

WHY APPLE IS TAKING ON THE FBI

Macworld

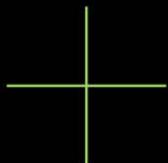
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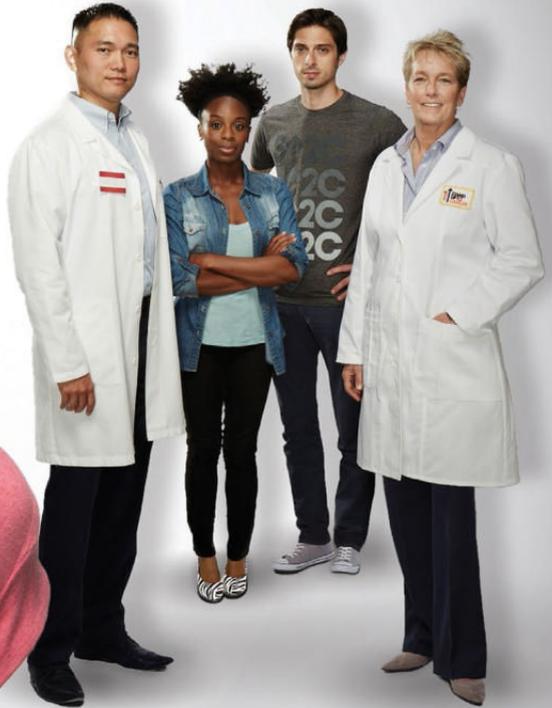
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The one-year (12-issue) subscription rate is \$34.97; the two-year rate, \$59.97; and the three-year rate, \$79.97. Checks must be made payable in U.S. currency to *Macworld*. Please allow 3 to 6 weeks for changes to be made to an existing subscription.

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Starting with the March 2003 *Macworld*, back issues can be downloaded in digital format, from www.zinio.com (\$6.99; Mac OS X 10.1 or later required). Print-format back issues (subject to availability) cost \$8 per issue for U.S. delivery, and \$12 for international delivery; prepayment in U.S. currency to *Macworld* is required. Send a check or money order to *Macworld* Back Issues, P.O. Box 37781, Boone, IA 50037-0781; or phone 800/288-6848 (U.S. and Canada) or 515/243-3273 (all other locations).

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PUBLICATION INFORMATION

April 2016, Volume 33, Issue 4

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A Mac for all seasons: Why the Mac has so much staying power

It's always iPhone this and iPad that, but as the sturdy workhorse of Apple's lineup, the Mac deserves some praise.

BY DAN MOREN

Let's hear it for the Mac.

There's been plenty of ink shed on the meaning and impact of iPhone and iPad sales in Apple's most recent quarters. In and of itself, that's no surprise: The iPhone is the company's biggest product and makes up more than two-thirds of its revenue. The iPad, on the other hand, has been struggling, unlike most of Apple's other devices.

But through it all, the Mac has quietly kept on doing steady business, and I think the sturdy workhorse of Apple's lineup deserves some accolades. Not only has the Mac entered its fourth decade—impressive for any piece of technology—but it's seen tremendous success and even growth in an era where all anybody can talk about is smartphone this and tablet that.

DON'T CALL IT A COMEBACK

The Mac's success is especially heartening for someone like me, who grew up in the late '80s and early '90s, when the platform was a target for jeers and the company name seemed to perpetually appear with that good old "beleaguered" adjective in every news story. No matter how much we asserted the merits of the Mac, we were told that it was nothing more than a niche product, okay for creative use, but not sufficient for real work.

Twenty-some years later, and the worm has certainly turned. As Tim

Cook is fond of reminding us on every quarterly conference call, the Mac routinely experiences growth despite the contraction of the overall PC market. Ten years ago, Apple was selling 3 or 4 million Macs in a year. In 2015, it topped 20 million. While it may be only a small chunk of the company's overall revenue, the Mac has maintained an upward trend for the last decade.

It's hard not to attribute much of that success to the so-called "halo effect," the fact that sales of other Apple products—first the iPod and now the iPhone—have encouraged users of PCs to switch to Macs instead. And there has remained a certain cachet in the brand that has probably attracted younger folks when they purchase their first computers.

THE MAC ROUTINELY EXPERIENCES GROWTH DESPITE THE CONTRACTION OF THE OVERALL PC MARKET.

THE ERA OF THE MAC

But given the longevity and success of Apple's personal computer line, I think there's something more at work here. By and large, the mission of the Mac hasn't changed for 32 years: Computing made simple. As much as we get done with our smartphones and tablets these days, and as much as we may get done with our VR goggles or smartwatches in the next couple of decades, the computer remains a compelling device.

I've said before that the iPad is unlikely to dethrone my Mac (go.macworld.com/ipadwontreplace) as my daily work machine, and while a lot of that may be due to the muscle memory of a device that I've been using regularly for twenty-five years, I think it also speaks to the Mac's continued relevance.

More than ever, popular apps and services are built to work with the Mac first, not as an afterthought, and more than that, creators of those products have internalized the cues first pushed by Apple years ago

when the Mac debuted: Good design, pleasing aesthetics, simplicity, and user-friendliness.

The Mac may not rack up the sales of the iPhone, or even the faltering iPad, but it has to be acknowledged that the Mac laid the groundwork to make those devices possible. The overall philosophy of the Mac has, in the end, emerged victorious.

LONG LIVE THE MAC

I also can't discount the power of emotion. I love my Macs—always have. And despite the fact that I carry my iPhone with me everywhere I go, I've never quite developed the same attachment, in part because I trade in my iPhones nearly every year. By contrast, my iMac, on which I type this, is nearing the five-year mark. There's an old Blue & White G3 sitting next to my desk. Somewhere in the mess that is my office is my PowerBook



THE MAC MAY NOT RACK UP THE SALES OF THE IPHONE, OR EVEN THE FALTERING IPAD, BUT IT HAS TO BE ACKNOWLEDGED THAT THE MAC LAID THE GROUNDWORK TO MAKE THOSE DEVICES POSSIBLE.

G3, one of my favorite Macs of all time—and the first laptop I ever owned.

Nostalgia is a powerful force, and given that I've spent the majority of my life using a Mac, it's no surprise how many memories are tied up with the platform. From typing my first stories as an elementary schooler, to writing papers in high-school, to editing videos in college, the Mac's been there at every stage of my life.

During my tenure at *Macworld*, people used to suggest with reasonable frequency that the name was obsolete, and the publication would

be better off as something more topical: "iPodworld," "iPhoneworld," or even just "Appleworld." The former seems positively archaic these days, but even the latter strikes me as potentially transient in the grand scheme of things.

Thirty-two years later, the Mac is still chugging along, and while it's occasionally been eclipsed by the meteoric success of its newer, flashier siblings, it's never really fallen out of favor. The Mac has proved its staying power, and if the past three decades are any indication, it's got plenty of life left. ■

Why the FBI's request to Apple will affect civil rights for a generation

No legal case applies in a vacuum, and in this case the FBI needs the precedent more than the evidence.

BY RICH MOGULL





On February 23, the United States District Court of California issued an order (go.macworld.com/fbi-appleorder) requiring Apple to assist the FBI in accessing a locked iPhone—and not just any iPhone, but the iPhone 5c used by one of the San Bernardino shooters. The order is very clear: Build new firmware to enable the FBI to perform an unlimited, high-speed brute force attack, and place that firmware on the device.

Apple is not only fighting the request (go.macworld.com/oppose-courtorder), but posted a public letter (go.macworld.com/tcletter) signed by Tim Cook and linked on Apple's front page.

Make no mistake: This is unprecedented, and the situation was deliberately engineered by the FBI and Department of Justice to force a showdown that could define limits to our civil rights for generations to come. This is an issue with far-reaching implications well beyond a single phone, a single case, or even Apple itself.

As a career security professional, this case has chilling implications.

WHY NOW?

I've been writing about Apple's role in our digital civil rights (tidbits.com/article/15137) since 2014, and recently specifically addressed why Apple is at the center of the battle over encryption (tidbits.com/article/16210) on TidBITS. The short version is that

Apple is one of the only companies with the technologies, high profile, and business model to both find itself in the cross hairs, and take a strong position.

Make no mistake, Apple has a long history of complying with court orders and assisting law enforcement. Previous to iOS 8, they could extract data off devices. Even today, data in most of their online services (iCloud, excluding iMessage and FaceTime) can be provided upon legal request.

This case is different for multiple reasons:

- > Apple is being asked to specifically create new software to circumvent their security controls. They aren't being asked to use existing capabilities, since those no longer work. The FBI wants a new version of the operating system designed to allow the FBI to brute force attack the phone.

- > The FBI is using a highly emotional, nationally infamous terrorism

case as justification for the request.

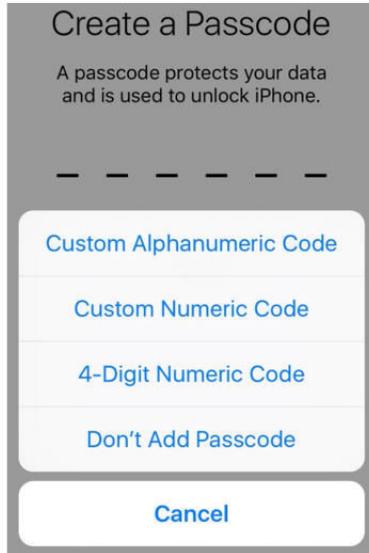
> The request refers to the All Writs Act, which is itself under scrutiny (go.macworld.com/effallwrits) in a case in New York involving Apple. Federal Magistrate Judge James Orenstein of the Eastern District of New York is currently evaluating if the Act applies in these cases.

> That's why this is about far more than a single phone. Apple does not have the existing capability to assist the FBI. The FBI engineered a case where the perpetrators are already dead, but emotions are charged. And the law cited is under active legal debate within the federal courts.

The crux of the issue is this:

Should companies be required to build security circumvention technologies to expose their own customers? Not “assist law enforcement with existing tools,” but “build new tools.”

The FBI Director has been clear that the government wants back doors into our devices (go.macworld.com/fbibbackdoor), even though the former head of the NSA disagrees and supports strong consumer encryption (go.macworld.com/haydenencryption). One reason Apple is likely fighting this case so publicly is that it is a small legal step from requiring new circumvention technology, to building such access into devices. The FBI wants the precedent far more than they need



APPLE HAS BEEN PROMPTING users to choose longer and more complicated—and harder to crack—iPhone passcodes.

the evidence, and this particular case is incredibly high profile and emotional.

The results will, without question, establish precedence beyond one killer's iPhone.

THE TECHNICAL DETAILS

The court order is quite specific. It applies only to one iPhone, and requests that Apple create a new version of the firmware that eliminates the existing feature that erases the iPhone after 10 failed attempts at entering the passcode. It further asks Apple to allow passcode attempts to be performed as rapidly as possible.

Beginning with iOS 8, devices are

encrypted using a key derived from your passcode. This is combined with a hardware key specific to the device. Apple has no way of knowing or circumventing that key. On newer devices, the hardware key is embedded in the device and is not recoverable. Thus the passcode must be combined with the device key in a chip on the phone, and that chip rate-limits passcode attempts to make a brute force attack slower.

Reading through the order, it seems the FBI thinks that a modified version of the operating system would allow them to engage in high-speed attacks, if the 10-tries limit was removed. The request indicates they likely can't image the device and perform all the attacks on their own superfast computers, due to that hardware key. With a four-character passcode the device could probably be cracked in hours. A six-character code (go.macworld.com/6digitpwd) might take days or weeks, and anything longer could take months or years.

Dan Guido over at Trail of Bits posted a great explanation:

As many jailbreakers are familiar, firmware can be loaded via Device Firmware Upgrade (DFU) Mode. Once an iPhone enters DFU mode, it will accept a new firmware image over a USB cable. Before any firmware image is loaded by an iPhone,

the device first checks whether the firmware has a valid signature from Apple. This signature check is why the FBI cannot load new software onto an iPhone on their own—the FBI does not have the secret keys that Apple uses to sign firmware.

This opens up a few questions. Could this work on newer devices with the enhanced encryption of the Secure Enclave (go.macworld.com/secureenclave)? How can Apple pair the device and replace the firmware in the first place? Would they be using the shooter's computer? An over-the-air update? Apple says that all devices (with or without the Secure Enclave) are vulnerable to this kind of attack, but declined to comment on the specific technical methods, a position I initially disagreed with, but on reflection is probably the right move for reasons we will get to in a moment.

Thus the FBI wants a new version of iOS, signed by Apple and installed on the device, that removes limitations on their attempts to brute-force the password.

A SIX-CHARACTER CODE MIGHT TAKE DAYS OR WEEKS, AND ANYTHING LONGER COULD TAKE MONTHS OR YEARS.

WHY THIS MATTERS

Legal precedent is like a glacier, slowly building over time until it becomes nigh unstoppable. Major issues like this are first, and sometimes ultimately, decided on a series of small steps that build on each other. It's the reason the NRA fights any attempts at gun control, since they fear a slow build, not a single small law.

The crux of this round of the encryption debate is if companies should be forced to build tools to circumvent their customers' security. If the answer is "yes," it could be a small step to "should they just build these tools into the OS from the start?"

I have no doubt the FBI deliberately chose the highest-profile domestic terrorism case in possibly a decade. We, average citizens, want the FBI to stop this sort of evil. We don't necessarily see this one case as applying to our lives and our rights. Why the big deal? What if the FBI could find the terrorists' contacts and stop other attacks?

But the truth is that no legal case applies in a vacuum. If this goes through, if Apple is forced to assist, it will open a floodgate of law enforcement requests. Then what about civil cases? Opening a phone to support a messy divorce and child custody battle? Or what about requests from

other nations, especially places like China and the UAE that already forced BlackBerry and others to compromise the security of their customers?

And once the scale of these requests increases, as a security professional I guarantee the tools will leak, the techniques will be exploited by criminals, and our collective security will decline. It really doesn't matter if it's the iPhone 5c or 6s. It really doesn't matter if this is about dead terrorists or a drug dealer. It doesn't matter what specific circumvention Apple is being asked to create.

What matters is if we have a right to the security and privacy of our devices, and of our communications, which are also under assault. If we have the right to tools to defend ourselves from the government and criminals alike. Yes, these tools will be sometimes used for the worst of crimes, but they're also fundamental to our civil rights, freedom of discourse, and our ability to protect our digital lives from the less impactful, but far more frequent criminal attacks.

This situation was engineered by the FBI and Department of Justice for the maximum impact and chances of success. Apple is fighting, and as a security professional it's my obligation to support their position, and stronger security. ■

You might know **Joshua**. He loves video games, and he owns enough to know they're not all meant for kids. That's why he reminds his friends (at least the ones that have kids) that they all have **big black letters on the box** to help parents find the ones that are best for their families.

You can learn about those ratings at **ESRB.org**



Los Angeles, CA





Apple TV vs. Amazon's Fire TV: The gaming match-up

We put the set-top boxes up against each other on game selection, remotes, and more.

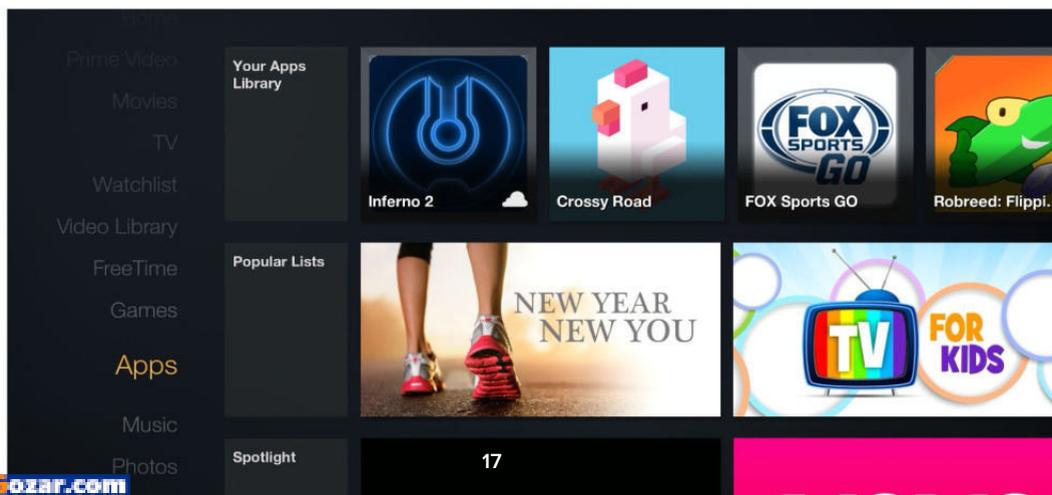
BY ANDREW HAYWARD

When it comes to gadgets, Apple and Amazon tend to have very different audiences. Consider tablets, for example: Amazon's entry-level Fire tablet is priced at a stunning \$50, while Apple's cheapest active iPad (2013's iPad Mini 2) sells for \$269. There's a noticeable gap in quality between the two in many regards, but Amazon's focus on cheap, usable tech contrasts sharply against Apple's higher-end polish and performance.

The difference is less obvious when it comes to set-top boxes, however. Last fall's overhauled Apple TV was a big leap for the device, adding apps and games along with the touchpad remote, but Amazon had already mined that territory with the first Fire TV. Right after the Apple TV was released, Amazon refreshed the Fire TV with added processing power, 4K resolution support, and other enhancements. And the price difference isn't quite so dramatic.

Game on? Game on! We've already put the Apple TV through its gaming paces, sharing our early impressions (go.macworld.com/appletvgaming) and highlighting some of the best games (go.macworld.com/10appletv_games) and gamepads (go.macworld.com/appletvgamepads) alike. But after spending the last couple weeks with the latest Fire TV, we think there's healthy competition here. If you're an Apple fan, should you really grab an Amazon box? Maybe, and

IT'S NOT AS ELEGANT an interface as Apple's, but then again, it's not super easy to find the apps and games you want on either box.





MANY APPLE TV GAMES are ports of ideal iPhone experiences, like *Alto's Adventure* here—luckily, many of them (*Alto* included) hold up well.

maybe not—here's our take.

THE BASICS

As you may know from reading this very publication, the current-gen Apple TV sells for \$149 with 32GB storage or \$199 with 64GB, and comes with the unit itself, the touchpad-equipped Siri Remote, a power cord, and a Lightning-to-USB charging cable for the remote. It's powered by the same dual-core, 64-bit A8 chip from the iPhone 6 and iPad mini 4, along with 2GB RAM inside, and runs at a maximum resolution of 1080p on your TV.

Meanwhile, the new Fire TV sells for \$100 in one configuration with 8GB of internal storage, although you can increase that tally significantly with a microSD card. Otherwise, you get the unit, a non-touch remote control, and the power adapter. It runs off of a MediaTek quad-core processor with 2GB RAM, and can

play 4K resolution media (movies and TV shows) on a compatible TV.

In both cases, you get a compact, HDMI-connected black box and a slim remote to control it. With the Fire TV, you save \$50 off the entry-level Apple TV but get a less-capable remote and much less storage—so much so that you'll probably want to spring for a microSD card to store more apps and games. Otherwise, both do a lot of the same things: They run Netflix and Hulu, tap into each company's respective media offerings, and can play their own games and apps.

GAME SELECTION

When it comes to gaming on the Apple TV and Fire TV, there are more differences than similarities, surprisingly. Some common games exist between platforms (more on that shortly), but the overall shape of each library reveals stark differences in approach so far.

Look at the Apple TV App Store and you're likely to find a whole lot of iOS ports. There's some really great stuff in the mix, including Alto's Adventure, Badland, and Oceanhorn, but many of the releases are already available on your iPhone or iPad—and if you're reading *Macworld*, we have a feeling an Apple TV probably isn't (or won't be) your first Apple device.

There are also games that started on PC and/or consoles and then hit iOS en route to the Apple TV, such as Transistor, Geometry Wars 3: Dimensions Evolved, and Octodad: Dadliest Catch, and those are all better enjoyed on the big screen with a gamepad. And there are a handful of noteworthy original Apple TV experiences, as well, such as Galaxy on Fire: Manticore Rising and Beat Sports, along with peripheral-based console game ports like Guitar Hero Live, Disney Infinity 3.0, and Skylanders Supercharged.

The Fire TV also has mobile-to-TV



ports, like Pac-Man 256, Crossover Road, Badland, and Riptide GP2, but more noticeably, it has larger-scale, controller-centric games that the Apple TV doesn't. Most crucially, it has Minecraft: Pocket Edition, which is delightful with a gamepad, but it also has Telltale Games' excellent episodic adventures, including The Walking Dead, Tales from the Borderlands, and Minecraft: Story Mode.

And the list goes on a bit: You can grab huge classic console games like Grand Theft Auto III, Vice City, and San Andreas, as well as Star Wars:

DISNEY INFINITY 3.0, which is played with smart figurines and a Bluetooth-connected base, is one of the rare big, console-style games on the Apple TV. And it's Star Wars!



THIS IS MINECRAFT: POCKET EDITION on an iPhone, but imagine it on a big screen without all the extra UI junk—it's swell.

Knights of the Old Republic and beloved Final Fantasy and Sonic the Hedgehog games. The Fire TV also has Shovel Knight, a beloved recent console homage to old-school 2D games, along with great Mac games like Luftrausers, Read Only Memories, OlliOlli, and Titan Souls.

The more I browsed the listings, the more I found Fire TV gems that aren't on Apple TV—yet, at least. And because all Apple TV games must offer Siri Remote support, many of those games may not arrive anytime soon. The Fire TV lets creators sell games that require the gamepad, which is another \$50, but it opens up the possibilities so much. It allows the Fire TV to effectively bridge the gap between what you can play on your phone and what you could play on a game console or computer.

PERFORMANCE

When it comes to games that are on both the Apple TV and Fire TV, the differences are small but worth noting. Generally, if there's a difference, the Fire TV versions run a little more smoothly. That was very evident with Asphalt 8: Airborne (go.macworld.com/asphalt-ios), which frustrates on the Apple TV with frame rate hitches—but on the Fire TV, it's smooth sailing. In both cases, you'll have to deal with waiting around and downloading big chunks of extra content before you can play, but the in-game action is slicker on Amazon's device.

Same for Crossy Road, which runs fine on the Apple TV but has little split-second hitches here and there—it's even visible during the developer's Hipster Whale logo. But on the Fire TV, that's not an issue. Not every



YOU WON'T FIND Telltale's episodic adventure games, like The Walking Dead, on the Apple TV—not right now, at least. Surely someday, we expect.

game has noticeable differences: Twin-stick shooter Xenowerk (go.macworld.com/xenowerk) runs about the same on both boxes, as do Pac-Man 256 and Badland. In any case, the performance differences in those earlier games aren't dramatic, but they are there.

REMOTE PLAY

When it comes to the bundled remote control, there's no doubt about it: Apple's Siri Remote is much, much better for games. It's not an ideal device for all types of games, as discussed in our initial Apple TV gaming impressions (go.macworld.com/appletvgaming), but it's versatile and responsive enough to handle a lot of different inputs between the touchpad, motion controls, and physical buttons.

I can't say nearly as much for the Fire TV remote, which is a more traditional button-based option. It doesn't have any touch or tilt movement whatsoever, and it's not configured to be any more useful for games when held sideways like a gamepad. The primary input is a large button surrounded by a directional pad, much like the last-gen Apple TV remote—and that's fine for something like Crossy Road or Pac-Man 256. Not great, but usable.

Switch to Asphalt 8: Airborne, however, and the default control scheme

is terrible, trying to convince you that it's possible to hold the button to accelerate and then also steer with the surrounding directions. Turn on auto-acceleration and it's playable, but still not very comfortable. Jet ski racer Riptide GP2 is likewise playable with the remote, but there's no nuance to the streamlined steering, and you'll bump up against the sides a lot more.

Many Fire TV games require the gamepad, while most others are just way, way better with it. In other words, if you're not willing to pay extra for the gamepad, don't get a Fire TV to play games. It's clear that games are a very



THE SIRI REMOTE (left) packs a lot of functionality into a tiny space. Amazon's remote does a lot less.



AMAZON'S FIRE TV CONTROLLER (right) is pretty evenly matched with our favorite Apple TV MFi gamepad, the SteelSeries Nimbus.

small perk out of the box, but only a real benefit if you shell out for the controller. At least Amazon sells a Gaming Edition bundle (go.macworld.com/firetvgameedition) with the box, a gamepad, and two games (Shovel Knight and DuckTales Remastered) for \$140—a nice savings.

GAMEPADS

Apple doesn't make its own official Apple TV gamepad, but there are several licensed MFi (Made for iOS) controllers that work well with it—and the recent SteelSeries Nimbus (go.macworld.com/nimbus) and Hori Horipad Ultimate (go.macworld.com/horipad) also have the Apple TV Home button clearly marked. My pick is the Nimbus (\$50), which feels great in the hand, is nicely sturdy and responsive, and has a battery pack that you charge with a Lightning cable. It's a near-console quality device, although again, you've got options and we've covered most of them (go.macworld.com/appletvgamepads).

Meanwhile, Amazon has its own Fire TV Game Controller (\$50) (go.macworld.com/firetvgamecontroller), which was revised for the latest Fire TV model, and it's also very good. The gamepad is nicely contoured and the buttons are very responsive, plus it has perks like a headphone jack for pumping in audio from the box, as well as a microphone for voice commands. The downside is that it takes AA batteries, but Amazon says that two of them last for upwards of 90 hours.

Some other controllers—which you might have laying around—also work with the Fire TV, including Xbox 360 controllers (connected via USB) or an OnLive gamepad—although you might have to fuss with the in-game settings to get them properly configured. Reddit has a whole thread (go.macworld.com/firetvgamecontrollers) about alternative options and troubleshooting, if you care to try.

Really, it's pretty much a wash between the SteelSeries Nimbus and the official Fire TV Controller: Both feel

pretty good, work well, and are the same price, so there's not much of a sway here in either direction. The Fire TV Controller is a lot more mandatory for its box, given the wealth of controller-only games on Amazon's storefront, but the Apple TV needs a gamepad for serious gaming too. It's a worthwhile expense in both cases.

THE VERDICT

If you're already deep into the Apple device and app ecosystem, the Apple TV is an easy buy: An ever-increasing number of your existing games and apps transfer over with ease and you can tap into Apple's own media services on top of all that. Furthermore, the Siri Remote has more flexibility as an input device, and the Apple TV interface and storefront are leaps and bounds better than Amazon's.

However, if you're looking to play larger, more complex, and particularly console-like games on your TV rather than a phone or tablet, I have to give the slight nod to the Fire TV at this time. With the option for gamepad-only games, the Fire TV's library has big, engrossing games you just can't find on the Apple TV right now, including *Minecraft*, *The Walking Dead*, and *Game of Thrones*, plus classic *Final Fantasy* and *Grand Theft Auto* entries.

On the other hand, the Apple TV has *Transistor*, *Lumino City*, *Oceanhorn*,

Guitar Hero Live, and *Disney Infinity 3.0*—not to mention a very strong array of smaller but still great experiences. Both platforms have excellent games that aren't found on the other (as of this writing), but I find both quality and quantity in the Fire TV listings when it comes to larger-scale games. And when there's a performance difference between the same game on both platforms, it's in favor of the Fire TV version in my experience.

Keep in mind that the gaming value of the Fire TV is almost entirely dependent on buying a gamepad. Without it, the Fire TV has a small collection of decent games, but certainly not enough to buy a set-top box for. And I don't think that's going to change—the Fire TV's main remote isn't designed for even lightly complex games.

But the situation could change for the Apple TV. It has been on the market only a short while now, and the game library will continue expanding and evolving—and I'm sure Telltale's games will be adapted for the Siri Remote, and perhaps other noteworthy Fire TV games will follow too. At some point, I expect Apple will cave on the Siri Remote requirement for games, allowing more complex fare like *Minecraft* to make a smooth transition over. Until then, the Fire TV has extra gaming allure that the Apple TV can't fully match. ■



MAC GEMS ARE APPS THAT OFFER
STANDOUT UTILITY OR UNIQUE
FEATURES AT A GREAT PRICE.



UTILITY

1PASSWORD 6 FOR MAC: ENTERPRISE FEATURES AND LOTS OF SMALL IMPROVEMENTS

BY MARCO TABINI

UNLESS YOU'VE BEEN living under the proverbial rock, there's a good chance that you have, by now, become aware of how tragically easy it can be for your online credentials to be stolen. From picking weak combinations of characters that can be easily guessed—it's somewhat sad that, in 2016, *password* is still the most common passphrase—to reusing the same password across multiple websites, it doesn't take much to make a mistake that could very well turn out to be fatal.

1PASSWORD 6 FOR MAC



PRICE WHEN RATED
\$50 single-user license

COMPANY
AgileBits

While there is no bulletproof solution to this problem, the easiest way to alleviate it is to engage the services of a password manager—an app designed to provide an encrypted digital vault in which all your different logins are stored. This way, you can use completely different (and highly secure) credentials for each website while only having to remember the one “master password” that unlocks your vault.

AgileBits’ 1Password (agilebits.com/onepassword) is perhaps one of the most venerable members of this family of programs, and one that, with its newest version 6.0 release, aims to retain its position as the leader of the pack.

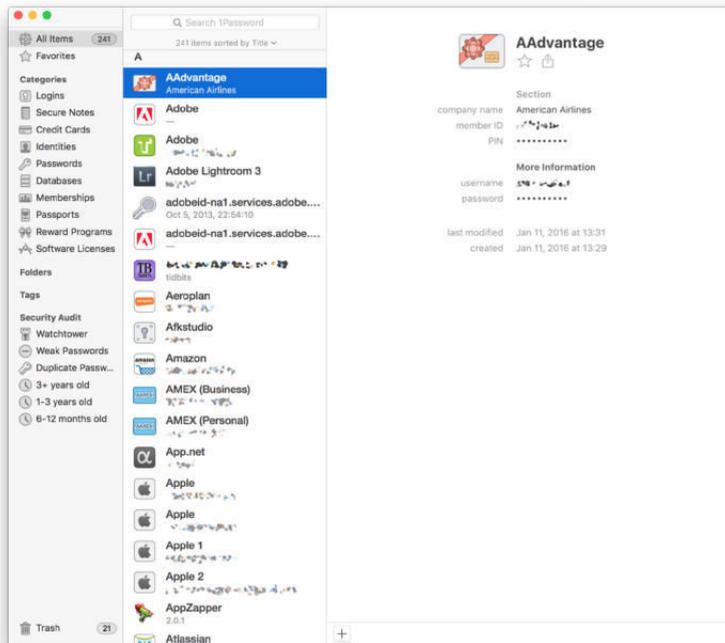
A FAMILIAR FACE

Curiously for a major release, 1Password’s user interface has remained largely unchanged compared to its predecessor. In fact, if you bought your copy from the Apple Store and you have auto-updating enabled, it’s entirely possible that you may already be running it without even knowing!

At the cost of sounding old and crotchety, I must say that this is good news. It’s certainly trendy for apps to undergo drastic UI redesigns with every major release. 1Password has had its share of those in the past, but I happen to think that the current interface works really well. Thus, new users will enjoy a mature experience that has been refined over time, while veterans of AgileBits’ software won’t have to do away with their familiarity and learn how to use the app all over.

That’s not to say, of course, that a few tweaks

1PASSWORD’S USER INTERFACE hasn’t changed much—which means that current users won’t have to learn everything from scratch.



haven't found their way into 1Password 6. For example, the app now features a redesigned setup workflow, and a new Save Login window now pops up in your browser when you register on a website. This last change, in particular, makes the process of adding new logins to your digital vault more obvious, thus reducing the likelihood that you will forget to save a set of credentials.

A PEEK UNDER THE COVERS

The lack of flashy UI changes means that the meat of 1Password's new release lies under its skin, starting with the app's password generator.

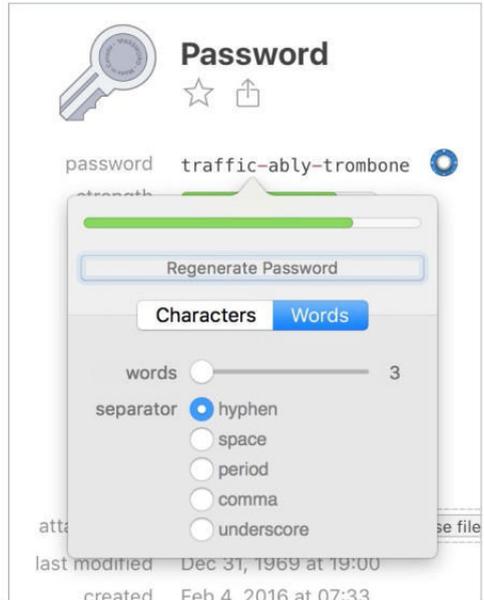
This nifty feature allows you to create cryptographically-secure passwords based on random data. In the past, this has meant having to deal with really complex sequences of letters and digits like, say, Fmr7M6JwWp. While undoubtedly safe from a mathematical perspective, these tended to be...a little hard to use. Not a big problem if you can use 1Password to both store and automatically fill web forms with them, but definitely less user-friendly if you had to either remember them in your head or type them in by hand.

With version 6, the generator can now be used to combine a series of words into passphrases that, while still secure, are much easier to remember and type in. Thus, the old jumble of random characters can now be replaced by a combination of nouns and adjectives that, while just as aleatory, are at least easier to recall and type on a keyboard.

A VAULT FOR EVERY TEAM

The ability to share a vault among multiple users has been baked into 1Password since version 5. This very convenient feature relies on some external synchronization service like Dropbox to create a vault file that can be accessed simultaneously by different people, and is great, for example, to keep tabs on all your family logins and other private details.

Unfortunately, this feature has never worked well for groups of people



THE NEW PASSWORD generator can now use words instead of random characters.

in which a higher level of control was required: While it's unlikely that one of your relatives will suddenly resign from your family and join a competing clan, this is a very real possibility in every workplace, for example.

The latest release of 1Password gains a brand-new feature called 1Password for Teams (teams.1password.com), which combines the concept of a shared vault with the kind of features you expect in an enterprise settings, like support for multiple users groups, the ability to manage access to secure storage with fine-grained access, and so forth.

The product, which is currently in beta and will eventually cost around \$5 a month for each user on a team, comes with a few additional perks, such as free access to the professional edition of every version of 1Password, and support for unlimited vaults and storage.

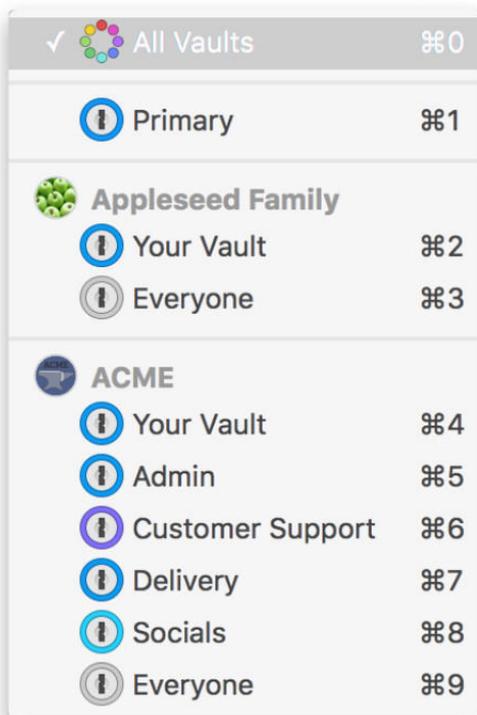
Clearly, the introduction of all these vault-centric changes over the last couple of versions have complicated the lives of those who share their data with family and team members. Luckily, the app now includes an All Vaults view that allows you to work with a merged view of all your data while keeping the contents of each vault physically separate.

GROWING PLANS

With the launch of 1Password for Teams, AgileBits' business model gets closer to that of its competitors, most of which have switched from one-time purchases to subscription-based revenues over the last few years.

Unlike many of its competitors, however, 1Password retains the ability to unlock its more powerful features using a one-time purchase, which feels to me like a smart decision, particularly in light of the fact that the app is compatible with a number of cloud-based synchronization services that most of us are already likely to access, like Dropbox or iCloud.

BRINGING ALL THE data from your digital vaults together into a single interface is the All Vaults view.



As a result, the base version of the app remains free, individual users can take full advantage of its advanced functionality in exchange for a reasonable amount of money, and enterprise-level customers enjoy the kind of flexibility they require with a small monthly expenditure.

BOTTOM LINE

1Password 6 is an incremental release for a great product. The lack of flashy new features is made up for by a focus on advanced features—and the fact that the upgrade is available as a free update for existing users, either through the App Store or directly from AgileBits' online store.

While 1Password remains my favorite digital vault, I must say that the product is falling behind its competitors in some aspects; for example, several other password managers now support the ability to automatically change passwords on many popular sites—something that can greatly increase security by reducing the effort it takes to keep all your logins fresh and cryptographically sound, and that is not yet possible with AgileBits' app.

Its great feature set, longevity, and ability to rely on multiple synchronization services, however, still make this app one of the very best of its kind. Here's to hoping that, now that the folks at AgileBits have had an opportunity to complete their work on 1Password's enterprise features, they will once more turn to improvements that have a more direct impact on helping users get a handle on their digital lives. ■

**1PASSWORD'S
GREAT FEATURE
SET, LONGEVITY,
AND ABILITY TO
RELY ON MULTIPLE
SYNCHRONIZATION
SERVICES MAKE
THIS APP ONE OF THE
BEST OF ITS KIND.**

UTILITY

DISK DRILL PRO 2: LAST LINE OF DEFENSE FOR MAC DATA RECOVERY

BY J.R. BOOKWALTER

ALTHOUGH FASTER, MORE DURABLE solid-state disk (SSD) storage eliminated spinning platters and therefore reduces the chance of losing precious files due to mechanical failure, there are plenty of other ways drive-related catastrophe can rear its ugly head. Frequent backups are one highly recommended method of protection, but that alone isn't enough to prevent complete data loss.

As the old saying goes, the best offense is a good defense. In the case of your Mac, that strategy involves keeping good data recovery software on hand for when a file or—God forbid—an entire disk partition eventually winds up disappearing without a trace. (And remember, it's not a question of "if," but "when.")

Unless an afflicted drive craps out entirely—in which case your only hope will be paying for costly recovery services like DriveSavers—all you need is the right software tool for the job and you'll be back in business in no time.

TO SERVE AND RECOVER

Disk Drill Pro 2 (cleverfiles.com) is one such Mac utility for scanning, recovering, restoring, and protecting OS X files and volume partitions. Also available in free Basic and commercial Enterprise editions,



DISK DRILL PRO 2.4



PRICE WHEN RATED

\$89

COMPANY

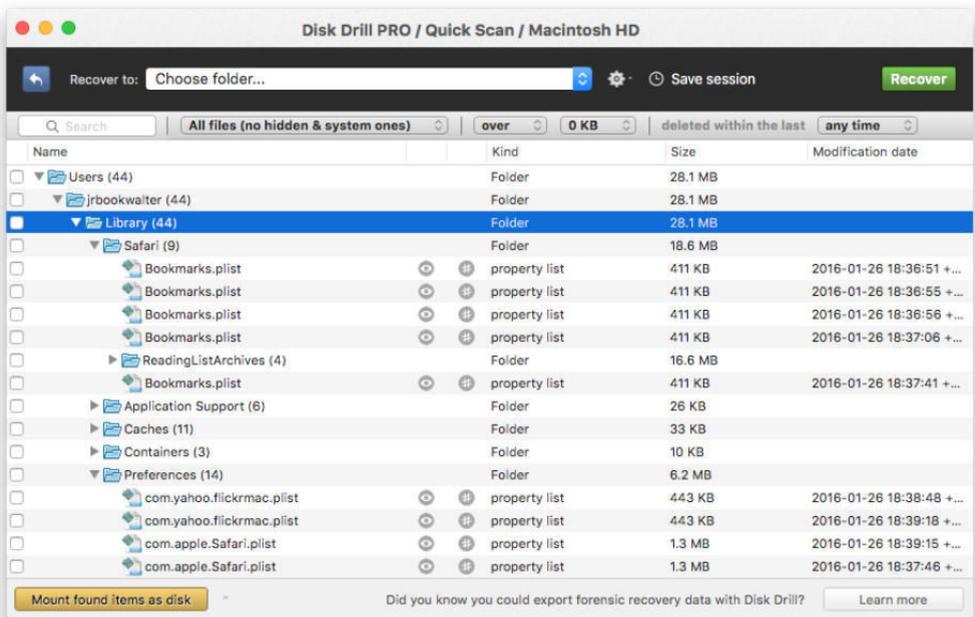
508 Software

the software provides comprehensive data recovery from any type of disk media, including USB flash drives and memory cards.

While the Basic edition provides continuous protection with core features such as Recovery Vault and Guaranteed Recovery along with the ability to back up failing volumes to a disk image backup (DMG) stored on an external drive, the Pro version adds a few more robust options. A single-user license works on up to three Macs, with lifetime upgrades available for an additional \$29.

In addition to the Quick Scan that skims through deleted files within seconds on even the largest volumes, Disk Drill Pro also offers Deep Scan, a process that takes significantly longer but has far better odds of rooting out lost media. I tested the latter option on my 15-inch MacBook Pro with Retina Display's 500GB internal SSD which clocked in around eight minutes, and did indeed turn up a respectable number of additional photos, documents, and other files that

DISK DRILL PRO'S Deep Scan mode tunnels through your volume in search of files that are capable of being recovered.



Quick Scan could not.

Once a scan has completed, users preview a file's contents using the Quick Look or view in hexadecimal format to assure it's complete prior to recovery. Returning one or more files and folders from the grave is as easy as making a selection and clicking the green Recover button in the upper right corner. The Pro version can also mount found items as a new disk, but this feature requires the aging (and occasionally buggy) Fuse for OS X to be installed.

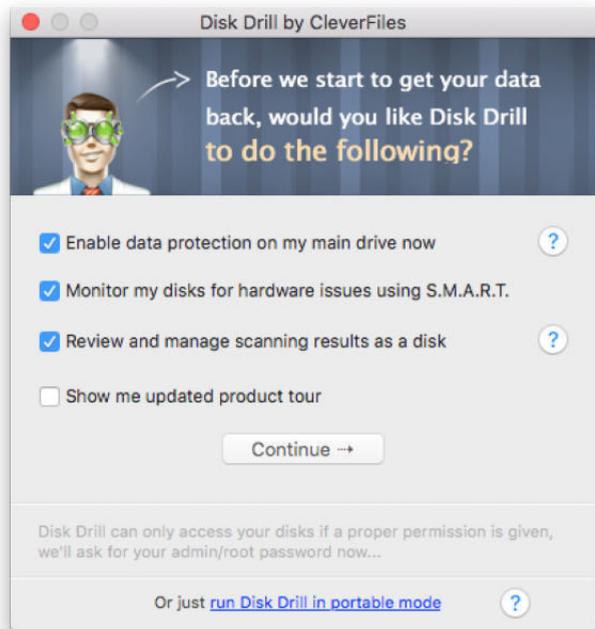
Disk Drill Pro 2 can also be used to rebuild the catalog of Mac HFS+ partitions, a task traditionally reserved for utility software like DiskWarrior. Unlike that venerable application, Disk Drill Pro can only perform a catalog rebuild on partitions that refuse to mount correctly; otherwise this option won't appear at all in the drop-down menu.

DRILL DOWN

Disk Drill's first major upgrade isn't actually new: Version 2.0 made its debut nearly two years ago, and developer CleverFiles has been steadily releasing regular updates ever since, including several that tuned up the application ahead of last year's OS X El Capitan. Unfortunately, the user interface has remained largely untouched during this time.

With Disk Drill 3 on the horizon (currently in beta testing), I'm hoping the engineers take this opportunity to give the software a fresh coat of UI paint. As it currently stands, Disk Drill is a dated, often confusing morass of options and menus, and it's not always entirely clear which buttons and options do what.

Part of this stems from how Disk Drill displays volume information



AT FIRST LAUNCH, Disk Drill walks users through an extensive tutorial, along with setting up a few options to help future data recovery.

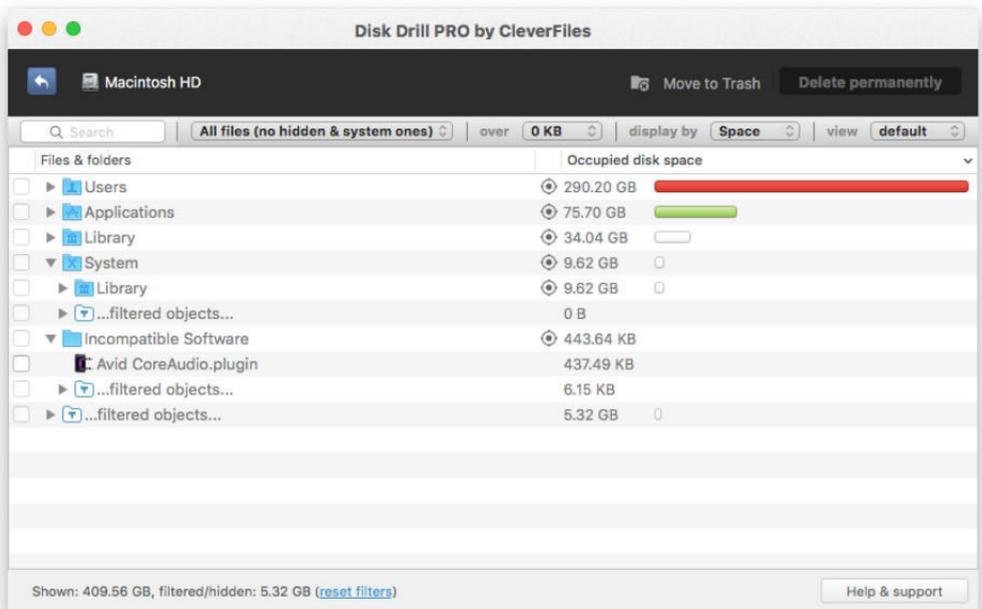
typically hidden from users. For example, my Drobo 5D and Drobo mini both show additional EFI and Unallocated partitions, although there's an option in the lower left corner of the Disk Drill window to filter such volumes from view; this also applies to the Recovery HD, which is now standard on all Macs since OS X Lion.

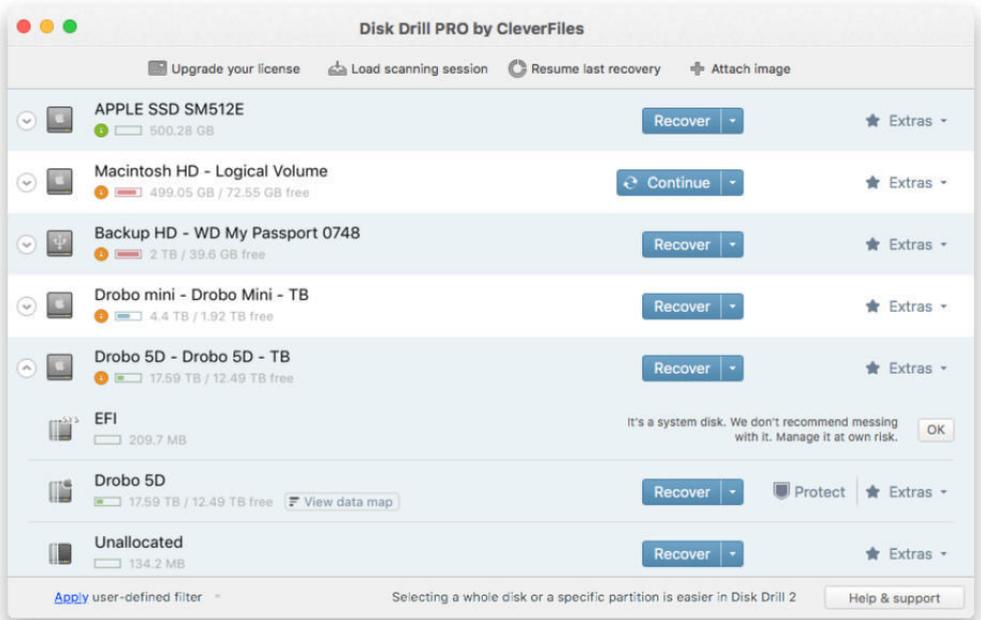
Aesthetics aside, Disk Drill should be considered an essential component of any Mac owner's utility belt. In addition to HFS+, the software can also recover disks formatted with other file systems including Windows NTFS or FAT and Linux, and built-in Self-Monitoring, Analysis, and Reporting Technology (better known as SMART) will keep tabs on your internal drive even when the application isn't running.

BOTTOM LINE

Disk Drill 2 is your first and last line of defense for dealing with misbehaving volumes on the Mac, and the Pro version easily pays for itself the

DISK DRILL ALSO provides a look at what's consuming space on your drives, with the option to trash or permanently remove files or folders no longer needed.





first time trouble comes along. Aside from a UI that feels out of step with OS X El Capitan, my only caveat would be to hold off for the forthcoming version 3.0 so your investment will last as long as possible, especially when the Basic version offers sufficient peace of mind today without breaking the bank. ■

DISK DRILL PRO 2 offers comprehensive data recovery for Mac, but nearly two years after release, the UI is looking rather busy and dated under OS X El Capitan.



SOCIAL MEDIA

GRIDS FOR INSTAGRAM: VIEW (BUT DON'T SHARE) SOCIAL PHOTO FEEDS ON MAC

BY J.R. BOOKWALTER

CONSIDERING INSTAGRAM'S BAKED-IN LIMITATIONS, it's a miracle the photo-centric social network has become as wildly popular as it has. After all, third-party apps aren't permitted to upload images to the service at all, and nearly six years after the debut of the iPad, there's still no tablet-optimized iOS update to be found.

Instagram is also oddly walled off from desktop computers. Sure, you can use a web browser to search or view images, but it feels like something the company grudgingly maintains. Even after Facebook acquired the service in 2012, Instagram remains stubbornly mobile-

GRIDS FOR INSTAGRAM 3.1.1



PRICE WHEN RATED

\$5

COMPANY

ThinkTime Creations

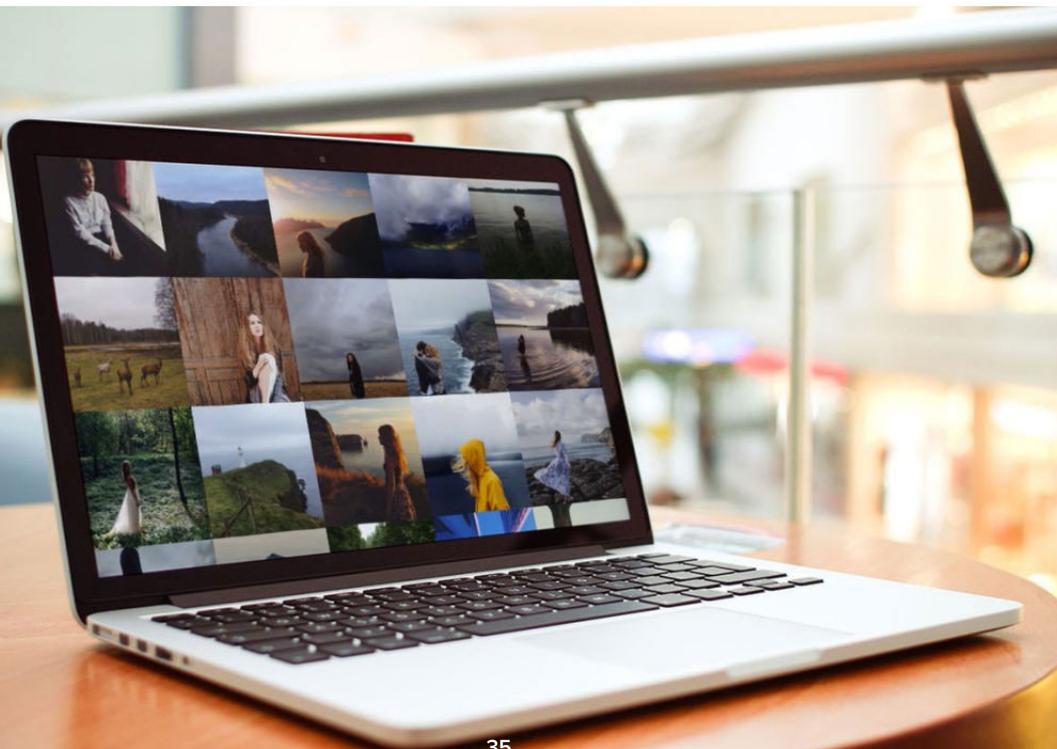
first, despite the efforts of developers like ThinkTime, who keep trying to expand its reach.

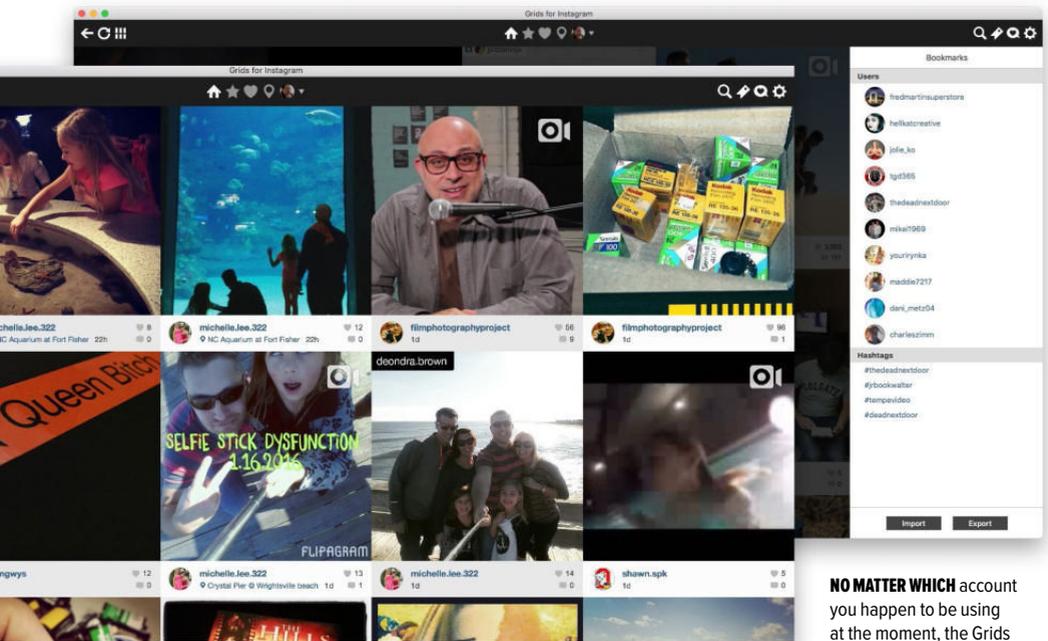
INSTAGRAM FAUX MAC

Grids for Instagram (go.macworld.com/grids) puts more emphasis on photos than user interface, and the result feels like a native Mac application Facebook might have built if they chose to do so. Although it can't be used to actually upload photos from the Mac due to an API restriction, Grids otherwise improves the Instagram experience in several ways.

First of all, there's support for multiple accounts, and you can switch between them in seconds with the click of a mouse. For years, Instagram users have begged for this feature on smartphones, which comes in handy for those of us who depend upon the service for personal as well as business use. There's also a universal bookmark option for specific

WITH SUPPORT FOR Retina Displays and full-screen mode, Grids makes Instagram photos look their best on the Mac.





GRIDS FOR INSTAGRAM'S Brief view offers a nice compromise between visual eye candy and information about the photo.

photos, users, or hashtags, so you can find them again quickly from whatever account you happen to be signed into.

Grids can display content in four different layout styles: Square (image only), Brief (image plus user details), Vertical (a close approximation of the Instagram app with the description and tags displayed at the bottom), or Horizontal (which relocates the description to the right side). I found Brief to be a nice compromise between eye candy and information.

In all views, photos are displayed in a grid with no spacing in-between, but users can adjust this for some breathing room via Preferences, with a white or black background. Grids supports full-screen mode, which looks as great on a 27-inch Thunderbolt Display (go.macworld.com/thunderbdisplay) as it does on my 15-inch MacBook Pro with Retina Display.

NO MATTER WHICH account you happen to be using at the moment, the Grids bookmark feature can be used as a shortcut to favorite photos, users, or hashtags.

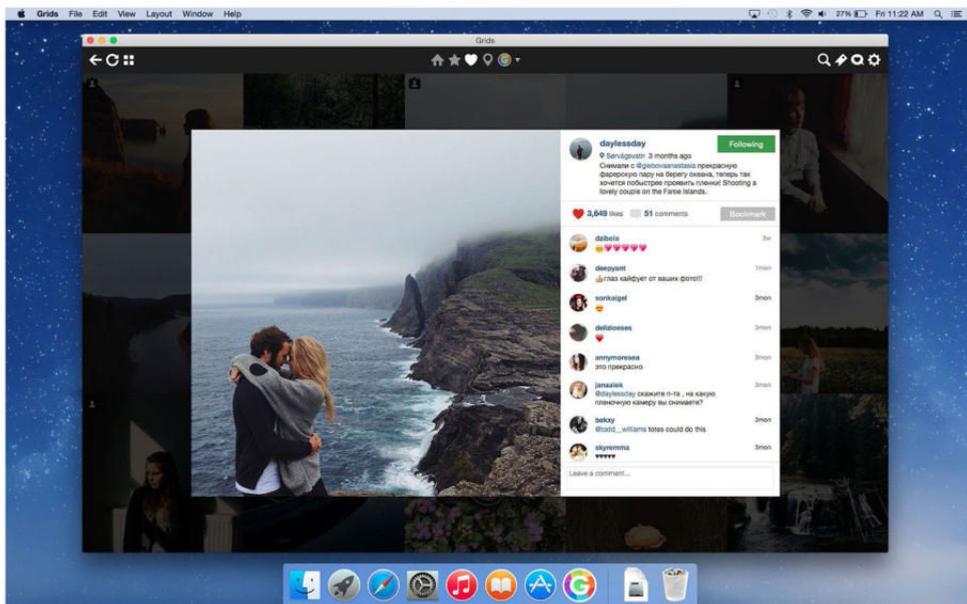
VIEW, DON'T SHARE

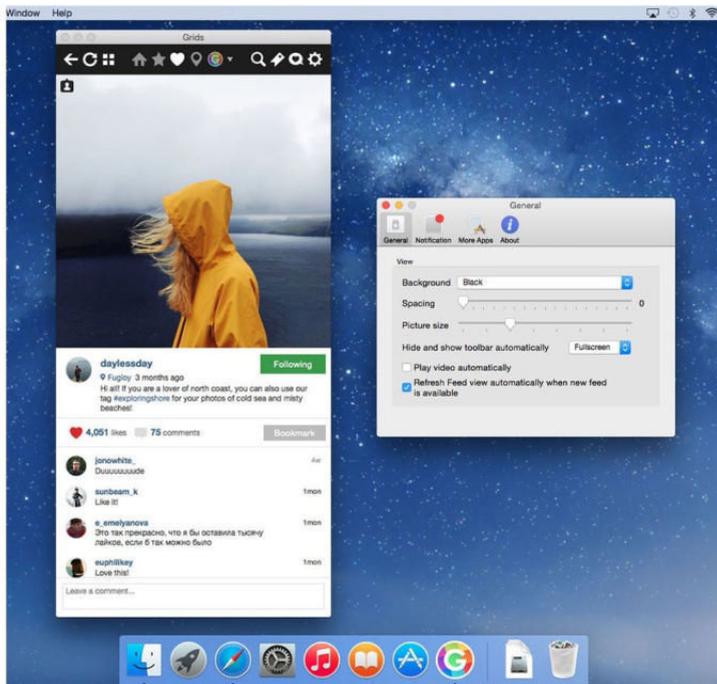
Clicking on an image (or pressing Return) opens in full-size photo view, where you can read or leave comments. Unfortunately, Grids can't enlarge or otherwise resize in this expanded view; the zoom options in the View menu are limited to the main timeline. This isn't surprising since Instagram doesn't allow zooming on smartphones, although it's technically possible, since third-party apps like Primary for iOS can do it.

Grids offers keyboard shortcuts for nearly every feature. Press the L key or double-click to like a photo, C to comment, or scroll one page at a time by pressing Page Up or Page Down (Shift-Space or Space will also work). Some options are also available via contextual menu with a Control-click action.

One thing Grids doesn't do as well as it could is sharing photos: There are options to copy or open a URL and save to disk (in full-resolution "HD," if available), but there's sadly no support for the OS X built-in share extension. Having recently launched a social networking campaign that

PHOTO VIEW DISPLAYS an image full-size, but there's no option to zoom or otherwise enlarge from here.





GRIDS FOR INSTAGRAM

includes preference settings for spacing, picture size, and background in the main view.

required a lot of sharing to Facebook, this would have been a convenient option to have.

Sharing aside, Grids is an otherwise faithful Mac port of the Instagram experience, complete with conveniences like push notifications for new activity, customizable views, and automatic feed refresh while the application is open.

BOTTOM LINE

Aside from uploading and the lack of native OS X sharing, Grids delivers an authentic Instagram experience on the Mac, and actually does it one better with support for multiple accounts. ■

PRODUCTIVITY SOFTWARE

AIRTABLE: A DROP-DEAD EASY RELATIONAL DATABASE MANAGEMENT SYSTEM

BY WILLIAM PORTER

AIRTABLE IS AN ONLINE platform for creating, using, and sharing small relational databases. It's not ready for enterprise users yet (that's coming), but right now, if you want help managing data for personal use or for your small business, if you need to share that data with others, if you'd like users to access it anywhere, and if you'd love to do all this for free (or next to nothing), then Airtable (airtable.com) might be the answer to your prayers.

AIRTABLE



PRICE WHEN RATED

Monthly fee ranges from free to \$24 per user

COMPANY

Airtable



The screenshot shows the Airtable mobile app interface for a base named 'House Hunter'. The top navigation bar includes a home icon, the base name 'House Hunter', and options for 'MOBILE', 'HELP', a notification bell, and a user profile. Below the navigation bar, there are tabs for 'PROPERTIES' and a '+' icon to add more. A secondary bar contains 'Hide columns', 'Add filters', 'Apply sort', a share icon, and a 'SHARE' button. The main table has columns for 'Address', 'Rating', 'Attachments', 'Price', and 'Neighborhood'. It displays three rows of property data.

	Address	Rating	Attachments	Price	Neighborhood
1	8547 Hillside Dr., Dallas, TX 75432	2		\$659,000	Vista del Lago Lindo Estate
2	41033 Pincus Cir, Dallas TX 75432	1		\$462,000	Vista del Lago Lindo Estate
3	3083 Garland Ln, Dallas TX 75440	1		\$519,000	Farm Ranch Meadows

At the bottom of the table, it indicates '3 rows' and an 'AVERAGE \$546,667'.

On your computer, there is nothing to download. Just launch your browser, go to [Airtable.com](https://airtable.com), and sign up. It's free to get started.

THIS IS MY simple house-hunting base viewed in a browser on a computer.

FIRST BASE: HOUSE HUNTING

You can pick from a couple dozen starter bases for different purposes. (*Base* is Airtable-speak for database.) Or you can import a .csv file or paste column and row data from an existing spreadsheet. But it's a snap to build a base from scratch, so let's do that. And since it's easier to show how this works with concrete examples, let's do that, too.

Imagine you are in one city looking for a new house and your spouse, having drawn the short straw, is back home packing. On your new Airtable account's home page, click New Base, give the base a name, then double-click the base's icon to open it. Three columns are pre-defined for you: Name, Notes, and Attachments. The Name field in Airtable is for a unique description of each row or record, so in this scenario, you'd want to use the Name field for property addresses. Define two or three more columns—Price, Neighborhood, Rating—and you're ready to go. All this takes, oh, 60 seconds.

One last thing. Before you hit the streets, download the Airtable app to your iPhone and use the app to sign in to your new account. (There's an iPad app, too. An app for Android is in beta now and will be released later this winter.)

SECOND BASE: ON THE PHONE

Now, when you are out visiting properties, you'll launch the Airtable app

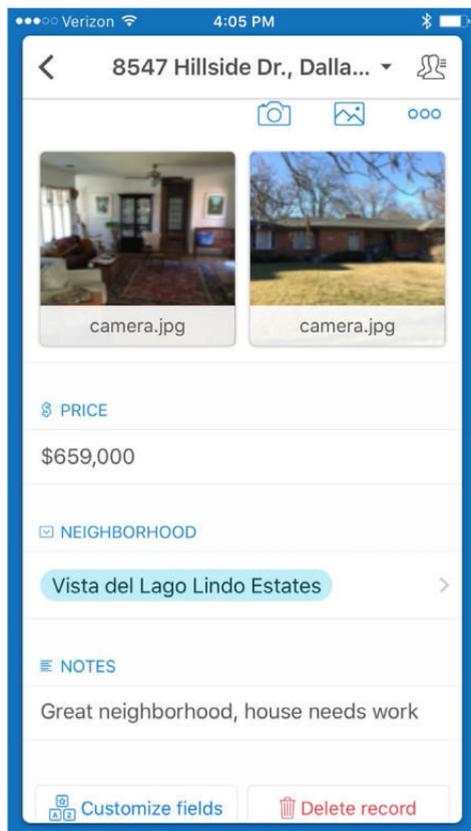
on your phone, open the househunting base you created earlier, click on an empty row, and enter each property's address, price, etc. Click on the Attachments column, then on the camera icon, and you can take one or more photos of the property and they will automatically be stored in the base. The app integrates well with your phone. If configured properly, addresses can be opened in Maps; phone number values can be tapped to make calls. There's even a barcode column type so you can scan barcodes.

Now if you visit many properties in the same area, you'll probably get tired of typing the same neighborhood description again and again ("Vista del Lago Lindo Estates"). So in the Record view, click on Customize Fields, then click on Neighborhood and change its field type to Single Select. Save your way out of the base editor. Next time you create a new record, when you click into the Neighborhood field, the value picker will appear and you'll type in a value only if it's not already there for the picking.

Notice what is going on: You're not only entering data (including photos) on the iPhone, you're editing the structure of the database. Need another column/field, say, Square Feet? Click Customize again, and add a field. Or fields. On your iPhone. You could actually create the base from scratch on your phone, but that would be showing off.

And once you've shared your househunting base, your spouse will now be able to take a break from packing boxes, access the base, review what you've seen, look at the photos, and write encouraging notes to you in the Notes field. ("Are you kidding me? This place looks like a dump!") This data gets synced in both directions instantly. ("Hey babe, take another look at the price.") If you wanted to share with your teenager without giving the

VIEW OF A SINGLE property record in a house-hunting database. Clicking on the camera button lets you take a picture and store it directly inside the base.



teenager the ability to edit the base, you'd adjust the access privileges for that share.

THIRD BASE: A FUNDRAISING BANQUET

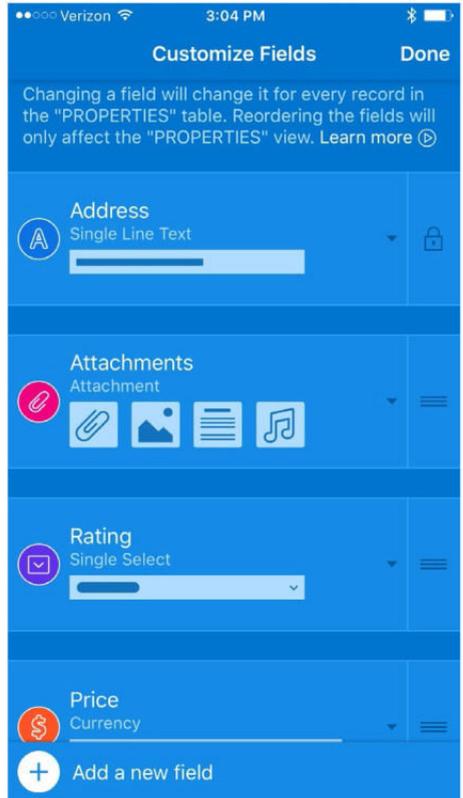
You can even give access to people who don't have an Airtable account. For example, if you were organizing a fundraising banquet, you could create an RSVP form for your Airtable Invitees base, publicize the url of the form, and let invitees enter their own info (name, phone, attending or not attending, number of guests, etc.).

As the RSVPs come in via the online form, you'll want to start assigning attendees to tables, and Airtable can help here, too. Add a column to your list of invitees and select Link to another table, then create a new table and name it Tables, as in "tables that guests will sit at". Now just click into that column to link attendees to tables. Congratulations: You've created a relational database—er, *base*!

And you'd probably want at this point to take advantage of a couple of Airtable's calculation options. A roll-up column in the Tables view can keep track of how many guests have been seated at each linked table, and a lookup column in the Invitees view can mirror that total so you can easily see whether there's enough room left at table 11 to seat Linda Lufkin's party of five.

HOME RUN: DATA BASICS

Airtable may look like a spreadsheet but it isn't. It's a database. Unlike spreadsheets, databases require rigid data structures, so you will have to think a little about how to organize your Airtable base. Will a column be used for short bits of text like names or addresses or long text like memos? Will a column be used for date values, numbers, currency? If the data you'll put into an Airtable base calls for two or more related tables, you'll want to think carefully about how to link them.



THE AIRTABLE APP for iPhone isn't just for entering and viewing data on the go, it's powerful enough to create and edit base structures. This screen is used to customize column data types, add columns, etc.

You'll also need to give some thought to how you want to view your data. You can't easily program or script Airtable but you can create different views that filter (find) and display data in different ways. For example, I built a to-do base and made different views that show me only uncompleted tasks, or tasks to be done today, etc. Sound complicated? It's not. There's a lot of help available and live support is terrific. And you can undo almost every action, so relax. If it can be done at all in Airtable, it's usually pretty easy.

Airtable is easy partly because its developers have done a great job of eliminating common relational database headaches. For example, you never have to think about the primary or foreign keys that link tables together. But it's also easy because it sticks to data basics. The scenarios or use cases I described earlier are, I think, examples of where Airtable shines. Hunting for a house or organizing a banquet, you will appreciate everywhere access and the ability to share your data. In these scenarios, you probably will not need to worry about complex business rules during data entry (like "an order

RSVP • Jackson Elementary Gala

Let us know if you can attend the Jackson Elementary Fundraising Gala on April 1 in the school gymnasium. We hope you can come—and don't forget your checkbook!

Name(s)*
(Required) Your name and the name of any guest(s) who will accompany you

How Many*
(Required) Enter 1 if you're coming alone, 2 if you'll bring a date, etc.

Seating Request
(Optional) If you'd like us to seat you with friends who are RSVP-ing separately, let us know. No promises, but we'll do our best!

AIRTABLE LETS YOU create online forms where anybody with the URL can provide and submit info. In this example, the form is used to collect RSVPs for a fundraising banquet.

	Name	How Many	Seating Request	Table	#/Table	ERR	Notes
1	Matt Donahue, Jessie Wells	2		1	7		
2	Iiana Covetti	1		1	7		
3	Laura Lifton	5		2	8		
4	Peter Koscy	1		2	8		
5	Carlos & Connie Zepeda	2		2	8		
6	Tom Tenebaum	5		3	10	! Table 3	
7	Andy Gallagher, Tim Ross	2		3	10	! Table 3	
8	Payne Bellinger + mom and d...	3		3	10	! Table 3	
9	Penny and Al Reinhart	2	Could we sit with Bill and Pau...	1	7		
10	Bill Forrester et ux.	2		1	7		

can't be created unless an account exists and payment info has been entered"). If you're entering the data yourself, you also won't have to worry about minimum wage data-entry clerks making careless but costly mistakes. And you probably won't care about beautifully formatted printed reports.

AIRTABLE'S VARIOUS CALCULATION columns can do a lot. In this view, the user can see that Table 3 (which seats 8) has too many people assigned.

BOTTOM LINE

Of course, there are other scenarios for which Airtable is not such a good fit. I doubt Airtable is going to pull many users away from richer database application development tools like FileMaker Pro. In FileMaker, for example, a developer can write a script that finds uninvoiced line items for a particular account, goes to another layout, sorts and totals those line items, saves the whole thing as an attractively formatted PDF, sends the PDF to the client via email, then comes back to the records and archives them.

Now Airtable does have a fully documented API. Some benefits of the API are easily accessible to Airtable users through third-party services.

With a Zapier account (not free), you can get dated rows in your Airtable base copied to Google Calendar (or integrate in other ways with a large number of other online apps), and Slack can let you know when your base is updated and help users sharing a base communicate. But using the Airtable API to generate multi-step actions that resemble FileMaker scripts will require programming, and it's a safe bet that most do-it-yourself users of Airtable won't go there.

But even without programming, Airtable is amazing. Folks who, for lack of a better option, have been throwing structured data into Excel or Google Sheets or (gasp) into tables in word processing apps, now have the better option they lacked: they can put that data into Airtable, which is an honest-to-goodness database tool. Factor in its cost and accessibility advantages, and to many users Airtable is going to be a revelation. ■

A LIBRARY DATABASE is shown with three linked tables (Authors, Titles, and Subjects). A classic example of relational database design, this would be nearly impossible to do in a spreadsheet but was easy to put together in Airtable.

	TITLE	AUTHORS	Subject	Notes	Publisher	Year	Cover
1	Beauty in Photography	Adams, Robert	Photography		Aperture	1996	Paperback
2	Brutus	Cicero, Marcus Tullius	Classics	ed H. Malcovati	Teubner	1979	Hardcover
3	Crypto: How the Code Rebels Beat the Gov...	Levy, Steven	Technology		Penguin	2001	Paperback
4	Demetrius on Style	Roberts, W. Rhys	Classics	*The Greek Text of...	Oims	1969	Hardcover
5	Fine Art Printing for Photographers	Gulbins, Juergen Steinmueller, L	Photography	2nd edition	Rocky Nook	2011	Paperback
6	Green Centuries	Gordon, Caroline	Novel		Cooper Square	1971	Hardcover
7	Hackers & Painters: Big Ideas from the Co...	Graham, Paul	Technology		Oreilly	2004	Hardcover
8	Henri Cartier-Bresson	Cartier-Bresson, Henri	Photography	Intro by Michael...	Thames & Hudson	2006	Paperback
9	History of the Catholic Church: From the A...	Hitchcock, James	Religion History		Ignatius Press	2012	Paperback
10	Latin Metre: An Introduction	Raven, D.S.	Classics		Faber and Faber	1965	Hardcover
11	Laurus	Vodolazkin, Eugene	Novel	Kindle format	Oneworld	2015	Ebook
12	Life of a Photograph, The	Abell, Sam	Photography		National Geograph...	2008	Hardcover
13	Light—Science & Magic	Fuqua, Paul Biver, Steve Hunte	Photography	3rd edition	Elsevier / Focal Press	2007	Paperback
14	Lost Lawyer, The	Kronman, Anthony T.	Law		Harvard University ...	1993	Paperback
15	Magna Carta: Text and Commentary	Howard, A.E. Dick	Medieval Law History		University of Virginia	1964	Paperback
16	Mastering Regular Expressions	Friedl, Jeffrey	Programming	1st edition (1998; 7th...	O'Reilly	1997	Paperback
17	Metamorphoses	Ovid, (P. Ovidius Naso)	Classics	ed. W.S. Anderson	Teubner	1988	Hardcover
18	Napoleonic Wars, The	Rothenberg, Gunther E.	History	Smithsonian History ...	Smithsonian/Collins	2006	Paperback
19	On History and Other Essays	Oakeshott, Michael	Philosophy History		Liberty Fund (India...	1999	Paperback

Hot Stuff

What We're
Raving About
This Month

ANKER POWERCORE+ 20100

If you need a high-capacity battery that can fully charge a 12-inch MacBook, the \$50 Anker PowerCore+ 20100 (anker.com) is your best bet. It's far cheaper (especially adjusted for inflation) than what a removable replacement used to cost when Mac laptops offered swappable batteries. Plus, it performed well in our tests, has an attractive shape and material that fits nicely in the hand, and features a perfectly-adequate three ports, including a combined in/out USB-C charging port. —GLENN FLEISHMAN



TALENTCELL 10400MAH 38WH PORTABLE CHARGER 🟢🟢🟢

The \$27 Talentcell 10400mAh 38Wh Portable Charger (talentcell.com) is sturdy and well snapped together, and performed extremely well in testing. While it ostensibly has just 10,400 mAh of capacity, in testing it seemed to punch well above its class. It was able to recharge a MacBook to 80 percent (as reported by OS X) before the juice stopped flowing. However, it caps input at 1.5A, making it take nearly as long to charge as a pack with twice the capacity. —GLENN FLEISHMAN



Hot Stuff

RAVPOWER 20100MAH EXTERNAL BATTERY PACK

The \$56 RAVPower 20100mAh External Battery Pack (ravpower.com) only charged my 12-inch MacBook up to 90 percent before it was exhausted. However, if you need speed and diversity of ports, and you have the right mobile equipment to go with it, you might actually prefer the RAVPower to other models. It can be recharged through two ports (Micro-USB and USB-C), and the USB-C port can also charge other devices. And it has two Type-A ports with distinct characteristics.

—GLENN FLEISHMAN



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V I D E O G A M E V O T E R S . O R G





Why you should use your iPhone with a Bluetooth keyboard as your main travel computer

It's not as crazy as it sounds.

BY CHRISTOPHER PHIN

With all the unsettling, unblinking zeal of a missionary, I want to try to convince you that something which sounds a bit weird is actually a great idea that will completely change your life. I want you to consider using an iPhone as your primary computer when you're traveling, especially on business, only carrying one extra thing with you: a Bluetooth keyboard.

Let me admit up front that you will look a bit peculiar. As you board a train, as you check into a hotel, as you post up at a coffee shop—if all you're carrying is a keyboard, you will attract looks. You could, naturally, carry a bag instead and stash the keyboard in it, but while this makes you look less goggle-eyed crazy, it

takes away from one of the main advantages of the iPhone-plus-keyboard setup: traveling light.

Why bother with the keyboard at all? Well, of course, for most of us, we can type faster, more accurately, and more comfortably on a familiar full-sized keyboard than if we're pecking away on an iPhone's screen.

THE KEYBOARD I

personally tend to use with my iPhone is an ancient model from Think Outside.





And why not just use an iPad with its bigger, soft keyboard, or indeed a laptop? Because you don't need them! You probably have your iPhone with you at all times anyway, so if you can then why not use it rather than giving yourself the physical and logistical baggage of carrying another device?

And an iPhone is an astonishingly useful and capable work device. It's always connected (unlike your MacBook), and with a little planning and exploitation of cloud services (unless you have very specific needs) it's likely that you can do far more

work on an iPhone, and far more easily, than you might assume.

Indeed, for many of us, the one thing that stops us doing big bouts of focused work on an iPhone—whether that's writing emails, working on documents, even just keeping in touch with the office or friends through iMessage—is that it can be tiresome to write much more than a few tweets on its onscreen keyboard. Hence the Bluetooth keyboard—and I promise you that the first time you try this, as well as feeling a bit conspicuous, you'll be amazed at how productive you'll be on the go.

PICK YOUR KEYBOARD

Let's start with some shopping. If you don't already have a Bluetooth keyboard, you'll need to pick one, and I have some suggestions. (If you do already have one, great, but just note that unless it's one that's designed to be paired to multiple devices, and you don't intend to use it full-time with your iPhone, then it will be a bit of a faff as your iPhone and your Mac, say, fight over which of them the keyboard is connected to.)

The keyboard I personally tend to use with my iPhone is an ancient model from Think Outside.

I love it because it folds in half, so I'm not walking around with a keyboard like some twenty-first century equivalent of the wandering troubadour; I love it because the keys feel genuinely amazing; and I love it because it's just powered by a couple of AAAs, so I can pick up a pair of batteries from basically anywhere if I run out of juice. Plus, it has a handy, detachable stand that can hold my iPhone at two angles.

Yeah, it was designed for Pocket PC and Windows Mobile devices, so some of the keys are in weird places or serve no purpose, but it's a small price



to pay for such a compact, handy keyboard. The catch is that while you can still buy it today, the few remaining new units (go.macworld.com/thinkoutside) will set you back nearly \$190, but you could go second-hand and save money.

But, of course, you could go for a more modern and less fussy keyboard. The other one I especially like is the K811 from Logitech (go.macworld.com/k811), which has great-feeling backlit keys, and can pair with three devices—for me, that means my iPhone, my iPad, and my Mac.

The current equivalent of that in Logitech's lineup is the K380 (go.macworld.com/k380), but you might also consider the K480 (go.macworld.com/k480), which has a little gutter behind the keys in which you can prop up a smartphone or tablet. Or, of course, you can go for the familiarity of one of Apple's aluminum keyboards.

There is another option: Although rarely seen (mostly because with some justification manufacturers think it will only appeal to education buyers), there are keyboards from the likes of Belkin (go.macworld.com/B2B124), Griffin (go.macworld.com/XB38326), and Kensington (go.macworld.com/k72447ww) that connect not over Bluetooth but via the Lightning or 30-pin port on the bottom of your iPhone. While the cable is a little untidy,



it means you don't even have to worry about charging your keyboard, since it draws power from the iPhone.

STAND UP!

So, you've got your keyboard—now you probably want to prop your iPhone up. If you're working on a plane or train with a seat-back tray in front of you, it's likely that the grippiness of a silicone case from, say, Apple, is enough to stop it from sliding flat if you prop it up leaning against the back of the seat in front of you.

If not, something like a Glif (studio.neat.com/products/glif) is handy and can be attached to your keychain so you always have it with you.

Indeed, basically any other stand you might have handy will work, such as the Compass by Twelve South (below), which, while technically designed for iPads, can be pressed into service for an iPhone.

HEAD IN THE CLOUDS

You're all set! All you need to do now before you head out the door is make sure you'll be able to access any stuff you'll need to work on as you travel. Usually, this means ensuring documents are stored in the cloud—Dropbox or iCloud, most commonly—but it might mean dropping stuff across to your iPhone via iTunes for some older apps.

One final recommendation: If you're going to be working a lot on your iPhone on the go, you'll quickly burn through the battery. Consider a battery case, such as one of Mophie's Juice Packs or Apple's Smart Battery Case.

Converted? Go forth and prosper! ■

THIS ONE IS the original Compass, but Twelve South has moved on to the Compass 2 now.





How a Pro model could change the iPhone

Mac Pro, MacBook Pro, iPad Pro...what about an iPhone Pro?

BY MICHAEL SIMON

Back in May 1998, Apple hyped an upcoming special event in three words: *Pro. Go. Whoa.* After Steve Jobs had finished his keynote, it was clear what they meant: *Pro* was for the Power Macintosh G3, *Go* was for new PowerBooks, and *Whoa* appropriately captured the reaction to Apple's newest computer, the iMac.

It wasn't just a clever marketing slogan. For the first time, Apple made a clear distinction between consumers and professionals. The Power Mac and iMac may have both used G3 processors but they were marketed to different audiences; the beige tower was for users who craved speed and expandability, and the translucent iMac was for everybody else.

Nearly 20 years later, all of Apple's computing lines have a pro delineation, with one notable exception: the iPhone. The Mac Pro, MacBook Pro, and iPad Pro are obvious upgrades to their second-tier counterparts, but the iPhone line serves no such distinction. Even when it introduced two sizes with the iPhone 6, Apple opted for the Plus surname instead of Pro, separating the models by size rather than performance.

But I think that may be about to change.

BREAKING AWAY

Despite Apple marketing them merely as larger phones, the iPhone

6 Plus and 6s Plus are positioned much in the same way as Apple's other pro products. Where Samsung's Note actually has a lower ppi density than the Galaxy S6, Apple gave the iPhone 6 Plus a 401ppi 1920x1080 display, making it the first iPhone to have a screen density higher than the 326ppi retina standard. The Plus also got a larger battery, an iPad-like rotating home screen, and a camera with optical image stabilization.

But where other phablets are packed with extra RAM, smart stylus support, and other tablet-esque features, the iPhone Plus doesn't act much like an iPad at all. The difference between it and the standard iPhone 6 boils down to little more than a matter of prefer-



ence. The battery and camera advantages are nice, but anyone who decided to buy one more than likely did so solely on the basis of the screen size.

And that's where Apple could shake things up with the iPhone 7—if that's even what it'll be called.

HEIR TO THE AIR

To say Apple has a lot riding on this year's iPhone is an understatement. Not only have sales plateaued, but for the first time Apple doesn't have any real expectations to ride. Every non-S iPhone release has brought a major feature users had to have—3G, retina display, larger screens—but the next iPhone's flagship feature is

less obvious.

By this time we usually have a pretty decent picture of what the next iPhone will look like, but the most persistent rumor we've heard (go.macworld.com/7iphonerumors) so far is that Apple is doing away with the headphone jack (go.macworld.com/hponejackrumor). That could push the next inevitable major change—the removal of the home (go.macworld.com/nohomebutton) button—out at least one more revision. Since the new iPhones are expected to retain the same screen sizes, any major improvements will need to come from the inside.

Things like battery life and wireless charging are certainly on the



table, but I think the new iPhone might be something of an iPad Air-style reboot rather than the usual redesign. And as we approach the first revision of the Plus, Apple has a chance to separate it further from the smaller model—perhaps even give it a new name. Calling the new phones iPhone Air (4.7 inches) and iPhone Pro (5.5) would accomplish two things: It would position the larger iPhone as more than just a larger iPhone, and it would allow Apple to abandon its naming scheme (or at least reset it) before it starts getting too clunky.

FEATURE PRESENTATION

Sitting next to the iPad Air, the iPad Pro seems just like the iPhone Plus: a model for people who want a bigger screen. But as with the Mac, it's not the size that makes it pro, it's the capabilities, from the Smart Connector to the Pencil support. With its smart speaker system and A9X processor, the iPad Pro is a beast of a tablet, much closer to the performance of a MacBook than the iPad Air.

It's not too much of a stretch to imagine an iPhone Pro that bridges a similar gap between phone and tablet with a smattering of features exclusive to the 5.5-inch model. There have already been rumors of a 256GB Plus model and a dynamic



dual-camera system, but Apple could take even further by embracing the productivity and power benefits of its largest iPhone.

Aside from a faster processor and extra RAM, the most obvious addition would be a smaller Apple Pencil geared for note-taking and other light tasks. Samsung's S Pen is one of the main differentiators between the Note and Galaxy S lines, and I could see Apple selling one as an accessory for Notes (which is poised to get even better with iOS 9.3), as well as a navigation aid.

But while an iPhone Pro would be the ultimate handheld device, the idea that Apple is going to keep all of this power confined to our pock-

ets seems silly. If the iPhone is going to stay at its current size for a few revisions, I think Apple will find more ways to use it as a hub.

EXPANSION PROJECT

Each of Apple's Pro devices is anchored by a greater level of expansion: Thunderbolt, the iPad Pro's Smart Connector. But it's hard to imagine Apple adding another port to the iPhone—even a magnetic one. But through Wi-Fi and Bluetooth 4, Apple could let the iPhone operate both independently and as part of a seamless larger system.

Recently HP showed off its [Mobile Extender](#), essentially a touch-based laptop that comes to life when the Elite x3 phone is within range. It's an interesting concept for an iPhone Pro—not a hybrid per se, but a way to maximize productivity based on location. When you're on the go it's a fully capable phablet, but at a desk it

lets you work with a keyboard and a full-size screen, without having to sync data or hand off tasks (go.macworld.com/handoffandcont) between devices.

And Apple could soup up iOS as well. It's already shown how well it can specialize features with iOS 9's iPad multitasking (go.macworld.com/ios9multitask) and the iPhone Plus's landscape home screen. Drawing a line between an iPhone Air and the iPhone Pro presents interesting possibilities for navigation and productivity, like a version of the iPad's Slide Over or keyboard Shortcut Bar, or borrowing the Smart Lock feature from Android.

But no matter how it goes about it, I think the sixth major iPhone revision will represent a monumental shift for Apple's most important product. Maybe even big enough to make us all go "Whoa" again. ■

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Hands-on: LifePrint AR printer lets you share GIFs, Live Photos and Vines in real life

LifePrint creates photos equipped with augmented reality that can be shared remotely via its connected printers.

BY OSCAR RAYMUNDO

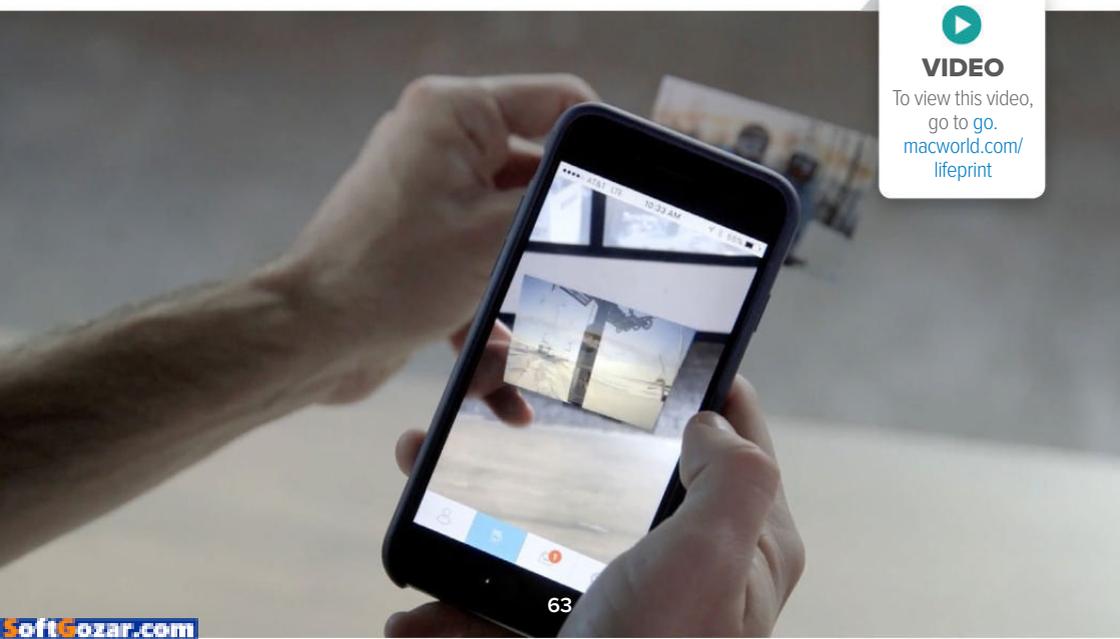


Your Instagram videos are getting the augmented reality treatment thanks to a new mobile printer.

The LifePrint (lifeprintphotos.com) can print instant photos directly from your iPhone, Android phone, or GoPro via Bluetooth. It uses Zink film and its thermal printing technology so it doesn't require ink or toner. In that way, LifePrint is very much like the Polaroid Zip Instant Mobile Printer (go.macworld.com/polaroidzip). In fact, the two printers are nearly the same price: the LifePrint is \$129 and the Polaroid Zip is \$129.95. But the LifePrint can print Apple Live Photos, GIFs, Vines, Instagram videos, and GoPro clips. And you can use the LifePrint app to see how these printed images move, loop, and rewind.

The LifePrint app for iOS and Android connects to your camera roll and social media accounts (Facebook, Vine, Instagram, YouTube, and

Twitter) so you can quickly select which image you'd like to send to the printer. If you want to print a video or a moving image—like a Vine



VIDEO

To view this video,
go to [go.
macworld.com/
lifeprint](http://go.macworld.com/lifeprint)



or Live Photo—then you get to select the exact still frame you'd like to have printed. Moving images that get printed as still photos are referred to as HyperPhotos. You can use the LifePrint app's augmented reality viewfinder to bring these HyperPhotos back to life.

Here's how it works: When the LifePrint prints a HyperPhoto, it adds a special code to the picture that's not visible to the eye. Meanwhile, the LifePrint app uploads the associated raw image file to the LifePrint cloud. When you want to view the moving photo, the app uses photo recognition technology to pick up the invisible code and matches it to the

raw file of the moving image. The app then pulls up the raw file from the LifePrint cloud and plays it instantly, along with any audio. You can watch the video on the previous page to get a better idea of how LifePrint works.

The LifePrint takes about 30 seconds to print a picture, whether it's a regular still image or a HyperPhoto. The printer takes about an hour to charge and you can print up to 15 photos on a full charge. Even though you won't need to refill it with ink nor toner, Zink film costs about 50 cents per photo.

You can pre-order LifePrint now for \$129 and get it shipped to you in

August. After initially raising over \$200,000 on Kickstarter, the LifePrint team is now using Indiegogo as a pre-sale platform.

AR PHOTOS ARE THE NEXT SOCIAL SURPRISE

In addition to including an invisible code, the LifePrint also adds a watermark to the corner of your HyperPhoto so you can tell which images are equipped with this augmented reality technology. There's also an option to remove the watermark altogether.

The LifePrint doesn't require that you print a still frame taken directly from the moving image if you want to create a HyperPhoto. In fact, the still frame and moving image can be

completely unrelated so you can pull off an amusing bait-and-switch. For example, you could print a still photo of a sexy model that would play a clip of Rick Astley singing "Never Gonna Give You Up." Think of it as "rickrolling," augmented reality style.

HyperPhoto clips can last up to 15 seconds, the length of an Instagram video. However the LifePrint team is hoping to increase the length to two minutes so in the future you might be able to watch an entire music video or movie trailer by viewing a HyperPhoto with the LifePrint app.

In the future, the LifePrint team also hopes to bring this AR photo-viewing capability to the masses. LifePrint-made movie billboards, for example, would play an exclusive



movie clip, and pop stars might want to send photos to their fans that play their latest music video. Bringing QR code-scanning to a more visual realm is something other mobile companies are starting to tap into. Last month, song recognition app Shazam partnered with RCA Records (go.mac-world.com/rcashazam) to send music fans a postcard of their favorite artist. These fans were then able to use the Shazam app to view the postcard and unlock an exclusive song.

CONNECTED PRINTERS DO PHOTO-SHARING IRL

AR technology is not the only thing that differentiates the LifePrint from the Polaroid Zip. The LifePrint app also has your standard social features: adding friends, liking photos, and posting comments. But with the LifePrint, you can do photo-sharing in real life and even remotely.

Once your friends pair their LifePrint printer to their LifePrint profile, you can use the app to send them a photo to have printed remotely on their LifePrint printer.

You can even send a photo to all your friends at once. Your friends will then get a notification on the LifePrint app where they can choose to print the photo or ignore it. If they choose to have the photo printed, they can go back to the app to add a digital “like” or comment.

The LifePrint team is hoping that social media stars and celebrities with a lot of followers might want to mass-send a HyperPhoto to all their fans with a LifePrint printer to unlock promotional content, similar to the Shazam and RCA Records stunt.

For normal folks, LifePrint’s connected printer network might also be a fun way to send party invites, greeting cards, or family holiday pictures. Of course, this relies on all of your friends having a LifePrint printer at home. ■

THE LIFEPRINT APP ALSO HAS YOUR STANDARD SOCIAL FEATURES: ADDING FRIENDS, LIKING PHOTOS, AND POSTING COMMENTS.



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CONNECTED HOME

ELGATO EVE CONNECTED-HOME SYSTEM: ELEGANT DESIGN AND OPERATION WITH HOMEKIT COMPATIBILITY

BY JON L. JACOBI

IF ELGATO'S HOMEKIT (elgato.com/eve) kit products aren't an homage to the movie Wall-E, I'll eat my hat. It would be a baseball hat, and my least favorite, but I don't think I have to worry. Look at the image above. Even if the company claims otherwise.

If you don't know what the heck I'm talking about, Elgato's environmental and door/window sensors and its remote on/off switch are styled much like EVE, the robotic love interest in the animated Pixar movie;

they're clean and glossy white with just a hint of green. Okay, there's blue in the movie as well and the green flashes, but...then, of course, there's the name. It's all-caps in the movie, but those are about the only things that aren't note-for-note. I'm dishing out compliments here. They look nice, and unobtrusive in my largely white-walled rooms and hallways.

Elgato sent me all four devices in the kit: the \$50 Eve Energy, a smart power receptacle; the \$40 Eve Door & Window, which is a door/window sensor; the \$80 Eve Room, which tells you the temperature, humidity, and air quality of any space; and the \$50 Eve Weather, which does largely the same thing outdoors (with the exception of barometric readings replacing the air-quality function). Missing from Elgato's connected-home collection is a motion sensor (the company does offer a smart LED light bulb, which is not part of this review).

HOMEKIT AND AUTO-MAGICAL, TRANSPARENT FRUSTRATION

First a little on HomeKit, Apple's connected-home technology. HomeKit devices can be controlled by iOS apps connecting directly with them via Bluetooth and/or Wi-Fi if you're nearby, or your iCloud account when you're out and about. Remote access should "just work" once you've entered the device code into your iCloud keychain. More on that in a bit.

Elgato's products use Bluetooth, probably because it's far less power-hungry than Wi-Fi. The only issues there are that it limits the range of communications to about 25 feet and requires a bridge to reach the Internet.

Via Bluetooth, when I was within the range of the devices, everything was hunky-dory. The nicely rendered Elgato app gathered all the pertinent information, and I was pleased to note that the air quality inside my house was considerably better than I had thought it was.

Elgato thoughtfully loaned me an Apple TV to serve as a Bluetooth hub and to relay the device readings to iCloud. This is where I ran into problems.

For me, "just work" meant several days of sign-ons, sign-offs, resets, reboots, iCloud

ELGATO EVE DOOR & WINDOW



PRICE
\$40.00

ELGATO EVE ROOM



PRICE
\$80.00

ELGATO EVE WEATHER



PRICE
\$50.00

ELGATO EVE ENERGY



PRICE
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THE EVE DOOR & WINDOW lets you know the status of your egresses.

keychain enables/disables, reinstalls, and so on before I got remote access to function correctly. What appeared to fix things was signing off one of the iPads from iCloud. On the other hand, there was another Apple TV nearby. I never did learn the exact cause, because Apple veils connection and status information so that HomeKit seems “magical” and “transparent.” It also makes troubleshooting difficult in the extreme. The Apple TV doesn’t show you what’s connected to it, and there’s zero info about HomeKit communications on the iCloud website. In the end, it all worked, even if I don’t know why it didn’t to begin with.

Even when everything is working, you must still have all the Eve devices within 25 feet of the Apple TV, which could be tough depending on the size of your abode and the location of your TV. The Apple TV can’t be allowed to sleep if you want it to relay things to iCloud. There are third-party repeaters in the works, and to me, HomeKit won’t be a universally viable connected-home solution until they arrive.

IN DEPTH

The Eve Door & Window sensor, which tells you whether a door or window is open or closed, is a two-piece device with one half residing on the door or window frame and the other on the door/window itself, I thought I might have problems mounting these on my rather ornate woodwork, but I didn’t.

In fact, it was easy and the two parts aligned without my having to use the provided spacers. One thing I didn’t mention is that it tracks the number of times the ingress/egress has been accessed. I guess that might let you know that you need to get outside more. Or stay at home more. Elgato says the Door & Window will run for approximately a year on its single half-length AA battery.

The Eve Room environmental sensor is an approximately 3.0-inch



Temperature

Humidity

Air Pressure

ELGATO'S EVE WEATHER is an outdoor barometer, thermometer, and hygrometer (humidity) sensor.

square, 1.25-inch thick cube that runs for three months on three AA batteries. It measures the air quality (in parts per million) as well as the temperature and humidity. I actually found this handy when trying to figure out if there was second-hand smoke drifting into my apartment from downstairs. (It turned out to be someone with a malfunctioning chimney nearby.)

Then there was the Eve Weather, another white flattened cube of the almost same dimensions as the Eve Room, requiring only two AA batteries to run four times as long—about a year. It measures humidity, air pressure, and temperature and is designed for outdoor use. I guess testing air quality is power intensive. Its measurements jived quite well

THE EVE iOS app having just updated via iCloud. Notice that Bluetooth is off.



with my other instruments, and it has the mounting recess which is for some reason absent on the Eve Room. (I mounted the Room with double-sided tape)

The Eve Energy, a three-prong single-outlet power adapter functioned perfectly as well. But it serves only as an on/off switch (it cannot dim a light) and energy meter, and there currently is no scheduling mechanism, though I was told one is planned. The Eve Energy doesn't require a battery because it plugs into an AC outlet.

The Eve app can break down information along a graph. Other than that, it basically shows you what the sensors are reading and lets you turn the Eve Power on and off.

CONCLUSION

I didn't really think I'd use the Eve products much, but they were surprisingly handy. I could tell if my roommate had walked the dogs with the Eve Door, whether it was raining or likely to with the Eve Weather, and I already mentioned accumulating evidence of second-hand smoke with the Room. Once it was working, the Eve system proved useful, but not life-changing.

There are software features yet to come, but I'm giving all four Elegato products my seal of approval as is. That said, the actual ratings on page 69 reflect their current state of usefulness. ■



THE EVEROOM is an indoor environmental sensor.

PHOTOGRAPHY APPS

PHOTOWALL+: EVERY iOS DEVICE CAN BE THE LIFE OF THIS APPLE TV PARTY

BY J.R. BOOKWALTER

PARTIES AND EVENTS take forever to plan and organize, only to be over in the blink of an eye. Once everyone leaves, photos taken on their smartphones go with them. As host, you're left with only memories and a mess to clean up should guests forget to share their pictures—and even if they do, it could be days or weeks later.

It doesn't have to be this way: Assuming you own the latest Apple TV and your partygoers have iOS devices, you can not only gather all of the photos being taken as they happen, but make those images part of the actual event itself.

Built upon the company's mobile-only Partysnapper app, Boinx Software touts PhotoWall+ (boinx.com/connect/photowallplus) as "a social photo wall for Apple TV" that could very well become the life of your next party.

WHERE'S THE PARTY?

PhotoWall+ is an app for the fourth-generation Apple TV that works in tandem with a free, universal companion app for the iPhone, iPad, or iPod touch called PhotoWall+ Cam (go.macworld.com/photowallcam). After creating a new photo wall (or opening an existing one) on the



PHOTOWALL+ 1.2



PHOTOWALL+ CAM 1.0



COMPANY

Boinx Software



Apple TV, iOS devices will be able to add new or existing images to the television screen for all to see.

Aside from getting everyone on the same Wi-Fi network, there's literally zero configuration. Open the PhotoWall+ Cam app on your mobile device, snap a picture using front or rear cameras (with optional flash), then select a hosted event. (If PhotoWall+ isn't running, the Cam app displays Find Host instead.) Now tap Send, and within seconds the image appears on-screen, then begins cycling through a slideshow of everything added to the event thus far.

While the slideshow is active, the Siri remote can be used to control playback. Play/Pause freezes the current photo until you press it again to resume, while the Menu button is used to exit. Sliding your thumb left or right across the Touch surface jumps to the previous or next slide, while up and down controls playback speed.

Participants aren't limited strictly to shots taken on their own devices. Anything in your photo library is fair game. By default, new photos are saved in each guest's respective Camera Roll, but this can be turned off in the Cam app. Worth noting: Guests can only send one photo at a time, and there's no support for videos.

SAY CHEESE!

PhotoWall+ can be used even at venues without an active Internet

PHOTOWALL+ CAN CREATE photo walls for any event, syncing them via iCloud so you won't miss a single moment.

connection. All that's required is a wireless router, such as an AirPort Express or AirPort Extreme. Wi-Fi is used to push full-resolution images to the Apple TV, and the images are temporarily saved on its internal storage. Once the device is reconnected to a wired or wireless Internet connection back home, shared images are backed up to your iCloud account.

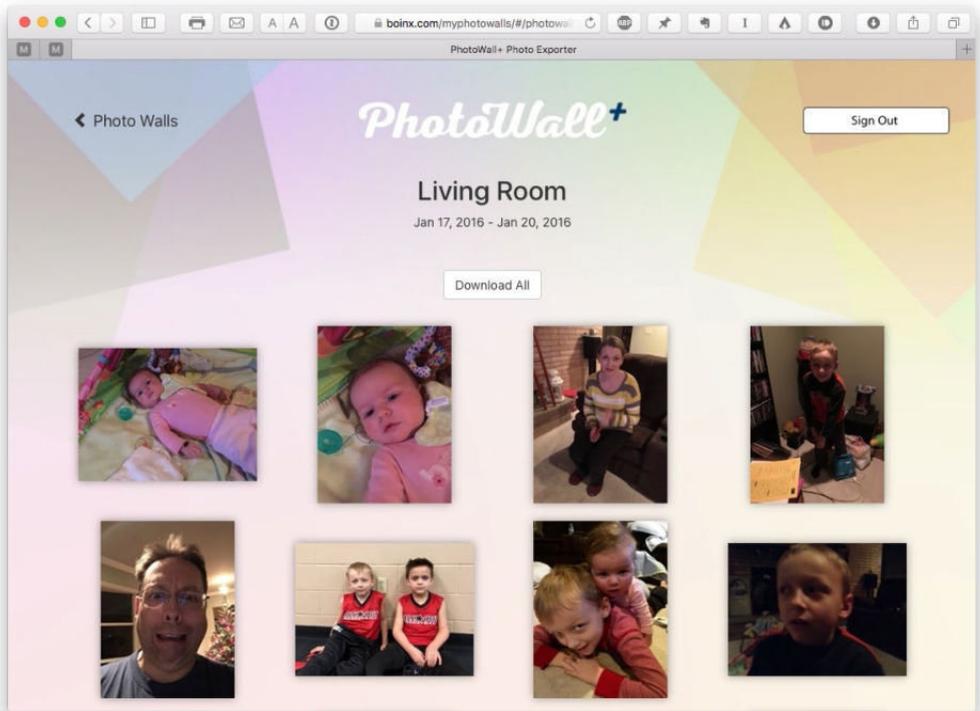
That's where things get interesting, because Boinx has created a web app so PhotoWall+ users can log in with their iCloud credentials and browse or download images shared by guest photographers. (For those like me who keep separate accounts for iCloud and iTunes/App Store purchases, you'll log in with the former.) JPEG files can be downloaded individually from Safari, but doing them all at once requires Google Chrome.

Hosts can also change the transition style of the current photo wall by pressing firmly on the Touch surface of the Siri remote and selecting from the available options: Fade, Ken Burns, Latest Image, Spring, or Stream. (This also works with the older aluminum remote by holding down the center button on the directional pad.) The remote can also be used to selectively hide or delete individual photos.

THE FREE COMPANION

PhotoWall+ Cam app is all your iPhone-, iPad-, or iPod touch-loving guests need to join in the fun.





PhotoWall+ works just as seamlessly as it sounds, and it's a whole lot of fun to use. There's really only one downside, and that's the lack of a companion app for Android or Windows Phone. Unless you've surrounded yourself with friends who share the same good taste in Apple products, someone's bound to be left out of the party. There's also no way to directly share photos from the web app, which feels like a missed opportunity.

WHEN THE PARTY'S over, the host can log in to a web app with their iCloud credentials to download everything shared by guests.

BOTTOM LINE

PhotoWall+ is a great way to liven up any party, event, or family fun night, requiring no technical savvy or fiddly settings to use. The only thing missing is support for mobile platforms not named after a fruit, which would allow everyone to join in the fun. ■

What's new at the App Store



2016 ELECTION CENTRAL

Nate Ashworth, a self-proclaimed hobbyist who claims he's "not sponsored by any candidate, PAC or any other election-related entity." He's just a guy who really likes covering campaigns. His "hobby," has yielded an extremely robust 2016 Election Central (go.macworld.com/2016ElectionCentral) app, not typically found elsewhere: 2016 primary schedules and delegate counts, party debate schedules (and info on getting tickets!), election-related videos and a stream of Nate-authored posts disguised as a newsfeed.

270toWin



270toWin (go.macworld.com/270toWin) aims to educate while it informs. This app brings the Electoral College to colorful life across a variety of U.S. maps. The Library supplies electoral templates from the last three presidential elections, any of which you can use as the basis for creating your own, custom map. This is where you can channel your inner Nate Silver and try to predict this year's outcome, or just track the results on election night.

RealClearPolitics



The idea behind RealClearPolitics (go.macworld.com/RealClearPolitics) (the app offshoot of "the most visited political website") is to provide curated non-partisan coverage of all the issues. It's not specifically an election-oriented app, though obviously a lot of the current news falls into that bucket. It's a pretty basic, plain app, with an omnipresent ad banner across the top. But if you want a simple political-news aggregator that at least promises balanced coverage, this is it.

U.S. Election 2016 News



Election NF 2016 (go.macworld.com/uselection2016)—U.S. Presidential Elections News is all about election news, presented here in a straightforward, nicely designed scrolling feed. The app provides one-tap access to poll data from Politico, complete with search and filtering options. You can customize the news feed to block any unwanted party or person, getting exactly the election coverage you want. Just be prepared for the occasional pop-up and interstitial ad.—**RICK BROIDA**

Carry-all options for commuting

This month's roundup of iPad bags brings you new "weekender" style briefcases from HEX and MacCase, and plenty of carry-all options for commuting.

BY EMANUELA CORSO AND MARCO TABINI



TOFFEE

The Centennial Backpack, all iPad models and iPad Pro are \$137; toffeecases.com) sports a water-resistant exterior made with waxed canvas and finished with leather. The backpack includes a zippered main compartment with a dedicated padded pocket for your iPad and laptop, as well as a generous amount of additional room for all your accessories. It comes with both adjustable shoulder straps and leather handles.

MACCASE

The Premium Briefcase (iPad Pro; \$249.95 to \$279.95; mac-case.com) features a dedicated main compartment for your iPad Pro and many smaller pockets for everything else you need when you're out and about. Available in "vintage" (pictured here) or black, the briefcase comes with an Apple Pencil holder, an optional shoulder strap, and a padded interior lined with poly-suede for a smashing look.





GRIFFIN

To make your commute easier, the Survivor Briefcase (all iPad models and iPad Pro; \$190; griffintechology.com) gives you plenty of padded room for your iPad, MacBook, and iPhone. This weatherproof briefcase has been tested to withstand drops from up to six feet, sports a sealed zipper to keep out excess moisture, and comes with a number of compartments to neatly organize all your belongings. The Survivor also features a removable shoulder strap and a handle, and its velcro back pad slips let you easily attach the bag to a luggage handle.

SPIGEN

The Klasden 3 (all iPad models and iPad Pro; \$100; spigen.com) is a modern-looking backpack that doesn't skimp on functionality. It's compact, durable, and weather-resistant. Available in gray or black, the Klasden 3 features a synthetic fur-lined sleeve for your iPad, several zippered and open pockets for your accessories, and padded shoulder straps for a comfortable fit.



Carry-all options for commuting

HEX

The Calibre Black Sneaker Duffel (all iPad models and iPad Pro; \$159.95; shophex.com) is a duffel bag tailor-made for all your high-tech equipment. Finished with a water-resistant coating, the bag includes a faux-fur lined main compartment for your iPad, two side pockets for your sneakers, and a detachable shoulder strap for hands-free carrying.



PAD & QUILL

The Roll Top Backpack (all iPad models and iPad Pro; \$319; padandquill.com) protects your iPad in style with gorgeous rich leather, hand-pounded copper rivets, and parachute-grade nylon stitching. The backpack features a dedicated compartment for your iPad, a zippered internal pocket to secure your valuables, and plenty of room for a water bottle, books, and other daily necessities. Available with adjustable shoulder straps for a comfortable fit, it comes in Chestnut, Chocolate, Galloper Black, or Whiskey.



*“I want
to be
a bench.
Recycle me.”*



IWantToBeRecycled.org

SoftGozar.com



KEEP AMERICA
BEAUTIFUL

How to experience

VR

THE LOW-COST PLATFORM LETS YOU ENJOY IMMERSIVE APPS AND GAMES USING YOUR OWN PHONE.

By Andrew Hayward



on your iPhone

with Google Cardboard



Both the Oculus Rift (go.macworld.com/oculus-preorder) and HTC Vive (go.macworld.com/htcvivepreorder) headsets will soon be released to the public, finally delivering on the long-envisioned promise of immersive virtual reality experiences. However, both require a seriously beefed-up PC—not a Mac, either—along with a significant investment, with the Rift priced at \$600 and the Vive trumping it at \$799.

That's premium VR, obviously. What about the low end? Well, assuming you have an iPhone 5 or newer, you can try out mobile VR using a simple viewer shell, and Google's Cardboard platform is the easiest way in. Cardboard lets you buy or even build a viewer made of low-cost materials, and then slot your phone in to use as the brains and the screen. And then you'll hold it up to your face and stare into the future. Or, at least, a pretty cool diversion. Cardboard isn't anywhere near as immersive or impressive as the Rift or Vive, or even Samsung's Gear VR headset (go.macworld.com/samsunggearvr)—but at minimal cost, it's a neat way to check out virtual reality

using the device you already own. Eager to try it out? Here's what you need to know.

How it works

Rather than use a dedicated screen and processor, Cardboard relies on an affordable shell with specialized lenses, using your iPhone to do the heavy lifting. Depending on your viewer of choice, the iPhone will either slide or strap in, and then once you fire up a compatible app or game, the image will be split into two halves on the screen.

Stare into the lenses and the two images are combined into one immersive, 3D image, and most Cardboard apps use your phone's gyroscope and accelerometer to let

GOOGLE'S OWN

Cardboard app includes fun demos, and it can point you toward other apps to download too.



you freely look around the virtual world. Cardboard isn't a hugely interactive platform, so games are pretty simplistic, but it's a great way to view 360-degree videos and photo spheres, along with other visual experiences.

Cardboard first launched in 2014 exclusively for Android, and as user and developer support grew, so too did Google's own focus on the platform. In the summer of 2015, the company released the enhanced 2.0 viewer blueprint and added iOS support, launching the official Cardboard app (go.macworld.com/cardboardapp) and letting app makers bring their VR experiences to

the App Store.

The core Cardboard app isn't required to use a Cardboard viewer—any VR app designed for Cardboard can launch and work independently without Google's main app installed. However, it's a nice introduction to the world of mobile VR and has a handful of neat VR diversions to check out, such as a dazzling kaleidoscope and some 360-degree tours of various locales.

Hardware options

When Google first launched Cardboard, it had a very strong DIY ethos around it—but then a whole community of resellers quickly spawned



UNOFFICIAL CARDBOARD'S 2.0
Plus viewer adds little tabs for adjusting the position of each lens, but otherwise it's similar to the standard 2.0 cardboard viewer.



THE VIEWMASTER VR is sturdy and comfortable, although the clamshell latch doesn't always hold tight.

around the concept, each offering their own commercial take on the viewer. Google itself doesn't make or sell Cardboard viewers, but it has given an official "Works with Google Cardboard" stamp (go.macworld.com/getcardboard) to many manufacturers that make viewers of all sorts.

The most common Cardboard viewer is, quite literally, made primarily from cardboard. Companies like Unofficial Cardboard (\$15, go.macworld.com/cardboardwwgc), I Am Cardboard (\$20, go.macworld.com/imcardboardv2), and Knoxlabs (\$24, knoxlabs.com/products/knox-v2) all

sell versions that are mostly similar aside from small differences in build and components. Each comes with the lenses and a conductive touch button, and they're lightweight and easily customizable. Unofficial Cardboard also has a 2.0 Plus viewer (\$20, go.macworld.com/ucardboard-20plus) that tweaks the design with adjustable lenses and an optional headstrap.

We're also seeing more plastic and foam options, some bigger and stronger than the cardboard viewers and others smaller and more portable. Mattel's View-Master VR (\$30,

view-master.com) is a neat option: When I wrote about it for our sister site Greenbot (go.macworld.com/viewmasterrev), I praised the sturdy build and comfortable fit against your face, although the latch was a little finicky. Holding my heavier iPhone 6s Plus, sadly, the latch is even more prone to popping open. That's disappointing, but I still think it's a good overall option, and an improved second-gen model is coming this year.

Otherwise, there's the Go4D C1-Glass (\$15, go.macworld.com/go4dc1glass), which snaps onto your phone, or I Am Cardboard's EVA

Foam viewer (\$25, go.macworld.com/imcardboardeva), which is similar to the cardboard viewers in design. Merge VR's Goggles (\$99, mergevr.com/vr-goggles) are a much sturdier option with a head strap and an extra input button for compatible apps, meanwhile, and it's hard to overlook the novelty of the handmade Knox Aluminum VR Viewer (\$85, go.macworld.com/knooxalum), which is only recommended for the iPhone 6 and 6s.

Even with all of those options, you can still make your own: Google provides the plans and points you to places that sell the components—and



MERGE VR'S GOGGLES are pricey, but they come with big perks compared to the cheaper options.



some sites sell all the non-cardboard pieces in a bundle, like I Am Cardboard's \$10 parts bundle (go.macworld.com/imcardboardpartonly). Just note that it will take a fair amount of precise cutting to get the viewer into working shape. Still, it could be a fun weekend project.

Lastly, if you don't want to buy a Cardboard viewer but also don't want to make one yourself, keep an eye out for promotional giveaways—they're becoming more common. The *New York Times* gave out more than a million free viewers to subscribers last fall ([\[nyt\]\(http://nyt\)\), but Verizon also gave away free Star Wars–themed viewers \(\[go.macworld.com/cardboardverizon\]\(http://go.macworld.com/cardboardverizon\)\) before *The Force Awakens* came out, and other companies have done similar mass handouts to promote app and media releases.](http://go.macworld.com/cardboard-</p></div><div data-bbox=)

Worthwhile apps

Cardboard has been available for iPhone for a much shorter span than Android, so it's not surprising that there are fewer overall apps available. Still, many of the most interesting options are available on the App Store, and nearly everything is free.



We profiled 11 apps worth a look (See page 90), many of which are focused on immersive news reports and documentaries, as well as photo spheres and other quick diversions. Beyond those, you might also consider Proton Pulse (\$3, go.macworld.com/cbprotonplus)—a delightful arcade-style brick-breaking game where you use your gaze to control the paddle—as well as Vanguard V (free, go.macworld.com/vanguardv), a dazzling one-level space shooter demo from the same developer.

The official Star Wars (free, star-wars.com/games-apps/star-wars-app) app also has some amusing shorts

inspired by *The Force Awakens*, while Sisters (free, go.macworld.com/sistersvr) is an unsettling, albeit brief horror experience. Besides all of those, we recommend hitting the App Store and downloading anything that catches your eye: Again, most Cardboard apps are free and offer compact experiences, so you might as well sample the buffet of VR options.

More than five million Cardboard viewers are out in the world now, which means more and more people are checking it out—and more and more interesting apps and games will come, too. Now you can jump in yourself and give it a look. ■

THE STAR WARS APP offers a series of free “Jakku Spy” 360-degree videos to enjoy in VR.

11 GREAT VIRTUAL REALITY APPS

THAT YOU
SHOULD
TRY OUT
RIGHT NOW

By Jackie Dove



If a picture is worth a thousand words, then virtual reality must be worth a million. That's because unless you are present on the spot, there's no way a single photo or video can convey the desperate squalor of a refugee camp or the weightless sensation of floating in space. As a passive observer, you merely witness; with VR, you're where the action is.



The key to VR's power and growing popularity is presence—the sense of being immersed in time and space regardless of actual location—accomplished by an artful fusion of still images, video, animation, and interactivity viewed through a head-mounted display.

While VR and gaming have always gone hand-in-hand—relegating it to a niche audience—the genre is rapidly evolving to include journalism, creative filmmaking, and mainstream storytelling. VR is not just for recreation anymore.

And that's where Apple's new interest (go.macworld.com/appleintovr) in the tech comes into play, despite Tim Cook's muted praise during Apple's most recent earnings call.

Whether you own a simple Cardboard (go.macworld.com/getcardboard) viewer or one of the more expensive iPhone compatible plastic or foam headsets, there's plenty to see and do with VR.

The past year has seen an explosion of VR content in every category for both iOS and Android smartphones, and a huge number of apps are available for free.

Here are some of our favorites.



1

Vrse

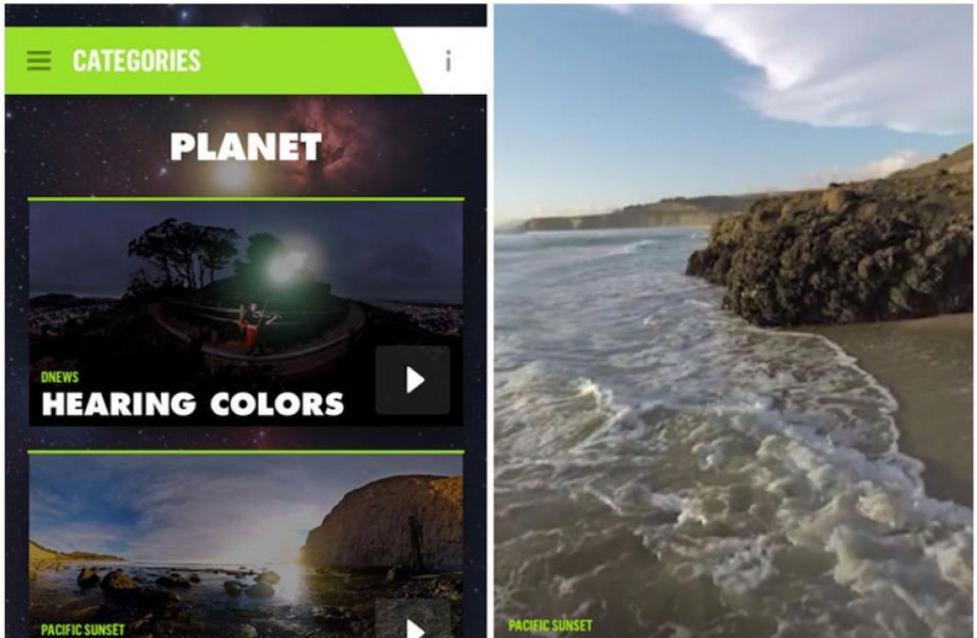
For non-gamers who see VR as an informational and news vehicle, Vrse—a PBS, HBO, or Pixar kind of app—lets you tap into a spectrum of cultural, topical, and political content. Vrse (vrse.com), which partners with *The New York Times*, the UN, NBC, and other mainstream news outlets, offers presentations shot in 360-degree video, which you can watch either in a browser or on your phone or in VR via a headset. “The Displaced,” for example, takes you inside various refugee camps while “Walking New York” offers a unique overhead perspective of an immigrant-based visual project. Vrse does not offer a huge selection, but each piece, produced by its own Vrse Works, has newsworthy or artistic value.

2

Jaunt Player

Jaunt's (jauntvr.com) specialty—the art of storytelling through cinematic virtual reality—employs 360-degree stereoscopic 3D imagery with directional audio, for superlative productions. For starters, you can view news and cultural selections like Paul McCartney's "Live and Let Die" or "Zombie Purge," but there's more: The company has invented its own proprietary VR camera system called Neo (pictured here), which features custom optics for 3D light-field capture, large format sensors, time lapse, high-frame-rate capture, and tools for configuration, rendering, and asset management. Working with creative brands, artists, and filmmakers, Jaunt also integrates with popular industry tools like Avid, Premiere, Final Cut Pro X, After Effects, and more.





3

Discovery VR

Discovery—the famous TV company (discoveryvr.com)—propels a 30-year-old historical enterprise into the future. With its storytelling cred down to a science, the Discovery VR app lets you dive into various locales in pieces from “Let’s Go Places,” “Puppy Bowl,” “MythBusters,” “Racing Extinction,” “Gold Rush,” “Wildlife,” and other programs. Discovery VR’s 360-degree videos can be viewed on your desktop in most browsers. But for the immersive experience, download the app for your iPhone or Android device to work with your headset.

4

VR One Cinema

Zeiss, famed manufacturer of professional camera lenses, is now putting a new spin on movie night. With its branded VR One (zeissvrone.tumblr.com) headset and companion app (go.macworld.com/zeissvroneapp), you can watch movies on the “big” VR screen in a dark, immersive theater environment, complete with curtains, seating, and other patrons. Zeiss does not distribute content, but rather a more interactive way to watch videos you already have from various sources. Dig into your iTunes or Camera Roll non-DRM MP4 movies or view downloaded 3D side-by-side (SBS) movies through your Cardboard-compatible headset.

Select your video by turning your head to activate the menu. In addition to providing a 3D movie theater, an intuitive interface lets you play/pause or select among various videos.





5

NYT VR

Leave it to *The New York Times* to push its vast mainstream, non-tech audience into VR via its branded app, NYT VR (go.macworld.com/nytvr). If you notice some similarities between the content on Vrse and NYT VR, that's no accident because Vrse collaborated with the newspaper on several of its headline VR projects, the most famous of which, "Walking New York," was featured on the cover of the Sunday magazine. NYT VR video must first be downloaded to watch in a viewer—the app does not stream content.

After viewing, tap Remove Video on the gallery or video detail screen to move the file off your device. The 360-degree videos can also be watched without a headset either on the phone or in the browser. *The New York Times* produces additional VR-based news and cultural programming and is updating its catalog each month.

6

inVR

Some VR players are simply viewers that hook into third-party content, but InVR (invr.co), a user-generated content platform, lets you both create and view VR video from others on the network.

Made for the Google Cardboard app, InVR lets you use a host of 3D packages (Maya, Max, Blender, or SketchUp) to create your own original content, and export files to InVR's cloud. The app builds your creation for you, which you can later view and share with others.

Most of the public videos are animated works of art that you are free to download and walk through. And there's a command that lets you create and share a GIF of anything you see.

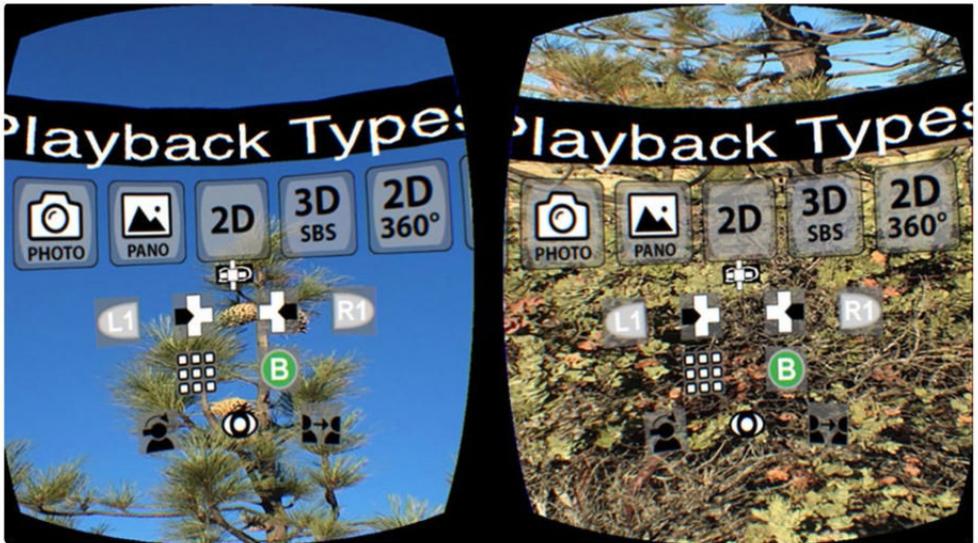


7 Vrideo

With Vrideo (vrideo.com), VR video content morphs into a YouTube-style social networking and hosting platform. Not only does the app let you stream content through a headset and tilt and pan your phone to adjust your view of 360-degree video, a sophisticated interface tells you which videos are trending, and lets you browse categories like News & Politics, Travel & Events, Gaming, Vehicles, and more.

You can create an account, subscribe to channels, like or dislike videos, and build playlists. You can even play back videos without a network connection.





8

Mobile Station VR

If you're looking for both vast variety and granular control over what you see and how you see it through your headset, look to the Mobile Station VR (go.macworld.com/mobilestationvr) media player for a ton of fascinating options. Its head-tracking technology let you view photos, videos, and panos from different perspectives, which are projected onto a floating screen. Various screen projections include Curved, Full Dome, Plane, Cylinder, and Sphere Upload, which you choose by moving or tilting your head.

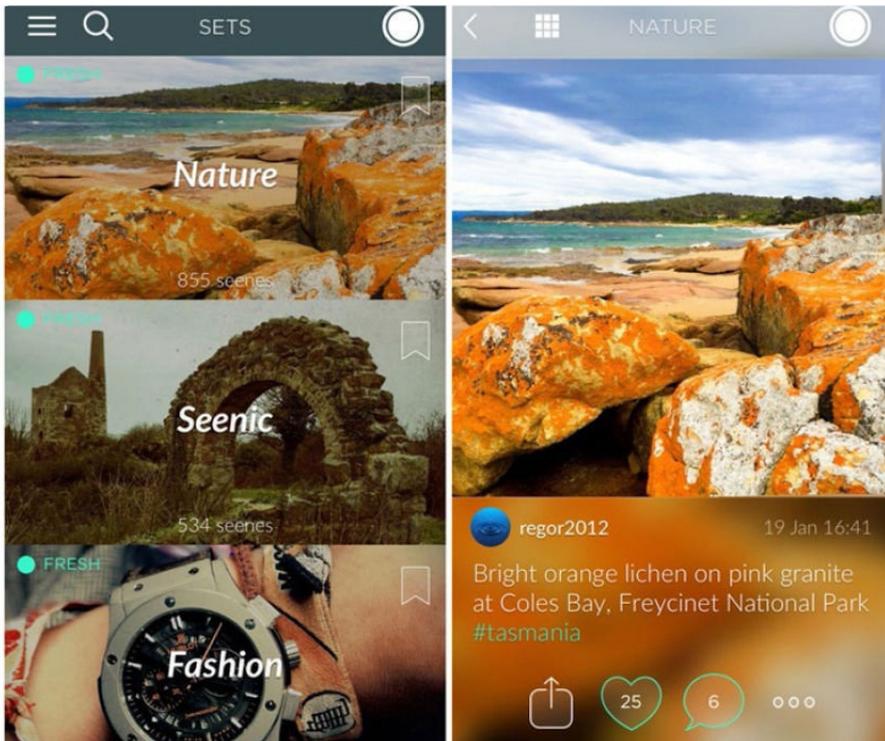
You can also watch your own creations in MOV, M4V, and MP4 file formats. Numerous instructional videos posted on YouTube and a 31-page user guide (go.macworld.com/mobilevrguide) alert you that there are plenty of permutations and a learning curve to using this app. But once you get the hang of the interface, there's plenty to enjoy.

9

InMind VR

This arcade-style adventure game (inmind.nivalvr.com) concentrates on getting inside the human brain to track down the neurons that cause mental illness. Fast-paced with excellent graphics, the presentation—which can be played via a VR headset or on your phone—depicts a surgical prototype bathyscaphe scaled down to a fraction of its original size, moving through the brain. Your job is to target and neutralize those cells. A companion app, InCell (incell.nivalvr.com) is also available via an in-app purchase.





10

Seene

Seene (seene.co), a creation and viewing app for Cardboard-compatible smartphone viewers, lets you capture and share your own photorealistic world by merging image, depth, and movement into a scene, video, GIF, or JPEG. The app's built-in utility facilitates creation of your own 3D scenes, complete with adjustable depth of field and artistic filters. Seene technology incorporates 3D face capture and scene construction, 2.5D scene reconstruction and computational photography, object tracking, and augmented reality. Social network sharing lets you choose channels and create sets, like and comment on scenes, view in VR, create a GIF animation or video, and save it to your Camera Roll.

11

Ryot VR

Watch the evening news in VR with Ryot (ryot.org/virtualreality). This production company sends reporters all over the planet, including dangerous war zones, to produce stellar 360-degree and VR stories on a daily basis. The production values are slick but the information-gathering technique is solid and, as an added kick, it's designed to inspire action on the part of the viewer. New selections each day assure fresh content and each story has built-in contact and activist references in the browser to help viewers be part of the solution rather than merely passive observers of a problem.



Do you have a favorite?

This is just a small sampling of the vast variety of VR apps being released for this marketplace. Check out YouTube 360 (go.macworld.com/360video) or the Google Cardboard apps (go.macworld.com/apps4cardboard) site for more.

To browse the App Store sans iTunes, check out fnd (go.macworld.com/fndiphonevr) for links to and descriptions of a large selection of documentaries and games. ■

The image shows a screenshot of the YouTube channel page for #360Video. At the top, there is the YouTube logo, a search bar, and an 'Upload' button. Below this is a red banner with a white play button icon and various VR-related icons. The channel name '#360Video' is displayed, along with a 'Subscribe' button and a subscriber count of 851,020. Navigation tabs for 'Home', 'Videos', 'Playlists', 'Channels', and 'About' are visible. The 'Trending 360° Videos' section features four video thumbnails with their titles, creators, and view counts:

- Unstitched** by VIRTUALIZE: 8,470 views • 4 days ago (2:26)
- NASA's Curiosity Mars Rover at Namib Dune (360 Video)** by NASA Jet Propulsion Laboratory: 1,260,214 views • 4 days ago (2:01)
- 360° Getting Jumped Over by a Horse - 4K - Tredstep** by 360 Thrill: 51,931 views • 3 days ago (1:48)
- Tour the Super Bowl NFL Experience in 360-degree video** by USA TODAY: 46,556 views • 6 days ago (2:05)



How to boost your Wi-Fi signal without any tricks

The higher-frequency flavor of Wi-Fi used by 802.11n and 802.11ac can have higher power output and further range by picking the right channel.

BY GLENN FLEISHMAN

A frequent reader problem related to Wi-Fi—one I hear all the time as a result of having written books about Wi-Fi and Apple’s AirPort base stations for a decade—is getting good coverage, even when a network is seemingly well planned. But there’s one simple change you can make that could have a surprisingly strong effect. There’s a signal-strength property that’s not well known.

Modern Wi-Fi adapters and base stations can use two frequency bands: 2.4GHz and 5GHz. The lower-frequency 2.4GHz band suffers from a lot of competing uses beyond Wi-Fi (Bluetooth, baby monitors, industrial sealers, microwaves, medical devices, and a lot more), but it’s better at penetrating walls, floors, and ceilings than the higher-frequency 5GHz. The 802.11b, g, and n standards can work over 2.4GHz.

The 5GHz band gets used by 802.11a, 802.11n, and the latest

802.11ac—unlike the n flavor, the ac type only works over 5GHz. The 2.4GHz channels overlap one another, and in America, the best ones to choose to avoid this overlap are 1, 6, and 11. (You’ll get advice about using other channels, which is usually bad advice because you wind up getting interference from more channels that way.)

In the 5GHz band, channels don’t overlap, and there are a bunch of them available—eight using Apple’s current base station generation and

Wireless Options

5GHz network name: Portage Airbasestation

Country: United States

Create hidden network

2.4GHz Channel: 9

5GHz Channel: 149

Cancel Save

WIRELESS OPTIONS LETS

you lock a channel for the two frequency bands used by Wi-Fi, but also set a distinct 5 GHz network name to separate out usage.

Summary	Network Name	BSSID	Security	Protocol	RSSI	Noise	Channel	
Total	10	CenturyLink1484	ec:43:f6:1f:23:81	WPA/WPA2 Personal	802.11b/g/n	-69	0	1
2.4 GHz Count	5	Not5GHzApplicable	c4:ea:1d:b6:cf:ad	WPA/WPA2 Personal	802.11ac	-46	0	36
5 GHz Count	5	pebblebeach	90:72:40:18:b3:fe	WPA2 Personal	802.11b/g/n	-72	0	1
Current Channel Count	1	pebblebeach	90:72:40:18:b3:ff	WPA2 Personal	802.11ac	-78	0	149
Best 2.4 GHz	6	Portage Airbasestation	28:cf:e9:81:5a:6a	WPA2 Personal	802.11b/g/n	-72	0	11
Best 5 GHz	40	Portage Airbasestation	28:cf:e9:81:5a:6b	WPA2 Personal	802.11a/n	-81	0	52
		Portage Airbasestation	60:e3:27:ad:dc:...	WPA/WPA2 Personal	802.11ac	-40	-93	165
		Portage Airbasestation	60:e3:27:ad:dc:f7	WPA/WPA2 Personal	802.11b/g/n	-43	0	6

more using equipment from some other makers. That makes interference less likely. Both 802.11n and 802.11ac can bond together multiple 5GHz channels, which is how they push through hundreds of Mbps to nearly 1Gbps depending on the circumstances.

But here's the thing you probably didn't know. The 5GHz band has different power restrictions based on which channel is used. The lower-numbered channels on Apple hardware (36, 40, 44, and 48) can use just *five percent* of the power of the higher-numbered channels (149, 153, 157, and 161). That twenty-fold difference is huge. (These channels are available in the U.S.; not all 5GHz channels are available in every country, as regulations vary.)

Apple's base stations and those of most manufacturers are set by default to choose Wi-Fi channels automatically. Some base stations prefer the higher-numbered, higher-powered channels, but others pick

the least-congested channel. Because channels 149 and up can push out more power, they can also be "heard" from farther away, and are thus likely to seem like interference to a router trying to find an uncongested channel.

You can see what channel a base station has been assigned to using OS X by holding down the Option key and selecting the Wi-Fi menu, then selecting Open Wireless Diagnostics. In that hidden app, choose Windows → Scan, and you can see all base stations within range with a variety of details, including their channels.

If you're having poor coverage with your existing 802.11n or 802.11ac base station and you see it's assigned to channel 36 to 48, launch AirPort Utility:

1. Select your base station and click Edit.
2. Enter the password if prompted.
3. Click the Wireless tab, and click Wireless Options.

THE WIRELESS DIAGNOSTICS program has a scanner that shows you all the base stations around your Mac.

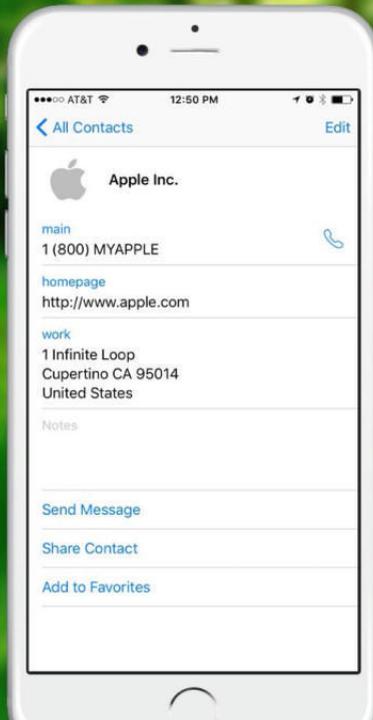
4. From the 5GHz Channel menu, select 149 or higher.

5. Click Save and then click Update. Your base station will restart.

If you want to be sure to lock devices to the higher 5GHz band, there's no setting in iOS nor in OS X, but you can use that same Wireless Options dialog to check 5GHz Network Name and name that base station (or each base station you

have) to a distinct name from the 2.4GHz network.

Then, on every device you want to lock to 5GHz, use Settings → Wi-Fi in iOS or the Network preference pane's Wi-Fi adapter's Advanced dialog to forget the 2.4GHz network name. Connect to the newly named 5GHz network, and all your devices that support 5GHz (all modern hardware) will only use that band. ■



How to back up your contacts on your iPhone and Mac

When it comes to backing up your address book data, you have a few options.

BY NICK MEDIATI

It goes without saying, but digital address books are great. You have instant access to all of your contacts, and your brother's phone number is just a few keystrokes away. But just as you can misplace your real-world address book, you can just as easily lose your digital one if you aren't careful. Read on, and we'll show you a few ways to safeguard your precious contacts list.

CLOUD SYNCING SERVICES: A PRIMER

The easiest, most pain-free way to store your contacts is to use a cloud-based contacts management service. Most of the big-name email services—Google's Gmail, Microsoft Outlook, Apple iCloud, and Yahoo Mail—offer some sort of contact manager. And since they're fully integrated with your email, you don't

have to hop from service to service to find the person you're looking for.

For all these services, you can view and edit your contacts' info through a website that you can access on just about any computer, tablet, or smartphone. Many of these third-party (non-Apple) services also offer their own iOS apps, but these apps often lack full-fledged contact management capabilities.

iCLOUD OFFERS THE requisite email, contact management, and calendar services, plus a lot more.



You can usually access contact information stored via services like Gmail or Yahoo Mail through iOS's bundled apps, but caveats abound, as we'll see in a moment.

Finally, there's an inherent risk to storing your contacts' information in the cloud—namely, someone with nefarious intents to break into your account or breach a provider's servers—but for most people, the benefits of these services outweigh the risks. Strong passwords ([go. macworld.com/strongpw](http://go.macworld.com/strongpw)) combined with other good security habits—like using two-factor authentication ([go. macworld.com/2factorauth](http://go.macworld.com/2factorauth))—can mitigate these security risks to a degree.

Without further ado, let's look at some of your options.

SYNCING CONTACTS WITH ICLOUD

If you're fully entrenched in the Apple universe, using iCloud to manage your contacts might be the easiest, most straightforward way to go. iCloud will keep all your contacts in sync across your Apple devices, so it's pretty pain-free. Plus, you likely already have it turned on.



If you don't have iCloud Contacts turned on, you can easily change that: On your Mac, open System Preferences, then click iCloud. Sign in to your iCloud account using your Apple ID if you have one—if you don't, head to iCloud (iCloud.com) to get started—and once signed in, check the box for Contacts.

On iOS, go to Settings → iCloud, then switch the Contacts toggle to the On position (it'll turn green).

USING SERVICES LIKE GMAIL, YAHOO MAIL, AND OUTLOOK

Apple has a clear self-interest in steering you toward using iCloud, but Apple's service isn't the only option you have for storing, managing, and syncing your contacts across devices: Google, Microsoft, and

MAKE SURE THE

Contacts option is enabled in order to sync your address book on your Mac.

others offer tools that let you manage and store your address book. Sadly, none of these services work quite as seamlessly on iOS as iCloud does.

While all three companies offer iOS apps for their respective email services, not one provides a full-fledged contact-management tool for iOS: You either have to use your email provider's website or use Apple's built-in Contacts and Phone apps to manage your data.

To set up your iPhone's Contacts and Phone apps to work with any of these services, go to the Settings app, then tap Mail, Contacts, Calendars. Tap Add Account located under the Accounts subheading, then tap the appropriate service (Google, Outlook, Yahoo, and so on). Next, follow the onscreen prompts to log in to your account—the process varies slightly depending on the service, but it's pretty straightforward regardless.

Setting up the Contacts app to work with your contacts service is similarly straightforward: Open System Preferences, then select Internet Accounts. Pick the service you want to use, then follow the onscreen instructions to set it up.

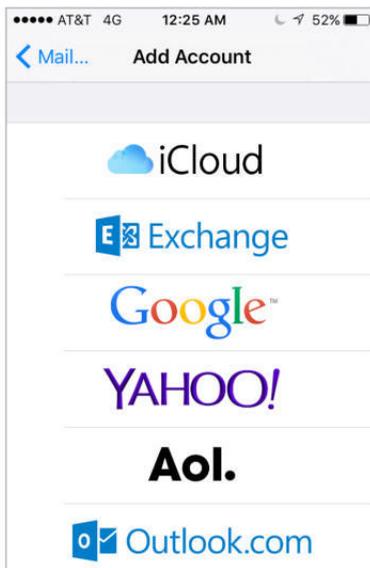
In terms of third-party apps, the Mac offers a little more flexibility, so you aren't stuck with Web interfaces or OS X's bundled apps. Microsoft Outlook for OS X lets you manage your contacts in addition to calendars

and email, and like Outlook for iOS, it works with a wide variety of services. It also isn't the only third-party option available for OS X.

If you'd like to try something new, BusyContacts (go.macworld.com/busybontacts) (\$50) (go.macworld.com/busycontactsapp) is one option worth looking into. It is a \$50 application, however, so it may be a little steep for some users, but it might be worth a look if you need something more powerful.

MANAGING MULTIPLE ACCOUNTS ON IOS

Using multiple services to manage contacts on iOS is a bit cumbersome,



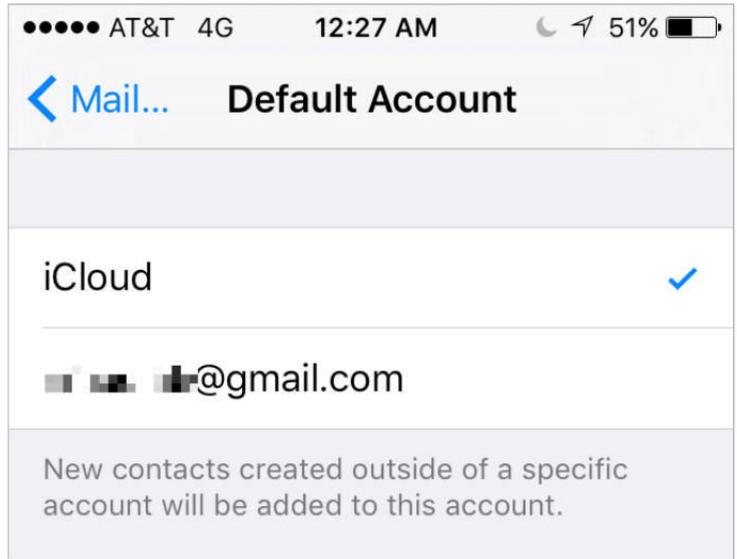
iOS SUPPORTS A number of popular email and contact-management services.

so for the sake of simplicity, you'll probably want to pick one service and run with it.

If you already have multiple contact-sync services set up on your Mac or iOS devices—say, you use Gmail and iCloud—you can turn off the contacts feature on your devices. By doing so, however, you may have to delete some contact information from your device, so it's probably best to leave everything turned on.

In such a case, your best option is to set a different default account for contacts storage—useful if you want to use iCloud for things like Photos and Notes but want to switch to Gmail for email, contacts, and calendars. To make the change, go to Settings → Mail, Contacts, Calendar. Scroll down to the Contacts section, then tap Default Account. From there, pick the account you want to save new contacts to.

This isn't an ideal setup—in a perfect world, you would be able to easily specify where to save a contact card as you create or edit



it—but you can change your default contacts account at any time.

GETTING THE JOB DONE WITH EVERNOTE

Evernote is a useful tool for note-taking, and like the services mentioned above, it lets you access your data from all your devices, either via dedicated apps or the Evernote website. It wasn't really designed as a contacts manager, but it's powerful enough that you can use it to store your contacts if you really want.

Open your Evernote app (or head on over to Evernote's website) and create a notebook to store your contacts. Next, create a new note for each contact: You'll have to format

WANNA USE A DIFFERENT service to store your contacts? You can do that with a few taps.

each one manually, but notes are fully searchable so you can easily find the info you're looking for.

THE IMPROV WAY

If you use a cloud storage service like Dropbox or OneDrive, you can manually back up your contacts, but it requires a little improvisation.

Making a list:

Manually cobbling together a list of contacts isn't exactly an ideal solution, but it can work in a pinch. If you use a cloud storage service, you can toss your contacts into a text document that you can update as needed. Updating can be tedious, however, so this isn't something you'll want to do unless you have to.

Alternatively, if you use OS X's Contacts app, you can create a PDF list of your contacts: Open the Contacts app on your Mac, then

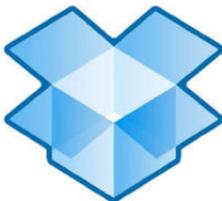
select everyone in your contacts list by going to Edit → Select All. Go to File → Export as PDF, and then give your file a name and choose where you want to keep it, then press Save. You'll get a full readout of your contacts that you can take with you or print out.

Exporting an archive on your

Mac: Another option is to export your address book from your Mac's Contacts app and save it to your cloud storage service of choice.

Open the Contacts app on your Mac: Go to the File menu, mouse over Export, then select Contacts Archive from the submenu that appears. Give it a name

and choose where you want to save your archive, then click Save. If you ever need to recover your contacts, open the Contacts app, select File → Import, choose your contacts archive, and you'll be back in business. ■



COBBLING TOGETHER A contacts list and uploading it to Dropbox is one quick-and-dirty way to back up your contacts.

Reasons to love TextEdit, a secret powerhouse of rich text

A utility that dates back before OS X to Next's operating system still delivers a punch for handling text formats and converting one to another.

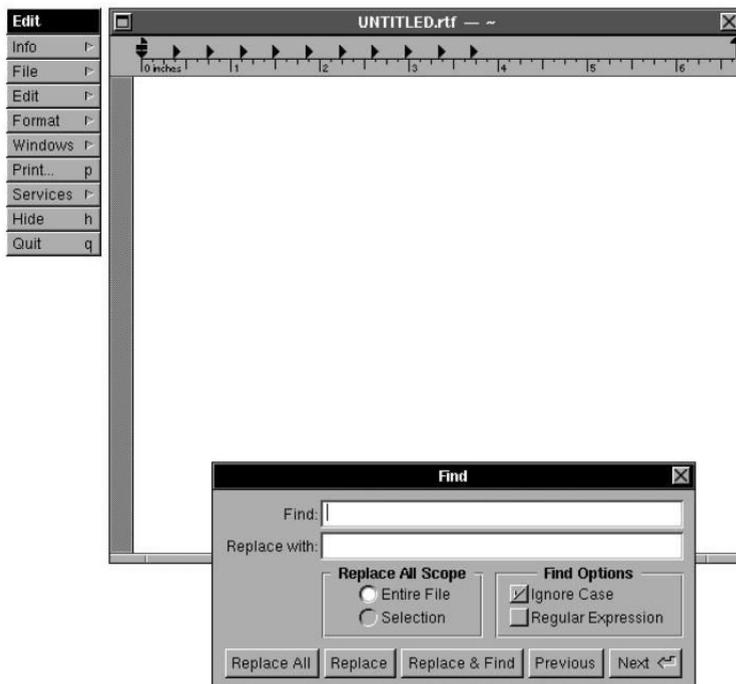
BY GLENN FLEISHMAN



Poor little TextEdit! Despite having a rich history—starting life as Edit (go.macworld.com/nexedit) in the Next's NextStep operating system before becoming a feature in Mac OS X—the app gets little regard. But it deserves our attention. It's the best and simplest place to go in OS X for converting among text formats and has features that are still missing in Pages 5 after they disappeared in the bump up from Pages 4 ('09).

TextEdit seems like a homely little app. When launched, it doesn't present a list of templates and folderol. Rather, its dialog box lets you open a document or create a

new one. Click Create Document, and you're presented with a stripped-down screen. It looks true to its origins, like something from the 1990s.



TEXTEDIT EVOLVED
FROM the original
NextStep Edit
program.

I've turned to TextEdit dozens of times recently, and I've referred readers, friends, and family to it when Pages 5 doesn't cut it for their needs. Here are a few key examples of where TextEdit helps.

FORMATTED TEXT IS ITS NATIVE LANGUAGE

At its heart, TextEdit is a rich-text engine and that's because its native encoding is Rich Text Format (RTF). RTF is widely supported and decades old, developed originally by Microsoft. It's an interchange format that can preserve formatting, like a bold text style and type size, while also incorporating images, font references, and comments.

While Microsoft's word-processing formats, .doc (pre-2007) and .docx (Word 2007 and later), are somewhat universal at this point, there's often a mismatch between formats with which you're presented to open or save as and those you need, especially if you're using Pages, OpenOffice, or Word as the hub through which data passes.

TextEdit can open Word files (the older .doc and newer-but-now-quite-old .docx formats), Open Document .odt files (from OpenOffice and other programs), RTF, and plain text files. It also handles HTML, which can be displayed either as rich text with embedded formatting and links or, by

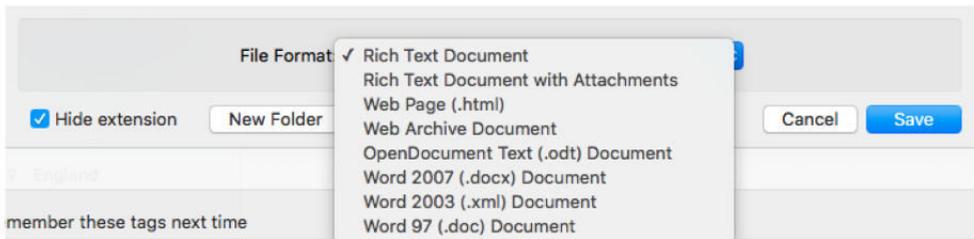
changing an item in TextEdit preferences, as raw HTML. (RTF files can also be edited in their raw format, but this is much less typical and useful that you'll need access to their underlying code.)

It supports Safari's Web Archive format (File → Save As and select Web Archive from the Format menu), which preserves all the content on a webpage, though when TextEdit opens it, it's not necessarily perfect at rendering the page as it appears in the original. However, by including formatted and linked text along

with images, the format makes it possible to take a page in a browser and in TextEdit extract its text or turn it into a word-processing file.

I frequently use TextEdit as a converter, too, because not only can it open all of those formats, it can save files out in a wide variety of formats. (To see the options, hold down the Option key while selecting the File menu and select Save As, which replaces the default Duplicate menu item. The formats are listed under the File Format drop-down.)

I FREQUENTLY USE TEXTEDIT AS A CONVERTER, TOO, BECAUSE NOT ONLY CAN IT OPEN ALL OF THOSE FORMATS, IT CAN SAVE FILES OUT AS A WIDE VARIETY.



> Rich Text Document (RTF, saved as .rtf)

> Rich Text Document with Attachments (.rtfd) creates a bundle with an RTF file and all the referenced images. This is often a great way to take a document with embedded images and, instead of copying and pasting each image separately, creating essentially an exported directory with every image contained. (To see the images, you right-click the .rtfd file, and select Show Package Contents.)

> Web page (.html)

> Web Archive Document (.webarchive), discussed above

> And a range of word-processing formats: OpenDocument Text (.odt) and three Word formats: .doc, .xml, and .docx. TextEdit identifies these as Word 97, Word 2003, and Word 2007, respectively. The .doc format remains the baseline for a lot of older software.

SEARCH AND YOU SHALL RE-FIND

Many choices Apple made in creating Pages 5 have left users and this

writer baffled, but none more so than the removal of advanced search-and-replace options. Search-and-replace is one of the best parts of word processing after actual typing and spellchecking, as it allows you to find problems or matches throughout and optionally fix them. If you misspelled a word consistently (or even inconsistently), you can find all its iterations and replace them with the right version. Or you can check if you've overused a term.

The Pages 5 find features have little sophistication, but you can turn to TextEdit when you need more advanced options. Save your Pages 5 file as a .docx file (File → Export As → Word with default settings) to best preserve all its formatting, then open it in TextEdit. (Yes, it's more than a little peculiar that Apple's text utility can handle Microsoft and Open Document formats, but not its own Pages' files, whether Pages '09/ version 4 or Pages 5.)

In TextEdit, press Command-F (Edit → Find → Find), and a search field

TEXTEDIT HAS A huge array of file export options.

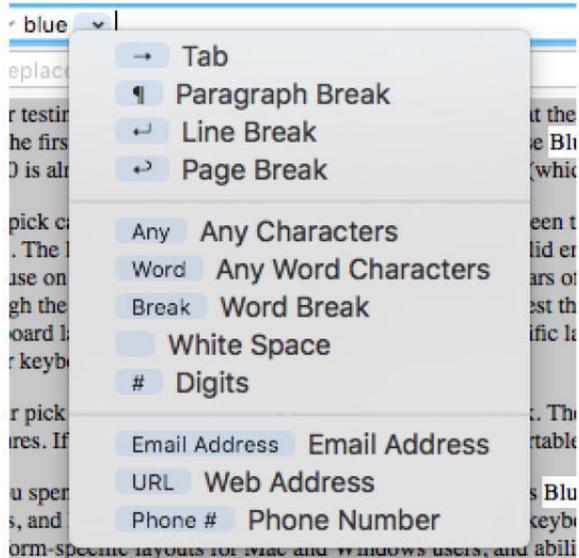
opens at the top of the window for quick searches. As you type, a count appears at the right of the field for the number of matches. Check the Replace box and now you can swap in results, too (or select Edit → Find → Find and Replace, or press Command-Option-F). An oddly divided Replace and All conjoined button corresponds to “replace just the next match” and “replace all matches in the file.”

Click the magnifying glass icon, and a drop-down menu offers basic options (like ignore case and full word) found in Pages, but also lets you select whether a pattern is at the start of a word—like “key” finding both “keystroke” and “keyboard”.

Click Insert Pattern, and you get to the good stuff, where you can find invisible characters like tabs, paragraph breaks (returns), line breaks (Shift-return), and page breaks, as well as wildcards. TextEdit can also parse and recognize email addresses, URLs, and phone numbers.

The nifty part that’s hidden at first is that you can also use patterns in the Replace field, although ones defined in the Insert Patterns pop-up. So let’s say you want to find all email addresses in a document that are followed by a comma and a space, then replace them with the address followed by a paragraph return.

> In the Find field, select the



pop-up, select Insert Pattern, and choose Email Address, and then type a comma and then a space.

> With the cursor in the Replace field, click the pop-up icon and select Insert Pattern, and you’ll see only options relevant to replace, which will include Email Address because it’s used in the Find field. Select that, then repeat to insert Paragraph Break.

When you click All, all matches are replaced in the document, preserving the email address in each case. This is a limited form of pattern-matching replacement, something found in more advanced and varied versions in Word, BBEdit, and OpenOffice.

INSERT PATTERN

ALLOWS more powerful searches in TextEdit than Pages 5.

CONVERTING FROM MARKDOWN'S HTML OUTPUT INTO AN EDITABLE WORD-PROCESSING FILE

I often write in Markdown ([go. macworld.com/markdowntext](http://go.macworld.com/markdowntext)), an explicit text-formatting language that combines human readability with parsing (in content-management systems, blogs, native software, and elsewhere) to let you tag lightly and then run through a parser that spits out nicely made HTML. However, the path from Markdown to rich text or .doc while retaining text formatting, incorporating images, and keeping hyperlinks active is often rocky.

TextEdit eased that path for me, and you've got two ways to make use of it.

I could open a Markdown-exported HTML page from within a browser window with images and all and paste it into Pages 4, which appropriately accepts rich-text pasting between apps, then export that document to RTF (holding down Option, select File → Save As). (Pages 5 doesn't offer RTF export.) That RTF file can be opened in TextEdit and exported as a Word .doc or .docx.

You can also work from the HTML

end, if you're not trying to incorporate images, and load an HTML file in TextEdit, which renders it into rich text while preserving formatting and links. It doesn't open referenced files. This can then be exported as .doc or .docx, which can be opened in Pages 4 or 5.

In either case, you wind up with an editable word-processing document with everything or nearly everything intact.

PAGES 5 FINAL FORM

While TextEdit is a stop gap for a lot of routine purposes, Pages continues to evolve. Apple stuffed more than one would expect in minor releases in Pages 5.5 and 5.6, see our review of 5.6 (go.macworld.com/Pages56), restoring long-lost functionality. We can only hope that Pages 5.7 or, could we even dream, Pages 6 would bring the power of TextEdit back into Apple's flagship word processor. ■

WE CAN ONLY HOPE THAT PAGES 5.7 OR, COULD WE EVEN DREAM, PAGES 6 WOULD BRING THE POWER OF TEXTEDIT BACK INTO APPLE'S FLAGSHIP WORD PROCESSOR.



iCloud Photo Library requires copying images to the Photos for OS X app

Photos lets you reference images and duplicate them in its library, but it won't upload them to iCloud.

BY GLENN FLEISHMAN

Is it possible to use iCloud Photo Library without actually copying all the photos into the Photos app (the way iTunes lets you use it as an indexer without storing the files in its own central location)?

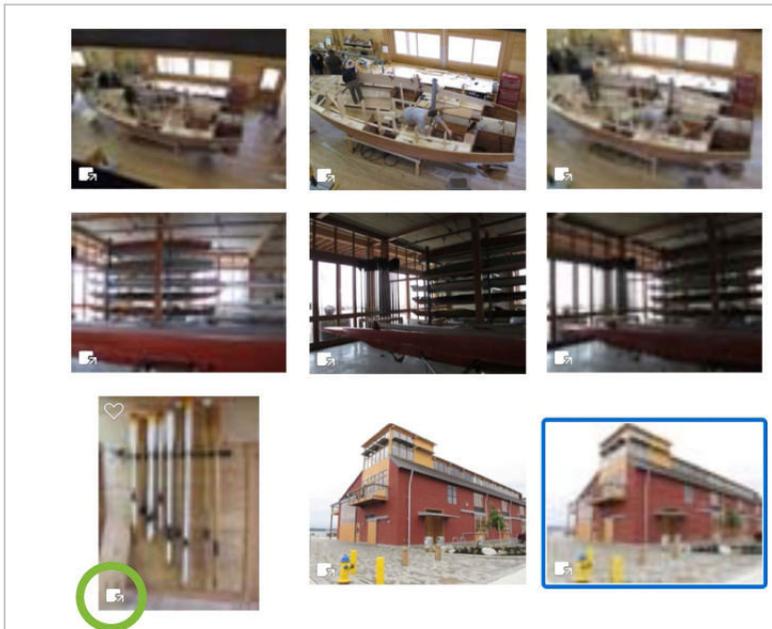
Unfortunately, no! Photos for OS X does let you reference files without making a duplicate copy in the currently selected Photos library.

1. Select Photos → Preferences.
2. Uncheck the Copy Items To The Photos Library option.

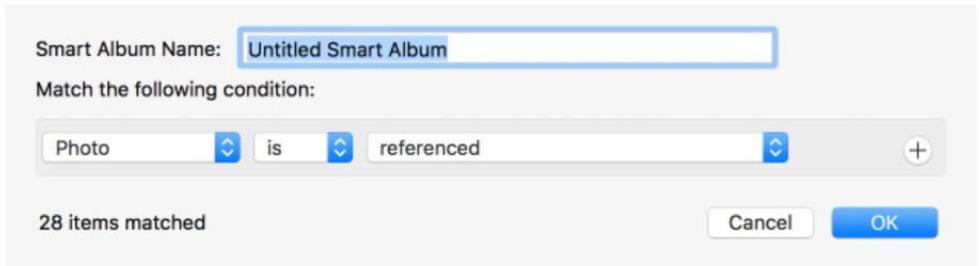
Any images or video you “import” now create a thumbnail and a link in Photos. If you want to see which media is referenced, select View →

Metadata → Referenced File, and a tiny icon appears in the lower left corner of any such image.

However, if you have iCloud Photo Library enabled, when you perform step 2 above, you’re warned by Photos that referenced images won’t be synced. Foiled! This makes sense, because Photos can “optimize” images stored locally if you choose that setting—keep a lower-resolution



REFERENCED IMAGES CAN have an icon displayed that indicates their status.

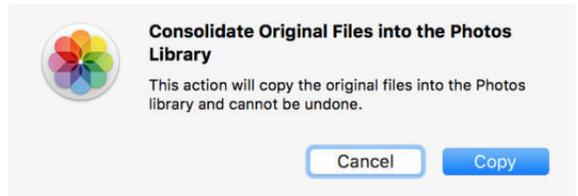


version for previewing—and it would be strange to modify a file referenced outside its library in such a fashion, or delete it.

You can find all referenced images in a library by creating a new Smart Album (File → New Smart Album) and setting the criteria Photo, Is, Referenced.

Our colleague Jason Snell recently documented an interesting parallel operation at his site, Six Colors, for Ted Landau, a veteran Mac writer and troubleshooter. Ted wanted to consolidate images he'd imported by reference accidentally. Jason notes

SMART ALBUMS CAN find all referenced images in the library.



YOU CAN COPY referenced images into your Photos library.

that after selecting referenced images (as with the smart album approach above), selecting File → Consolidate will perform that operation. ■



“ SURE,
AT FIRST I WAS A LITTLE TAKEN ABACK
BY THE WHOLE PEEING STANDING UP THING.
BUT I TAUGHT HIM TO THROW A STICK
AND NOW HANGING OUT WITH HIM
IS THE BEST PART OF MY DAY.”

—EINSTEIN
adopted 12-09-10

A PERSON
IS THE BEST
THING TO HAPPEN
TO A SHELTER PET

 **adopt**

theshelterpetproject.org





Macphun Creative Kit 2016: Critical photo editing functions delivered in one diverse app

With Creative Kit, Macphun wants to pick up where Apple's now-defunct Aperture left off.

BY JACKIE DOVE

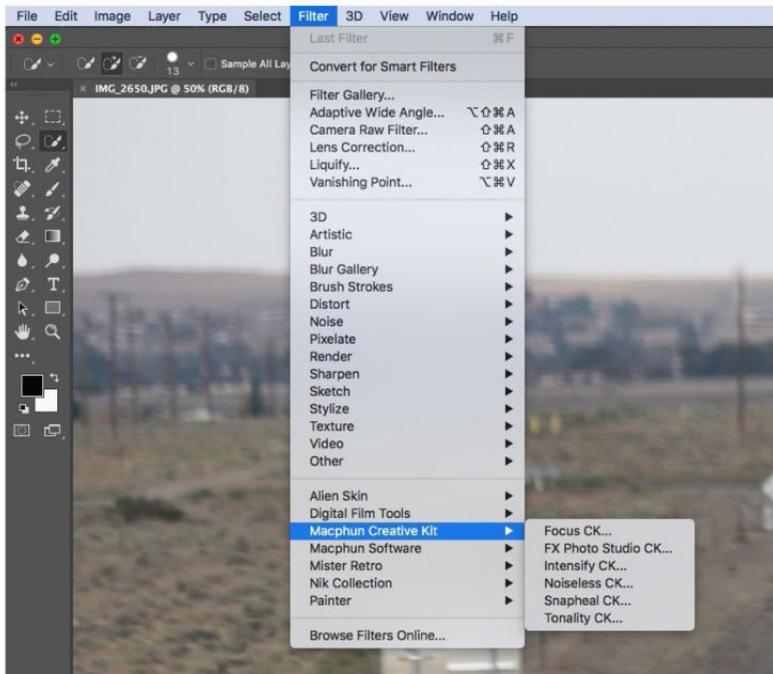
As a plug-in to Photos (go.macworld.com/photosforosx), Macphun's apps significantly augment the Apple app's bare-bones editing tools. Despite their power, Creative Kit apps require a minimal learning curve.

Creative Kit does not seek to replace Photos' organizational utility, though Macphun (macphun.com) does market a separate app called Snapselect for organizing and choosing the best photos from a batch and trashing duplicates.

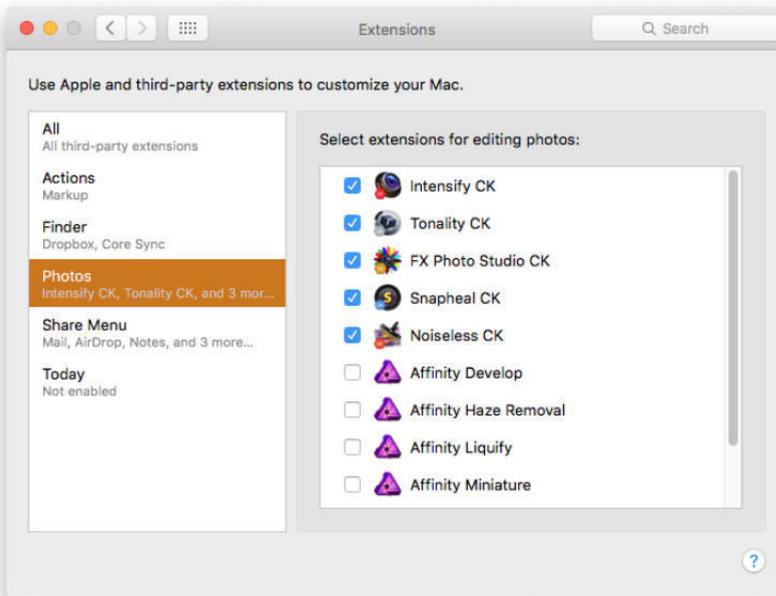
The Mac-only Creative Kit is a six-app bundle that functions both as

a standalone app and a plug-in to Adobe Photoshop, Lightroom (go.macworld.com/lightrcc), and Elements (go.macworld.com/elements14).

Available via a single installer for one discounted price, Creative Kit lets you access some of Macphun's most popular image enhancement packages: Noiseless, Focus, Intensify,



YOU CAN ACCESS
Macphun's Creativity Kit directly from within Adobe Photoshop, Lightroom, or Elements.

**YOU CAN OPEN**

Creative Kit apps as extensions in Apple Photos. Focus is not an extension yet, but it will be soon.

Tonality, Snapheal, and FX Photo Studio. Each is also available as a standalone app (though in your Applications folder, they are separate apps appended with a CK) and variously support features like batch processing and multiple file formats including JPEG, PNG, 8- and 16-bit TIFFs, PSD, and various flavors of RAW.

Creative Kit component apps are not new—just the all-in-one package: Each app has been previously released, and is still available separately. But there are tremendous financial and functional advantages in purchasing the kit though even in

this update you can only work on one photo per app at a time.

COMPONENTS

Intensify (go.macworld.com/intensify) takes shots that looked a lot better through the lens than they do on your screen and lets you achieve results that better resemble your original vision—and in most cases improves on it.

Focus, which includes a facial recognition feature, spotlights specific parts of your image after the fact, letting you emulate intriguing lens blur, tilt-shift, vignette and motion blur styles. Tonality, a sophis-

ticated black and white editor, adds old-fashioned drama and monochromatic special effects to portraits, landscapes, and action shots.

Snapheal removes unwanted objects, people, and flaws from your photos while Noiseless (go.macworld.com/noiseless) removes ugly pixel artifacts from poorly lit shots.

INTERFACE

Choosing the plug-in gives you the same interface as launching the app

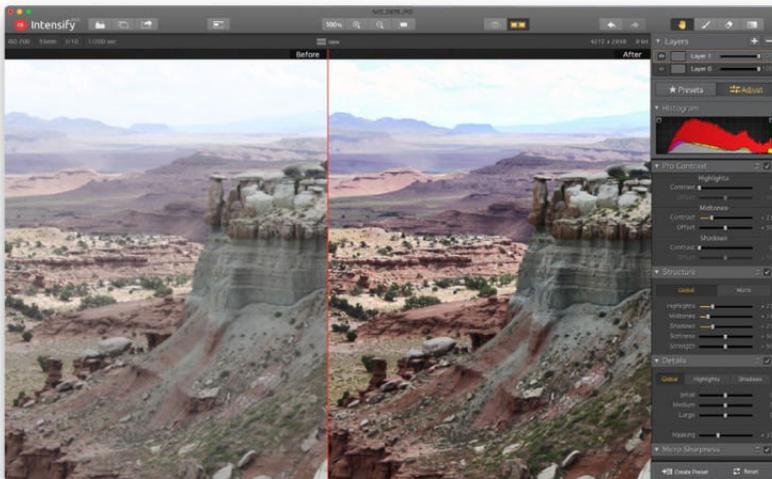
independently: It opens in its own window and will either save in its native format or export to a universal format like JPEG or TIFF.

If you save in Macphun's native formats hoping that other CK apps will read or open them, you'll be disappointed. Focus, for example, will not automatically open an image saved in Noiseless MPN format.

Note that to use the apps as Photos extensions, you have to launch them independently once.

TONALITY CK INTERFACE



**INTENSIFY
INTERFACE**

Focus, the only app that does not show up in Extensions, will be updated soon, Macphun said, though you can still use it in standalone mode.

And, while the suite's File → Open In command is the easiest way to bounce a photo among the different apps without having to save, close, and relaunch them, you will have to save and relaunch if you are using Creative Kit as an Apple Photos extension.

App interfaces are similar but not identical. The original standalone and plug-in apps were created at different times and with different functions, so expect controls to be located in various places.

The best part about Creative Kit is that there's no need for a manual.

Just fire up each app and poke around. There are an abundance of presets to get you started, and quite often the presets are all you need. The Macphun website also features video tutorials and guides that demo the programs' major functions.

For the most part, the app gives impressive results without your having to do much more than click and keep your eyes open.

That's not to say there aren't plenty of tweaking opportunities that will put you in an alternative time zone—you can literally experiment for hours on a single shot. That's because each app has an abundance of manual settings that work alongside the presets.

If a portrait or landscape needs a little more than a single preset

offers—or the preset is the right idea, but just too little or much—adjustable sliders and manual controls are there for fine-tuning. Most of the apps also have a layers function that lets you stack edits on top of each other and switch them on and off.

There are also several ways to view real-time edits: a side-by-side view, a slider view, a compare button, and a complete restore for starting over again.

App performance, on the whole, is swift on my 2013 MacBook Air. Preset changes appeared instantaneously, for the most part. However, if you use the

grabber hand to change the position of an image on screen, the app will often take a few seconds to rescan the entire image in order to register the details, which can get tedious.

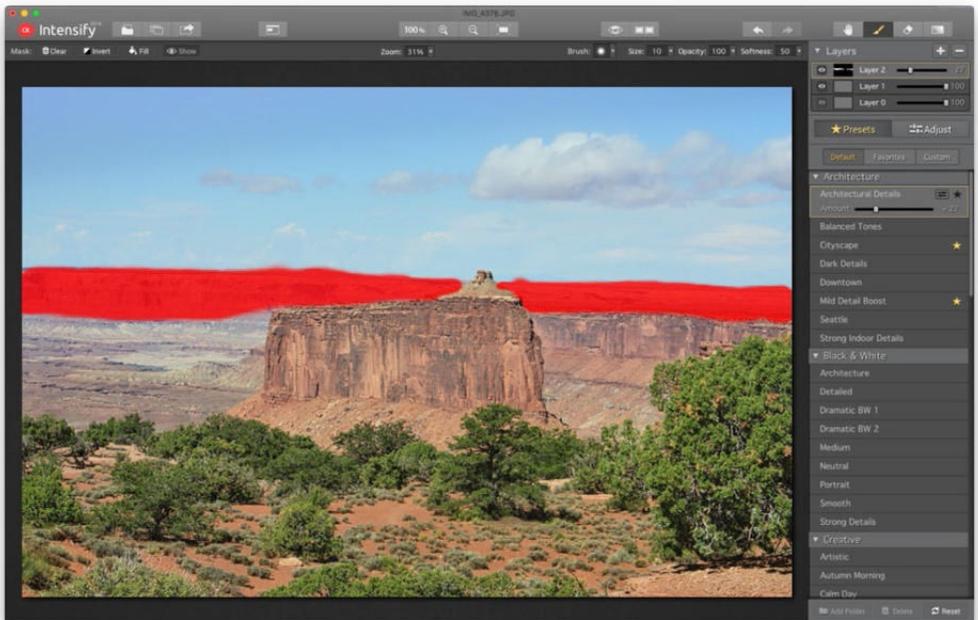
INTENSIFY CK

Photoshop has a variety of sharpen tools (including my favorite, Smart Sharpen), but Intensify CK has so much more for achieving precise control over contrast, structure, detail, and sharpening across different tonal ranges—in one click—that there's no comparison.

Seven categories of presets—

ADJUSTABLE ROUND BRUSHES let you paint edits on to different areas of your image.





Architecture, Black & White, Creative, Detail Enhancement, Landscape, and Soft—which also feature up to 14 specific presets each, give you a head-spinning array of sharpening options.

Slider adjustments and layered effects help you avoid that pixelated over-sharpened look while at the same time focusing your concentration on specific areas of the image with layers and masks.

Intensity CK's adjustment panel offers eight categories with an assortment of slider-based fine-tuning tools.

Don't rely on the names of the

adjustments, as it's difficult to determine their exact effect. Just click through all of them—previews are very quick—to determine how to proceed.

You don't have to stick to the presets that come with the program; you can create your own. Save Favorites and Custom presets right in the interface for easy reach. The app's layers feature lets you combine and brush in presets. Switch layers on and off to see the effects in action.

The adjustable brush works well, but it would also be nice to have different brush shapes in addition to round.

INTENSIFY MASKING TOOLS AND LAYERS let you paint in effects to specific parts of your image to avoid oversharpening.

SNAPHEAL CK

If you're familiar with Adobe Photoshop's content aware fill feature, then you get the point of Snapheal. Its proprietary algorithm helps you remove offensive or extraneous objects or people from your photos and analyze the surrounding context to "fill in" what is "behind" the removed item.

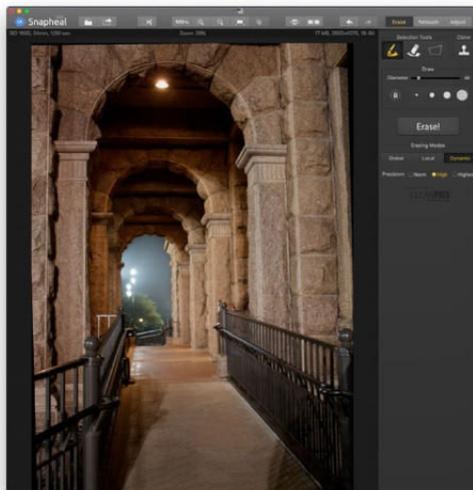
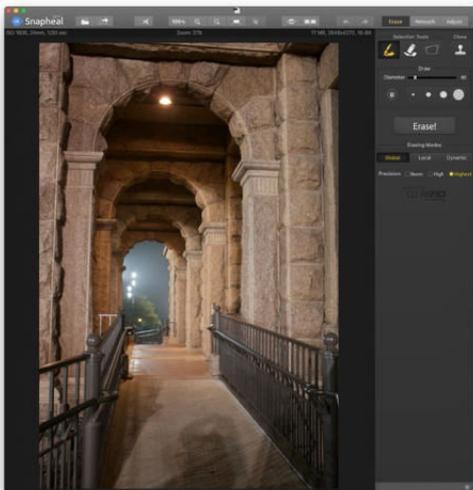
Snapheal's three tabs—Erase, Retouch, and Adjust—provided all of the controls I needed to improve the photo below. Editing tools such as crop and straighten and adjustments for contrast and clarity delivered a fine rendering of my vision of what the scene would look like.

The app comes with three erase modes, so if you don't get the result you like the first time, you can try different ones. The Global mode looks at the overall image while the Local mode uses nearby pixels to calculate a background fill. The Clone tool helps to remove leftover artifacts from the frame for a pristine composition.

FX PHOTO STUDIO

Special effects are not mandatory for photo editing, and many photographers eschew them altogether.

Taking an image into FX Photo Studio special effects app can give your run-of-the-mill picture much-



THIS SHOT—TAKEN AROUND midnight—has deep shadows, including the one in the middle of me taking the photo. Not pretty. I used Snapheal to erase my own shadow from the shot while retaining all the natural shadows.

NOISELESS CK

The very definition of photography is light, and with low light comes color or luminance (light) noise—artifacts that make even the best composition unbearable to look at.

Noiseless, with ten adjustable presets, helps you salvage noisy shots and remove ugly colored speckles from your smartphone or DSLR photos without sacrificing sharpness or clarity.

There are many utilities on the market that do a similar job, including Photoshop's own controls. But I found that Noiseless worked very

well, often with a single click.

The app's controls are designed to retain edge details, giving your image a crisp but natural look.

FOCUS CK

Focus helps spotlight specific parts of your image after the fact, letting you create the popular bokeh effect, for example, with a sharp foreground and a blurred background in addition to selective focus and vignette effects.

A face detection feature helps put portraits into focus, too. Add motion blur and tilt shift for a dynamic sense of action.



Don't rely on the named presets: Adjustable aperture settings for Portrait, Nature, Architecture, Macro photo, and Tilt-Shift let you enhance portraits, street photos, and landscapes. Try each on your image to determine which one is right, or use selective masking to precisely control blur and focus for photo areas of your choice.

If you just want to highlight a specific part of the image, use the app's masking function. The paintbrush can mask the parts you want to focus on and then choose the effect, which shows up only for the chosen part of the image.

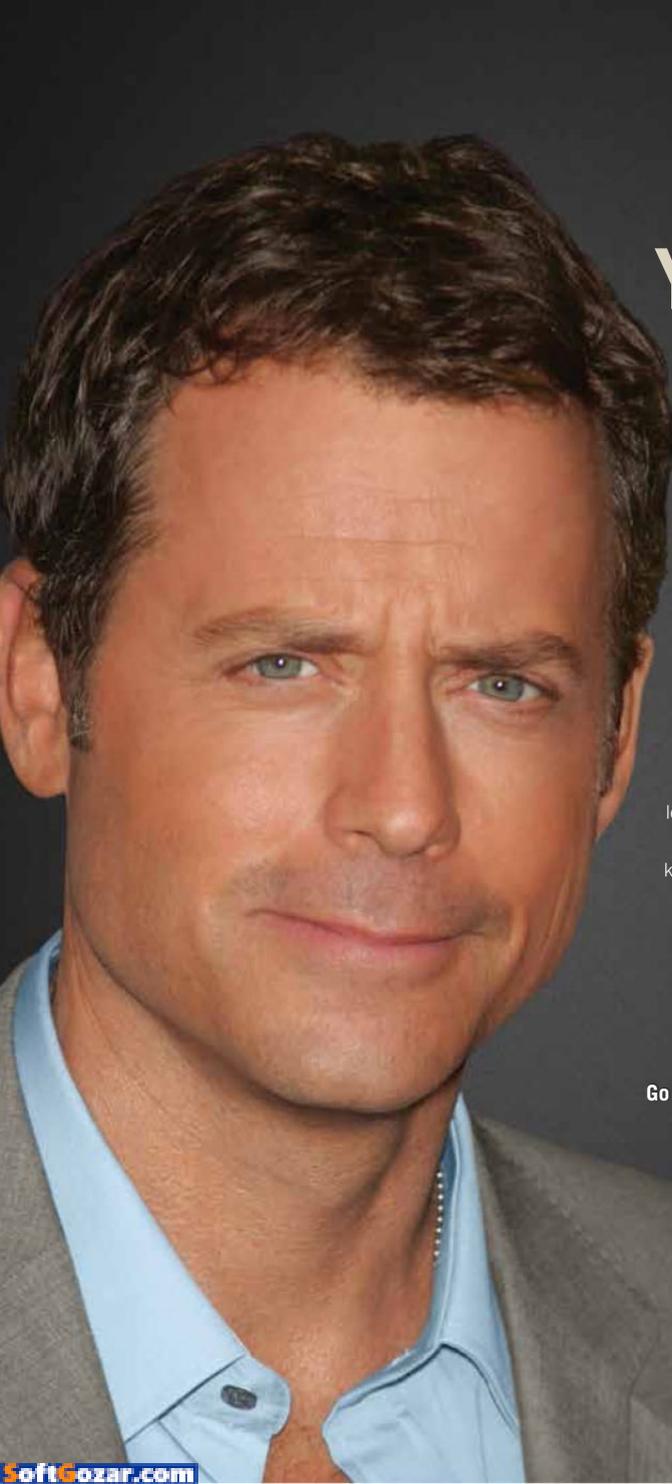
BOTTOM LINE

Macphun's Creative Kit is a super-impressive entry into the bundled photo editing app arena, rivaling packages like On1 Photo 10 ([go](#).

[macworld.com/on1photo10](#)), the Google Nik Collection ([google.com/nikcollection](#)), and Topaz Labs' ([topazlabs.com](#)) vast collection. Its flexibility, ample supply of presets, and excellent performance help a wide range of photographers—spanning amateur to pro—get quick results.

Why purchase a suite? Because chances are that over time, you'll need all of the included utilities, and the deep discount available for the package makes it a good investment for use as either standalone apps or plug-ins.

Creative Kit is an exceptional bargain at \$130 for the complete package, as opposed to paying prices ranging from \$30 to \$60 for individual app components. A pro kit, which includes a training package, is available for \$155. Tryouts are free. ■



YOU ARE YOUR MOST POWERFUL ADVOCATE.

**MORE THAN EVER,
COLORECTAL CANCER
IS A PERSONAL MATTER.**

Today, colorectal cancer (CRC) is the second leading cause of cancer death in the United States,* but that may be changing. Research shows that knowing the genetic and molecular makeup of your colorectal tumor may lead to safer, more effective treatment, just for you. Make it personal. It's your tumor.

Talk to your doctor about testing your tumor.
Speak up. Ask questions.

Go to SU2C.org/colorectalancer to learn more.

Greg Kinnear, SU2C Ambassador



Stand Up To Cancer is a program of the Entertainment Industry Foundation, a 501(c)(3) charitable organization.

*According to the Centers for Disease Control and Prevention (CDC), colorectal cancer is the second leading cause of cancer death in the United States when men and women are combined.

How to calculate print size for your photos

A little bit of easy math is all it takes to make sure your prints look their best.

BY LESA SNIDER



IMAGE BY JORGE ALEJANDRO

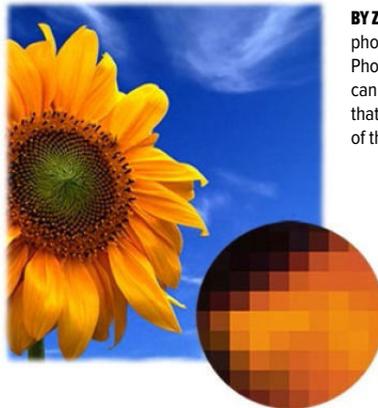
Resolution is one of the most commonly misunderstood concepts in digital imaging, though it's crucial when printing your mementos. You could trudge through life without understanding resolution, and the Print dialog box in most apps and most online print labs alert you if you don't have enough of it to print. However, mastering resolution enables you to figure out not only what size prints you can make from your pictures but also what the quality will be.

WHAT IS RESOLUTION?

Your digital pictures are made from thousands of tiny blocks of color called pixels. If you zoom far enough into a photo in an image editing app, you can see them individually (you'll need to squint to see them in Photos as you can only zoom in to 200 percent).

Contrary to popular belief, pixels have no predetermined size, which is where resolution enters the, uh, picture. *Resolution* is the measurement that determines how many pixels get packed into a linear inch in an image, which therefore controls how big or small the pixels are. With that in mind, you may find it helpful to think of resolution as pixel size (though pixel density is more accurate).

On your computer screen, resolution is measured in terms of pixels per inch in the U.S. (ppi, as folks typically call it); in most other countries, it's measured in pixels per centimeter (ppc). Scanners and



BY ZOOMING way into this photo (to 3,200 percent in Photoshop, to be exact), you can see the individual pixels that make up a tiny section of this sunflower.

printers, on the other hand, refer to resolution as dots per inch (dpi).

The higher the resolution of an image, the smaller the pixels. Small pixels make for smooth, high-quality prints. The lower the resolution, the bigger the pixels, which makes for blocky prints resembling a pile of Legos.

Generally speaking, you need a resolution of at least 240 ppi to



produce a nice print on most inkjet printers and online printing services. However, if you forked out big bucks for an inkjet printer that can spray ink at higher resolutions—say, 1440 dpi or 2880 dpi—you can sometimes get a better result by aiming for a higher resolution in your calculation.

WHY YOU SHOULD CARE ABOUT RESOLUTION

To keep things simple, Apple Photos won't let you see image resolution, much less change it. Adobe Photoshop Lightroom doesn't flaunt the setting either; you only encounter it when exporting images. Why? Because those apps calculate the resolution for you whenever you ask

them to print an image at a certain size; if you don't have enough resolution, the app tells you so.

Other apps, such as Adobe Photoshop, Photoshop Elements, and Pixelmator also alert you to resolution deficiency in their print dialog boxes but they also let you fiddle with the resolution setting in their Image Size dialog boxes. If you don't know what you're doing, increasing resolution can trash an image because the app will add (interpolate) fake pixels that weren't really captured.

Now, this column isn't about whether you should or shouldn't change resolution or even how to do it in those apps. This column is about empowering you to calculate

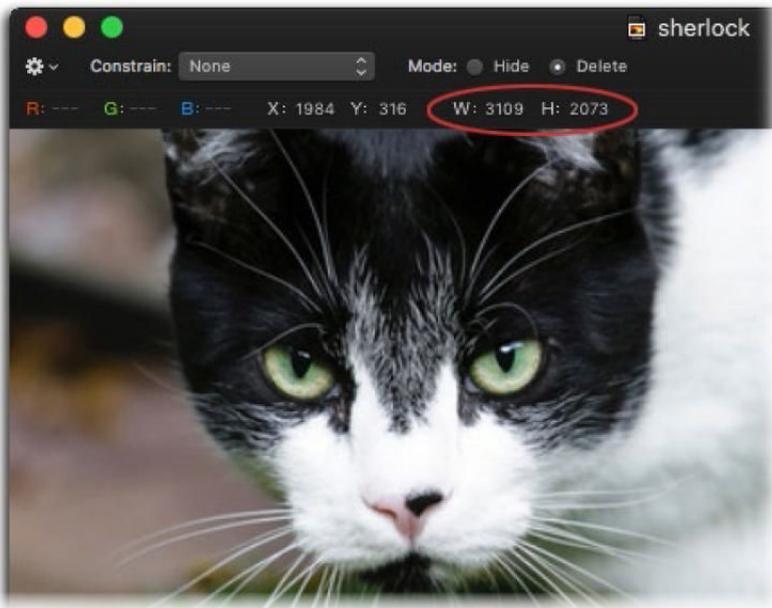
resolution manually using the image's pixel dimensions and the size of the print you want to make. Doing so lets you know exactly what level of quality to expect from printing at a certain size. And if the resolution you calculate isn't high enough to print at, say, 8 by 10 inches, then you can make an informed decision to print at a smaller size before wasting time and money. Besides, if you always shoot with the same cameras at the same quality settings, you only have to calculate resolution a few times to learn what print sizes you can expect to make from those devices.

HOW TO DO THE CALCULATION

The first step in calculating what size print you can make is to find the image's pixel dimensions and jot them down. In Photos, select a picture and press Command-I to open the Info panel. The dimensions appear in the second section of the panel.

In Pixelmator, choose Window → Info Bar and the dimensions appear at the top of the image window.

In Photoshop Lightroom the dimensions are visible in the Library module in the Metadata panel. In Photoshop and Photoshop Elements,

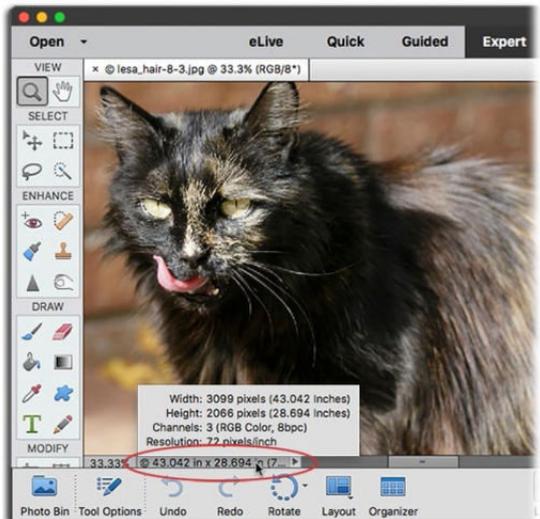
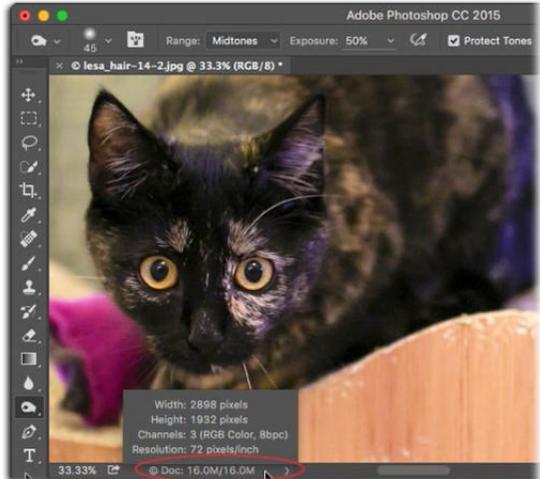


**PIXELMATOR
DISPLAYS**
dimensions in
the Info Bar.

point your cursor at the Status bar at the lower left and then click and hold down your mouse button to make the dimensions appear.

Next, open your Mac's Calculator app and divide the longest edge of your image (measured in pixels) by the longest edge of your desired print size (measured in inches). For example, if an image measures 3,840 by 5,760 pixels and you want an 8-by-10-inch print, take the longest edge in pixels and divide it by the longest edge in inches of the target print size: $5,760 \text{ pixels} \div 10 \text{ inches} = 576 \text{ ppi}$. That's more than enough resolution to produce an awesome print; remember, you need a minimum of 240 ppi though it really depends on the printer. However, if you want make a 30-by-20-inch poster out of that image, you'd have a resolution of 192 ppi ($5,760 \div 30$), which isn't high enough to print well. Since big prints aren't cheap, you'll wisely decide on a smaller size and you'll be more satisfied with the results.

As you can see, all it takes to calculate print size is a little know-how and a little math. Until next time, may the creative force be with you all! ■



THE STATUS BAR in Photoshop (top) and Elements (bottom).



How to make gorgeous landscape panoramas with Adobe Lightroom's new Boundary Warp

Adobe's Creative Cloud update to Lightroom offers a quick fix for vexing pano problem.

BY JACKIE DOVE

In a brand-new update made available only to Lightroom's Creative Cloud subscribers, Adobe has launched a feature that is sure to delight panorama fanatics: Boundary Warp (go.macworld.com/boundarywarp).

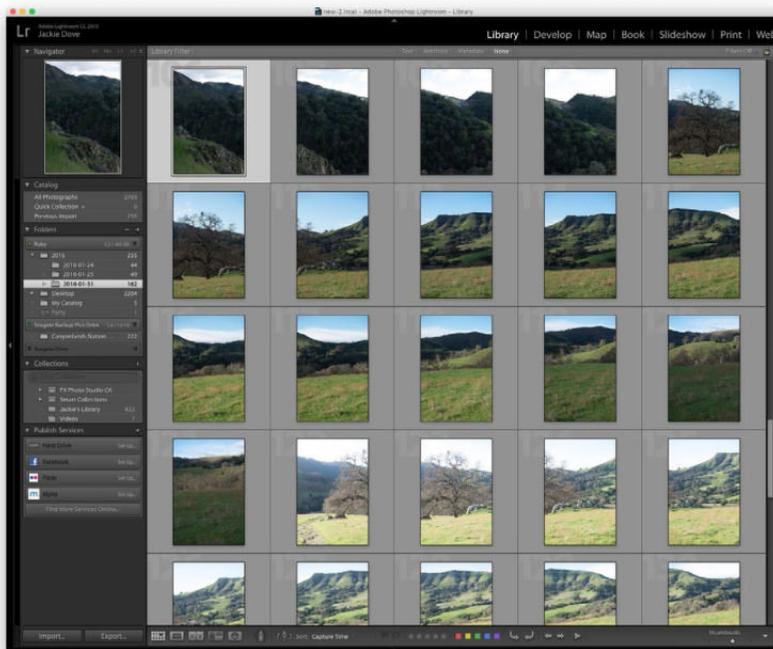
The object is to protect parts of a stitched image that would otherwise be cut off with a typical rectangular crop. Lightroom's Photo Merge feature simplifies the process of photo stitching, and the new Bound-

ary Warp offers a greater degree of control than in the past.

Even if you shot your images in vertical orientation with height in mind, Lightroom's panorama feature might still cut off outlying edges of

IMPORT IMAGES DIRECTLY from your camera card, Dropbox, or a folder on your hard drive.





CHOOSE THE IMAGES
you want to include
from your Lightroom
library.

your stitched image. As you shoot, it's sometimes hard to tell exactly what you'll have to later discard.

This oddly named feature restores full edge content to panorama landscapes. Here's how to use it.

1. Launch Lightroom and choose the Library module to select the images you want to include in your pano.

A panorama consists of two or more images, shot in sequence, which can be stitched together to display the kind of broad scenic expanse that the eye can easily perceive but which the camera does

not automatically capture.

You don't need any special equipment or preparation to create a pano: Just use your favorite camera and a standard lens, choose a vista, and frame a series of shots as you gradually rotate your body. A tripod is extremely helpful for keeping each frame in alignment, but it is not strictly necessary. If your camera has a built-in level, that will work just fine, too.

Vertical images are generally preferred for panos to capture as much height in the image as possible.

Though Lightroom's Photo Merge

feature is designed to work with Raw files that offer enhanced flexibility and dynamic range, you can easily build a pano with either Raw or JPEG files.

Note that your pano is not constrained by the number of images you use, but by the output size supported by the app. Both Lightroom and Adobe Camera Raw have a maximum image size of 65,000 pixels on the longest edge or a total of 512 megapixels, whichever is reached first.

2. Once you have chosen the images, switch to the Develop module and find Photo → Photo Merge → Panorama.

The Photo Merge tool has two built-in functions: HDR and Panorama, and you can choose to use both on your pano images.

Bracketing each image will give you a choice of the best exposure for your pano, letting you use the HDR function to start off with the best images. But it is not strictly necessary.

Tip: If you do use both functions, start with HDR first, and then follow with Panorama. But you can easily build a beautiful pano with a series of single shots, as shown.

3. Choose a projection model for your final image.

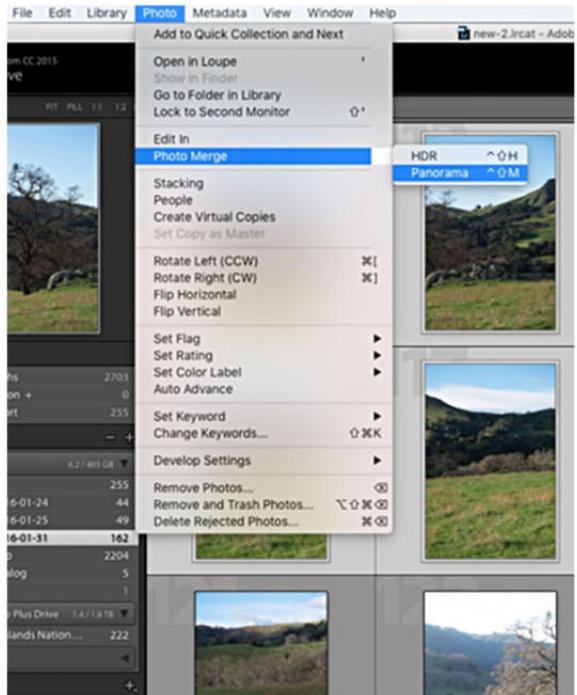
Lightroom's pano stitching feature offers several options: You can let Lightroom automatically pick a

projection model for you or you can choose one yourself. Beginners will do just fine letting Lightroom do the work, but a quick click through the different choices shows you a preview of what the finished sequence will look like with each.

Auto Crop will trim your picture, while shaving off some of its edges. That may not be a problem for every pano, but if it is, Boundary Warp will come to the rescue.

The Spherical projection is best for landscapes. It distorts the image as if

AFTER SELECTING YOUR photos, find the panorama option under the Photo menu.





it were based on a sphere. Most often, Lightroom will automatically pick this projection.

The Cylindrical option is something of a hybrid that will try to keep the vertical lines of the image straight but may wind up distorting non-vertical parts of the image. The visual distinction between it and Spherical is subtle and the one you use depends on the image.

The Perspective choice is best for architectural renderings and buildings where you want to preserve horizontal or vertical straight lines. This model tries to seek a reference frame in the middle of the image to maintain all straight lines.

Because the algorithm is designed to maintain straight lines, a warp operation defeats the purpose.

4. Adjust the image manually by using the Auto Crop and Boundary Warp slider together.

The slider preserves important

information for the edges of the picture that you might otherwise have cropped out.

But you may not want to restore every detail from the four corners of your image, so if you enable Auto Crop, you can move the slider to cover just the part of the image you're concerned about and stop when you're satisfied. Then click Merge.

Lightroom will then process the pano and deposit it in your Library.

Tip: Processing panoramas requires adequate disk space, so make sure you have enough space on your hard drive for the function to work.

5. Add finishing touches in the Develop module.

Once you generate your panorama, it doesn't have to end there. Sometimes, you'll still need adjustments to exposure, contrast, sharpness, and other elements to make

WITH AUTO CROP

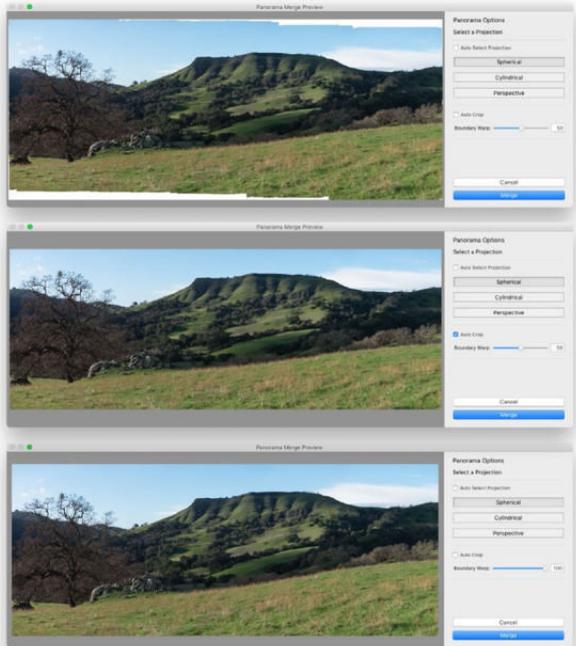
selected, Lightroom will automatically trim your pano. No muss, no fuss.

your image shine. Just access your image from the Develop module and proceed as with any other image.

Normally, you don't have to worry about lens profiles as Lightroom has so many built in that it will automatically choose the right one. Nonetheless, if you do get a Lens Profile error message, just check Enable Profile Corrections and Remove Chromatic Aberration in the Lens Corrections Basic tab in the Develop module. The Profile tab records the default Lens Profile and other information.

Try Boundary Warp out on some of your older images first just to check it out. I recruited some old JPEGs I shot years ago, and it worked nicely. Then, next time you try for a sweeping vista, remember to keep your camera at a vertical orientation, bracket each shot, use the Photo Merge → HDR function first on each frame, and then finish up with the Boundary Warp pano.

Photographers with a perpetual Lightroom license do not have the



Boundary Warp feature yet, as it was released to Creative Cloud subscribers first. It will be available to everyone when Lightroom releases its next general update. Adobe is mum on exactly when that will be. ■

YOU CAN USE Boundary Warp with Auto Crop or by itself, if you want to preserve edge content.

Apple ID

Manage your Apple account

Remember me

[Forgot Apple ID or password?](#)

Mac 911

Solutions to your most vexing Mac problems.

BY GLENN FLEISHMAN

I have multiple Apple IDs. What happens if I delete one?

Q: I do indeed have two Apple ID accounts and it appears that my iPhone and iPad are listed as the two devices on one account (the one I use to sign into iTunes with). My laptop is listed as the device on the other account. I am afraid to delete the ID that my computer is linked to for fear that I will not be able to reconnect it/sign it into the Apple ID account that has the iPhone and iPad. If I delete the apple ID with the computer listed as the device, will I be able to start fresh and add my computer to the Apple ID account with the other two devices?

— Nicole Max

A: There's no problem in what you suggest: You can use any Apple ID to sign into any device for iTunes, iCloud, iMessage, and more. (Some older Apple ID accounts might give you trouble with iCloud and related services, but they have to be more than several years old.)

You can always sign out of an Apple ID on any iOS device or Mac, too, without rendering that hardware incapable of logging in with another account.

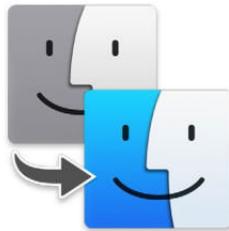
However, if you've made any purchases with an Apple ID, those purchases can't be transferred or merged—they're permanently connected with the account that bought them.

As Apple notes in one of its help documents (go.macworld.com/idsupport): We recommend that you use the same Apple ID for all Apple services on your device—including the iTunes & App Stores and iCloud. Using multiple Apple IDs might be confusing and cause issues with accessing purchased content or using some services. If you have multiple Apple IDs, you can't merge them.

For historical reasons, because of how I originally set up an iTools account (thanks, Geoff Duncan, for snagging the short ID for me back in 2000) and later an iTunes account, I

still maintain two separate presences. I use what is now an iCloud account for syncing, iMessage, and other data-based services, and my upgraded-from-iTools-through-.Mac-through-MobileMe-to-iCloud Apple ID for all my media purchases. It can be irritating to have to enter different passwords repeatedly at different points in setting up a new device or when upgrading, but it has allowed me to keep all my purchases intact.

How to manage media when migrating to a Mac with a smaller drive



“Bass Hound” writes in with a set of interlocking problems. Their new computer has a 128GB drive while the old one was 512GB. They have a Time Capsule backup and wonder if they can make choices while restoring the backup. While they've opted into iCloud Photo Library, they “have not, however, joined Apple Music because I don't

want to pay the ongoing fee.” Finally, they’d like to “add all my media—music, movies and possibly pics—to an external drive.”

A: This is not an uncommon collection of questions, so I’ll do my best to knock them all out.

First, you can use Migration Assistant (go.macworld.com/migrationasst) instead of OS X Recovery to restore just Applications, certain user (Home) directories, and other files. That may be a good place to start with a fresh computer.

Second, Apple Music doesn’t include iTunes Match, the service that syncs your current music library, including uploading files that don’t match tunes in Apple’s music store. Kirk McElhearn ran down the way those two subscription services interact (go.macworld.com/matchmusic) last July. There is an ongoing fee (\$25 per year) for iTunes Match, but less than the \$10 a month for Apple Music if you don’t want or need that.

Finally, you can store iTunes libraries (go.macworld.com/moveituneslib) media (music, videos, and locally downloaded iOS apps) and your Photos library (go.macworld.com/externaldrivephotos) on an external drive, or even a network-attached server (go.macworld.com/itunesnas).

Is there a way to sort Safari bookmarks?

Q: I recently edited my bookmarks, and the links I created in each folder changed to be in alphabetical order. Yikes! I needed them to stay in chronological order.

Any way to fix this?

— Christine Girone

A: What’s peculiar about this? Safari doesn’t feature a way to alphabetize bookmarks! There is no built-in way to sort bookmarks (or URLs) alphabetically in Safari. So I’m not sure what happened that caused this spontaneous reshuffle.

If you were to *want* alphabetic sorting of bookmarks, there’s a free and up-to-date

donationware app called SafariSort (go.macworld.com/safarisoft) that you could turn to. (It’s an unsigned app,

requiring that you bypass Gatekeeper, but it’s been in development for years. Make your own decisions about whether to run it or not, but there are no red flags.)

If you sort out what happened, Christine, let us know.



**SAFARI DOESN'T
FEATURE A WAY
TO ALPHABETIZE
BOOKMARKS!**

How to fix the t.co Twitter problem

If you're a Twitter user, you've seen the t.co domain the company uses: It rewrites all URLs in tweets to pass through this redirecting domain to track "engagement." It wants to know how many times links are passed—ostensibly, it could also filter against malware and spam, though I've never seen such a mechanism engaged.

But for years, some Twitter users in OS X have had a problem with t.co in Safari. Instead of redirecting, the link results in an endlessly loading page that times out. Reloading the page results in a non-existent domain. Reload again, and the destination URL finally loads.

What's up with that? Nobody knows! Or at least, nobody did. I looked at years of forum postings all over in which people noted the problem, and no one had a consistent solution. That appears about to change.

An Apple engineer who works on the WebKit team—the technology underneath Safari—recently tweeted in response (go.macworld.com/tcosafari) to well-known Mac developer Rich Siegel and developer and podcaster John Siracusa that the problem has been identified, and a fix is underway. So relief is coming.



In the meantime, developer Stef Pause recommends a command-line fix you can issue in Terminal, if you've got the stomach for it! Enter the following and press Return: **dscacheutil -flushcache**

This command dumps the domain name system (DNS) cache, which is a temporary repository of relatively recently retrieved values for linking human-readable domain names with the actual numbers and other bits of Internet plumbing needed for connections. Pause writes that it might need to be entered multiple times.

Another option, if you're using Tweetbot for OS X, is to change a setting via Terminal that turns off URL rewriting. (This tip via Dermot Daly on Twitter.) Enter this command and press Return: **defaults write com.tapbots.TweetbotMac OpenURLsDirectly YES** ■

Ask Mac 911

We're always looking for problems to solve! Email us at mac911@macworld.com including screen captures as appropriate.

Mac 911 can't provide direct email responses or answers for every question. For that, turn to Apple-Care, an Apple Store Genius Bar, or the Apple Support Communities.