# Mac|Life

MAC  iPHONE

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**APRIL 2017  NO.126**

## BECOME AN APPLE GENIUS

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Future

# Mac|Life

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APRIL 2017  NO.126

# CONTENTS

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74

55

78

54

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# APPS BECOME PLATFORMS

**APPLE RECENTLY** released big updates for its music apps: a new-look interface and many more advanced features for Logic Pro X on Mac, and a whole raft of new stuff for GarageBand on iOS, which you can read more about on p14. I'm leaving the judgments on Logic Pro to someone who really knows what they're doing for our review next issue, but I've been using GarageBand, and I'm just blown away by what Apple has added. Without making the main interface any more complex, it's now full of fantastic granular tools, and offers expansion via app extensions.

It's interesting that an app that's theoretically very focused on casual users gets updated alongside the pro app. I feel like we're seeing one of Apple's strategies for the future of iOS really come into focus: to make its apps capable on their own with very clean and friendly interfaces, but with extensions to allow for more advanced and high-end features.

GarageBand's tools are now impressively deep, but they're nothing compared to Logic. But third-party apps are now capable of adding their own interfaces into GarageBand to apply sounds and effects. And if you've seen some of what's out there, you'll know these apps can be incredibly complex and detailed. But Apple is leaving that choice up to you – instead of it making a Logic-style pro app for iOS, it's up to users to add app developers' more advanced offerings. We see this approach in Photos too, and Maps, and even Siri. I kind of love the idea – pull you in with a free easy default app, while leaving the door open for you to expand that however you want as you become more confident.

I hope we get the same approach in iMovie soon – I can imagine extensions adding new transitions, titling styles, color grading, and all kinds of effects. Inevitably, this approach can't satisfy everyone, but when I think about how easy this will make it for new people to get into video or music creation, and grow their skills to produce truly polished work, I get really excited.

**MATT BOLTON,** Editor
Twitter: @matthewbbolton

# LETTER OF THE MONTH

Apple has got quite a lot money, and armchair pundits love to spend the company's money for it. Buy Tesla! Buy GoPro! Buy Sonos! At the risk of joining the crowd, I would like to offer my opinion to the fray. Apple should strongly consider acquiring Nintendo. With a slew of valuable intellectual property under Nintendo ranging from Mario to Star Fox, it could add an advantage to Apple's hardware offerings. The Apple TV would be poised to enter the game console market as a low-priced offering. The iPhone could flex some exclusive games muscle over Android, with titles like Zelda and Donkey Kong. **CHARLES GILLESPIE**

It's a very tempting thought for Nintendo fans like myself, but I doubt it will happen. For a start, Nintendo is still worth a huge amount of money: $28 billion. That's a bit rich even for Apple. I also doubt the traditional Japanese working culture of Nintendo would mix well with Apple's centralized style. We're starting to see big Nintendo names on iOS now anyway – keep your eye out for Animal Crossing soon!


You can still find OS X 10.11 El Capitan via Apple's support website.

## A map to El Capitan
The Ask column in the February 2017 issue (#124) states that older iMacs cannot be upgraded to El Capitan because it isn't available from the App Store. According to this article (**apple.co/2jU76oI**) on Apple's Support website, El Capitan is indeed available. I followed the link in the article which took me to the El Capitan App Store page. I hope that someone finds this useful. **OBERT LINDSTROM**

**Thank you for sharing this, and we apologize for the error. You can't get to the El Capitan installer on the App Store by searching for it, but the link above does enable you to find it on the page.**

## Time options
If Apple is going to do away with creating the Airport/Time Capsule, I sincerely hope they release the API to allow third-party vendors to back up wirelessly via Time Machine. It's an indispensable part of my life. I have everything set up to back up so I can set it and forget it. **BEN HOLETON**


NAS drives such as the WD My Cloud work with Time Machine.

**There kind of already is! It's not an API (application programming interface – a way for different bits of software to talk to each other), but is instead a specification that network hard drives can use which means they'll show up in Time Machine as a valid backup option. Synology, Western Digital and others offer compatible products.**

## Extended Windows
Your article on managing disk sets was great. However, I have the following question: Can disks formatted in Mac OS Extended format be read by a Windows PC? **RAFAŁ**

**Windows can't do this natively, but there are tools that can enable it. HFSExplorer (free, catacombae.org) lets you read drives and extract files. Paragon HFS+ ($20, paragon-software. com) enables you to write to them as well. However, we don't know what will happen after the arrival of APFS, which will probably be later this year. This is a replacement for the HFS system used in Apple's current formatting, which is what these pieces of software are designed to deal with.**

## Extended Windows
Regarding the speculation that the touchpad might be turned into a screen in future iterations of the MacBook, I can't shake the image of a giant Nintendo 3DS with an Apple logo on it… **MICHAEL LAVALLÉE**

**It's a double appearance for Nintendo this issue! It does sound a bit like that, but we're intrigued by the idea…**

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**Mac|Life**

## FEED YOUR MIND, FEAST YOUR EYES.

Amazon's Fire TV is significantly cheaper than the Apple TV.

# Apple TV is in decline - what's going wrong?

## Apple's newest platform is struggling against competitors

**BY EMMA BOYLE**

**DESPITE ITS REVAMP** in 2015, Apple's video streaming box isn't having the best time. Reviews were positive, though identified weaknesses, but recent data from market research firm eMarketer indicates sales aren't picking up. Its report says that Apple TV "is at the bottom of the U.S. connected TV market, behind Google Chromecast and Roku, with its share shrinking." That's got to hurt for a company that's not exactly known for releasing unpopular products. The data suggests that Apple TV is used by 11.9% of connected TV customers, marking a steady decline from 12.5% in September and 12.6% in 2015.

So what could Apple be doing wrong with its offering? The new Apple TV was a significant improvement on the previous generations of Apple TVs, with its 1080p output, third-party apps, and speedy hardware. However, in the

# Useful changes come to App Store reviews

## You won't get bugged for reviews as much, and devs get to reply BY ALEX BLAKE

context of the wider streaming device market, devices from the likes of Amazon and Roku are offering do the same (and more, in some cases) for around half the price. Apple's competition with some of the most popular streaming services, such as Amazon and Spotify, means it's unlikely we'll see them bring apps to the device any time soon, again putting Apple TV at a disadvantage.

**APPLE IS** increasing the maximum size for apps on the Apple TV from 200MB to 4GB, which should make the device better for game designers – although improved gaming options aren't likely to make the Apple TV more appealing to those looking for a TV streaming device.

The company originally had a great vision for the Apple TV, going as far as calling it the "future of television." But while it's undoubtedly a good device, we haven't really seen any sign of that yet. Though Apple clearly isn't giving up on its box, it's highly unlikely that improving it is at the very top of the company's priority list.

And, while Apple may be making improvements, so are its competitors who were offering more in the first place – making it difficult for Apple to catch up enough to be considered serious competition. Until it's able to offer a service that justifies its price, Apple TV is still aimed more at dedicated Apple users than the mainstream.

**BIG CHANGES ARE** coming to the App Store, both for customers and app developers. In abridged notes for the release of the iOS 10.3 developer beta, Apple revealed that it's introducing an official way for app and game developers to solicit review feedback from customers. But, to combat complaints from users about apps that spam you for ratings over and over again, developers can only do this three times per year, and this counter does not reset when new versions are released. Users can universally disable prompts to leave ratings and reviews using the Settings app, will be able to post reviews from within apps rather than bring forced to go to the App Store, and can use 3D Touch on iPhone to mark reviews as helpful when browsing the App Store.

**ONE CHANGE THAT** will be welcomed by developers is the chance to be given a right of reply to reviews on the app stores for iOS and Mac, visible to all customers. Before, developers had no connection to customers unless they had collected information via user registration, and were given no right of reply on the App Store. This has been a bugbear for app makers for years; if anyone left bad ratings because they misunderstood an aspect of the app or had a solvable technical issue, the developer had no way to help them, while their average rating was still lowered. Apple uses an app's ratings as part of its metrics for App Store search results, so a good rating can be vital to an app's success.

Users will also be able to edit their reviews, and developers can then edit their replies, enabling a kind of conversation - albeit in an awkward layout.

Apple hasn't given a timeline for the implementation of the changes, saying only that apps already on the App Store won't have to change their review prompt behavior immediately.

The App Store changes should help everyone.

The Alchemy synth sounds really cool, even if you don't know what you're doing.

# GarageBand for iOS gets serious

Apple's mobile music maker gets more easy tools, and some killer pro ones, too

**BY MATT BOLTON**

**APPLE HAS RECENTLY** updated its flagship music apps on Mac and iOS: Logic Pro X and GarageBand respectively (though GarageBand on Mac hasn't had the same recent love). We'll take a look at the host of technical and feature improvements made to Logic Pro X in an upcoming issue, but it's GarageBand that's been impressing us most.

The biggest new addition is audio plugins, enabling third-party apps to apply effects to a track using their own interface within GarageBand. It work just like Photos app extensions: you install an app from the App Store, and then select it from a list of options within GarageBand's newly expanded mixer tools. GarageBand also gets more of its own built-in effects and tools to apply to recorded tracks, which have all the controls necessary for experts to manipulate them individually and in-depth – though there's also a new voice-recording effects tool that can apply a silly or useful effect with just a tap.

One of the other big features is a new synth, named Alchemy, which has been brought over from Logic using the same pro-quality sound engine, but with some simplified controls. It's perfect for those wanting to play around with *Stranger Things* or *Blade Runner*-style sounds, and is packed with options while still being easy and fun to experiment with. Part of what makes it simple to use is a new option to play keyboard instruments with a chord-based layout, like the one available for all of GarageBand's string instruments. Again, it's perfect for people who know nothing about music but want to play with making something fun.

There are even more tools for pros hidden away, including a two-handed keyboard layout and the ability to record multiple takes, plus fast access to instruments. We're blown away by what Apple has included without making the app harder to use. We hope iMovie gets a similar treatment soon!

You can tweak a visual equalizer for individual tracks while they play…

# >THE SHIFT

A lot of people struggle to get into new apps. **DAVID CHARTIER** says more developers need to get on board with onboarding

Technology has a strange knack for making us feel lost or inadequate. I stopped counting the number of family, friends, and clients who start tech (support) questions with "I'm sorry," or "I must be dumb." This feels unique to tech, too. Do you hear people apologize to their doctors or car mechanics like they do in tech? I don't think so. And while there are myriad underlying problems that perpetuate what we could perhaps call "techxiety," I believe one could be tackled fairly easily, and its solution could have a vast, positive impact for just about everyone: better onboarding.

The process of teaching a customer about how a product works while they use it is referred to in tech as "onboarding." The first time you start up most new Apple devices, they tell you a little about new features or ask you to turn on certain things. Some App Store apps present a message after a big update. A few of the good ones will walk you through a new feature, ensuring you use it at least once to give you an understanding of how it works.

The industry's onboarding techniques have improved in recent years. But considering that there are still so many people who feel powerless with, or even unwelcome by, technology, and the blossoming popularity of "digital literacy" programs to help people from all walks of life, I'd say we have a lot more work to do.

Think about onboarding you've experienced. Much of it has probably been in the form of a few pop-up pages the first time you run an app or start a new device. It's good stuff, but it's usually too much to take in all at once. It also usually vanishes once you're done, leaving you with nothing to turn to for tips, insight, or help besides a big body of support documents.

More progressive and effective onboarding is surfacing, slowly. As much as I dislike the company's invasive business practices, I submit Facebook as a leader here. It rolls out new features methodically, and when one is ready for you, the app displays a small pop up, sometimes with a quick tutorial. Infrequent, contextual, and never lasting long, these nibbles of onboarding feel more like a quick, pleasantly useful tap on the shoulder from your friendly neighborhood tech guru, versus being whacked with an overstuffed bible of feature details.

Other progressive apps are building in new kinds of systems that are onboarding, in-app chat, and support all in one. When you can't find an answer, you can chat almost immediately with an expert from the company and get on with

## Some apps are building in onboarding, in-app chat, and support all-in-one

your day. It's one-tap access to that neighborhood tech guru, except they're actually trained in the product at hand.

These new techniques and tools make a huge difference. When users are better informed in how their tools work, they're more confident in their capabilities and more apt to explore further. As long as the trend continues, more people can feel in control of their tech, instead of the other way around.

Some apps provide great support, while others leave users to try to work things out.

>>> David Chartier is a content strategist and writer with vast experience analyzing the tech world. He runs the website *Finer Things in Tech* (finerthings.in) and hosts its podcast, The Finer Things In.

# >GAME LOOP

Is the US prepared for the future that technology is ushering in? **BRIANNA WU** doesn't think it is, but we can change that

There's not a polite way to say it, but American technology policy is absolutely terrible. In fact, the word "inept" is probably fair. I can't sit by any longer, and I'm running for the US Congress in Massachusetts for 2018. Chances are, because you read *Mac|Life*, you should consider running too. We desperately need technology experts serving across our government.

A major factor in deciding to run was the FBIs attempt to force Apple to develop an iPhone backdoor for law enforcement. After a terrorist attack in San Bernardino, the FBI wanted to open the terrorist's phone to try to gather intelligence. The problem was, agents had not followed procedure, and entered an incorrect password until the iPhone permanently locked. To correct their mistake, the FBI tried to pressure Apple in court to write a custom version of iOS to access this phone.

Though some members of the public are always eager to trade civil rights when the word terrorist is used, technologists saw the extreme danger. Not only could the American government use the program to spy on anyone's phone with this iOS version, it could be used by foreign governments and hackers to compromise everyone. Fortunately for the public, Apple stood firm – but even former President Obama wanted Apple to comply. We desperately need technologists serving that will protect our civil rights. Because, the truth is, congress is comprised of 42% lawyers and they don't understand these issues.

## We desperately need technologists serving in government to protect our civil rights

Another major reason I'm running was last year's Mirai Botnet attack, which congress largely shrugged at. The Mirai attack used so-called "Internet of Things" devices to shut down large portions of the internet in late 2016. Popular low-cost webcams and video recorders shipped with the same default password. The Mirai botnet locates those devices and rewrites the firmware leaving them under the control of hackers. All across America, people unknowingly have devices in their homes that were used to attack our infrastructure.

**YOU WOULD** think the technological equivalent of a terrorist sleeper cell would have congress working late into the night. It did not. Congresswoman Martha Blackburn, who serves on the same House technology subcommittee I hope to serve on, had the temerity to go on CNN and blame the attack on software piracy. Gizmodo very fairly ran the headline, "This is the kind of idiot that Congress puts in charge of technology."

But our problems go beyond the Mirai Botnet. Because our consumer protection laws are bought and paid for by large corporations, there's no real consequence if a company is reckless in securing your data and ends up hacked. They simply send out a warning email to you, and then it's back to business as usual.

Smart technology is hugely beneficial, but it comes with security concerns.

Data breaches usually happen because a database has not been properly secured. Recently, one security researcher threw an insecure database online and it didn't even last 24 hours. Hiring security experts to do it correctly is expensive, so companies often cheap out, and consumers pay the price.

**ECONOMISTS HAVE** a term: "externality." If I run an oil drill, and don't spend the money to keep the environment clean around it, there is an external cost. Nearby water will be polluted, and local municipalities will have to spend a fortune to clean it up. That cost is an externality to my oil drill business. Similarly, when companies don't keep their databases secure, the rest of

us pay a steep price with identity theft, hacking, and financial fraud.

We have to make it more expensive to do the wrong thing than the right thing. That's why congress needs to open up large companies to civil liability if they show extreme negligence in protecting user data. That would have three immediate benefits for the tech industry. First, it would be a huge boon to open source. Having your code reviewed would mitigate liability and would incentivize corporations to invest in open source development. Secondly, it would create a huge market for cybersecurity experts. Thirdly, it would vastly improve our national security – hardening us against attacks on our infrastructure.

Here in the United States, we spend 54% of our discretionary spending on the military. Yet, we are completely unprepared for the wars of the future – which will be

## We have to make it more expensive for companies to do the wrong thing

fought less often with tanks and submarines, and more often by hacking our infrastructure. The corporations that lobby our politicians are quite happy to keep it this way. Vulnerable infrastructure is great for their business.

The free market cannot solve these issues, because the consumer doesn't care and the producer has no incentive to spend the money. Beyond that, our current president is poised to eliminate net neutrality, which would be a huge blow to free information. The stakes are too high for inaction. It's time for those of us that understand tech to step up and serve in government.

# 6 iPhone accessories to get you in shape for summer

## It's time to shed the winter weight and look great again

**BY ALAN STONEBRIDGE**



The TICKR X sensor can track your ground contact time and other stats, and has a treadmill mode.



Yes, this smart jump rope really is a thing.

**SUMMER IS COMING** and you'll want to look and feel your best, so it's time to set aside some time, do some stretches and get your pulse racing. Perhaps you've been in this place before and given up, or maybe you just need a little tune-up. Smart tech can help keep you on track by giving you an idea of how your efforts are paying off without having to wait for plainly visible results – which is one reason many of us lose motivation.

Apple's second-generation Watch is one way to track the energy you're burning, especially now you can use it while swimming, but don't limit your quest for a healthier life to only activities one wearable caters for – check out these iOS accessories for a broader, more flexible, choice.

### 1
**Wahoo TICKR X**
This $79 sensor tracks the motion and intensity of workouts. Apple sells a $149 bundle with a one-year Beachbody On Demand sub, with hundreds of workout videos.

### 2
**AfterShokz Trekz Titanium**
These sweatproof headphones use bone conduction and an open-ear design to keep you aware of things while running; if music motivates you, consider whether staying safe is worth the $129 price.

### 3
**Zepp Tennis Sensor**
Get fitter while having fun: add this $99 gadget to your favorite racket's handle and you'll be able to improve your game while getting fit.

### 4
**Tangram Factory Smart Rope**
LEDs in this $79 rope use persistence of vision to show your jump count; a software update will add calories burned and more.

### 5
**Withings Body**
As well as weight, this $129 scale measures muscle, fat and body mass, plus hydration. Its Health Mate app visualizes data and provides progress updates to help you stick to goals.

### 6
**Concept2 Model D rowing machine**
Add this $945 kit to your home gym and realize serious ambitions thanks to its performance monitor, which can be paired with iOS to send data to mobile apps.
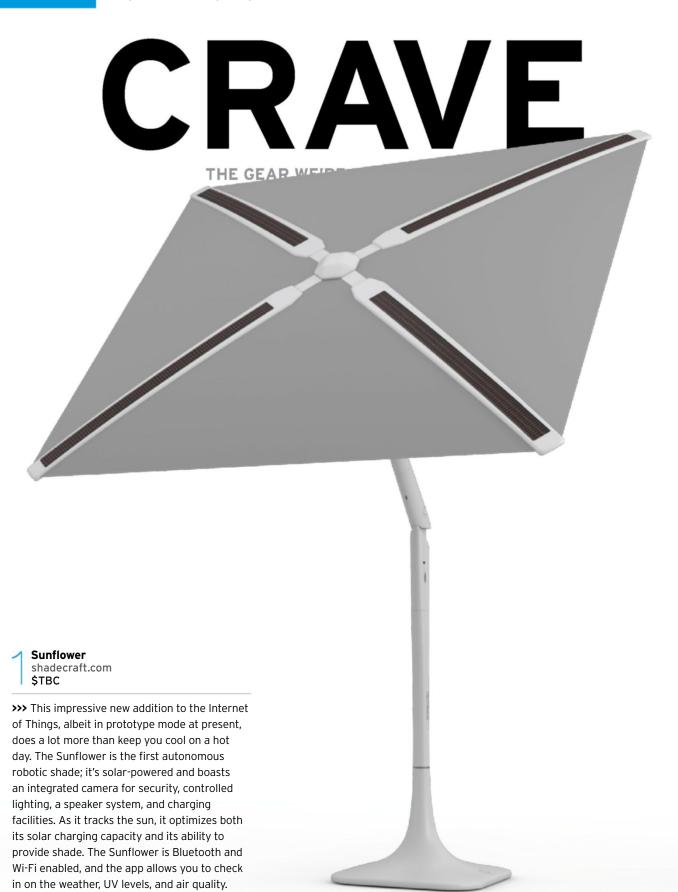


Zepp's sensor can be fitted to any racket.

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# CRAVE

THE GEAR WE'R...

## 1 Sunflower
shadecraft.com
$TBC

>>> This impressive new addition to the Internet of Things, albeit in prototype mode at present, does a lot more than keep you cool on a hot day. The Sunflower is the first autonomous robotic shade; it's solar-powered and boasts an integrated camera for security, controlled lighting, a speaker system, and charging facilities. As it tracks the sun, it optimizes both its solar charging capacity and its ability to provide shade. The Sunflower is Bluetooth and Wi-Fi enabled, and the app allows you to check in on the weather, UV levels, and air quality.

## 2 Kuri Smart Robot
heykuri.com
$699

>>> A home robot, Kuri will move around your house with ease, avoiding obstacles and learning your floor plan along the way. It'll also learn about your habits and routines, so that it can, for example, wake you at the right time each morning. It'll connect with your home devices, play your favorite songs, and respond to your spoken commands – it can even respond to touch. The robot's blinking, emotive eyes are equipped with a camera so that as well as offering facial recognition, it can monitor your home and take HD photos and video.
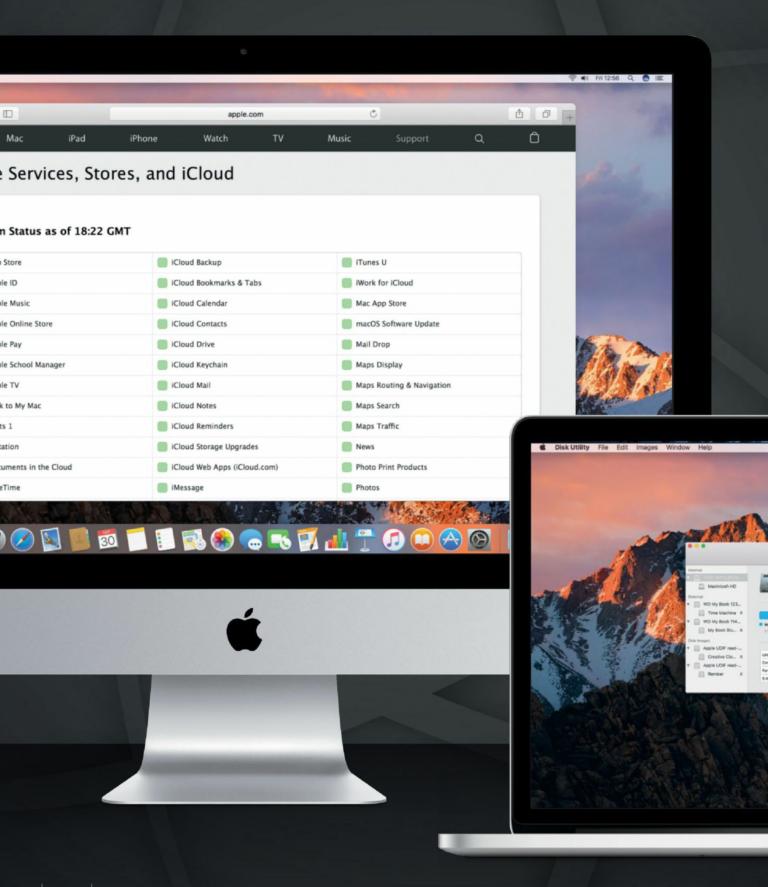
## 3 Canon PowerShot G9 X Mark II
canon.com
$530

>>> Canon's PowerShot range has been revamped for 2017, and the G9 X Mark II now packs a 20.1-megapixel sensor, DIGIC 7 processor, 3x optical zoom, and 3-inch touchscreen LCD. There's built-in Wi-Fi, Bluetooth and NFC technology, and intelligent image stabilization. And you get all this within a truly compact and super slim form – the camera weighs a mere 7 oz. The high-quality image sensor will help you to capture impressively detailed images for a camera of this size. We particularly love the classic look of the silver version.

## 4 LEGO Boost Creative Toolbox
lego.com
$TBC

>>> LEGO: simple bricks, right? Well, the bricks are getting a little bit smart, with the help of the LEGO Boost Creative Toolbox. The Toolbox includes over 840 pieces; the accompanying app provides instructions to build and code five multifunctional models. There's Vernie the talking robot, a multi-tooled Rover 4 transport unit with spring-loaded missile, the Guitar4000 musical instrument, Frankie the interactive cat, and the AutoBuilder – which promises an automated production line for LEGO models. An inspirational update to our favorite interlocking bricks.

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| eTime | | iMessage | | Photos |

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# BECOME AN
# APPLE
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If only there were a secret Apple handbook we could all use. Well, **Nik Rawlinson** has conjured one up for us

What do you do when your Mac goes wrong? Over the following pages, we will unveil the answers. In our *Mac|Life* "handbook," you'll learn how to diagnose problems with unresponsive Macs, misbehaving network connections, uncooperative backups, and macOS mishaps. A word of advice before you begin: don't let on to friends and family about your newfound skills, or you'll be forever plagued by requests for help and advice…

# OH NO, MY MAC'S BROKEN!

## Don't panic – many common problems are simple to fix

### I CAN'T EMPTY THE TRASH

The operating system locks files that it's using or previewing, so if you can't empty the Trash entirely there's a good chance one of its contents is still required by macOS or an app. Quit your apps and try again. If that doesn't work, it could be that one of its contents is locked. Click Finder in the menu bar, hold Alt and click the Empty Trash option (note that the ellipsis after it disappears when Alt is held, meaning you won't be asked to provide additional instruction in a dialog). Still no luck? Open Terminal, enter **sudo rm ~/.Trash.\*** and provide an admin account's name and password as confirmation, then press ⏎. Back up first!
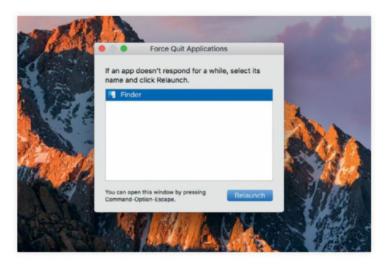
### THERE'S AN OPTICAL DISC STUCK IN MY DRIVE

If the eject icon next to the disc in Finder doesn't work, and neither does dragging the disc's desktop icon to the Trash, open Terminal and enter **drutil eject**; if that also fails, shut down your Mac, then power it on again, holding down the primary mouse button or trackpad while the Mac starts up.

### I'M SEEING FREQUENT KERNEL PANICS

An unexpected black screen overlaid by a multilingual error message is about as serious a problem as Macs ever get. If it's caused by a software glitch, it's usually fixed with a simple restart. However, if it happens often, check your Mac's memory is properly seated (assuming it has removable modules) and other components you've added recently are securely connected.

### FINDER IS UNRESPONSIVE

You can't Force Quit Finder like other apps, but you can force it to restart from that menu.

Or, place the pointer over Finder's icon in the Dock, hold down Alt then press and hold down the trackpad or mouse button; from the menu, choose Relaunch. Beware that doing this will terminate any file operations that are in progress.

### I'M GETTING A LOT OF SPINNING BEACH BALLS

Seeing the beach ball now and then is to be expected – it often appears when an app is waiting for storage to catch up with its requests, say – but if it's happening frequently, check in Activity Monitor (located in /Applications/Utilities) for apps that are excessively consuming resources, or which have become unresponsive. If the same culprits show up again and again, either reinstall them, see if there's an update or, failing those approaches, try to find an alternative app.

### DIAGNOSING OTHER HARDWARE PROBLEMS

Hold [D] while starting up your Mac to open Apple Diagnostics, or Alt+[D] to open it over the internet if it can't be found on your Mac's storage. (If your Mac is from prior to June 2013, you'll need to use the Apple Hardware Test instead; see **apple.co/2je4tN4** for details).

All being well, you should see the code ADP000, which means no problems have been found. Anything else suggests an error, which will either give you a starting point for your own investigation, or guidance when talking to a professional engineer. Apple documents the meanings of diagnostic codes at **apple. co/2j4AGey**.

### MY MAC IS DEAD

If your Mac won't turn on, check the power supply. Exercise caution while trying both a different power outlet and a different lead if you have one, then check the fuse in the plug. The problem may be



internal, such as a transformer or the power switch itself. The latter two are risky fixes – we'd recommend a trip to a Genius Bar or Authorized Service Provider – turn to p32 for details.

### MY MAC IS BECOMING FORGETFUL

If your Mac forgets volume, screen resolution, startup disk or other system settings, try resetting its NVRAM (non-volatile random-access memory). Shut down, then power on again and hold [⌘]+Alt+[P]+[R] till you've heard the startup sound twice (or for at least 20 seconds on a late 2016 MacBook Pro), then let go and allow startup to complete.



### IS IT TIME TO GIVE UP AND START OVER?

Back up all of your data, just in case you change your mind, then hold [⌘]+[R] immediately after powering on or restarting your Mac to enter the Recovery system. When you see a window that lists four options, choose Disk Utility from it, use it to erase your startup disk, then quit Disk Utility and choose the option to reinstall macOS; this will confirm over the internet that your hardware's eligible to run macOS, so ensure it has a reliable Wi-Fi or Ethernet connection to the outside world.

# HELP! I HAVE PROBLEMS WITH MY FILES

From damaged drives to broken Bluetooth, file errors can be fixed

### RANDOM FILES ARE UNUSABLE

If your files are corrupting or becoming inaccessible, check your Mac's storage isn't failing. Internal drives incorporate SMART (Self-Monitoring, Analysis and Reporting Technology), which will alert you to developing problems so you can salvage your data before the drive becomes unusable. In Disk Utility, select the drive in the sidebar (not a volume on it) and check its SMART status at the bottom of the window. If it says anything other than "Verified," back up your data and replace the drive as a matter of urgency.

### SPOTLIGHT RESULTS HAVE BECOME UNMANAGEABLE

Strip down what Spotlight includes in its search results by unchecking what you don't need through its pane in System Preferences. Use the same pane's Privacy tab to exclude files and folders entirely – perhaps even a drive that contains only old archived project files you rarely need.

### AIRDROP PROBLEMS

Check both devices against "What you need" at **apple. co/2eA1elc**, and that Bluetooth and Wi-Fi are on. If receiving on a 2012 or older Mac, click "Don't see who you're looking for?" then "Search for an older Mac" on the sender; iOS devices can't send to them. If the receiver's an iOS device and the sender can't see it,

try the Everyone option. Personal Hotspot (Settings › Mobile Data) mustn't be active. "Block all incoming connections" in a Mac's firewall (p33) prevents AirDrop receipt. Toggling Wi-Fi can fix devices' inability to see each other.

## I CAN'T ACCESS THE LIBRARY FOLDER

There are two Library folders on your Mac: one at the top of your startup disk for assets shared by all user accounts, and one in your account's folder. The latter holds your preferences and other personal items, and is usually hidden. To open this Library folder, switch to Finder, hold Alt and pick Go > Library, or press ⌘+⇧+G and enter **~/Library** in the dialog.



## I'VE ACCIDENTALLY DELETED A FILE I NEED

If you don't have a Time Machine or other backup, and the file has been removed from the Trash, step away from your Mac so you don't risk overwriting the file's data; there's a good chance it's still on the drive, and reference to it has simply been removed from the file system. Apps like Data Rescue ($99, **prosofteng. com**) can often recover "lost" files by interrogating a drive directly, rather than through its index, and are a lot less expensive as a first course of action than a professional recovery service.

## I CAN'T ACCESS MY FILES FROM ANOTHER COMPUTER

The Mac you want to access must be awake and connected to the same network. If you still can't see the remote Mac under Shared in Finder's sidebar, return to it, check File Sharing is enabled in System Prefs' Sharing. If that Mac still doesn't appear in the other's Finder sidebar, try connecting directly: in Finder, press ⌘+K and enter **smb://[machine name].local**, replacing [machine name] with the name shown at the top of the other Mac's Sharing pane.
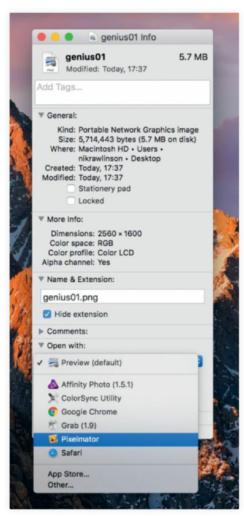
## DOUBLE-CLICKING A FILE DOESN'T OPEN THE ASSOCIATED APP

Check that files of that type are still associated with the expected app: select one, press ⌘+I and ensure the app is listed in the "Open with" section. If the wrong app is listed there, pick the correct one from the pop-up menu, then click the Change All button to set that as the new default app for this file type.

If the app is already running, it may have hung. Press ⌘+Alt+esc to bring up the Force Quit Applications dialog and check whether it says "Not Responding" alongside the app's name. If it does, select the app and click the Force Quit button, and then try double-clicking the file again. If not, try dragging the file onto the app's Dock icon, or using the app's File > Open command.

# I'VE GOT TROUBLE WITH BACKUPS
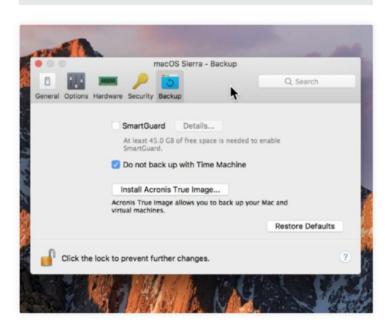
## Don't ignore stalled, incomplete, or missing backups

### THE FILES I NEED AREN'T IN TIME MACHINE

Check the drive or folder in which they're stored isn't excluded from the backup set. Open the Time Machine pane in System Preferences and click Options. If the drive or folder is listed here, it's excluded from Time Machine's backups: select it and click the – (minus) button. If your backups are on a network drive – a Time Capsule or a NAS with Time Machine support – check their health: hold Alt and click Time Machine's menu bar icon, and choose Verify Backups; macOS will detail any problems it finds.



### TIME MACHINE IS TAKING TOO LONG TO BACK UP

The first backup creates a complete copy of your Mac's contents. Later ones should be quicker as Time Machine then only saves incremental changes to files.
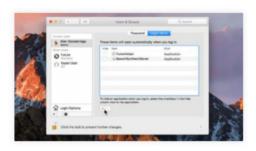
If using a NAS drive or Time Capsule, check both get a strong signal from your network and, if you can, connect both to the same access point. If you run another OS in a virtual machine (VM) within macOS, follow the advice from your virtualization tool's developer on how to back up your VMs: refer to **bit.ly/2jUPJVA** for VMware Fusion and **bit.ly/2k3Ygrd** for Parallels Desktop.

### TIME MACHINE ISN'T BACKING UP AT ALL
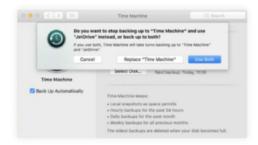
Check the drive is connected and shows in Finder. If backing up to a local drive, use a Mac port rather than an external hub. Don't use a USB port in a display that's set to sleep; that will disconnect the drive. If Time Machine backs up to a NAS drive, ensure your Mac connects to it at login: in Users & Groups preferences, click your account, Login Items, then +, select the drive and click OK.



### MY TIME MACHINE DRIVE IS GETTING FULL

Time Machine is designed to automatically remove very old incremental files when it runs out of space. It does so automatically; to be informed when it happens, in Time Machine's preferences click Options and turn on "Notify after old backups are deleted." Or, connect a new drive and switch to using it ahead of time. It's worth having a second routine to archive files in a way that won't see them disappear over time.

# I'M HAVING PROBLEMS WITH iCLOUD

## Solutions for Apple's online storage and personal data service

### I WANT TO CONTROL SYNCED PHOTOS

If you don't use iCloud Photo Library to store and sync photos between devices, go to iCloud's prefs, click Options next to Photos, turn on My Photo Stream. On iOS, enable My Photo Stream in Settings > iCloud > Photos; pics upload when that device is on Wi-Fi. Photos for Mac adds items from the stream if Copy Items to the Photos Library is on.

### PERSISTENT ERROR MESSAGES

If you can't access iCloud services, there may be an iCloud authentication issue. Sign out and in again in System Prefs' iCloud pane. You'll see the option to remove synced data; though it ought to reappear when you sign in again, the safer approach is to decline so you retain a copy on your Mac throughout.

### HOW DO I KNOW WHETHER A PROBLEM IS MINE OR APPLE'S?

iCloud tends to be very stable and its various services exhibit excellent uptime. However, like all online services it can suffer outages from time to time. It's a good idea to check the service status at **apple. com/support/ systemstatus** before tinkering with anything to see whether a problem is at Apple's end or yours.

### MY ACCOUNT IS UNEXPECTEDLY FULL

Sierra can make use of iCloud to store your Documents and Desktop folders in iCloud Drive so they are available on all your devices. You may have enabled this when you installed Sierra. While useful, this can eat up your iCloud space. To switch it off, go to System Preferences' iCloud pane, click Options next to iCloud Drive; uncheck Desktop & Documents Folders. Empty versions appear on your Mac; drag items back from those in iCloud Drive.

### IS ONLY YOUR USER ACCOUNT AFFECTED?

If an app misbehaves, create a new user account (Users & Groups), log in, and check if it's affected. If not, the preferences file for that app (~/Library/ Preferences) may be damaged; restore from a backup or trash it so the app can recreate it.

# HELP! I'VE GOT NETWORKING ISSUES

## Many networking problems can now be fixed with easy tweaks



### I OFTEN NEED TO CHANGE NETWORK SETTINGS

As long as Location in System Preferences' Network pane is set to Automatic, all network interfaces will be active and macOS will check which can provide an internet connection and use it. If you can't get online or use network services, choose Edit Locations, click + and give the location a name, click Done. Click the cog under the list and pick Set Service Order to what's appropriate. In turn, select each interface, click the cog; for any interface you need active, select it and click Advanced, set it up however the administrator has advised – for Wi-Fi, don't remove networks you need from the Preferred Networks list as that'll remove them from all locations. Click OK > Apply. To switch between location settings, use the  > Location menu.

### MY BROWSER CAN'T CONNECT TO SOME SITES

Your DNS (Domain Name System) server might be having problems or set to block access. In System Preferences' Network pane, select your active connection then click Advanced. Switch to the DNS tab, make a note of existing settings in case you need to reinstate them, then delete them. Add these two entries: 8.8.8.8 and 8.8.4.4, which will set your Mac to use Google's DNS servers.
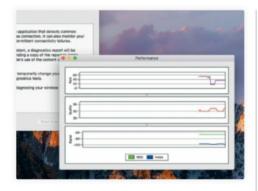
### WI-FI JUST WON'T WORK

Still not working? Try temporarily removing your Mac's Wi-Fi connection.

In System Preferences' Network pane, select Wi-Fi in the left pane, then click

the – (minus) button. Then immediately add it back by clicking the + to create a new Wi-Fi connection with default settings.



### I'M HAVING LONGER-TERM ISSUES WITH WI-FI

Use Wireless Diagnostics (enter its name in Spotlight, or hold Alt and click the



Wi-Fi icon in the menu bar) to inspect your connection and compile a

diagnostics report that you can read through yourself or send to Apple or another support agent – say, your ISP if you're trying to get it to send a replacement router. If these tests don't reveal immediate issues, opt to monitor your connection over time and watch for problems. Check out the options in the tool's Window menu for other useful tools.

## I CAN'T CONNECT USING BACK TO MY MAC

Ensure both Macs are signed in to the same iCloud account and that Back to My Mac is enabled in their iCloud panes. In the remote Mac's Energy Saver pane, set it to wake for network access. Your router must support UPnP or NAT-PMP; use its admin tool to enable it – usually that tool's accessed by going to the router's address in a browser.

To find out its address, Alt-click the Wi-Fi icon and look under your network's name. Still can't connect? Go to **apple. co/2jVvWVK**.



## HOW DO I RESET MY PREFERENCES?

Make a full backup of your system. Turn off Wi-Fi. You need to copy five files related to network preferences to a removable drive, so you can restore them if necessary. In Finder, browse to the top of your Mac's startup disk and then dig into /Library/Preferences/SystemConfiguration. Move (as opposed to copy) the following files to your removable drive, then eject that drive:

com.apple.airport.preferences.plist
com.apple.network.eapolclient.configuration.plist
com.apple.wifi.message-tracer.plist
NetworkInterfaces.plist
preferences.plist

Restart your Mac and turn on Wi-Fi again; macOS will recreate those files, which should no longer include any problems that existed in the versions you removed.

# REPAIR OPTIONS

## If you haven't found a solution, here's how to get professional help

**IF ALL** else fails, taking your gear to Apple may be the answer. That said, Apple isn't always the cheapest option. Before booking in at a Genius Bar, compare Apple's prices with those charged by your local Authorized Service Provider (**apple. co/2fBpTUO**), and third party repair stores. If you use a local repair shop, go to **getsupport.apple.com**, click "See your products" and sign in with your Apple ID to see the warranty status of devices, and whether consumer law might still apply. From here, you can book an appointment for a repair, not only with Apple but also members of its authorized support network.

### DATA RECOVERY

Broken and corrupted hard drives are a frequent cause of lost data, which is why we recommend running both Time Machine and a second backup service at the same time – the latter ideally offsite – to protect your files. If you lose your data, consider its worth, as the cost of recovery can run to thousands of pounds, depending on the time the job takes. Specialists like Kroll Ontrack (**krollontrack.com**), which has several decades' experience in this field, can turn around your data in as little as 12 hours.

### iPHONE SCREEN REPLACEMENT

Outside of warranty, Apple asks $129 for a regular-size iPhone, and $149 for the larger Plus variants. If going to a main street store, take care choosing who to use; a fat-fingered engineer might invoke the dreaded Error 53 on a Touch ID-enabled device (see **apple. co/2kxBNzA**) and cause more problems.



### MACBOOK BATTERY REPAIR

Replacement batteries cost between $129 (for MacBook Air) and $199 (for 12-inch MacBook and the MacBook Pro with Retina display) when supplied and installed by Apple. In recent models, they aren't user serviceable parts, but with older portable Macs, DIY replacements are possible. You should be able to source, say, Duracell batteries for older MacBooks from **amazon.com**.



### HARD DRIVE REPLACEMENT

Checking in for a faulty hard drive replacement will often involve two separate costs: one covering labor, which should include initial investigation to diagnose the problem (Genius Bars don't charge for diagnosis) and one for the new part. Expect to pay around $99 for labor on a Mac mini, say. This service won't necessarily include the transfer of data, so ensure you have a backup before handing over your Mac. For security reasons, also ask for the faulty drive back so you can ensure it's safely destroyed prior to disposal.

# THE ESSENTIAL macOS SOLUTIONS CHECKLIST

## DO

✓ Keep apps up to date. If updates delivered through Mac App Store aren't set to install automatically, regularly check the store's Updates tab, and use a Check for Updates command or check websites of apps obtained elsewhere.

✓ Where a utility or feature of your Mac has a menu bar icon, such as Bluetooth, holding Alt and clicking that icon often reveals useful diagnostic information or menu items that are otherwise hidden.

✓ If your Mac won't start up properly, enter safe mode by holding ⇧ as you power on. If that works, disable login items one at a time (Users & Groups preferences), and start up normally. Repeat until you find the culprit.

✓ Learn helpful startup key combinations to diagnose problems, like resetting the memory that holds system settings, and more. Apple maintains a list of startup shortcuts at **bit.ly/2jeOILg**.

✓ Use the Utilities folder, located in the Applications folder. There's a wealth of apps that can help diagnose and fix problems with networking, displays, passwords, and more.

✓ Send crash reports to developers. If you use El Capitan or earlier, try Console: check lines in system.log from before a crash and copy to your app's developer. Sierra's Console can be less useful; consider opting in to auto-sharing reports – see **bit.ly/SieCo**.

✓ Enable macOS's firewall to boost your Mac's defences against any unwanted connections from other computers. Turn it on in System Preferences' Security & Privacy pane and then configure it by clicking Advanced.

## DON'T

✗ Disable Gatekeeper in Security & Privacy in System Preferences (options listed under "Allow apps downloaded from"). Though it may be annoying when it stops you installing apps from unknown sources, it's easy enough to circumvent for one-off installs.

✗ Use simple passwords: they make it easy for others to gain access to your Mac. Use Keychain Access's Password Assistant (click the key button when adding a new entry) to enter passwords and get feedback on their strength.

✗ Share user accounts. Give each person who'll use your computer their own. This applies to iCloud accounts; to share calendars, music, and more, click Set Up Family in Users & Groups.

✗ Make every account an administrator. Create a standard user account to reduce the possibility of harmful changes. Additionally, use System Preferences' Parental Controls pane to further monitor your kids' actions.

✗ Risk losing your data. With Time Machine built in to the OS, there's no excuse for not backing up. Particularly when external hard drives are now so affordable; a 1TB portable model can be bought for about $50.

✗ Leave windows open when quitting apps if your startup disk is a hard drive. In System Prefs' General pane, turn on "Close windows when quitting…" so documents don't reopen with their app.

✗ Run unnecessary services. If your Mac is the only computer on your network, go to System Preferences' Sharing pane and turn off screen and file sharing at the very least.

# PERSONALIZE YOUR
# iPhone and iPad

Think all iOS devices look and work the same? Think again. **Matt Bolton** shows you how to make your iPhone and iPad your own

# HOW TO CHANGE YOUR WALLPAPERS

**1  Wallpaper settings**
Go to the Settings app and choose Wallpaper. On this first screen, you can see your current wallpaper setup for the Lock screen and Home screen. Tap the "Choose a New Wallpaper" option to change either, or tap the current ones to change how they display (see step 3).

**2  Image types**
Tap "Choose a New Wallpaper." At the top are choices from Apple, including Dynamic wallpapers (which animate by themselves), Still images, and Live wallpapers (which animate when you 3D Touch the screen). Below are your photo albums from the Photos app.

**3  Setting the image**
Tap an image to see a preview of how it will look. Choose whether it stays static (Still), whether it moves as you tilt your device (Perspective), or if it animates (Live). Tap Set when happy, then choose whether it should be your Lock screen, Home screen or both.

## > Change iOS's appearance

**TEXT SIZE**
Go to Settings > Display & Brightness and tap Text Size to bring up a slider that enables you to adjust the default size of text in iOS. The change will be visible in all apps that tie into iOS's Dynamic Type feature, which all the best should. But there's more! Go to Settings > General > Accessibility > Larger Text and there's a switch that enables even bigger sizes.

**REDUCE ANIMATIONS**
Also in Settings > General > Accessibility is an option named Reduce Motion. Tap it you'll see a switch labeled the same thing. Turn this on to disable effects such as the way app icons gently move as you tilt your phone, and the animation of apps shrinking and growing when you open or close them. This can save power, and some people find it more pleasant to use.

**BOLD TEXT**
In Settings > Display & Brightness, just below the Text Size option is a switch that enables Bold Text. If you activate (or deactivate) this, your device will need to restart. It does exactly what you expect, turning text in iOS to bold. Again, apps will have to tie into iOS's built-in text engine for you to see the benefits, but most should.

**BUTTON OUTLINES**
When the look of iOS went flat and simple in iOS 7, many buttons lost their obvious shapes, making it occasionally confusing about what you can tap. Go to Settings > General > Accessibility and turn Button Shapes on, and you'll see that many buttons now get dark gray shapes around them, showing you that they're tappable. The "General" button at the top of the screen should already have changed!
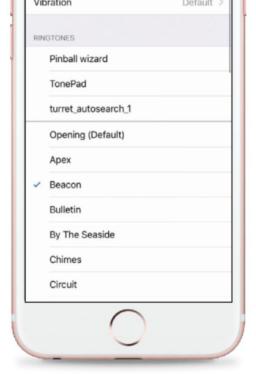
## > Choose some new sounds

> In the Settings app, go to the Sounds option to change the default alert noises your iPhone or iPad makes, as well its vibration options. There's a range of options here, right from the obvious (such as ringtone or text tone) to things such as what noise an AirDrop request makes, or even tweets and Facebook posts. Each is totally changeable from the built-in sounds in iOS – just tap on one to change it. You'll then get a big list of the sounds available, which will be divided into Ringtones and Alert Tones. Ringtones are the longer of the two, but there's nothing stopping you choosing one of these for a Mail alert or similar.

Tap an option to switch to it and hear a preview of the sound, and feel its accompanying vibration pattern. You'll also see an option named Classic – tap this and you'll get a different set of options dating from before iOS 7, when the newer options were introduced. You can buy more ringtones by tapping the Store button at the top, though it's also possible to add ringtones yourself – see below for details.

The options here apply across your device as a whole, but you can customize the ringtones and text tones for individual contacts. Go to the Contacts app, then to someone's entry. Tap Edit at the top right, then scroll down until you see the Ringtone and Text Tone options, which will be set to Default if you've never changed them in the past. Tap one and you get the list of ringtones and alert tones again – just choose a new one for that person and you'll have an easy way to tell them apart from other callers or texters. You can also customize their vibration patterns similarly through this menu.

### KEYBOARD CLICKS

Some people like the keyboard clicks of an iOS device for the feedback, but most people want to turn them off ASAP. Go to Settings > Sounds and scroll to the bottom.

## > ADD YOUR OWN RINGTONE

>>> It may not seem as if you can create your own ringtone for iOS, but it is possible. You need an audio file less than 30 seconds long in M4A format, which you can make on iTunes on your Mac. Select the song you want to use, then right-click and choose Get Info. In the Options tab, set the start and stop times to match the portion you want to use. Close this window and go to File > Convert > Create AAC Version. You'll get a new file that's the length you selected (you can set the original back to normal). Next, manually change the file extension of this new file from ".m4a" to ".m4r" – this is Apple's ringtone format. You'll need to sync your iPhone or iPad with iTunes to transfer the file (or use an app such as iMazing 2), and it will then be available in the Sounds menu in Settings. Ringtones you've installed appear at the top of the ringtones list.

## › Notification options

> Lots of apps send you notifications, though some are more useful, important, or urgent than others. Happily, you can easily customize how these are managed. Go to Settings > Notifications and you'll see an entry for every app that wants to show notifications. Tap one to see its options. The top button stops it from providing notifications at all. The next chooses whether its messages appear in Notification Center, and the next whether its notifications make any sound. Badge App Icon allows it to show a little red dot on the Home screen with a number showing how many notifications you've missed from that app. Show on Lock Screen determines whether its notifications display on the Lock screen. Below that are three options for how it shows alerts on your phone. None means the notification will just make a sound or vibration. Banners slide in at the top of the screen for a moment, then back out. Alerts means the message doesn't go away until you dismiss or open it. Tap one to select it.

## › CUSTOMIZE THE HOME SCREEN

›››One of the best things about the iPhone and iPad is the huge choice of apps, and over time you've no doubt built up a wide range of tools, which may be filling multiple Home screens on your device. But it's simple to organize your icons to make things easier to use. You can move an icon on your Home screen by lightly holding a finger on it until you see the icons jiggling around on screen. Now just drag any of them to reposition them – to move one to a new screen, drag it to the left or right edge and hold there until the next screen slides in, then drag it to the location you want. When you're in this mode, with the icons wiggling around, you'll see that they all have an X icon in their top-left corner. You can tap this to delete an app from your phone (a confirmation will pop up so you can back out if you've made a mistake). Apps deleted like this, including those from Apple, can always be re-installed from the App Store.

You can group apps into a folder to make them easier to find, or to save Home screen space. Hold a finger on one to enter the rearrangement mode, then drag it directly on top of another app and hold it there for a moment. A new square will cover the screen, showing the icon for the other app. Let go of the app you're dragging to deposit it in this new folder. The folder will have a name based on what kinds of apps are in it. You can tap the name to change it; just type in the new one – it can include emoji! You can even add folders to the Dock at the bottom.

## > The Today view

> The Today view is a screen full of widgets, powered by the apps you have installed, enabling you to see information or perform some tasks instantly, without having to open the accompanying app. You can see your calendar entries, turn on a smart light, check the weather, call your favorite contacts… the list is almost endless. It can be a little command center for things you do often – as long as you set it up right. You can access it in three places: by swiping down from the top of the screen (if you see Notification Center here, swipe left to right on it to open the Today view); by swiping left to right from your first Home screen; or swiping left to right on the Lock screen. You get the same screen in all cases. You can change what's shown here by swiping to the bottom of the Today view and tapping Edit. Tap the red minus button next to an app to remove it from view, or the green plus button next to one to add it. You can change the order in which included apps appear by dragging the three lines symbol on the far right of an app's row up or down. Some apps have more than one widget – Maps has several, for example, serving different needs. Experiment with layouts to see what's best for you.

Some widgets have two different views: a small one and a larger, extended one. Tap Show More in the top corner of a widget in the Today view to expand, or Show Less to collapse. You can open the app for any widget by tapping its symbol in the top-left corner.

## > GO PLACES WITH LAUNCHERS

>>> One of the great things about the Today view is the way it lets you get information right on the Lock screen, but with the right apps, you can turn it into a shortcut paradise. Apps such as Launch Center Pro are able to create Today view widgets that serve to launch apps or link to communication options, putting these just a tap away at all times. And you can go even further with apps such as Workflow, which are able to build complex tasks across apps and services, which you can then trigger with just a single press.
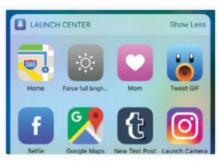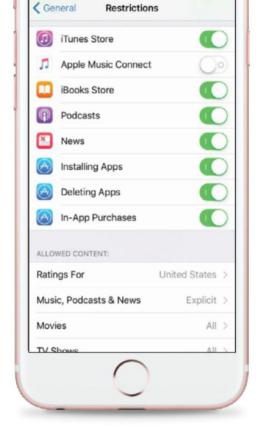
Let's take a closer look at Launch Center Pro. You can build "Actions" in it, which are basically triggers for a series of tasks. For example, the excellent photo app Camera+ works with it, so you can set an action that's just "Launch Camera+" – and you could then make this button available in the Today view, giving you a shortcut to that app. But you can also be more specific with the command, such as opening directly to a specific shooting mode within Camera+. Hundreds of apps have similar options.

You can also set shortcuts to do things such as making a FaceTime call or sending a WhatsApp message to a particular person, or to create a new Calendar entry – all from the Lock screen! These launcher apps can be confusing at first, but once you get used to them, they can save you a huge amount of time.

## > Lock it down with Restrictions

> Go to Settings > General > Restrictions on your iPhone or iPad and you'll find options to limit certain aspects of your device. Some of these relate to things such as what content you'd like your kids to be allowed to access, while others relate to privacy.

First, you'll be asked to set up a passcode for Restrictions, so they can't be turned on or off at will. Make sure you don't forget it! At the top you'll see the ability to turn off access to some built-in apps and features, mostly to do with communication. Below that are options to disable stores and things like In-App Purchases. Under that, you can set content-ratings limits for different media types. Then comes the big list of privacy options – you can stop an app from changing your settings for certain kinds of data by tapping on it, as well as rescind the ability of individual apps to see your information. The options range from obvious stuff such as your contacts and location, right down to your Facebook account and mic access.
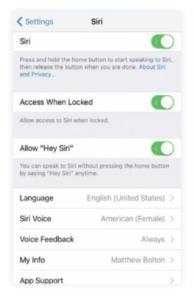
## > MAKE SIRI A SMARTER ASSISTANT

>>> When you interact with Siri, Apple's voice-controlled assistant built into iOS, you don't see many options, but you can actually personalize it in a number of ways. For a start, make sure it knows who you are. In Settings > Siri, tap My Info near the bottom and choose your own entry in your address book. This gives Siri a bunch of useful information, such as your home and work addresses (so you can ask it things like "Find me a route home"), plus tells it what your name is. That said, if you'd rather it called you by a nickname, activate Siri and tell it "Call me..." and add the name you'd like. You can then give Siri some extra information about your family, to make it easier to contact them. Tell it something like "David Smith is my father" or "Janet Smith is my wife" and it will find their contact information, and store that familial relationship, so that in the future you can just say something like "Call my wife" to trigger a call.

Sometimes, Siri's pronunciation of names isn't great. You can tell it that it's getting it wrong, and it will ask for your guidance, and give you new pronunciation options to choose from. You can also manually fix how it says names from within someone's Contacts field. Go to one, tap Edit, then scroll all the way down and tap Add Field. Choose Phonetic First Name and Phonetic Last Name, then type in the phonetic versions.

There are also options to change how Siri works. Go to Settings > Siri and you can choose whether it works on the Lock screen, what kind of voice it uses, and whether it can be activated hands-free by you saying "Hey Siri" (on the iPhone 6s or later).

# > Personalize the outside of your iPhone and iPad

## 1 DECALS FROM THE DECAL GURU

thedecalguru.com

**From $11**

Get a cool new stick-on design for the back of your iPad and really make it your own. This site has everything from pop-culture icons to classic art reimagined, or just cool motifs. Whatever you're into, you'll almost certainly find something here. The decals are vinyl, and attach with an adhesive that shouldn't leave any nasty residue.

## 2 OTTERBOX DEFENDER iPAD PRO 12.9

otterbox.com

**$79**

If you want serious protection for the 12.9-inch Pro, this is the way to go. It's totally drop-proof and dust-proof, including a screen protector. A stand helps you view the iPad when it's placed somewhere, and there's even a storage spot for the Pencil (which works through the Defender's screen protector).

## 3 LIFEPROOF FRE

lifeproof.com

**From $50**

If want to make sure your iPhone is as protected as it can be, this waterproof, dust-proof, snow-proof, and very-high-drop-proof case is it. The Fre totally encompasses your iPhone, with a scratch-proof layer over the screen. It's military spec, and perfect for hardcore outdoors lovers. LifeProof also makes models for iPad named nüüd, because they lack the screen covering...

## 4 DECALGIRL DECALS

decalgirl.com

**From $10**

If you like to keep your iPhone case-free, you can still give it a striking look on the back and front with a gel skin. The designs from decalgirl. com pretty much cover the whole device, and come with a code to download a matching wallpaper, giving an all-over effect. They're easy to apply, are fairly durable, and there's a huge range – or you can design your own if you really want to!



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### 5 LOGITECH CREATE KEYBOARD

logitech.com

**From $119**

Want to turn your iPad Pro into a portable workstation? Apple's Smart Keyboard cases are nice, but Logitech's Create range (for both sizes of Pro) have more control keys, and are backlit. They're really comfortable to type on, though do make your iPad notably heavier. If you have a non-Pro iPad, Logitech's Ultrathin Keyboard Cover range is our pick.

### 6 KHOMO DUAL CASE

khomoaccessories.com

**From $14**

We didn't feature Apple's Smart Cases here because they're kind of obvious, but if you want a cheaper alternative, this is our pick. It protects your iPad front and back, comes in a wide range of colors, and the front folds into a triangle to form a stand, just like the Smart Cover. The auto sleep/wake feature works with the cover, and there are versions for all recent iPads.

### 7 GEAR4 PICCADILLY

gear4.com

**$34.99**

This case uses a magical substance called D3O to protect your devices – it's a liquid that gets harder as it compresses, absorbing impacts easily. D3O is injected into the outside ring of the case, making it amazingly drop-proof for something that adds relatively little bulk. It comes in iPhone-matching finishes, too.

### 8 JUST MOBILE TENC

justmobile.com

**From $19**

Going from heavy protection to light: the TENC case is very thin and clear – it's designed to let your iPhone show through as much as possible. It resists scratches well, but isn't the most drop-proof option – it'll take one good fall onto a hard surface for sure, but may need replacing after. If you want some protection without extra weight or bulk, it's a great choice.

# Multi-mon setups

**MADE EASY!**

Sometimes, one display just isn't enough. Craig Grannell shows how several can benefit you, connectors you'll encounter, and a host of clever apps

**THERE WAS A** time when you would be thrilled at getting your hands on a "gigantic" 17-inch CRT monitor that weighed about as much as a sedan. Today, though, genuinely huge flatscreen displays are cheap, and so you might be tempted to grab one (or even two), attach it to your Mac, and revel in acres of desktop space.

Should you? That depends. We spent hours looking at actual science about the productivity benefits of multiple displays. Unsurprisingly, quite a lot of it was written by companies that make displays. Still, the gist of the more impartial research is this: having access to more pixels can boost your efficiency

– to a point. It depends on the tasks you're doing and how you best focus on them. This article, then, explores the ins and outs of using multiple displays. It's designed as a primer for the features within macOS, an overview of enhancements provided by third-party apps, and also to give you ideas of how to best use several screens.

So, whether you're feeling hemmed in by your tiny MacBook Air, or want to offload tasks to a second screen to free up some room to breathe, our tips and insight will help you get more value from those extra pixels.

# Configure your displays

### >>> ARRANGE DISPLAYS
In System Preferences' Displays pane, use the Arrangement tab to define the relative virtual positions of your displays (they don't have to be side by side). Drag the menu bar strip to the display you want to be considered the main one.

### >>> SET RESOLUTIONS
A display's resolution can be adjusted in the Display tab. Default is the recommended resolution, but Scaled offers others. Holding Alt and clicking Scaled may reveal more options beyond the initial range that's shown.

### >>> MIRRORING OPTIONS
By default, additional displays extend your desktop, giving you more room to work. But should you want the same image to be shown on your Mac and all connected displays, you'll need to put a check mark next to the Mirror Displays item.

### >>> DETECT DISPLAYS
External displays should be automatically detected by your Mac (but ensure the correct input is selected on your monitor if it has manual controls). If not, hold Alt so the Gather Windows button becomes Detect Displays and click it.

## WHAT YOUR MAC CAN DO

Apple's new MacBook Pros can drive two 5K displays. Along with its own Retina display, that's a lot of pixels! However, before you splash out on a new display, be aware this capability in part comes from Thunderbolt 3 ports, delivering staggering bandwidth. So, you need to find out what your own Mac's capable of – and the older your Mac, the more restricted your choice will be.

If you can settle for a low pixel-density panel, even a 2010 MacBook Pro is capable of driving an external 23-inch screen. To see what your Mac can handle, note its details from  > About This Mac, then visit **everymac. com**. Find your Mac listing and read the "2nd Display Support" section under tech specs to see what connections you can use and the maximum supported resolution of each.

# Understand your displays

**A** PPLE TENDS to simplify where connectors are concerned; the original iMac obliterated old-school ports in favour of USB, and the new MacBook Pro has only USB-C/Thunderbolt 3 and a headphone jack. However, Macs have featured various display connectors over

## Be mindful of optimal resolutions… As well as a screen's size, consider its pixel dimensions

the past decade or so, and their different capabilities potentially complicates buying a display.

If you have a new MacBook Pro and the money, go for a Thunderbolt 3 display. They're pricey, but look great and simplify connectivity – including data for their USB ports – to a single cable. However, you'll find cheaper options from the likes of Dell, which also tend to offer a larger selection of ports. For example, Dell's U2715H has HDMI, Mini DisplayPort, and DisplayPort, enabling it to work with a wide range of recent (and not so recent) Macs. You would just have to ensure before buying that your Mac's capable of driving it – see "What your Mac can do" to the left.

Be mindful of optimal resolutions. As well as a screen's size, consider its pixel dimensions; if two have a 2560x1440-pixel resolution but one of them is several inches larger than the other, content on the bigger one will appear less sharp since there are fewer pixels per inch. Displays with a high pixel density (Apple calls its own "Retina display") vastly increase the pixel count, but they are more costly – and need a fairly recent Mac to run them. See **apple.co/29ZPMM9** for info.

# MAKE THE CONNECTION

**>>> DVI**
Favors of DVI have existed since 1999, arriving on the 2002 PowerBook G4 and Power Mac G4. A year later, a Mini-DVI port was seen on the 12-inch PowerBook G4, and later added to other Macs before being phased out in favor of the current Mini DisplayPort.

**>>> HDMI**
Used in HDTVs, the HDMI showed up on the Mac mini in 2010. The 2012 MacBook Pro with Retina display and the 2013 revision to the Mac Pro gained an HDMI port. Most 2010 or later Macs without one can connect to a display with an HDMI input by using an adapter.

# Multi-monitor tricks

**T**HE KEY BENEFITS of using multiple displays are flexibility and focus. If you're a digital artist using the likes of Illustrator, Photoshop, or Pixelmator, you can dedicate one display to artwork. This means your work is never covered by tool palettes, and your palettes residing on their own display means more of them can be kept on screen at any given moment.

Similar advantages can be had in audio and video apps. With Logic Pro X, choose Window > Open Main Window to open a second window, and fiddle with the layouts until one display is primarily a mixing desk and the other is used for tapping out notes. In Final Cut Pro, put the viewer on a secondary display to get a more detailed, larger look at your edit. (Sadly, Apple's consumer equivalents to these apps – GarageBand and iMovie – are resolutely single–screen only.)

Dual displays are also great when you require ongoing access to multiple apps. Whether penning a potential bestseller or fine–tuning a presentation, having one display devoted to an office or writing app and another for research can be efficient. If you use a minimalist word processor such as iA Writer, you can have that fullscreen on your MacBook, turning it into a futuristic typewriter, while a larger display contains Safari, a mind–mapping tool like MindNode, or inspirational imagery in Preview. Similarly, if you use Windows–only software, run it in Parallels Desktop on one display, leaving the other for macOS; this can work well if you're a web designer and need to test sites across browsers on both operating systems.

Alternatively, you might want to monitor data of some kind – to keep an eye on your schedule in Calendar, rather than switching to that app and away from whatever you're doing. Similarly, you might stick Mail on a second screen so you can glance at emails when they come in, rather than getting a notification, opening the app, and getting sucked into a billion other messages. Or, if you hate productivity, go for the ultimate procrastination setup of using a second display for YouTube, Twitter, and Facebook.

Incidentally, whichever of these ideas takes your fancy, pay close attention to ergonomics. It's best to have your primary display right in front of you, your eyes in line with the top of the screen. The other should be easy to turn to and briefly use. If you spend a long time interacting with any display that's set at an angle, ensure you can shift your chair and input devices accordingly. Don't spend a long time twisted in your seat, tapping on an awkwardly placed keyboard, or you may give yourself back problems later on.

Whatever your use, a second screen can really free up your workspace.

>>> **MINI DISPLAYPORT**
Mini DisplayPort arrived in 2008. Initially proprietary, it was later rolled into the DisplayPort standard. It debuted on the aluminum MacBook and 15-inch MacBook Pro, and was added to Apple's entire line of Macs. The 12-inch MacBook was then the first model to drop it.

>>> **THUNDERBOLT**
Originally using the same connector as (and compatible with) Mini DisplayPort, Thunderbolt arrived on the 2011 MacBook Pro. It can carry both video and data. Thunderbolt 3 uses a USB-C connector, and the MacBook Pro with Touch Bar has four such ports.

>>> **USB-C**
Apple's 2015, 12-inch MacBook was the first Mac to include a USB-C port. Like Thunderbolt, it can carry video and data (and also power), but the data connection isn't as fast. After its late 2016 addition to the MacBook Pro, expect new Macs in 2017 to adopt USB-C, too.

# Take control

**O**NE OF the issues with using multiple displays is that managing what's on your desktop can require more effort. Stick with vanilla macOS and it can become tiresome to arrange windows and drag them between displays. Thankfully, third-party utilities provide you

**Third-party utilities provide you with extra control over arranging windows across multiple displays**

with an extra degree of control in these key areas. Moom ($10, **manytricks.com**) and BetterTouchTool (from $3, **boastr.net**) both enable you to set up commands for manipulating windows. Want to drag a window to make it fill half of the screen? Done. Swipe with five fingers to send a window to

your other display? Easy. Want to use keyboard shortcuts instead, to send windows between screens and resize them? No problem. Read the walkthrough below to see how rapidly you can set up such behaviors.

For switching display resolutions, we recommend Resolutionator ($3, **bit.ly/ 2iNxkHL**). Normally you have to go to System Preferences' Displays pane, move the pointer to the relevant screen and then hunt for a new resolution. Resolutionator simply requires you to click its menu bar icon and select a new resolution from the submenu that corresponds to the screen on which you want to set a new resolution.

There's also an optional system-wide shortcut for bringing up a switcher window that can be controlled by keyboard – so, as with Moom or BetterTouchTool, you don't have to remove your hands from the keyboard to make adjustments.

Another type of dual-screen setup is rather different. Duet Display ($19.99, **duetdisplay. com**) is actually an iPad app that talks to a free companion app on your Mac. You connect your iPad and Mac using a Lightning cable, whereupon Duet turns the iPad into a display for the Mac. The iPad's Retina display means the resulting visuals can be pin-sharp (though there's a touch of lag at higher quality settings). Duet becomes really interesting on macOS 10.12.2 or higher, where it can mimic Apple's Touch Bar tech, enabling you to try a brand-new control method.

One nuisance in having a ton of screen real estate is finding the pointer, but there's a solution baked into macOS. In System Preferences' Accessibility pane, select Display on the left and ensure "Shake mouse pointer to locate" is enabled. If it is, wiggling the pointer temporarily enlarges it.

## MANAGE WINDOWS ON MULTIPLE DISPLAYS



**1 USE MOOM**
In Moom's preferences, click Custom then + (bottom left) to create a new shortcut. Set it to Move & Zoom and fill the right side of the grid. Click the box to the top right of the grid and press `ctrl`+Alt+`▶`. Now when you use that shortcut, the current window will resize to fill the right half of the display.



**2 MOVE BETWEEN DISPLAYS**
Create a second shortcut and set its behavior to Move to Other Display. Click the rightmost button in Direction and then enable "Loop through displays." Set the shortcut to `ctrl`+`⇧`+`▶`. Each time you press this key combo, the current window will move to the next display, eventually coming full circle.

# Accessorize!

### >>> NOTEBOOK STAND

You may want to raise your MacBook off the desk so it's more comfortable to glance at when focusing on the larger external screen. Consider Griffin's Elevator stand ($40, bit.ly/griffin_elevator), or Lavolta's laptop table ($23, bit.ly/lavoltatable).

### >>> VESA MOUNT ADAPTER

If your display is compatible, you could use a VESA mount adapter ($25, bit.ly/vesa_adapt) to hang the monitor on a wall. Research the right mount, check your wall – and ensure the monitor's vertical position will be just right prior to drilling.

### >>> LOGITECH C920 HD

Most monitors don't come with a webcam. You can, of course, get by using FaceTime or Skype through your MacBook's built-in camera (or use an iPhone), or you could opt for propping a webcam on your larger external monitor. Logitech's are among the best; the C920 webcam is $63 (bit.ly/logi_c920).

### >>> APPLE'S MAGIC ACCESSORIES

If you're adding a second display to a portable Mac, it pays to make it bigger than the built-in one, and to put your MacBook to the side and invest in other input devices you can position centrally. Though other options exist, Apple's Magic Keyboard and Magic Trackpad 2 are very nice – however, they're not cheap at $99 and $129 respectively.

---

**3** **TEST AND EXPAND**
Open a Finder window and press the shortcut from step 2 a few times. Try interchanging it with the shortcut from step 1. Open Mail and put it on your Mac's second screen, open a new message by pressing ⌘+N, and move it to your other screen. Powerful, huh? Now add any other shortcuts you want.

**4** **USE BETTERTOUCHTOOL**
You can add similar functionality to a trackpad. In BetterTouchTool, select Trackpads, click Add New Gesture and set the gesture to 5 Finger Swipe Right. Click the Predefined Action pop-up and pick Move Window to Next Monitor. Just as with Moom, performing this gesture repeatedly will take a window full circle.

**5** **MOVE AND RESIZE**
BetterTouchTool offers two more actions for moving a window between displays: Maximize Window to Next Monitor makes it as big as possible (but doesn't switch it to full-screen mode); Center Window on Next Monitor centers the window on the next screen as soon as it's moved there.

# THE BEST 4K displays

Whether you do top-end image editing or just want to bask in high-res glory, Keith Martin tests three of the best 4K displays

>>> **AOC U3277PWQU**

>>> **BENQ PD3200U**

>>> **LENOVO THINKVISION X1**

**T** HERE'S NOTHING quite like a large, high-resolution display, especially if you work with graphics. 4K monitors have been around for a while, and some of the latest models are showing the benefits of this maturity, but the price drops we've seen for these screens over the last couple of years have slowed. They're great for serious work, but they're not cheap.

A 4K monitor usually has a resolution of 3840x2160 pixels, a scale that falls into the "Ultra High Definition" (UHD) class. You can drive a 4K monitor from pretty much any Mac made in the last three or four years, although running at 60Hz rather than 30Hz can present a challenge. See apple.co/29ZPMM9 for more details.
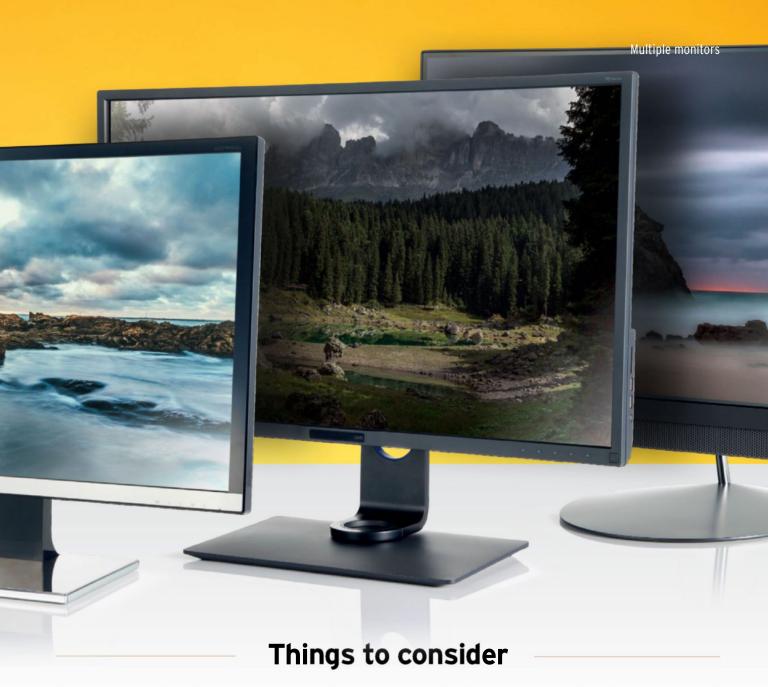
The "4K" label doesn't define the physical size of the display, which is why in this test we've included a 27-inch model alongside two enormous 32-inch screens. Technically, none of these are actual Retina-class displays, but the "smaller" screen packs in an impressive 163 pixels per inch.

At this level you could choose to work with Apple's "larger, sharper" display-scaling tricks, or run as a large, fine-grained desktop. Two of the models we look at use IPS technology and one uses VA. See "Things to Consider" opposite for what this means in practice.

One of the monitors in our test boasts a built-in webcam, and one can automatically dim and even blank the monitor if nobody is in front of it for a while. But remember these are extras. Whether you're a professional graphic designer or someone with wider-ranging requirements, if you're looking for a good 4K monitor then you'll be demanding a lot from the display itself. That's why we've made image reproduction quality our overriding priority.

>>> **HOW WE TESTED**
The image rendering and fidelity of these displays is critical. We tested each one using a Datacolor Spyder5Elite colorimeter, using it to assess the color accuracy in particular. We also assessed how easy it is to use the on-screen controls to make adjustments. Features such as speakers are nice, but accuracy of the display itself is the bottom line.

# Things to consider

### >>> THE BIG QUESTION: IPS OR VA?

IPS (In Plane Switching) panels are more expensive to make than VA (Vertical Alignment), but they handle wider viewing angles. With large VA panels, looking from the center to sides can show contrast shifts.

### >>> 60HZ CONNECTION CHALLENGE

Running at 60Hz gives a smoother experience. Sadly, at 4K this needs HDMI 2.0, which Macs still don't have, or DisplayPort 1.2. Use a Mini DisplayPort cable, or a USB-C to HDMI 2.0 adapter with the latest MacBook.

### >>> MORE SPACE OR MORE VISIBILITY

You can adjust your display to run in pixel-for-pixel "more space" mode, where there's acres of room but everything looks fairly small, or with macOS scaling things smoothly so that they render at normal size but in greater detail. It's up to you.

### >>> 10 BITS ARE BETTER THAN 8

Monitors that work internally with 10 bits per color, rather than the standard 8 bits, are able to render subtle color gradients without visible banding – over 1 billion colors, in fact. All three displays featured here process 10-bit color.

### >>> PERSONAL SPEAKERS

While all of these monitors have built-in speakers, don't expect too much from them in terms of audio quality. They'll do at a push for simple audio feedback or perhaps dictated text, but they're really not built for hi-fi purposes such as playing music.

## Test 1 **Design**

### Mirror mirror on the wall, who is the sleekest one of all?

All three screens here are fairly sleek, sporting the traditional monitor fashion of varying shades of mid or dark gray. Regardless, they all look good enough to grace a high-end studio. It's the Lenovo in particular that looks eye-catchingly thin – particularly at the top. Both the AOC and BenQ displays are relatively angular, almost industrial from the side, and with bezels that look solid but not obtrusive. The Lenovo display is a bit of a curious one in terms of appearance. Its speakers are behind a grille array that runs along the bottom of the display, and are thus far more obvious than any other speaker arrangement – but they're still very stylishly done. Its webcam is surprisingly functional; it sits on a slim articulated arm, and can tilt to face the desk to scan docs, with its own LED light.

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|---|---|
| AOC U3277PWQU | ▰▰▰▱▱ |
| BENQ PD3200U | ▰▰▰▱▱ |
| LENOVO THINKVISION X1 | ▰▰▰▰▱ |

## Test 3 **Ease of use**

### Ease of setup and day-to-day use are important to bear in mind

The initial setup of a monitor is something you'll probably only do once, but it's important that it doesn't frustrate. The AOC needs a crosshead screwdriver and a soft place for the screen while you affix its stand, but the others are simpler. They all have tilt adjustment, but only the AOC and BenQ add swivel, height adjustment or the rarely-used portrait rotation. It's the on-screen display controls (OSD) and control buttons that you'll deal with most. BenQ uses a touch-sensitive bezel with LED bumps that help fingers find the spots. Many monitor manufacturers opt to tuck the buttons out of sight, which obviously looks sleek but is pretty unhelpful in use. In contrast, Lenovo's designers really considered the user: its buttons are easy and clear, including volume control.

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|---|---|
| AOC U3277PWQU | ▰▰▰▱▱ |
| BENQ PD3200U | ▰▰▰▱▱ |
| LENOVO THINKVISION X1 | ▰▰▰▰▱ |

## Test 2 **Picture Quality**

### Screen quality is critical for large displays

Because 4K displays appeal particularly to designers, video editors, and anyone else who works with large visual projects, the quality of the display itself is critical. We've tested these screens in both moderately low and office-level ambient lighting. In addition, each screen warmed up for an hour before we ran our tests to ensure full stability of the image.

Our Spyder5Elite colorimeter tests showed that, while none of these displays achieved full coverage of the Adobe RGB color space (no surprise, since that's a rare thing indeed), the 32-inch AOC came much closer than other two. The BenQ and Lenovo both managed 80% coverage.

However, the AOC's higher score is actually undermined by its VA panel. This means you must sit face-on to see colors and contrast accurately. With a screen this wide, that's not possible, so things will always look a little different in different parts. For gaming that's not a big deal, but any kind of graphics creation can suffer.

Contrast ratio, the difference between darkest and lightest tones, is an interesting statistic. It's tossed around a lot, and high ratios can make a difference in brighter environments. We noted scores at 50% brightness in particular as that's likely to be a real-world average brightness setting. AOC's display achieved 1330:1, a score almost twice as high as the rest, so if your environment is strongly lit and can't be muted, this will hold out better. This is almost certainly due to the use of the aforementioned VA panel type, a technology which generally produces a far greater contrast ratio than IPS. However, the scores of the BenQ and Lenovo are more than good enough in typical conditions. This is partly related to absolute brightness. The best brightness level setting is one that balances with your surrounding ambient lighting. Pushing a display to its maximum brightness in lower lighting conditions is dazzling and can interfere with color perception, so in practice, the contrast ratio difference matters less.

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|---|---|
| AOC U3277PWQU | ▰▰▱▱▱ |
| BENQ PD3200U | ▰▰▰▰▱ |
| LENOVO THINKVISION X1 | ▰▰▰▰▱ |

# The Winner **Lenovo ThinkVision x1**

## A close-fought race with good contenders

All three monitors have very good points. The unevenness of the AOC U3277PWQU's VA panel technology puts it out of the running, despite the impressive contrast ratio, but it's still a useful screen in general. Ultimately, however, it didn't impress quite as much as the other two: the Lenovo ThinkVision X1 and the BenQ PD3200U.

The BenQ 32-inch 4K display is easy to set up, performs very well and has loads of ports, including an SD card reader. It's a display any professional would love to use. It is, however, quite a step up in cost, and that money could be used for other accessories and cables.

The Lenovo is the cheapest here, but it's impressive: the display quality is excellent and the panel itself is super slim. It's the extras that bring it to the front; the speakers are more than a basic gesture at sound, the controls have been thoughtfully designed, and the webcam can act as a document scanner. It's a great display with features that set it apart from the crowd.

This IPS-based display is impressively slim, performs very well, and the webcam's usefulness surprised and impressed us.

| THE SPECS | AOC U3277PWQU | BENQ PD3200U | LENOVO THINKVISION X1 |
|---|---|---|---|
| **PRICE** | $699 | $898 | $684 |
| **DISPLAY PORTS** | HDMI, DisplayPort, DVI, VGA | 2x HDMI, DisplayPort, mini-DisplayPort | HDMI, DisplayPort |
| **USB** | 4 (+ 1x USB 3.0 Type B) | 4 (+ 2x USB 3.0 Type B) | 4 (+ 1x USB-C) |
| **PIP/PBP** | Yes | Yes | No |
| **TILT** | Yes | Yes | Yes |
| **SWIVEL** | Yes | Yes | No |
| **HEIGHT ADJUSTMENT** | Yes (5.1 inch) | Yes (5.9 inch) | No |
| **PIVOT** | Yes (90 degrees) | Yes (90 degrees) | No |
| **WEBCAM** | No | No | On slim arm, fully positionable |
| **VESA-MOUNT COMPATIBLE?** | 100mm VESA-compatible mount sockets | 100mm VESA-compatible mount sockets | 100mm VESA-compatible mount sockets |
| **CONTRAST AT 50% BRIGHTNESS** | 1330:1 | 700:1 | 720:1 |
| **WEIGHT (LBS)** | 22 | 18.7 | 14.1 |
| **PANEL TYPE** | VA (Vertical Alignment) | IPS (In Plane Switching) | IPS (In Plane Switching) |
| **PPI** | 138 | 138 | 163 |
| **% OF ADOBE RGB** | 92% | 80% | 80% |
| **OVERALL** | ■■■□□ | ■■■■□ | ■■■■■ |

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## Splittable

### Get your shared finances in order

**Free** **Developer** Locatable Ltd, splittable.co

**Platform** Universal   **Requirements** iOS 9 or later

Living with other people can be a challenge, especially when it comes to sharing household expenses or settling up after a night out. Factor in roommates who are night owls or hardly ever home, and it's easy to see how money causes stress for renters who split bills.

Available as a web app as well as for Android devices, Splittable is a free iPhone app that reduces this potential friction by putting everyone on the same page. Whether it's rent, utilities, groceries, or other shared expenses, you'll always know where everyone stands thanks to the All Square Meter, a dashboard that shows at a glance who owes money.
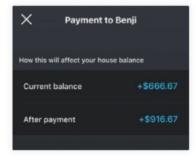
To get started, set up a house, then add the relevant costs and who's responsible for them. When a new purchase is made, Splittable notifies each roommate with a push notification as a reminder to pay their share. Clearly aimed at college students and young professionals, the basic premise also applies to unwed couples or even spouses living under the same roof who maintain separate bank accounts.

Splittable can't currently be used to make actual payments – the app simply keeps track of who owes what. But the developers are working on payment integration, first in the UK with an eventual international rollout. We were treated to an advance look at this feature, and it has real potential to make the whole process as easy as PayPal, Venmo, and Square Cash.

For the time being, Splittable users must be content collecting money the old-fashioned way. There are a few improvements we'd like to see, such as the ability to check off costs as they're paid, rather than waiting until the due date. Also, adding a new cost requires hopping between a few too many screens.

You'll need to sign up for an account or use a Facebook login to get started, and for now the clean, well designed user interface is free of ads or other intrusions; hopefully that will remain the case down the road. Finally, we were a little put off by the initial setup wizard, which forces you to add a cost or payment before you have a chance to get the hang of things.

**THE BOTTOM LINE.** Splittable puts an end to keeping tabs on how much roommates owe for shared costs, but you'll still have to collect payments the old-fashioned way for now.
**J. R. BOOKWALTER**

Splittable's All Square Meter is a dashboard that makes it easy to see at a glance which roommates still owe money.

You still have to pay roommates the old-fashioned way for the time-being.

### SPLITTABLE

- Free app for keeping track of shared costs among roommates
- All Square Meter shows where everyone stands at a glance
- No payment processing (planned for future updates)
- Adding new costs requires too many steps

**GOOD** ▪▪▪▪▫

# Weather Line

## Graphs make everything better!

**$2.99** **Developer** Off Coast, weatherlineapp.com

**Platform** Universal **Requirements** iOS 10 or later

Mac|Life EDITORS' CHOICE



Weather watchers can pore over all sorts of monthly and yearly information.

You may wonder why you'd need a third-party weather app in the first place. As it turns out, there are lots of reasons: maybe you do a lot of work on your iPad – and the default Apple Weather app isn't available for the iPad; maybe you want something that shows a lot of information in a small space. Whatever the reason, Weather Line has a lot of great stuff to offer.

The app is really easy to use: input your location and be greeted by a sleek interface that can be read at a glance. It displays information clearly on a white background for optimum visibility, and the infographic-style presentation of data gives you everything you need to know instantly. You'll be able to see the weather throughout your day, as well as the projection for the week, and there's a smart feature that allows you to see averages for specific months of the year. Worried about precipitation? Check out what sort of rainfall-related weather you'll be in for over the next hour, from clear skies to heavy rain and everything else in between.

We find Weather Line to be an improvement over the standard Weather app, especially for those who like to plan their events using weather projections, and a nice alternative to Dark Sky Weather, which uses the same highly accurate forecast data.

**THE BOTTOM LINE.** Both functionally and aesthetically pleasing, Weather Line is a brilliantly designed app to keep you abreast of the weather. **AMBER NEELY**

**AWESOME** ▪▪▪▪▪

# Infuse Pro 5

## Get your videos on all your devices

**$12.99** **Developer** FireCore, firecore.com

**Platform** Universal **Requirements** iOS 8 or later



Split View and Picture in Picture support on iPad is a welcome addition to Infuse Pro 5.

If you have a large digital video collection, watching shows and movies on an iPhone, iPad, or Apple TV can be an exercise in frustration. Devices are limited in what can be stored at any given time, and using iTunes to transfer files is the opposite of fun.

Infuse Pro 5 provides a better way. Point the app at specific folders on your network or a cloud service and it will present a list of items to play, then stream your selection to your device.

From a visual standpoint, Infuse is a treat. On iOS and tvOS, folders are represented as large thumbnails – or cover art if the app correctly interprets the file name. When it doesn't, you can edit the video's title – handy should your adorable "toddler and dog" video be erroneously listed as "Edge of Darkness" for some reason.

This latest release has further niceties. On Apple TV, you get a home screen that highlights in-progress and recently added items. On iPad, there's Split View and Picture-in-Picture support. Cross-device sync worked seamlessly during testing.

From a performance standpoint, the app fared well, too. Playback was generally snappy, although shared folders took a long time to appear on an Apple TV. Subtitle support worked very well, too, automatically being downloaded for films and shows lacking local subtitle files.
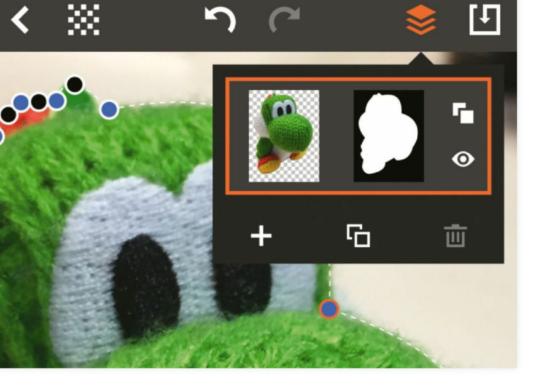
**THE BOTTOM LINE.** A solid, great-looking and versatile streaming video player for both iOS and tvOS. **CRAIG GRANNELL**

**GREAT** ▪▪▪▪▫

You can see your full selection in previews, and easily invert it.

# Exacto - Photo Cut

## A more advanced image cut-out tool?

**$2.99** **Developer** Samer Azzam, exactoapp.com

**Platform** Universal  **Requirements** iOS 8 or later

With a bit of care you can produce some excellent, crisp cut-outs.

Exacto has one real aim: to bring a pen selection tool (very much like the one in Photoshop on desktop) for cutting out parts of an image to iOS. This isn't an option in Photoshop Mix or Pixelmator. The latter app does have other selection options, but not this particular and precise tool, so Exacto looks to be a useful addition to a mobile photo editing suite. And it works… but not perfectly.

The way the pen selection tool works is that you tap around the outline of the subject you want to cut out, which adds End points. Each time you tap, you'll add another End point, connected to the last by a dotted line, which is the cut-out. Between the End points are Control points, and these are key. You can move Control points to curve the line between End points, so by adding plenty of points, you can get a massively clean and precise cut-out line – more deliberate than any of Pixelmator's cut-out options, though it's much slower to do and requires more finesse.

Once you've finished polishing the cut-out line (you can easily preview it along the way), you can then remove either the inside or the outside of the selection. You can also create a new layer and cut out a separate object. Finally, you can export the cut-out image to another app, or save it to the Camera Roll.

The problems come in the little details, mostly. Exporting is much more awkward than it

needs to be, and when we sent a multi-layer image to Pixelmator, it arrived in one layer regardless. Limitations in iOS sharing mean you can't use multiple exports to get around this – you'd need to save each layer to the Camera Roll individually, clogging up your Photos app.

We also experienced a pretty annoying bug where End points were being added out of order, making it a chore to build our outline. The manual "+" button helped a bit here, but we were really slowed down. We also don't like that you have to a tap a point to select it before you can manipulate it when using the Pencil (though this is sensible on iPhone). And we'd also like to see an option to feather our cut-outs' edges in the future, to produce a smoother result.

**THE BOTTOM LINE.** An app that does what it sets out to do, but with some feature issues and small bugs. If these can be worked out, this could be a great tool. **MATT BOLTON**

### EXACTO - PHOTO CUT

- ➕ A pen selection tool on iPad!
- ➕ Overall good results
- ➖ Awkward export and layers get lost
- ➖ Issues with selection process

**SOLID** 🟩🟩🟩⬜⬜

# Darkr

## Relive the days of analog photography with Darkr

**Free ($2.99 IAP for Pro version)** **Developer** Marcus Carlsson, miliam.net

**Platform** Universal   **Requirements** iOS 8.1 or later

Digital photography has made us a little bit lazy, as we don't have to worry about the limitations of film or the process of developing our own pictures. As would follow, some of us have let our skills slip a bit.

Darkr is an app that is designed to emulate the feeling of working in a real darkroom, and hopes to help you take better pictures. The app only shoots images in black and white, but the results are so striking that we didn't mind.

Getting to know Darkr is a bit intense. There are a few different cameras to try out, each offering different amounts of

control, allowing users to manually control focus and exposure, as well as set the contrast in the darkroom. The idea is that if you have to slow down the process, you'll be more mindful of the photographs you're taking, and thus take better photographs. We'd have to agree, as we've been very pleased with the results so far.

We suggest you take the time to read the tutorials. While they may seem a little excessive at first, you will get a far better result than if you were to go in completely blind. If you do forget something, Darkr allows you to go back and view the tutorials again.

Darkr details how the app functions as it works, including an explanation of analog tech.

If you're looking to improve your photography, Darkr will help you create stunning results while teaching you how to properly compose photographs.

**THE BOTTOM LINE.** Daunting at first, Darkr quickly guides users to taking better photographs. **AMBER NEELY**

**GREAT** ■■■■□

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# Pic Scanner Gold

## Not everything that scans in is gold...

**$4.99**   **Developer** App Initio Ltd, picscannergold.com

**Platform** Universal   **Requirements** iOS 9 or later

The original Pic Scanner was one of the most convenient ways to scan multiple photos and share them with friends. Since then, rivals such as Scanbot and Unfade have improved the process, but developer App Initio Limited isn't taking this challenge lying down.

Pic Scanner Gold works the same way it always has: point your iPhone or iPad at one or multiple photo prints, tap the shutter button, and the app does the rest, cropping images into separate files stored inside the app's gallery. From there, users can organize pictures into share-ready albums, export to cloud

storage services, order greeting cards, or view brief tutorials for photo craft ideas.

The "View Caster" feature presents all your scanned photos in a Viewmaster-style slideshow complete with music; the Showtime feature works similarly, but on a per-album basis. Sadly, there's no way to choose music from your own iTunes library, or even pick a general theme from the built-in royalty-free cues.

Although Pic Scanner Gold boasts enhancements in image quality, they're largely negated by limitations in core scanning functionality, which lacks the automation and precision of rival apps. There are now 19 Creative Cloud-powered

Do more with your scanned photos, including slideshows, greeting cards, and craft ideas.

image-editing tools available, but none does the kind of basic enhancements necessary to restore old photos properly.

**THE BOTTOM LINE.** Pic Scanner Gold takes a few steps forward, but fails to keep pace with progress made by newer rivals. **J. R. BOOKWALTER**

**SOLID** ■■■□□

Turn your iPad Pro into a graphics tablet with Astropad, which enables you to draw directly into Mac software such as Photoshop.

# Astropad Studio

Draw on your Mac with an iPad Pro

**$64.99/year, $7.99/month** **Developer** Astropad, astropad.com

**Platform** iPad **Requirements** OS X 10.10 or later, iPad Pro, Apple Pencil



You can combine finger touches with Pencil movement to trigger shortcuts such as simulating a right-click.

Astropad is an app that links your iPad and Mac together: the iPad displays whatever program you're running on your Mac, and whatever you draw with a stylus on your iPad appears on your Mac.

Last year's Astropad Standard app enabled you to do this with a variety of iPad models and any stylus you owned. Studio, however, works only with iPad Pro and Apple's Pencil. Another important difference is that Standard costs a one-off payment of $29.99, but Studio is only available through a monthly or annual subscription, managed through an online account. It's clear that Studio is a professional solution, aimed at working artists and designers who expect to be drawing for hours every day.

Setting everything up is a chore, simply because of the number of components you're working with. First, create your Astropad Studio account and set up your subscription. Next, download and install the Astropad app on your Mac and the Astropad Studio app on your iPad Pro. Now run both apps: as long as your Mac and your tablet are on the same network, they'll recognize each other and your Mac screen will be reproduced on your iPad Pro. Of course, all this only needs to be done once.

The combination works well in practice. If you link your iPad and Mac with your iPad charging cable, the connection between the two screens feels instantaneous. If you decouple the iPad and link through Wi-Fi instead, you might notice a lag between the Mac screen changing and the iPad screen updating, depending on the speed of your wireless network. We were never excessively bothered by the time lag, though.

The exclusive use of iPad Pro and Pencil means that Astropad Studio has several extra features compared with Standard. For example, Studio's Magic Gestures feature enables you to combine finger tap and Pencil gestures to trigger responses, including simulating a right-click or switching between tools.

**THE BOTTOM LINE.** State of the art, but you might prefer the Standard edition's pricing if you're a more casual sketcher. **RICHARD HILL**

### ASTROPAD STUDIO

- ◘ Easy to set up, reliable to use
- ◘ Gestures make drawing fluid and flowing
- ◘ This version only works with iPad Pro
- ◘ Subscription-only

**GREAT** ▪▪▪▪▫

# Milkmaid of the Milky Way

## We've got no time for needless rhyme

**$3.99** **Developer** Mattis Folkestad, machineboy.com

**Platform** Universal  **Requirements** iOS 9.1 or later

Old-school point-and-click adventures often didn't make much sense – combine the kitten with the doorknob to make moonshine, or whatever – but Milkmaid of the Milky Way does it in a way that grates more than usual.

For starters, Milkmaid is written entirely in verse, and it's terrible. The meter changes all the time, and the rhymes often feel forced, like "this put me in a squeeze. What about my mountain cheese?" It's just unnecessary, feels gimmicky, and distracts from the game – there's quite an interesting plot behind all the bad rhymes.

It's also pretty tedious to play, with the character having to run across several different screens to get to where she needs to go, which isn't helped by the fact that the items you need to pick up are often hard to see, and the things you need to do with those items are even more obtuse. At one point you need to put logs on a mountain to dry. How are you supposed to know that?

There are some redeeming qualities – the style, though minimalistic, is nicely done in places, and the way the plot twists early on is a surprise. For fans of Lucasarts point-and-click games, there's a tingle of nostalgia that may override



The verse is unnecessary and cringeworthy. Just stick to regular words!

the tedium. However, largely, Milkmaid of the Milky Way is a bit of a milk dud. It's a shame that the game's qualities couldn't save it from grating writing and overly difficult puzzle solutions.

**THE BOTTOM LINE.** Attempts to replicate classic point-and-clicks, but falls short of the mark. **KATE GRAY**

**OKAY** ▪▪▪▪▪

# Mysterium

## A fun game that stumbles on iOS

**$6.99** **Developer** Asmodee Digital, asmodee-digital.com/mysterium

**Platform** Universal  **Requirements** iOS 7 or later

Mysterium is fantastic – a board game in which all the players but one are trying to solve a murder, and that last player is the ghost of the murderee, attempting to tell them what happened without being able to speak, only being able to show them frustratingly obtuse and abstract pictures.

Let's say the murder weapon was poison, and the ghost picks a card with a well in it – signifying liquids, *obviously* – but the other players are convinced that the well represents the knife, because the metal bucket in the image could be the knife's metal. Meanwhile,

the ghost is tearing out their hair, unable to correct them.

Mysterium is very much worth playing, but is not as compelling in this version. There's a one-player story mode that you play to learn the rules, but playing the game with AI is impossible – they're unpredictable and you have no idea how smart they actually are.

The multiplayer mode is fine, but it requires you to register an account with Asmodee, and though the art is good, it's so much better in person where you can appreciate the details. It's also pretty hard to find people to play with online, especially if you want



As the ghost, you're trying to help people pick the right culprit – it's really difficult.

a larger game of up to seven players. Granted, the board game version is significantly more than the $6.99 iOS game, but it's worth it if you want to appreciate this game at its best.

**THE BOTTOM LINE.** A very good board game that doesn't translate too well to mobile. **KATE GRAY**

**SOLID** ▪▪▪▪▪

Hats offer protection from the weather, as well as some stylish flair.

# Don't Starve: Shipwrecked

## Turns out Tom Hanks had it pretty easy

**$4.99**  **Developer** Klei Entertainment, kleientertainment.com

**Platform** Universal  **Requirements** iOS 8 or later

Whether on land or at sea, the Don't Starve games are out to test your survival instincts.

The original Don't Starve was a masterclass in misery, pitting you against a hostile landscape in which everything – even your own brain – was out to get you. The new standalone version, Shipwrecked, takes that concept and sends it off to sea.

As in the original game, your goal is essentially to survive as long as possible. You'll need to scavenge for food; use raw materials to fashion crude tools to help you chop, hack, and mine (and murder); and make sure you've got a fire burning by the time night falls, lest your sanity take a severe hammering. Oh, and don't camp too close to the shore – if the tide encroaches while you're distracted, out goes your fire and you're plunged into darkness… which can kill you. Of course it can.

While the joy of splitting your survival workload remains from the original (scout by day, build camp at dusk, huddle up and eat snacks through the night), the real fun in Shipwrecked comes from the exploration. Now, rather than being dropped in a hostile wasteland, you're on one hostile island among many.

Each is small enough that you can usually scope out the whole thing in one day, and strip it of its bounties in the second, so you're actively encouraged to seek out seaweed-logged pastures new.

Your mom apparently never invested in swimming lessons, so you have to put your trust in a hand-hewn vessel, whether that's a rickety wooden raft or a fully tricked-out sailboat complete with spyglass, cannon, and fishing net. Its seaworthiness erodes over time, so setting out on an unknown voyage can be risky in an older boat.

Death is permanent, so the game is unforgiving, and the starting stages can feel repetitive. However, fight your way through that and it's possible to spend a few hours at a time without feeling like you've scratched the surface. Any criticisms? We couldn't find a way to paint a face on a basketball and call it Wilson.

**THE BOTTOM LINE.** An expansion that redelivers on what made the original great, while adding new depth to the exploration. **EMMA DAVIES**

### DON'T STARVE: SHIPWRECKED

- Loses none of its predecessor's savage charm
- Procedurally generated worlds offer a new experience each time
- Interface is perfectly suited to playing on iPad
- Autosave function tends to temporarily freeze the game

**EXCELLENT** ▪▪▪▪

# 6 apps to make traveling easier

## Take the pain out of getting from A to B with this collection of downloads
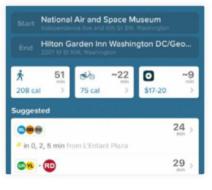
**BY EMMA DAVIES**

Taking a trip can be a logistical headache, so download our top six apps to make organizing your next journey a (sea) breeze.

The first step is, of course, booking a flight. Load up **KAYAK** (Free, iPhone/iPad) and it couldn't be simpler to track down the best deal. Input your original and destination airports, plus dates, and the app will do the research for you. As well as checking out the best prices, you can filter by myriad options such as stops, layover lengths, and aircraft – and even see at a glance which flights offer amenities such as Wi-Fi. Found what you're looking for? One more tap will take you through to the booking site. Easy.

After a lengthy flight, the last thing anyone wants is an even lengthier wait in the customs line. With **MOBILE PASSPORT** (Free, iPhone/iPad), you can cut that right down. Whether arriving in the US via plane or cruise ship, this invaluable, officially authorized



Kayak makes it really easy to plan your flights, including any layovers.



Citymapper's transport options are well detailed, so you can find your way around.

app stores your passport details, which can then be submitted at 21 airports and ports to waltz you through a special line.

To save the hassle of sifting through email folders to dig out bookings, load up **TRIPCASE** (Free with IAP, iPhone/iPad). Once you've made an account, forward any confirmation emails relating to your trip, and they'll show in the app. You can keep track of multiple vacations, or merge them into one. It's a convenient means of keeping transport and hotel details handy, along with automatically added contact details and flight tracker.

Once you've reached your destination, **CITYMAPPER** (Free, iPhone) is your buddy. Essentially Google Maps on steroids, it enables you to plan routes for nearly every transportation type in cities all around the world – as well as how many snacks you could burn off by using the more active methods. It also integrates support for Uber, though not other ride-sharing services, sadly.

Sure you've got everything? This is where **PACKPOINT** (Free with IAP, iPhone) comes in. Input your destination, the dates and whether you're traveling for business or pleasure. You can then choose the activities you'll be partaking in (meals, outdoor activities, sightseeing, museums, and so on), and the app will use these plus a weather forecast to supply you with a list of essentials to pack. Sadly, it won't make sure you're under the luggage weight limits – you're on your own there.

And how best to spend your meticulously organized trip? Ask **TRIP PLANS-TRIPHOBO** (Free with IAP, iPhone). Supply it with your travel dates and destinations, and then choose whether to add in attractions and create your own itinerary, or have one sketched out for you. If you're pushed for time with a lot to see, this virtual tour guide is a great helper. Now, where's the app to magic up the funds for our next world trip?



TripCase: the countdown to your departure is great for indulging your inner kid.

# WATCH

**APPS AND GUIDES TO GET MORE FROM YOUR WATCH**

## infltr

### Easy photo filter control comes to Watch

**$2.99**  **Developer** Yooshr, infltr.com

**Platform** watchOS, Universal  **Requirements** iOS 9 or later

There are countless apps for enhancing mobile photos, but few offer the kind of liberating freedom that infltr does. With just the swipe of a finger, shutterbugs can concoct millions of different looks without scrolling through endless menu options. Infinite filters can be applied either to new shots taken with the in–app camera or those already in your library.

The latest update adds support for Live Photos, panoramas, and images stored on Adobe Creative Cloud, as well as iMessage and Apple Watch. The former makes it easy to enhance images prior to sending them to friends, while the latter brings control onto your wrist.

First open infltr on your iPhone and tap the Camera button, then launch the Apple Watch app. Oddly, you can't use your finger on the Watch display; instead, you must rotate the Digital Crown to change filters, and you'll see the filter's color scheme change on both devices at the same time.

The Apple Watch app also supports Force Touch for toggling Live, Flash, Flip, and Vignette options, as well as on–screen buttons for camera shutter and time–lapse. When it works, it's a pretty neat trick – but more often, infltr refused to connect to the iPhone at all, or just wound up crashing on Apple Watch.

infltr is also best used with the connected iPhone on a tripod or another camera mount, since it's more than a little awkward to hold your smartphone while manipulating the Apple Watch on your wrist at the same time.

**THE BOTTOM LINE.** infltr makes Apple Watch part of your shutterbug fun, but there are still a few lingering connectivity bugs.
**J.R. BOOKWALTER**

**INFLTR**

- Change live filters on iPhone app
- Remote-control camera buttons
- Frequent crashes and connectivity issues
- Awkward to hold iPhone while using Apple Watch at same time

**SOLID** ■■■□□

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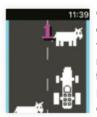## Return to previous app

When you want to quickly return to your last open Watch app from anywhere else, double-press the Digital Crown to jump over to it. Best of all, a second double-press will return you to whatever you were doing originally.

# DONKEY.APP

## Watch out for asses on the road...

**99¢** **Developer** XVision, xvision.me

**Platform** watchOS, iPhone  **Requirements** iOS 10 or later

Classic racing game DONKEY.BAS will forever be remembered as the favorite of IBM PC owners in 1981. Co-written by Microsoft co-founder Bill Gates, this classic computer game has now been ported to Apple Watch in all its original CGA, four-color glory.

The goal is to steer your car clear of the donkeys popping up on the road ahead. All that's required is turning the Digital Crown to switch between the left and right lanes, but believe us, it's way more difficult than it sounds, because there's barely any room to maneuver.

Unlike many other Apple Watch games, this one also works on iPhone, where you tap the screen to avoid oncoming donkeys. In keeping with the retro gaming spirit, DONKEY.APP also offers sound in all its PC speaker glory, and it's quite a bit louder than what you're used to from a smartwatch.

**THE BOTTOM LINE.** A faithful port of a DOS-era classic, but it's bound to raise your blood pressure. **J.R. BOOKWALTER**

**GOOD** ■■■□□

# Watch Player

## Take podcasts on the go

**Free** **Developer** Peter Knapp, peterknapp.me

**Platform** watchOS, iPhone  **Requirements** iOS 10 or later

A smartwatch might not seem like the ideal device for enjoying podcasts, but if you like to walk, run, or exercise with your favorite show on the earbuds, you needed to have your iPhone along for the ride – until now.

Watch Player is exactly what it sounds like: an app for transferring favorite podcast episodes to Apple Watch and playing them on the go without an iPhone. The process is simple, but requires first knowing the feed URL before subscribing to a podcast on the iPhone app. After that, download one or more episodes to your iPhone and transfer the files to your Apple Watch. This process does take some time (about 15 minutes for a 62MB file), but you can queue multiple files and let them transfer. Once a podcast is on your Apple Watch, tap to begin playing, then carry on with your favorite activity.
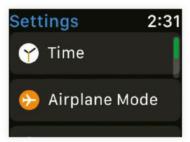
**THE BOTTOM LINE.** Podcasts take a long time to transfer, but this is the ultimate in convenience for die-hard listeners. **J.R. BOOKWALTER**
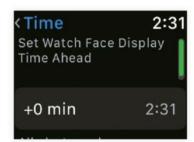
**SOLID** ■■■□□

## HOW TO

# Set your Watch to be a little fast

**1** **FUTURE LIFE**
Ever wanted to live in the future? You can by setting the Apple Watch display time ahead. First press the Digital Crown, then open the Settings app.

**2** **TIME AHEAD**
Tap the first button, Time. Here you'll find a setting to change the display by up to 59 minutes in the future without affecting alerts or notifications.

**3** **TURN FORWARD**
Finally, tap the +0 min button, then turn the Digital Crown to add the desired time to the clock. Tap Set, and enjoy living in the future.

# ⟩REVIEWS

## TOUGH TESTING, TRUSTED RATINGS

# Nikon D5600

## Modest updates to a great DSLR

**$700 ($800 with 18-55mm kit lens)** **Manufacturer** Nikon, nikon.com

**Features** 24.2 megapixels, 3.2-inch touchscreen, SnapBridge, ISO 100-25,600

Nikon's D5xxx range is designed for those looking for a few more features and greater creative control than its more entry-level D3xxx range. The D5600 is the latest camera in this latter series, replacing the D5500.

Resolution remains at a decent 24.2 megapixels, with the APS-C-sized CMOS sensor again shunning an optical low-pass filter in the quest to pull even more detail from the data recorded. The D5600 also uses the same EXPEED 4 image processor, with a native sensitivity range running from ISO 100 to 25,600.

There's a 3.2-inch vari-angle touchscreen display with a 1.037 million-dot resolution, although its operation has been improved. It now offers the frame-advance bar to speed up toggling through images, as well as a crop function for use during playback. A new addition is Nikon's timelapse movie function. This enables timelapse movies to be captured and put together entirely in-camera, with an exposure smoothing function helping to even out variations in lighting. In terms of video, Nikon has disappointingly decided to stick with 1080p video capture – with a choice of 60p, 50p, 30p, 25p, and 24p frame rates – rather than opting for 4K.

The most pronounced difference between the D5500 and D5600 is the inclusion of Nikon's SnapBridge connectivity. This creates a constant connection between the camera and your smart device, once you've downloaded the free SnapBridge app. Using a wireless connection, batches of images – 2MP JPEG versions to be precise – can be automatically transferred from the D5600 to your device, or you can select individual images to transfer at full size, though again this is JPEG-only.

The D5600 sticks with Nikon's proven 39-point Multi-CAM 4800DX AF system. It may be starting to show its age against mirrorless rivals offering ever more AF points, but it's still a solid and accurate system when shooting with the viewfinder. With the same sensor as the D5500, the results from the 24.2MP chip didn't throw up any nasty surprises. Resolution is good, with the absence of a low-pass filter allowing for intricate details to be recorded. Images captured at lower sensitivities appear clean, with little or no noise present.

**THE BOTTOM LINE.** A modest upgrade, but the D5600 is a capable DSLR that delivers great images with polished handling. **PHIL HALL**

### NIKON D5600

- ⊞ Superb image quality
- ⊞ Good autofocus
- ⊞ Touchscreen interface
- ⊟ Pricey compared to rivals

**GREAT** ▪▪▪▪▫

# Quicken for Mac 2017

## A personal finance manager worth investing in

**$74.99** **Developer** Quicken, quicken.com

**Requirements** OS X 10.10 or later



Budget your finances for the next 12 months with Quicken 2017, easily the best Mac version to date.

To say Quicken has a checkered past on the Mac is an understatement. It took Intuit nearly three years to make the software compatible with Intel processors after Apple made the switch in 2009, at which point the company started over with the stripped-down Quicken Essentials.

Things have improved since. Quicken 2017 still doesn't have complete feature parity with the Windows edition, but this is easily the best Mac release to date.

For starters, Quicken for Mac 2017 has a refreshed user interface that's easier to navigate, thanks to the blue header menu across the top for quickly refreshing data, adding new accounts, or jumping directly to Reports, Budgets, Bills, Calendars, or Alerts. The sidebar now displays a blue dot next to connected accounts to indicate when they've been updated with new transactions.

If you haven't kept tabs on Quicken since the troubled 2007 edition, the software now automatically downloads transactions from more than 14,500 banks, includes 12-month

budgeting, and there's a free, quite good iOS companion app for entering transactions or keeping tabs on your money from anywhere. Managing investment accounts remains a work in progress compared to Windows, and a few 2007-era features such as loan amortization schedules and automatic reconciliation are still MIA.

The good news is, Quicken is now listening to what Mac users need and working quickly to fill any remaining gaps in functionality. The full-fledged Quicken Bill Pay makes a triumphant return here (although a $9.99 per month subscription is required to use it), and aside from answering a few security questions when adding certain new bank accounts, syncing was a breeze. Only a few secondary accounts gave us any grief, mostly store-branded cards issued by Synchrony Bank, which required downloading and importing a QIF file rather than maintaining an active connection.

Upgrades from older Mac or Windows versions can be bumpy, but thankfully Quicken 2017 now includes US-based telephone support in addition to the previous live chat option.

**THE BOTTOM LINE.** Quicken is back in fine form, and the 2017 edition opens a promising new chapter. **J.R. BOOKWALTER**

## QUICKEN FOR MAC 2017

- Interface improvements for easier navigation
- Robust automatic sync with over 14,500 financial institutions
- Lacks complete feature parity with Windows version
- Still missing features from Quicken 2007

**EXCELLENT** ■■■■



Back and better than ever, Quicken for Mac 2017 offers a more streamlined user interface that's easier to navigate.

**Mac|Life EDITORS' CHOICE**

# Pastebot

## Infinite clipboards for your Mac

**$9.99** **Developer** Tapbots, tapbots.com/pastebot

**Requirements** OS X 10.11 or later

At its most basic, Pastebot is a massive clipboard, holding up to 1,000 clippings. You can ignore copies over a certain size, sync clippings over iCloud, and easily get at them using a Quick Paste window invoked using ⌘+⇧+V. The most recent 10 copies can be pasted using number keys; or you can navigate using cursor keys or the mouse, and can delve deep into your clipboard history using the window's search field. This proves responsive and reliable, but it's arguably elsewhere Pastebot's real magic happens. The main window lists data for each clip – origin, size, date, and so on – and you can search by these criteria. Favorites can be stored as custom clipping sets, and again accessed using shortcuts.

Best of all are the filters, which rework copied text, for example changing its case or transforming words into an HTML list. Several are included, but you can also make your own. In the right hands, these filters make Pastebot hugely powerful, but even when just using the basics, it's well worth the outlay.

**THE BOTTOM LINE.** A utility that should appeal to the widest range of Mac users – and end up permanently welded to a great many Macs. **CRAIG GRANNELL**

### PASTEBOT

➕ Feature-rich

➕ Usable yet deep

➕ Can opt-out apps

➕ Filters are superb

**AWESOME** ■■■■■

# CustomMenu 3

## A global menu utility for Mac

**$7.99** **Developer** PointWorks Software Dev, pointworks.de/software/custommenu-3

**Requirements** iOS 10.11 or later; 64-bit processor

CustomMenu 3 takes a similar approach to the Default Folder X utility, adding a global menu that can be customized for quick access to favorite applications, files, and folders. Just create groups from the Customize Menu window, then add your desired items. Click on the CM menu bar icon and groups and items appear as a cascading menu used to navigate, preview, or open files with a single click. CustomMenu 3 offers two submenus for recent items and a switcher for hopping between running applications. Hovering on a file displays a preview as well as basic info (file type, size, and date created/modified); users also have the option to open files with applications other than the default, or reveal files in the Finder.

One feature we'd like to see is the ability to customize folder names – if you have multiple folders with the same name on different volumes, there's no easy way to differentiate between them.

**THE BOTTOM LINE.** An affordable alternative to Default Folder X. **J.R. BOOKWALTER**

### CUSTOMMENU 3

➕ Customizable groups and items

➕ Submenus for application switcher and recent items

➖ Can't customize names for added items

➖ Global menu isn't available directly from the Open and Save dialogs

**GOOD** ■■■□□

# Student Assistant Prof

## Organize your college life – the academic part, that is

**$24.99** **Developer** Academ Media, academmedia.com

**Requirements** OS X 10.11 or later



Student Assistant Prof makes it easy to schedule and manage all your classes, grades, and teachers from one app.

Let's face it: university life isn't always the wild free-for-all depicted in Hollywood movies. It's also a lot of hard work and long study hours, which require intense focus and educational commitment.

Student Assistant Prof ("Professional") is a Mac app to help organize your schedule and visualize the studies and homework necessary to excel. The user interface is straightforward and easy to understand, although not always designed with American students in mind; for example, the software only displays 24-hour military time, although dates do appear in the US-friendly "month before day" order.

The application is divided into three main screens, each represented by a shortcut in the left-hand sidebar: Timetable, which displays details for each day's events in a weekly calendar view; Journal, where you keep track of attendance and assigned grades; and Teachers, an address book with email, phone, Skype, and Facebook contact information for educators and their subjects.

In Timetable view, classes display relevant information such as date, time, subject, teacher, and event type (regular or exam), with 10 assignable colors and 48 different icons to help differentiate between them at a glance. The process works a lot like regular calendar apps, complete with a recurring schedule option.

Journal allows students to create a group from different subjects, as well as add sub-journals for tracking homework and grades for quizzes or exams. The software also automatically calculates an average attendance and grade as info is entered.

The software comes preloaded with demo data including subjects, schedule colors, icons, and teacher assignments that help you get up to speed quickly; at any time, you can purge this data and replace it with your own.

Aside from the Euro-centric time display and occasional interface misspellings (for example, "ungroupped" instead of "ungrouped"), Student Assistant Prof is a useful tool in any college student's arsenal. It's a bit on the expensive side, but there's a free ad-supported version also available, which can unlock the full version via In-App Purchase for a more affordable $9.99.

**THE BOTTOM LINE.** It's a little pricey, but Student Assistant Prof provides the tools necessary for surviving your college studies. **J.R. BOOKWALTER**
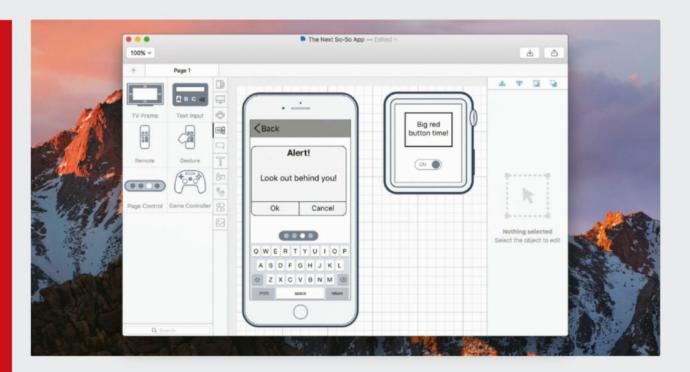


Timetable view is a great way to keep tabs on what classes are coming up for the week ahead.

## STUDENT ASSISTANT PROF

- ✚ Calendar and organizer specially designed for college students
- ✚ Automatically averages attendance and grades
- ✚ Built-in teacher contacts
- ▬ Expensive

**GOOD** ▪▪▪▪▫

A Make My App 2
Pro canvas with an
iPhone and Watch
app being created.

# Make My App 2 Pro

A tool for bringing app ideas to life, on "paper" at least

**$24.99** **Developer** IT Top, ittop.mobi

**Requirements** OS X 10.10 or later, 64-bit processor

Everybody gets ideas for The Next Great App. But to move on it, you need a clear, strong mockup of your vision to share with others. Make My App 2 Pro wants to be the vehicle for your vision.

Available in free (with ads) and paid versions, Make My App 2 Pro is a tool for building visual examples of your app, allowing you to tinker with how your apps might look and work at a basic level. Think of it like an app for diagrams or mindmaps along the lines of OmniGraffle or MindNote, but specialized for apps.

Make My App 2 Pro has built-in objects to represent devices like the iPhone, iPad, and even Apple Watch. Drag one to your canvas, then drag a variety of iOS objects on top to build your interface. There's a good choice of objects – buttons, text boxes, scrollbars, tables, charts, switches, and more. However, a few essentials are missing, including tab bars (at the bottom

of the likes of Tweetbot, Day One, and Safari). It would be nice to see Make My App 2 Pro get rounded out with some of these common visual building blocks. Something else we found disappointing is a lack of what we call "alignment smarts." If you've ever dragged things around in apps like Apple Pages, Pixelmator, OmniGraffle, and others, you'll have seen the smart guides that help you align objects. Make My App 2 Pro has ways to group and resize objects to your specifications, but no tools to help you polish a clean, clear layout.

Make My App 2 Pro could do with a few more of the core objects found in iOS, and a little more smarts to help polish ideas. Still, for $25 (or free, if you can put up with ads), it isn't a bad way to get started.

**THE BOTTOM LINE.** A decent app mockup tool that could benefit from some fleshing out. **DAVID CHARTIER**

**MAKE MY
APP 2 PRO**

- Easy to get started
- A good variety of visual objects
- Lacks a few standard iOS objects
- Alignment options are absent

**GOOD** ■■■■□

# Photolemur
## Photo editing and AI combine

**$49**  **Developer** Photolemur, photolemur.com

**Requirements** OS X 10.10.5 or later, Core 2 Duo (late 2009 or later), 4GB, 1280x800 display

Photolemur is a photo editor with a difference: it uses subject recognition and applies adjustments automatically. Rather than applying specific filters or fixes, it identifies features such as faces, trees, skies, and landscapes to make enhancements that are specific to the subject and image. What's more, it learns as it goes, so should get better the more it's used.

Photolemur looks at image colors, exposure, contrast, and white balance, and analyzes an image on a pixel-by-pixel basis before making adjustments to enhance each shot individually. If you save an image, it's added to the "success" list, but if you don't it's added to the "blacklist," thus helping Photolemur learn what you like to see.

Photolemur couldn't be easier to use. Click Load Photo to upload an image or a selection of images, or drag a collection of files to the main screen. It then starts processing the images before revealing the first image, with a line dividing it into before and after views. You can drag the line left or right to reveal more or less of the adjusted version. A sliding control under the preview lets you alter the adjustment on a scale from Realistic to Vivid. In most cases we found the default effect was fine, but it's nice to be able to make a tweak occasionally. The only other control is a crop/rotate tool accessed via the scissors icon. This can be used as a click-and-drag tool, but you can also enter a specific angle of rotation if you like. It's also possible to set an aspect ratio for the crop.

If you upload more than one image, the unopened images are visible in the collapsible browser bar underneath the central preview screen. Simply click any of the images to see the adjusted version.

Photolemur is extremely easy to use and works very well, with a variety of adjustments applied to varying degrees to different images. In some cases the adjustment can be very subtle, whereas other images may have a more dramatic edit applied. It works especially well with dull or dark images, bringing them to life by brightening them selectively, boosting the local contrast to bring out details, and increasing color saturation.

**THE BOTTOM LINE.** Photolemur is very easy to use and it successfully enhances a wide variety of images automatically. **ANGELA NICHOLSON**

**PHOTOLEMUR**

- Easy to use
- Automatic adjustments
- Effective results in many cases
- Limited control

**GREAT** ■■■■

# Frequency - Music Studio

## A serious music app for not-so-serious money

**$2.99**  **Developer** Valentino Frati, sites.google.com/site/frequencyquentinapps

**Requirements** OS X 10.10 or later

Frequency's interface reminds us of GarageBand, or a Logic instrument. It's very user-friendly.

The first thing we noticed about Frequency was the price, which puts it firmly into novelty-app territory: serious software doesn't cost three bucks. But then we used it, and all that changed.

If you've ever wrestled with complex audio software when all you want to do is combine a couple of files, fade out a track, or tweak the sound a little bit, you're going to love Frequency. It's a multitrack-capable audio editor and mixer that enables you to make big changes to sound files with little effort.

It's the sort of app that will have podcasters in particular jumping with joy, because it makes combining multiple pieces of audio, equalizing them, and positioning them exceptionally quick and simple, but we can see the possibilities for musicians and movie-makers too.

The app's layout is simple enough. There's a ten-band equalizer at the bottom, and the various audio tools are set to the right. The track or tracks you're working on appear as waveforms in the main window, and you can move them around with the mouse or trackpad as needed.

You can import M4A, MP4, MP3, AIFF, and WAV, and you can extract the audio from MOV, MP4, and M4V videos. You can also

drag and drop from iTunes, or directly from the Finder. It's all very intuitive.

Once you've got your audio file(s), the fun can begin. You can use the sliders to fade tracks in or out, boost the low frequencies, apply high or low pass filters, or adjust the pitch and/or speed of the track.

You can adjust each track's stereo position and volume, apply reverb and boost the low frequencies, and if you find a combination you like you can save it as a preset for later, or just copy it to the other tracks. Once you're happy you can export as AIFF, MP3, or WAV, and you can also automatically add it to your iTunes library if you wish.

If you've used the open-source audio editor Audacity you'll be familiar with this kind of thing, but Frequency's user interface is much more friendly: it looks like it came from the same place as GarageBand, and that means you'll get the hang of it in no time.

It's fast, too, handling multiple long AIFFs on an aging iMac without breaking sweat. In a market where apps are often frighteningly expensive, Frequency is an exceptional value.

**THE BOTTOM LINE.** Cheap doesn't always mean cruddy. Frequency is exceptionally good value for money, and ideal for podcasters and musicans **GARY MARSHALL**
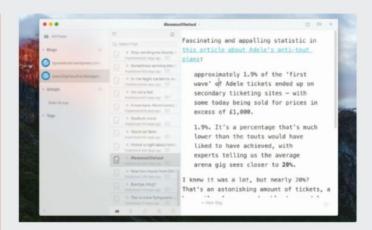
Combining multiple audio tracks couldn't be simpler: just import and then move it to where you want it.

### FREQUENCY - MUSIC STUDIO

- Lightweight and fast
- Really easy to use
- Surprisingly powerful
- Interface isn't customizable

**EXCELLENT**

# Desk 3

## Popular WordPress app gets a reboot

**$19.99** **Developer** John Saddington, desk.pm
**Requirements** OS X 10.10 or later

The much admired Desk app has been redesigned and recreated with macOS Sierra in mind. It's attractive to work on, and powerful too. Desk is designed to make writing for WordPress a pleasure. It has a clean, simple interface, shortcuts to speed up common tasks, a range of modes to suit particular preferences, and it makes even the most ill-thought-out blog post look amazing. It saves work offline, automatically backs up to iCloud, supports multiple WordPress blogs, and makes it easy to embed media. It can also be customized for specific designs – for example, you might want to specify featured images, categories, or tags for your content on one site but not on others.

It's clear that the developer is a prolific blogger: the app offers both WYSIWYG and Markdown editing, real-time previewing, word counts, and estimated reading times. There are a few odd choices. For example, the font options and style definitions don't appear in the Edit or Format menus; you need to right-click the post to see them. The app also crashed on us every time we tried to export as PDF.

**THE BOTTOM LINE.** Desk 3 is a powerful writing tool for WordPress, but we found it to be crashy. **GARY MARSHALL**

### DESK

- Beautifully designed
- Very fast and flexible
- Multiple blog support
- PDF export crashed the app

**GREAT** ■■■■□

# QuickKey – Text Expansion

## Smarter text replacement?

**$9.99** **Manufacturer** LittleFin LLC, littlefin.com
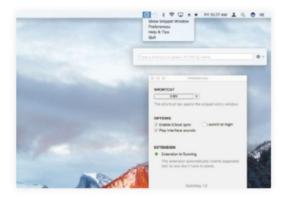**Requirements** OS X 10.11 or later

QuickKey is a text expansion app that aims to go beyond macOS's built-in tools. TextExpander is usually our go-to for this, but not everyone loves its new subscription system. With QuickKey, you press a keyboard shortcut, type in your text shortcut, and the snippet automatically pastes into your document (provided you have an extension installed, which the app helps with). Snippets are added via a dedicated manager, and sync over iCloud. They can only be plain text, so you can't include characters for complex equations or similar. All of which makes it actually not a lot better than the Mac's built-in tools. It's easier to enter and edit multi-line snippets, but you can actually enter these in macOS's seemingly single-line tool by pasting them in. And QuickKey is more awkward to trigger because you have to press a shortcut in the first place.

**THE BOTTOM LINE.** A fine app, but doesn't do enough for us to get excited. **MATT BOLTON**

### QUICKKEY - TEXT EXPANSION

- Easy way to create multi-line text snippets
- Good snippet organization tools
- Only plain text support
- Not enough standout features

**SOLID** ■■■□□

NFC

SPLASH PRO

# Kodak Pixpro SP360 4K

## Want 360-degree 4K video? This could be for you

**$500 (single pack), $633 (dual pack)  Manufacturer** Kodak, kodak.com
**Features** 12.76 megapixels, 235-degree field of view, 3840x2160 resolution, Wi-Fi

When you film movies on an regular video camera, you point at what you want to film, and the camera will capture a flat frame's worth of image in a set resolution. Where a VR camera differs is that it can capture a 360-degree scene – everything that happens around you. Kodak's new action-oriented Pixpro SP360 4K has two cameras bolted together, the lenses pointing away from each other. This captures every ounce of detail around the device. Naturally, this sort of imagery is perfectly suited to VR: don a compatible pair of glasses and you can look in all directions as the video plays. You'll feel like you're actually there, experiencing the action first-hand.

The SP360 4K comes as either a single pack or a dual pack, the latter of which we tested. This gives you full spherical video capture, while the single pack manages only half that. If you go for the dual pack, you get the advantage of a wrist-mounted remote control, but mounting options are limited to a suction mount or an extending selfie-type stick.

There are a simple set of controls on one side, an LCD on the other, and access to the ports and memory card slot underneath a plastic tab. The case is splashproof, but you'll need an underwater case for proper wet-weather activities. We found the buttons to be a little flimsy at times – particularly the record button, which would occasionally get slightly stuck within the housing. The LCD screen is tiny, too, which makes reading on the fly a little tricky.

The software side of things is, frankly, just not that good. If you're planning to edit via a Mac, you have two separate programs to download and install – one for editing videos and one for stitching two videos together – and neither is great. There are no help guides within the software either, so you just have to fumble your way around until you figure out what to do. The mobile app does much the same thing but is a little more refined, and a mite more intuitive.

Even with the power of double 4K, the video quality doesn't rival the static image you get from a regular 4K action cam, so we were left slightly underwhelmed. It's good, it's just not exactly awe-inspiring. Of course, having to cover such a huge amount of picture real estate, the quality is always going to take a hit; it's probably why GoPro has settled for three times the number of cameras in its own VR setup.

**THE BOTTOM LINE.** If you want to bring your action videos to life, the SP360 is a good option, imbuing incredible depth to scenes. It's also a relatively inexpensive way of jumping on the VR bandwagon. **NICK ODANTZIS**

**KODAK PIXPRO SP360 4K**

- Immersive footage
- Easy to use
- Comparatively good value
- Movie quality could be better

**GOOD** ■■■■□

# Lume Cube Smartphone Video Kit

## Shed some extra light on your iPhone photos and videos

**$109  Manufacturer** Lume Cube, lumecube.com

**Features** 150 lux at 3m, Bluetooth connectivity, app control, smartphone mount

The Lume Cube is a rugged external light to help when taking photos or video, which can be controlled from an accompanying iPhone app. It's waterproof, so can be used in poor outdoor conditions without any worries. You can buy the Lume Cube on its own, or in a set with the Smartphone Kit, which includes a hand-held mount. The mount can hold your iPhone in its clip as well as the Lume Cube (or just one of the two can be attached if you want an off-light effect), and the setup is impressively flexible thanks to multiple thread points on the clip and an included ball-joint attachment.

The Lume Cube's light has multiple levels of brightness accessible by pressing buttons on its body (a slider can be used to control it in the iPhone app), and is really quite powerful for its size, with a wide, long-reaching throw at higher levels. It's quite a hard light (there's not much diffusion), so can seem fairly harsh, with sharp shadows. It also appears cooler than expected, so if you're using it in an area with warmer lights around, the results can be odd. For closer objects, we got better results with the iPhone's TrueTone flash. We wish the Lume Cube came with an easy way to attach filters to diffuse or change the light's color (a diffusion kit is coming soon, but in a pretty expensive attachment).

The battery life is decent – a couple of hours at mid-level strengths. You can trigger it to flash only when you start shooting in the app, saving power, but we got better results forcing it on, controlling the light level with its app, and using a superior camera app.

**THE BOTTOM LINE.** A strong, convenient portable photo and video light kit, but we'd like more control over its effect. **MATT BOLTON**

## LUME CUBE SMARTPHONE VIDEO KIT

- ➕ Small, portable, tough
- ➕ Powerful light...
- ➖ ...but hard and cool
- ➖ App not as useful as it should be

**GOOD** ◼◼◼◻◻

# Olloclip Core Lens Set

## Better iPhoneography to the core

**$100** **Manufacturer** Olloclip, olloclip.com

**Features** Fisheye, superwide, and macro (15x) lenses

Add-on lenses for the iPhone are now quite common, although they vary wildly in quality and price. If the Zeiss ExoLens (see last issue) is a little too hot for you at $200, here's a more attainable alternative.

The Olloclip Core Set for iPhone 7 and 7 Plus has superwide, fisheye, and 15x multiplication macro lenses, with the macro lens being revealed when you unscrew the fisheye. You can attach two lenses to the frame that sits on the iPhone, so changing a lens simply means flipping the frame and snapping it into place.

The superwide lens is great for landscapes, since the iPhone's camera is somewhat narrow, although Olloclip's lens suffers from horizon distortion near the edges of the frame. We really like the macro lens, though; its focus range is admittedly narrow, but that can add to the appeal in the right circumstances. You may not find much use for the fisheye lens beyond the odd shot, on the other hand. The price feels a little steep considering Olloclip sells a 4-in-1 lens set for $80, but that's only for earlier models.

**THE BOTTOM LINE.** A great starter set for taking better iPhone shots – though it's not without issues. **ALEX BLAKE**

### OLLOCLIP CORE LENS SET

- Fun macro lens
- Increases your picture-taking options
- Horizon distortion on superwide lens
- Fisheye is very specialist and/or gimmicky

**EXCELLENT** ◼️◼️◼️◼️◻️

# Prynt

## Bring your photos to life

**$150** **Manufacturer** Prynt, prynt.co

**Features** Zink printing, Lightning connection

Prynt is a handheld printer, relying on a Lightning connection rather than Bluetooth: you slot your iPhone SE/5s/6/6s/Plus into the camera-lookalike case. (There's no iPhone 7 version yet, and you have to buy a version for your particular iPhone model.) It relies on inkless Zink technology for its 3x2-inch prints. Image quality isn't amazing, but neither is it terrible: pics are reasonably sharp, but have noticeable horizontal scanlines.

Using the Prynt app you can take photos, load snaps from your library or create video "stories." This, as it turns out, is the most interesting part of Prynt. Choose a photo as a "cover" (the picture that gets printed out) and attach one or more videos to create a story. Once your picture has been printed, hold your iPhone over it and your videos play through the not-quite magic of augmented reality. It's fun and, given the so-so quality of the printouts, is probably the part that will appeal most.

**THE BOTTOM LINE.** Fun video prints and decent image quality are offset by some design- and app-related quirks. **ALEX BLAKE**

### PRYNT

- Video prints are fun
- Easy to use
- No Bluetooth, and limited phone model support
- Surprisingly big case

**SOLID** ◼️◼️◼️◻️◻️

# Hexo+

## You'll never be alone with this drone

**$999** **Manufacturer** Squadrone System, hexoplus.com

**Features** Max speed 45 mph, max range 300 ft, three-axis stabilization, Bluetooth

A new kind of drone is taking to the skies. Over the past 18 months or so, we've seen a number of "autonomous" drones being launched via Kickstarter. These drones will follow your every move, hands-free, whether you're thrashing down a mountain on a bike or shredding deep powder (it's a thing) on an Alpine black run.

A key difference with the Hexo+ is its six arm-mounted propellers, which make it a hexacopter rather than the more common quadcopter design. Despite its ample size, the Hexo+ is light enough to be transported to filming locations off the beaten track – even with the GoPro-compatible gimbal attached (you'll need to buy the camera separately) and a battery installed.

Assembly is a cinch. Slide the two plastic landing gears into place, screw the color-coded propellers onto the motors, attach the gimbal to the rails on the drone's belly and plug in the gimbal's power cable. The battery slots neatly inside the rear of the drone, and charging takes just over an hour via an aftermarket eCube charger.

Additional batteries cost $130 each; that's cheaper than other brands, but still steep considering the average 15 minutes of flight time per battery.

The Hexo+ uses a phone's GPS position via the free app, along with four other sensors (accelerometer, gyroscope, barometer, magnetometer) to pinpoint where the subject is and how it's moving to ensure optimum tracking and framing. It takes just 21 seconds from switching the drone on to it syncing with GPS, and connecting your phone to the drone via Bluetooth is simple.

It's safe to say that trees and power lines are a no-no for this device. That aside, the fun really begins when you're comfortable with the drone and ready to shoot. Camera movements are selected by a single tap within the app menu; the drone flies into position and awaits your command to Start Shooting. Highlights include Hover High, where the drone sits directly above you, taking in a huge amount of the landscape and moving with the smartphone-wielding subject on the ground.

The panoramic 360, Fly In/Out and Slide Sideways modes all perfectly capture the moment when you conquer your next mountain peak. Reaction to sudden bursts of speed or movement is instant, and the gimbal's three-axis stabilization keeps the camera fixed firmly on the subject.

Connection between drone and smartphone is consistently strong, and there's no noticeable difference in drone reflexes whether the phone is in your hand, or stowed in your pocket or backpack.

**THE BOTTOM LINE.** It's still early days for the Hexo+, but this is an impressive foundation for the fledgling brand to build upon. **CHRISTOPHER BARNES**

### HEXO+

- ▣ Accurate tracking
- ▣ Great stability
- ▣ App is glitch-free
- ▣ Lengthy charging time

**GREAT** ▣▣▣▣▢

# Vifa Oslo

## Warm sound from this textile-covered speaker

**$549** **Manufacturer** Vifa, vifa.dk

**Features** Bluetooth aptX, 3.5mm aux-in, rechargeable battery

This portable Bluetooth speaker costs, as you've probably already noticed, a large number of dollars. Vifa's sales pitch makes it out to be an objet d'art as much as a way to listen to music, and we do like the design a lot.

The frame is a single piece of aluminum that covers the sides and connects all the way around to form the handle, with a matt finish. The grilles on the front and back are covered with a custom textile from a Danish manufacturer that feels a lot like a high-quality wool finish – because that's partly what it is. It's all very finely made and very polished, as you'd expect.

Most importantly, the sound has had the same treatment. The Oslo's audio is big and rich, full of detail and warmth. Bass is thick and disciplined, meaning that it doesn't overwhelm the rest of the soundscape despite having good punch for the size of speaker. You'll have no problem picking out not just individual instruments, but exactly how they're being played. It fills a room with its audio easily without any hint of distortion – it's great across the range. Our only complaint is with the volume gradation steps; on iOS, we found that pressing the volume buttons led to it being either too loud or too quiet in a fairly average-sized living room.

We also found that it tended to hijack our Bluetooth connection a lot if we left it on. We'd switch to our iPhone speaker, then suddenly find it apparently silent, because it was playing on the Oslo in another room. We've been disconnecting in the Bluetooth menu as a workaround, and reconnecting when needed, but we're not keen on the extra hassle.

**THE BOTTOM LINE.** An excellent-sounding speaker with a cool design – but it's expensive and has a few small niggles. **MATT BOLTON**

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### VIFA OSLO

- Excellent audio
- High-end design
- High-end price
- Some connection irritations

**GOOD** ■■■

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# G-Drive Slim SSD USB-C 500GB

## Pick up some speed

**$230** **Manufacturer** G-Technology, g-technology.com

**Features** 500GB, USB 3.1 Gen 2

This looks like it should contain a 2.5-inch hard drive, but is much lighter, thanks to flash storage. The maker draws attention to the G-Drive's 0.39-inch body, but its 4.4 lbs weight is just as attractive. Over the bundled USB-A cable, this drive peaked at 440MB/s when using an adapter to connect it to a Late 2016 MacBook Pro. But over its USB-C cable, peak transfer rates when reading files were just a few megabytes per second less than what's quoted: 550MB/s. Peak, mean average, and minimum sequential transfer rates were all healthily ahead of our old favorite, Samsung's T3, peaking at 534.7MB/s when reading and 496.1MB/s when writing.

In our difficult random read and write tests, which use small file sizes up to 1MB, the G-Drive exhibited excellent speeds – except for randomly reading files upwards of 256KB, where it lagged behind the T3, but not enough to be a concern. **ALAN STONEBRIDGE**

### G-TECH G-DRIVE SLIM SSD USB-C 500GB

- ▣ Mostly great speeds
- ▣ Sleek and lightweight
- ▣ Bus-powered and easy to set up
- ▭ Minor speed drops

**GREAT** ■■■■□

# Netgear Orbi

## Faultless networking for large homes

**$380** **Manufacturer** Netgear, netgear.com

**Features** High speed tri-band Wi-Fi, covers up to 4,000 sq ft

Orbi is designed to eliminate wireless deadspots, particularly with large−family or multiple−occupancy homes where everybody has multiple wireless devices.

It consists of a tri−band Wi−Fi router, and a separate satellite that you place in an area where your wireless signal isn't so good − you can add more if needed. Together, you get a strong, robust, and reliable signal with one single network, so your device will have the best possible signal wherever you are in the home.

Setting up Orbi is a piece of cake and synchronizing the satellite is easy. You can also plug in numerous wired devices to both units, so if you have the satellite near your TV, you can connect other devices such as Apple TV and games consoles too. So far, so good… But Orbi has one pretty big downside: it costs a lot of money. Indeed, it's such a high upfront cost that you really do need to be sure you need it. Unless you have an extremely large house, you'd be better off buying a high−end tri−band router for less than $200.

**THE BOTTOM LINE.** Very expensive, but a faultless solution for large home total coverage. **DAN GRABHAM**

### NETGEAR ORBI

- ▣ Superb total-home coverage
- ▣ Very simple to set up
- ▣ Useful connection options
- ▭ Very expensive, and do you need it?

**GREAT** ■■■■□

# Dying Light: The Following Enhanced Ed.

## Do not go gentle into that good night…

**$59.99** **Developer** Techland, techland.pl

**Requirements** OS X 10.12.1, Intel Core i5 3.2GHz, 4GB RAM, 2GB VRAM



Clear out defensible, fenced-off areas: they make for ad hoc fortresses at night.

**DYING LIGHT: THE FOLLOWING – ENHANCED EDITION**

- Parkour provides a new twist on both zombie and open-world games
- Day and night cycles keep things fresh
- Enhanced Edition is full of new content
- Looting and combat can become repetitive

**GOOD** ■■■□

"Open-world zombie game with crafting and parkour" doesn't gin up much excitement in 2017, but don't overlook Techland's Dying Light. Far from capitalizing on industry zeitgeist, free-running is the foundation upon which the fictional, Turkey-ish city of Harran is built. It's relatively easy to simply scarper up the side of a building or to bound across the rooftops of Harran's labyrinthine slums, so skirting the zombie throng is often more effective than hacking through it.

The setting sun marks a dramatic shift in tone and priorities: during the day, protagonist Kyle Crane is free to scavenge scrap parts, craft increasingly exotic weapons, and chase down the intermittent supply drops filtering in from the outside (and un-zombified) world. At night, Dying Light mutates into a mix of desperate stealth and panicked chase scenes as Crane tries to escape the feral, snarling Volatiles long enough to find a safehouse.

Dying Light's parkour and real-time day-night cycle combine to prop up even the most menial tasks: fetching a fellow survivor's reading glasses or delivering a batch of tainted drugs to a rival faction. When chance, quest design, or Harran's dizzying geography force a more direct confrontation, Dying Light focuses on close-quarters melee combat. One of Crane's three skill trees is full of elaborate take-downs and grapples, but the appeal of any zombie game is the indulgent thrill of squishing undead skulls like so many overripe casabas. In combat, too, Dying Light's parkour provides interesting twists: hop up to high ground to hurl Molotov cocktails, or herd a flock of undead toward enemy thugs and let them sort each other out. Adapt and survive.

Dying Light is a free-flowing romp, complete with seamless drop-in, drop-out cooperative play and a bevy of multiplayer options. Some of its finer details are less accomplished, though: weapon degradation (and subsequent crafting) is never as fun in practice as in theory. The immediacy of melee combat and the tension of nighttime sorties are what make Dying Light scary.

**THE BOTTOM LINE.** Techland improves on its previous series while carving out its place in two crowded genres. Dying Light isn't bold or striking, but smart design that encourages player freedom wins the day – and night.

**JOSEPH LERAY**



Volatiles are single-minded in their pursuit, and poor Crane doesn't have the lungs or the legs to run all night.

Zone out '70s-style with some retro sci-fi action.

# Headlander

## So trippy and fun you'll lose your head

**$19.99** **Developer** Double Fine Productions/Adult Swim Games, adultswim.com

**Requirements** macOS Sierra, dual-core Intel i5, 4GB RAM, GeForce GT 650 Ti/AMD Radeon HD 7800 or newer graphics, 4GB storage

It's not often we see entirely new mechanics in gaming, but Headlander is as refreshing as it is colorful – and with its 1970s sci–fi aesthetic, it's also positively groovy.

You start out as a disembodied human head in a world full of machines, and your quest is to discover what happened to the rest of your body – and uncover your past. Playing as a disembodied head is fun; the helmet surrounding it can float, boost, attach to random machinery, and even shield itself temporarily. But when limbs are required to get to a certain spot, you can pop that head down on any available body – after you use your helmet's vacuum to suck their head off, naturally.

Combining elements of exploration, platforming, and combat on a slowly revealed map isn't exactly new; this "Metroidvania" genre is named for two games from the '80s, after all. It's Headlander's core mechanic and plot point – the disembodied head – that

makes it so different. Throughout the game, you'll embody passersby, soldiers, brawlers, dogs, map droids... you name it. That's not taking into account all of the other things you can do with your head, such as finding secret rooms with upgrades to stats, moving elevators, and more. It makes combat even more fun – if your current body is low on health, you can pop off your head, throw up your shield, and vacuum off the head of a shooting robot.

Other than enemies respawning a bit too quickly at times and a few vague objectives, there's almost nothing to complain about. It's a groovy good time, just as intended, imbued with humor and style. It's the type of game you play when you want to escape into a more entertaining, colorful world for a while.

**THE BOTTOM LINE.** Headlander mashes a well worn genre with original ideas and a great retro aesthetic, and the result is massive amounts of fun. **SARAH LEBOEUF**

**HEADLANDER**

- Bright, colorful '70s sci-fi feel
- Head-swapping mechanic feels fresh
- Side quests and secrets throughout the map
- Respawning foes can be a hindrance

**EXCELLENT** ▮▮▮▮▯

# HOME LIFE

## BETTER LIVING THROUGH SMARTER TECHNOLOGY

> GET STARTED WITH…

# IN-CAR SMART TECH

The Apple Car may never happen, but there's plenty of smart tech that you can use in your vehicle already

**BY CLIFF JOSEPH**

D espite all the rumors, it's still not clear whether Apple is planning to develop its own self–driving smart car, or simply focus on intelligent driving software that it could license to other manufacturers. In any event, nobody is expecting the famously secretive company to unveil the Apple Car for a few years yet at least.

In the meantime, there are still plenty of ways to add some Apple tech to your car – or buy a car that has Apple software built right into them. Apple's CarPlay technology is a display and controller for your dashboard that enables you to control key iPhone apps.

If your vehicle supports CarPlay (see **apple.co/2j2vFSc**) and has a compatible screen installed on its dashboard, you can connect your iPhone to it and see and interact with apps such as Maps, Messages, and Music without handling the phone. You can use Siri for handsfree voice commands, telling it to play your favourite playlist, for example, or "call the office" so you can tell someone you're stuck in traffic.

CarPlay made big strides in 2016, and there are now dozens of manufacturers, from Audi

Garmin has a number of variously priced models in its nüvi sat-nav range.



Get yourself a new Mustang and you'll get CarPlay thrown in.

to Volkswagen, that include CarPlay as a standard feature in many of their latest models. But you don't need to go out and buy a brand new car, as there are plenty of car accessories that allow you to use your iPhone while you're driving.

Safety is all-important, of course, and there are many handsfree kits that use Bluetooth to connect to your iPhone so that you can make or take calls without taking your hands off the wheel.

Many of these will also allow you to talk to Siri while you're driving, with prices starting as low as $20 for a basic model such as the Besign Car Kit. One of our favorite handsfree kits is the Parrot MiniKit Neo 2 HD, which is a little more expensive at around $70, but includes additional features, such as an app that remembers the location of your car when you park. We're also fans of Pioneer's range of receivers, especially the AVH-X3800BHS ($230), which provides HD Radio, Sirius XM compatibility, and voice integration with Siri.

Sat-nav systems are probably the smart car tech most people are familiar with. TomTom makes a number of affordable models, starting from $90, and there's the Garmin nüvi range starting at around $100.



Thinkware's Dash Cam X550 isn't cheap, but has both front and rear cameras plus GPS.

If you really want to give your wheels a high-tech upgrade, you can choose from several in-car entertainment systems also made by Pioneer. These include its own dashboard displays and full support for CarPlay, with prices starting at around $400 for its entry-level SPH-DA120. Some of Pioneer's CarPlay systems also allow you to connect a rear-facing camera, so that you can view the camera image on the dashboard screen to help you with parking, although these tend to be more high-end models costing $700 or above.

Because we're fans of JBL's speaker systems, we're very much looking forward to its first entry into the automobile market – the forthcoming Legend CP100. Like its Pioneer rivals, the Legend will include a dashboard display with support for CarPlay, and an option for connecting a rear-view camera, although it should be more affordably priced at $400. The launch of the Legend was delayed after Apple updated CarPlay along with iOS 10 last September, but it's now due for release in early 2017.

Cameras are another technology that's getting more popular in cars. It started with professionals using action-cams stuck onto the dashboard for recording footage during races, or for TV shows

**A NEW CATEGORY OF "BACK-UP CAMS" HAS RECENTLY APPEARED THAT CAN BE ATTACHED TO THE BACK OF A VEHICLE**

The Parrot MiniKit Neo HD 2 is a handsfree kit with extra smarts.

such as *Top Gear*. The action-cam specialists at GoPro quickly saw the potential here and released a series of dashboard mounts and accessories for the company's popular Hero cameras, and you can get a kit that includes the Hero5 camera and complete set of car accessories starting at around $300.

There's a more down-to-earth use for these dash-cams too. Apart from anything else, the footage from a dash-cam could prove that you weren't at fault in the event of an accident, saving you money and headaches. Some insurance companies will also offer discounts if you have a dash-cam in your car. You can get a basic

dash-cam such as the Haoponer dual-camera for around $55, but it might be worth looking at a more advanced models such as the WheelWitness HD Pro ($125) or Thinkware F750 ($250), which include additional safety features, such as collision warnings in case you get too close to the car in front, or start to veer across lanes.

A lot of accidents happen when drivers are reversing, and a new category of "back-up cams" has recently appeared that can be attached to the back of a vehicle in order to provide a clearer view than you get from your normal rear-view mirror. As we've mentioned, dashboard systems such as the JBL Legend allow you to connect to a rear-view camera and display the image on their dashboard screens, and there are several companies that make rear-view cameras, such as the low-cost BC30 from Garmin ($150).

Thinkware also makes a number of kits that include both front and rear cameras, such as the Dash Cam X550, which is fairly expensive at around $300, but includes advanced features such as GPS tracking, and the ability to warn you of nearby traffic cameras. It even has a Mac app for viewing your recorded footage on your computer, in case you want to create a library of driving videos.

# FIVE OF THE BEST

We recommend the best five in-car gadgets for you

**1**

### PIONEER SPH-DA120
**$400**
pioneerelectronics.com

> Also known as the AppRadio 4, Pioneer's in-car entertainment system can give your car a major digital upgrade, with touch controls and support for Siri and CarPlay. Pioneer provides its own apps to play a variety of digital music formats, and you can connect a rear-facing cam.

**2**

### PIONEER AVH-3800BHS
**$230**
pioneerelectronics.com

> Pioneer's in-dash DVD receiver offers a whole lot of stuff for the price, including Bluetooth control, Sirius XM satellite radio, HD Radio, Spotify app control (new to this model, in addition to the existing Pandora support), and integration with Siri's Eyes Free functionality for spoken directions.

**3**

### WHEELWITNESS HD PRO
**$130**
wheelwitness.com

> The WheelWitness's camera and recording resolution is impressive at 2560x1080 pixels, and with a 170-degree wide-angle lens, it's recording virtually the entire field of view in any given direction. You can also follow your recorded video alongside a Google Maps screen to precisely pinpoint an event.

**4**

### COBRA JUMPACK CPP 8000
**$100**
cobra.com

> More brute-force than smart tech, but this could be a life-saver in an emergency. It looks like a conventional battery pack, with a USB port for charging your iPhone – but it's also powerful enough to jump-start a car, and even includes its own set of jump cables.

# WHEN THINGS GO WRONG

Digital tech can help to keep your car healthy and safe, too

**M**ost cars sold since the mid-'90s have a connector for OBDII (on-board diagnostics 2.0). You can read the diagnostic data these collect with a hand-held scanner. However, many of these scanners are aimed at professional mechanics with advanced knowledge, so they're not exactly simple to use.

In addition, while there are some that integrate with a smartphone to analyze and display stats, there are surprisingly few that support iOS. One that does is the Bluedriver ($100), which can read and clear codes, generate repair reports for countless models, and which works seamlessly over Bluetooth.

Another useful maintenance tool is the FOBO Tire sensor set ($229), which uses Bluetooth to transmit info about your tires to an iPhone app. And, in a pinch, we'd definitely recommend the Cobra JumPack (around $100, see left for more). This looks like a conventional battery pack that you can use to charge your iPhone while you're driving, but it's so powerful that it can jump-start the battery on most small and medium-size cars, and could really get you out of trouble on a cold winter morning.

## 5

**PARROT MINIKIT NEO 2 HD**
$70
parrot.com

> With phone handsfree kit available for next to nothing, manufacturers have to justify higher prices. So Parrot has incorporated support for dual phones with simultaneous connections, "HD-quality" sound, voice control (though not through Siri), and more.

## HOW TO
# ADD CARPLAY TO YOUR CAR

### 1 CarPlay kit
A CarPlay kit such as JBL's new Legend is a fairly chunky piece of gear. It includes a 6.75-inch touch-sensitive screen, along with all the electronics needed to run the CarPlay software and apps. There's a microphone for voice calls and Siri, too.



### 2 In-car entertainment
Once installed, the Legend acts like a standard car-entertainment system. It includes AM and FM radios, and can play music from any device with a USB connector. The Phone button switches everything over to CarPlay, so it can link up with the iOS apps on your iPhone.



### 3 Eyes free
You need Maps for navigation, but CarPlay primarily focuses on audio-based apps such as Music and Phone, which don't require you to take your eyes off the road. There are some third-party apps that work with CarPlay but these also focus on audio, such as Spotify.



### 4 Hey, Siri
And, of course, there's Siri. You can use Siri in your car just as you would ordinarily use it with your iPhone, so you can ask it to launch Maps and locate a particular destination, play some music, or make a call to your office. Or just pass the time on a long trip…

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# GET SMART

CONNECTED GADGETS [...] LE

1 **Yamaha Disklavier Enspire**
yamaha.com
From $28,000

>>> Yamaha has a long history of producing musical instruments, including the new Disklavier Enspire range of pianos, which works as part of its Musicast multiroom audio system. While it's a traditional acoustic piano you can play at home or even in a concert hall, it's also packed with digital technology, including the ability to stream your piano party-pieces to Yamaha speakers around your home. Other features include the ability to record your performances, which is great if you're a musician or studying the subject.

If you're not that musically gifted, there are 500 recordings stored on the piano, covering genres such as classical piano solos, jazz, and even a few pop tunes, too. The Enspire doesn't simply play back these songs like a glorified speaker – it plays the piano parts itself, with the keys and pedals moving like an old player-piano, thanks to a built-in servo drive mechanism.

There are 14 models in the Enspire range, starting at around $28,000 for the Enspire DU1, an upright piano that's suitable for homes or schools where space is tight. Step up to $92,000 and you get a grand piano model, the DC3X, while a premium grand piano such as the Enspire DCF6 comes in at a cool $160,000.

## 2 AirBolt Smart Travel Lock
theairbolt.com
**$80**

>>> Keep an eye on your bags with the new AirBolt smart lock, which you control over Bluetooth from an app on your iPhone. This can track your bag too, sounding a buzzer if it starts to move beyond Bluetooth range. If the bag truly gets lost, the lock can message other AirBolt users nearby and prompt the companion app on their phones to tell you where your bag is, anywhere in the world.

## 3 Withings Steel HR
withings.com
**$180**

>>> Withings is the latest company to come up with a hybrid smartwatch that ditches a digital screen for a more traditional analog watch face. The Steel HR is available in three styles, with a 36mm face in black or white, and a 40mm model in black only. As you might guess from the HR part of its name, it can monitor your heart rate as you run, walk, or swim, and it displays your data on a small digital counter set within the main face. The Steel HR can also alert you to incoming calls and text messages from your iPhone, and has a built-in alarm feature too, which can be set to vibrate.

## >SMART HOME LIVING

In her efforts to glam up, **JENNIFER PHIN** discovers an unexpected app ally

>>> **MY MOTHER** has started pressing money into my hands and urging me to "Treat yourself," which in Mom-to-Adult-Daughter-speak means "You're a hot mess, put on some damn lipstick before the pitchfork-wielding villagers show up." My make-up bag yields seven cotton balls and a Tic-Tac, so I do what any nerd would do and download the L'Oréal Make Up Genius app.

I'll be honest; I fully intended to make fun of this. It's a virtual mirror for iPhone that allows the user to "try on" L'Oréal cosmetics. I expect it to be a novelty promotional tool with strong potential for cat-makeover hilarity, but it is unexpectedly brilliant. I see what eyeliner should look like when properly applied (hint: not like a direct punch to the ocular cavity). I try costly lipglosses in outrageous colors – and on my lips rather than the back of my hand, very high-brow. Even better, the Snapchat-like AR means the virtual make-up moves with my face as I look into the camera; I can wink provocatively to get a better look at mascara. I can suck in my cheeks and the blusher follows along... which is how my family finds me on a quiet Saturday afternoon. A half-hour later and we know exactly how my mom, husband and one-year-old look with a glam smokey eye. (*Fabulous*, obviously.)

Depending on where you live, it's possible to order products online too, and I can suddenly see how virtual cosmetics apps could totally change the lives and looks of women – and men – who are too busy, remote, or self-conscious to set foot in a department store for a makeover.

# APPLE TV

## THE LATEST tvOS APPS AND THE HOTTEST HARDWARE



Make your Sunday afternoons matinee movie afternoons, with the Mill Creek Entertainment app on your Apple TV.

# Mill Creek Entertainment

## Magical movie memories

**Free**

The Mill Creek studio specializes in the best of nostalgic entertainment, with a catalog that's ripe with classic movies, retro TV shows, and fascinating documentary collections.

Thanks to the Mill Creek Entertainment app, now you won't have to shamble into Walmart or Target in search of your favorite sci-fi, mystery, horror, drama, comedy, or Westerns featuring iconic stars. That's because all those massive movie collections are now assembled in digital form, ready to stream on your Apple TV.

While 50-movie sets such as Midnight Movie Madness, Cowboy Legends and Icons of Comedy aren't free, plenty of individual titles are – and collections can be had for as little as $4.99. You can even purchase DVD + Digital sets and redeem codes to add them to your streaming collection. **J. R. BOOKWALTER**

# Minecraft: Apple TV Edition

## Building blocks of fun

**$19.99**

Mojang has finally delivered Minecraft: Apple TV Edition in all its glorious blocky wonder.

Like the iOS Pocket Edition, the Apple TV Edition allows players to explore randomly generated worlds and build things, from the simplest of homes to the grandest of castles. Whether you choose survival mode for mining, or take advantage of unlimited resources by playing in creative mode, you'll have the same ability to craft weapons and armor to protect your turf. Naturally, Minecraft landing on Apple TV is a Big Deal, but there are a few things worth noting. First, you'll need an Apple TV-compatible gamepad to play. Also, there's currently no support for Realms, nor can you sign into Xbox Live or play with friends. While those features are coming, for now it's more like "Minecraft Lite." That said, playing with a proper game controller beats the experience of tapping on-screen buttons in the Pocket Edition. **J. R. BOOKWALTER**



Minecraft: Apple TV Edition may not offer all the features you'd like it to just yet, but it's still Minecraft on your Apple TV. And is, therefore, a Big Deal!

# Easy Comic Reader

## Read comics on TV

**$1.99**

With support for cloud storage providers Dropbox, Google Drive, and OneDrive, this inexpensive app allows comic book enthusiasts with existing collections to download and read books right on the TV screen.

Easy Comic Reader supports all popular comic formats including CBZ, CBR, CB7, CBT, ZIP, and RAR, allowing one-click downloading of your favorite titles. Getting started is a snap by using a four-character code to link your account from any web browser.

The app fills the screen horizontally, so you'll need to use the Siri Remote to swipe down the page, clicking the left

*Kapow! Get your favorite superheroes to save the day on your TV screen.*

or right edge to turn the page backward or forward. Most compressed JPEG pages don't look super-clean on a big TV screen, but it's an entertaining way to catch up on favorites while lounging on the couch. **J. R. BOOKWALTER**

# WatchAir TV

## Over-the-air streaming

**Free (hardware required)**

Networks may keep most live television out of reach for Apple TV owners, but WatchAir app/antenna may be the solution. A $239 wireless smart antenna delivers over-the-air signals to iOS and Android devices, as well as smart TVs, Roku boxes, and more.

The free WatchAir TV app is what ties the service together, wirelessly streaming live or recorded content from within a 60-mile range directly to the big screen. With no monthly subscription fees, WatchAir TV includes an enhanced schedule guide as well as sorting shows by category or type so it's easy to find something on to watch.

*With a wireless smart antenna, WatchAir offers a live TV solution for Apple TV owners.*

And you can record live TV to watch later – up to five hours of storage is built into the smart antenna, or you can plug in a microSD card or USB device to keep H.264 recordings for hours or even days. **J. R. BOOKWALTER**

## HOME THEATER

### Make the most of home entertainment

**LEECO SUPER4 X65 ECOTV**
$1,199  LEMALL.COM

Not familiar with LeEco? This upstart Chinese brand has invaded US shores with a 65-inch 4K UHD television offering Harman Kardon sound, and powerful specs for responsive apps – all at a pretty affordable price that includes three months of DIRECTV NOW plus EcoPass, the company's own cloud storage and all-around entertainment service.

**NEWER TECHNOLOGY NUSTAND ALLOY**
$24  NEWERTECH.COM

Sure, Apple TV was designed to lay flat, but if you like to do things differently, here's an inexpensive aluminum-alloy desktop stand to cradle your media streaming box, with a silicone center and non-skid rubber feet.

# ASK

**TECH SUPPORT & TECHSPLANATIONS**

not careful, the iCloud copy won't be up to date, and you could end up with different versions of files on your Mac and PC.

To implement the second method, you'll need folder synchronization software running on both your Mac and your PC. It must be able to see your iCloud Drive so it can copy to it, and it must run automatically. For your Mac, the Mac App Store has good options, such as Folder Sync ($8.99, apple.co/2gwdzn5).

## Backups halt in Sierra

**I upgraded to a 27-inch iMac with a 1TB Fusion Drive, but every time it tries to run a Time Machine backup, the process stalls at the same point. I have even bought a new external hard drive, but it won't complete the first backup to that either. Is Time Machine broken in Sierra?**

Some users have reported problems backing up with Time Machine, but most of these issues can be fixed. If you can, archive the drive containing your old backups and switch to using the new one, starting afresh with it.

Ensure that Sierra is fully up to date, and that there's ample free space on the external drive to perform a full backup, as well as incremental backups thereafter. It's also wise to check that any migration from your old Mac didn't bring old or buggy software across to your new one, particularly extensions and enhancements.

Turn off Time Machine, connect the new external drive, and restart in macOS Recovery (hold ⌘+R at boot). Using Disk Utility there, run First Aid on your Fusion Drive, then initialize the external drive to Mac OS Extended (Journaled) format. Restart your Mac as normal. In Time Machine's preferences, click Options and add any folders you don't wanted backed up to the exclusions.

Re-enable Time Machine to back up to the new drive. Leave the iMac alone to back up, running no apps; overnight is ideal. If Time Machine sticks again,

## CROSS-PLATFORM SYNC

I'm delighted with my new MacBook Pro, but I still use a Windows PC too, so I'd like to use iCloud to keep files and folders synchronized between them. Is it possible to automatically update changed files on my PC to iCloud, and with my Mac too? I want to keep originals on my PC, and have them copied to my iCloud Drive.

There are two ways to use iCloud for this type of synchronization. The simpler way is to work on the files in iCloud, and only make local copies for backups and archives. This is easier because you don't have to do any synchronization, just pull down copies when you want to back them up locally.

You can use iCloud Drive as a means of synchronizing local copies, as you've said you would prefer. Of the two methods, this is inevitably the more complicated option, as it requires local software that copies from each computer whenever you make changes to the local copy of each file. If you're

Sierra's Console isn't much help in diagnosing it. You could try to use Recovery to reinstall Sierra, erase the new back-up drive, and then try again.

## Lost Handoff in Sierra

**I upgraded my MacBookPro (Late 2011) with an internal SSD, along with Bluetooth 4.0 (LE) support so I can use Handoff. Now that I've upgraded the MacBook to Sierra, Handoff has stopped working. How can I restore it?**

According to Apple, your model of MacBook Pro doesn't support any Continuity features, including Handoff. The oldest MacBook Pro models that support them are those released in Mid 2012. This is despite your upgrade enabling your Mac to support Bluetooth Low Energy.

You can check that by opening System Information and selecting Bluetooth under Hardware in the list on the left. The pane on the right will probably report that Bluetooth Low Energy is supported but Handoff isn't.

When you upgraded your Mac's hardware, El Capitan's Bluetooth drivers were clearly happy to work with the new components.

Unfortunately many people have found that such ad hoc support doesn't extend to macOS Sierra, and the moment they upgraded to that system, Handoff stopped working – probably a result of the new Bluetooth drivers in Sierra.

There is currently nothing that you can do to get Handoff working again under Sierra. Hopefully this will be restored in a future update, but given that Apple considers that your MacBook Pro doesn't support Handoff, it's best that you don't expect it.

## Ongoing memory hogs

**When running OS X 10.11 El Capitan, Safari, and Safari DAVClient consumed huge amounts of memory – up to 50GB according to Activity Monitor – and I often saw the spinning beach ball and heard the**

## > iCloud Photo Library mess

**Over many years, I've built a large and carefully ordered photo library, first in iPhoto, and more recently in Photos. I use iCloud Photo Library so that I can access this from all my devices. A few weeks ago I needed to change my Apple ID. Ever since I first signed in to my new account, new albums have proliferated and the library has become badly messed up. How can I restore order?**

With a lot of photos and albums, once an iCloud copy becomes corrupted like this, it's very hard to reorganize properly.

One strategy is to get everything back onto a single Mac, kill the iCloud

Photo Library, reorganize the library on that Mac, then turn iCloud Photo Library back on, first on that Mac, then on your other devices. It's best if you ensure that all are upgraded to macOS Sierra and iOS 10 before starting.

Killing the iCloud Photo Library is the only step that can be tricky. Once you're confident that you

have the whole library stored locally on your Mac, on an iOS device go to Settings > iCloud > Storage > Manage Storage > iCloud Photo Library and tap Disable and Delete. Or, on a Mac, open System Preferences' iCloud pane, click Manage (bottom right), select Photo Library, then click Disable and Delete.



**disk in my Mac thrashing. I thought that upgrading to Sierra might fix this, but it continues. What can I do?**

Run a malware checker, such as Malwarebytes (Free, malwarebytes. com/mac), as a common cause of Safari swallowing lots of memory is unwanted software. SafariDAVClient is unusual to see running; find out the cause and ensure the instigator is current and configured correctly.

Next, check Safari for old and unwanted extensions and plugins; extensions are listed in a tab in Safari's prefs, but also check these folders for plug-ins: /Library/Internet Plug-ins and ~/Library/Internet Plug-ins, and look for extensions in ~/Library/Safari/Extensions.
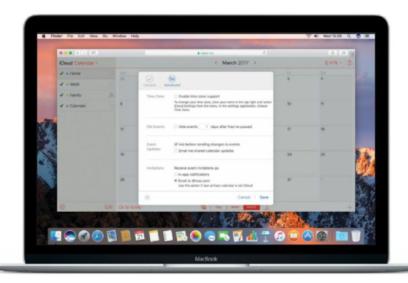
Activity Monitor should still show quite a lot of memory in use; macOS is designed to make best use of what's available, and the Memory Pressure chart on the Memory tab should show



Memory Pressure should almost always be green, and not venture into the red zone.

>>>

Block unwanted invitations in Calendar by changing a setting that's only available at **iCloud.com**.

green almost all of the time, and never hit the red. Utilities that claim to "free up" memory are pointless; their effects are transient and soon overtaken by events.

### Wrong search engine
**Whichever search engine I choose in Safari, it keeps defaulting back to Yahoo. How can I get it to stick?**

This is almost certainly being set by unwanted software on your machine. Like the previous question, check your Mac for that and malware by running the current version of a tool such as Malwarebytes Anti-Malware (Free, **bit.ly/2hF6oKi**), which should be able to remove any nasties it finds and report back to you.

Next, browse Safari's preferences again, looking for old or suspicious extensions and plugins. You'll find these in its Extensions tab, and by clicking on the Plug-in Settings button in the Security tab. It's also worth disabling all plugins for the time being, as that can help you track down the culprit.

Follow this up with a manual check of the three folders in which Safari's plugins and extensions are kept: /Library/Internet Plug-ins, ~/Library/Internet Plug-ins, and ~/Library/Safari/Extensions.

Once that's done, set the correct search engine, quit Safari, and then reopen it. If the first anti-malware scan picked up anything, consider running another scan now to check that there's nothing left behind.

### How to stop spam calendar invites
**Just recently, I've been getting unwanted Calendar appointments inserted automatically from someone who's writing them in Chinese. Have they gained access to my iCloud account, and how can I stop this?**

These almost certainly don't result from any failure on your part, or any compromise of your iCloud account.

They result from Calendar's ability to receive push notifications about event invitations that have been sent to you. This feature would normally work as a benefit to you by alerting you when people you know invite you to an event. In fact, anyone can send you invitations. All this spammer has been doing is using your iCloud account's email address to send an event invitation. Apple's servers then convert that into a push notification, which ends up in your calendar.

In the Calendar web app over at **iCloud.com**, there's an option to

receive event invitations as emails instead. Sign in through your browser on a Mac or PC using the same Apple ID and password as on your iOS device, then click Calendar's icon. Click the cog icon (bottom left) and choose Preferences, then click Advanced and, next to Invitations, set "Receive event notifications" to "Email to..."
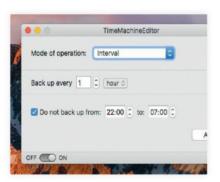
You'll still receive these spam invitations, but only as emails, and they won't be inserted into your calendar automatically any more.

You can also delete these spam invitations without declining them and inadvertently confirming to the spammer that your email address is active. Move the invitations to a new and otherwise blank calendar, and then delete that calendar to get rid of it and the event invitation at the same time.

### Partition location
**Why can't Boot Camp installer locate its partition?**

This can happen if you have a Thunderbolt or USB storage device connected while trying to install Windows in Boot Camp. Disconnect all storage bar the USB media that contains the Windows installer, then start up and try again to install Windows. If that fails, try upgrading to Sierra, if possible.

### Nightly backups
**How can I stop backups occurring during the night?**



TimeMachineEditor can suspend backups without affecting other Power Nap features.

If you put your Mac to sleep overnight then, by disabling Power Nap in the Energy Saver pane, Time Machine will stop running.

Alternatively, TimeMachineEditor (Free, bit.ly/2hl9KFS) can suspend backups between certain hours without affecting other Power Nap capabilities that occur while your Mac is ostensibly asleep.

## Dropbox compatibility
**Is Dropbox compatible with macOS Sierra yet?**

Yes, but there can be some problems. Full details are at bit.ly/2grNyFo. Avoid using it with iCloud Drive's Optimize Mac Storage feature or other forms of iCloud syncing, and don't move or rename Dropbox's folder from its defaults. Putting items with aliases into Dropbox can also cause issues.

## Security code
**Do I really have to use an iCloud Security Code?**

No, but if you create one while setting up iCloud Keychain, it adds an extra level of security that enables you to access your keychain on additional devices without the need to approve them from one that's already authorized. It can be six digits, a complex alphanumeric code, or a random code.

## Login keychain
**How can I repair my login keychain in Sierra?**

The Keychain First Aid feature was removed from Keychain Access in OS X 10.11.2 due to a security vulnerability. Unfortunately, all you can do to work around this is create a new keychain and copy the old one's items to it.

## › Mail issues in Sierra

**I've upgraded to Sierra, and have two issues with Apple Mail. First, I can't find a way to auto delete sent messages after a month, which was configured prior to Sierra. Second, an empty window appears every time I open Mail, which I have to close. How can I prevent that and automatically delete old sent messages?**

There's no longer a setting in Mail's preferences to achieve this. In an account's Mailbox Behaviors' tab, you could set sent messages to be saved in the Deleted Messages mailbox and have those erased after a month, but this carries the risk that you might accidentally erase things early. The blank window problem has occurred in the past when Mail had been upgraded. It's the remains of the Welcome to Mail splash screen, which should have been turned off after the upgraded app ran for the first time. A trick that has fixed this previously is to open Mail, disable all accounts, quit Mail, open it again, re-enable accounts, quit the app again, and finally open it a third time.

If the window remains, you may be able to kill it by trashing Mail's preferences file, but that would create more work to configure the app again. You may find it simpler to live with it for now. Let's hope a future update to Mail will do away with this for good.

### Sshh...
**Why is AirPlay music quietened on my Apple TV?**

This is because you've enabled the Reduce Loud Sounds feature on your Apple TV. This not only affects video played on that Apple TV, but also music sent from your iOS device via AirPlay. To restore normal volume, go to Settings > Audio and Video in Apple TV's settings.

### Damaged app
**How can I run an app macOS says is damaged?**

You can't, and the only action you can take on it is to put it straight in the Trash.

When you open an app, macOS checks the signature, and if the app's damaged it will fail that check. You will need to obtain an undamaged copy of the app.

# CREATE

**HOW TO DO ANYTHING ON YOUR MAC, iPHONE & iPAD**

# Keep your workspace organized

Learn essential techniques for keeping track of your files and apps

**TIME IS** precious, which is why it's important to ensure your Mac is working for you, not the other way around.

Tags enable you to keep track of files by subject, no matter whether they're on your desktop, buried five folders deep in Documents, in iCloud, or even spread among all these locations. You can also make the Desktop and Documents folders available on iCloud-connected devices.

Pages, Numbers, and Keynote have the built-in ability to use a document you've set up as a template on which to base future work. You can achieve a similar effect with any file in Finder, so that when you open it you work on a copy, which keeps the original intact while making your work consistent and professional.

Any apps, folders or server connections you regularly use can be set to open when you log in. Additionally, you can create a stack in the right-hand side of the Dock that shows your most recently used apps.

Most of the tips here can be used on any Mac, because they focus on features in macOS itself, but we've also included a third-party tool, Quicksilver.
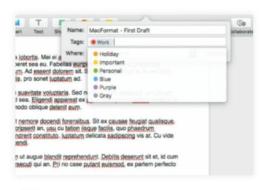
For the most part, the techniques you'll learn about here are pretty simple to get to grips with. However, one requires a command in Terminal. **ADAM SMITH**

**SET APPS TO OPEN**

For quick access, you can set apps to open at login by adding them to Login Items in System Preferences' Users and Groups pane.

## HOW TO Get your work organized
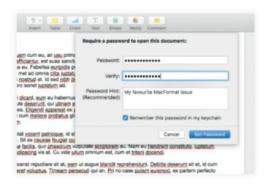




### 1 Use tags effectively

Tags help you group files across folders. You can pick which are listed in Finder's sidebar; click one there to see relevant files. You can add multiple tags when saving a doc, or add them by right-clicking a file in Finder.

### 2 Flexible search

You can use tags with other criteria in Smart Folders. In Finder, choose File > New Smart Folder, click the + on the right, choose Other as the attribute and find "Tags." You can also save Smart Folders in Finder's sidebar.
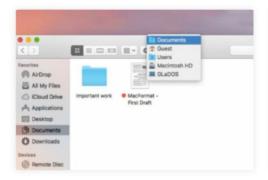
### 3  Reusable template

To turn a document you use often into a template, ensure it's closed, select its file in Finder and choose File > Get Info. Put a check mark next to Stationery Pad. Now when you open that file, you'll actually work with a copy.

### 4  Sync your desktop

In iCloud's prefs, iCloud Drive provides an option to put your Desktop and Documents folders online and keep them in sync across all your Apple devices. (You can go straight to iCloud Drive in Finder by pressing ⇧+⌘+2.)

### 5  Access using stacks

Simply drag a folder (or a tag in Finder's sidebar) to the right-hand side of the Dock for quick access to it. To change how it shows files, right-click on the stack and pick grid, list or fan view. You can choose a sort order as well.

### 6  Recent Apps stack

To create a stack of recently used apps, in Terminal enter **defaults write com.apple. dock persistent-others -array-add '{ "tile-data" = { "list-type" = 1; }; "tile-type" = "recents-tile"; }'** then log out and in again.

### 7  One click to folder path

Right-click the name at the top of a Finder window or doc that's open in an app to see the path to it. Click an item in the path to open it. You can also drag a folder onto an Open or Save dialog to focus on that location.

### 8  Use Quicksilver

Quicksilver (Free, **qsapp.com**) enables you to use keyboard shortcuts to open folders, files, and more. Click the + button to create custom trigger conditions, and link multiple actions together to streamline your workflow.

## FINDER'S SIDEBAR

Drag a folder from a removable drive into Finder's sidebar; it only appears there when that drive is connected, cutting down on clutter.

# Create your own typeface

## Use a free, open-source app to draw new fonts or edit existing ones

**FONTFORGE IS** an open-source tool for creating and editing typefaces. It is made for Unix's X11 windowing system, which you'll need to install in macOS to be able to use it. FontForge is pretty clunky, which is why most type designers pay for alternatives such as Robofont (around $430, doc.robofont.com). But it does the job for free.

In this tutorial we can only give you a quick introduction. Creating a typeface requires planning and organization, and if you want to get into the subject in depth, the process is thoroughly explained at designwithfontforge.com. It's worth reading everything there.

### DRAWN THIS WAY

Fonts are stored as vector graphics, but rather than drawing these from scratch, it's usual to start by roughing out glyphs on paper, big, and then scan them. You could also sketch on an iPad using Apple Pencil or a third-party stylus.

Either way, you import a bitmap image of a single glyph into FontForge's glyph window using File > Import. This image appears in the background layer, which you can edit by clicking Back at the bottom left or pressing ⇧+B. Position it, then switch back to the foreground layer and draw over the top of it. Upon completion, you can choose Edit > Clear Background to remove the bitmap, although it's ignored anyway when you export your finished font using File > Generate Fonts.

You can import glyphs drawn with other apps. Copy and paste won't work, but we found that exporting an SVG file from another app and using File > Import in FontForge was reliable, though saving as EPS file back out of FontForge wasn't.

Another way to use FontForge is to tweak an existing font, bearing in mind that any licensing terms will still apply to your edited version. Just go to File > Open – almost any font file will work, enabling you to edit each glyph, add missing characters, and learn from how professional fonts are drawn. Google's Chivo (see below and bit.ly/2hhWdf6) is an especially tidy example. **ADAM BANKS**

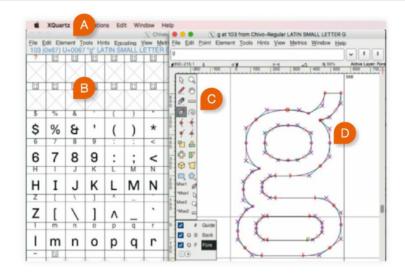## QUICK LOOK FontForge's interface



### GET XQUARTZ
This version of X11 is no longer included with macOS. It's free and you can obtain it from xquartz.org.

### GLYPHS
The character set for your font is listed here. Double-click any glyph to create it from scratch or edit what's there.

### THE EDITING WINDOW
Editing glyphs takes place in another window, which has its own menu bar and tool palette.

### EDITING PATHS
Points with handles work much like Béziers in other apps, but some tools will be less familiar.

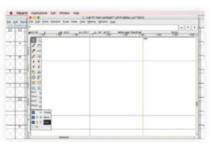## HOW TO Get started with FontForge



### 1 Install XQuartz

Go to xquartz.org, download the disk image (dmg) file, then double-click it to open it. Open XQuartz.pkg from the image to install the software. Log out and back in, or restart, to enable XQuartz to work correctly.
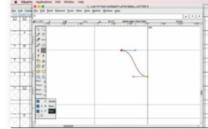


### 2 Download

Go to bit.ly/2hzMzaw and enter your email address. You'll get a confirmation email, but you can ignore it. Either way, you can make an optional donation to support development of the app or click to download FontForge.
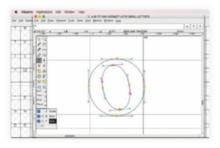


### 3 Up and running

Click Short Guide and skip to where you're asked to pick a download. Drag the FontForge app to your Mac's Applications folder, then double-click it to open it. XQuartz should open and you'll see a window named "Untitled 1."
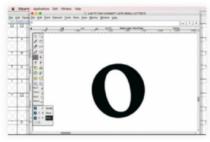


### 4 Edit a glyph

The window has its own menu bar, rather than using macOS's. In the grid of empty characters (glyphs), start by double-clicking the lower-case "o." A second window opens with a tool palette and, again, its own menu bar.
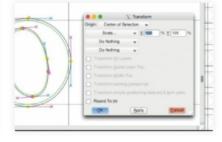


### 5 Adjust metrics

The window's horizontal guides set the ascender/descender heights for all glyphs; alter them in Element > Font Info > General. The vertical guide on the right can be adjusted per glyph. Drag it to about 800 (1/8th of an em).



### 6 Draw a curve

Rather than using the Bézier pen, let's try one of the alternative tools below, "Add a curve point always either horizontal or vertical." With this, click – don't drag – in the middle of each side of the central square in turn.



### 7 Add a counter

Keep going and you'll complete the o's outline. Hold the Spacebar for a preview; it appears as a solid disc. Switch to the plain curve point tool on the left and draw a counter (the white space inside) by placing points.



### 8 Correct path

If you preview the glyph again, you'll still get a solid disc, because both paths have the same direction. Press ctrl + ⇧ + D to correct this. Holding down the Spacebar shows your finished letter o. Almost done…



### 9 Scale for overshoot

To make curves align optically with straight lines of other glyphs, they need to overshoot. Press ⌘ + A to select all points, press ctrl + \, choose Scale, enter 105%, click OK. Draw additional glyphs, then export the font.

# Print your photos as posters

## Make the most of your photos' pixels to get optimal giant printouts

**OKAY, YOU'VE** taken your personal "shot of the year," a photo so stunningly great you want to blow it up to a giant size and display it. The trouble is, even a 12MP shot from an iPhone 7 can barely reach 16 inches across without starting to look soft. So how did Apple create those giant "real iPhone shots" for its billboard ads? The answer is simple: interpolation. The images have been processed for large-format printing by dramatically boosting the number of pixels and applying careful sharpening.

Repeat after us: it's not cheating, it's *optimizing*. Photographers and designers tweak and tune images for different kinds of output all the time. It'll help to know a bit about image resolution and to get hold of software to do the optimization. First, though, make sure your photo really is technically good. If it's a bit fuzzy, if the focus is off, or there's camera shake,

that's going to be magnified along with the scene itself. Start with the best originals you have.

The secret to image resolution is simple. Never forget this fact: a digital photo is just a grid of pixels, like a sheet of graph paper with extremely fine squares. If you stretch that grid to fill a larger space, you make the squares bigger. Take this enlargement too far and that grid becomes noticeable; the image looks pixelated and we call it low resolution. Scale the same image grid down to a smaller print size so we can't see the pixels and we call it high resolution.

You can take a photo and "interpolate" it – recalculate all the pixels using a finer grid – so it can be printed much larger without those pixels being visible. On its own this would soften the image a little, so sharpening tricks are often used to make the picture look crisp again. However, always remember that you

Resampling images can avoid visible pixels, although eventually you will notice clumps and lack of detail.

cannot add detail to the image; if it wasn't in the original, it never will be.

There's a resolution rule of thumb that says you should go no lower than 300 pixels per inch (ppi, also known as dpi). This means that an image that is 3,000 pixels wide can be printed at up to 10 inches across without going below that threshold. But that's really for best magazine-quality printing; if you hang something on a wall you'll be viewing it from further away, so you can scale that same image up a bit, taking the effective resolution down to around the 240ppi mark. Really giant posters are normally seen from even greater distances, so you could even swing under 200ppi.

This should help you work out roughly how many pixels wide and tall you need to interpolate to for your final print. Remember: size in inches x minimum pixels per inch = the total number of pixels your image needs to be. For example, a 36-inch-wide print at 240ppi needs to be at least 8,640 pixels across. So you'd better get interpolating!

Doing this resizing process well is much easier now than it was in the past. If you have a recent version of Photoshop to hand, you can use its Image Size command. Photoshop CC includes a "Preserve Details (enlargement)" option that does an excellent job of preserving detail and avoiding ugly pixel blockiness while upscaling images. Photoshop Elements has the slightly simpler "Bicubic Smoother" for this job.

**RESIZING IMAGES MORE EASILY**
ON1 Resize ($79.99, free trial available at **on1.com**) is the latest version of what used to be called Genuine Fractals. It is dedicated to the process of resizing images for large-format printing, and it includes a number of presets. You can apply a short selection of effects to your image, then pick from a range of printer-specific paper sizes and types, or enter the dimensions and pixel resolution by hand. Printing can be done directly, or the scaled image can be saved. It also has some special tricks to tile your image into multiple parts or create a "gallery wrap" border to cover the sides of a canvas print frame. The app creates images that preserve detail well, but you get exactly the same quality level from Photoshop, and you'll do so significantly faster.

**JARGON BUSTER**

**Resolution** is the scale of an image's pixel grid when it is printed, which determines how many of its pixels fit within a linear inch.

**ONE-STEP SOLUTIONS**

Don't resize by small amounts over many steps. This old-school trick doesn't do any better than today's one-step processes, and it's very slow and awkward.

# VISUAL GUIDE Resizing images in Preview



## A

### CHECK INFORMATION

Choose Tools > Show Inspector to see facts and figures about your image: its format, resolution, and so on.

## B

### SET DIMENSIONS

Choose Tools > Adjust Size and use this sheet to set an image's final resize dimensions and pixel resolution.

## C

### ADD SHARPNESS

Choose Tools > Adjust Color to use this panel to alter saturation, contrast and, crucially, sharpness of an image.

## D

### CLOSE EXAMINATION

Always check details by zooming in after resizing an image, so that you can then set sharpening perfectly.



### JARGON BUSTER

**Interpolation** is the recalculation of an image and generating a new pixel grid. Different interpolation methods work better for scaling up and scaling down.

### ADJUST SIZE SHEET

In Preview's Adjust Size sheet, click the first row of text in the Resulting Size box to cycle through all the different units of measurement.

What really surprised us is how good the humble Preview app – yes, the one that comes with macOS – is at scaling images up. It doesn't apply the same automatic sharpening as Photoshop and ON1 Resize, but the difference is relatively slight. It's also easy to apply sharpening yourself after you've resized an image. You get world-class photo editing options in Photoshop, and easy paper presets with ON1 Resize, but you needn't buy anything to scale, sharpen, optimize and crop a photo. In our tests the differences were hard to spot!

All digital photos are captured as RGB images: they are made from different strengths of red, green, and blue light. Printing doesn't work in the same way; it's done using CMYK – cyan, magenta, yellow, and black. (The K stands for "key," for the definition and contrast that the black ink adds to the colors.) Some inkjet printers use additional pale colors or extra orange and green ink, but it's still all about light reflecting off the page. The old advice was to convert images to CMYK before printing, but that's no longer best practice. Most of today's print engines (from desktop inkjets to high-end commercial raster image processors, or RIPs) will happily convert RGB to CMYK for you as the print is sent, and they'll

know exactly how to do this to best suit their own idiosyncrasies. Convert the image yourself with the wrong settings, and your prints could look awful. If you're sending files off to be printed it's worth asking, but the answer will almost always be to leave things in RGB. That's good in other ways too, as a CMYK version of an image is less flexible and less suitable for different uses than an RGB original.

When you look at the final printed result, remember that print simply can't reproduce the deep lushness of fully saturated RGB colors. Any print will always be a little more dull, although you probably won't notice this if you don't hold the result next to your screen.

Your images are almost certainly in 8-bit RGB, not least because that's all that the JPEG format supports. Each of the three color channels uses eight bits of data for each pixel; 256 levels from full-strength color down to nothing, enabling roughly 16.8 million different colors to be represented. ON1 Resize can convert an image to 16-bit color, but that's unlikely to be any benefit for a final-stage printing tool. This is great for photo-editing adjustments, but only really if the original was in that mode.

Let's look at how to apply the techniques… **KEITH MARTIN**
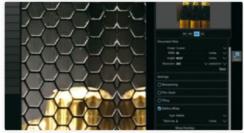
# HOW TO Prep a photo for a large print



## 1 Set pixel size in Photoshop

Choose Image > Image Size, set Width and Height to Pixels, and set the number of pixels this needs to be. Alternatively, set the physical size your print needs to be, then set resolution to the pixels-per-inch value you've calculated.



## 2 Set interpolation method

In the Resample pop-up menu, choose an interpolation method. We recommend "Preserve Details (enlargement)" for most images, but test the available choices to see which you prefer for your image.



## 3 Use ON1 Resize

The Document Size pane can be used to set an image's dimensions and pixel resolution manually; a pop-up menu of suggestions is provided as an aid. Alternatively, pick a printer and paper type from the presets on the left.



## 4 Tricks for ON1 Resize

The big benefit of ON1 Resize is its bag of print-related tricks. Here, the Gallery Wrap feature mirrors the edges of the image to create a print that's suitable for wrapping around the sides of a frame.



## 5 Resize in Preview

Open your image in Preview and choose Tools > Adjust Size. Next, either set the overall pixel dimensions you need, or use the drop-down on the right to set the physical width and height, and the pixel resolution, then click OK to scale the image smoothly.



## 6 Sharpen in Preview

To sharpen the results of resizing your image, simply choose Tools > Adjust Color from the menu bar and drag the Sharpness slider to the right. Try setting it from the three-quarters point onwards. (Dragging the slider to the left actually blurs your image.)

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### JARGON BUSTER

The **interpolation styles** called Nearest Neighbor, Bilinear, and Bicubic are increasingly complex ways software looks at surrounding pixels when it is resizing an image.

### REAL-WORLD OUTPUT

Never forget that an image's "per inch" resolution is ultimately meaningless if you don't know the real-world output size this gives.

# Make full use of 3D Touch shortcuts

## Unleash the extra power of your iPhone's pressure-sensitive screen

**REQUIRES**
An iPhone 6S,
6S Plus, 7, or 7 Plus

**YOU WILL LEARN**
Many different ways you
can use 3D Touch to
take shortcuts

**IT WILL TAKE**
10 minutes

**THE SCREEN** in the iPhone 7 and 6S series (but not the SE) can sense the amount of pressure you apply, enabling apps to react differently than if you simply tap on an item. Apple calls this tech 3D Touch. On the Home screen, 3D Touch provides shortcuts – or Quick Actions, as Apple calls them – to popular features in many apps with just a firm press followed by a tap. In fact, you don't even need the tap; just press your finger on an icon, slide it to the Quick Action you want and let go to choose it. Sometimes you'll also be shown a widget containing key information from the corresponding app, such as current conditions from Weather, the last item you worked on in Notes, and up to four of your most recent Memories in Photos. (Note that items in widgets have to be tapped.)

3D Touch also provides a more powerful experience when selecting text in apps such as Notes and Pages. It enables you to move the insertion point around a document while keeping your fingers over the on-screen keyboard rather than

obscuring the text with them and having to rely on iOS's magnifying glass effect and find the desired finishing position. 3D Touch also enables you to very quickly extend your selection by additional whole words, sentences or paragraphs.

Though we say text selection with 3D Touch is powerful, it can take a few attempts to master applying different levels of pressure. If you find 3D Touch over- or undersensitive, bear in mind that its responsiveness can be altered; you're shown an option to tailor it when you first set up your iPhone, and it can later be adjusted to one of three levels in Settings > General > Accessibility > 3D Touch.

There is, of course, a chance that you'll dislike some aspects of 3D Touch. Sadly, unlike being able to turn off certain gestures on a multi-touch mouse or trackpad on your Mac, iOS provides no way to selectively disable some 3D Touch behaviors. So, you must get used to accidentally triggering some features and try to adjust the firmness of your presses, or, if that doesn't work out, disable 3D Touch altogether. **ALAN STONEBRIDGE**
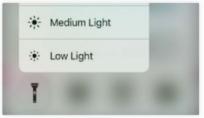
## HOW TO Use 3D Touch system shortcuts



### 1 Quick app actions
For many apps, a firm press on their Home screen icon reveals a list of actions. In some cases, it also shows a widget with info or additional actions; if you refer to a widget often, there's an option to add it to iOS's Today view.
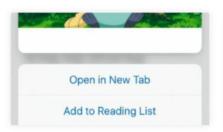


### 2 Switch apps
Instead of double-pressing the Home button to open the app switcher, press firmly on the left edge of the screen. Alternatively, press firmly while swiping to the screen's right edge to go back to your previous app.



### 3 Control Center
Apply 3D Touch to an icon in Control Center's bottom row: pick from flashlight strengths, start a 1, 5, 20, or 60-minute timer, copy the last result from Calculator, or jump into Photo, Selfie, Video, or Slo-mo camera modes.

## HOW TO Take a closer look at things

### 1 Peek and pop

In many apps, pressing lightly on an item (say, a message in a mailbox in Mail or a link in Safari) peeks at that content. Let go to close it, or press harder to pop it open. You can swipe up from a light press for available actions.

### 2 Notifications

Tapping a notification's banner takes you to the relevant place in an app, but you can deal with an item by pressing firmly on it, then swipe down to clear it. This also works at the Lock screen and in Notification Center.

### 3 Live Photos

If you take or receive a Live Photo (with a short amount of video either side of a still image), you can tell it apart from regular pics by an icon of concentric circles when editing. Apply 3D Touch to a Live Photo to play it.

## HOW TO Work with text using 3D Touch

### 1 Move within text

To select a range of text, press firmly on the on-screen keyboard and its keys will go blank. Keep your finger on the screen and slide it around to reposition the insertion point in the document, relative to your movements.

### 2 Start a selection

After positioning the insertion point, keep your finger on the screen, press firmly again to select the word. Slide your finger to add more words. After lifting your finger, you can access options by tapping your selection.

### 3 Bigger selection

Position the insertion point, press firmly twice in quick succession to select the sentence; slide your finger to extend the selection a sentence at a time. Or, press three times to select, then grow your selection in paragraphs.

## ❯ OTHER 3D TOUCH SHORTCUTS

A few more useful places you can press firmly

3D Touch can help you in even more ways in iOS and many third-party apps. On the Home screen, a firm press on a folder reveals a shortcut to rename it and direct routes to apps inside that have notifications waiting. 3D Touch the cross to the right of a heading in Notification Center for a shortcut to dismiss all items. In Reminders, press on an item to set a location or time at which to be nudged about it. When restoring from a backup or downloading several apps, press on an app's Home screen icon to pause or resume, cancel, or prioritize its download.

# Edit and format text in Pages on iOS

Tap into Pages' powerful text-handling tools to improve your documents

**REQUIRES**
Pages for iOS, Bluetooth keyboard (optional)

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**YOU WILL LEARN**
How to style and edit text; master keyboard shortcuts

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**IT WILL TAKE**
20 minutes

**IF YOU'RE** looking to edit text with a bit of flair and panache, there's no substitute for Apple's own Pages app. But for all its extra features, Pages remains first and foremost a word processor. In this tutorial we're going to focus on exploring its text-based tools to reveal how to simplify, speed up, and improve the way you work with text documents on your iPad.

Pages has evolved to put more text-editing and formatting tools at your fingertips. Start typing, and you'll see the pop-up keyboard now offers shortcuts to a number of useful formatting options. You'll notice one particular option, the resize text tool, offers a limited number of text sizing options, but don't worry – if none of these fit, you'll find the Format Painter enables you to resize in one-point increments, from single-point text up into the hundreds. You'll also find other text-styling tools – bold, italic, underline, and strike-through – here too.

One major limitation is that there's still no way to update text styles on your iPad.

You can, naturally, edit text styles on the fly for selected text, following the step-by-step guide opposite. It's just a shame you can't yet save those changes, either by updating an existing style or by creating a new one. Instead, you need to open the document in Pages on your Mac, apply changes there, then sync the document back via iCloud.

Don't forget to make use of Pages' spellcheck tool. Tap the "..." button and make sure Check Spelling is switched on. Once enabled, misspelled words will be shown with a red underline. Tap it and choose Replace to see suggested alternatives, then tap the correction. Pages will also use your system-wide autocorrect settings to correct mistyping; to switch this on and off, return to the Home screen and choose Settings > General > Keyboard.

Last, but not least, flick on the Word Count switch under "..." and you'll see a running word count appear at the bottom of the screen. Tap and drag it to reposition it, or tap it to reveal more detailed statistics. **NICK PEERS**

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## HOW TO Format text from the keyboard



### 1 Indent and tabulate
The indent button allows you to shift the entire paragraph to the right (Indent) or left (Outdent) using tab markers (tap again to shift to the next marker). Tap "Tab" to insert a single tab at the cursor point.

### 2 Change font/size
Tap the current font name to select a different font to type new characters with, or select your text first to change its font. Tap the ᴀA button to change its size using one of the supplied presets (10 to 48).

### 3 More controls
Tap the paragraph button to change the alignment of the current paragraph: choose from left, center, right, and justified. Tap the final button to access controls for inserting comments, breaks, and footnotes.

## HOW TO Style text with Format Painter

### 1 Paragraph style

Tap three times to select a paragraph. Then tap the Format Painter to view its current paragraph style. Tap the style name to bring up a list. Try a style by choosing it, then tap another until you find one you want.

### 2 Tweak text style

You can select a style as your starting point, then tap "<" to return to the main Format Painter screen where you'll find controls for tweaking font, style, size, and color – note this only affects the selected text.

### 3 Change page layout

Scroll down further and you can set the paragraph alignment, implement bullets or lists, and change the text to a multi-column layout. Adjust line spacing to change the gap between each line of text.

## HOW TO Master page margins

### 1 Quick changes

Tap the "…" button in the toolbar and select Document Setup. Use the arrows at the sides of the document to tap and drag the margins to resize them in set increments. Set them to 0 inches to remove them.

### 2 View on-screen

Tap Undo to start again, or Done to return to the document – you should see the text has reflowed. Tap "…" and turn on Edge Guides so you can use the margin to snap images and other elements to.

### 3 Set custom tabs

Tap "…" to enable the ruler. Tap your text to bring up the ruler. Tap and hold on the ruler and a > sign will appear, magnified. Drag it to the desired spot and release to set it; repeat for as many stops as required.

## › KEYBOARD SHORTCUTS

### Speed up Pages using an external keyboard

Pages works brilliantly with a physical keyboard – you can pick up a serviceable Bluetooth keyboard for under $10 on eBay. Not only does this make typing easier, it also opens up a number of great keyboard shortcuts. Most are similar to those you find on the Mac, and a comprehensive list can be found at the Apple support site (apple.co/2jYzJE4). But why memorize that when you can simply hold down the ⌘ key on your keyboard? After a short pause a pop-up window appears, listing all available shortcuts for the currently selected item.

# Perfect photos in Lightroom for iOS

## Discover the advanced camera and editing tools in Adobe's updated app

**PERHAPS ONE** of the most compelling features of a Creative Cloud membership for photographers is the tight integration of Lightroom between desktop and mobile devices. The two apps work in harmony, syncing image collections over the internet, enabling you to begin editing a set of images on your Mac, then pick up where you left off on an iPad. You can also work through a collection of images and approve or reject them, as well as assign star ratings. All the changes you make work their way back to Lightroom on your Mac, from which you can export the full‑size versions to get the best quality.

You'll need a Creative Cloud subscription. Adobe's Photography subscription plan – which includes Lightroom, Lightroom Mobile and Photoshop CC – costs $9.99 per month when you sign up for a year.

Not all of the images in your Lightroom library are synced via Lightroom Mobile. To sync just a few images, press ⌘+N to create a new collection. In the dialog box that appears, once you've chosen a name, ensure "Sync with Lightroom mobile" is checked. Drag the images you want into the new collection and syncing will begin.

Alternatively, under Catalog in Lightroom's left toolbar you'll see a collection called "All synced photographs" – simply drag individual shots or groups of images into that collection to synchronize them.

There are a few organizational tools in the mobile version of Lightroom to be aware of. Tap an image to open it fullscreen, then swipe up to apply a Picked flag to it, or swipe down to mark it as rejected – useful for sorting through a batch of images. You also have the ability to assign numeric ratings out of five. Once you've sifted through a batch of shots, tap "Lightroom Photos" (top of the screen) to find controls that filter the images based on the flag or rating applied – useful if you're working through initial edits of a large collection. **DAVE STEVENSON**

## HOW TO Sort and process images in Lightroom on iPad

**1** ### Gesture control

Before you begin, you should note a few useful gestural shortcuts. Tapping on an image with three fingers reverts it to its original state, and double-tapping any image attribute's slider resets it to its original position.

**2** ### Check image attributes

Tap an image until it opens fullscreen. Tap the "i" icon (top of the screen) to show information about the image's file at the top left - tap this data to cycle through information such as EXIF data, star rating, and so on.

### 3 Open the editor

Once your images are synced and flagged, swipe to the left of the toolbar at the bottom of the fullscreen view to reveal the editing panel. This is where you can begin the process of finishing off your images.



### 4 Add a gradient filter

Gradient filters are just as useful in the mobile version of Lightroom as they are on the Mac. Choose Selective on the right-hand side of the toolbar, then tap and drag downwards on your image to produce a graduated mask.



### 5 Adjust gradient filter

To rotate your graduated mask, tap its middle line, then tap the exposure tool below your image and, in the case of a landscape like this, reduce that attribute a little. You might also want to raise the saturation a little.



### 6 Selective saturation

This is a useful color technique. Tap Edit at the bottom of the screen, then the left-most icon to display different sets of editing tools. Tap Color/B&W and you can use the various sliders to change individual colors' saturation.



### 7 Adjust a color channel

Tap the compass-like icon just above the color sliders then tap anywhere on the image. Now slide your finger left or right to reduce or raise the saturation of the color you tapped. This is useful to make blues bluer, say.



### 8 Fix with a lens profile

Tap the left-most icon again and pick Lens Corrections. This tool doesn't have the power of its Mac counterpart, but if you trust Lightroom's built-in lens profiles you can quickly correct problems like barrel distortion.

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**JARGON BUSTER**

**Picked, rejected, and unflagged** are the three basic flags Lightroom provides to help you quickly pick good shots and reject bad ones.

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**SHARE TO EXPORT**

Lightroom uses iOS's built-in Share sheet to send photos elsewhere. Tap the Share icon at the top right to quickly export and post images.

# iBook

**Adam Banks** remembers when wireless internet was the stuff of dreams

That clamshell truly was portable when it came to internet connections.

**AN AIR OF** unreality pervaded Apple's keynote at Macworld Expo New York on July 21 1999. Proceedings began as usual with Steve Jobs striding on to the stage, dressed in his now familiar jeans and black turtleneck; except it wasn't Steve Jobs at all, but Noah Wyle, star of the TV hospital drama *ER*, who'd recently played Jobs in the film *Pirates of Silicon Valley*.

Steve himself soon arrived to mock Wyle's actually pretty passable imitation of his physical and vocal tics, a rare acknowledgement of the interim CEO's cult of personality. Things looked set to get even weirder when he invited Ozzie Osbourne on stage to demonstrate IBM's

ViaVoice speech recognition software, but it turned out he was referring to the similarly named general manager of IBM Voice Systems, who completed his presentation without biting the head off anything.

But it was what happened later that was truly "magical." Bringing out a long-awaited consumer laptop – which was described as "iMac to go" – in the colorful plastic form of the iBook, Jobs talked through its style, practicality, and performance, and showed a series of TV commercials the company had made to promote it. Then he loaded up the Apple website on its 12-inch 800x600 color

screen, picked up the machine, walked across the stage and opened another website. Seeing the point immediately, the audience erupted as Steve milked the moment by passing the machine through a hula hoop. Look, no wires!

Once again, a technology not invented by Apple – the 802.11b Wi-Fi protocol, then branded by the company as a series of products under the AirPort name – became a groundbreaking, unique selling point of the Macintosh.

Mac|Life
NEXT ISSUE ON SALE
**APRIL 4**

Contents subject to change