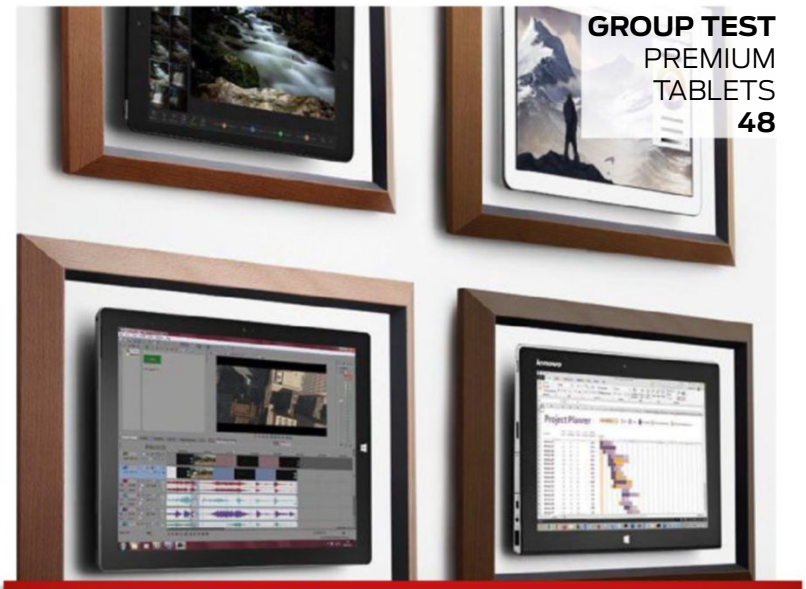
We use pre-recorded demos in Crysis and DIRT 3 to test gaming performance where relevant. We have three standard test settings, depending on the power of the graphics card: Low, Medium and High.

To test gaming performance, we use our own recorded Crysis benchmark. We use the Low, Medium and High quality settings in 1366 x 768, 1600 x 900 and 1920 x 1080 screen modes respectively. Very high-end systems can also be tested using the ultra-intensive Very High settings, with all detail switched on, and varying levels of anti-aliasing enabled.

LAPTOP BATTERY LIFE

We subject laptops to two battery tests. In the light-use test, we optimise the system settings for the greatest power efficiency. We then disconnect the mains and run a script scrolling a selection of web pages until the system shuts down, giving you a realistic idea of the surfing time each laptop offers.

For the heavy-use test, we engage Windows' High Performance power profile, set the display brightness to maximum, and allow the taxing Cinebench 3D renderer to push the processor load to the limit. This gives a worst-case figure, revealing how long you can expect the battery to last under the most demanding conditions.



GROUP TEST
PREMIUM TABLETS
48

REVIEWED THIS ISSUE...

PCS & LAPTOPS

Aorus X3 39
Acer Switch 10 41

HANDHELDS

Apple iPhone 6 35
Sony Experia X3 Compact 46
Apple iPad Air 56
Microsoft Surface Pro 3 58
Samsung Galaxy Tab S 10.5in 60
Sony Xperia Z2 61
Amazon Kindle Fire HDX 8.9in 62
Asus Transformer Pad TF103C 62
Samsung Galaxy Note Pro 12.2 63

PERIPHERALS

AOC U3477PQU 34inch 41
Seagate 2Bay NAS 39
Gigabyte Force H3X 46
LG Mini Beamer 47

COMPONENTS

Kraken X61 AIO 42
Antec Kühler H2O 1250 42
Cooler Master Mizer 46
Cooler Master Novatouch TKL 46
Cooler Master Storm Quickfire Rapid 47
Asus Gladius Mouse 47

GAMES

Defense Grid 2 72
Shadows of Mordor 74

WEARABLES

Jabra Sport Pulse 47

NVIDIA'S next steps

BIG CHANGES ARE COMING FOR GRAPHICS TECHNOLOGY AND NVIDIA IS PUSHING TO STAY AT AHEAD OF THE PACK. **JOSH PHILPOTT** ROUNDS UP THE NEW TECH, AND THE LAUNCH CARDS

As 4k monitors become a less bleeding edge and more accessible option, and as new games begin to put pressure on the cards available, Nvidia's new ideas bring a more powerful and stable generation of its graphics hardware to the market.

NEW CARDS

Newly designed GTX 970 and GTX 980 cards are just arriving with a closer focus towards balance this time. Nvidia's new build uses a large single heat sink for better cooling, taking the weight off the fans, effectively lowering the need for large amounts of power usage and giving more freedom for overclocking through better heat management. There is also a huge increase in Cuda Cores, pushing performance for supported applications well above previous generations. Power draw has also been addressed, new cards are tame compared to the high draw nature of the last generation, which again helps stabilise this powerful technology. Each company will of course take this reference design in different directions, however this focus on basic requirements and balanced technology will help give better performance with longer lasting and more reliable end products you can really use.

NEW CORES

The new Maxwell GPU's have been redesigned from the ground up with performance-per-watt in mind and a lot of focus on the unit's efficiency. Improvements have been made to the GPU's control logic partitions for better workload balancing, new features and capabilities are also being implemented, some of which include Dynamic Super Resolution (DSR) and Multi-Frame Anti-Aliasing (MFAA), with support for VXGI (Voxel Global Illumination).

Maxwell's new Streaming Multiprocessors (SM's) architecture delivers up to 40% more performance per Cuda Core from shader-limited workloads than the previous Kepler GPU, with almost double the performance per watt.

Basically this new core is faster, more efficient and most importantly, more stable.

NEW TECHNOLOGY

Though hardware is always an important focus, some of Nvidia's new technologies are adding even more to the mix. Geforce Experience is being overhauled, giving better optimisation for older cards through testing. Dynamic Super Resolution is also worth a mention, basically rendering the game at a super high, more detailed resolution and then re-adjusting the content back down to the maximum output of your monitor. Effectively this gives you emulated 4k resolution on any kind of display. Nvidia are also adding more power to their Multi Frame Anti-Aliasing processing (MFAA) offering up to 30% faster AA processing at the same quality.

Lastly, new Voxel Global Illumination (VXGI) technology, is being developed to better depict indirect lighting using a Voxel based system and applying cone tracing to better map output and create a more natural experience. This new technology enables GPU's to deliver real-time dynamic global illumination for the first time and includes amazing steps forward in diffuse lighting, specular lighting and reflections.

Putting the focus this time on powerful but balanced hardware, Nvidia are looking to rework their range instead of aiming for groundbreaking new ideas. Though some of this technology has yet to be proven in the field, it's good to see the direction is one of improving on its current technology, pushing into better lighting and high quality output for the current generation of monitors.

HOW THE 900 SERIES STACKS UP

	GTX 980	GTX 970	GTX 780 Ti	GTX 770
CUDA Cores	2048	1664	2880	1536
Texture Units	128	104	240	128
ROPs	64	64	48	32
Core Clock	1126MHz	1050MHz	875MHz	1046MHz
Boost Clock	1216MHz	1178MHz	928Mhz	1085MHz
Memory Clock	7GHz GDDR5	7GHz GDDR5	7GHz GDDR5	7GHz GDDR5
Memory Bus Width	256-bit	256-bit	384-bit	256-bit
VRAM	4GB	4GB	3GB	2GB
FP64	1/32 FP32	1/32 FP32	1/24 FP32	1/24 FP32
TDP	165W	145W	250W	230W
GPU	GM204	GM204	GK110	GK104
Transistor Count	5.2B	5.2B	7.1B	3.5B
Manufacturing Process	TSMC 28nm	TSMC 28nm	TSMC 28nm	TSMC 28nm

Billion, where functionality meets affordability.

The Billion brand has been providing customers in Australia with quality and affordable networking products for over 12 years. We also define our user-friendly product packages by integrating with new technologies such as wireless, powerline, and VoIP into our product family to enable our customers to enjoy the beauty of compact design without purchasing extra hardware.

With the launch of the popular dual-band wireless "V series" in 2012, followed by the fibre ready triple-WAN "7800 series" in 2013 and the recent wireless AC 8800AXL, Billion continues to offer feature loaded, affordable products, that won't let you down.

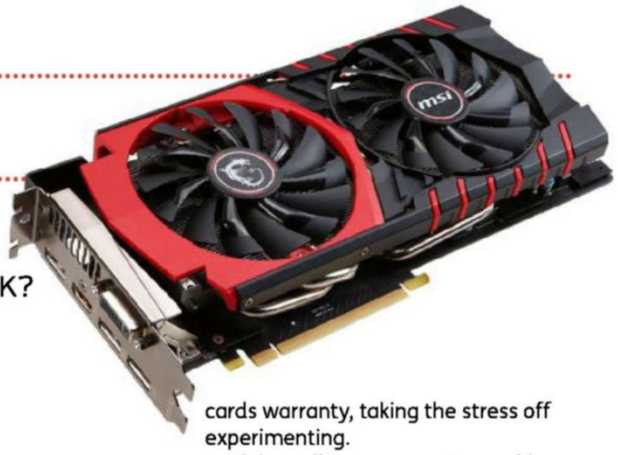
For more information on any of the Billion product range or for a full list of Billion stockists throughout Australia head to billion.com.au.

Phone: 08 8186 1800 **Email:** sales@billion.com.au

Billion Electric Co., Ltd. (Talex: #3027), since 1973, is one of the leading providers of network equipment in the Asia Pacific region.
For more information, please visit **billion.com.au**. Billion is exclusively distributed by PC Range Pty Ltd. **pcrange.com.au**

BILLION®

MSI GTX 980 GAMING 4G



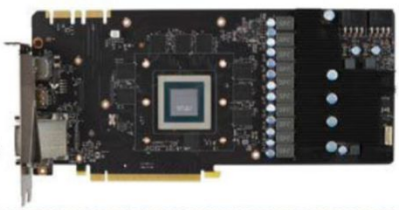
COMING OUT A TAD CHEAPER THAN ITS SISTER CARDS, THE MSI GTX 980 4G MAY LOOK SLEEK BUT CAN THIS STYLISH MONSTER KEEP UP WITH THE REST OF THE PACK?

PRICE $829
SUPPLIER www.msi.com

Sitting at the lower scale of the GTX 980 cards in terms of price, MSI's new GTX 980 4G is a high end option for budding tech enthusiasts and is great for overclocking if it's still a scary concept for some.

MSI's built in Afterburner overclocking software is available for those who want to push this card to its limits. However for those wanting something a bit more streamlined, the MSI Gaming App allows users to play around with the card's output without risking damage, offering three simple modes to tailor performance to your situation: Silent Mode, Gaming Mode and and Overclocking Mode. The Silent Mode brings the base clock down to 1172GHz, which is ideal for day-to-day use keeping the noise to a minimum. The Gaming Mode works as a balance between power and fan volume with a base clock of 1190GHz and a boost clock of 1291GHz. And finally the Overclocking Mode, bringing the base clock up to 1216 GHz and allowing a massive boost clock of 1317GHz with surprisingly low noise levels considering its output.

As an added bonus for those who are weary of pushing the card too far, all of these options available through the app are covered by the cards warranty, taking the stress off experimenting.



High quality components provide lower power usage and better performance, and the two Twin Frozr V fans provide plenty of cooling, with a 5% reduction of noise from the last generation of MSI cards. This GTX 980 is a standout product, the card may not offer a zero noise option like some of its competitors, but out of this new range, safe overclocking options and a high boost clock give it a good place in the market, and great value for money.

PC &TECH AUTHORITY RECOMMENDED

KEY SPECS
4GB DDR5 video ram · 1x HDMI, 1x DVI-I, 3x DisplayPort · PCI Express 3.0 · 1317GHz Boost clock (OC Mode)

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

MSI GTX 970 GAMING 4G

DESIGN, POWER AND STABILITY, ALL AT A REASONABLE PRICE.

PRICE $519
SUPPLIER www.msi.com

Proving smart design can make all the difference, MSI's new take on the GTX 970 has primarily focused on construction to sell its card. Running a large copper base plate connected to its GPU, the card distributes its heat through two 6mm and two 8mm pipes, which run through the card's full length aluminium fin heat sink at multiple points, to help to maximise heat distribution and take full advantage of its design.

This system allows for high performance use with next to no need for the fans to spin up. Its low noise design may still have a slight hum instead of pure silence, but this constant trickle of air is more about maintaining stability, giving impressive performance and offering some of the best card temperatures out of the GTX 970 series that we have used.

Lacking much in the way of new features, this GTX 970 relies on well known MSI technology like its gaming app to prove its worth. Using this small piece of software, users can perform basic overclocking options to bring the card up as high as 1279MHz for its boost clock speed or into a silent mode lowering the GPU clock speed right down and dropping the fan speed for low output tasks like film watching.

For those with more technical knowledge, MSI's Afterburner is also on hand to help you further tweak the output, giving impressive and stable results and thanks to high quality components.

With low noise fans, good cooling and solid results under pressure, the MSI has put its attention into important aspects for the GTX 970 4G, and though it is not huge on special features, the overall ability to give performance whether using the provided app or manually overclocking makes it a great choice, at a competitive price, and makes this – and the 970 range overall – a serious contender for game rigs that demand perfroamnce at a budget.

PC &TECH AUTHORITY RECOMMENDED

KEY SPECS
4GB DDR5 video ram · Twin 10mm Frozr V fans · Base clock speed 1140MHz (OC Mode) · 2x DVI-I, 1x HDMI

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

GIGABYTE GEFORCE GTX 980 G1 GAMING

CHOOSING POWER OVER QUIET PERFORMANCE, GIGABYTE PUSH THE NEW HARDWARE, WITH INTERESTING RESULTS.

PRICE $839
SUPPLIER www.gigabyte.com

While the competition look to create cards that provide lower power usage, Gigabyte have different plans for this new Maxwell GPU. Pulling up to 600W of power, the card uses more raw output than any of the other options reviewed, and with its heavy duty fan support it has some stand out features, especially for those users who are all about high performance.

The Gigabyte GTX 980 G1 Gaming comes out of the box with a super high base clock speed of 1228GHz, and takes its boost clock to impressive new levels offering 1329GHz. This may seem like overkill but Gigabyte have made sure to offer as much cooling as they possibly can to try to compensate for this raw grunt.

The unit is using a chunky heat sink split into two sections with five 8mm heat pipes and one 6mm composite pipe that runs through it from end to end to help disperse the large amount of heat created with the output that this card produces. Though Gigabyte's triangular shaped heat sink is designed to help combat fan turbulence, once the card is put under pressure even the smart system won't stop it from becoming extremely hot when under duress.

Thankfully the Windforce X3 fan system is there to help counter this. Far from the quietest fan on the market, Gigabyte's three fan approach delivers plenty of cool air, giving this card huge potential for those that are all about pushing their system a little further.

However unlike the competition in this range it rarely runs quiet, with a high level of fan noise under pressure.

Though the Gigabyte GTX 980 G1 Gaming may draw a lot of power and run intensely hard, this moderately priced card is clearly focused on high performance, and though it won't suit users aiming for a quieter computing experience, hardcore users will likely appreciate its overclocking potential.

KEY SPECS
4GB DDR5 video ram · PCI Express 3.0 · DirectCU II with 0dB fan technology · 1279MHz Boost clock

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

GIGABYTE GEFORCE GTX 970 G1 GAMING

WITH THREE FANS AND BOASTING LOW POWER USAGE, THE GIGABYTE GTX 970 MAY NOT BE THE QUIETEST CARD AROUND, BUT IT MAKES UP FOR IT WITH POWER AND POTENTIAL.

PRICE $519
SUPPLIER www.gigabyte.com

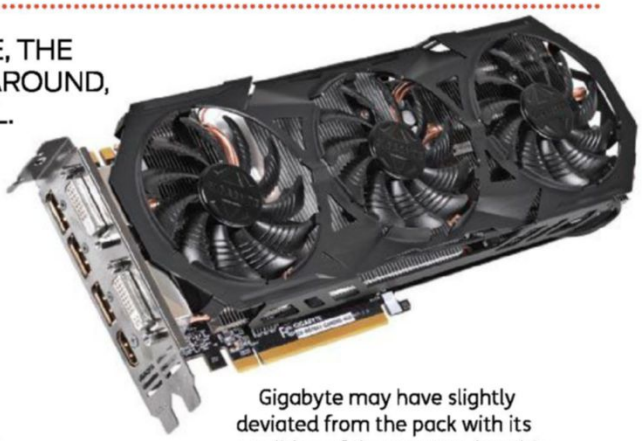
As most other cards are geared towards super silent designs, Gigabyte take a different direction with their new GTX 970 card. Sticking to a more industry standard approach this new GTX 970 uses its own Windforce 3X system of cooling that runs its copper piping through the heat sink and directly connects to its GPU, then adds three impressively low noise fans to help balance its performance.

This design may not run as quiet as the competition, however the plus side is the ability to heavily overclock the card due to its smart construction, offering an impressive boost clock of 1329GHz. Durable boards, high quality components and less voltage impedance help maintain the GTX 970's performance and even though its base clock speed is only 1178GHz, its overclocking focused construction means that users can easily find a sweet spot by tweaking its performance.

The fans do add a small audible hum to your cases total noise output compared to some of the zero noise options available, but it's barely noticeable and even under pressure the three-fan system keeps its sound output at a comfortable audio level.

Another technology demonstrated is Gigabyte's Flex Display technology, which makes multi-display gaming easier to configure through any of its many display options.

Using any variation of the GTX 970's inputs users can stitch together its screens and offer easy setup of ultra HD resolutions, using up to four monitors with a straightforward interface for adjustment of your are upgrading your setup.



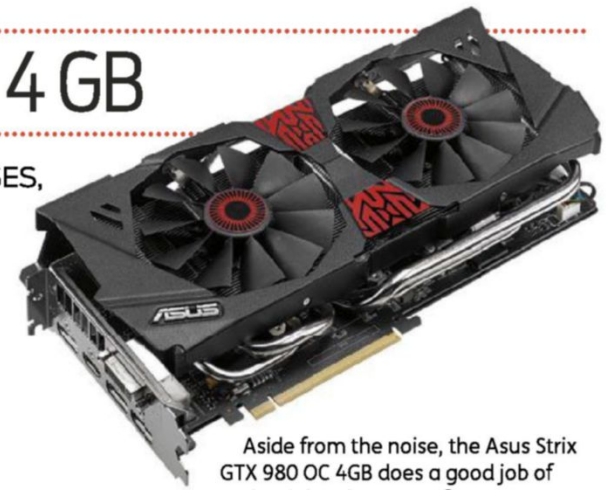
Gigabyte may have slightly deviated from the pack with its rendition of the GTX 970, but this focus on overclocking and high performance output is typical for Gigabyte, and definitely earns them attention and a reasonable price-point gives this affordable option some real stand out performance in the market.

KEY SPECS
4GB DDR5 video ram · PCI Express 3.0 · Flex display technology · 2x DVI-I, 3x DisplayPort, HDMI

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★☆☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

ASUS STRIX GTX 980 OC 4 GB

PUSHING FOR POWER AND SILENCE AS ITS MAIN FOCUSES, ASUS IS MAKING THIS CARD WORK FOR ITS MONEY.



PRICE $869
SUPPLIER www.asus.com/au

Having such a strong reference card to work off, this generation of GTX 980 cards sees a lot of attention paid to performance and low noise. Asus has aimed for the higher end of the price bracket, putting some of its best technologies on board and directing its efforts toward a smart cooling system and using DIGI+ VRM, to give high durability and better power efficiency.

The Strix GTX 980 uses DirectCU II cooling technology, splitting its dispersion across a system of heat pipes to distribute 220% more heat reduction than the reference design. This alleviates most of the need for fans at lower temperatures, reducing overall power usage and allowing them to remain at idle for tasks like movie watching as well as for lightweight gaming.

With a base clock speed of 1178 MHz it's not pushing far from the reference speed but with so much work on cooling, this card is just waiting to be pushed further. Overclocking is done through Asus's GPU tweak software, giving users plenty of room to play with a decent boost clock speed 1279 MHz.

It's worth mentioning that once the fans kick in, this card is anything but quiet and the increase in volume can be a little alarming the first few times it kicks into gear.

KEY SPECS
4GB DDR5 video ram · DVI, VGA, 3 x Display port · DirectCU II with 0dB fan technology · 1279 MHz Boost clock

Aside from the noise, the Asus Strix GTX 980 OC 4GB does a good job of maintaining decent performance under pressure, and for those looking for a powerful high end card with plenty of overclocking potential, if you can handle the slightly higher price than its competition (at least in terms of the official RRP – actual street prices will be better), this card is giving a high quality option with only a slightly noisy fan as a downside.

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

ASUS GEFORCE GTX 970 STRIX

STEALTHY, POWERFUL AND READY FOR OVERCLOCKING, ASUS'S NEW GTX 970 PROMISES LOW POWER USAGE, AND NOISE FREE GAMING.

PRICE $535
SUPPLIER www.asus.com/au

Finding a way to stand out with so many cards to compete against can be a difficult job, Asus may not be revolutionising the wheel with this model but what it does offer is a quality option with all of its attention right where it needs to be.

Like its sister card the Strix GTX 980 OC 4GB, this unit uses Asus's 0db fan system, putting the weight of the cooling on the heat sink and pipes allowing the fans to stay idle for most of your day-to-day use. Only kicking in when the card hits high enough temperatures to warrant its use, the card maintains its zero noise system far better than any of the other tested cards from this range, remaining cool without needing the fans even after long sessions of relatively demanding gaming.

It has quite a low base clock speed compared to some of the other cards from this new GTX 970 range, sitting at only 1114GHz, but using Asus's GPU Tweak software the card can be very comfortably overclocked with the help of DIGI+ VRM to add stability and reduced power noise when pushed well outside its base clock speed. Offering a boost clock speed of 1253GHz, the Strix GTX 970 performs very well under pressure, its two large fans remaining surprisingly quiet even when put to the test.

A cutaway of the card's cooling system.

PC &TECH AUTHORITY RECOMMENDED

KEY SPECS
4GB DDR5 video ram · PCI Express 3.0 · DirectCU II with 0dB fan technology · 1279 MHz Boost clock

Asking only a small cost premium more than the other options, the Strix GTX 970 strikes a balance between power and features, creating a reliable and flexible option that gives owners plenty of room to overclock the hardware, while also keeping your machine more noise free without substituting stability or performance in the process.

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★★

APPLE IPHONE 6

IT'S A BRAVE NEW WORLD FOR APPLE'S NEW LARGER IPHONE, WITH IMPROVED CAPABILITIES ACROSS THE BOARD

PRICE 16GB $869 , 64GB $999, 128GB $1129
SUPPLIER www.apple.com/au

After years of mocking rivals for producing ever-bigger screens, Apple finally caved in this year, introducing not one such model, but two: the iPhone 6 with a 4.7in screen, and the iPhone 6 Plus with a 5.5in screen. It's quite a climbdown, but Apple had little choice: another year with only a 4in screen on its flagship phone and consumers would have voted with their feet, trickling away to Samsung, HTC, and LG's larger-screened alternatives.

In reality, we don't think Apple shouldn't have been so cautious about making the move, because neither of the new phones feels out of place in today's large-screen-obsessed smartphone market.

KEY SPECS

1.4GHz Apple A8 SoC • 1GB RAM • 16/64/128GB storage • Apple A8 graphics • 4.7in 750 x 1,344 IPS display • 1,810mAh battery • 802.11ac Wi-Fi • Bluetooth 4 • 8/1.2MP rear/front cameras • 1080p video l iOS 8 • 1yr RTB warranty • 63 x 7.1 x 138 (WDH) • 129g

SIZE AND DESIGN

The iPhone 6, the smaller of the two phones, is the one that works best. Apple has reverted to rounded edges this time around, moving away from the dead-straight sides of the previous four handsets (the edges of the glass on the front are slightly curved, too), and this works to create an impression that the phone is smaller than it is. The unit is comfortable to hold, doesn't feel too slippery in your hand – an accusation we could level at the iPhone 5 and 5s – and the 4.7in screen size is just right.

If you've been worried about the jump from the 5s's 4in diagonal, you'll wonder what all the fuss is about once you get your hands on the device. Yes, the iPhone 6 is taller, wider and a touch heavier than its predecessor, but it's far from unwieldy.

In fact, the extra size means it's easier to use in some respects: typing accurately, for instance, becomes far simpler thanks to the more sizeable onscreen keys.

The sheer thinness of the handset makes it more comfortable to hold, too. It measures only 7.1mm from front to back, 0.5mm slimmer than the iPhone 5s, and in the current smartphone market it's out-skinnied by only the skeletal Huawei Ascend P7 (6.5mm).

For those who still have a problem with the extra size, Apple has an elegant fix: a light double-tap on the home button slides the whole screen down, allowing one-handed access to icons, buttons and address menus located in the top half of the screen.

Aside from the size, there are a couple of other physical changes of which to take note. The power button has moved from the top edge of the device to the side, simultaneously making it easier to reach and also more likely to hit by mistake when picking up the phone. The volume buttons are long and slim instead of circular, which makes them simpler to locate when relying on touch alone, and there's now a single speaker grille on the phone's bottom edge, where the iPhone 5s had a pair flanking the Lightning interface.

The oddest change to the design, however, is to the camera lens, which protrudes around a millimetre from the rear of the case. In everyday use, it won't be particularly noticeable, but we have concerns about how it will fare in the long run with the lens bearing the brunt of the impact every time you slap the phone down on a flat, hard surface.

DISPLAY

The sleek design is accompanied by a swathe of upgrades to the hardware inside, but it's the screen that makes the biggest impact. Along with the increase in size, Apple has boosted the iPhone 6's resolution to 750 x 1,344, giving a pixel density of 327ppi (a mere fraction higher than the iPhone 5s' 326ppi) – and it looks pin-sharp.

Brightness, contrast and colour accuracy are exemplary, with the iPhone reaching a maximum brightness of 585cd/m2, gaining an eye-popping 1,423:1 contrast ratio, an impressive Delta E of 1.74, and sRGB coverage of 95%. That contrast ratio is remarkable, and a huge improvement on the 5s's 972:1, lending onscreen

images more depth and dynamism.

There's one small caveat, however. On our sample model, we noticed a dim strip around 5mm thick running along the top of the screen. Initially we didn't spot it thanks to the clutter of menus, but it became apparent when we dropped into the full-screen reading view on the Kindle app. This is a shame, since aside from this the iPhone 6's display is the best we've seen on any smartphone.

PERFORMANCE

Behind the screen, the changes are even more dramatic. The iPhone 6, along with its big brother, sports a new dual-core A8 CPU, with 1GB of RAM, upgraded graphics and an improved M8 motion co-processor. There are models with 16GB, 64GB and 128GB of storage (but, notably, no 32GB model), and interestingly Apple has added a barometer to the phone's line-up of sensors, for more accurate reporting of relative altitude and atmospheric pressure.

It comes as little surprise to find that the iPhone 6 feels completely smooth in general use. We noticed no judder or hitching while moving around in iOS 8, browsing graphics-heavy web pages, or panning and zooming in Google or Maps. Given that iOS 8 runs smoothly on the two-generations-old hardware in the iPhone 5 and iPhone 5c, that's to be expected. However, the performance of the new processor in benchmarks is dramatically quicker than any of its predecessors. We started with the simple, single-threaded SunSpider JavaScript test, which the iPhone 6 dispatched in 347ms. Of its rivals, only the Samsung Galaxy S5 gets close at 391ms.

Moving on to the slightly more demanding Peacekeeper benchmark, we saw a score of 2,533, which is way out in front of every other smartphone we've tested. It's the same story in Geekbench 3, where a single-core score of 1,631 wipes the floor with everything else; the multi-core score was only marginally beaten by the quad-core Qualcomm hardware in the Samsung Galaxy S5.

▼ The camera hasn't changed much, and the excellent True Tone flash remains

"The sleek design is accompanied by a swathe of upgrades to the hardware inside, but it's the screen that makes the biggest impact"

Given that the iPhone 6 has half the number of cores as the Samsung, it's still a seriously impressive showing. As for the GFXBench T-Rex HD gaming test, there's no competition: the only phone capable of beating the iPhone 6's 51fps is the iPhone 6 Plus, which averaged a silky-smooth 53fps.

BATTERY LIFE AND OTHER FEATURES

Perhaps more importantly, battery life is also excellent. The new, more efficient 20nm CPU clearly helps here: playing a 720p video with flight mode on and the screen set to a brightness of 120cd/m2, the battery

◀ The iPhone 6's mild-mannered exterior hides a beast of a performer

depleted at a rate of 7.5% per hour, while streaming audio continuously from our SoundCloud account over 3G with the screen off reduced capacity at 1.7% per hour. The former result isn't all that special: plenty of other phones we've seen perform at this level or better, notably the Sony Xperia Z2 (5.6%), Samsung Galaxy S5 (5.2%) and the HTC One M8 (6.5%). However, none of these handsets can match the iPhone 6's results in the 3G streaming test, a figure that points at highly impressive standby performance.

Even in continuous use, the iPhone 6 is a trooper. In one morning, we saw the battery dip from 100% to only 84% during four hours of heavy testing. In that time, we streamed a podcast for 1hr 32mins, downloaded and installed the Facebook and Twitter apps, ran the Peacekeeper benchmark twice and the SunSpider browser test once, received a short phone call, and replied to a handful of texts. The display was also continuously on throughout this period. This is a phone that will easily get you through a day and a half of moderate to light use and, if you're careful, two full days isn't beyond its capabilities.

As with most smartphones, battery life does depend on your usage, and one thing that hits it hard is gaming. In the GFXBench battery test, which loops a 3D OpenGL animation for around half an hour and then estimates total runtime, the iPhone 6 achieved 2hrs 29mins. That's an improvement over the iPhone 5s's 1hr 52mins (impressive given how many more frames the phone is rendering), but it still indicates that graphics-heavy gaming will lead to a significantly shorter time span between charging sessions.

Elsewhere, Apple has added NFC to the iPhone 6, which is used solely for the Apple Pay touch credit card-payment system. It's an interesting development that could eventually see you settling the bill for your morning coffee by tapping your phone to a card reader; it uses the phone's Touch ID fingerprint reader in conjunction with your credit card details to provide increased security. Since the system won't arrive in the UK before early 2015, however, you'll still need your plastic for the foreseeable future.

We're much more interested in the move from 802.11n to 802.11ac. Connection speed is a maximum of 433Mbits/sec and, at close range

using the FileBrowser app to transfer a large movie file from shared NAS storage to the iPhone, we saw roughly twice the speed from the iPhone 6 over the 5s, with transfer rates hovering between 7MB/sec and 8MB/sec compared to 6MB/sec and 7MB/sec for the 5s.

CAMERAS

On paper, the camera isn't a huge upgrade from last year's flagship. You get an 8-megapixel 1/3in backside-illuminated CMOS sensor with 1.5u photo sites, and an aperture of f/2.2 – the same as the 5s. It's accompanied by Apple's True Tone flash, so indoor shots don't look horribly washed out and ghostly.

However, the camera now sports a number of phase-detect autofocus pixels on the surface of the sensor, in a similar fashion to the Samsung Galaxy S5 and many enthusiast and high-end SLR cameras, enabling much faster autofocus.

In practice, what this means is that the iPhone 6 will almost instantly transition from focusing on a subject that's far away to one that's really close, where the iPhone 5s would take a second or so. This isn't such a dramatic upgrade for taking photographs, but it makes a big difference to video: the effective digital stabilisation and super-quick focusing combine to produce stunning Full HD videos, with much less need for focus-hunting.

▲ The iPhone 6's softer, more rounded edges make it comfortable to hold

Alas, the other major upgrade – optical image stabilisation – is restricted to the iPhone 6's big brother, the iPhone 6 Plus. Even there, Apple is restricting its use to low-light conditions and stills. It isn't used in video mode, presumably to save on battery life.

What this all boils down to is that most of what we said about the iPhone 5s's rear camera holds true of the iPhone 6's. It produces clean, detailed and well-exposed photographs in most conditions, but isn't quite as good as the Nokia Lumia 1020 in low light. Its digital image stabilisation remains excellent, producing smooth, shake-free videos. The only difference is that the iPhone 6's improved processing engine tends to apply less aggressive noise-reduction settings, leading to slightly grainier but more detailed photos in low light.

The front-facing "selfie" camera also benefits from a small improvement. Although resolution remains the same at 1.2 megapixels, the aperture is now a wide f/2.2, which lets in "81% more light"; there's also a burst mode to help capture your best side. It produces more detailed, cleaner self-portraits in low light, but in brighter conditions you'll struggle to tell the difference between the iPhone 6 and the 5s.

To round things off, Apple has added a handful of features to the camera front-end. Top of the list is a time-lapse video feature, which produces top-quality sped-up footage, and there's also an additional Slo-mo mode, which captures video at 240fps – twice the frame rate of the iPhone 5s. This is quite an achievement for a smartphone camera, and the resulting videos look incredible.

VERDICT

The Apple iPhone 6 is a pleasure to use. An iPhone with a larger screen works very well indeed, so much so that we wonder why the company didn't do it sooner. But the question is: has Apple done enough? In some respects, we'd say it has: battery life is excellent, the display largely superb, the camera as good as any we've seen bar the Lumia 1020, and when it comes to performance, the iPhone 6 kicks every other smartphone on the market into the long grass.

But, once again, it's undermined by Apple's intransigence on price and upgradability. Supplying only 16GB in a phone that costs $869 and commands a huge premium on contract is mean beyond belief, and the fact that there's no storage expansion simply compounds the issue. We wouldn't consider shelling out on anything less than the 64GB iPhone 6 and, at $1129, that's substantially more expensive than any other flagship handset out there.

Yet, despite those qualms, the Apple iPhone 6 is so accomplished that to not give it some sort of acknowledgement would be churlish. All-round it's a superb handset, and at least as good as anything on the market right now. If you can afford to pay the price, you won't be disappointed.

Jonathan Bray

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★★

APPLE IOS 8

It wouldn't be an iPhone launch without an upgrade to the software, and there's plenty to get your teeth stuck into with iOS 8.

It's now possible to respond to messages directly from the pull-down notifications menu, meaning you don't have to leave the app you're using when you receive a text. The scope of the iPhone's Spotlight search has expanded to include results from the web and the App Store, as well as items in your iTunes library; the Photos gallery app now boasts a hugely improved range of editing tools; and the camera app has live onscreen exposure adjustment.

Family Sharing finally makes it possible to share apps and other iTunes purchases with up to six members of your household, without having to pay for them multiple times. Open keyboard support lets you install alternative keyboards such as SwiftKey and Swype, and Apple has also improved the default keyboard, with multiple word suggestions that appear in a row immediately above it.

Elsewhere, the terrifyingly comprehensive Health app is designed to hook into all your fitness software, although we haven't yet seen any of our favourite third-party apps – such as Strava, RunKeeper and Zombies, Run – take advantage. iCloud Drive finally brings unified cloud storage to iCloud for documents; support for this is built into Pages and Numbers from the start, and other developers can also tap into it.

It isn't all good news, though. As with most new OS releases, iOS 8 has had its fair share of bugs since public release, some quite serious. Wireless problems were widely reported, some of which affected devices in the PC Pro office, and the 8.0.1 fix the company released was quickly withdrawn after reports that it had "bricked" some users' handsets. We've updated all our iOS devices with 8.0.2 now, and the signs are promising: the Wi-Fi issues our iPhone 5c, iPad Air and iPhone 6 Plus experienced have all been rectified, and we haven't had any further troubles.

The 6 Plus' 5.5in display makes it feel more like a small tablet than a phone and although the handset is large, it's very slim and elegant

APPLE IPHONE 6 PLUS

APPLE'S 5.5IN GIANT ISN'T FOR EVERYONE, BUT FOR SOME IT MAY BE THE PERFECT MIDPOINT BETWEEN AN IPAD AND IPHONE

PRICE 16GB $999 , 64GB $1129, 128GB $1249
SUPPLIER www.apple.com/au

You can't get your hand around it." "No-one's going to buy that." Not our words, but rather those of Steve Jobs. He was referring to Android phones with big screens – rivals to the iPhone 4 way back in 2010 – but times have changed. Apple has now done the unthinkable: not only has it released the iPhone 6, but also the king-sized iPhone 6 Plus. Shockingly, Apple has made a phablet.

The iPhone 6 Plus sports the same newly curvaceous design as its smaller sibling, but with one major difference: its beefed-up body frames a substantial 5.5in, Full HD display. At only 7.3mm thick, however, the slender, curved profile fits surprisingly well in the hand. The extra girth does bump the weight up a tad, but this is by no means a heavy phone. At 172g, the iPhone 6 Plus is only 43g more than the iPhone 6, so it won't be the weight that will cause problems for your pocket – it's the size. In practice, the iPhone 6 Plus often feels more like a miniature iPad than an iPhone. Hold it in landscape orientation and, for the first time on an iPhone, the iOS homescreen spins around into a landscape view. And while it's impossible to reach every corner of the display with one hand, the iPhone 6 Plus shares the iPhone 6's "Reachability" function: a quick double-tap of the home button slides the upper half of the screen downwards to bring icons, buttons and address bars within reach.

As you'd expect, the iPhone 6 Plus' Full HD display is the centre of attention. It does lag a little behind its smaller sibling in terms of its technical performance, but it isn't far off. We measured a maximum brightness of 493cd/m2 and a contrast ratio of 1,293:1, and the colour accuracy is excellent, too. To the naked eye, the iPhone 6 Plus' display is superb; moreover, we noted none of the backlight inconsistency that afflicted our sample of the iPhone 6.

In terms of power, there's scant difference between the two iPhones. As the same 1.4GHz Apple A8 chip is the driving force in both handsets, it came as little surprise to see a near-identical set of scores in the SunSpider, Geekbench and Peacekeeper benchmarks. What's really impressive, though, is that despite pushing more than twice the number of pixels, the iPhone 6 Plus pulled slightly in front in the GFXBench T-Rex HD test: it turned in an average frame rate of 53fps.

One area where the iPhone 6 Plus beats the iPhone 6 is battery life. In GFXBench, it achieved a projected runtime of 3hrs 26mins; in our 3G audio-streaming test it used 2.1% of its battery per hour; and 720p video playback sapped only 4.9% per hour.

In terms of features, there's little to separate the two new iPhones. We're pleased to see that 802.11ac has finally made the cut; Bluetooth 4 is now accompanied by NFC; and, of course, there's the now familiar Touch ID sensor embedded in the home button.

Fittingly, Apple has also equipped the iPhone 6 Plus with the same superb pair of snappers found on the iPhone 6. The Plus does trump its stablemate in one key area, though: its larger body has given Apple room to squeeze in optical image stabilisation.

Call quality is identical to that of the iPhone 6, which is to say it's crisp, clear and full-bodied. However, the iPhone 6 Plus houses a larger, louder speaker than that of its sibling.

Thus far, we haven't been universally won over by giant-sized smartphones, but the 6 Plus makes a great halfway house between a smaller-screened iOS device and the iPad mini. But even if you're a firm believer in the "bigger is better" mantra, there remains one major hurdle to overcome: the price. This is the most luxurious, high-performance phablet that money can currently buy, but just as with the iPhone 6, Apple is demanding a daunting premium. With competent alternatives available for substantially less, we'd think long and hard about spending this much on any handset.

Sasha Muller

KEY SPECS

1.4GHz Apple A8 SoC · 1GB RAM · 16/64/128GB storage · Apple A8 graphics · 5.5in 1,080 x 1,920 IPS display · 2,915mAh battery · 802.11ac Wi-Fi · Bluetooth 4 l 8/1.2MP rear/front cameras · 1080p video; iOS 8 · 1yr RTB warranty · 77.8 x 7.3 x 158.1mm (WDH) · 172g

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

SEAGATE BUSINESS NAS 2-BAY

SEAGATE OFFER UP A SUB-$1000 SMALL BUSINESS NAS OPTION WITH PLENTY OF FEATURES.

PRICE $999
SUPPLIER www.seagate.com/au/

Aiming way above basic consumer equipment, this Seagate drive squeezes a small business option in at just under a $1000, with plenty of the features available around its price point. The system is designed to handle around 25 users at a time, not suited for larger office environments but a decent option for places without a massive network infrastructure, with onboard software that allows control of user's permissions and maintenance without help from an in-house IT specialist.

Out of the box the system can be ready to use in only a few minutes, connecting up to a network via a Gigabit connection and powered by a 1.2GHz ARM processor and 512MB of DDR3 RAM, this NAS drive is smart and very self sufficient needing very little interaction once it has been set up. Once it is up and running, authorised users can interact with the device through a web browser via Seagate's own NAS OS 4 system, and though a little limited as far as apps go, users still have access to antivirus software, personal cloud storage programs, and even a Wordpress server if owners of this NAS product want to locally run their own website. There is room for expansion in the future with additional functionality added via software, but the apps that are available at this stage offer all the functionality that is required to get the most out of this product, although nothing really unique is on offer, or is required.

Thanks to an internal fan and a low power CPU, the system is designed to run 24/7 if need be, with power saving settings to schedule the drive to spin down outside of office hours and to help increase its lifespan.

Though software is a tad limited and the price is well above personal network storage options, the Seagate 2-bay NAS is a great product for an expanding business or small studios in need of some centralised storage.
Josh Philpott

KEY SPECS
2x 4TB NAS optimised drives · NAS OS 4 · Apps store · USB 3.0 expansion

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

AORUS X3 GAMING LAPTOP

POCKET-SIZED WITH A PREMIUM PRICE.

PRICE $2499
SUPPLIER www.aorus.com

We've been very impressed with the debut 17 inch gaming laptop from Aorus, known as the X7, so were keen to see if they could squish as much love into a 13.3 inch form factor. Well, it turns out that this little tacker packs a hefty punch, provided you don't mind paying the extra for it.

Borrowing the same sleek stealthy black design of its bigger brother, it uses a mixture of metal and plastic to balance sturdiness with weight and price. Overall it's relatively sturdy for such a small laptop, though the backlit keyboard exhibited a worrying amount of travel. It's also surprisingly heavy for such a small laptop, tipping the scales at 1.8kg. This is undoubtedly due to the high-end specs stuffed inside, starting off with Intel's quad-core i7-4860HQ CPU, which maxes out at 3.6GHz under load. This is paired with 16GB of speedy DDR3 1866 memory, along with a sizeable 512GB SSD.

So far, so very good, and it just gets better when we look at the GPU. NVIDIA's powerful GTX 870M is included with another 6GB of onboard memory, and we found it easily powered the crisp 2560 x 1440 display. Whether it was Grid Autosport or Tomb Raider, the GPU and CPU combined to deliver swift and smooth frame rates. Having said that, this resolution is a bit of overkill for such a small screen – 1080p would have been fine. There's also one other issue; all of this powerful hardware gets rather hot inside such a small case. Fan noise is definitely an issue, even when the system is set to run at "Stealth" mode. Having said that, most gamers use headphones, so it'll only bother the person sat next to you.

Overall the Aorus X3 is a very powerful system in a tiny package, but you'll pay the price for such slender dimensions in combination with such high-level performance
Bennett Ring

KEY SPECS
Windows 8.1 · 13.3" 2560 x 1440 display · NVIDIA GeForce GTX 870M GPU

Quite the looker, and with stellar performance to boot.

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

fractal design

Edison M

Designed for power + precision

80PLUS® Gold certified Modular PSU

- Japanese electrolytic capacitors
- Over Temperature Protection
- Sleek look to add to the overall design of your build
- 5 year warranty

AU Reseller

Online

Mwave	1300 727 446	mwave.com.au
PCCG	03 9551 0889	pccasgear.com.au
Umart	07 3369 3928	umart.com.au
IJK	02 9745 0877	ijk.com.au

NSW

MSY	02 9648 4116
PC DIY	02 9648 1001
Online Comps	02 9211 0898
IJK	02 9745 0877

QLD

Computer Alliance	07 3421 3200
Online Comps	07 3387 1531
MSY	07 3217 9070
Umart	07 3369 3928

SA

MSY	08 8212 1656
[illegible]	08 8410 0446

VIC

CPL	03 8542 8688
MSY	03 9560 2288
Nexus	03 9663 9988
PC DIY	03 9077 9811
Scorptec	1300 726 770
Centrecom	03 8311 7600

WA

Austin	08 9201 2788
MSY	08 9344 1002
PLE	08 9309 4771

AOC U3477PQU 34" MONITOR

TIRED OF MULTIPLE MONITORS? TRYING TO FIND A SLEEK ONE PIECE OPTION WITHOUT THE CABLES OR POWER USAGE OF SEVERAL SCREENS? LOOK NO FURTHER, AOC'S NEW 34" HAS YOU COVERED.

PRICE $899
SUPPLIER www.aoc.com

Coming in a box bigger than most stereo systems, the AOC U3477PQU may seem mammoth in comparison to the standard 16:9 screens we are mostly accustomed to, but this ultra wide experience is surprisingly multi-purpose. Once assembled, the monitor is easily adjustable to any height or angle to suit your needs and even allows a full 90 degree adjustment for those that need a profile setup. AOC have all bases covered as far connections are concerned; offering DisplayPort, HDMI, DVI and VGA inputs, and even MHL support for those wanting to use tablets or phones.

The screen is not limited to single inputs at a time either. Straight from the front of the monitor users can select a standard picture in-picture mode offering up a corner of the screen for reference material or some background TV, or a second option is available as well, dividing it in half, ideal for running multiple computers from the same desk. The U3477PQU also comes bundled with software that divides the monitor into four panels to even better utilise the massive amount of screen real estate.

Image quality on the panel is superb, capable of 3440 x 1440 resolution in a 21:9 aspect ratio, the matte screen puts out a 50,000,000:1 dynamic contrast ratio with a 5ms response time. It has a rich and clear panel boasting 1.07 billion colours, using Flicker Free technology to reduce eye strain and help combat fatigue. Its ultra wide IPS display gives a clear visual experience even with multiple people watching the same display, from different angles and works well for all general purpose tasks.

Josh Philpott

PC & TECH AUTHORITY RECOMMENDED

KEY SPECS
21:9 · 4k output · PIP mode · Adjustable and rotatable stand

PERFORMANCE	★★★★★
FEATURES&DESIGN	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★★

ACER SWITCH 10

A BUDGET TRANSFORMER WITH A CLEVER AND RUGGED ATTACHMENT MECHANISM.

PRICE $699 (64GB SSD + 500GB HDD)
SUPPLIER www.acer.com.au

Most likely, it's the 10.1in size that will determine whether this (or any similarly sized) machine makes your shortlist. A detachable, the tablet half holds almost all of the innards, including the battery. For the size it's just right as a tablet, and feels good and light in the hand when freed of its keyboard, though the bezel takes up a great deal more space than average. As a consequence of that size, the keyboard is a little cramped, but the chiclet keys feel good and they have been spaced apart, it seems, as widely as possible to minimise typos.

A quad-core 1.3GHz Atom is coupled with 2GB of RAM, a 500GB hard drive and 64GB of SSD storage. For the price, it's a reasonable level of performance and is certainly sufficient for day to day tasks (provided your apps aren't memory intensive). Looking at this as a relatively powerful tablet with an attachable keyboard is probably more appropriate than considering it as a just-enough laptop with a detachable screen.

The locking mechanism is the big innovation, here. It's magnetic and doesn't need any kind of button or release. Just yank it free and plop it back. The magnets are very powerful and really grab hold of the screen when it's within range of its mighty magnetic field. In our week of daily use it never let us down, despite carrying it around with one hand, the heavy-ish screen dangling down but always attached. The screen can be placed facing rearwards, which then also lets you fold it over and stood upright in 'tent mode'.

The IPS screen is good, and despite being glossy it didn't act too much like a mirror. Inbuilt speakers delivered adequate volumes and fidelity. All up it's a sweet little travelling PC, or a general purpose surfing and socialising device. The quad-core Atom Z3745 CPU running at 1.33GHz can certainly handle Office apps and 1080p video.

There are many competitors in this space, and Acer has shown that the budget end of the choices we have aren't lacking in innovation and good general utility.

Ben Mansill

KEY SPECS
Quad-core Atom Z3745 CPU · 10.1in 1366 x 768 display · 2GB RAM · 64GB SSD · 500GB HDD

PERFORMANCE	★★☆☆☆
FEATURES&DESIGN	★★☆☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

NZXT KRAKEN X61

IS VARIABLE PUMP SPEED THE INNOVATION AIO'S NEED?

PRICE $159
SUPPLIER www.nzxt.com

The Kraken X61 is NZXT's latest 280mm All-In-One water cooling product and comes with a nice six year warranty. The radiator itself has a matt black finish and measures 140 x 312.5 x 27mm with the core itself being 1.5cm thick with a fin density of 22fpi. Connected to the radiator are the two very flexible low-evaporation rubber tubes that are well secured and are a generous 40cm long, making it great for tall cases.

The copper base plate on the CPU block is very smooth and comes with a thin thermal paste layer already applied. On top, the block has an NZXT logo which lights up and or pulses in any colour you can think of, which is configurable via NZXT's "CAM" software. Inside, the pump which is claimed to be the first variable speed pump for an AIO cycles between 2400 and 3600rpm. A ringed clamp design allows the block to be seated onto any recent AMD or Intel socket in almost any orientation you desire.

From the CPU block comes three sleeved cables, one for a motherboard USB header to control the unit, one for a motherboard fan header and the last one sprouts four 4-pin fan connections and a SATA connector for power to the unit.

Two NZXT FX140 V2 fans are provided and enough screws for a full push-pull configuration. However the fans rubber standoffs prevent a close fit, meaning air leaks out the side. Best remove those before fitting.

To test we put this on an Intel i7 4770K @ 4.4GHz in a room temperature of 23C. At idle it had a temperature of just 25C. Stressing the CPU with Prime95's small FFT run the unit remained completely inaudible as we recorded a temperature of 80C while operating in the CAM software's Silent mode.

Cranking the unit up, in CAMs Performance mode we saw temps peak at 74C with an acceptable low frequency increase in noise. Pushing all the way to 100% speeds manually the unit was very loud but dropped temps to 72C.

It must be noted the CAM software even when minimized uses a lot of CPU time, we recommend setting the colour scheme, choose silent mode, then exiting CAM and don't let it start on boot.

Mark Williams

PERFORMANCE	★★★★☆
FEATURES&DESIGN	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

ANTEC KÜHLER H20 1250

A LITTLE INNOVATION FINDS ITS WAY INTO THIS AIO SOLUTION FROM ANTEC.

PRICE $129
SUPPLIER www.antec.com

This 240mm unit from Antec is quite unique as it has not only two 900rpm pumps but they're situated above the two 120mm fans. As striking as it looks, it's not a convincing sales pitch as to why two pumps are necessary. Typically you'd use an extra pump if you have multiple heat sinks and radiators connected, restricting flow rates. Being a single block with radiator this choice seems superfluous. It will aid liquid flow speeds but that doesn't greatly help temperatures. Having two will add some redundancy though should one pump fail. Situating them above the fans is an interesting choice too, effectively you can't replace or change the preinstalled fans which cycle between 600 and 2200rpm. The thin blades also suggest high CFM fans, not necessarily high static pressure ones needed to force air through the radiators 17fpi, 15mm thick core.

The radiator unit itself with fans and pumps measures 280 x 120 x 90mm, so be sure you have clearance in your case. The flexible low-evaporation rubber tubes are 30cm long, or 25cm if measuring to the pump.

The CPU block itself, missing the pump, is thinner than other AIOs and has a slightly fiddlier than necessary clamping solution. Its copper base is well machined and comes with a generous helping of thermal paste already applied. The top sports the Antec logo which glows any colour you desire via the included GRID software.

The software is pretty basic as only fixed fan speed options are possible, no temperature mapping.

To test we put this on an Intel i7 4770K @ 4.4GHz in a room temperature of 22C. At idle it achieved a temperature of 25C. Stressing the CPU with Prime95's small FFT run the unit remained pretty quiet as it hit a temperature of 81C while in the GRID software's Silent mode (600rpm), only a slight electrical hum could be heard from the pumps.

Manually setting the fans to a mid-way 1400rpm, temps peaked at 78C but the high CFM fans at this setting produce a noticeable whine. Pushing all the way to 2200rpm the unit was very loud, lots of air turbulence can be heard and the fans become higher pitched, but drops temps to 74C.

Mark Williams

PERFORMANCE	★★★☆☆
FEATURES&DESIGN	★★☆☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★☆☆

SAMSUNG

Samsung Super-speed Drive

Samsung SSD 840 PRO

Samsung SSD 840 PRO with RAPID mode technology

Samsung's fastest and most powerful SSD range yet with RAPID mode technology. A distinguished level of Samsung performance available to anyone. Visit **www.samsung.com/ssd for more information**

APPS ROUND-UP

JENNETH ORANTIA WITH THE WISE WORD ON THE ESSENTIAL APPS, TOOLS AND UTILITIES WE THINK YOU NEED.

SWIFTKEY KEYBOARD

PRICE FREE **DEVELOPER** SWIFTKEY
PLATFORM IOS

One of the long sought after features that Apple introduced in iOS 8 was the ability to use third party keyboards. Naturally, it wasn't long before SwiftKey – a gesture-driven, predictive text keyboard popular on the Android platform – was announced for iOS 8.

The main difference between SwiftKey and the standard iOS keyboard is the typing method. Instead of lifting your finger off the screen after you tap each letter, you keep it on the screen and drag it to the next letter. This continues for the entire word, at which point you lift your finger from the screen and start the next word. SwiftKey interprets the pattern of the letters you've swiped and uses predictive text technology to figure out which word you were most likely to write. It even uses auto-correct for fixing typos and inserting things like apostrophes and hyphens where they belong.

SwiftKey goes one better than predictive text with its 'next-word prediction' technology. This feature learns your writing style over time and predicts the next word you're likely to write. You can speed up the next-word prediction learning by connecting it to your Facebook or Google accounts so it can trawl through your emails and social media content – although this does raise privacy concerns, however no abuses or hacks of this have been reported, that we are aware of.

It may sound tricky, but after practicing with it for a few minutes, it becomes surprisingly easy to do. It also makes one-handed typing a lot easier – even on the larger iPhone 6 Plus. Of course, you can use SwiftKey like a standard keyboard by typing each letter out one by one, and you'll still get the benefit of the keyboard's predictive text and next-word prediction technology. If you've connected your Facebook or Google account to SwiftKey, it will also sync your personalised settings across devices.

SwiftKey isn't entirely bug-free. Sometimes it disappears in favour of the stock keyboard, and other times it locks up and you have to exit the app to get text input back. Whether this is the fault of the app or iOS 8 in general isn't clear – we've had similar stability issues with the iOS 8 stock keyboard as well.

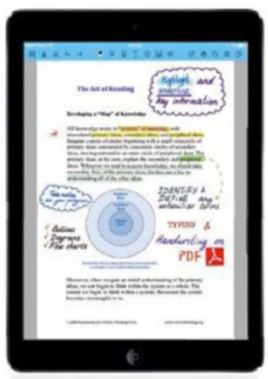
EASE OF USE	★★★☆☆
FEATURES	★★★★☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★☆

NOTESHELF 9

PRICE $7.49 **DEVELOPER** FLUID TOUCH
PLATFORM IPAD

The iPad may not have a fancy active digitiser like the Microsoft Surface Pro 3 or the Samsung Galaxy Note Pro 12.2, but it does have the benefit of multiple Bluetooth styluses available that add features like palm rejection and pressure sensitivity. It's also the only tablet supported by the Livescribe 3, a smartpen that digitises handwriting when using special paper.

There are dozens of excellent note-taking apps in the App Store that support digital ink – what sets the latest version of Noteshelf apart is that it happens to support all of the Bluetooth styluses on the market, along with the Livescribe 3 (which also connects to the iPad over a Bluetooth connection). Of course, you don't need a special stylus to use Noteshelf. It also works with standard touch input and using a generic stylus – while you don't get the benefit of pressure sensitivity, the app offers a modicum of palm rejection that lets you lean your wrist against the screen while writing without making too many stray marks.



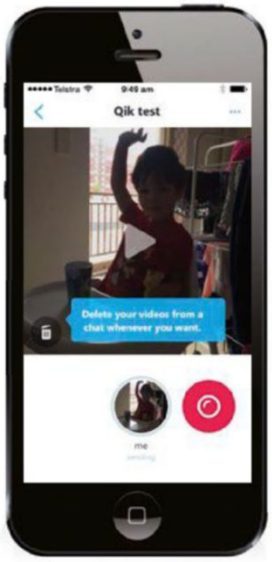
If a paperless office is something you've been aspiring to for years, Noteshelf brings the dream a lot closer. You can import documents, PDFs and images into Noteshelf through various cloud services like Dropbox and Google Drive, as well as through the standard iOS 'Open in' file picker. From there you can mark it up with various pen types and colours (including a highlighter), insert images, and export notes to Evernote, Dropbox or Mail.

Noteshelf's intuitive interface makes it easy to manage multiple notebooks and customise everything from the notebook cover to the paper template. The ability to customise the paper template means you can create different types of virtual notebooks for everything from day planners and tasks lists to music scores and storyboards. Through optional in-app purchases, you can add an Evernote Auto Publish feature that automatically saves the contents of specific notebooks to Evernote ($2.49) and different paper packs.

EASE OF USE	★★★★☆
FEATURES	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

SKYPE QIK

PRICE FREE **DEVELOPER** SKYPE
PLATFORM IOS, ANDROID, WINDOWS PHONE



There's no shortage of options for sending short video messages to friends, between Snapchat, Facebook Messenger, WhatsApp, and a dozen or so other messaging services. Skype is simply the latest service to jump on the video messaging bandwagon, but it does offer a few standout features.

Qik makes it easy to send instant videos to groups of people, and you can view all of the videos in a conversation one after the other like a movie. You can also delete any of your own video messages after you've sent them, and for those too lazy or shy to create your own video, you can choose from a library of pre-recorded videos to send – not unlike animated emoticons. Qik is designed for ephemeral video conversations: there's no way to save videos in the app, and everything is automatically deleted after two weeks.

OVERALL ★★★★☆

OFFTIME

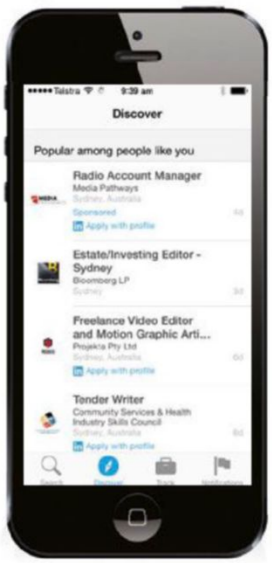
PRICE FREE
DEVELOPER OFFTIME
PLATFORM ANDROID

With most apps are designed to make you stare at your smartphone or tablet longer, it's refreshing to come across an app that encourages you to 'unplug'. Offtime is a free app that forces you to disconnect from your digital world using a handful of pre-set profiles that do things like block incoming calls and messages (a message is sent to people trying to get in touch that you'll be off the grid until a certain time), and restrict access to certain apps. You can also set it up so that specific contacts will get through. Unlike most other apps of this type, Offtime is simple enough for your mum to use. It also quantifies how often you use your smartphone throughout the day, including the number of times you've unlocked your device and how often you have interacted with a specific contact.

OVERALL ★★★★★

LINKEDIN JOB SEARCH

PRICE FREE
DEVELOPER LINKEDIN
PLATFORM IPHONE



LinkedIn has always had a section where you could check out 'jobs you may be interested in' based on the job experience you have listed on your profile. The ability to closely match available jobs with your existing job history sets LinkedIn apart from standard job search sites, and now LinkedIn has made job seeking even easier by breaking this functionality out into a separate app.

LinkedIn Job Search provides all of the features that are available through the web app, but in a more easily digestible format. The 'Search' tab lets you find jobs matching a particular title or keyword within a specific location, while the 'Discover' tab displays jobs that match your profile. You can see which jobs you've previously viewed, saved or applied for in the 'track' tab, and any listing changes show up on the 'notifications' tab.

OVERALL ★★★★★

FLIPBOARD

PRICE FREE
DEVELOPER FLIPBOARD
PLATFORM WINDOWS PHONE

Flipboard fans will be pleased to know that they can switch over to a Windows Phone without losing access to their favourite interactive news app. Flipboard on Windows Phone looks much like it does on other platforms (only tweaked to match Windows Phone's unique graphical user interface), but it's not quite as full-featured as we have become used to with other versions.

For starters, it doesn't actually flip when you turn pages over, which is ostensibly where the app got its name from in the first place. It doesn't support inline video playback, either, and you can't save stories into one of the many 'read later services' (such as Instapaper and Pocket) for later, off-line reading. We're crossing our fingers that these features make it into a later Windows Phone update.

OVERALL ★★☆☆☆

LABS BRIEFS

COOLER MASTER MIZAR

PRICE $69
WEBSITE gaming.coolermaster.com

This, the Asus Gladius also on this page, and of late, Steel Series mice, all look largely identical. Simple, long and slim, and free of frippery, i you like that style, then in its purest form is the CM Storm Mizar.

It's just about the lightest mouse I've ever held, at 120g, and that, combined with a perfect on-screen translation of movement makes it instantly natural and intuitive to use. A high (8200) DPI response comes thanks to its use of a laser sensor, being the Avargo 9800 which has an excellent reputation ¬-- although the Asus Gladius with a regular optical sensor and a maximum DPI of 6400 feels more or less identical.

Like the Cooler Master keyboard also here in Labs Briefs, it's a no-nonsense and high quality bit of kit. As a daily desk mouse it's a well designed device that will please almost everyone. As a gamer device the ultra light weight will suit FPS and other twitch games.

Ben Mansill

OVERALL ★★★★☆

GIGABYTE FORCE H3X

PRICE $99
WEBSITE www.gigabyte.com.au

The Gigabyte Force H series encompasses a range of sound formats ranging from virtual 7.1 down to stereo. The Force H3x headset takes an analogue, stereo approach to deliver decent mid-range sounds, slightly tinny high range and stomping bass thanks to two 50mm speakers, housed in some rather futuristic looking angular ear cups.

The design of these cups is a little odd, so depending on the size of your ears they may be over ear or on ear, but despite the design the headset is still quite comfortable, if a little heavy. Rather than using a regular round cable for the jack, the H3x headset instead opts for a flat ribbon that neatly resists tangling into an impenetrable ball. The built in mic has good clarity for Skype calls and online gaming and recesses discretely into the earpiece, making them suitable both for gaming and more casual headphone use.

Dan Wilkes

OVERALL ★★★★☆

COOLER MASTER NOVATOUCH TKL

PRICE $220
WEBSITE gaming.coolermaster.com

While it seems to be an all-Cherry keyboard world, there is another. The Topre keyboard mechanism uses a rubber membrane, but with electrostatic capacitive actuation. Key presses feel similar to old-style membrane cheapies, but with a super-premium feel, and with a clear 'bump point' as the key moves through half way point. They don't need a full-depress to register.

Movement is soft yet defined, with a lovely dulled (almost silent) sound. This is certainly a luxury product. No backlighting (disappointing) or macro software (not missed), peg it as a typist's board, and not for gaming. But where are the numerical keys? Lopped off, to make for increased desk-room, gamer-style.

At around $200 it's difficult to justify value, unless you want a premium keyboard free of stylistic silliness, and one that reminds you with every single press that you are using the Mercedes Benz of the keyboard world, but don't need everyone around you to know it.

Ben Mansill

OVERALL ★★★★★

SONY EXPERIA X3 COMPACT

PRICE $699
WEBSITE www.sonymobile.com.au

On a pure hardware level, the new Sony Experia X3 is a real beauty. Sony's new 'OmniBalance' design, in the real world, means a well balanced form that's comfortable and attractive to hold and behold. The full-face (and rear) glass looks lovely, too, but hold fingerprints a bit too well. For the size (4.6in), there isn't a nicer looking, or nicer to use smartphone on the market today that beats it.

It's lag-free to move around screens and app loading times are as fast as we've ever experienced. The IPS screen leverages Sony's TV division technologies, producing a vibrant yet realistic-looking colour range, and brightness. It's certainly less garish than Samsung's AMOLED screens, and I definitely prefer the Sony. It's waterproof, dustproof, can run for two days on a charge and is largely faultless, perhaps apart from the heavy-handed inclusion of Sony ecosystem apps, which are easily removed or ignored.

Ben Mansill

OVERALL ★★★★★

COOLER MASTER STORM QUICKFIRE RAPID

PRICE $135
WEBSITE gaming.coolermaster.com

While a lot of keyboard manufacturers are moving to Cherry alternatives to differentiate themselves in what is fast becoming a very crowded market, Cooler Master, via its CM Storm gaming brand, is sticking with the original and the best. Well, in our opinion, at least.

The CM Storm Quickfire Rapid is a lovely compact keyboard, that maintains its slim figure by doing away with the number pad. It's a very solid piece of kit, with a detachable cable, making it great for taking on the road, though it does lack any USB pass-throughs. With Cherry Brown switches, it has a very soft and fluid key movement, with a slightly tactile click.

It's also strikingly designed, with a white plate under the keys, and white backlighting on the keys, which can n be set in a variety of ways via key command. The rest of the chassis is finished in a soft, rubber finish, which feels great and doesn't show up fingerprints, but does show wear pretty quickly. Overall, it's a very solid board for the discerning gamer.

David Hollingworth

OVERALL ★★★★☆

LG MINI BEAMER LED PROJECTOR

PRICE $988
WEBSITE www.lg.com/au

Pizo-projectors are nothing new, and while a projector the size of an old mobile phone is kind of cool, you really have been sacrificing quality for convenience. LG's newest projector, the Mini Beamer, is a little larger, but packs in so much more quality and fidelity that it's easily the best of its breed we've seen.

It projects images at 1280x800, and while you're not getting true HD, it still shows off HD files very well for the size. Its compact body means it mount just about anywhere, and project up or down, and a separate battery pack offers over an hour of mobile use, too. And with a 500 lumens LED, it's satisfyingly bright for its size.

It's no replacement for a full size, but if compactness is your jam, the Mini Beamer is your answer.

David Hollingworth

OVERALL ★★★★☆

ASUS GLADIUS MOUSE

PRICE $70
WEBSITE www.asus.com.au

For about ten dollars more than the Cooler Master Mizar (street price), Asus, as is its way, has thrown in a dazzling selection of 'extras'. The cable is detachable "for better mobility"... ok. Something actually useful, but also faintly absurd, is the ability replace the main button switch mechanisms. This, if you don't like the stock clicky feel out of the box. Asus provide two replacement switches in the package with a different click resistance value to the default switches. As we always say 'life's too short to waste a moment using an improperly weighted actuating mouse button mechanism'.

Elsewhere, innovation can be found within the big plastic LMB and RMB covers. They're independent, as in, not an extension of the mouse shell itself, and with that all the unwanted shell flex that costs frags.

In terms of pure comfort and feel, it's very nice and won't disappoint. It's heavy for the type, but that's a drawcard for many people. In any case, it's priced well, is seemingly of good quality and after using it for two weeks the PC PowerPlay designer Malcolm says he's not giving it back. That's a mighty endorsement.

Ben Mansill

OVERALL ★★★★☆

JABRA SPORT PULSE

PRICE $189
WEBSITE www.jabra.com.au

The headphones are very good and comfortable, and with the Dolby app produce good clean sound, but when they are paired with the Jabra Sport App (also free with headphones) this is when they really shine.

The app is brilliant. It measures all the important workout stats like heart rate, distance covered, calories burnt and at the end of a run, it even has a map that shows you your route and colour codes it to how fast your heart rate was in certain areas. It also offers users training programs like interval training or target pace, and the app will guide you if you are hitting your target pace or when to go hard or slow down, it is like having a personal trainer in your ear. It even keeps track of stats like your best time for 1km/3km, longest distance run and many others, and you can set achievements as well and if achieved, the app will let you know.

Tim Frawley

OVERALL ★★★★☆

Premium tablets

20 BEST APPS, 7 BEST DEVICES

CONTENTS

Apple iPad Air	56
Microsoft Surface Pro 3	58
Samsung Galaxy Tab S 10.5in	60
Sony Xperia Z2 Tablet	61
Amazon Kindle Fire HDX 8.9in	62
Asus Transformer Pad TF103C	62
Samsung Galaxy Note Pro 12.2	63
How to buy your perfect tablet	50
20 expert apps for Android and iOS	52
Feature table	54
View from the Labs	64
Test results	64

CORSAIR®

GRAPHITE SERIES **760T** FULL-TOWER PC CASE

Uniquely Gorgeous. Uniquely Cool.

The stunning new Graphite Series™ 760T is the world's first performance PC case with panoramic windowed side panels that are hinged for easy access and secured with discreet, flush-mounted latches. Inside, there's room for multiple full-sized GPUs and the sophisticated cooling you'll need to build a truly state of the art system. Each drive mount is tool free and every drive cage is modular, so you can customize your 760T to fit your exact needs.

Your PC deserves to look as good as it performs.

Learn lots more at **corsair.com/graphite-series**

MOBILE WIRELESS STORAGE
The Voyager Air™ family lets you enjoy all your videos, music and photos wherever you go.

SSDs
Amazing storage performance that will improve the speed of virtually everything you do with your PC.

KEYBOARDS
Flexible and ergonomic designs, highly customizable and built with quality components for superior key feel.

MICE
Precision gaming tools that help you play your best ... whether it's professionally, or you're just playing to win.

HEADSETS
Accurate audio reproduction for compelling gaming and the situational awareness you need for a competitive edge.

/corsair @CorsairMemory

How to buy the perfect tablet for you

WHICH FEATURES ARE MOST IMPORTANT TO CONSIDER WHEN BUYING A TOP-END TABLET? WE GUIDE YOU THROUGH THE BASICS AND SHOW YOU WHAT TO LOOK FOR

Other manufacturers tried for years, but it took Apple and Steve Jobs' insight to give the tablet PC the kick-start it needed with the first iPad. Ever since, Apple has stamped its dominance all over the market, and rivals have been trailing in its wake.

Today, consumers have a varied selection of tablets from which to choose, as evidenced by the larger-screened and premium tablets in this Labs. Of course, there's the iPad Air, but there are also a couple of Windows 8.1 devices and a hoard of Android tablets; all are highly capable models, and some even double as laptops.

So what sets these tablets apart from one another, aside from the software platform? Which features should take priority when making a choice and which aren't worth bothering with at all?

SCREEN

We've said it before and we'll say it again: the display is the single most important item on any tablet. You use the screen not only to view content – from watching films to checking Facebook updates – but also as your principal control surface, to enter text, scroll, zoom and perform other navigational tasks.

It's absolutely critical, therefore, that the tablet you buy is equipped with a top-notch screen, and the difference between the best and worst is greater than you may imagine. However, resolution isn't something you should concern yourself over too much. All but one of the tablets on test this month boast better than Full HD resolution, which on a 10in or even 12in screen provides perfectly adequate sharpness.

This is a situation that's reflected in the tablet market as a whole. If you pay $600 or more for a tablet these days, resolution won't be an issue. It's only as you drop down the price scale to tablets such as the Asus Transformer Pad TF103C that grainy, pixellated picture quality becomes an issue.

Even then, resolution plays only a small part in the quality of any given display. Other factors, such as the brightness, contrast and colour accuracy will have a far greater impact on your enjoyment. A display that doesn't reach above 300cd/m2 (candela per square metre) won't be as easily readable outdoors in bright light as one that hits 400cd/m2 and above, as the Apple iPad Air and Amazon Kindle Fire HDX 8.9in both do.

The contrast ratio can have an effect on quality, too. This measurement expresses the relative distance between the brightest and darkest tones: the higher it is, the more pop and punch the onscreen image will have; the lower it is, the more lifeless and grey the screen will appear. Fortunately, due to the prevalence of IPS (in-plane switching) panels at the top end of the tablet market, most models boast contrast ratios of between 700:1 and 1,300:1.

Some manufacturers "cheat" a little by implementing a technique known as dynamic contrast. Here, the brightness of the backlight is boosted whenever a bright image is on the screen, and dimmed when the picture has a predominance of darker tones. This can be distracting, with the brightness of the backlight rising and falling as the onscreen image changes from bright to dark; most of the time, however, your eyes will simply adjust and you won't notice.

"We've said it before and we'll say it again: the display is the single most important feature on any tablet"

The clear winners when it comes to contrast ratio are tablets with AMOLED displays. AMOLED screens boast infinite, or perfect, contrast, since each pixel generates its own light when displaying colours and switches off when black. Other technologies use an always-on backlight that permanently shows through a little, even when blocked off completely. The downside of AMOLED screens is that they tend not to be as bright as IPS displays when set to maximum brightness and so aren't as easy to read outdoors.

ACCESSORIES

Don't forget to take accessories into account when weighing up your options. Some modern tablets come with keyboard docks in the box or as optional extras, specially designed for the product in question. These provide a much-needed productivity boost when required, but can be disconnected when you don't want the encumbrance. The best compromise is the Surface Pro 3's Type Cover, which is so thin that it even doubles as a cover, yet is good enough to use for hours of typing at a time.

If you plan to use your tablet as a sketching or photo-editing device, it's also well worth considering a model that includes a stylus, such as Samsung's Note series or the Surface Pro 3. They offer more accuracy when editing, and are also pressure-sensitive, so pen strokes appear more natural.

However, don't discount the iPad Air here. It may not have an official keyboard cover or stylus, but its popularity means there's a huge community of third-party manufacturers producing top-quality peripherals.

PERFORMANCE

Performance is tricky to compare across devices that encompass three different operating systems and two types of hardware architecture. It's difficult to find a suite of benchmark

tests that will run across all three platforms, and even then, the numbers don't reveal the whole story.

If you look at the Asus Transformer Pad TF103C's numbers, it would appear to be as quick as all other models here. This is in part down to its lower-resolution screen: it doesn't have as many pixels to push around as the others. The numbers are a little misleading, however: there are certain areas where it doesn't feel as slick in operation as its rivals. Typing lag is one critical area where it falls down, with a short delay apparent between hitting the keys on the screen and seeing or hearing the visual and audio feedback.

"As with all benchmark tests, we use the figures as a handy adjunct to how we find the tablets in real-world use"

At the other end of the scale, although the Windows-based tablets' numbers don't look much better than the iOS- and Android-based hardware, with the right accessories and software, you'll be able to do much more with them. In particular, they're available with Core i5 and i7 processors, which are capable of churning through heavy-duty tasks such as video editing faster than more lightweight, ARM-based designs can manage.

Our gaming tests, meanwhile, can tell you how smoothly a tablet will run a game programmed using OpenGL. However, since not all titles are coded in this way, it isn't a perfect gauge. As with all benchmark tests, we use the figures as a handy adjunct to how we find the tablets in real-world use, and you should do the same.

BATTERY LIFE

Stamina, as ever, remains critical. You don't want to have to plug your tablet in every day or even more frequently. Fortunately, modern tablets are pretty long-lasting, and most – if put to mixed, moderate use for around two hours a day – will need to be charged only once every two or three days. However, some are considerably better than others.

We test battery life by playing a 720p video on loop until the battery gives out, and setting each tablet's screen to the same level of brightness to ensure fairness. In this test, modern tablets last from inside ten hours to almost 17 hours. This may not be particularly representative of real-world use, but it provides a figure by which you can compare the tablets like for like.

Bear in mind, too, that if you're an avid gamer, you'll be charging your tablet more frequently; if you're only reading ebooks at lower levels of brightness then the tablet may last longer.

CONNECTIVITY AND EXPANSION

As far as connectivity is concerned, there isn't much to choose between modern tablets. All will feature Wi-Fi, with most premium tablets benefitting from dual-band; you'll usually have to pay extra for 3G or 4G wireless.

A few tablets are able to boast 802.11ac wireless, while some have infrared transceivers, enabling them to act as a giant universal remote control. Note that not all tablets have GPS, although this is less important on a larger, 10in device.

When it comes to physical connections, it seems that it isn't only cheaper tablets that suffer from a poor selection – the premium devices in this group test are limited too. However, there are a few areas to which you should pay attention. Storage expansion, usually supplied via a microSD slot, is well worth having. Famously, Apple doesn't offer this: you're stuck with the built-in storage you choose when you purchase it.

Adding a microSD card is cheap; it lets you store more movies and music locally, which is especially useful if you're travelling abroad and can't afford the costs associated with streaming your content; and, in the case of Android, you can even install some apps to the SD card. Bear in mind, though, that most cheap microSD cards are far slower than internal storage, and as a result, launching apps may prove sluggish.

Finally, HDMI output is fairly common, but you'll normally need an adapter cable; not many devices have a separate HDMI output. Even then, support for external displays can be limited, with iOS and Android devices allowing only the mirroring of displays to an external display. Windows devices such as the Surface Pro 3, on the other hand, have the ability to extend your desktop to a second screen via dedicated outputs, turning them into genuinely work-friendly machines.

1. An adjustable kickstand is useful if watching movies and using the tablet for more serious duties
2. Premium tablets are more likely to have alternative input systems – a stylus is handy for sketching
3. Most tablet displays top out at 10.1in, but pay a bit more and you can get larger screens
4. To make the most of a Windows tablet, a keyboard is a must; watch out, though, they can cost extra
5. Connectivity is critical, but it isn't a strength of tablets in general. microSD slots are handy, too
6. Tablets don't always have dedicated video outputs, but often can output via USB

20 expert apps for Android and iOS

TABLETS AREN'T ONLY ABOUT ENTERTAINMENT. HERE'S A SELECTION OF APPS TO TRANSFORM YOUR DEVICE INTO A MORE POWERFUL AND USEFUL TOOL FOR BUSINESS AND PRODUCTIVITY

ANDROID

1 BOOMERANG FOR ANDROID (FREE)

Boomerang is a smarter mail client than the one that comes preinstalled on your tablet. It lets you check Gmail and Microsoft Exchange accounts within the same app, and includes some neat advanced features.

You can compose an email to be sent at a scheduled time (handled in the cloud, so your message will be sent even if you're not connected when the time comes) and choose to be alerted if a response isn't received within a certain time.

2 CHROME REMOTE DESKTOP (FREE)

It happens to the best of us: you're out and about when you realise the crucial document you need is sitting on your desktop at home. Numerous remote desktop tools can save your bacon – on Google Play, you'll find clients for TeamViewer, LogMeIn and Microsoft Remote Desktop, among others – but Chrome Remote Desktop is one of the simplest, lightest options. It has the advantage of being free, too, as well as supporting both Windows and OS X.

It's particularly well suited to tablets: although it will work on smartphones, trying to tap on icons and drag scroll bars isn't easy on a small screen.

3 CLEAN MASTER PHONE BOOST (FREE)

Phone Boost makes some optimistic claims to maximise the performance of your Android device, and the in-app advertisements aren't a delight. But if space is tight, it's a handy one-stop tool for finding and clearing unneeded files (needless to say, it works on tablets as well as phones).

It also helps to identify and disable background apps and services that may be eating up battery power, and highlights outsized or rarely used apps that you could do without.

If you'd like to take charge of what's running on your device and the impact it is having on performance, Phone Boost will be a big help.

4 TERMINAL EMULATOR FOR ANDROID (FREE)

Android is based on Linux, and Terminal Emulator for Android lets you open up a regular Linux command shell to connect and get hands-on with your files and folders. You can even install and run Linux command-line scripts and applications, and there's no need to root your device (although you'll be able to access and edit more of your file system if you do). Note that not all of the commands you're used to are available in Android; you may want to install a separate collection of command-line utilities such as BusyBox (free).

5 HOLA FREE VPN (FREE)

Hola is best known for its Unblocker software, which circumvents regional restrictions on websites such as Netflix. This isn't necessarily as relevant on a tablet, but Hola's infrastructure has other benefits.

The software uses both local and peer-to-peer caching (courtesy of other Hola users) to fetch web pages more quickly and compress data as it goes. The result is faster browsing with less data transfer – great for those on data caps.

6 NETWORK SIGNAL INFO (FREE)

Wireless networks are notoriously temperamental, especially in a domestic environment. Network Signal Info displays all sorts of information about your wireless connection, including a live signal-strength tracker. This makes it a breeze to monitor how the signal holds up in different areas of your home and workplace, whether you're looking to deploy a wireless extender or move the router. On a 3G or 4G tablet (or smartphone), you can also view statistics for the mobile signal, helping you find the best place to surf and talk.

7 SMART TOOLS ($3.60)

Plenty of apps use the sensors and capabilities of your phone or tablet to simulate simple tools and appliances; Smart Tools brings together 16 of them in one place. The set includes a ruler, a spirit level, a compass, a magnifying glass and a torch, as well as more specialist tools such as a protractor, a decibel meter and a distance estimator, which works by measuring the inclination of the phone when you aim the camera crosshairs towards the base of a distant point.

You may not use Smart Tools every day, but it's a neat download that could be of use in all sorts of circumstances.

8 TASKER ($3.49)

Tasker is an amazing app that lets you automate a huge range of Android tasks and settings. More than 30 events are recognised – including alarms, user actions and device status changes – and the list of actions these can trigger is far longer, including showing alerts, opening apps, writing to a log, making phone calls and switching network settings.

Loops, variables and conditions can be used to set up sophisticated scripts, and support for external plugins means Tasker can integrate with third-party apps, too.

If you've ever wished your tablet could read your mind, Tasker provides the next best thing.

9 UNIFIED REMOTE (FREE/$3.75)

Remote-control apps are a dime a dozen, but Unified Remote is a cut above the rest. It turns your tablet into a general-purpose input device that's capable of fully controlling a nearby PC over Bluetooth or – via a small agent for Windows – through your local wireless network.

The free version comes preconfigured with mouse and keyboard controls, plus dedicated controls for Spotify, Windows Media Center, VLC and YouTube. Splash out on the Full edition and you receive a huge collection of extra controls, for programs including Chrome, Firefox, iTunes, Netflix and PowerPoint, plus support for OS X.

Unified Remote is a great deal more versatile than the classic Media Center remote control – and is much cheaper so it's a tough one to ignore.

10 WIFI FILE TRANSFER (FREE/$1.33)

Hooking up your tablet to a PC each time you need to transfer a file is a drag. With WiFi File Transfer, there's no need. The app runs as a tiny web server on your tablet that can be accessed from any PC on the same LAN; simply type the displayed address into a browser on your desktop, then use the friendly interface to move files back and forth. You can set the service to run automatically whenever your tablet is connected to a particular network, so it's always accessible whenever you're home without wasting battery when you're out. .

IOS

1 HOLA PRIVACY VPN (FREE)

Apple's strict approach to device security means Hola's advanced features (see opposite) won't work on iOS, although the developers say they're working on it. What Hola can offer, however, is a simple VPN service. You need to activate it yourself from within the iOS settings, but once that's done you can keep your browsing private. Also, by choosing in which country you want your exit node, you may be able to access web pages that are supposedly blocked from your country or within your organisation. It's free, so you may as well try it out.

2 IFILE ($2.07)

With the arrival of AirDrop for iOS last year, Apple finally began to give iPad and iPhone users access to the files stored on their devices - but there's still no officially sanctioned on-device file manager. iFile fills that gap, allowing you to easily browse and manage the files on your phone or tablet. Even better, it includes a miniature web server, which you can access from a Mac or PC attached to the same local network.

3 IFTTT (FREE)

The name means "if this then that", and this automation tool is more or less that simple: scripts ("recipes") trigger a single action in response to a single event. What makes IFTTT special is that it isn't limited to events that occur on your local device: eBay, Dropbox, Flickr, Gmail, Reddit, Twitter and dozens more services can be easily monitored.

With thousands of predefined recipes - sorted into useful categories such as "Recipes for a Road Trip" and "Recipes for Photo Enthusiasts" - it's easy to get it started.

4 SERVERAUDITOR (FREE/$7.49)

Many system administrators use an iPad as a trusty companion, and Serverauditor lets you manage your systems directly from iOS. It provides full SSH capabilities with both xterm and VT100 terminal emulator modes, and stored keys can be imported via iTunes. Subscribe to the Pro edition for $7.49 per year and you can take advantage of client-side encrypted (AES-256) data synchronisation across all your devices, and a tabbed interface that makes it easy to manage and switch between multiple sessions.

5 SWYPE ($1.06)

In iOS 8, it's possible for the first time to replace the system keyboard with third-party alternatives. Our favourite is Swype: rather than tapping onto the screen, Swype lets you enter text by simply dragging your finger from letter to letter. It's quick and easy to use, with optional shortcut gestures for capitals and punctuation marks. And, since Swype learns as you go, accuracy gets better and better. Choose from two attractive themes, with support for English, French, German, Italian and Spanish.

6 FING – NETWORK SCANNER (FREE)

Fing quickly scans your network to display information about all connected devices. You can view IP addresses, hostnames, MAC addresses and other hardware information - and you can also ping devices and scan them for open ports. Fing can even work with hosts outside of your local network, and show geolocation information for GPS-enabled devices.

7 POCKET (FREE/$US44.99 PER YR)

Pocket lets you save entire web pages for easy access at a later date. On a Wi-Fi-only device, it's a great way to ensure you can refer back to articles and documents when you want to. Many apps can save content directly to Pocket; alternatively, you can email a URL to your Pocket email address, paste it into the app or use a bookmarklet within Mobile Safari. At $US44.99 per year, the Premium edition is expensive, but it includes a full-text search and a permanent library of stored content.

8 PRINTER PRO ($8.99)

If your printer doesn't support Apple AirPrint, you can print from your iPad using this clever app. It installs as a helper application: to print a local document, select "Open In..." then Printer Pro. Web pages can be printed directly from Safari by adding a "p" to the web address. To print from a USB printer, install the small helper app on the Mac or PC to which it's connected, so the app can find and communicate with it.

9 VNC VIEWER (FREE)

A free, lightweight remote-desktop client that lets you take control of any computer running VNC-based server software. This includes the OS X Screen Sharing function, as well as equivalents for Windows and Linux desktop systems. The only limitation is that your target system must be reachable over the internet: if this is a problem, free alternatives include the TeamViewer client for iOS and Microsoft Remote Desktop for connecting to Windows PCs running a Professional, Enterprise or Ultimate edition of the OS.

10 AIR DISPLAY 2 ($12.99)

Air Display turns your iPad into a secondary display for your Mac or Windows PC. It's perfect for those times when you want to work on your main screen while keeping an email or movie window open at the same time. Dual-screen computing becomes practical even when you're on the move, and you can take advantage of the iPad's touchscreen to control Mac apps in a whole new way. Retina resolutions are fully supported, so your iPad may also offer more workspace than your laptop's built-in screen does.

WHAT ABOUT WINDOWS?

The Windows Store is growing to a decent size, with more than 150,000 apps now available. Browse the catalogue, however, and you'll find that much of what's on offer is low-quality "shovelware" – a consequence, perhaps, of Microsoft last year having offered developers an incentive of $100 per published app, with little in the way of quality control, to encourage the growth of the Windows Store. At this time, there's little in the way of apps for the advanced user.

This isn't necessarily a problem. While tablet-style apps may be thin on the ground, all of this month's Windows tablets run on Intel processors – so they can run the same utilities and productivity applications as a full-sized desktop PC. These tools aren't always optimised for a touchscreen, but the capability makes Windows a persuasive option for developers, administrators and managers.

The situation will improve next year with Windows 10, which unifies the Windows Phone and tablet platforms and allows Store apps to run in floating windows alongside conventional applications on the desktop.

		LABS WINNER	RECOMMENDED	
	Amazon Kindle Fire HDX 8.9in	Apple iPad Air	Asus Transformer Pad TF103C	
OVERALL	★★★☆☆	★★★★★	★★★★☆	
Price	$349	16GB, $598; 4G, extra $151	$348 with keyboard dock	
Manufacturer	amazon.com	apple.com/au	asus.com.au	
Warranty	1yr	1yr	1yr	
Dimensions (WDH)	231 x 7.8 x 158mm	170 x 7.5 x 240mm	256 x 10 x 182mm (23mm thick with keyboard dock)	
Weight	374g	469g	556g (1.1kg with keyboard dock)	
HARDWARE				
CPU (options)	2.2GHz Qualcomm Snapdragon 800	1.3GHz Apple A7	1.33GHz Intel Atom Z3745	
GPU	Qualcomm Adreno 330	PowerVR G6430	Intel HD Graphics	
RAM (options)	2GB	1GB	1GB	
Storage (options)	16GB (32GB, 64GB)	16GB (32GB, 64GB, 128GB)	8GB (16GB)	
Battery capacity	Not stated	8,820mAh (32Wh)	19Wh	
Accelerometer	✓	✓	✓	
Light sensor	✓	✓	✓	
GPS	✓	✓ (only on 4G version)	✓	
3G/4G	Optional 4G	Optional 4G	✗	
DISPLAY				
Type	IPS	IPS	IPS	
Size	8.9in	9.7in	10.1in	
Resolution	2,560 x 1,600	2,048 x 1,536	1,280 x 800	
Pixel density	339ppi	264ppi	149ppi	
Digitiser/active stylus support	✗	✗	✗	
Video outputs	✗	✗	✗	
MHL compatible	✗	✗	✗	
Brightness	470cd/m^2	410cd/m^2	407cd/m^2	
Contrast	1,244:1	1,000:1	1,018:1	
CAMERA				
Rear camera resolution	8MP	5MP	2MP	
Focus type	Autofocus	Autofocus	Fixed	
Built-in flash (type)	N/A	N/A	N/A	
Front-facing camera resolution	0.9MP	1.2MP	1.2MP	
Max video-recording resolution	1080p	1080p	720p	
PORTS & CONNECTIONS				
Wi-Fi standard	802.11n	802.11n	802.11n	
Bluetooth standard	4	4	4	
Dual-band	✓	✓	✓	
Memory card reader	✗	✗	microSD	
Ports & other connections	micro-USB	Apple Lightning	3.5mm headset jack; micro-USB 2; USB 2	
SOFTWARE & ACCESSORIES				
Operating system	Kindle Fire OS 3	iOS 8	Android 4.4	
App & media stores	Amazon Appstore; Lovefilm Instant	Apple App Store; iTunes	Google Play	
Bundled accessories	✗	✗	Keyboard dock	
BENCHMARK SCORES				
Battery life @ 120cd/m^2	16hrs 55mins	12hrs 55mins	9hrs 29mins	
SunSpider	704ms	391ms	610ms	
Geekbench 3 single-core	Not available	1,480	757	
Geekbench 3 multi-core	Not available	2,691	2,334	
GFXBench T-Rex HD (onscreen)	14fps	21fps	28fps	
GFXBench battery test	7hrs 16mins	4hrs 12mins	3hrs 11mins	

	Microsoft Surface Pro 3	Samsung Galaxy Tab S 10.5	Samsung Galaxy Note Pro 12.2	RECOMMENDED Sony Xperia Z2 Tablet
	★★★★☆	★★★★☆	★★★☆☆	★★★★☆
	$1209	$509	$589	$479
	microsoft.com.au	samsung.com.au	samsung.com.au	sony.com.au
	1yr	1yr	1yr	1yr
	292 x 9.1 x 201mm (14mm thick with Type Cover)	247 x 6.6 x 177mm	295 x 8.7 x 203mm	267 x 6.4 x 172mm
	800g (1.1kg with Type Cover)	465g	744g	439g
	1.9GHz Intel Core i5-4300U (Core i3/i7)	1.9GHz Samsung Exynos 5 Octa	1.9GHz Samsung Exynos 5 Octa	2.3GHz Qualcomm Snapdragon 801
	Intel HD Graphics	ARM Mali-T628 MP6	ARM Mali-T628 MP6	Qualcomm Adreno 330
	4GB (8GB)	3GB	3GB	3GB
	128GB (64GB, 256GB, 512GB)	16GB (32GB)	32GB (64GB)	16GB (32GB)
	42Wh	7,900mAh	9,500mAh	6,000mAh
	✓	✓	✓	✓
	✓	✓	✓	✓
	✗	✓	✓	✓
	✗	✗	✗	optional 4G
	IPS	Super AMOLED	IPS	IPS
	12in	10.5in	12.2in	10.1in
	2,160 x 1,440	2,560 x 1,600	2,560 x 1,600	1,920 x 1,200
	216ppi	288ppi	247ppi	224ppi
	✓	✗	✓	✗
	mini-DisplayPort	✗	✗	✗
	N/A	✓	✓	✓
	325cd/m^2	278cd/m^2	328cd/m^2	409cd/m^2
	798:1	Perfect	1,171:1	908:1
	5MP	8MP	8MP	8.1MP
	Autofocus	Autofocus	Autofocus	Autofocus
	✗	✓ (single LED)	✓ (single LED)	✗
	5MP	2.1MP	2.1MP	2.2MP
	1080p	1080p	1080p	1080p
	802.11ac	802.11ac	802.11ac	802.11ac
	4	4	4	4
	✓	✓	✓	✓
	microSD	microSD	microSD	microSD
	3.5mm headset jack; cover port; USB 3	3.5mm headset jack; infrared transceiver; micro-USB 3	3.5mm headset jack; infrared transceiver; micro-USB 3	3.5mm headset jack; micro-USB 2
	Windows 8.1 64-bit	Android 4.4	Android 4.4	Android 4.4
	Windows Store	Google Play	Google Play	Google Play
	Surface Pen pressure-sensitive stylus	✗	S Pen pressure-sensitive stylus	✗
	7hrs 57mins	13hrs 26mins	10hrs 44mins	14hrs 38mins
	156ms	478ms	522ms	885ms
	2,555	741	932	939
	5,301	1,769	2,686	2,530
	37fps	14fps	14fps	28fps
	N/A	4hrs, 30mins	4hrs 38mins	5hrs 43mins

APPLE IPAD AIR

A TABLET TO ASPIRE TO: IT PERFORMS BRILLIANTLY, AND THE SOFTWARE AND ACCESSORIES PUSH IT IN FRONT OF THE PACK

PRICE $619 (16GB); 4G extra $151
SUPPLIER www.apple.com.au

No tablet group test would be complete without an iPad. It kick-started the industry back in 2010, and each year Apple has refined the formula, slimming down the dimensions, ramping up the power and improving the display until you have what you see here: the iPad Air.

It's coming to the end of its cycle now, and a new version will be available soon, but that's likely to be only a gradual evolution of what is still, almost a year on from its launch, a remarkable piece of kit.

DESIGN AND SCREEN

Physically, the iPad Air is stunning. It measures a mere 7.5mm thick and weighs only 469g, and despite strong challenges from all quarters – in particular, the Sony Xperia Z2 Tablet and the Microsoft Surface Pro 3 –the iPad maintains its lead as the most attractive tablet on the market. Its smooth, all-metal rear catches the eye, especially in the "Space Grey" finish, and it feels incredibly luxurious.

Around the iPad's abruptly curved edges, you'll find little to distract the eye: a power button, volume buttons, a pair of speaker grilles, a switch for silencing notifications,and Apple's Lightning connector, used for charging the tablet and attaching accessories. Below the screen you'll

"Whether viewing photos, watching movies or browsing the web, you'll have no cause for complaint"

"Despite strong challenges from all quarters, the iPad maintains its lead as the most attractive tablet on the market"

find the characteristic home button.

Little has changed about the fundamental shape of the iPad's display since 2010. It retains the 4:3 aspect ratio that makes it feel natural to use in both portrait and landscape orientation, and the display size of 9.7in across the diagonal also remains. These days, the resolution is a much-improved 2,048 x 1,536, quadruple the original's 1,024 x 768. A resolution this high isn't strictly necessary on a screen of this size, but text looks crisp and photos are full of fine detail.

The quality of its IPS panel is still excellent, too. Apple has always crushed the grey into black at the low end, so some shadow detail is lost, but brightness and contrast are superb, and balanced colours elsewhere deliver superlative image quality. Whether you're viewing photos, watching movies or simply browsing the web, you'll have no cause for complaint.

CORE HARDWARE AND PERFORMANCE

You shouldn't have a problem with performance either. The dual-core, 1.3GHz Apple A7 SoC may not look much on paper next to the eight-core, 1.9GHz monster powering the two Samsung tablets on test this month, but with higher performance per core and 64-bit support, it isn't far off in the benchmarks. In the SunSpider browser test, the iPad Air came ahead of all the ARM-based tablets, with a time of 391ms, and its single-core Geekbench CPU test score was just as good.

Its multi-core result was a little further back, though, as was its result in the GFXBench T-Rex HD gaming test. Here, the high-resolution display held back the frame rate to 21fps, with the Sony Xperia Z2 Tablet, Asus Transformer Pad and Surface Pro 3 streaking ahead, but this isn't too much of a concern; even advanced games play smoothly on the Apple Air right now.

The only performance issue we have is that, with a 64-bit processor and only 1GB of RAM on board, the Safari web browser does occasionally crash through lack of memory. This is annoying, but it doesn't happen often enough to be a major concern.

And it's balanced out by an impressive showing in other areas. The 5-megapixel rear camera isn't up to the quality of the snappers you'll find on smartphones these days, but it produces clean, clear photographs in good light, and 1080p video that isn't marred by over-compression and noise. It's a touch behind the Samsung tablets in this regard, but you won't be disappointed by the results.

Battery life is also up with the best: a result of 12hrs 55mins in our looping-video test places it behind the Amazon Kindle Fire HDX 8.9in, Sony's Xperia Z2 Tablet and the Samsung Galaxy Tab S 10.5in, but ahead of the rest. It's also good to see that, with the included mains USB charger, the charge time is reasonably swift.

▲ The iPad's shape hasn't changed a lot since launch, but the resolution is much improved

▼ You'll find very little to distract the eye around the iPad's curved edges

SOFTWARE

With the appearance of iOS 8, meanwhile, Apple has brought a number of key enhancements to its excellent hardware. First on the list is an improved keyboard. Suggested words now appear in a bar above the onscreen keyboard, and you receive a greater number of options than before. Apple is also opening up the keyboard API to third-party developers, which means you'll see SwiftKey and other alternatives to the iPad's standard data-entry method on offer in the App Store.

Another of our favourite changes is Family Sharing, which allows you to share app purchases across a group of up to six people, each with separate Apple IDs. And at long last, apps will now be able to access a unified pool of files via iCloud Drive, removing the irritating need to share, move and create duplicate files when using multiple apps.

In the meantime, although Google Play is coming up on the rails, the Apple App Store still has a better selection of apps that work well on a larger-screened tablet. Also bear in mind that when it comes to accessories, Apple has the market sewn up: for cases, keyboards, audio add-ons, styluses and more, there's far more choice available than with any other tablet.

VERDICT

The iPad Air is at the top of its game, and it remains our favourite tablet. The form factor isn't as good as the Surface Pro 3 for carrying out serious tasks, such as video and photo editing – for that, we prefer more screen real-estate and proper desktop software, driven by a mouse, touchpad or stylus and physical keyboard.

Also, we aren't particularly fond of Apple's prices, which force you, through a lack of memory expansion, to pay through the nose for higher-capacity models: $120 to move from 16GB to a practical 64GB is a bit much to ask.

However, if you don't need a tablet to completely replace your laptop (and most people don't), the iPad Air – with its superb selection of apps, accessories and high-quality hardware – is still our pick of the bunch.

BATTERY: LOOPING VIDEO 12HRS 55MIN

OVERALL ★★★★★

MICROSOFT SURFACE PRO 3

WITH ITS THIRD HYBRID, MICROSOFT IS GETTING CLOSER TO NAILING ITS UNIQUE OFFERING.

PRICE $1209 (i5; 128GB)
SUPPLIER www.microsoft.com.au

When Microsoft first announced it was to make its very own Windows hardware, its intention was to show the rest of the market how it was done. In reality, the first Surface hardware was a hit-and-miss affair: it had great design and a fantastic screen, but the ergonomics were flawed – in particular, that single-position kickstand – and battery life was woeful.

This was in part rectified by the company with the Surface Pro 2, which added an extra position to the kickstand, but with the Surface Pro 3 the changes are even more dramatic.

ERGONOMICS AND DESIGN

The first big step forward is the new kickstand, which can now be adjusted from almost flat to almost vertical, or at any angle in between. This makes it a far more flexible design, and more stable to use on your lap than before.

The change in screen size, aspect ratio and resolution have an equally big impact on usability. Where most tablet manufacturers opt for a 16:10 ratio display – which is great for watching movies but not much else – Microsoft has opted for a 3:2 aspect ratio for the 2,160 x 1,440-resolution screen.

This has a number of advantages. First, more of the screen is visible when using the touch keyboard. Second, in desktop mode, there's a huge amount of desktop real-estate available. The larger, deeper display also has positive implications for

"The first big step forward is the new kickstand, which is far more flexible and more stable to use on your lap than before"

the new Type Cover: it's no match for a proper laptop keyboard, but its larger size does make it easier to type on than before. Physically, the Surface Pro 3 inherits the beautifully

manufactured VaporMg casing from its predecessor, complete with bevelled edges, and it's still equipped with a decent set of physical connections, including a full-sized USB 3 socket, a mini-DisplayPort output capable of supporting resolutions up to 4K, and a microSD slot beneath the kickstand for expanding storage. It still comes with the pressure-sensitive Surface Pen stylus, which is now made out of aluminium instead of plastic, although there's still no slot in which to stow it within the Surface itself.

PERFORMANCE AND SCREEN QUALITY

So, the new screen has a positive effect on the Surface Pro 3's ergonomics. It isn't such good news when it comes to image quality, however. It's bright enough that you can use it in the garden or in an office, but of all the tablets we've looked at in this Labs, it's the second dimmest, at 325cd/m^2. Contrast isn't amazing, either: at 798:1, it brings up the rear this month. However, there's one major saving grace: colour accuracy. Its average Delta E of 1.7 is superb, and this more than makes up for the display's other deficiencies.

Aside from this, the resolution Microsoft has chosen for the display is bang on: not too high that non-optimised legacy apps become unusable (at least not at the default scaling settings), but sharp enough that you can't see the pixels from a normal typing distance. The 12in, 2,160 x 1,440 display delivers a pixel density of 216ppi, which doesn't sound all that high, but it's high enough.

And, whichever model of Surface Pro 3 you choose, you'll benefit from fourth-generation Intel-powered laptop hardware inside, which means you can do far more with it than any Android or iOS tablet on the market. Our review sample, equipped with the Core i5, topped every single mobile benchmark we threw at it, scoring 156ms in SunSpider, 2,555 and 5,301 in the single- and multi-core Geekbench tests and 37fps in the GFXBench T-Rex HD onscreen gaming test.

We also ran the *PC & Tech Authority* Real World Benchmarks suite on the Surface Pro 3 to gauge performance compared to other Windows laptops. Surprisingly, its Overall score of 0.62 is almost level with its predecessor – it gets too hot for the CPU to properly stretch its legs, but it's plenty powerful enough for most Windows applications.

Battery life, however, is middling. In our looping-video test, with the screen set to 120cd/m^2, our Core i5 Surface Pro 3 lasted 7hrs 57mins, which places it someway short of most rivals; although that, perhaps, shouldn't be a surprise, given the amount of power on tap and the size of the screen.

"When it comes to the Surface Pro 3's image quality, it isn't such good news – of all the tablets in this group, it was the second dimmest"

▼ The new Type Cover is more comfortable in use than before

VERDICT

There are a number of configurations available for the Surface Pro 3, ranging from the Core i3 model with 4GB of RAM and 64GB of storage to the top-end Core i7 with 8GB of RAM and 512GB of storage, and prices range from **$979** to $2279, with $149.99 on top for the Type Cover 2 keyboard.

This may seem expensive next to the iPad Air and Android tablets, but when you consider what you're getting for this – a base 64GB of storage, top-end performance, and a pressure-sensitive stylus, plus compatibility with a world of professional applications – it starts to look better value.

Unfortunately, the Windows Store's lack of high-quality apps, as well as the Surface Pro 3's larger size and slightly less-impressive battery life, mean it isn't as convenient or portable as the iPad Air.

The Surface Pro 3 is a highly desirable product, but make no mistake: it is a compromise. If you want the very best tablet, we'd look to the iPad Air instead.

BATTERY: LOOPING VIDEO 7HRS 57MIN

OVERALL ★★★★☆

SAMSUNG GALAXY TAB S 10.5

STUPENDOUSLY GOOD HARDWARE, BUT LAGS NARROWLY BEHIND THE SONY AS OUR ANDROID TABLET OF CHOICE

PRICE $509
SUPPLIER www.samsung.com.au

Graphics and images seem to come to life on the Super AMOLED display

Samsung may rule the roost when it comes to Android smartphones, but the Korean firm hasn't yet stamped its dominance on the tablet sector. It's hoping to change that with the premium Galaxy Tab S 10.5.

The most notable feature is its stunning 10.5in, 2,560 x 1,600-resolution Super AMOLED screen. When you turn it on, it stops you dead in your tracks: graphics and images jump out of the screen in a way that they simply don't on IPS-based displays – such as on the Apple iPad Air or Sony Xperia Z2 Tablet – and darker scenes teem with inky blacks and oodles of detail.

As easy as it is to fall in love with the Tab S's screen, though, maximum brightness isn't as high as it is on the best IPS displays: the Tab S 10.5 reaches a maximum of only 278cd/m2, where the best IPS screens hit 400cd/m2 and above. In a train carriage, where bright sunlight is streaming through the window, this tablet won't be as readable as an iPad Air set to maximum brightness.

Tear your eyes away from the display, however, and the Galaxy Tab S 10.5 is a handsome device. It measures a waif-like 6.6mm thick, and it's extremely light, too: at 465g, you'll barely notice it in your bag, and holding it up to watch a movie or read won't prove tiring at all.

At the heart of this ultra-thin tablet lies a Samsung Exynos 5 Octa SoC, which has eight cores (four running at 1.9GHz, four at 1.3GHz), 3GB of RAM, a base storage allocation of 16GB and ARM Mali-T628 MP6 graphics. It completed the SunSpider test in 478ms, and gained single- and multi-core scores of 741 and 1,769 in Geekbench 3. Not surprisingly, though, the Tab S 10.5's high-resolution display hits gaming performance hard – it averaged a choppy 14fps in the GFXBench test.

It performed impressively in terms of battery life, with the power-efficient AMOLED screen paying dividends. In flight mode, with the display set to 120cd/m2, the Tab S 10.5 lasted 13hrs 26mins before hitting 5% capacity; the screen then dimmed automatically and continued for a further 31 minutes before the tablet powered down.

"Whether or not you like the way Samsung skins Android 4.4 with TouchWiz, there's no denying it has benefits"

In keeping with Samsung's traditions, there's a microSD slot capable of accepting cards up to 128GB, the micro-USB socket supports MHL for HDMI video output to your TV, wireless stretches to dual-band 802.11ac, and the infrared transceiver on the Galaxy Tab S's top edge means you can use the tablet as a giant universal remote control. There's even a fingerprint scanner, although it's housed in the centrally mounted home button, making it rather awkward to use.

It's good to see that the camera hasn't been overlooked. The Tab S's 8-megapixel rear camera, accompanied by a single LED flash, captures clean, clear stills and decent 1080p video. The front-facing 2.1-megapixel camera is less impressive, however, and the weedy sideways-facing speakers were disappointing too.

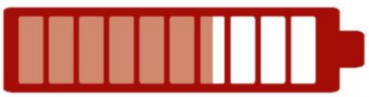
Whether or not you like the way Samsung skins Android 4.4 with its TouchWiz front-end, or preinstalls an array of apps, there's no denying it has its benefits. Smart Stay keeps the screen on while you're looking at it (handy if you use your tablet for reading ebooks); the Multi Window mode lets you line up two apps side by side; and the SideSync feature enables you to drag files back and forth between a Samsung Galaxy phone and the tablet, and even answer calls without picking up your handset.

We're not so keen on Magazine UX, Samsung's Flipboard-style tiled newsfeed, which sits permanently to the left of the main homescreen, but there's more than enough here to forgive such niggles.

As with many of Samsung's recent flagship mobile products, the Galaxy Tab S 10.5 is an excellent tablet. However, the Sony Xperia Z2 Tablet just edges it in the battle for the best of the Android models, thanks to slightly better battery life and its more resilient design.

You'll barely notice the Tab S in a bag: it's only 6.6mm thick and weighs 465g

BATTERY: LOOPING VIDEO 13HRS 26MIN



OVERALL ★★★★☆

SONY XPERIA Z2 TABLET

FABULOUS DESIGN AND PERFORMANCE FROM SONY – THIS IS OUR FAVOURITE ANDROID TABLET

PRICE $479
SUPPLIER www.sonymobile.com.au

It's impossible not to be impressed the first time you come across the Sony Xperia Z2. This Android tablet is the thinnest, lightest around, measuring a barely believable 6.4mm thick and weighing only 439g. It's thinner than either of the new iPhones, which is quite a feat of engineering.

You may think this would lead to insubstantial build quality, and you'd be right to a certain extent; the Z2 Tablet bends more than most when you give it a twist. But, in reality, it's a tough piece of kit. Sealed flaps all around mean the tablet is water- and dust-resistant, and it has an IP55 rating to prove it. There's Gorilla Glass on the front for scratch- and shatter-resistance as well. You wouldn't want to take it onto a building site, but reading an ebook or browsing the web in the bath is well within the realms of possibility.

The Sony Z2 Tablet is quite a looker as well, with metallic inlaid edges stretching around its circumference and a completely smooth, flat rear panel. Plus, it packs in all the hardware and features you'd expect of a modern, flagship device. There's a 2.3GHz quad-core Qualcomm Snapdragon 801 processor at the helm, coupled with 3GB of RAM, 16GB of storage and a microSD slot for expanding that by up to a further 128GB.

The display may not boast as high a raw resolution as the Samsung tablets or the Microsoft Surface Pro 3, but 1,920 x 1,200 is all you really need with a screen that's only 10.1in across the diagonal. Its pixel density of 224ppi ensures the pixel structure is visible only from viewing distances closer than 38cm, so you'd have to look at it from an unnaturally close distance for text and images to look anything but smooth and crisp.

In the areas that really do make a difference, the Z2's screen performs well: its maximum brightness is a respectable 409cd/m2 and contrast is good, too, at 908:1, ensuring there's plenty of dynamic range and no danger of images looking grey and flat. It also means there's plenty of shadow and highlight detail, which makes this a great tablet on which to watch movies.

The lower resolution also has a positive effect on performance, helping to keep demands on the 2.3GHz Qualcomm Snapdragon 801 SoC low. The upshot is that the Z2 Tablet eased along at an average of 28fps in the GFXBench T-Rex HD gaming benchmark, which is joint second with the lower-resolution Asus Transformer Pad TF103C. It's less impressive in SunSpider, where it completed the test in 885ms – some way behind the leaders this month – but in Geekbench it shot back up the table, with scores of 939 and 2,530 in the single- and multi-core tests respectively.

Back in the real world, the Z2 Tablet feels superbly responsive, both around the OS and when scrolling, zooming and panning around web pages and graphics-heavy apps such as Google Maps. Battery life is brilliant too. In our video test, it lasted 14hrs 38mins – good enough to put it firmly at the top of the table, second only to the Kindle Fire HDX 8.9in and ahead of the iPad Air.

There's one major weakness, however. The 8.1-megapixel rear camera is average: there's no flash, and photos in low light look much more grainy and noisy than those produced by the Samsung tablets and the iPad Air.

However, it's very difficult to find fault elsewhere, with the full gamut of tablet features and hardware: there's an infrared transceiver to enable you to use the Xperia Z2 Tablet as a universal remote control, you get dual-band 802.11ac wireless, and there's NFC to make Bluetooth pairing (with compatible products) as hassle-free as is possible.

The Sony Xperia Z2 is a brilliant tablet. It's astonishingly thin and light, performance is exemplary, and battery life is brilliant. It isn't the cheapest, though, and the iPad Air narrowly takes the lead thanks to the bigger selection of high-quality tablet-specific apps available in the App Store. However, if it absolutely must be an Android device then this is currently as good as it gets.

▼ At only 6.4mm thick, the Xperia Tablet Z2 is ludicrously thin

BATTERY: LOOPING VIDEO 7HRS 57MIN

OVERALL ★★★★☆

AMAZON KINDLE FIRE HDX 8.9IN

SUPER-LIGHT, WITH A GREAT SCREEN AND LONG-LASTING BATTERY – THE ONLY LETDOWN IS THE AMAZON APPSTORE LOCK-IN

PRICE $349
SUPPLIER www.amazon.com.au

The Amazon Kindle Fire HDX 8.9in is the smallest tablet in this roundup, but that gives it some key advantages over its rivals.

For starters, it's very light and portable. And, despite weighing a mere 374g – 65g lighter than even the Sony Xperia Z2 Tablet – it's rock-solid. Although there's no aluminium in sight, the soft-touch plastic back feels classy, and the unusual, shallow bevels that surround the edges don't impact negatively on comfort. We're not huge fans of the rear-mounted power and volume buttons, though; we'd rather they were placed along the edges.

Up-front, the display packs a 2,560 x 1,600 resolution into a 8.9in panel, although there isn't much point at this screen size; a Full HD display would look just as good. Still, it's pin-sharp, and brightness and contrast are superlative – we measured this at 470cd/m2 and 1,244:1.

Inside, it's powered by a quad-core 2.2GHz Qualcomm Snapdragon 800 CPU, which delivers decent benchmark scores and a responsive feel overall, although the high-resolution display has an impact on gaming performance. Battery life is amazing: the HDX 8.9in lasted for a table-topping 16hrs 55mins.

Elsewhere, there's an 8-megapixel camera on the rear and a 720p front-facing camera for video calls. What you don't get with the Kindle is any kind of wired video output or a microSD slot – you can stream movies wirelessly via Miracast, however.

Ostensibly, the Kindle Fire HDX 8.9in runs version 4.4 of Google's mobile OS, but the Kindle Fire operating system is so heavily modified that the underlying software is unrecognisable. It's easy to get to grips with, though, and the tablet even comes pre-registered to your Amazon account. The downside is you have to rely on Amazon's store for apps; Google Play is out of bounds.

Small but perfectly formed, the HDX 8.9in is as long-lasting as they come

This major limitation will rule out this pint-sized tablet for many people. If you don't mind the Amazon lock-in, however, there remains much to like about this compact, light and long-lasting tablet.

OVERALL ★★★☆☆

ASUS TRANSFORMER PAD TF103C

A WELL-DESIGNED, HIGH-PERFORMANCE ANDROID HYBRID – IT'S VERSATILE AND SURPRISINGLY CHEAP

PRICE $348
SUPPLIER www.asus.com.au

Asus Transformer Pads used to be marketed as a premium alternative to Apple's iPad. Over time, however, Asus has brought down the price, and the current Transformer Pad TF103C costs only $348 for the tablet and keyboard dock.

As a tablet alone, the TF103C is rather humdrum. Although the soft-touch plastic backing makes it pleasant enough to hold, it's dumpy at 10mm thick and 556g, and there's little about its specifications to set the heart racing. There's a bog-standard 1,280 x 800-resolution IPS display, a 2-megapixel camera at the rear and a 1.2-megapixel one at the front, 1GB of RAM, and only 8GB of storage on the base model.

Together with the keyboard that latches securely onto one edge, however, the TF103C is a different proposition. The keyboard lacks an integral battery like its more expensive predecessors, but it's ergonomically sound. The key action is firm and positive without being rattly, and the touchpad is responsive and comfortable to use. The dock adds a full-sized USB 2 port, so you can connect thumbdrives, and there's also a microSD slot on the tablet itself.

Performance is decent. The quad-core Intel Bay Trail Atom Z3745 clocked at 1.33GHz, coupled with Intel HD Graphics, put in a fine performance in the mobile benchmarks, scoring 610ms in SunSpider, and 28fps in the GFXBench test, which is about as fast as Android tablets get. Android 4.4 flies along, too; this is a particularly responsive tablet.

Despite its low resolution, the screen's image quality is excellent. Brightness peaks at 407cd/m^2, which is good enough for outdoor viewing, and a contrast ratio of 1,018:1 gives images real presence.

Despite the low resolution, the display looks vibrant

Only battery life disappoints, with a below-average time of 9hrs 29mins in our looping-video test, but that's a small price to pay. It may not be glamorous, but the Asus Transformer Pad TF103C delivers premium tablet features at a bargain price.

OVERALL ★★★★☆

SAMSUNG GALAXY NOTE PRO 12.2

A SUPER PIECE OF HARDWARE WITH A FANTASTIC SCREEN, BUT IT'S UNWIELDY AND A BIT OF A

PRICE $589
SUPPLIER www.samsung.com.au

The Samsung Galaxy Note Pro 12.2 is a giant-sized Android tablet. It has a 12.2in, high-DPI 2,560 x 1,600 screen, and even comes with a pressure-sensitive, active stylus, which stows away in the tablet's body.

Behind the scenes, the Note Pro 12.2 runs a heavily modified version of Android 4.4, but it clearly hasn't been designed as a laptop replacement in the same way as the Surface Pro 3. There's no integrated kickstand or official keyboard case.

Instead, Samsung wants you to use the Note Pro as a stylus-equipped tablet for writing, sketching and surfing the web. In some ways, it works well: the extra screen real estate provides more room for sketching and drawing. We love the capabilities the stylus adds to the tablet, such as the ability to quickly scrapbook portions of web pages, and write notes into the S Note note-taking application.

On the other hand, the extra bulk and size mean the Note Pro 12.2 is a bit of a lump; even the heavier Surface Pro 3 is more convenient in everyday use, since it can be propped up on your lap at a convenient angle. The Samsung needs to be physically held in place.

At least the company has done a sterling job with the hardware. The tablet's engine room hosts an eight-core processor, 3GB of RAM, and 32GB of storage, with a microSD slot for expanding that by up to 64GB.

The Note Pro 12.2 rattled through the SunSpider and Geekbench 3 tests, but the high-resolution screen had an impact on gaming. The Samsung averaged 14fps in the GFXBench T-Rex HD test.

▲ The 12.2in screen is huge and crisp – although it adds bulk to the tablet

Battery life is only middling, with a time of 10hrs 44mins in our looping-video test, and screen quality can't match the best tablets here. We encountered a little lag on occasion, and transition animations when launching apps stuttered frequently.

The Samsung Galaxy Note Pro 12.2 is a lovely bit of hardware, but despite the nifty stylus and the crisp, large screen, this tablet's unwieldiness and middling performance means it isn't our favourite this month.

OVERALL ★★★☆☆

Information Technology

Study IT in 2015

Undergraduate and Postgraduate

Monash University offers you a range of flexible degrees that prepare you for an exciting career in the dynamic field of information technology.

Discover your opportunities:

- Merit Scholarships available, **$5000** or **$7000** per annum
- Course Fee Allowance - **$1000**
- Industry Based Learning (IBL)
- Industry Experience Project
- Double degrees
- Research programs

Apply for 2015 now

Attend our information session where academic and admissions staff will be available for consultation.

NOV 26

Information session
Wednesday 26 November, 2014
Building H, Caulfield campus
Registrations 6:15pm for 6:30pm start

it.monash.edu/pgrego

MONASH University

GROUP OF EIGHT

Australia ▪ Malaysia ▪ South Africa ▪ Italy ▪ India

CRICOS Provider: Monash University 00008C

View from the Labs

THE IPAD AIR MAY STILL BE THE BEST PREMIUM TABLET AROUND, BUT AS THIS LABS PROVES, THERE'S MORE HIGH-QUALITY COMPETITION THAN EVER BEFORE. LONG MAY IT CONTINUE

Tablets have come a long way since the first iPad. Now it seems everyone owns a tablet of one type or another, and there are hundreds of models on the market: Android ones, Windows ones, hybrids, detachables, tablets with huge screens and tablets on which you can write. Whatever your predilection, it seems the tablet world has something to offer.

One thing hasn't changed: Apple's tablet remains at the head of the pack through a perfect combination of form and function. A gorgeous design that's also practical; a user interface that's easy to get to grips with; plus almost limitless extra features courtesy of top-value, high-quality apps and third-party manufacturers desperate to create accessories.

But that isn't to say we're not impressed with the iPad Air's rivals. Indeed, this month's crop of premium tablets represents the highest sustained quality we've seen in any tablets Labs in *PC & Tech Authority's* long history.

In the past, the iPad has stood head and shoulders above a fairly mediocre crowd. This month, the rivals are challenging for first place.

Even Windows tablets are beginning to challenge the historical Apple hegemony, with the Microsoft Surface Pro 3 offering a glimpse of a future in which we don't need to own a tablet for home use and a laptop for work, but one device that's good enough to cover every eventuality.

In the end, Microsoft's ambitious hybrid tablet falls short of perfection on both fronts, but it's the most convincing device of its type we've seen yet, and at last it represents a genuine alternative to running a traditional Windows laptop or even an ultrabook – provided, of course, you opt for the extra $149 Touch Type 2 keyboard. We can't wait to see what happens with the next generation.

"In the past, the iPad has stood head and shoulders above the rest. This month, the rivals are challenging for first place"

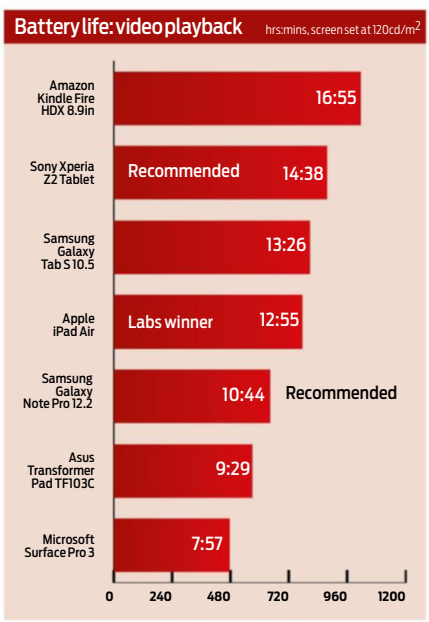
At the other end of the spectrum, it's been great to see both Samsung and Sony continue to hone their tablets to the point at which they're now serious contenders to challenge Apple's crown.

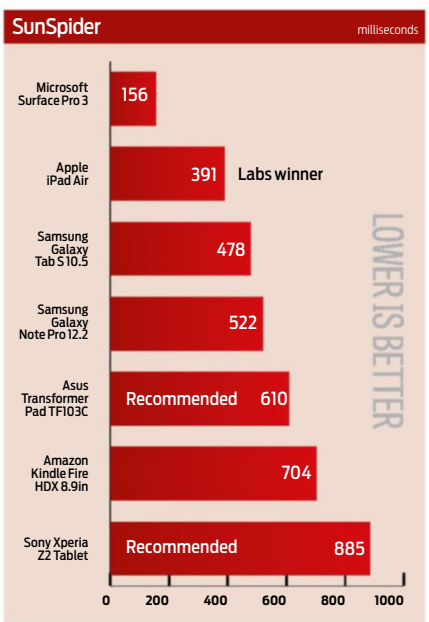
Samsung's AMOLED-screened Galaxy Tab S 10.5 is a fabulous piece of hardware: it's superbly slim and light, and has an amazingly colourful display that is extremely impressive. Sony's Xperia Z2 Tablet is powerful, practical and incredibly thin, with the ability to shrug off an encounter with a rain shower or a spilled cup of tea.

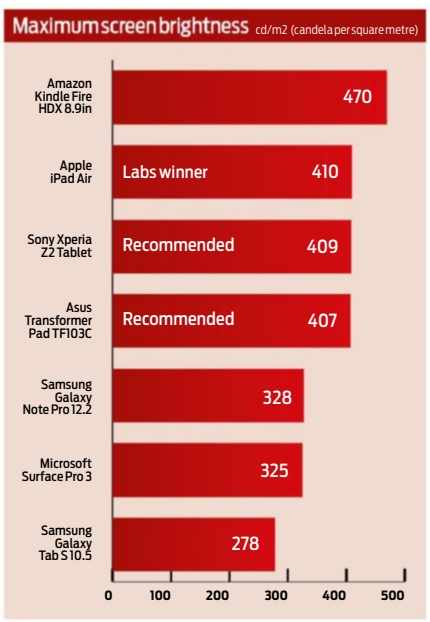
Meanwhile, Asus chips in with a reasonably priced hybrid tablet: the Transformer Pad TF103C. Its $349 price may not look high-end, but the tablet performs far above what you'd expect, and it slots comfortably into our group of high-flying devices, some of which are several times more expensive than the plucky Asus.

At the end of the day, and after balanced consideration, we'll leave this Labs with a sense of excitement and enthusiasm about the tablet market as a whole. The iPad Air may still be the best around, but if you'd like something a little different, there are now plenty of high-quality alternatives that you could consider. Go fill your boots.

Test results







NETGEAR®

3.2Gbps WiFi Speed

EXTREME SPEED ULTIMATE WIFI

Nighthawk™ X6

AC3200 Tri-Band WiFi Router

MORE WIFI FOR MORE DEVICES

- Breakthrough **Tri-Band** WiFi
- **1Ghz** Dual Core Processor
- **6** High Performance Antennas
- High Speed **USB 3.0**

GAMING | STREAMING | MOBILE

netgear.com.au/nighthawkx6

NETGEAR and the NETGEAR logo, are trademarks and/or registered trademarks of NETGEAR, Inc. and/or its subsidiaries in the United States and/or other countries.
Other brand names mentioned herein are for identification purposes only and may be trademarks of their respective holder(s). © 2014 NETGEAR, Inc. All rights reserved.

Lewys Martin - www.Paradox.Photography & Ben Mansill

THE EVIL WITHIN *PC&TA* EVENT

GAMERS CAME, GAMERS PLAYED, GAMERS SET A LOT OF WEIRD THINGS ON FIRE. GOOD TIMES.

We kicked off our first reader event this month, combining the forces of *PC PowerPlay*, *Atomic*, *Hyper*, and *PC & Tech Authority* – and it was a hoot! We converted our entry hall into a Chamber of Spooky Horrors, and had twenty or so lucky guests come round to share some gaming fun.

The game of the night was The Evil Within, and from hands-on reports, squeals of murderous glee and murmurs of fear from our guests, the game's looking like a solid bit of horror survival. Our guests – and their plus ones – got the play through about an hour of the game, thrown right in at the scary deep end of chapter nine.

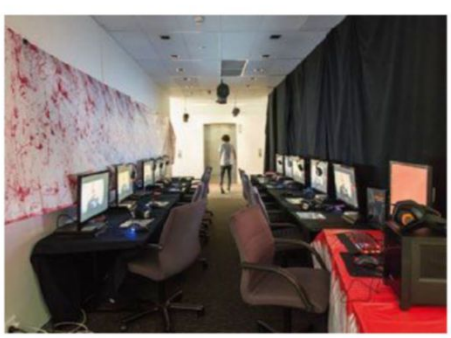
Sadly for PC fans, it was on PS4, but consoles are sadly that much more secure than PCs – and this was the best we could do to get the game to our readers ahead of release.

But PC component king Asus was on hand, and graciously supplied monitors for the event, which looked sharp, and set up a kick-arse gaming PC to show off its wears.

Of course, as is the *Atomic* way, we looked after our friends with loads of pizza, an elegant sufficiency of beers and drinks, and some pretty cool prizes. Each guest of a winner got an Evil Within t-shirt, while the winners themselves picked up a goody bag of swag. But perhaps coolest of all, was the lucky door prize – an The Evil Within baseball cap signed by the master himself, Shinji Mikami, the game's creator.

It was fun for all of us, and now that we've kicked off an event in the new (for some of us, at least) digs, we're looking forward to getting some more gaming and hardware preview events on the calendar.

Keep your eyes peeled, and thanks again to Bethesda and Asus for working with us. And now... the obligatory gallery of semi-embarrassing shots!



THE EVIL WITHIN
EVENT

THE EVIL WITHIN

THE EVIL WITHIN
EVENT

THE EVIL WITHIN

THE EVIL WITHIN

ASUS

Welcome to Upgrade Australia

DAVID HOLLINGWORTH HAS A PC THAT IS, BASICALLY, THREE YEARS OLD. IT'S TIME TO UPGRADE, AND HE KNOWS HE'S NOT ALONE...

We're kicking off something special this month. A grand project between all our enthusiast technology and gaming titles; a project that will let us, and our partners, share one, over-arching goal with our readers. We want Australia to upgrade - their PCs, their storage, their networks, any piece of technology that may be lying around... Out with the old, in with the new, that's the motto of Upgrade Australia, and you can follow it through *Hyper, PC & Tech Authority, PC PowerPlay* and *Atomic* online.

SO WHAT IS IT?

It's six months of hardware advice and recommendations from our most trusted partners, in our print publications and online, and it all culminates in a very special technology event next year, where it will all come together, and where you get to interact directly with the best tech brands and products in the industry. So, without further ado...

We speak to Intel Australia's V.R Rajkumar

On Intel's plans for the future, the company's tick-tock strategy - which is still ticking! - and what gamers can really get out of eight-core processors.

WHAT ARE INTEL'S DESKTOP PLANS FOR THE NEXT FEW YEARS?

Intel continues to drive PC innovation by offering new levels of processor performance on a wide assortment of operating systems and form factors, including desktops. Like many industry analysts, we believe the compute device landscape has stabilised and growth has returned to the PC market.

In addition to the new 4th Generation Intel Core i5 and i7 processor "K" SKUs launched mid-year, Intel recently demonstrated its next-generation 14nm microarchitecture at IDF San Francisco in September. This product family, formerly codenamed "Sky Lake," will follow Core M and the 5th gen Core processor family and is currently scheduled to be delivered in the second half of 2015.

INTEL USED TO KEEP TO A SOLID TICK-TOCK RELEASE STRATEGY, BUT THAT SEEMS TO HAVE GOTTEN A LITTLE LOOSE IN RECENT YEARS. IS THAT THE CASE?

Intel has successfully delivered its 'tick-tock' model and continues to do so. In fact we recently launched the Intel® Core™ M processor, the first commercially available 14nm processor, at IFA earlier this year, where we showcased how this new line of processors will power razor-thin 2 in 1 devices – delivering the optimal blend of mobility and performance.

14nm is the 'tick' in Intel's 'tick-tock' strategy. The 'tick' is the next advance in manufacturing process technology, such as the 2nd generation 3D transistors with the 14nm manufacturing process technology.

IF YOU WERE PRESENTED WITH A PC ENTHUSIAST WITH A TWO OR THREE YEAR OLD PC, WHAT WOULD YOU THINK WOULD BE THE MOST IMPORTANT PART TO UPGRADE?

Being the brain of your PC, the processor is what makes your PC 'think' and allows your machine to efficiently perform more than one task simultaneously, through the use of multiple processing 'cores'. A better CPU improves the ability of your PC to 'think' more quickly.

If you're upgrading your PC specifically for high-end gaming for example, you have a few options. The Intel 4th Generation Core i7 processor "K" SKU – the i7 -4790K is a 4GHz, unlocked processor with quad core and hyper-threading, delivering faster processing and multi-tasking with eight working threads.

The Intel Core i7-5960X Extreme Edition is another option for gamers wanting the fastest high-end PC available. It's the first eight-core, sixteen-thread processor on the market. The i7-5960X is optimised for present games and future-proofed for upcoming titles.

And then there is the Intel Pentium G3258 Anniversary Processor, which gives those who are dipping their toe into overclocking an affordable option. This dual core CPU has a 3.2GHz frequency and when overclocked will deliver impressive frame-rate boosts.

WITH A LOT OF MODERN GAMES AND OTHER SOFTWARE NOT REALLY SUPPORTING SIX AND EIGHT CORE PROCESSORS, WHAT DO YOU THINK ARE THE MAIN DRAWS OF THE NEW CPUS?

These days gamers aren't playing one game at a time, or using their desktop solely to game. They will be chatting over VOIP, streaming digital radio, running background applications to record or to surf the net, to mod the game they are in, or to stream their play live on Twitch – all at one time and on one desktop.

The new Intel® Core™ i7-5960X processor Extreme Edition allows for up to 12 or 16-Way Multi-Task Processing, this means gamers and enthusiasts can multi-task the way they want to.

The Intel® X99 Chipset supports the new High End Intel Core i7-59xx/58xx processor family.

With Intel X99 chipset-based platforms gamers and enthusiasts will be able to customise their PCs for performance overclocking, exciting gaming and unlimited content creation.

WANT HIGHER PC PERFORMANCE?

THE OCZ ARC SSD SERIES WILL TAKE YOU THERE.

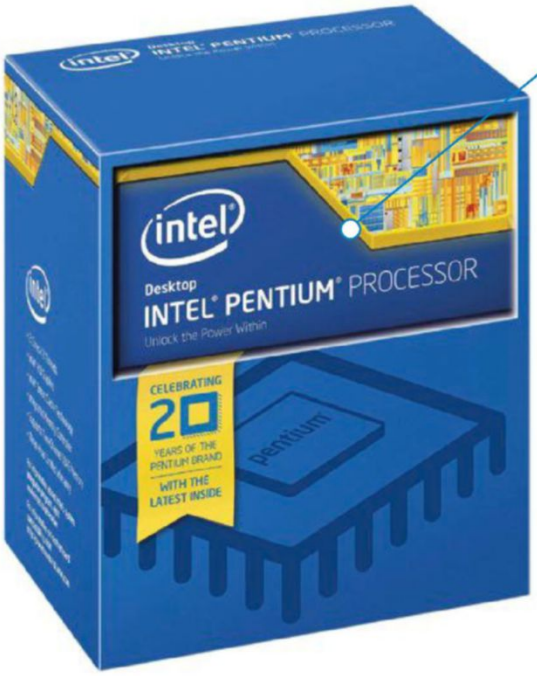
You've been hearing about what SSDs can do to jump start PC performance for a while now. But you haven't made the leap yet. Why, what is holding you back? Cost? Enter the all-new OCZ ARC solid state drive series. Known for its innovative enthusiast-grade SSDs, OCZ designed the ARC series to offer everyday users an excellent value while still leveraging the proven technology found in our flagship SSDs for a robust performance and reliability feature-set. Crossover…no faith needed with this leap.

Up to 490 MB/s · Up to 80,000 IOPS · OCZ Barefoot 3 M10 Controller · Toshiba 19nm Multi-Level Cell (MLC) NAND · Available in 120GB – 480GB

OCZ STORAGE SOLUTIONS | A Toshiba Group Company

ocz.com

#jumpstart



INTEL PENTIUM G3258 ANNIVERSARY PROCESSOR

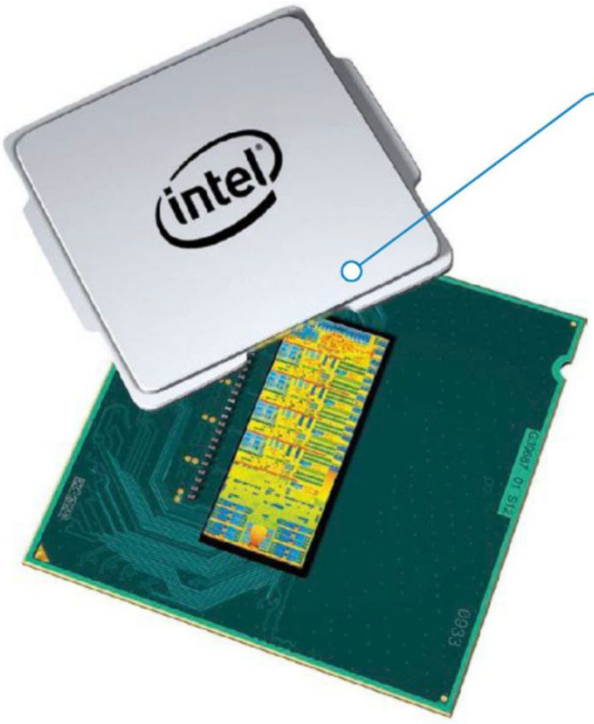
It's fitting that Intel marks the 20th year of Pentium processors with an Anniversary edition that boasts impressive performance for a desktop CPU upgrade that won't break the bank. In fact, investing in a G3258 as part of your next economical upgrade will likely be the cheapest internal component you buy. The Intel Pentium Anniversary Processor ships unlocked, meaning it's designed to be overclocked and pushed to its full speed potential. For a fraction of the price of a high-end Quad Core CPU, this Dual Core offering has a 3.2GHz base frequency, which can be safely overclocked while maintaining low power consumption and similarly low temperatures. In its stock state, the Anniversary Processor handles the latest games admirably; when overclocked, it proves itself a shrewd gaming investment with impressive frame-rate boosts. A lot of popular games such as Counter-Strike and League of Legends don't require expensive high-end parts, and the G3258 grants an immediately noticeable enhancement to your PC's performance without having to pay top dollar.

INTEL NUC

The sleek design of an Intel NUC is the perfect living room addition, which won't take up space thanks to its compact four-inches-square design. This means it's a fantastic choice for running a media server, playing the latest indie games from the comfort of your couch, or taking advantage of gaming via Steam In-House Streaming. The Intel NUC's snug dimensions house an impressively powerful combination of an Intel i5 CPU and Intel HD Graphics 5000. Intel Rapid Start Technology means less waiting time when firing up the NUC, while Intel Smart Connect Technology has all of your email, social network and essential news-feed information waiting for you at start-up. On the performance side, Intel Turbo Boost Technology 2.0 intuitively increases the performance of the NUC's CPU to keep on top of whatever you're doing. Four USB 3.0 ports are available for connecting external media drives, or controllers for gaming, an infrared sensor enables convenient playback control, while gigabit LAN affords speedy networking with unnoticeable latency when streaming games or video content.

INTEL CORE I7-5960X EXTREME EDITION

For serious gamers looking to build the fastest high-end PC available, it's impossible to look past the Intel Core i7-5960X Extreme Edition, which marks the first eight-core processor on the market and the first to support DDR4 memory. Whether you're interested in 4K gaming, live streaming, video encoding your latest victory or multitasking between other resource-intensive tasks, this eight-core, sixteen-thread beast will effortlessly keep up with you every step of the way, with power to spare. Intel Hyper-Threading technology intelligently breaks down highly threaded applications, which means the i7-5960X is optimised for present games and future-proofed for upcoming titles that take advantage of the Intel tech. Discover the maximum potential of your gaming desktop with this unlocked processor, as it entices you to safely overclock it and unleash even greater speeds. Every facet of normal computer operations, from booting up to playing the latest hardware-melting games on the highest settings, is faster when armed with an Intel Core i7-5960X Extreme Edition.



INTEL CORE I7-4790K UNLOCKED PROCESSOR

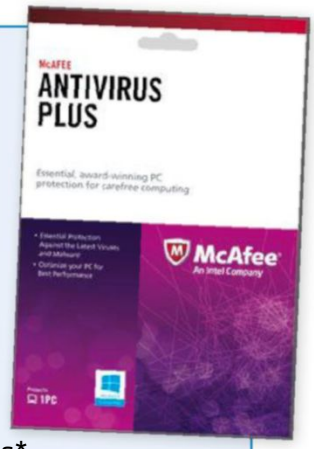
If you're in need of a CPU upgrade, you're in need of the Intel Core i7-4790K chip. The 4790K is incredibly speedy out of the box, and even faster when overclocked, with four cores that take full advantage of 2.0 Intel Hyper-Threading for faster processing by way of eight threads. Put simply, this chip shines when under load and multitasking between resource-intensive tasks. It's the first consumer-available Quad Core 4.0GHz base-frequency CPU, with an inbuilt intuitive 4.4GHz Turbo Mode for when your gaming PC needs a performance boost. That's just the beginning. The beast of a CPU is ready and waiting for you to overclock it to its limits. Even with ambient cooling methods, you can tap into the full power of an Intel Core CPU that's purpose-built to be pushed. Thanks to Next-Generation Polymer New Thermal Interface Material, CPU heat is conducted more efficiently, which means cooler running temperature whether idle, under load or when overclocked. Less heat is also synonymous with lower power drainage. Reworked power management equates to a reduced energy footprint, which is great for your PSU and energy bill.

> "This beast of a CPU is ready and waiting for you to overclock it to its limits."

INTEL 730 SOLID-STATE DRIVE

Say no to compromise when you choose an Intel 730 Solid-State Drive for your next desktop internal-storage upgrade. The 730 series offers the potent combination of speedy performance with unprecedented endurance, which keeps you in the game today and well into the future. Factory overclocked components and optimised Intel firmware unite to provide a 50 percent boost on controller speed and 20 percent improvement on NAND bus speed. The result is 50-microsecond read latencies, with 550MB/s sequential reads and up to 89,000 IOPS random reads. In lay terms, this means your desktop boots-up faster, loads applications quicker and empowers you with more gaming time and less time waiting to play. In terms of durability, the Intel 730 480GB model is rated for up to 70GB of writes per day for five years (50Gb per day for the 240GB model), compared to the current industry standard of 20GB per day, offering greater peace of mind over a longer period of time. For ultimate performance, use multiple 730 SSDs in a RAID-0 configuration and take advantage of 1,000MB/s sequential reads via Intel Rapid Storage Technology.

BONUS! McAfee Antivirus



Mention this ad when you purchase any Intel Desktop CPU or NUC from a participating Intel Technology Provider and receive bonus McAfee Anti-Virus*

*Promotion on a while stocks last basis - 15000 copies available for redemption or until 31st December 2014. Available only if purchase (of qualifying Intel product) is made from a participating Intel Technology Provider. Qualifying Intel based products are any Intel desktop CPU or Intel NUC. McAfee Anti-Virus will be given out after payment for purchase. Use of McAfee Anti-Virus is subject to the software's end user license agreement.

Want to upgrade to the latest Intel products?

Find your local Intel Technology Provider at *intel.com.au/findareseller*

intel Look Inside.™

F1 2014

ONE SEASON TOO MANY WITH NOTHING NEW APART FROM HORRIBLE CARS, ONE NICE TRACK AND ONE TILKE DISASTER TRACK EQUALS A BIG SAD DNF FOR F1 2014.

DEVELOPER Codemasters
PUBLISHER Codemasters
WEBSITE www.codemasters.com

PLATFORMS
PC · Xbox 360 · PS3

It boils down to this: If you own last year's F1 2013, you have the best in the series, and there's not a single thing the new title brings from a gaming perspective that warrants the purchase. I've always touted each new Codemaster's F1 game as a worthwhile upgrade, since 2010, but for the first time it's just not worth it unless you absolutely must have the new cars.

But herein lies the killer blow. The new real-world F1 cars are horrible things. They aren't vehicles you would drive – or hell – design, by choice. If Codemasters has realistically modelled them (within the need to dumb the handling down enough to be 'mainstream'), then they've been cornered into making a game with cars that are nasty to drive and sound like a gentle breeze.

Compared to F1 2013, they feel heavier, duller, less dancy on the track and generally muted. There's no feel of weight shift, so thus, there's no sense of satisfying driving, and no intuitive seat of the pants fanging it through corners – which, in 2013 wasn't perfect, but there was a lot more of that than with this. Instead, Codies have given the front end rail-like grip, while the rear pendulums about through turns depending on how much you cook the throttle. In low gears wheelspin is unbelievable, so throttle moderation is the name of the game.

But it's not rewarding, only frustrating and annoying. Yes, Codemasters' were lumbered with a crappy new FIA regulated formula, but heck, if the FIA has 'refreshed' F1 for the next five years could Codemaster's not have used this opportunity to do the same to the 2014 game? You get the awful new cars, Sochi and Red Bull Ring tracks, and exactly the same graphics, gameplay and interface.

Ben Mansill

A poor implementation of a crappy formula with no attempt to deliver beyond the minimum required.

OVERALL ★★☆☆☆

DEFENSE GRID 2

A MOST ADDICTIVE GAME,THIS TITLE LEADS THE GENRE, SHOWING THE REST HOW IT'S DONE.

DEVELOPER Hidden Path Entertainment
PUBLISHER Steam
WEBSITE www.hiddenpath.com

PLATFORMS
PC · PS4

Tower defence games, bless em, should not be viewed by games developers as a template for experimentation, I believe. Space Run, for example, was just silly, but Defense Grid – and now DG2 – is an utterly perfect distillation of the core concept, unadulterated, not a single unnecessary bit, or thing done wrong. This is a game that definitively represents the genre, so much so that I can honestly say it's the only tower defence game you need to play.

And, pardon my insistence; you do need to play this – unless of course you have an aversion to the genre itself. The mechanics are pure. Tower types are generic, and that's the charm, being: machine guns for close but weak saturation fire, lasers for longer range sustained fire, Teslas for sparky chained shield reduction, concussion for area effect flak, plus Meteor and missile towers for long range whacking, along with the obligatory Temporal slow-them-down tower. Each tower can be upgraded twice, offering around 3x and 7x effectiveness each time, but at a huge cost. Decisions!

The maps are brilliant, offering, generally, either a long winding road to pepper with roadside fire, or a few big slabs of building areas for you to create mazes of death as the little aliens march steadfastly onwards.

There's not a single flaw, from the pacing to the interface, to the graphics which can probably run well on very low end machines. It's challenging, satisfying, and addictive and invites many re-plays with different tactics.

Ben Mansill

The apex definition of a genre.

OVERALL ★★★★★

The competition is green with envy.

Dual-X R9 285 OC

- Dual-X award winning technology
- Factory overclocked
- Quiet and efficient cooling
- Engine clock: 965 MHz
- Memory clock: 5,600Mbps effective

ITX Compact R9 285 OC

- Specially developed for small form factor PC systems
- Only 171mm long
- Factory overclocked
- Engine clock: 928MHz
- Memory clocks: 5,500 Mbps effective

The SAPPHIRE R9 285 graphics card is faster than the Competition. That's because we designed it for a single purpose: to play demanding PC games at maximum detail better than any card in its class. The SAPPHIRE R9 285 Graphics Card is loaded with the latest from Graphics Core Next Architecture, including mixed screen resolution and orientation for AMD Eyefinity Technology and support for DirectX®12 and AMD's groundbreaking Mantle API. So get Radeon™ and get gaming with forward-looking technology for the serious PC gamer.

SAPPHIRE R9 285 Graphics card

Get ready for the performance that demands respect.

RADEON™ is gaming.

AMD RADEON GRAPHICS

AMD GAMING EVOLVED

SAPPHIRE

www.sapphiretech.com

Authorized Distributors:

ALTECH COMPUTERS

Altech Computers Corporation Pty Ltd.
TEL : +61 2 8622 8000
Email : sales-syd@altech.com.au
www.altech.com.au/

LEADER

Leader Computers Pty Ltd.
TEL : +61 8 8112 6000
Email : sales@leadersystems.com.au
www.leadersystems.com.au

rectron

Rectron Electronics Pty Ltd.
TEL : +61 3 8545 2833
Email : sales@rectrom.com.au
www.rectron.com.au

Dove

Dove Electronics Ltd.
TEL : (+64-3) 338 4722
Email : ch_sales@dove.co.nz
www.dove.co.nz

PB Technologies Ltd
YOUR COMPUTER SUPERSTORE

PB Technologies Ltd.
TEL : (09) 526 9200
www.pbtech.co.nz

©2014 Sapphire Technology Limited. All rights reserved. Sapphire, Toxic, Vapor-X, Ultimate, Tri-X, and Dual-X are registered trademarks of Sapphire Technology Limited. ©2014 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, Radeon, and combinations thereof are trademarks of Advanced Micro Devices, Inc. All rights reserved. Microsoft and DirectX are registered trademarks of Microsoft Corporation in the United States and/or other jurisdictions. All other trademarks are the property of their respective owners. Products may not be exactly as shown.

MIDDLE EARTH: SHADOW OF MORDOR

LEAP, JUMP, STAB, AND ANGST YOUR WAY THROUGH SAURON'S REALM.

DEVELOPER Monolith
PUBLISHER Warner Bros Games
WEBSITE www.shadowofmordor.com

PLATFORMS
PC · Xbox 360 · Xbox One · PS3 · PS4

When Shadow of Mordor was first announced, we were quite sceptical. Shoe-horning what looked to be a very violent action game with some amazingly dark overtones into JRR Tolkien's Middle Earth seemed more than a little optimistic. After all, a main character haunted by a wraith and raising an army of orcs is not exactly the professor's idea of a hero.

But Monolith has pulled off a brilliant piece of storytelling, creating a game about a man who can't die, who'll do anything to achieve his vengeful aims.

Playing as almost-kinda undead Ranger Talion, you team up with the ghost of an ancient elf, and together you swear revenge on the dark forces that killed your families. Getting this revenge combines the mechanics of Assassin's Creed's parkour-style gameplay, with action borrowed from Warner's own Batman series, with some RPG elements and a lot of exploring thrown in. That it all works together so smoothly is a real credit to the developers. Combat is fast and very visceral, and surprisingly tactical when you start to get a few interesting powers. Movement is fluid, and climbing and leaping around orc fortresses is hella fun.

But arguably Monolith's biggest achievement is in the game's Nemesis System. This generates a set of random orc captains, complete with names and a range of strengths and weaknesses, and even motives. As you kill them, their ranks thin, but if you die, while you're being brought back the orcs also evolve. They'll turn on each other, or get promoted, gradually getting more powerful. Some might escape you, or kill you, and they'll remember you for it, and even sport scars from prior encounters.

Taken as a whole, the game delivers a remarkably rich world to explore, brimming with action and consequence, and wonderfully realised at a graphical level. All while being very clever with the dense weight of lore Tolkien generated in his lifetime. Shadow of Mordor could well be the best Middle Earth game released to date.

David Hollingworth

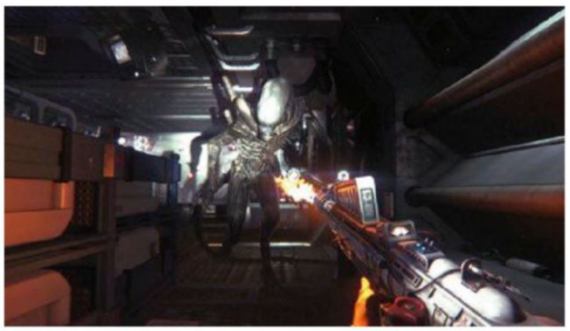
Great action and exploration, backed by a truly interesting story.

OVERALL ★★★★☆

ALIEN: ISOLATION

A TRUE LOVE LETTER TO A CINEMA CLASSIC.

DEVELOPER Creative Assembly
PUBLISHER SEGA
WEBSITE www.alienisolation.com



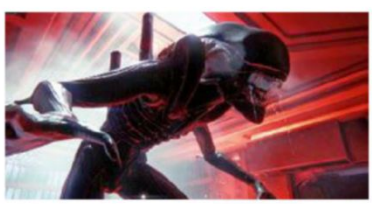
PLATFORMS
PC · Xbox 360 · Xbox One · PS3 · PS4

This may sound hard to believe, but for a game where it's possible – nay, necessary! – to run into and out of a cupboard a dozen times in a minute to hide from something, Alien: Isolation is absolutely, mindblowingly, amazing. It is one of the most tense games ever made, not to mention one of the most lovingly crafted. It is also one of the more terrifying experiences we've had in front of a computer.

The game places you in the space boots of Ellen Ripley's daughter, who's searching an abandoned space station for the lost flight recorder of the Nostromo, Ripley senior's old ship. But, as fate would have it, it seems that whoever found the recorder also might have found a new friend – a single xenomorph. So whole the few remaining people on the station have gone into full on survival mode, you've not only got to dodge them, and a horde of very creepy androids, but also the best apex predator that evolution could kick together.

Sevastopol station and its environments feel like they've come straight from the production designers of Alien, and the lighting engine that keeps them eerily lit is amazing.

But the real gem of the game is the slow burn to your first encounter with the alien, and the many games of cat and mouse that follow. As the alien actively hunts you, you have to create tools to distract it, use everything in the environment to hide in, on or under, and be very, very patient. You can't really hurt the alien, either, and even though you can take down human enemies, doing so loudly will often draw unwanted attention. The monster's sharp AI even lets it learn to ignore some of your tricks, and watching it stalk through the gloomy corridors of the station, or slink out of an airvent, is as scary as it is impressive.



Creative Assembly have, quite simply, outdone themselves.

David Hollingworth

Easily one of the best games of the year.

OVERALL ★★★★★

COMPANY OF HEROES 2

ARDENNES ASSAULT

FORGE YOUR PATH TO GLORY

NOVEMBER 18TH 2014

MA 15+ RESTRICTED Strong violence

PC DVD ROM

/COHOFFICIAL /COMPANYOFHEROES /COMPANYHEROES

WWW.COMPANYOFHEROES.COM

ESSENCE ENGINE THREE

relic ENTERTAINMENT

SEGA www.sega.com

© SEGA. Developed by Relic Entertainment. SEGA, the SEGA logo, Relic Entertainment and Company of Heroes are either registered trademarks or trademarks of SEGA Corporation. All rights reserved. All other trademarks, logos and copyrights are property of their respective owners.

THE A-LIST

ONLY THE BEST OF THE BEST MAKE IT TO *PC & TECH AUTHORITY*'S A-LIST

When we commenced our premium tablets journey in this issue of *PC & Tech Authority*, we fully expected to see a new entry here in A-List, but, it turns out not to be. Apple has retained the crown, the iPad Air sits atop its perch reigning supreme once again.

The results of our Labs group test are indisputable, and while there are many excellent Android tablets you can choose, the complete package belongs to Apple. We don't play favourites here, and we certainly don't hold pre-disposed prejudices against any platform that 'isn't PC'. The simple fact of the matter is that the Air is the best, and if you own one, you probably love it.

Apple missed out, though, on taking the crown for best smartphone. Our comprehensive review starting on page 34 spells it out. The difference between the iPhone 6 and the HTC One M8 are marginal, however, and you won't be disappointed with either.

Lastly, we've removed the two Editor's Choice PCs for now, they're both getting a little outdated, even though both were built only a few months ago. When we have another go at this we will adopt the same blend of outrageous performance balanced with pragmatic real-world relevancy. It's a project that will have a full feature story to go with it, and we plan to hit that beach in full attack soon.

PC DESKTOP

ALL-IN-ONE APPLE IMAC 27IN

★★★★★½

PRICE $1949 **SUPPLIER** www.apple.com/au

If you can afford it, the 27in iMac is the finest piece of all-in-one engineering on the market. A truly powerful beast with performance to match its looks.

SPECIFICATIONS 2.7GHz Core i5-2500s; 4GB DDR3 RAM; 1TB Western Digital Caviar Black HDD; DVD writer; AMD Radeon HD 6770M graphics; 27in 2560 x 1440 LCD.

HANDHELDS

SMARTPHONE HTC ONE M8

★★★★★★

PRICE From $820 **SUPPLIER** www.htc.com.au

A beautiful, highly competent smartphone that's packed with clever features. Right now it's the best Android smartphone you can buy.

SPECIFICATIONS Quad-core 2.3GHz Qualcomm Snapdragon 801 CPU · Adreno 330 GPU · 2GB RAM · 16GB storage · 5in 1,080 x 1,920 display

TABLET APPLE IPAD AIR

★★★★★½

PRICE $539 **SUPPLIER** store.apple.com/au

The new iPad is pretty much the king of the hill when it comes to tablets, smaller and more powerful than ever before.

SPECIFICATIONS 9.7in 1536x2560 widescreen Multi-Touch display; 1GHz A5X processor, 16, 32 or 64 GB available; 3G and/or Wi-Fi connectivity; max 652g weight.

EBOOK READER KINDLE

★★★★★★

PRICE $109 **SUPPLIER** www.amazon.com

The new model is quicker, slimmer, lighter and cheaper than before. If all you want to do is read books, its simple design and performance are perfect.

SPECIFICATIONS 6in e-Ink screen, 170g weight, 114 × 8.7 × 166 mm, 2GB memory, 10-day battery life . WEB ID 279534

PCS LAPTOPS

VALUE ASUS TF103C

★★★★★★

PRICE $429 **SUPPLIER** www.asus.com.au

While ostensibly a tablet with a removable keyboard, it also fits tidily into the value portable category thanks to it's immense usability and remarkably low price.

SPECIFICATIONS Quad-core 1.86GHz Intel Atom Z3745 • 1GB RAM • 8GB/16GB eMMC storage • 10.1in 1,280 x 800 IPS display • dual-band 802.11n Wi-Fi

PROFESSIONAL APPLE MAC BOOK RETINA

★★★★★

PRICE $3199 **SUPPLIER** www.apple.com/au

The machine that does everything right, and looks the part, too. We've chosen the top-end 2.3GHz i7 model with 16GB of RAM and a 512GB SSD plus GT 750M graphics.

SPECIFICATIONS 2.3GHz Intel Core i7; 16GB RAM; 512GB SSD; 15in 2880 x 1800 LCD; 1 x USB 3; 2 x USB 3; 2 x Thunderbolt 2; dual-band 802.11abgn Wi-Fi; Bluetooth 4; 3G

PERFORMANCE AORUS X7

★★★★★

PRICE $2999 **SUPPLIER** aorus.com

Super-sleek, light, outrageously powerful and with a spec-list that outclasses many high end desktop systems.

SPECIFICATIONS Q4-3.4GHz i7-4700HQ • 4GB/8GB DDR3L 1600, 4 slots (Max 32GB) • 17.3" Full HD 1920x1080 • NVIDIA® GTX 765M SLI GDDR5 4GB • mSATA 128GB/256GB, 2slot 2.5"HDD 500GB/750GB/1TB 5400rpm

ULTRA PORTABLE MICROSOFT SURFACE PRO 3

★★★★★

PRICE $1549 **SUPPLIER** www.microsoft.com.au

Attach the Type Cover 2 and it's as good, if not better, than any 'proper' ultra portable laptop. It took three versions, but Microsoft has nailed this format. At least an i5 is recommended.

SPECIFICATIONS 1.9GHz Intel Core i5-4300U; 12in touchscreen (2160 x 1440); 8GB RAM; 256GB SSD; 802.11ac/abgn; Bluetooth 4

PERIPHERALS

WIRELESS ROUTER NETGEAR NIGHTHAWK X6 AC3200

★★★★★

SUPPLIER www.netgear.com.au

Designed to keep pace with high-bandwidth content consumption, it is the router King.

SPECIFICATIONS 1GHz dual core processor with 3 offload processors, 6 High performance antennas, one 2.4GHz band and two 5GHz Wi-Fi bands

DESKTOP STORAGE SEAGATE 2TB BACKUP PLUS DESKTOP

★★★★★★

SUPPLIER www.seagate.com

This 2TB external drive still offers good value despite the rise of higher-capacity drives. The USB 3.0 adaptor makes for excellent transfer speeds.

SPECIFICATIONS 2TB external hard disk with NTFS; USB 3.0, with other docks available as optional; 44 x 124 x 158mm 894g.

NAS SYNOLOGY DISKSTATION DS214PLAY

★★★★★★

SUPPLIER www.synology.com

The fastest NAS in our grouptest (*PC&TA 197*), with excellent media streaming capabilities.

SPECIFICATIONS 2.1GHz Intel Atom; 2GB RAM; 2 x USB 3 + 1 x USB 2; iOS and Androidmobile apps; RAID 0, 1, 5, 10; JBOD.

ALL-IN-ONE PRINTER CANON PIXMA MG5460

★★★★★

SUPPLIER www.canon.com.au

The winner of our most recent printer grouptest, this combines excellent print quality with decent costs and is just as good at printing photos as it is documents.

SPECIFICATIONS 9600 x 2400dpi print; 2400 x 4800ppi scan; USB; 802.11n WLAN; 125-sheet tray; 455 x 369 x 148mm

LASER PRINTER DELL B1160W

★★★★★★

SUPPLIER www.dell.com.au

The best all-rounder in our printer grouptest, with excellent text printing and decent costs.

SPECIFICATIONS 1800 x 600dpi resolution; USB 2; Wi-Fi; 150-sheet input trays; 331 x 215 x 178

SOFTWARE

SECURITY KASPERSKY INTERNET SECURITY 2014

★★★★★★

SUPPLIER www.kaspersky.com/au

The winner of this year's security software grouptest, a big improvement over recent years, and a good solution for beginners and more advanced users. Kaspersky AV software runs well on even low-end machines, and operates relatively seamlessly and with a small memory and OS footprint.

BACK UP ACRONIS TRUE IMAGE 2015

★★★★★

SUPPLIER www.acronis.com.au

Still our go-to solution for backing up, the new 2015 version adds full-system backup and dual backup (local and cloud) and unlimited cloud storage!

OFFICE SUITE MICROSOFT OFFICE 365 HOME PREMIUM

★★★★★

SUPPLIER www.microsoft.com.au

The easiest to use Office to date.

WEB DEV ADOBE DREAMWEAVER CS5

★★★★★

SUPPLIER www.adobe.com.au

This edition makes PHP and CMS its core focus, which gives it the new lease of life it so desperately needed.

AUDIO CUBASE 7.5

★★★★★

SUPPLIER www.steinberg.net

The addition of better filters solidifies this program's continued place on the A-List.

VIDEO SONY VEGAS MOVIE STUDIO HD PLATINUM 11

★★★★★

SUPPLIER www.sony.com.au

May not have the bells and whistles of other consumer editing packages, but its tools are efficient.

PHOTO ADOBE PHOTOSHOP LIGHTROOM 5

★★★★★

SUPPLIER www.adobe.com.au

An excellent tool for photo management and light editing, as used by the pros and now available at a very reasonable price.

KITLOG

Scarce availability of Intel's new Haswell-E CPUs force us to leave them out of both the Game Box and Perfect PC, for now. Yes, you can buy them, but very few outlets have them and on balance the current rigs have approximately the same levels of performance anyway, outside of specialised applications that can take full advantage of the extra cores and threads.

We'll change all that when we see these new CPUs in quantity, and when we feel that the extra cost is matched by similarly weighted performance gains.

However it's a different story with graphics cards. Nvidia's new 900 series (GTX 970 and GTX 980), which we've covered in this issue beginning on page 30, are ready to go.

The Perfect PC get a GTX 980 and the Game Box a GTX 970. A couple of important provisos are in order. In this early stage of this GPU generation there isn't enough difference between competing manufacturer's cards to warrant recommending a particular brand or model, as almost all are based upon Nvidia's reference design.

Secondly, we are leaving the decision as to whether or not to SLI these up to you. The goal here is to recommend an ideal baseline product. If you choose to add multiple graphics cards you have an excellent starting point.

THE GAME BOX

CPU

INTEL CORE I5 4670K
PRICE $275
Gamers can do without Hyperthreading and save $100 or more, compared to an i7. The K version is unlocked for easier overclocking.

MOTHERBOARD

ASUS ROG RANGER
PRICE $259
Fully featured, extremely well engineered. Alternatively, the MSI Gaming 7 or Gigabyte Z97X-UD5H are equally as good at the same price.

MEMORY

KINGSTON HYPERX BEAST 16GB
PRICE $240
Our roundup award winner, it's well-priced, fast and overclocks very well.

VIDEOCARD

NVIDIA GTX 970
PRICE $500
Quiet, sips power, but when the performance is needed this blazer eats up the frames.

THE PERFECT PC

CPU

INTEL CORE I7 4970K
PRICE $400
Intel's top-of-the-line quad-core i7 delivers huge performance and can overclock easily to around 4.7GHz with the K version.

MOTHERBOARD

ASUS Z97 DELUXE
PRICE $485
Plenty of cutting-edge technology crammed into this package. It's for those who want it all in a LGA1150 system.

MEMORY

CORSAIR DOMINATOR PLATINUM CMD32GX3M4A2133C9 32GB
PRICE $619
These memory chips are hand selected and tested, and 32GB of fast RAM will keep things smooth and fast in intensive tasks.

VIDEOCARD

NVIDIA GTX 980
PRICE $800
It's a pure powerhouse, with the fastest single-GPU performance available today, and with support for advanced lighting and VR.

SUBTOTAL: $2992 RIG ONLY: $2263

COOLER

COOLERMASTER NEPTON 140XL
PRICE $140
Easy to install AIO CPU cooling, relative quiet and performance to rival twin-radiator units.

SYSTEMDRIVES

SAMSUNG 840 EVO 250GB
PRICE $190
Super-fast, cheap and space for the OS and your games.

WD BLACK 2
PRICE $340
An extra 128GB of SSD storage plus another 1TB of HDD space, all in a tiny 2.5in size.

DISPLAY

LG IPS277L
PRICE $400
27 inches of IPS glory. The resolution isn't perfect, but the price is. The thin bezel makes this a very attractive screen.

AUDIO

TT ESPORTS CRONOS
PRICE $80
Fantastic set of headphones that delivers great 2.1 audio for gaming and music without swamping you with bass.

SOUND BLASTER X-FI XTREME
PRICE $80
The best positional game audio and pretty good music quality, too.

CASE

BITFENIX RONIN
PRICE $99
Bitfenix continues to deliver great budget cases that look terrific and are easy to build in.

KEYBOARD

CORSAIR K70
PRICE $160
The glorious perfection of mechanical keys with well thought-out gamer design.

MOUSE

TT SPORTS VOLOS
PRICE $89
The easy first choice at *PC&TA* HQ where we play hard and test every mouse. Also superb value.

POWER SUPPLY

CORSAIR CS650M
PRICE $140
It's quiet, reliable, and at 650W is more than we need for this build, but has the headroom for additional graphics.

SUBTOTAL: $5511 RIG ONLY: $4408

COOLER

CORSAIR H105 WATER COOLER
PRICE $160
Best-of-breed cooling plus nice and quiet equals a happy CPU.

SYSTEMDRIVES

SAMSUNG 840 EVO 1TB SSD
PRICE $680
Samsung has conquered the market with its 840 EVO, so fill up with 1TB of incredible speed and storage.

WD BLACK 2
PRICE $340
Supplement the EVO with this hybrid drive and 128GB of SSD + 1TB of HDD space.

DISPLAY

ASUS PB287Q
PRICE $799
A fully-featured 4K monitor with near-perfect colour accuracy for under $800.

AUDIO

ASUS XONAR ESSENCE ST/X
PRICE $175
The go-to card for perfect music quality, though the motherboard's onboard sound is fine if this isn't so important to you.

CASE

COOLER MASTER COSMOS II
PRICE $400
The only case you'll ever need. Premium luxurious bliss.

KEYBOARD

CORSAIR VENGEANCE K95
PRICE $179
The perfect keyboard. Lovely Cherry Red mechanical switches, a slick and attractive aluminium body and customisable backlighting make this The One.

MOUSE

RAZER OUROBORUS
PRICE $125
An excellent performer and highly configurable mouse that suits both left- and right-handers.

POWER SUPPLY

CORSAIR AX1200
PRICE $349
Reasonable value for this mighty power unit, delivering stable power and able to handle quad-graphics.

GREAT REASONS TO SUBSCRIBE

SAVE YOURSELF OVER 37% OFF THE COVER PRICE!

SUBSCRIBE FOR 12 ISSUES AND **PROTECT YOURSELF FROM PRICE RISES!**

NEVER MISS OUT ON THE BEST TECH REVIEWS AND PC ADVICE FROM AUSTRALIA'S PREMIER COMPUTING MAGAZINE

PC & TECH AUTHORITY DIGITAL EDITIONS

If you'd prefer to read us on your mobile, tablet or computer, you can also now purchase a digital edition of the magazine! Visit ***au.zinio.com/pcta*** or ***itunes.com/app/pcandtechauthority***

Call 1300 361 146 to subscribe

12 ISSUES FOR JUST $75

Subscribe to PC & Tech Authority today and you'll receive 12 issues for only $75 – that's just $6.25 an issue! You'll have a year's worth of magazines delivered direct to your door, and SAVE OVER $44 ON THE COVER PRICE!

Subscribe online at www.mymagazines.com.au

Price offer available to Australian residents only. NZ – 12 issues A$89.95, overseas airmail – 12 issues A$127 – international callers +612 9901 6111. Offer ends 7/12/14. Prices include GST. Savings based on total cover price. Minimum subscription term is 6 months. Your subscription will start with the next available issue. Please allow 6-8 weeks for delivery of your first magazine. For more information, terms and conditions, visit www.mymagazines.com.au.

Why haven't smartphone batteries improved?

BATTERY TECHNOLOGY SEEMS STUCK IN THE DARK AGES. **NICOLE KOBIE** EXAMINES ITS LIMITATIONS AND REVEALS THE RESEARCH THAT COULD CAUSE A POWER REVOLUTION

Smartphone screens are getting bigger and sharper, processors are ever-more powerful, but battery life continues to be the bane of our ongoing mobile existence.

No wonder, then, that a recent pair of surveys showed battery life as one of the key considerations when buying a smartphone. Global Market Institute found that 89% rated a phone's battery life as "important" – far more so than the 68% who chose by the brand of the handset – and said extending time between charges was so crucial to users that some turned off key features or turned down screen brightness in order to extend battery life. A separate study by uSwitch revealed that 89% of Britons would be more likely to buy a smartphone purely based on longer battery life, rather than more flashy features such as voice controls, flexible displays or even 3D graphics.

But forget week-long battery life: manufacturers are fighting to provide us with a single day between charges, according to IHS iSuppli analyst Thomas McAlpine. "From discussions with battery manufacturers, the industry standard in smartphones is a battery that will last one full day during average use," he says. "This is one of the benchmarks that manufacturers aim to achieve."

That doesn't mean manufacturers aren't trying to improve upon this: contrary to the impression, capacity in smartphones is actually increasing. The iPhone 4 battery had a capacity of 1,420mAh; four models on, and the iPhone 5s has 1,560mAh, which is a decent improvement given the handset itself is smaller. In 2010, the Nexus One launched with a 1,400mAh battery; the larger Nexus 5 arrived in October 2013 with a 2,300mAh unit.

POWERING UP

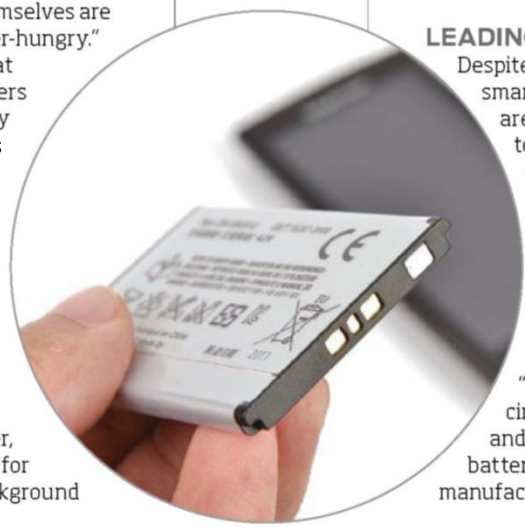
McAlpine puts the average increase at around 7% annually, pointing out that it may have gone unnoticed because the power has been sucked away by shiny new specifications and apps. "We have seen that this hasn't been enough to meet the annual increase in power demands for a smartphone," says McAlpine. "This increase in power is partly due to advancements in smartphone technology, such as the move from 3G to 4G/LTE, improvements in mobile displays and more advanced power-intensive processors. In addition, consumers are changing their habits and running a greater number of apps, which in themselves are becoming more power-hungry."

▲ Smartphones are increasingly power-hungry, and usually require charging daily

▼ With battery life increasingly eaten up by apps, manufacturers continue to push the capacity of lithium-ion units

This is one way that handset manufacturers are extending battery life: rather than mess with the lithium, they're trying to cut down on demand. For example, HTC's "Extreme Power Saving" mode, introduced with the HTC One (M8), limits the phone to its basic functions to keep it running longer, turning off vibration for notifications and background updates for apps, conserving CPU use and reducing screen brightness.

There's another obvious way to improve battery life: use bigger ones. "If you look at phablets and many of the best-selling smartphones, their size has increased partly to allow for a larger screen, but also to house a larger battery," notes McAlpine. "We are now getting to the limits in terms of the size of smartphones, so the technology of the battery is becoming increasingly scrutinised."



LEADING THE CHARGE

Despite the challenges, smartphone batteries are improving thanks to tiny technological tweaks. Just as chip designers make small improvements to squeeze more performance out of processors, the same is true of lithium-based batteries. "Battery-management circuitry that protects and monitors the battery is improving, so manufacturers are able to

> It's far more dangerous to push batteries to their limits than it is to push processors

push the lithium-battery chemistry to the limits of its capabilities," says McAlpine. "One of the easiest ways to improve this is to increase the peak voltage of the lithium cell. In recent years, the peak voltage has gone up from around 4.15V to 4.35V, which has enabled the capacity to increase. Over the next five years, this is predicted to rise even further to around 4.5-4.6V, which still leaves room for a significant improvement in battery lifetime."

However, getting it wrong is risky – it's far more dangerous to push batteries to their limits than it is to push processors. "One of the greatest limitations is the safety of the battery," says McAlpine. "Lithium is inherently volatile, so there's always the risk of combustion, which can lead to fires."

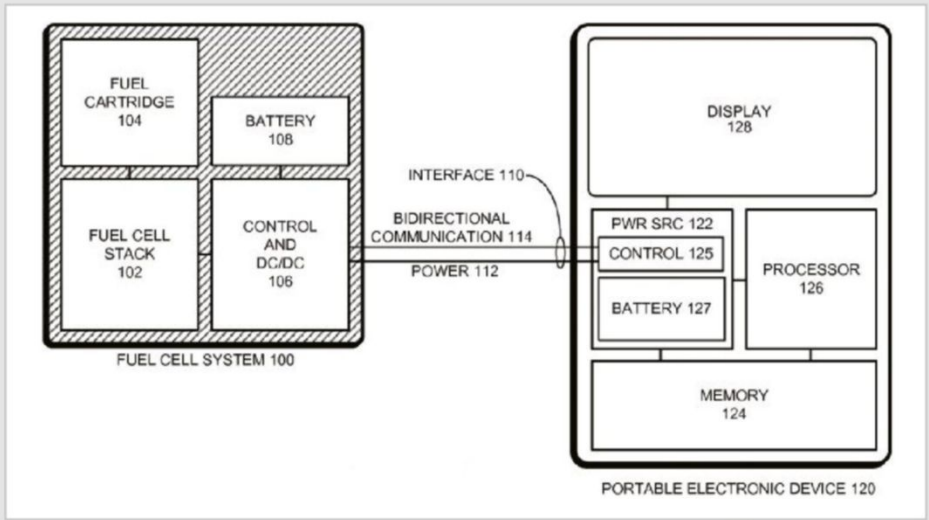
While such efforts should enable smartphones to last a full day between charges, there's no technological revolution in the immediate pipeline to see them last a week. The next five to ten years is a different matter: researchers are developing technologies that could improve the situation in that timeframe (see Batteries of the future, right).

NEW PROTOCOLS

"I don't currently see a viable technology that can compete with lithium-ion batteries in smartphones over the next two to five years," McAlpine says, but he goes on to explain that this doesn't mean that innovation in device charging will stand still. "Wireless and fast charging are two new protocols that are predicted to appear in many smartphones overs the next five years, which will make charging much more convenient, and could help tackle some of the limitations in battery lifetime in the short term."

In other words, you'll still have to charge your smartphone each night, but it will be quicker and easier. While this may not be a perfect solution, it's certainly a start.

Batteries of the future



CHARGED IN 30 SECONDS

Israeli start-up StoreDot has built a battery using nanotechnology that can charge in less than 30 seconds. The company's technology uses nanodots – bio-organic peptide molecules that are only 2nm in size – that can store as much as five times the charge as a similarly sized lithium unit, recharge more quickly, and last longer before wearing out.

IHS analyst Thomas McAlpine notes that the final product is expected to cost twice as much as lithium batteries do now. "If they can achieve anything close to that pricing point, meet all the safety tests and maintain the low charge time, then this will be a very interesting competitor to the lithium-ion battery," he says. The technology isn't yet ready for smartphones, but StoreDot is reportedly in talks with Samsung.

StoreDot's innovative battery could charge in 30 seconds

SILICON PLUS GRAPHENE

Other researchers are looking to use new anode materials such as silicon or graphene – and one company is pairing the two together. California Lithium Battery is working to combine the two materials to capture the improved capacity of silicon and the stability of graphene. Replacing the traditional lithium-anode material of graphite with silicon would expand capacity, since silicon can absorb lithium better than any other material. However, it breaks down after a few cycles, as the silicon expands when it's full of lithium, and shrinks when it releases it. Adding graphene encourages stability, and batteries with the silicon-graphene composite can triple in capacity. California Lithium Battery has already shown off working models, and is in the process of commercialising the system, predicting it could be on the market within the next couple of years.

FUEL CELLS FOR TABLETS

A patent filing revealed that Apple is working on a hydrogen fuel cell to be used to power smartphones and laptops. Hydrogen fuel cells combine hydrogen and oxygen into energy, and have been widely researched as a power source for electric cars. In its filing, Apple says the technology could "potentially enable continued operation of portable electronic devices for days or even weeks without refuelling". There's no saying if or when Apple will make hydrogen-powered iPhones and MacBooks, but portable device chargers such as Lilliputian's Nectar Mobile Power are already available on the market.

Silicon-graphene batteries have triple the capacity of lithium-based units

Where does hard drive storage go from here?

AS MAGNETIC STORAGE KEEPS SHRINKING, THERMAL STABILITY IS BECOMING A SERIOUS PROBLEM. **THOMAS THOMSON**, PROFESSOR OF NANOTECHNOLOGY AT THE UNIVERSITY OF MANCHESTER, EXPLAINS HOW RESEARCHERS HOPE TO OVERCOME THIS OBSTACLE

One of the key desires in the magnetic-storage industry is to create greater-capacity hard disks without increasing their physical size. Professor Thomas Thomson, and his team at the Nano Engineering and Storage Technology (NEST) research group at the University of Manchester, are working to develop new nanotechnologies to help achieve this important goal.

WHAT IS NEST AND WHY ARE YOU CARRYING OUT THIS RESEARCH?

We look at the more fundamental properties of nanoscale magnetic materials for a number of applications, of which data storage is probably the most important.

One of the problems is that as you make things smaller – for example, to get more bits on a disk – you start to run up against the phenomenon of thermal activation, where something has a preference for the magnetisation to lie in one particular direction. When you record a bit, you'd like it to stay in that state, not randomly switch back and lose your data – but we've made things so small that they now randomly switch, just because they're at room temperature or a little bit higher. Thermal stability is currently the biggest problem in media.

WHAT TECHNOLOGIES ARE YOU RESEARCHING TO OVERCOME THIS?

One is thin-film magnetic exchange springs, which allow you to use a material with a stronger preference for the magnetisation to lie in a particular direction, known as high anisotropy, which in turn lets you have very small magnetic grains. They couple a high-anisotropy material very closely with one that's much softer. When you put an applied field from the recording head on the top, low-anisotropy layer, it rotates in response and exerts an additional torque on the bottom, high-anisotropy bit.

This type of technology already exists in disk drives. Our work is to understand how it works and what tunes the strength of the spring, as well as how you can optimise it, and also which sort of high-anisotropy materials would be most appropriate for that.

Two other recording technologies being researched are heat-assisted magnetic recording (HAMR) and microwave-assisted magnetic recording (MAMR). Those are real future technologies, in that there isn't any product today that uses either.

HOW DO HAMR AND MAMR WORK?

With HAMR, you're trying to do the same thing as the exchange spring, but in a different way. Instead of having this coupling of two magnetic layers, which you very carefully tune, you heat up the material, which makes the preference to lie in a particular direction become less strong. If you heat it up enough, the field available from the head is enough to switch it. Then you cool it down rapidly, returning it to its high-anisotropy state, where it effectively gets frozen in the direction you switched it – frozen in this context being room temperature.

With MAMR, you apply a microwave field to excite the magnetisation, which then makes it easier to switch when the head field comes along.

WHAT CHALLENGES ARE INVOLVED?

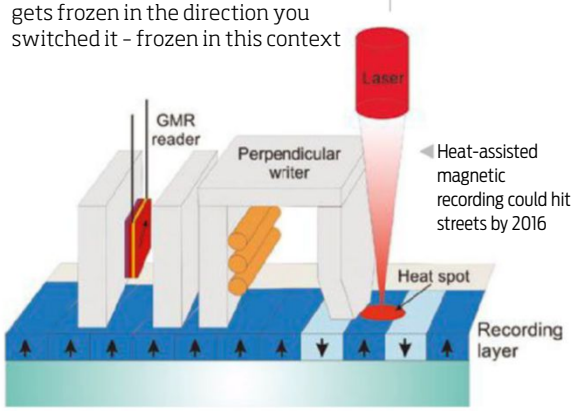
People try to keep the same technology for as long as they can because it's more cost-effective to tweak what you already have. They don't want to have to build a new factory and lots of new machines.

You can argue that exchange springs enable them to do that, because you don't have to do anything fundamentally different – just deposit two or three more layers. That's relatively easy and doesn't require changing anything else.

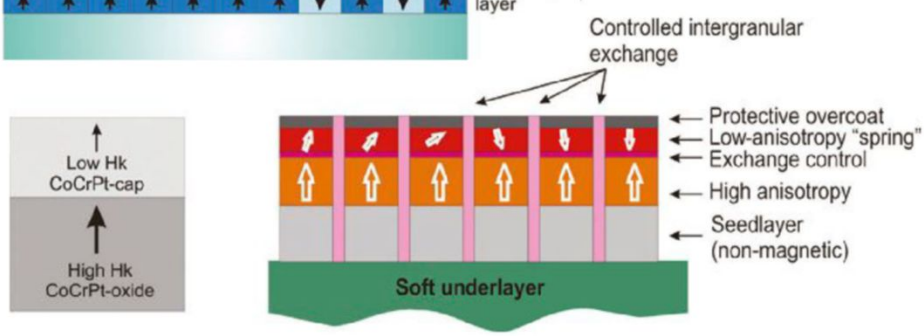
HOW LONG UNTIL HAMR AND MAMR DRIVES ARE AVAILABLE COMMERCIALLY?

HAMR is one of the more promising alternatives to the process we have now, and there's been significant investment in this technology from the data storage and HDD industry. Seagate has publicly said it expects a product in 2016.

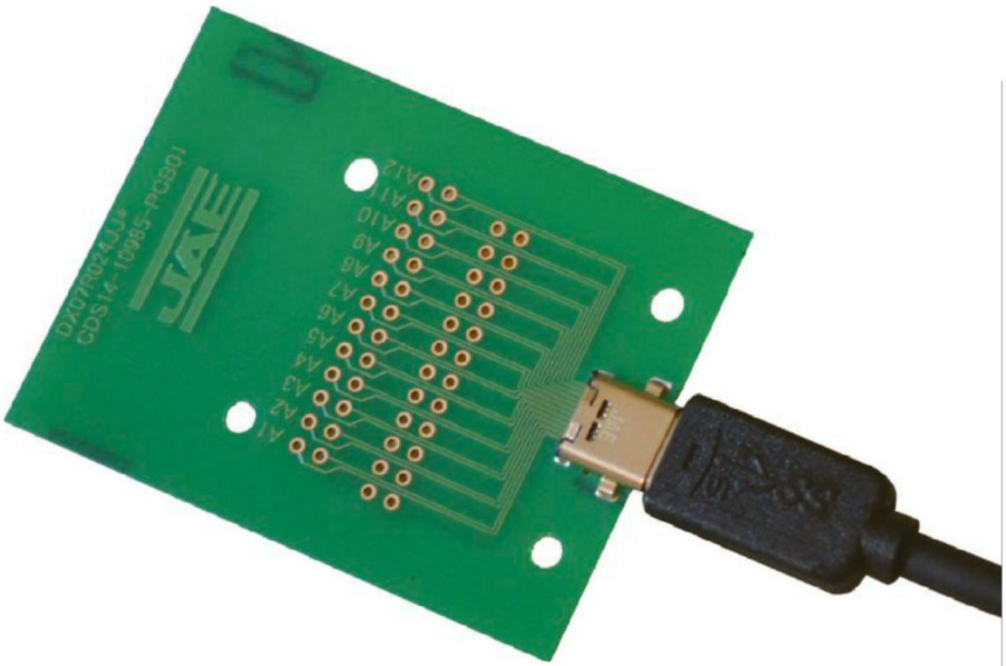
MAMR is slightly further out, but things do take a long time to research. Perpendicular recording, which is the current standard, was originally proposed in 1975 and only eventually went into production much later, finally making it to market in 2005.



Heat-assisted magnetic recording could hit streets by 2016



Magnetic exchange springs used in magnetic-recording media



What is... USB 3.1?

THE NEXT GENERATION OF USB IS HERE: IT'S FASTER, IT CAN CARRY VIDEO, AND IT COMES WITH A NEW, FRUSTRATION-FREE CONNECTOR. HERE'S WHAT IT MEANS FOR YOU

The latest USB specification brings several improvements over USB 3, including higher speeds, native support for high-resolution video and an increased amperage for powering and charging devices. It arrives alongside a new connector, which is now reversible. The experts at the USB Implementers Forum revealed full details of USB 3.1 and the Type-C connector to *PC & Tech Authority*. Here's what we found out:

THE MOVE FROM USB 3 TO 3.1 IS HARDLY NEWS, IS IT?

It may not sound like much, but USB 3.1 is a big step forward. For a start, the specification introduces a new connection mode dubbed SuperSpeed+, which allows USB 3.1 devices to transfer data between themselves at up to 10Gbits/sec. That's about twice as fast as its predecessor USB 3 – although still not as fast as Thunderbolt 2.

WHAT ELSE IS NEW?

As well as data, a USB 3.1 connection will be able to carry up to 100W of power in either direction – a huge increase from the 10W of today's USB 3 connections. This means a laptop could charge from a USB 3.1 dock, while simultaneously connecting to peripherals over the same connection. It becomes possible to use a single cable for power, peripherals and display output.

WHAT'S THAT ABOUT DISPLAY OUTPUT?

We've seen third-party USB video interfaces before, but now USB 3.1 brings native support for video. This means you can run a USB cable directly from a laptop to a compatible monitor. There's enough bandwidth to support the most demanding displays – we saw a single connector driving a pair of 4K monitors – and two-way communications are fully supported. In a demonstration by the USB Implementers Forum, we saw USB 3.1 used to connect a smartphone to a touchscreen display – handy for field workers who use a mobile device on the job but want a larger interface when back at the office.

WHAT ABOUT THE NEW CONNECTOR?

Alongside the new USB 3.1 standard, we're also getting a new connector, known as Type-C. For the first time, it's reversible – that is, it can be plugged in either way up, which means no more fumbling to get the cable into its socket. At 8.4 x 2.4mm, the connector is smaller than previous versions, so it's not only easier to plug in, it's also ideal for slimmer devices such as smartphones and tablets.

WHEN WILL IT GET HERE?

The USB 3.1 specification was approved back in July 2013, but as usual it's taken some time for the standard to make its way into real-world products. However, devices taking advantage of the new spec are now in production: the USB Implementers' Forum told us that laptops and smartphones using USB 3.1 should start to appear by the end of the year, with USB 3.1 displays following in 2015.

Well, congratulations – we're now excited about a USB specification. Don't be embarrassed: USB 3.1 and the Type-C connector are genuine steps forward. And think of the time you'll save fiddling with ports.

Coming up
Amelia AI

You may not have heard of IPsoft, but its latest creation could end up taking your job. Meet Amelia, the AI system that understands natural language

Artificial intelligence is nothing new: the most famous example may be IBM's Watson, which ran rings around human competitors on US quiz show Jeopardy. Amelia is a little different: IPsoft's AI is designed to take over repetitive office jobs, such as support calls.

Amelia does this through understanding "natural language". It can learn a new job by reading the same manual an employee would be given on their first day – and can do it in seconds. If Amelia doesn't know the answer to a query, it can search for it on an intranet or the web, or forward the email or call to a human employee. Plus, Amelia speaks 20 languages.

IPsoft says Amelia is already being used in tech help desks and call centres – a promotional video shows the technology responding to a car breakdown and sorting out fraudulent charges on a payment card – but the company is targeting all office jobs. Robots are transforming manufacturing, says the firm, and "cognitive technologies will drive the next evolution of the global workforce".

While Amelia may seem to threaten jobs, IPsoft paints a positive picture, suggesting the system can handle the "mundane, repetitive, routine and uninspiring tasks" that eat up much of our day, freeing up our time to spend on more rewarding work.

As if AI weren't enough of a tech buzzword, Amelia is also cloud-based: this means access can scale up during busy times and cut back when work's slow.

So what's with the name: did IPsoft's engineers enjoy AI-love film Her a little too much? Not quite: it's named after US aviator Amelia Earhart.

▼ Visit Harwell Science Campus in Oxfordshire to see a particle accelerator

HOW TO

Each month our experts get under the hood to provide you with detailed How To guides on hardware, software and everything in-between.

SYSTEM BUILDER

Build a better PC

88

HOW TO

Organise your work and life

91

HOW TO

Run your business for free in the cloud

94

CORE V1

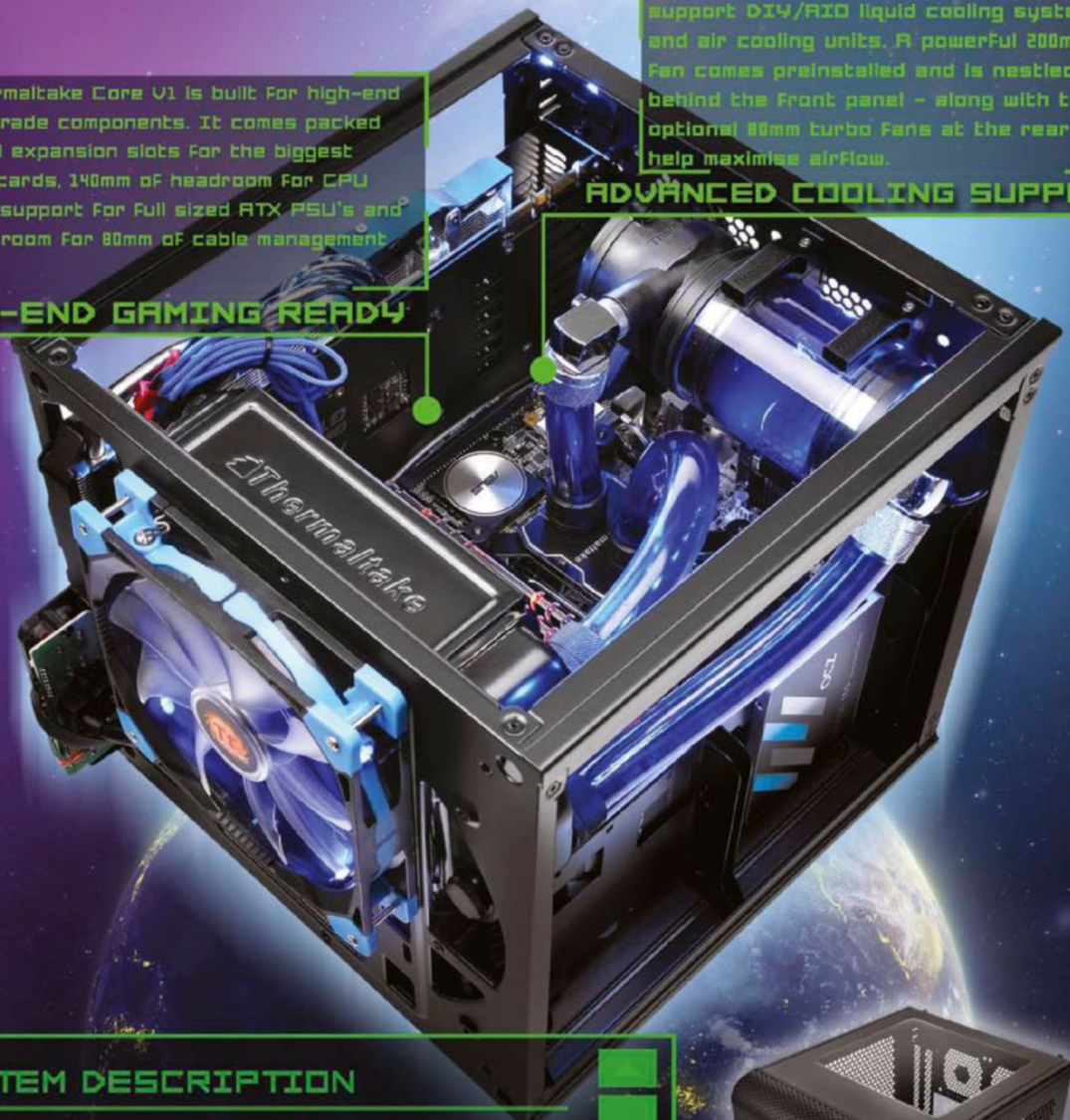
THE SMALL CASE WITHOUT LIMITATIONS

The Thermaltake Core V1 is built for high-end gaming grade components. It comes packed with dual expansion slots for the biggest graphic cards, 140mm of headroom for CPU coolers, support for full sized ATX PSU's and still has room for 80mm of cable management space.

HIGH-END GAMING READY

The Core V1 features mounting points to support DIY/AIO liquid cooling systems and air cooling units. A powerful 200mm fan comes preinstalled and is nestled behind the front panel – along with two optional 80mm turbo fans at the rear that help maximise airflow.

ADVANCED COOLING SUPPORT



SYSTEM DESCRIPTION

Complete with full size graphics card support and modular interchangeable panels, the Thermaltake Core V1 incorporates everything you'd expect in a normal size tower into a mini-ITX structure. Whether you have space limitations or are looking for a portable PC build, the Core V1 will fit all your performance, modding or liquid cooling needs.

Thermaltake
COOLing YOUR LIFE

www.thermaltake.com.au

BROUGHT TO YOU BY THERMALTAKE

SYSTEM BUILDER: Essential PC building tips

THERE'S NOTHING QUITE SO SATISFYING AS BUILDING YOUR OWN PC. **DAVID HOLLINGWORTH** HAS A FEW TIPS TO MAKE THE PROCESS AS SMOOTH AS POSSIBLE.

Building your own PC is almost a rite of passage for PC enthusiasts. It's not that it's that hard, either – in fact, it's more the opposite. Once you realise that you don't need to pay a premium for someone else to put together you're system, you're saving big money and you're learning important stuff about what makes your PC tick. It's a win-win!

But there are some easy to make mistake that can make you feel a little less-than-skilled, and there are some bad PC building habits it's best to avoid from the get-go. At the same time, there are some tips that will make your next PC build immeasurably more pleasurable, not to mention likely to turn on first time.

1. MEASURE TWICE, ~~CUT~~ BUILD ONCE

It's very easy to get carried with a new PC building project, but it always pays to do your research first. The last thing you want is to only find out that your video card won't fit into your case after you've bought it all.

These days some judicious Googling of both official hardware sites and reviews will tell you pretty much everything you need to know in terms of measurements, so make use of them. Measure your desk where you're going to locate your PC, measure the height beneath if that's your thing, or the AV unit you're placing your lovely new HTPC build in. Make sure your video card has room enough, and that whatever cooling solution you've chosen has similar room; check that, if you really want USB 3, that your case and motherboard are compatible.

> "Make your next PC build immeasurably more pleasurable"

But just as important, is to know the hardware you're putting together. Don't start building your PC with a pile of boxed tech. Unbox it all, have a play with it, do some test-fits of the motherboard and other hardware, and generally get to know how it's all going to go together. In terms of prep, also make you have a clear space handy, and make use of any packing foam or similar to protect delicate components as you lay them out. A few small bowls are also handy for keeping screws and other tiny parts from rolling around. And, of course, make sure you have the right tools to screw parts in and out.

2. THE RIGHT TOOLS

Really, as long as you have a medium sized Philips head screwdriver, you're fine, but if you like having the exact right tool for the job, you'll want some kind of socket wrench for screwing in your motherboard standoffs, of the 5mm variety. You can do this with your fingers, or a pair of pliers, but, you know, tools.

A small flashlight is very handy, because even in a brightly lit room a

▼ Not like this! Graphics cards are gradually creeping up in size, so make sure yours wiill fit. Card maker sites will have the length published so measure up the space you've got to be sure.

▼ Tool-up with essential PC building kit.

Life-time Warranty

Available in:
675W, 775W, & 875W

PC case has a lot of shadowy nooks. A head-mounted lamp is handy, but you'll look like the world's cleanest miner; personally, a small torch is better for getting into hard to light areas, and can be held in your teeth in a pinch.

▲ Lay out all the gear first so you know exactly what you're dealing with.

"Grab a handful of cable ties, and start getting your cables out of the way"

There are a lot of old-school types who also swear by an anti-static strap, so that you don't accidentally zap any of your precious parts, but modern PC components are much more robust these days. That said, even I still religious tap a metal case part to earth myself during the building process. I mean, it can't hurt...

3. BUILD ORDER

The order you actually start installing and connecting parts us very important, but it's also one that could easily change from case to case. There are some obvious things you can do with any build to make it go that much smoother, however.

The first thing you should do is run some dry fits of the motherboard, the PSU, and where the GPU(s) will sit. This should give you a heads up of any awkward fits or bits of case that might get in the way, as well as give you an idea of where to start running cables from the very beginning of the build. Getting on top of cable management from the beginning is important for a couple of reasons. For one thing, it'll look neat, but more importantly; random cables running through your case impede airflow, and can gather all manner of gunk.

Once you have an idea of how it's all going together, the first thing you should do is mount your CPU in its socket on the motherboard, and attack whatever cooling unit you've decided to go with. My personal preference is to then install the motherboard, when the case is free of other hardware and cables, and then any drives. Make sure you attach SATA cables at this point, because on many motherboards the SATA sockets are obscured once you install a video card.

Finally, install video card, and then the PSU - though, depending on how your cables are going to be arranged, you may need to reverse the order. Make sure everything is securely plugged in, and double and triple check that the power, reset, and front IO ports are all where they should be. 90 per cent of power-on issues in new builds that I've come across are because of poorly labelled power headers and the install issues that can follow.

Then, once everything is plugged, grab a handful of cable ties, and start getting your cables out of the way. Good cases tend to have a lot of room behind the motherboard plate, so use that to get long lengths of power cabling out of the way. Going a little crazy with cable ties can make future upgrades a little tough, but it's nothing a carefully applied sharp blade can't handle.

4. FINAL STEPS

At this point, everything should be ready for your software, including whatever operating system you're planning on installing. A lot of components will have come with driver discs, but nearly all of them will be out of date, so just go straight with the OS, and then go with the minimum you need to get the machine online - after that, simply go to each manufacturer's website and get the latest.

If you've any other software you regularly use, now's the time to install that, too, from productivity suites to games, to services like Steam.

It's best to do all this at once, so that once it's all installed and shiny new, you can then create a pristine disk image in case of any unexpected future emergency.

▶ Here's a well constructed build with excellent cable management.

NEW

THE ORIGINAL HIGH PERFORMANCE NOTEBOOK

NOW SLIMMER, LIGHTER & MORE POWERFUL

- NVIDIA GEFORCE GTX 970M OR 980M
- 3K OR 4K RESOLUTION DISPLAY
- M.2 PCIE SSD - UP TO 1170MB/S
- UP TO 32GB HIGH SPEED DDR3L RAM

View Full BlackBook Range

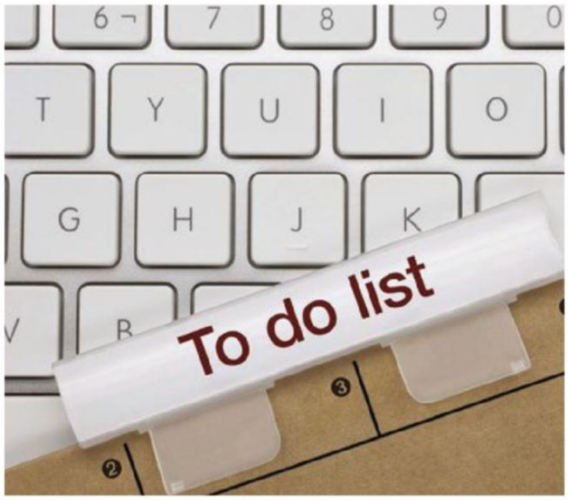
VENOMCOMPUTERS.COM.AU

AVAILABLE FROM MLN.COM.AU/VENOM/BLACKBOOK

HOW TO:

Organise your work and life

DON'T GIVE IN TO THE INFORMATION OVERLOAD, SAYS **TIM DANTON**. USE CLEVER ONLINE TO-DO LISTS AND APPS TO TAKE CONTROL



Chances are that you never feel organised. That your daily grind is a battle against email; that unexpected things happen to destroy the day you'd vaguely planned in your head; that you end up responding to the person – or deadline – that shouts loudest.

I'm not suggesting online to-do lists are the cure to all your organisational ills, but they're a powerful weapon if used correctly. This guide explores what makes them so effective, how to choose the right one for your needs, and how they could change your home as well as working life for the better.

WHY ONLINE TO-DO LISTS WORK

It took me some time to be convinced that an online to-do list was the right choice. I'd used a paper "Things to do today" list for years, and took a great deal of visceral pleasure from striking through completed tasks. Plus, wouldn't maintaining an online list simply waste more of my precious working day?

It turns out, no. Used intelligently, an online to-do list means you spend less time worrying about things and procrastinating, and more time doing the things that matter.

Take the nags that haunt us: "I have to call Bob to sign off the design", or "Arrange a strategy meeting with the new account director", or even "Call my sister to discuss what I need to bring to the barbecue on Sunday". If you don't do something about them, there and then, they'll haunt you.

You might be at your desk when such a thought strikes you, or you could be on the train or in a meeting and therefore unlikely to have that paper to-do list with you. However, if you have your laptop, phone or tablet, then you can add it as a task there and then. Assuming that your to-do list synchronises with your devices – as I discuss below, this is a key factor – then you can enter it into the app or website of your choice, safe in the knowledge that it will be added to your master to-do list.

Another key advantage of modern online to-do lists is that they allow you to keep track of all the projects you're working on, since the likelihood is you've got several projects on the go at any one time, big or small, work-based or personal.

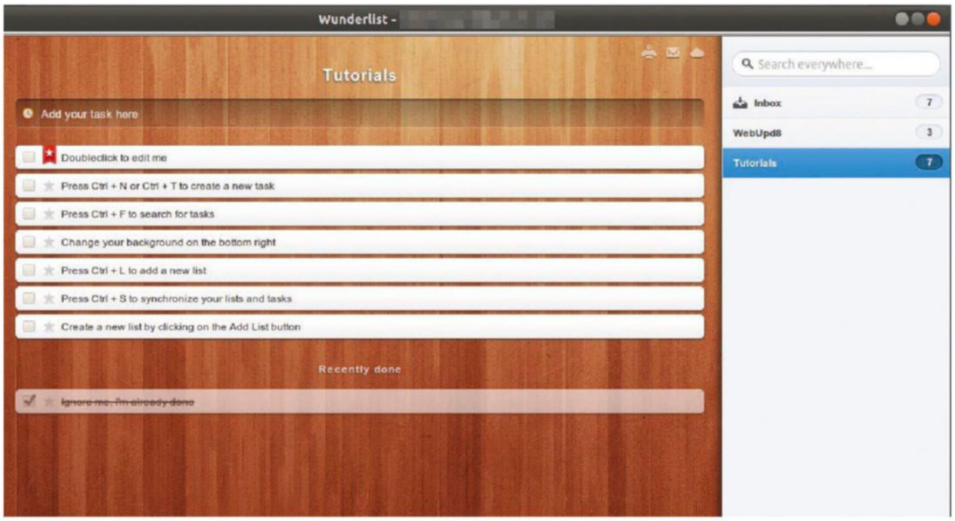
They can also help you to take control of tiny "projects", such as submitting your tax return online or buying a new mountain bike. These may not sound like proper projects, but they involve multiple steps such as doing proper research and collating paperwork. In other words, they can't be summarised in one, cross-offable defined task.

> **"Modern online to-do lists allow you to keep track of all the projects you're working on – big or small, personal or work-based"**

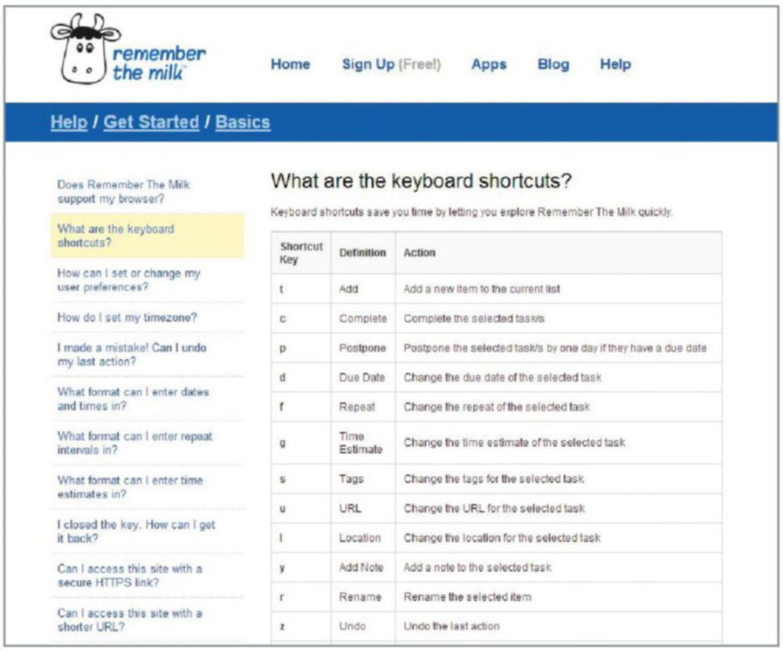
That's why many online to-do lists allow you to create subtasks: smaller projects such as buying a bike can be created as tasks with subtasks – get a recommendation from a friend, visit Halfords – filed underneath it.

All worthwhile online to-do lists allow you to set priorities and deadlines to tasks. Some of the things I need to do can wait until next week; others need to be done today; many have no fixed deadline. Without structure, my list of tasks becomes jumbled together, which adds to my stress levels since I'm never quite sure what's important and must be done immediately, what's important but can be done next month, and what isn't important in the grand scale of things but needs to be crossed off right now.

Online to-do lists also benefit from being searchable. If there are keywords – people's names or projects, for example – then you'll be able to keep track of them. I have monthly meetings with several people, by noting them down, and making sure I include their name in the task, I can search for topics before the meeting to ensure I mention the things I need to.



▼ Wunderlist doesn't try to match rivals for features: it's all about keeping things simple (and nice to look at)



Remember The Milk includes a number of powerful shortcuts: master them and you could save a lot of time

IT'S ALL ABOUT YOU

Deciding what to look for in an online to-do list is far from simple, not least because it forces you to ask yourself some difficult questions about the way you work. I looked at several options before settling on Toodledo, but I had requirements that may be different to yours.

First, I knew I wanted something that synced across different platforms. At various times I'm using Android, Windows Phone and iOS devices, and I wanted to capture any thoughts no matter which device I was working on.

At any one point I'm working on several projects – some with deadlines, many without – so I also needed a tool that would allow me to create a project list. Again, Toodledo ticked the box.

Toodledo also supports folders and contexts, which I find useful. Effectively, these are simply tags for your actions that allow you to associate the task "Phone Tony to confirm he's happy with award venue" with both a folder – I mainly use these for projects I'm working on, and a context, such as being in the office or at home.

CONVINCED? THIS IS HOW TO BECOME ORGANISED

Setting up an account with any online to-do list is simple, with most now tying in with Google or Facebook so that you don't need to remember yet another password.

To start, I find the best approach is to dedicate a good chunk of time – at least an hour – to capturing all those nagging tasks you have to do. Go through your email, your daybook, your diary, your voicemail; think about all the projects you're working on and their associated tasks, and write them down on scraps of paper.

Don't think about priorities: just focus on capturing everything that's on your mind. At some point, the ideas will stop flowing. Take a five-minute break (ideally away from your computer) and then come back to the bundles of paper in front of you.

One advantage of writing down actions on paper is that it's easier to group together projects; this will help you to work out what you're currently working on, which may prove to be a surprise. The next step is to add those projects to your online to-do list of choice. Then, flex your fingers, because you're going to spend quite some time typing in those tasks.

You may find that your choice of online to-do list demands a deadline. That's fine for the hyper-organised, but in my experience there are times when I don't know what the deadline is and I've been forced to put in a false one that comes back to haunt me; that's one of the reasons I use Toodledo, because it leaves this up to me.

I'd also recommend assigning all the tasks added to projects, even if that project is "Miscellaneous". I work best if I'm not distracted, and one way to remove distractions is to filter your efforts so you think about only one project at a time. Being reminded of another won't help.

By the end of this process, you should have a clear idea of the projects you're working on, the number of tasks associated with each one, and a good idea of the deadlines approaching. Out of the madness comes order.

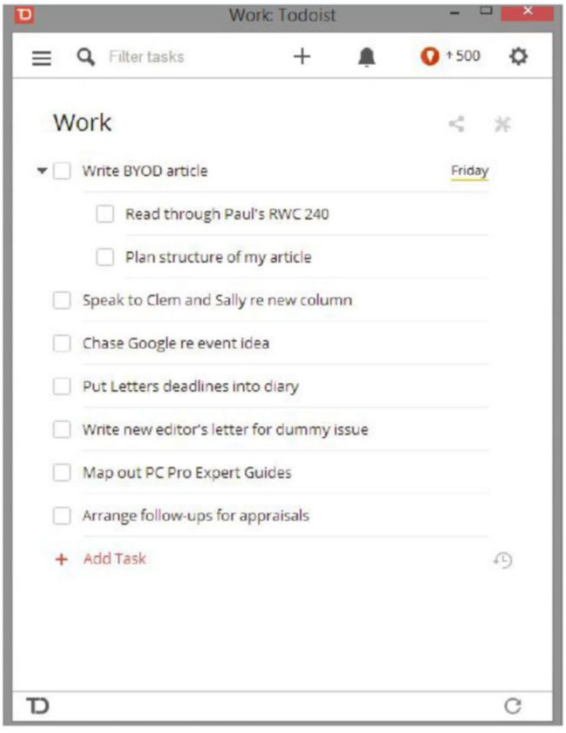
A SHORT WORD ON EMAIL

Email is a topic that could easily be covered by a separate article, or even a whole book (albeit not one I'd want to read), but the key is to avoid reading emails twice. Or three times. Or four times. Or scrolling up and down your inbox as you procrastinate about the next thing to do.

> "Thinking about when a task needs to be completed helps to set priorities, and this is what creating a to-do list is all about"

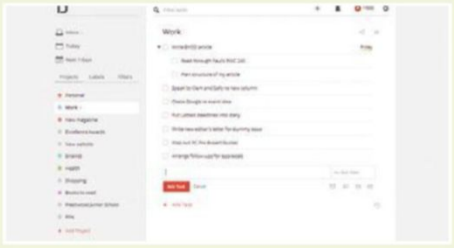
That's why, in parallel to this task, you may want to clear your inbox. First, create a folder called "zArchive" and move all – yes, all – your existing inbox and subfolders there (the reason for the "z" is to force this folder to sit at the bottom of your list). Then create four folders titled: Action, Waiting, Personal and Work. I've also added folders for the two separate organisations I work with, so email relating to them doesn't get

Online to-do lists all have accompanying iOS and Android apps; Todoist has also released a Windows 8 app



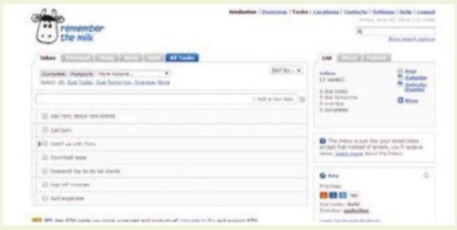
TOP 5 ONLINE TO-DO LISTS

TODOIST



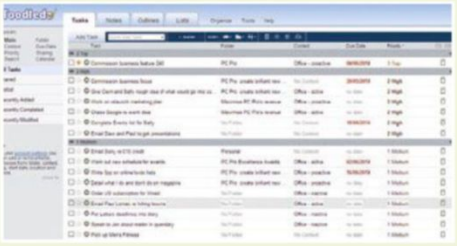
Todoist offers a pleasant combination of ease of use and advanced features that might just make it perfect for you. Adding a new task is a simple matter of pressing Q, and there are numerous other shortcuts if you're a keyboard maestro. The company even gamifies actions with a Karma rating: the more tasks you complete, the higher your rating. The biggest annoyance is that clicking many buttons brings up "this is a Todoist Premium feature", but the price is reasonable at US$31 per year, with a money-back guarantee. It includes a Windows 8 app, too, for offline usage. I'm seriously tempted to move from Toodledo.

TOODLEDO



This is the power user's to-do list of choice, with immense capability baked into it... and a poor user interface to scare everyone else away. Customisation is one of its strengths, with the ability to change what appears based on how you work: if you care about contexts but not about projects, only show contexts, and vice versa. It's been around for some time, so there's a big community to provide help if you get stuck, and one that has also developed apps (including one for Windows Phone) to fill the gaps Toodledo leaves. Still a great choice for the logical and highly organised, but it's starting to look old.

REMEMBER THE MILK



A dated interface belies the trendy name of Remember The Milk, but it has a huge userbase due to its longevity and power. Enthusiasts praise features such as keyboard shortcuts (pressing T creates a new task, for instance) and Smart Lists: lists created automatically based on criteria you define, such as tasks with no due date, or including a certain keyword. The large userbase also means there's plenty of third-party support, with Windows Phone apps, Firefox plugins and desktop apps to accompany official ones for Android, iOS and BlackBerry.

ANY.DO

In stark contrast to Toodledo, Any.do has a slick online interface (accessed via Google Chrome), which is matched by its iOS and Android apps – there's no Windows Phone support, though. It's beautifully simple to use, and allows you to view tasks by time and folder, if it's easy to split up your tasks by projects then you may well appreciate this straightforward approach. We also like the ability to create a task and then immediately add subtasks, which is a handy way to keep track of mini projects without creating a formal folder for them.

WUNDERLIST

Wunderlist is more than a great name: it's a beautifully simple task manager that looks great too. It takes an old-Apple, skeuomorphic approach to design, with a textured wooden background by default and a reliance on dragging tasks into folders rather than using dropdown menus. A Chrome web app ensures that it looks great on Windows as well as OS X, while there are the usual apps for iOS and Android. With its simplicity comes a few compromises, including only one method by which to prioritise tasks.

bundled up with everything else.

Then reset how you think about email. It's a communication tool, not a to-do list, and work should never be about "doing" email. If you think of your inbox as a tool, as a convenient but temporary holding place for communications, then it's much easier to remove emails as distractions and concentrate on what you have to do.

The first step is to always obey the two-minute rule made famous by David Allen's book Getting Things Done: if you can respond to an email in two minutes, do so. Then, unless it contains valuable reference information, delete it.

If it requires more time than you can devote there and then, either move it to the Action folder or turn it into an action on your online to-do list. If you can get away with deleting it, or moving it to the Work folder for reference, then do so. Again, the key is to avoid looking at emails twice unless necessary.

Many people also recommend switching off your email for most of the day, only switching it on for set periods. That's definitely an effective approach, but if you don't feel quite ready for this, then at least switch off all alerts, such as sounds or an envelope appearing in your taskbar.

BACK TO PAPER... IF YOU LIKE

So, you now have a clear inbox, a list of the projects you're working on, and an idea of the most important tasks you need to complete. I'm taking it for granted that you've also set up all your devices to synchronise, so that you can add tasks – and mark them as completed – wherever you happen to be.

At this point, I actually dig out my paper to-do list. Remember that visceral pleasure of crossing things off? Well, I still want that in my life, and I still want to reach the end of the day knowing that I've completed the most important tasks. For me, nothing matches paper for that.

That's why I create a daily list each morning from my "master" list on Toodledo, based on the most urgent tasks, and the things I really need to do that I've been avoiding.

My final thought: always bear in mind that you'll have good days and bad days. (Sometimes even bad weeks.) Don't let the bad ones drag you down, and remember that if things do get out of hand again then you can always reset the process and start fresh. ■

HOW TO:

Run your business for free in the cloud

CAN A BUSINESS BE RUN ON FREE SOFTWARE AND SERVICES? AND, IF SO, HOW DO YOU MOVE FROM A MORE TRADITIONAL APPROACH? **KEVIN PARTNER** EXAMINES THE CHOICES

The major cloud storage providers now offer large free storage allowances, making it possible to store, synchronise and, in some cases, edit your business documents without needing to invest in network infrastructure. For specialised purposes, such as advanced image editing and programming, locally installed and paid-for software may remain the best – or only – choice. However, there are plenty of general business functions, such as cloud-based word processing, spreadsheet analysis and media creation, that can be moved advantageously into the cloud.

WHY THE CLOUD?

First and foremost, the cloud is a storage medium. Microsoft and Google both offer 15GB of free space, which, while it may not be enough to contain all of a company's working files, provides ample room for core documents, spreadsheets and presentations. Since your files are stored off-site in secure facilities, the cloud is likely to be a safer repository than a network-attached storage (NAS) box balanced on an old filing cabinet in the broom cupboard – especially in the event of a fire or burglary.

> "The cloud is likely to be a safer repository than a NAS box in the broom cupboard – especially in the event of a fire or burglary"

All cloud services make it possible to collaborate with colleagues from anywhere there's an internet connection. This ranges from merely synchronising files, so that the latest version is always available to everyone, to the sort of "live" editing built into Google's Docs and Sheets tools, where multiple users can work on a file simultaneously. Furthermore, most cloud services offer cross-platform clients, so you can access files whether you're using a mobile device or a computer running Windows, OS X, Linux or Chrome OS.

Moving to the free cloud has some drawbacks, aside from requiring a decent internet connection. First, none of the mainstream services offers multiple logins or permission management in their free plans. You can get around this, up to a point, by getting every staff member to sign up for the same cloud service using their business email address. You can then share the folders containing the company's core documents with everyone, and more sensitive folders with those authorised to view them.

Second, cloud services meant for personal use don't enjoy business-quality service-level agreements, although they are, by and large, very reliable. You also need to think carefully of the implications of storing customer data in this form: the Information Commissioner's Office has a document explaining this, which you can find at tinyurl.com/plv2kx7.

Finally, there's no built-in option to back up your business documents, although most cloud providers keep old versions of files for a period of time. Given that all staff could delete files, it's essential you have an independent backup system in place, whether it be online (in which case you'd have to pay) or by copying the local version of your cloud folder to an external hard drive.

DOCUMENTS, SPREADSHEETS AND PRESENTATIONS

We've selected Google Drive as the best option for free business use, but there are reasons to be tempted by a combination of Microsoft's OneDrive and Office Online. Both Google and Microsoft offer 15GB of free storage, and both offer a free

built-in word processor, spreadsheet and presentation package, but Google leads the way for collaboration and lets users save documents to an offline drive.

For Microsoft, saving documents offline is only available if you sign up to a paid-for Office 365 subscription. Office Online, on the other hand, definitely wins for familiarity, slickness and compatibility; familiarity because your users will be quite used to its interface; slickness because the templates and styles it offers hold the distinct edge for professionalism; and compatibility because Microsoft Office remains the default productivity suite for businesses. At least for now.

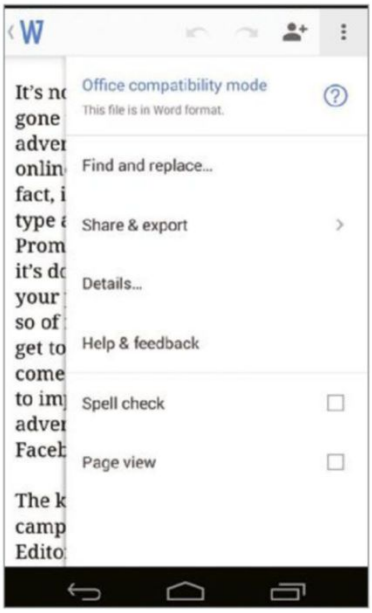
If you need more sophisticated office software than that included in Google Drive, you might consider using OneDrive for storage with LibreOffice for editing. If you haven't tried Google Drive lately, though, it's worth re-evaluating before plumping for a locally installed option, since regular upgrades make Google's tools more and more capable.

GOOGLE DRIVE

If you have a Gmail account, you already have Google Drive. If not, go to accounts.google.com/signup and create one. Either way, once you've logged in, type drive.google.com into your browser. If it's the first time you've visited this page, you'll be prompted to download the desktop client for Windows or Mac, which sets up a Drive folder on your computer to contain all the files you want to store in the cloud. If you don't see the prompt, there's an Install Drive button on the same site.

Once you've set up the desktop client, you can copy the files you intend to keep in the cloud to the Drive folder and Google will quietly upload them over time. If you have several gigabytes to upload, this may take a couple of days.

You're likely to have Microsoft Office documents in your existing library, and you can deal with these in one of three ways. If they're purely for archiving purposes, you can leave them in their current format – open them in Drive and you'll see a non-editable preview. For active documents, you can convert them to the native format for the Google equivalents by choosing to open them in Docs, Sheets or Slides, either using the web browser interface or the dedicated mobile apps. Once the conversion is complete, you can use all the built-in features of Drive, including sharing and collaboration.



Google Drive now features a mode that allows you to edit Microsoft Office documents without needing to convert files

There are occasions, however, where you may need to preserve the Microsoft format, such as when exchanging files with a client that uses Office. In this case, you can open Microsoft documents in the web client or mobile apps and edit them while preserving their file format, rather than having to convert them into Drive and then save them back out as, say, DOCX files. This is a very neat trick and, although it's a new feature, initial feedback suggests it works well with most Office files. Note this process only works with documents saved in Office 2007 and later.

To create a new document or folder, click the New button and make your choice. Google Drive supports a big library of third-party integrations, making it possible to create, say, mind maps or floor plans. It's a great way to expand on the functionality of Drive.

Docs, Sheets and Slides will be instantly familiar to anyone who has used an office suite in the past, although they lack the ribbon of the past couple of Microsoft Office iterations. In use, on a reasonable broadband connection, you'll find them nippy and, since you're working in the cloud, your edits will be saved every time you make a change; there's no Save button to worry about. If you plan to work on a document while out of broadband coverage, you can opt to download specific files to your mobile device or laptop – all changes are then synchronised when a connection can be established.

To share a document, right-click it in the web client or, if using a mobile device, open the built-in menu. Choose which level of permission the recipient needs and have Drive email them a link. Files shared this way only count towards the 15GB limit of the owner of the file, not the limit of those they are sharing with, so it should be possible to eke out dozens of gigabytes of effective

MOVE YOUR BUSINESS TO "FREE" DOCS IN THE CLOUD IN FIVE STEPS

1 Decide whether you're going to go fully cloud-based for your documents, or whether you'd prefer to use a desktop office package such as LibreOffice and reserve the cloud for document sharing only.

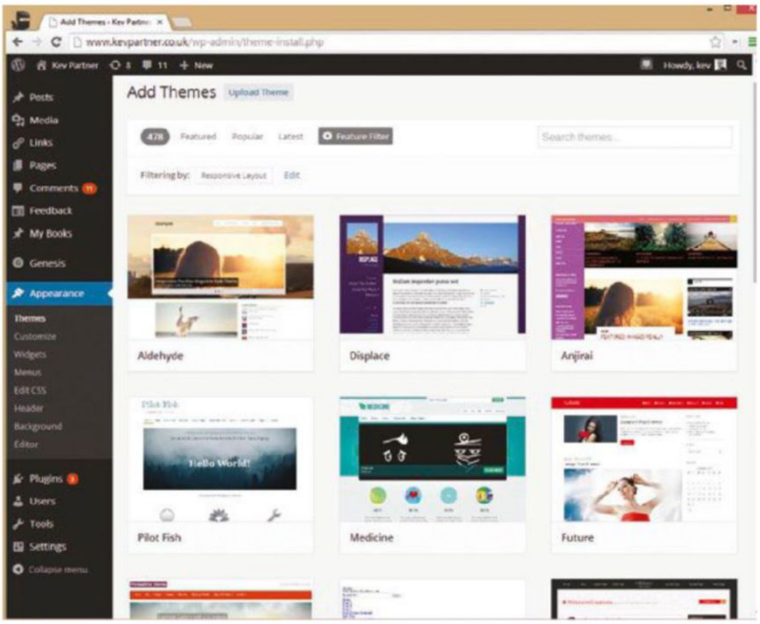
2 Sign up with your cloud provider. Google Drive is our pick of the major providers, since it includes built-in office tools, offline storage and a 15GB online allowance. Microsoft's OneDrive is a good alternative if you only want to store files in the cloud. Either way, it's best to insist that all staff requiring access sign up with your chosen cloud provider using their business email addresses.

3 Organise your documents. You may decide not to store customer data in the cloud, depending on the nature of information you keep, and if you have an existing document library, decide which files should be uploaded. Copy the files to the folder of your cloud provider's desktop client – if there is more than 15GB to upload, spread the files among trusted staff members.

4 Share folders. The owner of each folder can decide with whom it's shared and, in the case of Google Drive, the files don't count against the storage limit of those they're shared with, only the owner. You may want documents relating to personnel to be shared only with senior managers, for example, where other folders may be shared with everyone.

5 Get backed up. Cloud providers use highly reliable, secure data centres, but it's all too easy to accidentally delete a file. Most providers keep deleted files and revisions for some time, but the safest free option is to put an old PC into service as a backup server. Set up a routine to back up the contents of the desktop folder daily – this only needs to be done on one computer as long as it has access to the full set of files.

Finally, don't forget to train your staff. Google Drive and its constituent applications are familiar and easy to use but, for many people, the principles of working in the cloud are not. Search for "Google Drive tutorial" on YouTube.



▲ Create a website using WordPress and choose from a huge range of designs without paying a penny

space by organising which users store which files and folders.

Once set up, the system enables anyone with whom the files have been shared to edit documents using their laptop, tablet or smartphone, using either native apps or the browser. And it doesn't cost a cent.

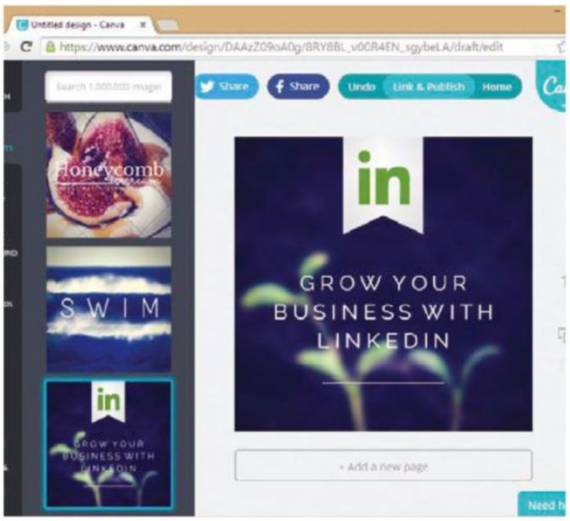
WEBSITE DEVELOPMENT

Every business needs a website but, while hosting is cheap – with plans starting at less than $20 per month – the cost of creating the site can easily stretch into four figures. Opting for the free option in web development is unlikely to net you a site that's as well targeted to your needs as hiring a professional. However, given the alternatives of either getting your nephew to hack something together or buying a web-creation CD and doing it yourself, one of the better, theme-able frameworks is a good, safer option.

Your site must be easy to update or it will undermine you as it ages, so in most cases, a content-management system will be the best choice. Of these, WordPress is the undisputed king. WordPress is a "framework" that provides a structure for both editing and displaying a site. It has a management interface with which you can add and edit content, apply a design and manage users, and you can add specific functions to the site using plugins, most of which are free.

Most modern web-hosting packages have an auto-install script for WordPress, which you'll find in your dashboard. Run the script and follow the prompts, and you'll end up with a basic website that uses a default look and feel ("theme"). You'll need to find a design that suits your purposes – to do this, go to the WordPress dashboard and select Appearance | Themes, then click the Add New button at the top. Now click Feature Filter and, under Layout, check the "Responsive Layout" box and then "Apply Filters". This ensures the theme you choose is claimed by its designer to work on mobile devices as well as desktop computers . Click Preview to see roughly how the theme would look on your site and, if you like it, click Install. You can change your mind at any time, so feel free to try various alternatives once you've populated your site with content.

▼ Canva is a free tool for creating superb graphics, primarily for use in social media campaigns



FREE IMAGES AND HOW TO EDIT THEM

Finding free photos is easy enough, but it's essential you check that the licence permits commercial use and, if necessary, that you're allowed to edit them. Get started by going to search.creativecommons.org, which is a convenient central hub from which you can search for images from a variety of services. Type your search term into the box at the top and select a service. Pixabay is a good choice, since all its photos are usable for almost any purpose; for the other services, make sure you've checked the boxes to limit the search to those suitable for commercial use. Be careful to check that the photos themselves don't contain copyright elements – for example, a brand logo – because while you wouldn't be infringing the photographer's copyright, you could be using the logo it contains illegally.

> "A content-management system will be the best choice if you're creating your own website; of these, WordPress is king"

Pixlr is a good, free, choice for editing your newly acquired graphics. You can integrate it with Google Drive by going to **https://chrome.google.com/webstore/category/collection/drive_apps** and selecting it from the list that appears.

Once it's installed, you can choose Pixlr via the "Open with" option when using Google Drive in Chrome; the image will be loaded into the editor and changes saved back to the original file.

When it comes to creating good-looking graphics for social media or website purposes for free, canva.com is unbeatable. Canva works on a template system, which includes profiles for Facebook, Twitter and Google+ so that you can create images that are correctly sized and laid out for those platforms. It includes thousands of pre-made layouts that you can amend either by altering the existing text or by uploading your very own background images.

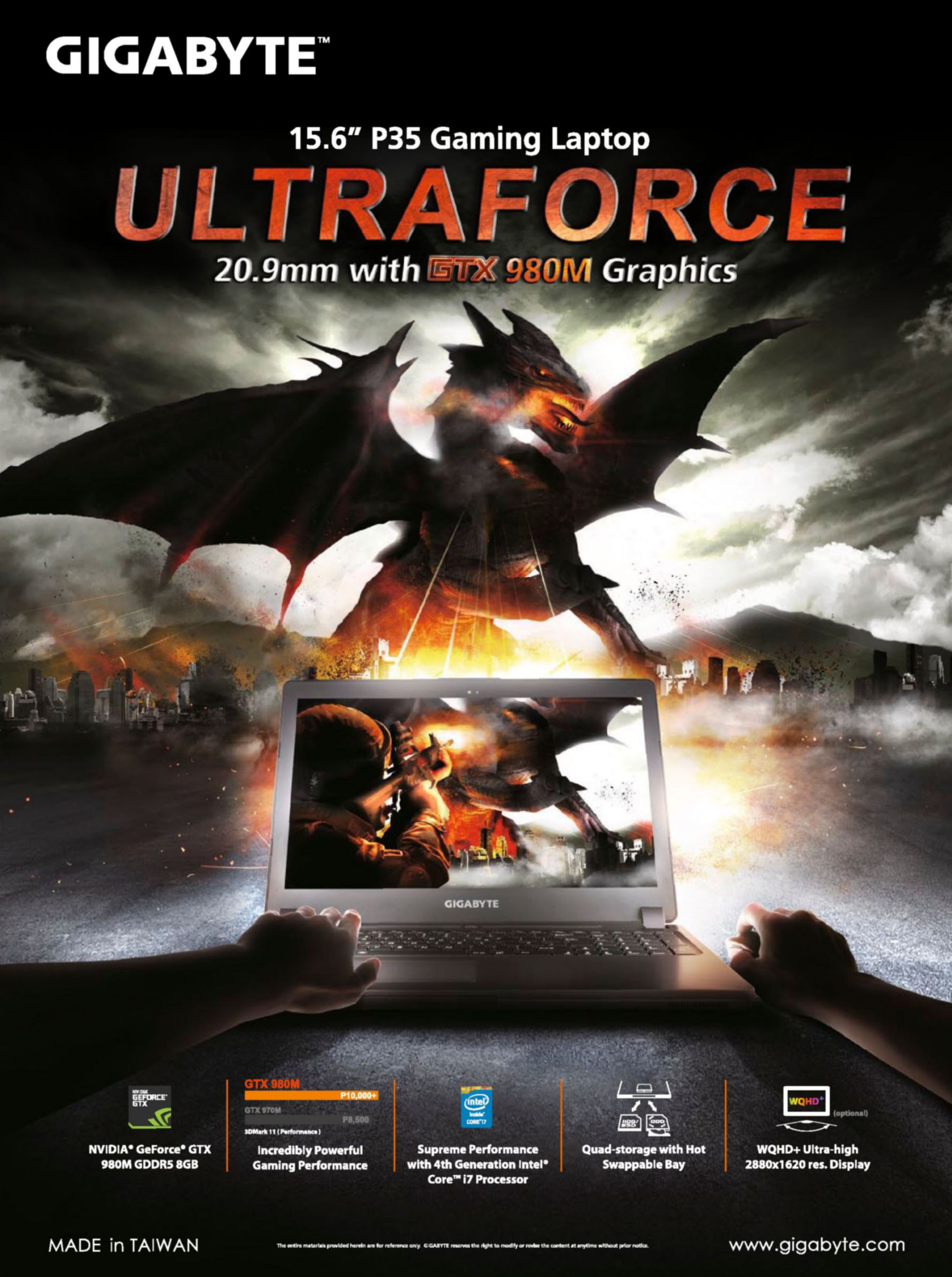
Canva makes its money by charging $1 per premium element used, but the range of free graphics and layouts is so large that there's no need to pay.■

GIGABYTE™

15.6" P35 Gaming Laptop

ULTRAFORCE

20.9mm with GTX 980M Graphics



NVIDIA® GeForce® GTX 980M GDDR5 8GB

Incredibly Powerful Gaming Performance

Supreme Performance with 4th Generation Intel® Core™ i7 Processor

Quad-storage with Hot Swappable Bay

WQHD+ Ultra-high 2880x1620 res. Display

MADE in TAIWAN

The entire materials provided herein are for reference only. GIGABYTE reserves the right to modify or revise the content at anytime without prior notice.

www.gigabyte.com

DVD contents

Apps, essentials, full software, drivers & more!

ON THE DVD:

FEATURE
+ BITDEFENDER INTERNET SECURITY 2015
+ PC OPTIMISER BOOSTSPEED
+ ASHAMPOO PHOTO OPTIMIZER 5
+ IDEO COMPRESSOR 2014

DRIVERS
+ ATI CATALYST
+ NVIDIA FORCEWARE

HELP
+ DISCLAIMER
+ DAMAGED OR FAULTY DVDS
+ USING THIS DVD
+ INSTALLING SOFTWARE

EDITORIAL
+ BURNING AN ISO IMAGE
+ PC&TA EDITORIALS

TROUBLESHOOTING
+ SERIAL CODES
+ BLANK REGISTRATION WEBSITE
+ CAN'T FIND A FILE?
+ INSTALLATION ERROR

WINDOWS
+ 7ZIP
+ CCLEANER
+ CUTEPDF
+ DEFRAGGLER
+ FOXIT READER
+ SANDBOXIE
+ VLC MEDIA PLAYER

INTERNET
+ VUZE
+ DROPBOX
+ GOOGLE CHROME
+ FILEZILLA
+ MOZILLA FIREFOX
+ MOZILLA THUNDERBIRD
+ SKYPE
+ STEAM

LINUX
+ TAILS LINUX

INSTRUCTIONS: Open Windows Explorer, navigate to your DVD drive and double-click Index.html in the root directory. **DISC PROBLEMS:** To replace faulty DVDs, please send the discs to: *PC&Tech Authority* DVD Replacements, Level 5, Building A, 207 Pacific Highway, St Leonards NSW 2065

Make sure to include your name and postal address on the back of the package so that we know where to send the replacements. For all other DVD related issues email **cd@pcauthority.com.au**. As the delivery platform only, *PC&TA* and Haymarket Media cannot and will not provide support for any of the software or data contained on these discs. Although all discs are virus scanned, Haymarket Media cannot accept any responsibility for any loss, damage or disruption to your data or computer system that may occur while using the discs, the programs or the data on them. There are no explicit or implied warranties for any of the software products on the discs. Use of these discs is strictly at your own risk.

BITDEFENDER INTERNET SECURITY 2015

Bitdefender Internet Security 2015 is the company's mainstream security suite, offering antivirus, firewall, browsing protection, parental controls, antispam, password management and more.

There are plenty of features to explore, but a revamped interface means the most common tasks (Quick Scan, Update, Safepay, Optimize) are now available with a single click, while wider groups of functions are accessible via three main tiles (Protection, Privacy, Tools). Even first-time users will quickly find what they need.

The focus on ease of use continues elsewhere. Bitdefender's Wallet can now automatically fill web forms with user names, passwords, even credit card details, often allowing you to pay online in a single step. And Bitdefender's Vulnerability Scanner not only finds missing patches on your PC, it also provides links to help you download and install them.

A new Activity Profiles feature sees the suite automatically optimise your system for different situations. Play a game and BitDefender enables the Game Profile, disabling unnecessary services and working to speed up your PC. The Movie Profile kicks in when you're watching a movie, optimising the suite's settings and enhancing visual effects. And if your battery is running low, the Battery Mode Profile optimises Internet Security and Windows settings to save energy.

If you're still worried about performance, the Tuneup section (Tools > Tuneup) provides six new modules to help: Boot Optimizer, PC Clean-Up, Disk Defragmenter, Registry Cleaner, Registry Recovery and Duplicate Finder. Or, if exploring all those sounds too complicated, the new One-Click Optimizer will effortlessly clean up your PC all on its own.

There are smaller improvements dotted around the suite: better reports, enhanced parental controls, and a more capable desktop widget, while the spam filter is now entirely cloud-based, improving accuracy and making it more responsive to the latest threats.

Bitdefender's real strength comes in the protection it provides, though. The independent labs typically give it very high marks, and as we write, AV-Comparatives' May 2014 Real-World Protection Test found Bitdefender's package blocked 100% of threats. Only Panda, out of 21 other entrants, could match them.

REQUIREMENTS: Windows XP, Vista, Windows 7, or Windows 8 · 100MB hard drive space
LIMITATIONS: 90 day license
WEBSITE: www.bitdefender.com

Auslogics BoostSpeed 7

Auslogics BoostSpeed 7 is a comprehensive suite of tools that will improve performance in just about every area of your PCs operations.

If your system is slow to boot, for instance, then use the Startup Manager to locate and disable unnecessary Windows startup programs, Explorer extensions and even IE add-ons for a comprehensive list. And BoostSpeed can highlight "dangerous" items, programs it believes may be spyware, for an additional security benefit.

Nothing slows down a PC quite as much as a poorly optimised hard drive, but BoostSpeed 7 makes it easy to get your system back into shape. There are tools to remove junk and leftover files, clear your web, Windows and application histories, and explore your drive to see which folders are consuming the most space. Then the excellent Auslogics Disk Defrag will rearrange your files to deliver the best possible performance.

Of course there are also tools to clean up and then defragment the Registry. As well as a module to speed up your internet connection; you can tweak these settings manually, if you know what you're doing, or let BoostSpeed 7 handle the tricky decisions. And you get plenty of useful bonus functions that aren't strictly performance-related at all, but they're generally worth having so we're not about to complain. These include modules to undelete files, discover and fix hard drive problems, view system information, securely shred data, or wipe entire hard drives to make sure any personal data they contained has gone forever.

But if browsing all these modules sounds too much like hard work, don't worry, Auslogics have thought of that, too. Launch a System Scan and BoostSpeed 7 will automatically and quickly identify Registry problems, leftover hard drive junk, file fragmentation and more. Then you can have the program fix all these issues in just one click.

BoostSpeed 7 adds some major new features, in particular to its Live Speedup module. A Disk Priority Manager optimises applications in real time, your hard drive is monitored to prevent file fragmentation, while disk and Registry cleanups can now be run automatically.

Elsewhere, a Desktop Protection tool prevents system library errors and reduces system crashes. Privacy improvements include a tool to help detect visits to sites containing adult content. And a host of smaller tweaks enhance the program's effectiveness, fix bugs, improve configurability, and generally ensure it does an even better job of boosting your PCs performance.

REQUIREMENTS: Windows XP, Vista, Windows 7, or Windows 8 • 50MB hard drive space
LIMITATIONS: 3 months of updates
WEBSITE: www.auslogics.com

Ashampoo Photo Optimizer 5

Ashampoo Photo Optimizer is a straightforward tool which makes it easy to enhance, optimise and share your photos.

As with previous editions, the program opens with a simple thumbnail browser. Navigate to a folder of photos and if you spot one which isn't up to your usual standards, then you can enhance its colours, lighting, sharpness and more in a couple of clicks.

Basic editing features make it easy to sharpen, blur, mirror or rotate an image. If the automatic enhancements don't quite work for you then you can manually tweak photo colours for more precise results. And while most of the "colour effects" on offer here are straightforward ("Greyscale", "Sepia"), the "Image Age" option is a little more interesting, giving any picture the look of an aged photograph.

There are plenty of improvements in this version. You can now compensate for shaky camera work by straightening the horizon; live previews show you the results of an effect right away.

REQUIREMENTS: Windows XP, Vista, Windows 7, or Windows 8 • 10MB hard drive space
LIMITATIONS: Registration Required
WEBSITE: www.ashampoo.com

VideoCompressor 2014

With even budget smartphones now often containing great cameras, it's never been easier to take high definition videos.

Sharing those movies can be a problem, as the files are often so large, but VideoCompressor 2014 just might be able to help. Point the program at your target video, choose a compression level and it'll be rewritten at a lower quality setting, reducing its size by anything up to 80-90%.

The VideoCompressor interface is extremely simple and straightforward, more like an app than a regular PC program. On launch, for instance, there's no menu, no toolbar, just a single "Add video" button where you choose whatever file you'd like to shrink.

Even after selecting a video, life doesn't get much more complicated as you use this appealing software.

Drag a slider to choose your compression level, VideoCompressor displays an estimate of the new file size, click Compress when you're happy, and the program goes to work.

REQUIREMENTS: Windows XP, Vista, Windows 7, or Windows 8 • 10MB hard drive space
LIMITATIONS: Registration Required
WEBSITE: www.abelssoft.com

FREE FULL VERSIONS: Each month, we offer *PC & Tech Authority* readers full registrable versions of some software on the DVD. See the installation instructions in the DVD menu to complete registration, if applicable. **IMPORTANT:** Full product registration closes on 8 December 2014

Input Output

DAN RUTTER BRINGS THE ANSWERS TO YOUR QUESTIONS LIKE NO-ONE ELSE CAN

RELIGIOUS CONVERSION

I recently switched from Firefox to Chrome in Windows 7 x64 Very Professional Etc, and almost everything is fine. The only thing that is not fine is that I can't make Chrome the default browser. Whenever some piece of software tries to open something in a browser, I always get Firefox again. (Well, except for some awful business software I've got that seems to have Internet Explorer hardcoded in it, but I don't expect you to fix that. Jesus couldn't fix that. Most likely).

Everybody else seems to be able to set a damn default browser. Why can't I?

Gabriel Pennington

Congratulations! You are not using your computer stupidly! (Actually, there are a few other ways this could happen, but a little correspondence nailed down this cause.)

Changing the default browser is not something a standard limited Windows user account is able to do. It's a relatively minor system setting, but it's still a system setting, with significant possibilities for malicious action if it's subverted. If the currently-logged-in user account can change the default browser, then malware inadvertently run by the logged-in user can change it too, and quietly swapping in a whole monkeyed-with browser allows malware-creators some *gorgeous* criminal opportunities.

When you install Chrome while logged in as a restricted user rather than as an administrator, you get it installed to your own user profile, and can't set it as default.

To change this, uninstall Chrome, then right-click the Chrome installer (the little ChromeSetup.exe program that downloads the rest of Chrome when you run it...) and select Run As Administrator, and give it the admin username and password.

Now you'll get the "normal", default-browser installation for *all* users, which we who foolishly run as admin all the time have.

VIVALDI = VAN HALEN

Some of my MP3s are quiet, and some of them are loud. I like random play for background music at home, but if I turn Albinoni up until I can hear it and Judas Priest is next in the playlist, it's... an alarming contrast.

Is there a way to iron out everything's relative loudness?

B. Edwin

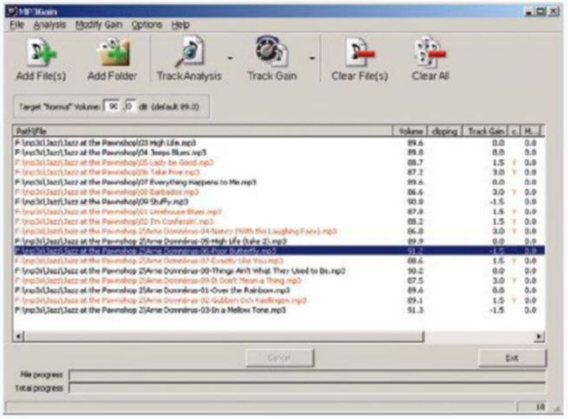
The generic audio-engineering term for something that smooths out volume changes is a "compressor"; they're routinely used to keep the volume of radio stations steady, and to squeeze all perceptible dynamic range out of a distressing amount of modern music.

You can get compressor plug-ins for various music players. You could also batch-process all of your MP3s through a compressor in an audio-editing program like Audacity (which is free, audacity.sourceforge.net), but this is not a great idea because now they'll be compressed forever. They'll also be re-compressed, in the lossy-MP3-audio-encoding sense, inescapably losing some data.

If you're making CDs to play in your car, though, compressing the audio before writing it to disc can be quite helpful.

There are also a couple of ways to regulate volume of compressed-in-the-MP3-sense audio files without losing any data by recompressing it. First, there's the "ReplayGain" pseudo-standard, which adds a little data to the file header - not touching the actual audio - which tells compatible players how much to turn the volume up, or down, for that file.

There's also MP3Gain, which you will find at mp3gain.sourceforge.net, which does modify the data but in a lossless, perfectly reversible way, and which has a clever overall-loudness algorithm that figures out how much you can boost each individual file to even things out, or apply common settings to all the files that make up an album or symphony, without any chance of distortion on particular tracks.



The audiophile-practical-joke possibilities of MP3Gain have only just occurred to me.

DON'T WORRY, IT'S SUPPOSED TO SMOKE

I have a shiny new GeForce 770, replacing poxy onboard graphics. I have discovered that the 770 needs a couple of extra power plugs to run it, which my computer's 500W PSU does not provide. I've got several spare 4-pin drive power plugs, though, and you can get cheap adapters that can turn drive power plugs into all of the special video power plugs.

I am clever enough to buy and plug in those adapters. I am also clever enough to know that those adapters do not magically make my PSU actually able to provide enough power to run this card the size of a skateboard. Is it acceptable to give it a try and buy a new PSU if the old one doesn't cut it, or is this likely to blow something up?

Finn Peterson

Yes, it is possible to damage the PSU, the video card, or various other components by overstressing your power supply. What will probably happen if the PSU isn't up to the task, though, is just that the computer will hang, or the PSU will turn itself off.

The full Thermal Design Power for a GeForce GTX 770 is 230 watts, and there are factory-overclocked versions that can draw more. The PC PSU market is also hideously debased (dansdata.com/gz086.htm). Off-brand PSUs are commonly rated completely fictitiously, and even brand-name units are not necessarily

able to reliably deliver their full rated current on any rail.

A new, real 500W PSU will probably be OK with your new video card, provided you don't have a fire-breathing overclocked CPU to run at the same time. Most PSUs with a "500W" sticker on them will not. Any proper brand-name PSU from 500 watts on up should come with the PCIe power plugs natively hanging off it for this purpose.

(Note that the Thermal Design Power is the most power a device can be expected to draw over any length of time; it's the amount of heat from that device that the cooling system has to be able to handle. Peak power consumption can be higher, and real-world power consumption is often quite a bit lower. If you're just using 2D desktop applications, all 3D-accelerated graphics cards will consume far less than their TDP.)

(Editor's note: we are working on a complete PSU round up for the next issue of PC & Tech Authority, testing all contenders with our custom rig.)

CCED TO CHILD PROTECTIVE SERVICES

I So my delectable kid just kept herself silently busy for a while jamming a pen into the vent hole in the side of my laptop, which offers direct access to the thin copper fins of the heat sink. The part of the heat sink visible through the vent now looks like a forest that several tanks have driven through.

When I have finished drowning my daughter in the toilet, is there any chance that I can just straighten the fins out again and be OK?

Ellie Molloy

O Yeah, you'll probably get away with that. The fin-straightening, I mean, not the infanticide.

Laptop heat-sinks are often on the end of a heat pipe, a sealed tube containing a liquid that boils at the hot end on the chips in the middle of the computer and condenses at the cool end where the heat-sink and fan are, taking the heat with it. If the tube is ruptured, the heat transfer won't work any more and your laptop will run hot.

(Modern auto-throttling CPUs can often survive with this sort of reduced cooling; if you're not stressing the computer, then even if its cooling is horribly compromised it'll probably still be able to run at its minimum possible clock speed.)

It's not easy to damage a laptop heat pipe without opening or grossly damaging the laptop itself, though, so your problem probably is limited to the bent fins.

You may even be able to get them acceptably straight again without taking the laptop apart, by levering them back with a paring knife or nail file (the usualy not-our-fault if you break it disclaimer applies). The heat sink probably won't be a lot longer than it's wide, though, so take care not to stab right through the heat sink and further into the innards of the computer.

I/O OF THE MONTH

WINDOW DROPPINGS

I Something I've always wondered but never asked about: Why do crashed programs leave trails on the desktop?

You know - either there's a window leaving overlapping copies of itself behind as you drag it around, or there's a window that's not really there any more but sort of blocks anything else from updating that area of the screen properly. I've seen this in a million versions of Windows, but I think not recently. Why does it happen?

Jere Kyt

O This has to do with the kind of "window manager" an operating system uses.

A "compositing" window manager, like the evocatively-named "Desktop Window Manager" that's been used by Windows since Vista, sits between the screen and all programs that want to display stuff on it. The manager listens to what the programs want, and to what the user is trying to do (like moving windows around, for instance). It then creates and updates the screen image based on all of that input, without being forced to do anything by anybody. The display a compositing manager creates can include fancy stuff like flip-book program switching; none of the programs need to know how to turn their window into a 3D perspective flipbook, the manager does it for them.

As long as a compositing window manager is itself healthy, no weird stuff like blank or trail-leaving windows from broken programs should make it to the monitor. It doesn't stop programs from crashing, but when a program does crash the window manager should be able to elegantly redraw that program's non-functional window in new places (and shapes, and sizes), without leaving utter garbage behind.

A "non-compositing" window manager, on the other hand, is the simpler kind that lets programs take care of drawing and re-drawing their windows themselves. They generally do this via functions built into the operating system - every program doesn't contain specific code for what its maximise/minimise boxes and scroll bars and so on should look like - but if you drag Program A's small window across Program B's large window, either or both of those programs and the OS functions that dumbly do their bidding have to be conscious and responding to hails. If one or more component in the screen-drawing committee isn't working, the little window won't be drawn properly, and/or the parts of the bigger window or desktop it obscured won't then be *re*-drawn properly.

Because the whole desktop interface doesn't have any real underlying similarities with the physical-documents-on-a-physical-desktop that it's designed to resemble, broken programs and/or delinquent window managers can allow windows to leave trails, or other windows to go blank and become unmovable, or all or part of a window that's meant to be "behind" another to be visible "in front" instead. Compositing window managers, used by all of Microsoft and Apple's OSes for some time now, keep this weirdness at bay.

◀ Thanks to bit.ly/doob-ie6, this computer-history landmark will never be forgotten. See also bit.ly/doob-solitaire!

There'll be no meaningful versions of Windows 11, 12, 13; rather, an ongoing progression of Threshold

JON HONEYBALL WONDERS DOES MICROSOFT HAVE THE INFRASTRUCTURE IN PLACE TO COPE WITH THE MORE STREAMLINED RELEASE CYCLE IT SO DESPERATELY NEEDS TO ADOPT?

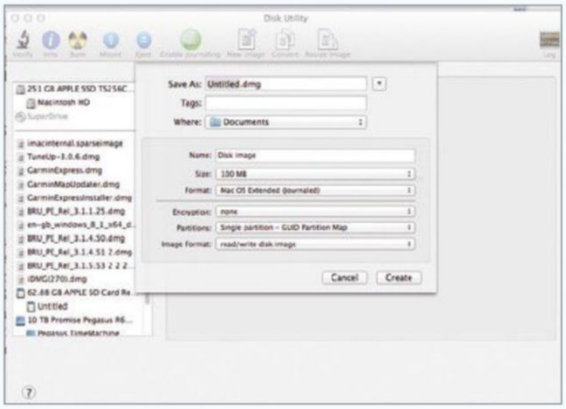
Even before the official announcement on 30 September, the intertubes were awash with leaks, screengrabs and videos about the Windows 9 preview codenamed "Threshold" – or Windows 10 as we shall henceforth call it. Among the new features is the ability to push all that full-screen Metro/Modern experimental stuff into the background, while the new-look Start button will operate via a rather groovy Metro-esque system of menus. Then there's the promise of running Metro apps in their own windows on the desktop.

So is this a great retreat for Microsoft, a final admission that it couldn't make Metro stick? It's difficult to say, because it still isn't wholly clear where all the new "integrated application" work is going to end up. We do know that Microsoft intends apps to run both on Windows Phone and on the Windows desktop – but exactly how this will be delivered won't be clear until all the pieces are actually shipping.

Having a single development platform for apps that scale from a phone all the way up to a large touch device is no mean feat, and it can be fraught with difficulty. After all, no-one else has managed this yet, with the iOS work from Apple really only going from phone to tablet. Remember that Microsoft sees its platform reaching all the way to large TVs too (indeed, it acquired a high-end hardware company in that space not so long ago).

All of this will have an impact on the Windows Phone platform. There's no doubt that Windows Phone has matured into a solid platform with its 8.1 release, but so far developers are largely ignoring it in favour of iOS and Android. Whether the new unified developer experience is enough to tip the balance will be interesting to watch. What is clear is that many of these changes should have happened years ago. Of course, hindsight is a wonderful thing.

Another, no less important, change is the speed of releases. Threshold is Microsoft's last big release of Windows. After Windows 10, the company wants and desperately needs to go for a more streamlined release schedule that runs more quickly. And by that, I don't mean every year; more like every six months or so.



▲ Creating a DMG file – a whole file system within a file – is simple, and useful for archiving

This means Microsoft must have the processes in place to deliver faster releases, and it's being suggested that there'll be no meaningful versions of Windows 11, 12 or 13, but rather an ongoing progression of the Windows 10 name. This is interesting, since it really does help to tie down users to a subscription model and, to my mind, it definitely points towards Microsoft bringing Windows licensing into the Office 365 Home licensing model.

It would be crazy for it not to do this. We know that Microsoft receives good revenue from the original equipment manufacturer (OEM) hardware builders – think HP, Lenovo, Dell – but maybe it thinks there's a possibility of still charging the OEMs for a small installation licence fee, and then grabbing all the money again directly from the home users.

You may think OEMs would be up in arms about such a move, but what alternative do they have? I'm quite a fan of Google's Chrome OS on a laptop – it works well, does what it claims, and lets you concentrate on the core task at hand – but many people will find it too limiting. A business would need to be fairly brave to deploy Chrome OS machines to its more demanding users.

I like the idea of more frequent releases from Microsoft, providing it matches this with more frequent roll-ups of all the patches. I'm sick of seeing "Updating 1 of 197" whenever I boot up a laptop that hasn't been touched for a month or two; this really has to stop.

Maybe the move to a post-Threshold fast release schedule will finally allow Microsoft to deliver smaller incremental upgrades. The question is how well the business community will react to this. Historically, big business has always preferred larger releases it can sit on for years at a time – look at what happened with XP. Going to incremental feature upgrades means more work for the IT department, more strain on the internal update servers, and generally far greater worry about moving from a known good platform to something that may be subtly different, with its own particular challenges, bugs and so forth.

If post-Threshold rapid upgrading is to work, then Microsoft needs to put serious effort into reassuring its business customers that they're not about to face a tsunami of uncontrollable upgrades, "Patch Tuesday" network overloads and sleepless nights. All of this is fixable, manageable and controllable if you have the right tools, processes and procedures in place. But many don't.

JON HONEYBALL
Jon is the MD of an IT consultancy that specialises in testing and deploying hardware

MAKE AN IMAGE FILE ON OS X

Here's a useful tip for users of OS X – how to create a DMG file. A DMG file is a whole file system within a file, and it's the method by which applications are usually distributed. Double-click on one and it will mount its contents into the file system, which can be useful if you want to do some archive work. To make one, simply fire up Disk Utility and choose the New

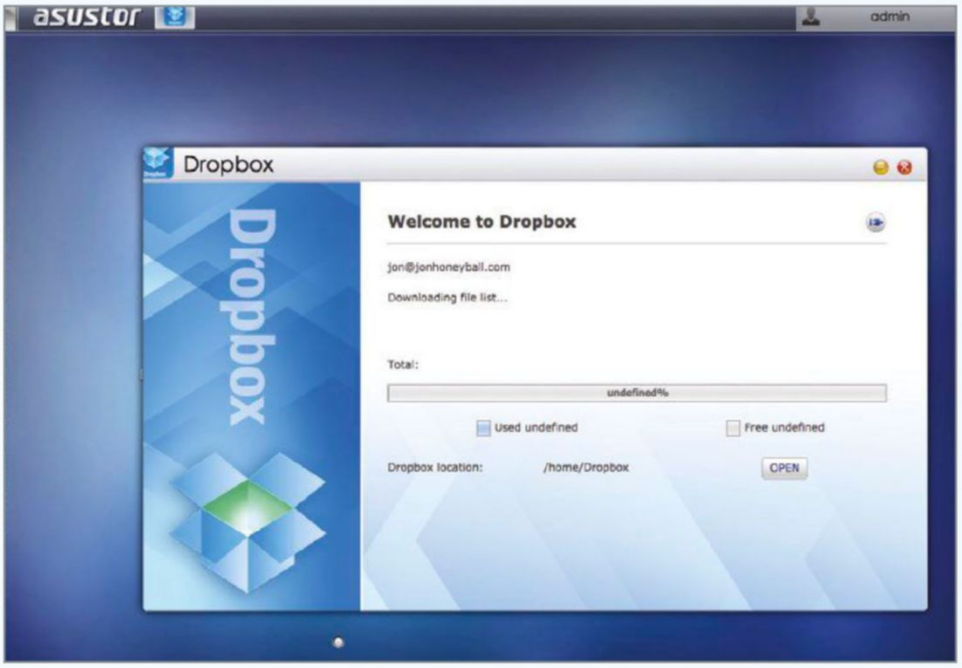
Image button. In there you'll see a bunch of options, the most important one being the desired size, which you can custom-specify if you wish. You can also specify whether it's to be read-only or read/write, and specify the partition format – Mac OS Extended (Journaled) is the best by default. Then simply drag and drop your desired files into it, and it will create the DMG file for you, encrypting the contents too, if you wish. It's all pretty simple, but there's a raft of even simpler tools around if you think you need them. Try iDMG, for example.

GARMIN UPDATES

Having a GPS entails keeping it up to date – not only the application code and maps, but also all those useful pointers to where "safety cameras" are currently lurking and similar. Some of the updating software in the past has been terrible, and I'll confess that this was one reason why I walked away from TomTom a few years ago: its updating process was so convoluted, horrible and unstable that I could take it no longer. Garmin seems to do a pretty reasonable job with its Garmin Express toolset, and I've had few problems with it – you can download the maps to be stored locally, too, or else just drop them straight into the device via USB.

A few days ago, however, I saw there was an update for my BMW Motorrad Navigator IV, which is a BMW motorbike version of a Garmin unit. I was somewhat confused by the claim that it would take 59 hours to update the device, downloading some 5GB of data in the process. There was no reason for this process to take so long – I wasn't downloading over a piece of wet string, but rather via my normal 100Mbits/sec line in the lab. As I was about to leave, within two hours, I cancelled this upgrade and went off on the journey with the maps and app that I already had.

On my return to the lab several days later, it was still claiming that it would take 59 hours, so I wondered whether my doubts had in fact been well founded. Of course, in the event the actual updating took 30 minutes. I really hate software that is this bad at guessing execution times, like the Microsoft update bar that quickly zooms up to 99% and then sticks there for what feels like an age, filling you with anxiety that it's crashed. How difficult can it be to measure the real current data rate and adjust estimates accordingly?



▲ Asustor's Dropbox client can't seem to figure out how much space I've used

UPDATING DROPBOX ON ASUSTOR

My 24TB Asustor NAS has been doing sterling service and, generally speaking, I'm pretty pleased with the purchase – pleased enough, in fact, that I'd consider buying a second one. But I have to say that my enthusiasm has been somewhat dented by the poor quality of the Dropbox client for this device, which is written by Asustor itself (or at least that's the clear implication in its built-in app interface). It has failed to impress me since day one, simply because it appears unable to work out how much data there is in my Dropbox account, preferring to irresolutely tell me that I've used "undefined%" of my space, and that "Used undefined" and "Free undefined" would somehow be helpful additional information.

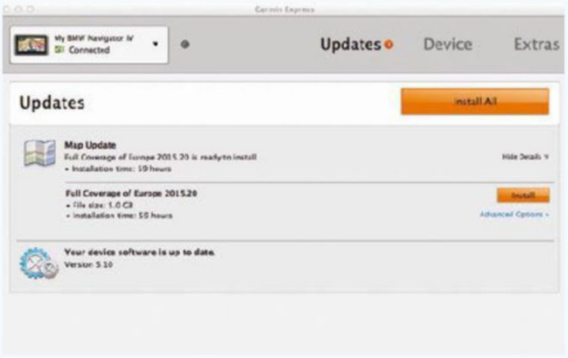
So you can imagine my annoyance upon receiving an email from Dropbox a few days ago, informing me that its client for this device was out of date and would shortly not be supported any more. Is there any sign of Asustor updating the app? No. Have I squealed loudly in its support forums? Of course. Has it made any difference so far? No. Am I impressed? Hardly...

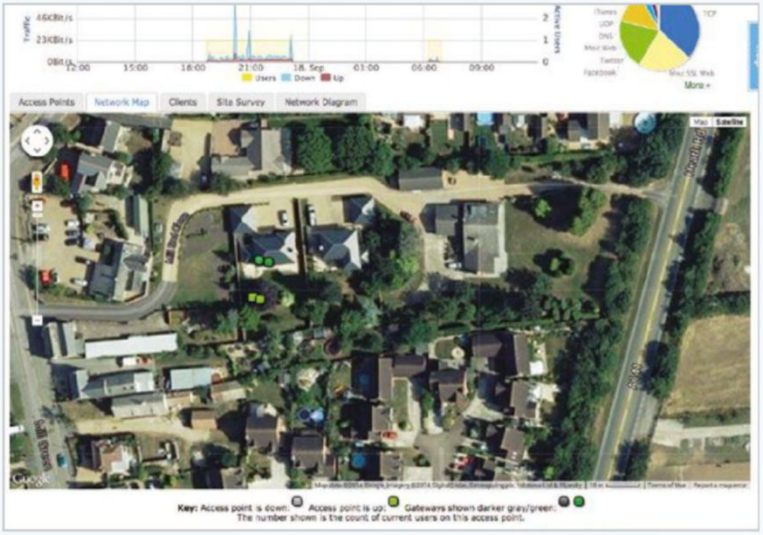
The good news is that Dropbox for Business has been improved: there are now better facilities for sharing stuff and managing users. In addition, as of today, every Dropbox Business user will receive 1TB of storage space, which is a considerable upgrade and helps justify continuing to pay for this service. All Dropbox needs to do now is allow me to put my own encryption keys in place and I'll be wholly pleased with it. (Oh, and send some heavies round to Asustor to knock some sense into its system developers, who appear to have fallen asleep at the wheel.)

MODELLING WI-FI

I have to give a little shout-out to the blog at http://jasmcole.com/2014/08/25/helmhurts/, the author of which has taken a first-principles approach using the Helmholtz equations to model the way that radio-frequency (RF) signals actually propagate. It's a work in progress and only in 2D at the moment, but it's a fascinating piece of work that explains how RF puddling happens in real rooms. People have this expectation that RF is some sort of miracle substance that "just works", and they don't take into account the real issues with interference patterns – and why would they, since we can't see, feel or touch RF waves (despite the inane ramblings of those who claim to be "electrosensitive")? Visualising

▼ 59 hours to install an update? It actually took only 30 minutes





Open-Mesh Wi-Fi lets you view connected devices on Google Earth

a very-high-frequency RF signal is simply beyond most people, so this sort of software can be a bit of a revelation. If the maths looks too daunting, just scroll down and take a look at the computerised visualisation models, which should help.

TILES

My Tiles have arrived! These are the little Bluetooth LE squares you can hang on key rings, which I wrote about a while back. I'd ordered a dozen of them so long ago I'd almost forgotten about them – it must have been almost a year past – but now they've finally gone into production and shipped.

The idea is that you can attach these Bluetooth 4 LE tags onto your key ring, then pair them to an app on any device running iOS 7 or 8. The device then regularly listens out for the Tile and can tell you where and when it last saw it.

Obviously, it's best to use it on pairs of things that you usually keep together – putting a tag onto a suitcase and then leaving it at home won't be all that useful, but it would be if you want to see whether your case is coming down the carousel when you eventually get to your destination airport.

I doubt there's enough range for you to see whether the bag is still in the hold underneath you on the aeroplane, and no doubt there'll be a whole raft of legal reasons why increasing the power to do that would be a deeply bad idea.

I like these Tiles; they're working for me. The only downside is that the battery lasts for only around one year and isn't user-replaceable. I believe there's going to be a replacement programme in place by the time this becomes necessary, however more than likely be just fine.

MESH NETWORK

Getting Wi-Fi to work around your home can be fraught with difficulty. At our place, I have two garages – one for cars, one for motorbikes – and there are half a dozen or so security cameras scattered around the premises. I didn't have the opportunity to put fibre or Ethernet cables into these garages, so a Wi-Fi bridge seemed to be the obvious solution. I put in place a system using Apple AirPort base stations and it worked pretty well, but it was clunky to manage – it didn't really give me the control I wanted, and always felt like the wrong tool for the job; other Wi-Fi extenders have been even more ungainly to use and manage. Which is why I was particularly fascinated to be recommended an Open-Mesh solution.

This system has been designed from the ground up as a mesh-based, repeating Wi-Fi network. Each Wi-Fi base is small and can be powered either via the Ethernet port or from a supplied mains brick, and you can hang devices off the Ethernet ports and use it as a bridge if you wish.

The boxes include one for 2.4GHz and another for 5GHz. I'm currently building up my network at home to test these boxes, and so far I'm quite impressed.

The nature of mesh Wi-Fi is that it halves the data rate at each repeat of the signal, so if you start at base station A and this connects to B and thence to C, performance at C won't be brilliant, at a quarter of the original bandwidth.

But it will be good enough for web browsing, emailing and so on, and with a carefully designed topology you can ensure you don't introduce too many hops, so the bandwidth will

> Microsoft must have the processes in place to deliver faster releases

What really makes the system work is a free cloud-based application that manages all the boxes: each box talks to the account on the cloud system, and talks to all of its neighbours. Configuration is via a web browser, and is well designed for managing a mesh: you even get a Google Maps and Google Earth view of the location of the devices, which is helpful for remembering where they are. Having a single place of management also means you need to update only the cloud service itself, after which each box is automatically updated for you, avoiding the nightmare of having to log into each base station to carry out a firmware update or change a password.

You receive two service set identifiers (SSIDs) on the network, one designed for public use and the other for more private home/office operation. The public one supports useful things such as login splash pages, where you can set up acceptable-use policies (AUPs) and homepages for users to read. It even has built-in facilities to accept pay-per-use tokens, which could be a boon in environments such as pubs, libraries and hotels.

The management tools are excellent – with strong graphing and traffic analysis – plus there's the ability to lock down users by bandwidth, and more: all the tools you'd need to run a public-facing Wi-Fi network, or a home mesh network similar to the one I'm building.

So far, despite it running on beta firmware and a beta web service, I'm thoroughly impressed. There have been a few lock-ups and glitches, but that's true of just about anything that has an aerial. Give it a try – it might work well for you. ■

Tiles are Bluetooth LE squares you can attach to anything you want to keep tabs on

When it comes to technology, I have a theory that we've now stopped buying things

THESE DAYS, MOST PEOPLE SEEM CONTENT WITH THE TECHNOLOGY PRODUCTS THEY ALREADY HAVE. HAVE WE FINALLY REACHED "PEAK TECH"? **PAUL OCKENDEN**

Back in 1979, pop-punks the Buzzcocks sang "Everybody's Happy Nowadays", and 35 years later I think they may finally be right. Of course, I'm not referring here to the really important things in life, such as the economy, employment and public services. But when it comes to technology – the very bones of this magazine – I think we've all become a lot more settled and content and, as a result, I have a theory that we've now stopped buying things. Allow me to explain...

A few years ago, many people would replace their phones every year, or perhaps after 18 months, often before their contract had expired. The mobile networks (and particularly their branded high-street stores) were very good at persuading people to upgrade before their contract had run its full course, and there was always excitement and buzz whenever a new high-end phone was about to hit the market.

This updated model would have wonderful new features – a better camera, stunning display technology and so on – and would almost always be thinner than the previous incarnation. Phone launches became events, sometimes even warranting a spot on prime-time TV news bulletins. Nowadays, however, things are different: the marketing push for each new phone still tempts you with ever-better specifications, but most people seem pretty happy with the phones they already have.

We're now at a point where even the most low-end, bargain-basement smartphone is fast enough for the majority, and does everything they want or need. A $100 pay-as-you-go device that you can pick up at the supermarket with your groceries will have a good-enough camera and great display, and be attractively thin. It's almost impossible to buy a bad phone, which means there's less demand for upgrades.

The DJI Phantom 2 Vision+ is a great toy, but be careful not to crash it or else you'll face expensive repairs

PAUL OCKENDEN owns an agency that helps businesses exploit the web, from sales to marketing and everything in between

At school, the kid with the latest iPhone was once a hero, revered by the rest of the playground, but now it's all gone a bit "meh" – a new phone is nothing special, and new shoes raise more excitement (even for boys).

The story is similar in the business playground. Those five minutes before a meeting, while you waited for the last person to arrive, was often spent playing smartphone Top Trumps comparing features. Now everyone just puts their phone on the table and no-one gives a damn. These devices have become commodities that may still vibrate, but no longer emit any buzz. Phones are now good enough to do everything we want, and a new one isn't necessarily going to bring anything extra to the party – in fact, in some instances a change might bring problems, such as shorter battery life.

Now that phone providers have given us everything we need, they have to try to sell us things we don't, such as 1,440 x 2,560-resolution screens (I'm looking at you, LG) that do almost nothing for readability and chomp through battery power at lightning speed. Such "innovations" can cause other problems, too: there are countless reports recently regarding high-end phones that are switching into low-power mode due to issues with overheating. These phones are actually too powerful for their form factor to accommodate.

What's the point of building a device with all those bells and whistles if you can't actually use it? There can be only one reason: marketing. Bigger numbers are all about attracting buyers rather than making better devices. It's a trick, a con, and one to which savvy consumers have started to open their eyes.

It isn't only in the smartphone market that we've reached this point. I have several tablets at my disposal here, but the one I usually pick up is an iPad – and it isn't the latest generation model either. When the iPad Air was launched, I wasn't even slightly tempted to upgrade, because my tablet already does everything

> These devices have become commodities that may still vibrate, but no longer emit any buzz

I need it to.

Of course, Apple will try to force my hand at some point, when a year or two down the line it releases a new version of iOS that will no longer work on my device, and then a month or two later any updated apps will refuse to work, since they'll require the new operating system. Anyone who's ever owned an iPad or iPhone will be used to this little game by now. I'm not sure what I'll do then – perhaps I'll cave, or perhaps I'll decide never again to buy another iOS device.

Such forced upgrades don't happen because the user wants or needs them; they're entirely manufactured, and Apple is very good at this. It's a technique (I almost typed "scam", but then softened slightly) that's worked well up until now, because, as mentioned at the start of this column, people had until recently actually wanted to update their tech on a regular basis. The forced upgrade was simply a means of pushing consumers towards doing something they were already considering.

In a way, it was simply a justification for making a "spendy" purchase. However, this tactic may backfire now that people are happier with their devices and less inclined to upgrade. Rather than cajoling them into making a decision they wanted to make, smartphone vendors will need to force them to spend a few hundred quid on something they neither need nor want, and I suspect this will really start to irritate people.

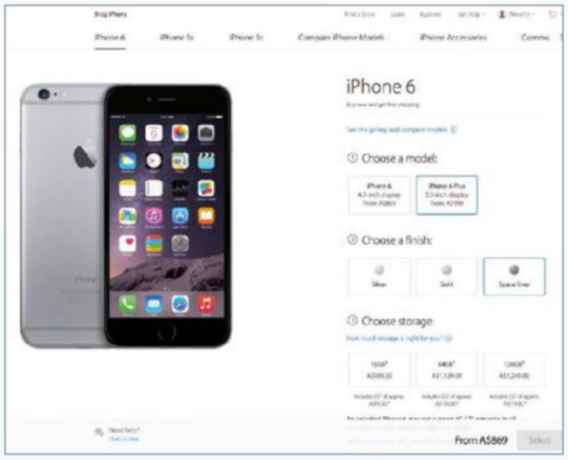
The same is true in many other areas, not only mobile technology. For example, once upon a time, I would change my car every 12 to 18 months, but I've owned my current car for several years now and can't imagine changing it anytime soon. Occasionally, when it needs a trip to my dealer for a service or a minor ailment, they'll loan me a newer version of the same car, perhaps in the hope that it will spark a desire to start spending again – but it doesn't work, because I'm always happy to get my own car back. In most respects, and especially in terms of comfort and drivability, it's as good as (if not better than) this year's new model.

And my laptop? That's a MacBook Pro with Retina display, and it's by a large margin the best laptop I've ever owned. It's two years old, and Apple has refreshed the range several times since I bought mine, but my machine is still stonkingly fast – I'm always amazed by how quickly applications such as Adobe Photoshop spring to life when I hit the relevant icon. Once again, there's no need to upgrade.

This feeling is spreading into the living room, too: my TV is now three years old and I'm still perfectly happy with it, so a new one wouldn't provide any major benefit. My various cameras provide me with far more megapixels than I'm ever likely to need, unless, of course, I land that **Vogue** cover shoot.

▲ Be sure to check the Civil Aviation Authority website for the latest on commercial drone operation.

▼ Do you really want to spend over a thousand dollars on a new iPhone when there's nothing wrong with your existing phone?



All around my house and office it's the same story: on the whole I'm very satisfied with my current tech. And it isn't only me. I recently tweeted: "Realised I've stopped buying stuff. Most kit is now so good that upgrades aren't needed. My car, telly, phone, PC and so on are all fine. Just me?".

Several of you responded, many confirming what I'd suspected. @benb3342 said: "Not just you. Home PC is fine. Phone is at the end of 18-month contract, also fine. Harder to find excuses to buy stuff :(."

@CynthiaGibling said: "My car, bought new, 1999 Volvo, still all good. I don't use a TV, internet far more controllable. All that saving to spend on wine." (I certainly won't argue with that.) So what's going on? Have we now reached "peak tech"?

Well, obviously not, because manufacturers are still releasing kit with ever-higher specifications. However, we may just have reached "peak useful tech", at least for a year or two. So does this mean it's time to sell your shares in technology companies and electrical retailers? Far from it, because there's a new growth area. Tech manufacturers, having cottoned on to the fact that we're not spending our disposable income on upgrading existing technology, are instead trying to sell us completely new kinds of gadget.

If I look at my recent tech purchases, they've all been things such as wireless streaming sticks, a couple of quadcopters (more about those in a moment), experiments in 3D printing and home energy management. These are all new categories rather than lifecycle upgrades to my existing kit, with some of them being fairly costly.

Looking beyond my own

The Hubsan X4 H107L is much cheaper than the Phantom; it's ideal for getting used to the controls

purchases, there's the whole new area of wearable technology, including personal health monitoring, sports and fitness bands, and smartwatches. Once again, all completely new concepts and areas into which existing manufacturers are looking to expand.

I do wonder whether smartwatches and health bands are too little, too late, though. Companies such as Samsung can obviously survive any smartphone slowdown because they have fingers in so many other pies, but for those companies whose main raison d'être is to make and sell smartphones, tablets and laptops, I suspect the road ahead will become somewhat rocky. If I were a tech investor, I wouldn't be looking to buy shares in such companies, nor indeed in those companies making the chips that power such devices. Instead, I'd be looking at some of the new areas mentioned above.

Crowdfunding sites such as Kickstarter and Indiegogo give a good indication of the kinds of products that will be next year's hot tech purchases, and the fact that last year's Ubuntu Edge crowdfunded smartphone campaign failed so spectacularly speaks volumes about the issues I've raised in this column.

Perhaps I'm completely wrong; maybe the tech world isn't facing such an upheaval, and I'm just being a grumpy old bugger. Maybe some of you really do find the latest phones exciting. Perhaps some readers are still slavering in anticipation of the next model of the iPad. Some of you might even be drooling over a wonderful new laptop. Have I got it wrong? Tweet and let me know.

HERE COMES A CHOPPER

I mentioned above that I've been playing with quadcopters recently,

> Tech manufacturers are instead trying to sell us new kinds of gadget"

and I've actually bought two. My main one is a DJI Phantom 2 Vision+ but I've also bought a much cheaper Hubsan X4 H107L – I'll explain why in a moment.

The Phantom is best described as a "prosumer" device: rather like a mid-range DSLR camera, it's capable of producing professional results, but no actual aerial video pro would be seen dead with one, since they'd consider it a toy. I, however, consider it great fun.

There are several different Phantom models available, but the Vision+ is the latest and greatest. Unlike earlier models, which required the separate purchase of gimbals and a GoPro or similar camera to shoot aerial photography, the Vision+ includes everything you need in one package. It's pretty well ready to fly out of the box, with everything supplied, apart from the smartphone or tablet you need to receive the video and telemetry links from the flying aircraft.

The system actually employs two wireless links: a one-way, 5.8GHz control link from the radio controller to the quadcopter; and a two-way, 2.4GHz telemetry and vision link between the chopper and your smart device. This is the opposite way round to most other systems, which use the 2.4GHz link for control and 5.8GHz for video; swapping them this way allows people to use their existing devices to receive the video, rather than having to buy an all new screen.

This setup costs just shy of

a couple of grand, so it isn't the cheapest toy I've ever bought, but it's brilliant fun. So why did I also buy the Hubsan alongside? Well, because it's all too easy to crash a Phantom, especially when you're a complete newbie like me – a quick browse among various forums and Facebook groups soon made it obvious that, when a Vision+ crashes, it will often break its gimbal and camera assembly, resulting in a seriously hefty repair bill.

I therefore decided to buy that second "toy" because it has very similar controls, thus enabling me to practise and get used to flying a quadcopter properly. Both aircraft are steered via two joysticks, the left-hand one controlling elevation and yaw; the right-hand one front/back and left/right tilt. Elevation is pretty obvious – up and down – while yaw spins the aircraft on its axis to turn in a different direction, and tilt sends it scuttling off in that different direction.

At first it can be quite tricky to get your head around how to fly these things. For example, if the aircraft is hovering just in front of you and you want it to fly off to the left, you have two options – use the yaw control to spin it round until it's facing the direction you want, then use forward tilt to send it off in that direction; alternatively, just use a bit of left-tilt and let it fly off in that direction sideways.

Remember, though, that the main reason for flying a Phantom is for aerial photography, and if you only use tilt, the camera remains pointed in the original direction. This means that mastering yaw control becomes important, because the effect of that control reverses depending on whether the aircraft is flying towards or away from you.

For the first few minutes this will probably do your head in, but once it clicks it will become second nature. That "until it clicks" point gets closer with each flight, but until you get there, a Hubsan is a good way to practise without risking your big investment, and it's a lot of fun doing so. ■

As for Google, I now trust it about as far as I trust Wikipedia as a definitive source for serious research

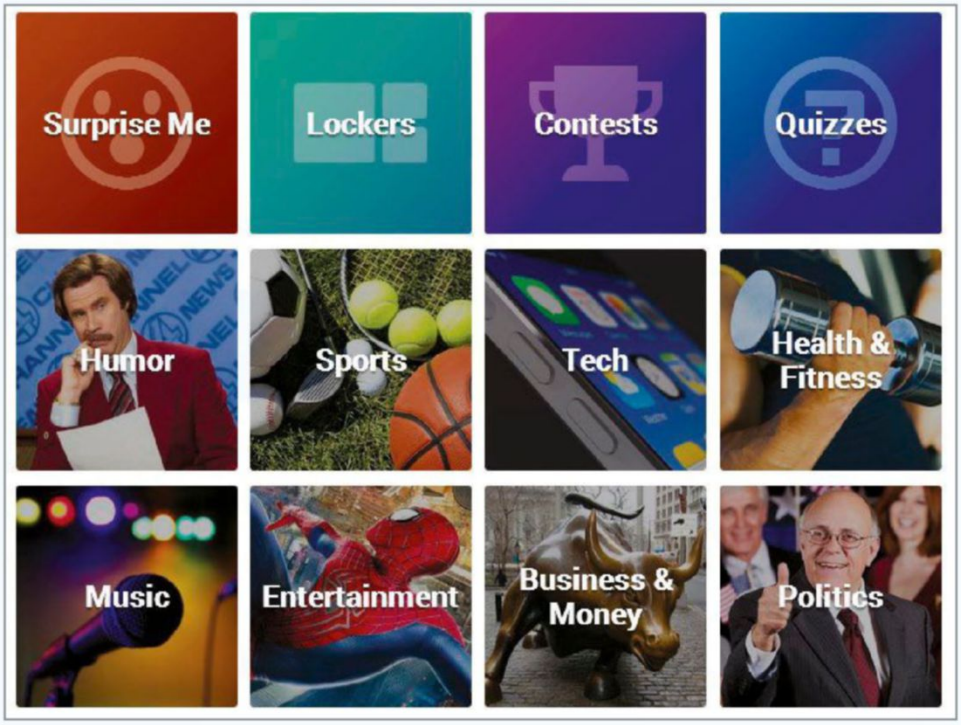
DAVEY WINDER HEARS WORRYING STORIES FROM READERS WHO CALL GOOGLE'S MORALITY INTO DOUBT – YET ELSEWHERE THE COMPANY IS TAKING SECURITY MORE SERIOUSLY THAN EVER

Google's unofficial corporate motto – "don't be evil" – is easier to say than to put into practice. Steve Cassidy recently made a Business Clinic visit to the Millpool Centre,, one of whose volunteers subsequently emailed me about some strange Google goings-on. Somebody had come into the centre – which supports the learning of IT skills – with a very slow-running computer, overloaded with unwanted pop-ups. To anyone who regularly provides tech support, this will set off alarm bells that this PC was likely infected with malware. In this case, however, the problems had started after the owner downloaded Microsoft Security Essentials...

On being quizzed, she explained that she'd searched for the package on Google after seeing it recommended in Which? magazine – and this is where "don't be evil" starts to look a little shaky. The first hit wasn't an organic link pointing to the Microsoft site from where Security Essentials could be downloaded. Rather, it was a paid-for advert, leading to a site hosting a Security Essentials installer with lots of other unwanted stuff bundled in, including the SweetPacks Toolbar, various games, cloud storage offers and other rubbish. It took the volunteer an hour and a half to remove all the cruft and restore the computer to good health.

Although Google isn't doing anything illegal here, one can certainly question its good faith. Sponsored links such as this should be placed in the sidebar, or highlighted in glowing satanic red, to ensure people know they're not actually organic results.

The download page itself was barely any clearer about the fact that this wasn't an official download site. To be fair, there were clues: the lack of Microsoft branding for one, and a link with a declaration that "this offering is not affiliated or endorsed by Microsoft".



LockerDome is no longer simply a sports-orientated network, but then what is it exactly?

DAVEY WINDER is an award-winning journalist and consultant specialising in privacy and security issues

As those running the site surely realise, though, few people will read this, and fewer still will follow the links to the Terms of Service and Privacy Policy documents that spell out what they're letting themselves in for by hitting that Download button. The strongest hint that this isn't the regular Microsoft download can be found at the bottom of the download page, where a banner advises that during the installation "you will be offered an alternative search service" and "one or more additional desktop utilities" – but, we're assured, this is merely to make your browsing experience "easier and more valuable".

It wasn't easier for the poor woman who found her computer rendered all but unusable, but it was definitely valuable to the company that installed the package. Her default search was changed to sweetim.com and various toolbars were added – not quite a malware attack, but what I prefer to call an "adware hijack". These "utilities" are notoriously difficult to fully remove using only the uninstall options provided, so I'd recommend anyone with an unwanted SweetPacks installation to pop across to Bleeping Computer (bleepingcomputer.com/virus-removal/remove-sweetpacks-toolbar) and follow the instructions. As for Google, I now trust it about as far as I trust Wikipedia as a definitive source for serious research. Its intentions may not be evil, but the links it serves up certainly aren't all good.

GOOGLING SECURITY

With that point made, it might seem odd for me now to turn around and praise Google for taking security seriously. Credit where it's due, however: earlier this year Google announced it was going to encrypt all Gmail connections with HTTPS, whether sending or receiving. The news wasn't the HTTPS support, which Google has provided since

2008, but the fact that it's no longer optional. It's applied to internal connections, too, so Gmail messages remain secure even while being shunted between Google data centres. Throw in a decent password and implement the two-step verification that's on offer and Gmail becomes pretty secure.

Incidentally, on that subject, I've been berated by a number of readers over my advice of using two-factor authentication (2FA) for any online service that offers it. The most common complaint actually arises from a misunderstanding of how this technology is implemented. 2FA is "not for me", I keep being told, because relying on a text message sent to your mobile is no use to folk in rural areas with poor phone reception. That would be a valid concern if 2FA relied solely on SMS to work, but this isn't the case. In any halfway-decent implementation, a range of secondary authentication methods will be offered – most will also offer a code authenticator, either in a dedicated hardware device or via a cross-platform app such as Google Authenticator. When asked for a verification code, just fire up the app and enter the code it produces. Simple.

Okay, back to Google. As well as tightening up Gmail's security, the search giant has announced a new measure that will impact everyone who has a web presence – in effect, it will punish anyone whose site isn't secure by giving them a lower search ranking. Basically, it has incorporated encrypted connections as a flag of desirability within the highly secret search-ranking algorithms that determine who you see, and where you see them, in Google search returns. Currently, the impact is described by Google boffins as "very lightweight", but that will surely change. The intention is pretty clear: as time goes on, sites that aren't using HTTPS will stand less and less chance of appearing towards the top of any search results you attempt.

As someone with more than a little interest in security and privacy online, I welcome the move; I think it sends a pretty strong signal that burying your head in the sand about such things is simply no longer acceptable. If it changes the attitudes of businesses that had, until now, calculated that implementing SSL and dedicated IPs wouldn't be worth the cost, then that's a positive step. The worry is that non-profits, hobbyists and the assorted weird and wonderful sites of the web forest floor may skip the technology and end up disappearing from sight.

However, this should be only a short-lived phenomenon, as every web development outfit and off-the-shelf hosting company will inevitably start pushing low-cost SSL options. I'm not so naive as to think simply encrypting web traffic this way will solve all the security ills of the internet, but it's certainly a step in the right direction, and one that takes Google – or another company of similar clout – leading from the front to bring it to reality.

Outside of the security industry, perhaps the more interesting debate will focus on marketing and targeting of services. With Google encrypting all its search traffic, webmasters will lose one of their most powerful tools: keyword data. From a privacy perspective this is great news, since it means tracking users by keyword searches will be no longer possible. At the same time, it's a pain for businesses, which will no longer be able to segment their visitors by keyword. The change shouldn't come as a surprise to anyone, as Google has been mucking about with encrypted search since 2010. What's new is the announcement regarding the ranking algorithm, which rubber stamps the route it's taking. Businesses that have become reliant on analytics will have to get used to more and more searches falling into the punishing "not provided" keyword data segment.

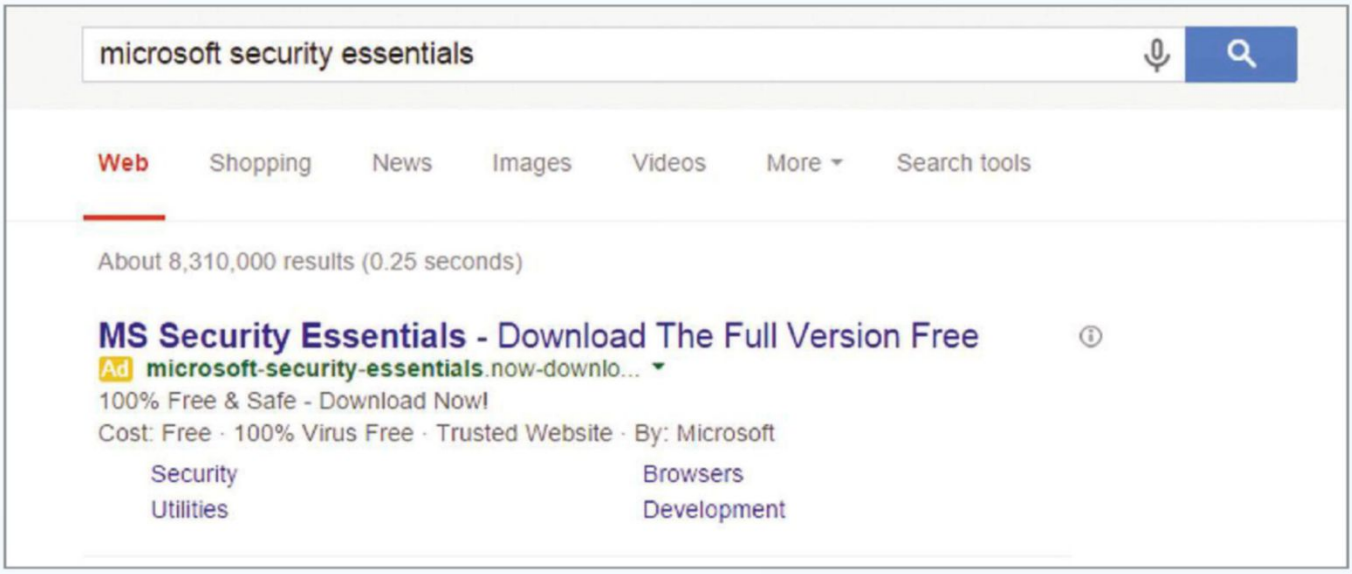
> It doesn't want to be the next Facebook – it wants to be the first Ideapod, which is a different kind of social network altogether

NICHE SOCIAL NETWORKS

For most of us, the major social networks are Facebook and Twitter. The business-orientated networker will probably be hooked up to LinkedIn, too, while those looking at an alternative may experiment with Google+. As the father of twin boys who have just entered this realm, I can confirm that Instagram is pretty high on the list too.

None of these services is perfect, however, so lately I've been exploring two less mainstream social networks – one so new it's still in beta, the other old but relaunched with a new focus – to see whether they're worthy of your attention.

The first is Ideapod (ideapod.com), with a mission statement that talks about "amplifying the ideas that shape the world". Dig a little deeper and it seems what Ideapod is trying to do is respectable enough: rather than providing just another



Google is promoting a non-Microsoft site when searching for Security Essentials, with dubious results

place for folk to post pictures of cats and inconsequential drivel, it aims to create an enduring dialogue about ideas that matter. It's being promoted as a platform for thinkers and "change makers", with an eye on creating movements to influence that change.

This doesn't mean Ideapod is a political launchpad: politics has a place there, but shared ideas can just as often be about technological change or business innovation. I've been invited to become part of the beta-test network, and if you put your name down on the list too (and are accepted) you'll find that what you actually get looks more like a magazine site than a social network.

In fact, it's a little "Pinteresty" in appearance, with many ideas expressed via images, videos and web links; text can be used too, but there's a 1,000-character limit, which does help focus the mind. Responses from like-minded members are also limited to 1,000 characters, positioning Ideapod somewhere between Twitter (bigger messages) and Facebook (more meaningful content).

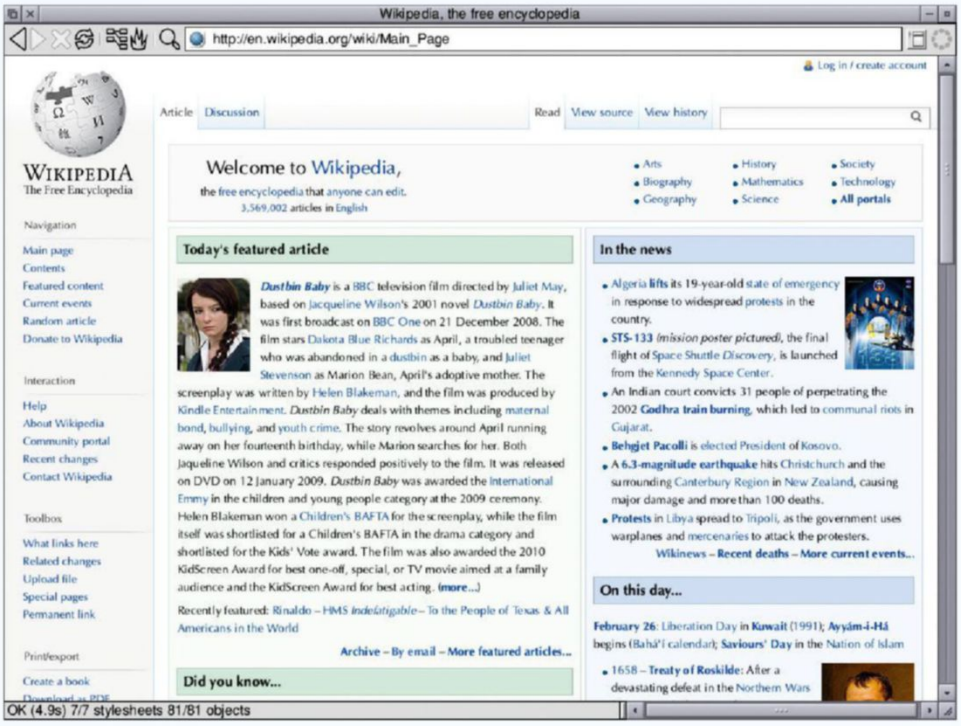
It's early days, but I've already found some thought-provoking ideas posted, and some fairly highbrow organisations are getting on board, including the UN and the World Economic Forum.

The major challenge for Ideapod is the same one facing anyone trying to start a social network in 2014: attracting users who are already invested in other platforms. Even Google+, despite the huge corporate machine behind it, has struggled to persuade users to jump on board. Ideapod isn't directly competing with Facebook, however, so in this sense it has an advantage: it doesn't want to be the next Facebook, it wants to be the first Ideapod, which is a different kind of social network altogether.

Only time will tell if it can succeed, but it's a fresh idea if nothing else.

Unlike Ideapod, LockerDome (lockerdome.com) is neither new nor short of members, having launched in 2008 and now boasting some 40 million users on its books. It shares some common ground with Ideapod in that it's looks even more like Pinterest, being built around networks of interests rather than people you know.

Originally those interests focused on US sports, but a series of relaunches has seen LockerDome's scope expand considerably (and good thing too, or you wouldn't have seen me within a mile of it).

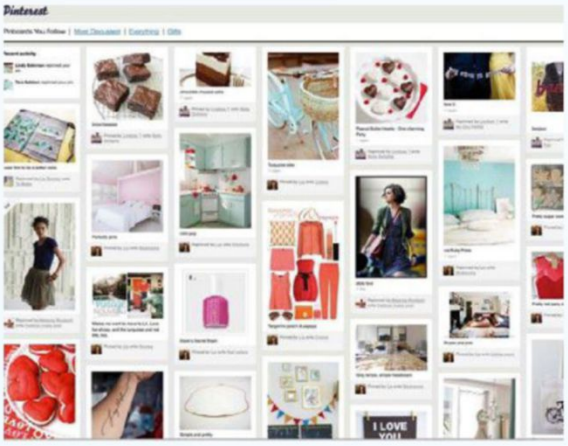


▲ Wikipedia's credibility as a reliable information source is questionable.

Quite what LockerDome is meant to be, though, is hard to put your finger on. Ideapod is clearly aimed at the thinker, whereas LockerDome seems to have a more scattergun approach to content.

In some ways, this isn't a bad thing: for me, as a writer, it's useful for gathering links when researching a subject, extending into that note-taking and scrapbooking territory covered so well by the likes of Evernote, but with added socialising.

Structurally, LockerDome is built around folders – or lockers as it calls them – of information on a subject, which are open to anyone. There's also a search function that opens up the "unified conversation",



▼ Pintrest's exploding popularity comes from giving people the power to create custom content sources.

giving you a view on what others are saying about a subject. So far, so good – until the legacy kicks in, by which I mean the sports-orientated history of the network. You quickly get used to sports content popping up in searches for seemingly unrelated subjects.

Some interesting feeds are included around the technology lockers, but there isn't much originality to them, and they generally just point elsewhere. You can vote topics up or down, and you can start a conversation, but there's far less dialogue going on than you might imagine.

I do like the move away from "who you know" to "what you like", but it's been done better before by others, notably Pinterest.

Where people are talking, the unified conversation feature kicks in and merges all chat about the same subject into a single thread, which works better than you'd think – although it can be hard to discover what everyone's talking about when it comes to my own geeky interests.

There's certainly potential for deeper conversations to take place here, but it will need more engagement outside of the sports topics that still seem to be at LockerDome's heart.

Given the number of users, I'd have expected this kind of diversification to have happened already, but evidently it hasn't – at least not in the space I occupy. ■

Internet of things

FIONA TEAKLE SEES THE INTERNET EVERYWHERE.

One of the topics discussed at the recent Youth Festival of ICT, YITCon was the Internet of Things. The exciting part of the Internet of Things (IoT) is that it is bringing together information from multiple devices and applications to provide insights. CISCO is currently predicting that about 50 billion machines and devices could be linked by 2020, this is incredible to think about!

In an environment where the world is going to become even more connected what does this for you and your business?

Having access to such insight can assist in terms of how and why decisions are made. We have started to see the creation and take-up of wearable technology. But what is going to happen when this is taken to the next level? What if your fridge could remind you that you were running out of milk and remind you to get it on your way home? The objects that we know now to just be objects will soon be helping shape the way we live our lives.

Steven Cooper a developer from PayPal/Braintree has said that, "The internet of things is an exciting space particularly for developers as it creates new ways for not only people to connect to developer websites/mobile apps but also everyday items like appliances and even furniture. As we approach 2020 when it's predicted there will be 50 billion IoT devices on the planet we see an amazing array of ways that we will be able to engage with users in a whole new way to create exciting opportunities particularly in the field of commerce."

IoT will enable users to carry a single device that will enable you to pay for something and then send you the receipt electronically. However on the other side there is also a requirement to ensure users are getting a choice about whether they want to share the data you are trying to capture. Do they want to be as connecting to the world as you would like them to be? As with any new technology there will be a lot of resistance to change.

> "It is not just about connecting the world for the sake of it, it's about understanding how we are improving the world for the better"

While the excitement exists around what may be, we also need to consider the downsides of IoT. It has the potential to further enhance the skills gap for those that are not as tech savvy as some of us. Yet, there is also the issue in that not many people have the required skills in order to be component and lead in this area. Many people are starting to understand the change and increase; there is potentially a gap that will be required to be filled.

Not only is there a gap in skills required to implement, maintain and progress, but also in terms of the use of data. We are going to be receiving amounts and types of data that have not been provided before. Understanding how you can use the data, either in a small way to understand when there is an anomaly; e.g. If the devices are able to provide information on a traffic problem and advise people before they hit the traffic they have an opportunity to go around it, some of this is already in place. There is, however an opportunity to look at the larger amounts of data provided to be analysed in order to solve the wider problems. With the increase in data and devices we risk the increase of hacks and potential harmful viruses. As we continue to be more connected there is going to be an increased reliance on security. Ensuring this is well built into all solutions will help to protect at the start, however it needs to be an ongoing investment. Security threats will only increase and ensuring you are in the right position to handle these is critical.

It is also important that we are clear on why we are connecting the devices we are connecting. What is the purpose and what is the problem we are trying to solve? It is not just about connecting the world for the sake of it, it's about understanding how we are improving the world for the better. Without this understanding you will not be successful.

Internet of Things will bring together devices in a way that we could not of imagined 10 years ago. Being prepared for how it may change your life and ensuring you have some knowledge to lead others is going to be critical.

If you missed YITCon, head over to our Facebook page and twitter feed to hear some of the feedback on the sessions. Also keep an eye out for the release of the recordings of some of the high quality sessions.

FIONA TEAKLE is Director of the ACS Young IT Board. You can contact her at fionateakle@acsmail.net.au

CORPSOFT.com.au

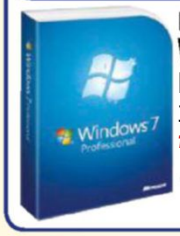
1300 SOFTWARE

Online: www.corpsoft.com.au
TollFree: 1300 763 892
Phone: (02) 9725 3700
Fax: (02) 9604 1983

Download Store • No Packaging • No Shipping • No Waiting
Reduce your environmental footprint, no shipping or packaging. Step1: Download. Step2: Purchase. Step3: Register and Activate

SAVE OVER 66%

Windows 8 Pro Upgrade
from WindowsXP / Vista / Windows 7
Retail or Download $125



Microsoft **Windows 7 Professional**
32 or 64 bit
for System Builders
Retail Pack $198

Microsoft **Windows 7 Home Premium**
32 or 64 bit
for System Builders
Retail Pack $143

Microsoft **Office 2013 Home & Student**
From $125

Microsoft **Office 365 Personal**
Download $79

Microsoft **Office 2013 Home & Business**
From $239

Microsoft **Office 365 Home**
Download $99

Microsoft **Office 2013 Professional**
From $495

Microsoft **Office 365 Small Business**
From $168

Microsoft Volume Licensing

Call us or visit oue web for all your licensing requirements

Office Standard 2010 From $589
+ FREE upg. to 2013

Win 7 Pro Upg From $289
+ FREE upg. to Win 8 Pro

Project 2010 From $898
+ FREE upg. to 2013

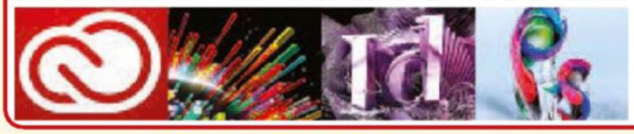
FINAL STOCKS CS6

Design Standard $1990 Save
Web Premium $2495 $500

Adobe CS6

	Education/Not For Profit	Upgrade from
Creative Suite CS6 Design Standard	$660	$559
Creative Suite CS6 Design & Web Premium	$880	$759
Adobe InDesign CS6	$300	$249
Adobe Photoshop CS6	$450	$440

NOW AVAILABLE Adobe Creative Cloud



12 Month Memberships (Win/Mac) *Prices ex GST*

	Education/ Not For Profit	Special for CS3-CS6 Users	Commercial/ Government
Adobe Creative Cloud Team	$420	$599	$839
Adobe InDesign CC	$179	$239	$360
Adobe Photoshop CC	$179	$239	$360

CLEARANCE CORNER . . .

Visit our web for up to 90% OFF stock clearances

CORPSOFT.com.au

CORPSOFT.com.au

1300 SOFTWARE

Free Delivery on purchases over $200 and under 3kg cubic weight

Your One-Stop Software Shop SINCE 1987

Order Hotline: 1300 763 892

NEW Releases for 2015

Adobe

NEW Version 13
Adobe Elements
Photoshop Elements $129
Elements BUNDLE $195

Adobe
Acrobat XI 12-Month Subscriptions
Standard $198
Pro $263

NUANCE
Speach Recognition Software

Dragon Naturally Speaking Professional v13
Retail Pack $529 Save $70

Dragon Naturally Speaking Premium v13
Retail Pack $169 Save $30
Upgrade $130 Save $20

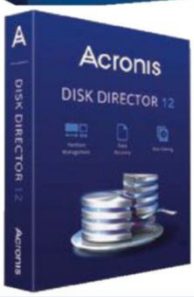
COREL

Corel
Paint Shop Pro X7
Standard $95
Ultimate $120

Corel
Video Studio X7
Pro $95
Ultimate $120

Acronis

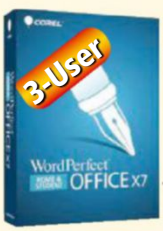
True Image 2015 for PC/Mac
PC Backup and Recovery
Retail Pack $79



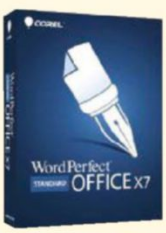
Disk Director 12
Partition Management - Data Recovery - Cloning
Retail Pack $70

Corel
CorelDRAW Home & Student X7
Retail Pack $149 Save $50

Corel
CorelDRAW Graphic Suite X7
Upgrade $239
Full Version $539

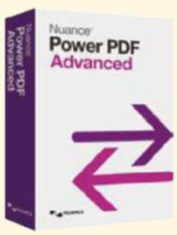


Corel
WordPerfect Office X7 Home & Student
Retail Pack $175 Save $50

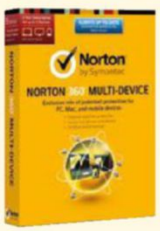


Corel
WordPerfect Office X7 Standard Upgrade
Retail Pack $225 Save $50

Nuance
Power PDF Standard
1-User $94
5-User $420



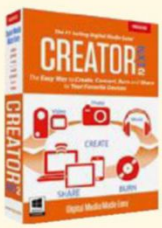
Nuance
Power PDF Advanced
1-User $132
5-User $620



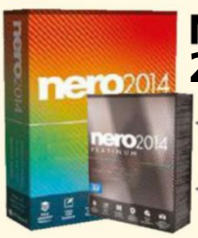
Norton
360 2014 Multi-Device
3-User $69
5-User $82

Norton
Internet Security 2014
Retail Pack $74
Download $74

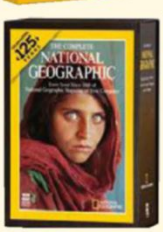
Adobe
Photoshop Lightroom 5
Upgrade $109
Full Version $189



Roxio
Creator NXT2
Retail Pack $79
Save $50



NERO 2014
Standard $95
Platinum $109



The Complete
National Geographic
NEW EDITION!
125 years (1888-2012)
Retail Pack $88

Unit 1, 28 Victoria St, Smithfield NSW 2164 • PO Box 6168, Wetherill Park NSW 2164 CorpSoft.com.au is a division of Corporate Software Australia Pty Limited ABN 65 003 338 029

PLEASE NOTE: • Delivery by Registered Post $11.00 (up to 3kg) • We accept payment via Direct Deposit or Mastercard and VISA with no surcharge. We accept AMEX with surcharge. Goods ordered in error incur a 15% restocking fee • We accept authorised returns for Credit within 10 days if goods are unopened and in saleable condition • Moneyback Offers (if any) are the responsibility of the manufacturer • Prices advertised, unless noted otherwise, are GST inclusive and correct at the time of artwork preparation, October 17th 2014 • Images shown are for illustration purposes only • Errors and omissions are excepted • Prices are subject to change without notice. CSA 1412

The clock is ticking for Microsoft, says Jon Honeyball, as Apple outsmarts it once again

"The Apple Watch marks a tipping point in the industry. The wearables market has so far been populated by products that were barely any good, at least in the eyes of the general population. Whether or not that's a fair viewpoint is immaterial – customers didn't buy them, or, if they did, often returned them for a refund.

I've been keeping an eye on this sector for a while now. My interest stretches all the way back to the original Timex Datalink device from Microsoft, which used a camera to read line patterns from your desktop PC screen to do the sync. That was really rather clever back in 1994.

More recent efforts have included the rather charming Pebble. It works, but doesn't do enough to reach that critical point where you must have it with you all the time. Samsung's effort, although much derided, tried to bring decent screen quality to the game, and even included clever circuitry within the watch strap itself. But again, it simply wasn't enough to make it a must-have, always-wear device. And you can tell I'm in a charitable mood by the fact I'm willing to describe the third-party developer effort as merely miserable.

Apple's device will be different. Not only will it be better than its forebears, it also brings with it a huge developer platform and application-delivery mechanism.

Actually, my interest isn't with the Apple Watch's display, but the way it will hopefully bring Siri to your wrist, and the implications this has for the useful size of the device you carry around in your pocket. For some months now, I've been trying out various Bluetooth solutions that can be mounted within or on the outside of motorbike helmets. Obviously you can't work with any touch device while wearing protective bike gloves, although Garmin makes a good stab at it for its GPS navigation devices. Useful, yes, but it's only a GPS at the end of the day. For really useful things, you need voice recognition.

Whether you're in the car, on a motorbike or riding a pushbike, the ability to control via voice is critically important. Once you get used to it, this works just as well around the office. A well-designed app should be able to present its information in a coherent way via voice, and to receive instruction the same way.

It's quite extraordinary to press the button on my Sena Bluetooth headset unit (which mounts onto the outside of my helmet) and get Siri to read me my inbox while I'm on my motorbike stuck in traffic. Or even select a track of music for calming Bach.

Where is Microsoft in all of this? The company has a long history of wearables, from the Timex I mentioned earlier through to the SPOT system that came and went (Smart Personal Object Technology, for those who need reminding, was meant to give extra intelligence to everything from key fobs to watches). Surely a Windows Watch could be an excellent Bluetooth 4 companion device to Windows Phone, together with desktops and laptops? It could use the Cortana voice-recognition system. There's a huge Windows-orientated development community just waiting to get its teeth into this market. But the only signs of an impending product come from rumours: there's no development programme, or at least not one we're aware of.

And why is Microsoft being left behind in the payments system world? It's big enough, has more than enough muscle with the banks, and this is yet again an area where Microsoft should be leading, but Apple has stolen the advantage.

I'm sure the Microsoft Apologista will be fuming, claiming that the Redmond product is just around the corner, will be so much better, and will blow the silly little Apple thing out of the water. The efforts by Samsung will be dismissed with a flick of the wrist, and Pebble will receive a passing nod if only for its initial oh-so-hip crowdfunding.

"Nadella may be loved by the stock market, but there's only one eventual outcome"

But will wearables, the health framework and payments infrastructure be the next arenas where Microsoft comes in last with usable products and platforms? After the debacles of Windows 8, you would think that the company would have stepped hard on the gas pedal. But Apple has stolen a march on Microsoft yet again. First iPod. Then iPhone. Then iPad. Now wearables, payments and health. Mr Nadella may be loved by the stock market, but let this pattern continue and there's only one eventual outcome."

PC & TECH AUTHORITY

Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065
Locked Bag 5555 St Leonards NSW 1590
Chief Executive Officer David Gardiner
Commercial Director Bruce Duncan

This magazine is published by nextmedia Pty Ltd ACN: 128 805 970, Level 6, Building A, 207 Pacific Highway, St Leonards NSW 2065 © 2014. All rights reserved. No part of this magazine may be reproduced, in whole or in part, without the prior permission of the publisher. Printed by Webstar Sydney, distributed in Australia by Network Services. The publisher will not accept responsibility or any liability for the correctness of information or opinions expressed in the publication. All material submitted is at the owner's risk and, while every care will be taken nextmedia does not accept liability for loss or damage.

Privacy Policy
We value the integrity of your personal information. If you provide personal information through your participation in any competitions, surveys or offers featured in this issue of Inside Sport, this will be used to provide the products or services that you have requested and to improve the content of our magazines. Your details may be provided to third parties who assist us in this purpose. In the event of organisations providing prizes or offers to our readers, we may pass your details on to them. From time to time, we may use the information you provide us to inform you of other products, services and events our company has to offer. We may also give your information to other organisations which may use it to inform you about their products, services and events, unless you tell us not to do so. You are welcome to access the information that we hold about you by getting in touch with our privacy officer, who can be contacted at nextmedia, Locked Bag 5555, St Leonards, NSW 1590

PERMISSIONS & REPRINTS: Material in *PC & Tech Authority* may not be reproduced in any form without the written consent of the Commercial Director of nextmedia. Quotations for reprints are available from the Production Manager. *PC & Tech Authority* logos are trademarks of nextmedia Pty Ltd. Editorial items appearing in *PC & Tech Authority* originally published by Dennis Publishing remain the copyright and property of Dennis Publishing. Copyright Felden 1994. All rights reserved.

EDITORIAL
Managing Editor: David Hollingworth: dhollingworth@nextmedia.com.au
Editor: Ben Mansill: bmansill@nextmedia.com.au
Art Director: Tim Frawley

REGULAR CONTRIBUTORS
Rosalyn Page, Mark Williams, Jon Honeyball, Sasha Muller, Tim Danton, Tom Arah, Ian Wrigley, Simon Brock, Jonathan Bray, Dan Rutter, Fiona Teakle, Jenneth Orantia, Bennett Ring

PRODUCTION
Advertising Coordinator: Melanie Ballard
Production Manager: Alison Begg
Circulation Director Carole Jones
Printed by: Webstar
Distributed by: Network Services Company, Australia; Netlink, NZ

ADVERTISING
Phone: (02) 8399 7603 Fax: (02) 8399 3622
Group Advertising Manager:
Joanne Ross: jross@nextmedia.com.au

SUBSCRIPTIONS
1300 361146
or subscribe@mymagazines.com.au

nextmedia

Printed on paper sustainably sourced from PEFC certified forests

Audited Media Association of Australia abc

Please recycle this magazine

CHARGE!

All Anyware power adaptors come from quality manufacturers with full Australian Electrical Safety Compliance approvals. 8Ware's and mBeat's new range of AC USB Chargers meet all necessary safety requirements so you can rest assured you are purchasing only the best. Power your life with these multi-port charging solutions suitable for up to 10 mobile devices to help keep you in charge!

6-Port USB Charging Station

- 6 dedicated USB ports (3 x 2.4A, 3 x 1.0A) with a huge 51W of total power
- Perfect for boardrooms, classrooms, offices etc.

Product Code: 8WD-LS6U

$49.95

4-Port USB Charging Station

- Provides 4 USB charging ports (2 x 2.4A, 2 x 1.0A) for tablets and smartphones
- Built-in overvoltage / short-circuit protection etc.

Product Code: 8WD-UH1042P

$29.95

5 Port USB Wall Charger with Travel Adapter

- 5-Port USB Wall Charger with Travel Adapter
- Includes 4 interchangeable plugs for international travel (US/ UK/ EU/ AU)

Product Code: 8WD-T301

$29.95

4 Ports USB Wall Charging Station

- 4 USB charging ports – 1 @ 2.4Amps, 3 @ 1.0Amps for tablets and smartphones
- Available in 3 stylish colours

Product Code: UH1041P-BL
UH1041P-GR
UH1041P-YL

$24.90

7 Port USB 3.0 + USB 2.0 USB Hub

- 6 dedicated USB ports (3 x 2.4A, 3 x 1.0A) with a huge 51W of total power
- perfect for boardrooms, classrooms, offices etc.

Product Code: MB-HUB716

$34.95

5 Port USB Wall Charger with Travel Adapter

- Huge 10-port charging hub
- Charge 10 devices at 1Amp or 5 at 2.4Amps simultaneously

Product Code: MB-CHGR10U-BLK

$69.00

Available from:

mwave.com.au
Australia's Largest Online Tech Retailer
www.mwave.com.au
1300 727 446

centre com
www.centrecom.com.au

scorptec
www.scorptec.com.au
1300 726 770

Distributed by: Anyware
1300 269 927
www.anyware.com.au

SEIKO

DEDICATED TO PERFECTION

seiko.com.au