

Macworld

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REVIEWED: **iPHONE 7**

⚡ A Worthy Upgrade ⚡

PLUS



**Apple Watch
Series 2 review:
FOCUSED ON FITNESS**

MAKE BREAKFAST HAPPEN SO KIDS CAN BE HUNGRY FOR MORE

Photo By: Peggy Sirota



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*“I want
to be
a bench.
Recycle me.”*



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KEEP AMERICA
BEAUTIFUL



macOS Sierra: Mixing iOS with OS X to make a better Mac

With Sierra, Apple takes advantage of its entire ecosystem to benefit the Mac.

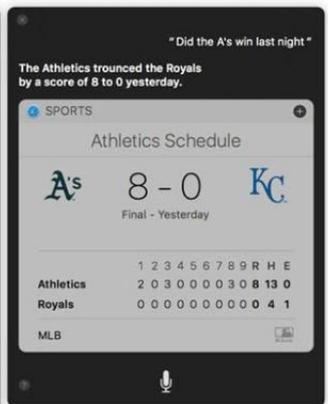
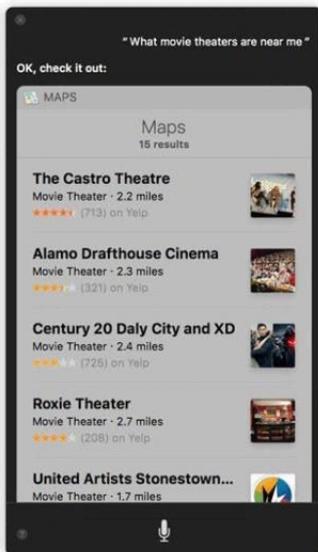
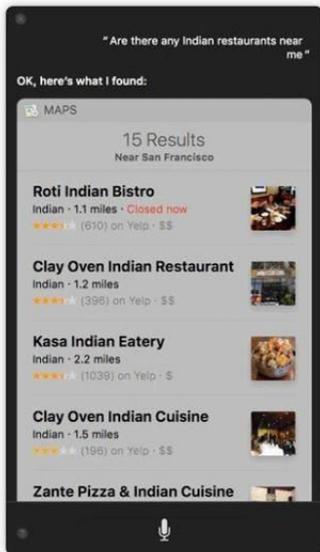
BY ROMAN LOYOLA

With macOS Sierra, Apple, as with previous desktop OS versions, integrates even more features that were introduced in iOS, the operating system for the company's mobile devices. But Sierra doesn't just add features found in iOS, it also does more to make your Mac and your iOS devices work together. Considering that nowadays, most people's primary computers are iOS devices, it's fitting that macOS Sierra does more to cater to those users' needs.

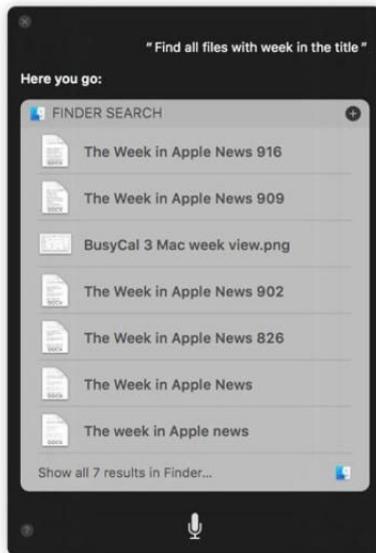
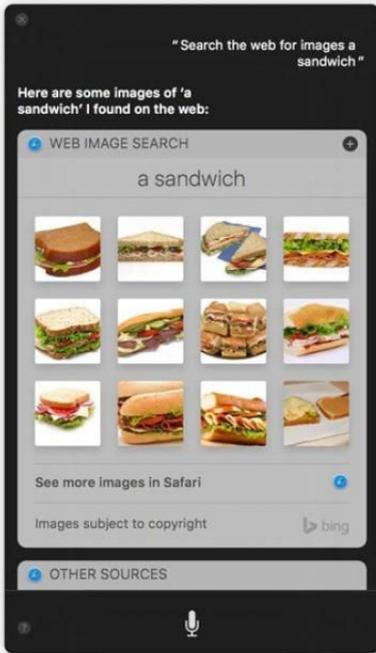
Before we dive into Sierra, let's address the main question: Should you upgrade? First, you need to determine how compatible your Mac is. The older the Mac, the more likely a feature won't work. You can check a list of Macs compatible with macOS Sierra (go.macworld.com/sierracom

apple.com/macos/feature-availability.) Checking this first may answer the upgrade question for you.

You also need to see if your software will still work with Sierra. If



SEARCHES FOR EVERYDAY items work well in Siri for Sierra.



WEB SEARCHES AND Finder search can be done in Siri. You can drag and drop files from the results.

your software worked with El Capitan, Yosemite, or Mavericks, there's a good chance it will work with Sierra. Check with the developer of your most vital apps before you upgrade.

I've been using the public beta and the golden master version since it became available, and on the five Macs I've been using, I haven't a single stability problem. That's one less thing to consider.

Once you've determined that your Mac is compatible to a point you're satisfied with and your software is

good to go, then it gets a little more complicated. One way to look at it is to gauge how much you use iOS. If you use your iPad and iPhone a lot, then you'll appreciate Sierra features like Siri, Universal Clipboard, and Apple Pay. Let's take a look at the main new features of Sierra, and see how they fit into your workflow.

(And if you do decide to upgrade to Sierra, be sure to back up your Mac before you run the Sierra installer. Always back up before installing any operating system upgrades.)

SIRI COMES TO THE MAC

Siri, Apple's voice assistant, is the marquee feature of macOS Sierra. It's also the most obvious feature that signifies the iOS-ification of macOS.

When Siri is active, it works exactly as it does on iOS. However, there is no default setting to allow Siri to activate by saying, "Hey, Siri" like you can on iOS. (You can get voice activation to work if you create a Dictation Command (go.macworld.com/dictationcommand) to trigger the Siri keyboard shortcut.) The default keyboard shortcut for Siri is to hold down Command-Spacebar, or you can click the Siri icons in the menu bar and in the Dock.

Siri works best for me when I perform web searches for everyday life-type stuff. When I asked Siri for places near me, or for specific news like sports scores, it almost always results in what I'm looking for.

As a writer and editor, I perform a lot of web research, and I'm always gathering files together to create content. Siri can be used to search the web for images, and conveniently, the images in the results can be dragged and dropped to the Mac from the Siri window. Siri can also be used to find files on the Mac.

Siri can be used to configure a limited set of system preferences. You can tell Siri to:

> "Increase my screen brightness"

> "Put my computer to sleep"

> "Start my screen saver"

> "Turn on Do Not Disturb"

> "Turn on/off Dictation"

> "Turn the system volume up"

> "Turn Wi-Fi off"

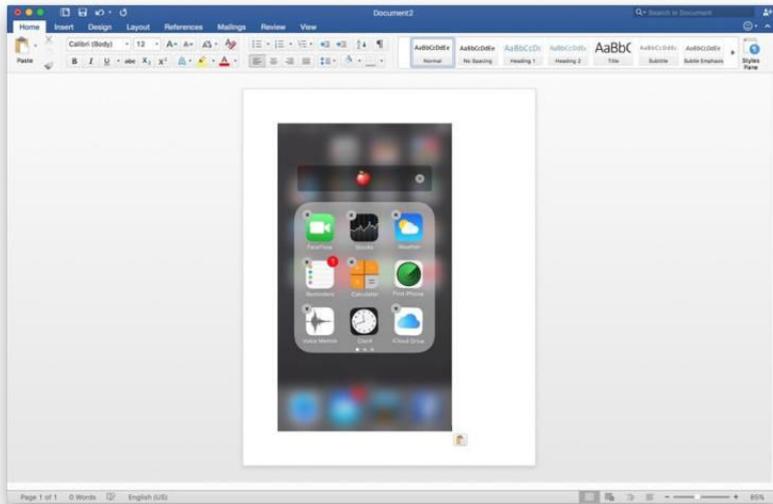
For anything else, you have to figure out the correct phrase to get you to the system preference you need. For example, I like to have a plain white desktop on my Mac; it's easier to deal with when I take screenshots. But when I told Siri to "Change the desktop," I got web search results (the first result was a Windows XP how-to). I had to tell Siri to "Open the Desktop System Preferences" to get what I wanted. (Lesson learned.)

One major caveat about Siri: It currently works only with Apple apps. I use Microsoft Outlook for my work email,

and when I asked Siri to read my latest email, it read a very old email that was in Apple Mail. Apple confirmed with me that the Siri third-party API is currently only for iOS.

After using Siri for a while, I couldn't help asking myself how useful Siri is on the Mac. Siri's usefulness on iOS is emphasized by

MY INITIAL RESPONSE WAS THAT ON THE MAC, SIRI FEELS MORE LIKE A LUXURY THAN A MUST-HAVE.



ICOPIED AN iOS screenshot that resided in my iPhone's Photos app. Then I pasted the image into a Microsoft Word document.

the iPhone's relatively small screen size, the single-screen nature of the operating system, and the need for hands-free usage.

My initial response was that on the Mac, Siri feels more like a luxury than a must-have. Usually, Mac users have their hands on the keyboard and mouse. Even if you haven't committed several keyboard shortcuts to memory, you can probably do something like launch a browser and type in a search for **sandwich pictures** faster than telling Siri to do the same task.

Then I came to a realization I didn't expect. When using any computer interface, there's a certain amount of tedium involved. In Unix, it's typing out commands. On iOS, it's tap, tap,

tap with your finger. On the Mac, it's double click, Shift click-click-click, right-click, highlight, and click to select a command, for example.

The little tasks you have to do to make your computer do what you want get tedious, and you're not really aware of it until you start to use Siri. Asking Siri to perform a web search of pictures of sandwiches may not be as fast as launching a browser, typing in **sandwich**, hitting Return, and then clicking the Images tab in Google, but it's not as tedious.

That tedium wears on you, sub-consciously, but Siri helps alleviate it. I've always thought that having more ways to do things on your computer is good, and Siri on Sierra allows for that. That's a good thing.

UNIVERSAL CLIPBOARD

On the surface, Universal Clipboard seems like such a simple feature: It's copy and paste that works across your Mac, iPad, and iPhone. While it's such a simple feature, I find it to be very useful.

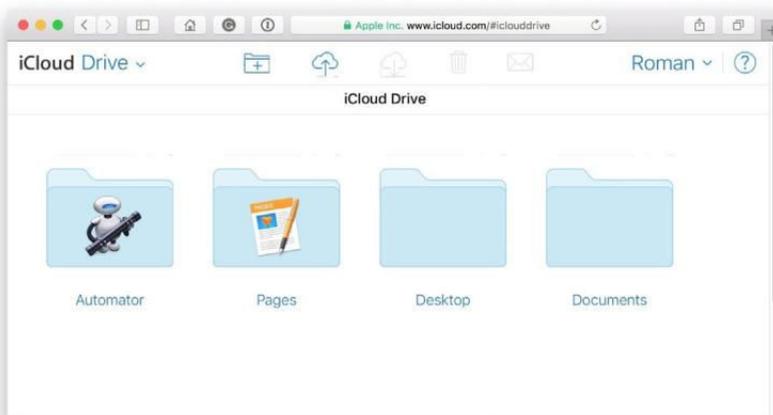
Universal Clipboard is part of Apple's Continuity feature set that works between Macs and iOS devices. In order for Universal Clipboard to work, you must have devices that meet the Continuity system requirements. For example, MacBook Pro models made in 2011 or earlier aren't compatible with Continuity, and thus, don't support Sierra's Universal Clipboard.

Other requirements include logging in to an iCloud account on each device, turning on Wi-Fi and Bluetooth, and keeping the devices within proximity of each other.

To use Universal Clipboard, you copy from your Mac or iOS device just as you normally would. Then go to your recipient device, and perform a paste. If you're pasting on a Mac, you may see a progress bar indicator. On iOS, you see a message window stating the device your paste is coming from.

I did find one hiccup involving Microsoft Word. When copying text from a Word document, it pasted in iOS 10 Notes as Chinese text. Apple said it is investigating this issue, and I'll provide an update to this review when it is fixed. Otherwise, I didn't have any problems copying and pasting from within different apps. If you use a third-party clipboard manager, Universal Clipboard may not work with it.

As someone who works in content creation, Universal Clipboard is a



WITH iCloud DESKTOP and Documents, your files are accessible through the iCloud website.

long-awaited function. No more emails or text messages I send to myself, or using AirDrop to transfer an image file that I want to place in a document. Universal Clipboard saves me several steps and helps me be more efficient.

iCLOUD DESKTOP AND DOCUMENTS

Though I don't have hard data to back it up, I suspect many *Macworld* readers use an online file storage service like Dropbox. I do, because I often use different Macs, and Dropbox makes it easy to get to my files. Even if the Dropbox software isn't installed, all I need is an Internet connection and a browser.

And though Apple didn't tell me so, I suspect that part of the reason iCloud Desktop and Documents exists is because Apple, like Dropbox, is in the online storage business. Why should all that business go to Dropbox, et al?

In my opinion, an online storage component should be part of any modern operating system. Data lives on the Internet and on the cloud, and we're using multiple computers (Macs, iPhones, iPads, even PCs) on a daily basis.

iCloud Desktop and Documents is compelling because it's pretty much seamless. After you set it up ([go. macworld.com/icloudrivesetup](http://macworld.com/icloudrivesetup)),

anything you save to your Desktop or Documents folder gets saved to like-named folders in your iCloud account, and that data is synced to your other computers.

For example, if I save a file to the Desktop on my work computer, I can go home and find the same file on the home Mac.

Or I can use the iCloud app on my iPad to access the file. If I have to use my son's PC, I can use the iCloud for Windows app.

The catch is that you need to make sure you have enough iCloud Drive space to accommodate your files since the files in Desktop and Documents count against your iCloud allocation. Apple provides 5GB for free. After that, it's \$1 per month for 50GB, \$3 per month for 200GB, \$10 per month for 1TB, and \$20 per month for 2TB.

For me, iCloud Desktop and Documents worked fine. On my test Macs, when I saved a file to the desktop, it shortly appeared on the desktops of the other Macs. I didn't encounter any issues, but I should make clear that I probably don't use my desktop like a lot of other people. I use my desktop as a temporary file location, and I save files to it but I will move them to their more permanent

**iCLOUD DESKTOP
AND DOCUMENTS
IS COMPELLING
BECAUSE IT'S PRETTY
MUCH SEAMLESS.**

location after a short while. I think a lot of people use the desktop in a more complicated way, and so iCloud Desktop and Documents may or may not work. *Macworld* senior contributor and Six Colors blogger Jason Snell has serious issues with iCloud Desktop and Documents, and you should give his review of Sierra (sixcolors.com/post/2016/09/sierra-review) a read and get a different perspective.

OPTIMIZED STORAGE

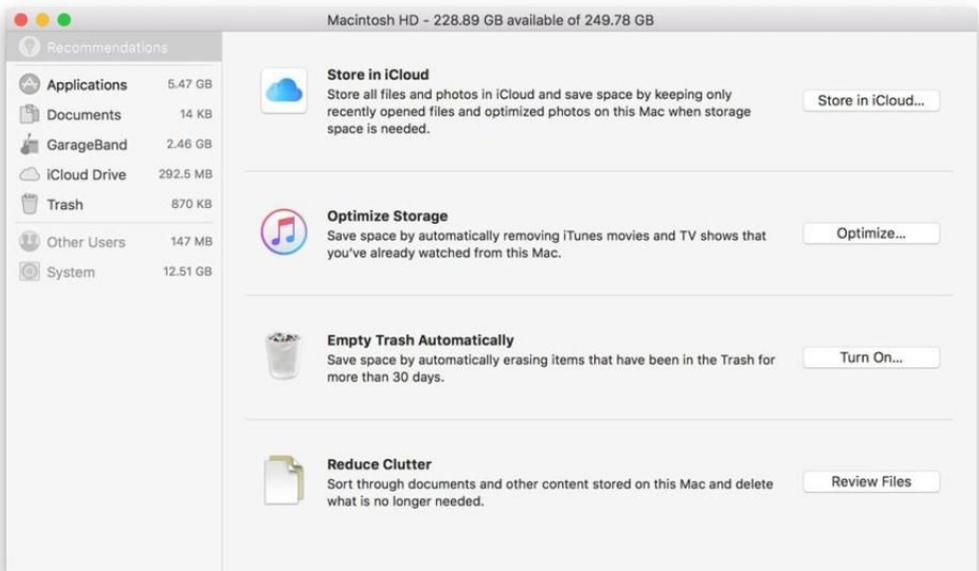
A few years ago, Apple decided to sacrifice the spacious capacity of hard drives for the speed for flash

storage in its laptops. The speed gains were impressive, but people are making more videos and photos, and those files eat up storage space. Users need to pay more attention to managing their local storage.

Optimized Storage provides more tools to manage your local storage. I go into deeper detail about the Optimized Storage tools (go.macworld.com/optimizedstorage) in a separate article, so I won't repeat myself here. But there are a few points worth reiterating.

> The Store In iCloud option requires a subscription to iCloud

OPTIMIZED STORAGE PROVIDES a set of tools to help you manage your Mac's storage.



Drive. A free 5GB tier is available, but you will probably want to sign up for more storage. (\$1 per month for 50GB; \$3 per month for 200GB; \$10 per month for 1TB; and \$20 per month for 2TB.)

> The Optimize Storage option works with emails in Apple Mail specifically, and only with iTunes movies and TV shows. Essentially, it deletes those files from your local storage and downloads emails from your email server and videos from the iTunes Store if you want to use them, which means you need an Internet connection.

> You can uninstall applications through this interface. Any app bought through the App Store will be completely removed. As for third-party apps bought outside the App Store, Apple said to me that it has been making an effort to encourage developers to follow its standard procedures for proper app installation, so if a developer has done this, you should be able to uninstall any app bought outside of the App Store along with all of its components.

Storage management is one of those chores everyone hates doing but is necessary—there’s always a sense of panic when you’re working on a project and you run out of space. Optimized Storage performs a lot of these tasks behind the scenes, which is convenient. Hopefully, flash

storage will become more affordable and capacities will increase to a point that users will be using Optimize Storage less and less.

PICTURE IN PICTURE

If you’re watching a video in either Safari or iTunes, you can click on the new Picture In Picture icon, which will open the video in a floating window that snaps to one of the four corners of your display. (Get more details on how to use Picture In Picture go.macworld.com/sierrapicinpip.)

What’s great about the Picture In Picture window is that it always stays on top, so if you open an application and a file within that app, the video window doesn’t get buried underneath the windows you’ve opened.

Picture In Picture isn’t a vital feature to Sierra. In other words, I don’t think it’s a feature that will drive people to upgrade. But it is one of my favorite features. I was part of *Macworld*’s “home base” crew

WHAT’S GREAT ABOUT THE PICTURE IN PICTURE WINDOW IS THAT IT ALWAYS STAYS ON TOP, SO IF YOU OPEN AN APPLICATION AND A FILE WITHIN THAT APP, THE VIDEO WINDOW DOESN’T GET BURIED UNDERNEATH THE WINDOWS YOU’VE OPENED.

during our coverage of Apple's iPhone 7 event (go.macworld.com/iphone7event) and Picture In Picture certainly came in handy. I had the video stream of the event playing in a Picture In Picture window in the upper right corner of my display, and while I switched between our chat-room, our web content management system, TextWrangler, Photoshop, and whatever other apps I used, the video window was always there, always visible. It made a tremendous difference.

I imagine most people will use

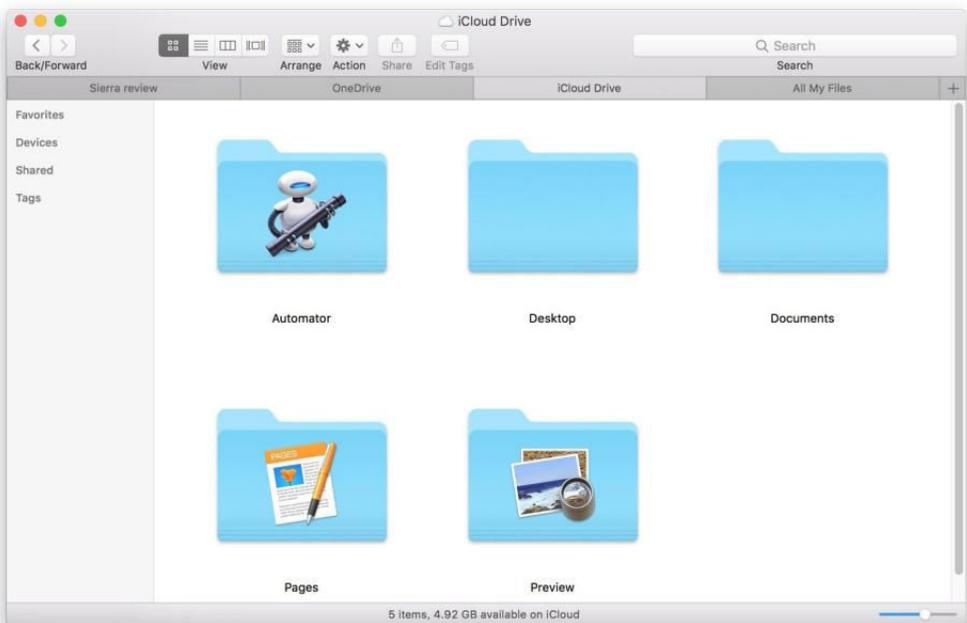
Picture In Picture more for entertainment, but it can also be good for, say, playing a how-to video while you follow along on your Mac. It's one of those features that falls under the radar but should be appreciated by all users.

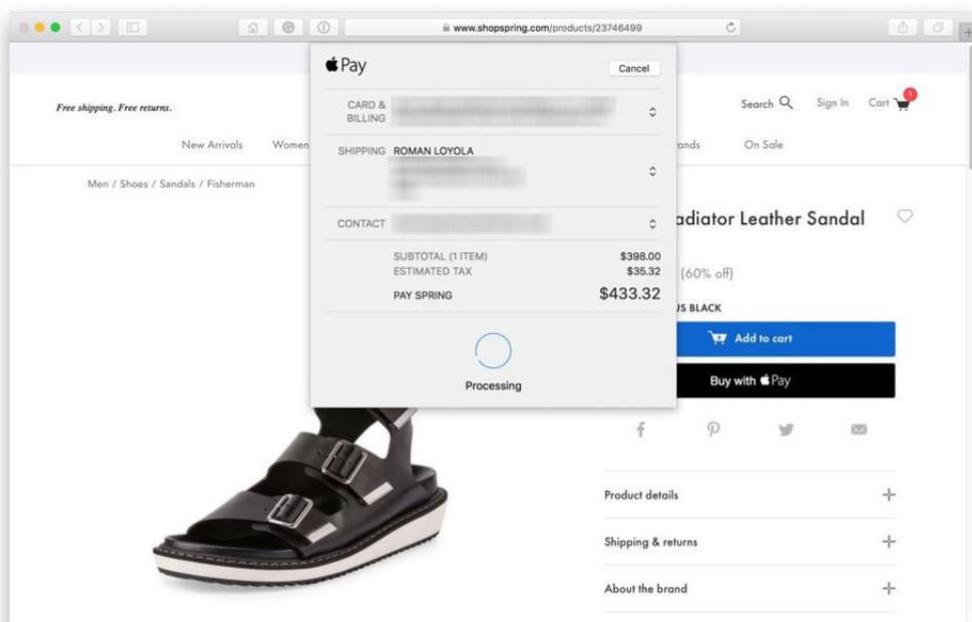
TABS

I probably spend the vast majority of my time on my Mac using Safari, and I've grown accustomed to opening webpages in new Tabs under one window. It's easier to find the window I need, and it helps cut down the on-screen clutter.

TABS WILL HELP

cut down screen clutter and make the window you're looking for easier to use.





Bringing Tabs to the general Mac user interface makes sense. I no longer have to try to figure out where a window is when I want to move files; you can just click and drag a file over to the tab to move it.

Tabs also works in many Apple apps, like Maps, Numbers, and Mail. Apple says that Tabs automatically works with many document-based third-party apps, with no developer adoption required. But as of this writing, Microsoft Office apps still open documents in separate windows. Take a closer look at how Tabs works (go.macworld.com/sierratabs).

APPLE PAY

With Apple Pay, you don't have to worry about filling out online forms with billing and shipping information. It's all in Apple Pay, and it's secure. According to Apple, over 300,000 websites will support Apple Pay when Sierra ships.

However, Apple Pay relies on your iPhone or Apple Watch, even when you're shopping in Safari on your Mac. When you are processing an Apple Pay payment on your Mac, the Mac looks for your iPhone or Apple Watch, and you must confirm your purchase on one of those devices.

APPLEPAY IN Sierra requires your iPhone or Apple Watch for confirmation.

When I'm at home, I sometimes shop online while sitting on the couch, with my Apple Watch and iPhone docked in my office on the other side of my house. So Apple Pay's reliance on an external device can be an inconvenience. But it's a security measure; having Apple Pay process payment without some sort of external confirmation could lead to the unwanted use of your Apple Pay account by anyone other than you using your Mac. It's a small compromise to make for the sake of security.

PHOTOS AND ITUNES

While Photos and iTunes have new versions with Sierra, they are separate apps that require a separate discussion. *Macworld* senior contributor Kirk McElhearn did an overview of what's new with Apple Music (go.macworld.com/newapplemusic). As for Photos, *Macworld* senior contributor Glenn Fleishman did a hands-on with the new Photos (go.macworld.com/sierraphotos).

MORE STUFF

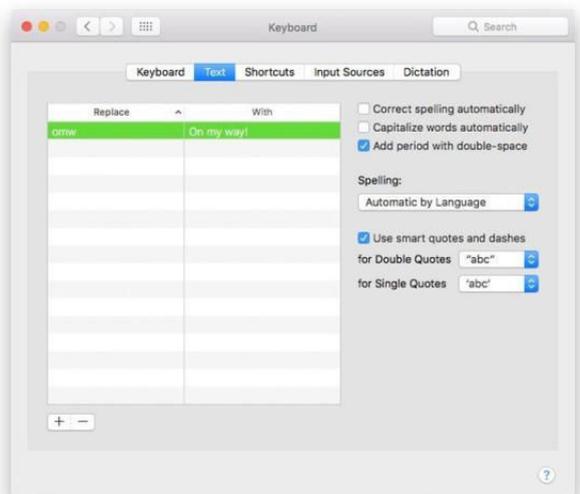
There's more to macOS Sierra than what's been touted in Apple presentations and on the company's website (apple.com/macOS/sierra). Here are a few of my favorite new features that play a smaller role in the Sierra showcase.

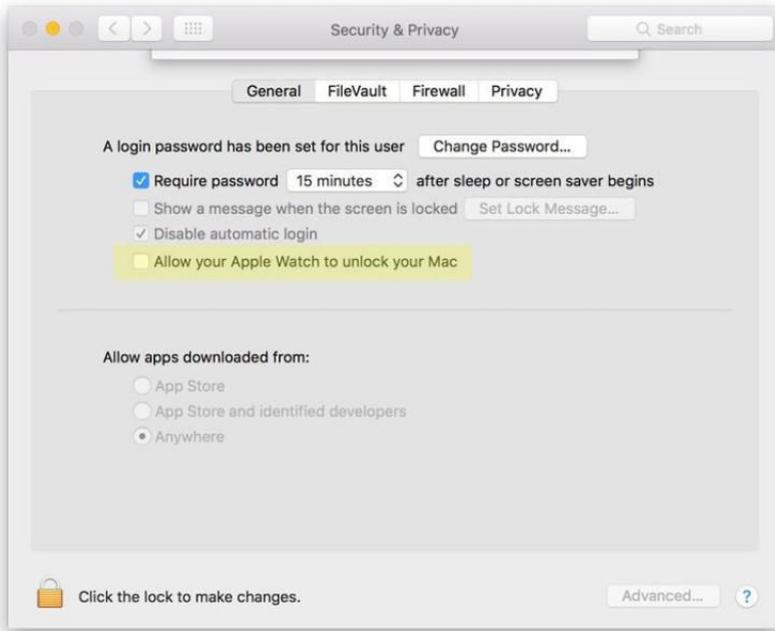
Double space for a period. You

know how in iOS, when you tap the spacebar twice, it creates a period? Now you can do that in macOS Sierra. Sure, it's not that big a deal, since the period key is near the spacebar, whereas on iOS, you have to navigate to another section of the on-screen keyboard. But if you frequently write on iOS and your muscle memory kicks in when you're on your Mac, it's a good feature to have—when it works. I have found that some third-party apps, like Microsoft Word 15.11.2, TextWrangler 5.5.1, and Firefox 48.0.2 don't allow this, so you can't completely depend on it.

Auto Unlock. OK, actually, Apple made this a promoted feature. But really, you only care about this feature if you have an Apple Watch, and a lot of you don't have one.

YOU CAN ACTIVATE the option to press the spacebar twice to type a period in System Preferences → Keyboard → Text.





YOU CAN ACTIVATE
Auto Unlock in
System Preferences
→ Security & Privacy,
and you'll see
the setting in the
General tab.

Instead of typing in your password on your locked Mac, your Mac instead senses the presence of your Apple Watch and then unlocks itself. Your watch has to be on your wrist and authenticated (meaning you unlocked it with the passcode at some point), otherwise it won't work.

Features like this one, where Apple can take advantage of its ecosystem, are nice to have.

Shared Notes. In the Notes app, you can now share a note with other users, and they can modify the note. It's a nice collaboration tool for work, or an easy way to make sure you're

all on the same page about the grocery list at home. Collaboration works on iOS 10, too (go.macworld.com/ios10notes).

Messages. If you are using Messages in iOS 10 (go.macworld.com/ios10messages), then you might be disappointed in the lack of improvements in Sierra Messages. You can see the Digital Touch messages, handwritten messages, invisible ink messages, and stickers sent from an iOS 10 device, but you can't create those same kind of messages in Sierra. Many Tricks' Rob Griffiths had a tweet that perfectly summed up my

feelings (twitter.com/rgriff/status/777881538058858500) about Sierra Messages: “[It] feels like the child that missed the bus. Standing there by the curb, watching the others head off into the future.”

The new Sierra Messages does allow for website previews, bigger emojis, and Tapbacks, which are iconic responses to text bubbles.

BOTTOM LINE

Overall, macOS Sierra isn’t a major overhaul of the Mac operating system, but I have a greater appreciation for the new features than I have for past revisions of OS X. They are ones I’ve wanted or needed, which means I find macOS Sierra a very satisfying upgrade.

Apple Pay, Universal Clipboard, and Auto Unlock have more demanding requirements than the other features, so you may not feel the urgency to

upgrade if you have an older Mac. For example, if you have an older Mac, you can’t use Universal Clip-

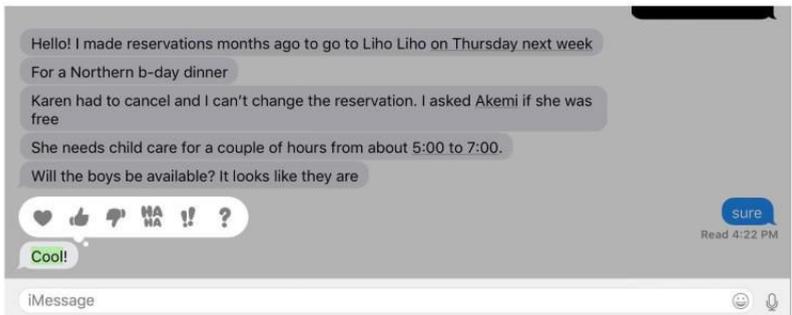
board—be sure to check the compatibility requirements (go.macworld.com/sierracompatible).

If you own a Mac and have been keeping up with the upgrade cycle, you should install macOS Sierra. I usually say to not upgrade immediately, and wait for Apple to release its first 10.12.1 update. That’s just to play it safe; companies like Apple do their best to address bugs and make fixes during the beta cycle, but there’s always a chance something major can show up when the software becomes widely available

But macOS has been pretty stable for a while. I still think it’s a good idea to wait, but I won’t blame you if you upgraded sooner than later. You shouldn’t have to wait for features

RESPOND WITH A

Tapback by right-clicking on a text bubble, select Tapbacks, and then select the icon to send as your response.

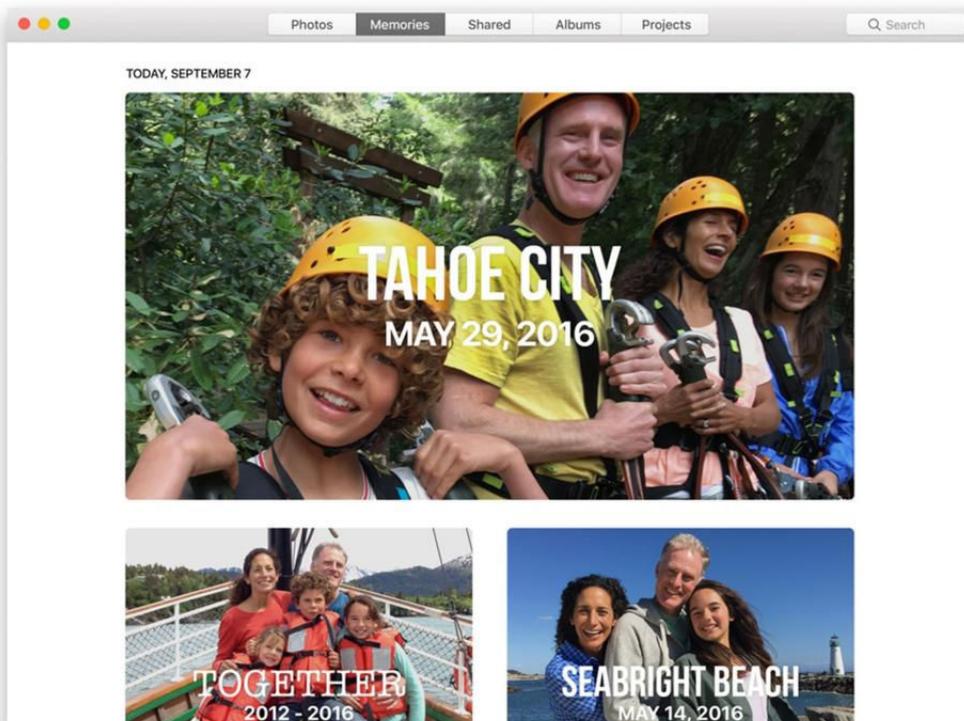


that will benefit you and make your Mac easier to use. Plus, the upgrade is free. ■

6 Photos features that are worth the upgrade to macOS Sierra

Version 2.0 of Photos includes some nifty new features that make Apple's photo manager a serious powerhouse.

BY JASON SNELL



When people ask me for the single best reason to upgrade to macOS Sierra, the answer I give them doesn't involve Siri (go.macworld.com/sierrasiri) or Auto Unlock or iCloud Drive (go.macworld.com/icloudrivesetup). It's version 2.0 of Photos (go.macworld.com/sierraphotoshandson), the biggest update to Apple's photo-management utility app since it debuted in the spring of 2015.

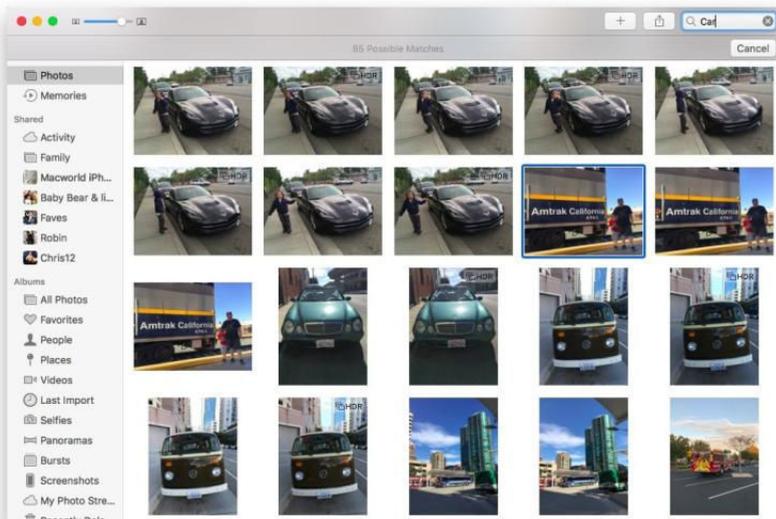
I've been using Photos 2.0 extensively all summer as a part of my testing of macOS Sierra. My six favorite features make Photos almost singlehandedly worth the upgrade to Sierra.

IT CAN FIND A ZEBRA IN A HAYSTACK

Apple spent a lot of time at its Worldwide Developer Conference

this summer promoting the machine-learning algorithm that sits at the heart of Photos for Mac and iOS 10. But you know what? It's awesome. Apple's not the first to go down this path—Google Photos does the same thing—but Apple's doing it on its own devices and not sending any of your stuff to be processed in the cloud.

There's no interface for this



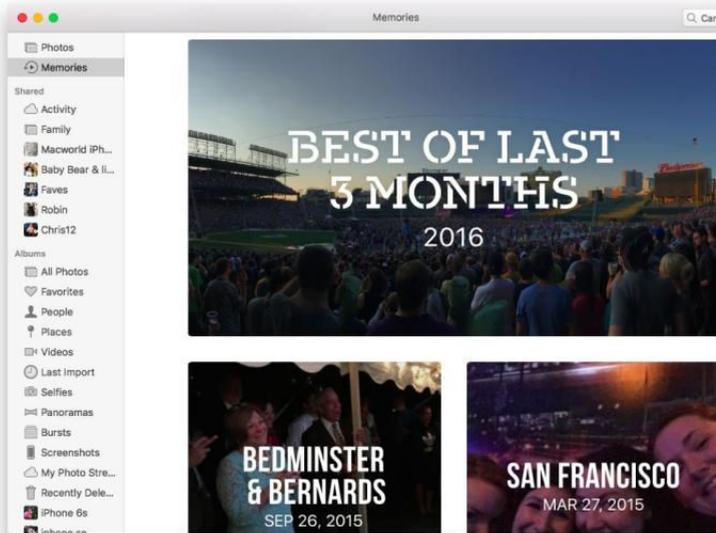
feature. When you upgrade to Sierra, Photos begins indexing your photo library, scanning every picture and detecting any information it thinks it recognizes, whether that's faces, places, objects, you name it. This isn't anything approaching omnipotence—the algorithm is apparently tuned to recognize about 4,000 different items. And it's far from perfect. When I searched for dogs, I got pictures with dogs—and with cats, and no animals at all. But I also got *lots* of pictures of dogs.

Let me give you another cool example. On a whim, I typed Zebra into the search box in Photos. Up popped four photos that I took of a pair of zebras at the San Diego Wild Animal Park a decade ago. Out of more than 10,000 pictures, Photos found the four pictures I took with zebras in them. It's a pretty neat trick. And while it's not perfect, it's a great tool to use to track down an elusive photo in a large library.

IT DUSTS OFF OLD PHOTOS AND MAKES THEM LIVE AGAIN

When Apple introduced iPhoto many years ago, it was the dawn of the age

of digital photography, and the metaphor it used to describe photo management was that of a digital



shoebox. In 2016 it's a couple of dozen shoeboxes with memories spanning decades. That's a lot of photos—and most of them you'll never, ever look at again.

Memories is a feature that aims to change that. Using all sorts of different techniques, Memories gathers up collections of photos and presents them to you as a ready-built trip down memory lane.

Memories mines your recent past. If you take a road trip to Oregon, you are almost certain to see that trip appear as a Memory a few days later.

It'll show you the best of the past week or month. But it'll also dive deep, showing you photos that you took on this date in the past.

It will also use some of the data gleaned from the machine-learning algorithm to come up with fascinating collections. One I saw was called “In Nature,” and featured a bunch of pictures of my kids with various wilderness backgrounds. It pulled out a selection of photos from my son's first birthday.

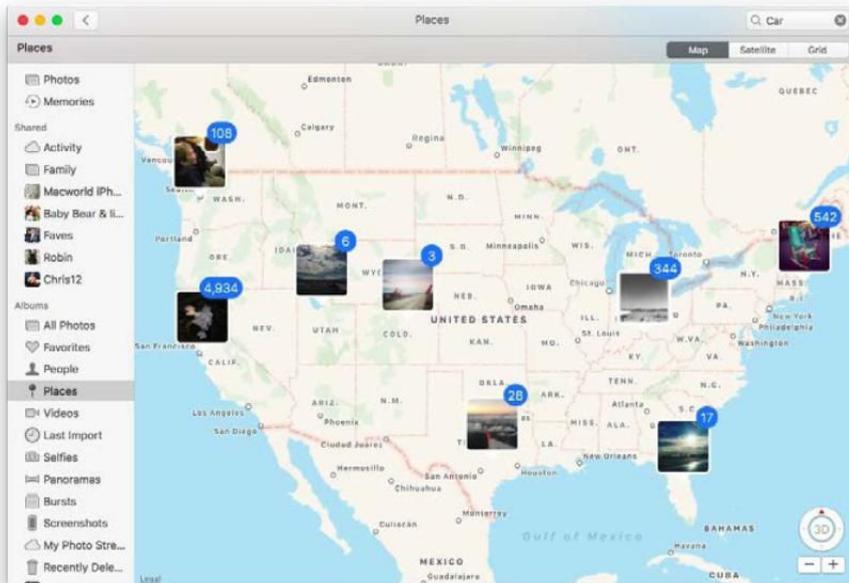
Memories does the job. It surfaces, well, *memories*—photos that I know are in my library, but that I'm rarely (if ever) motivated to view. I admit to getting a little emotional more than

once at the images that Memories chose to show to me. In a good way.

IT SHOWS YOU YOUR PHOTOS ON A MAP

iPhoto had the ability to display all your photos on a map, based on their geolocation data. When Photos was released, this feature was strangely stripped back, so you could only view a map of photos taken at a very specific time.

But now the map is back, and not only can you look at your entire library on a map, but you can also drill down into specific events, albums, and more. In fact, Memories display a map at the bottom, to show



you where the photos were taken.

I love this feature because it lets me relive trips, whether they're large (all the pictures I took in Bermuda) or small (a map of all the different spots where I took pictures during a mile-long beach walk).

IT USES ALL ITS POWERS TO CONNECT MEMORIES

Memories is a great feature, but I'm impressed with the fact that Photos uses all the metadata at its command to generate a list of related memories at the bottom of every memory. A memory featuring my kids at a ballpark in San Diego will generate related memories involving my kids, San Diego, and even *other ballparks*. A memory from a Christmas visit to my mom's house in Arizona generates links to other Christmases, other visits to Arizona, and other trips we've taken with my mom.

This is a subtle side effect of the

fact that a machine-learning algorithm is scanning all your photos: Photos can see what you're looking at, identify what the photos have in common, and generate whole other collections that relate in some way.

IT LETS YOU DRAW ON YOUR PHOTOS

It's silly, but in Sierra, Photos lets you use the Markup extension to edit your photos by drawing on top of them. Silly, yes, absolutely, but sometimes it can be useful! Every now and then I find myself wishing I could draw an arrow to point to something or circle something and send it to a friend. And now, with Markup, I can.

IT GETS ALONG WITH THE APPLE TV

This isn't a Mac feature per se, but with the release of tvOS 10, the fourth-generation Apple TV now has proper access to your iCloud Photo

Library. It can display albums, memories, the works. Apple TV access to your photo library before was pretty sad. But now you can sit down on the sofa, pick up the remote control, and look at your photos on that big living-room TV. ■

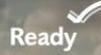


Make sure you

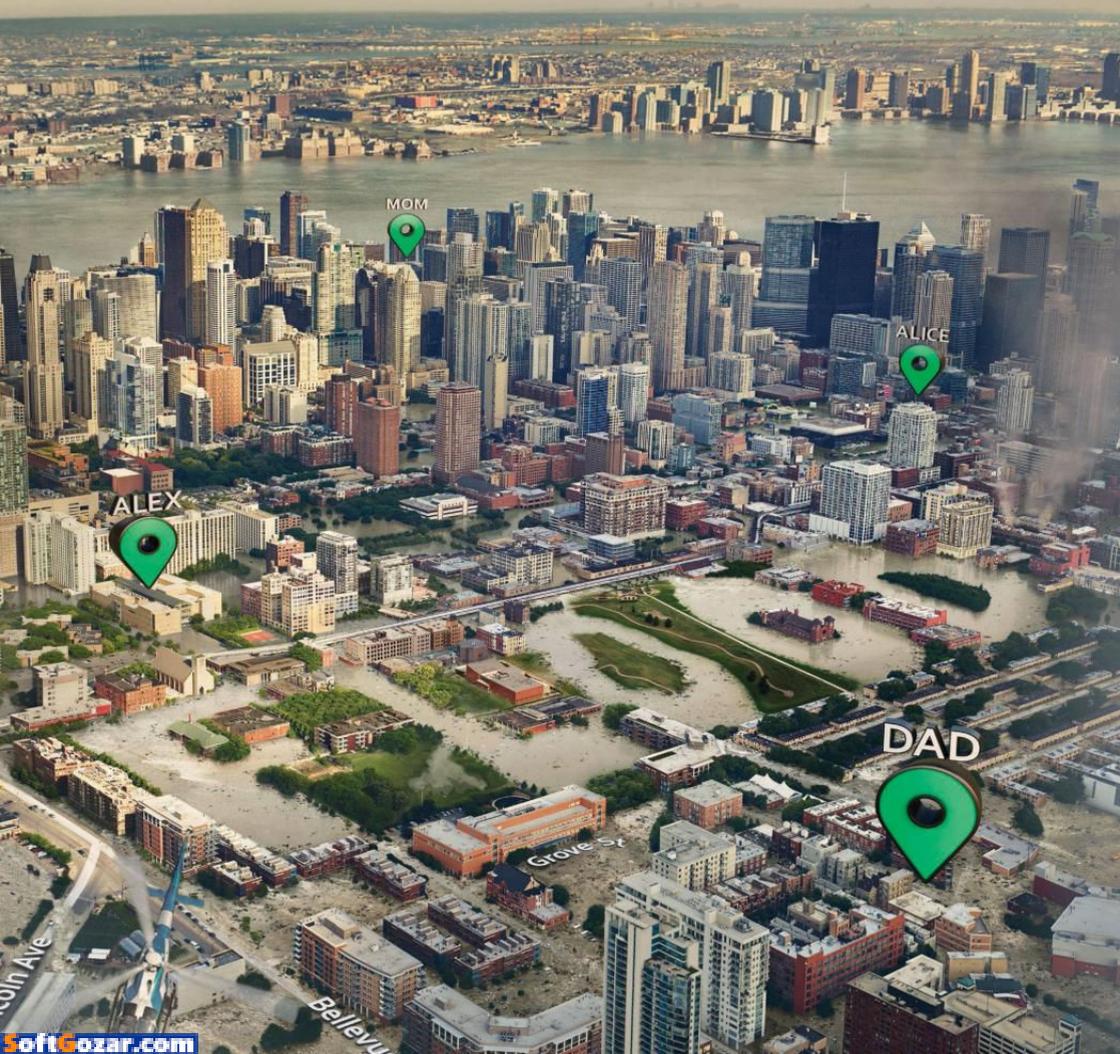
know where to find

your family

in an emergency



START YOUR PLAN AT [READY.GOV](https://www.ready.gov)





7 hidden features in macOS Sierra you may have missed

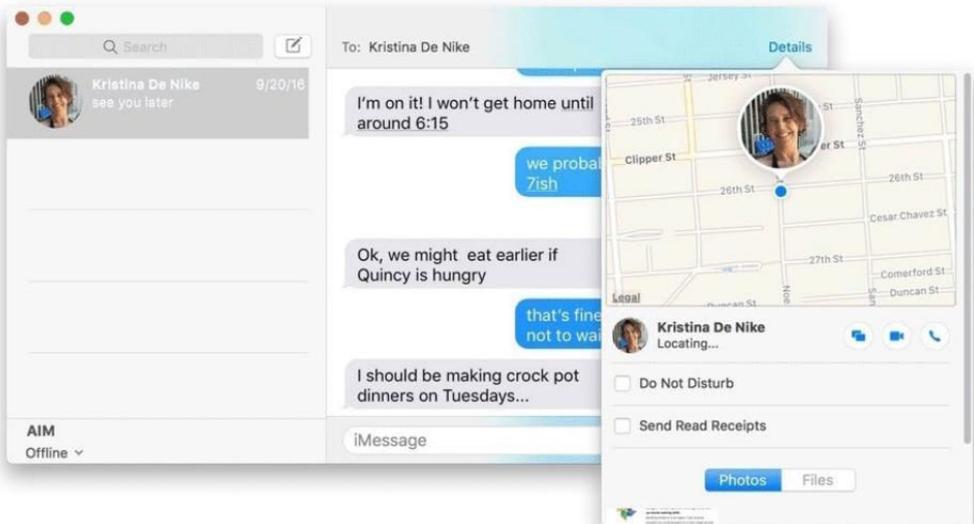
BY ROMAN LOYOLA

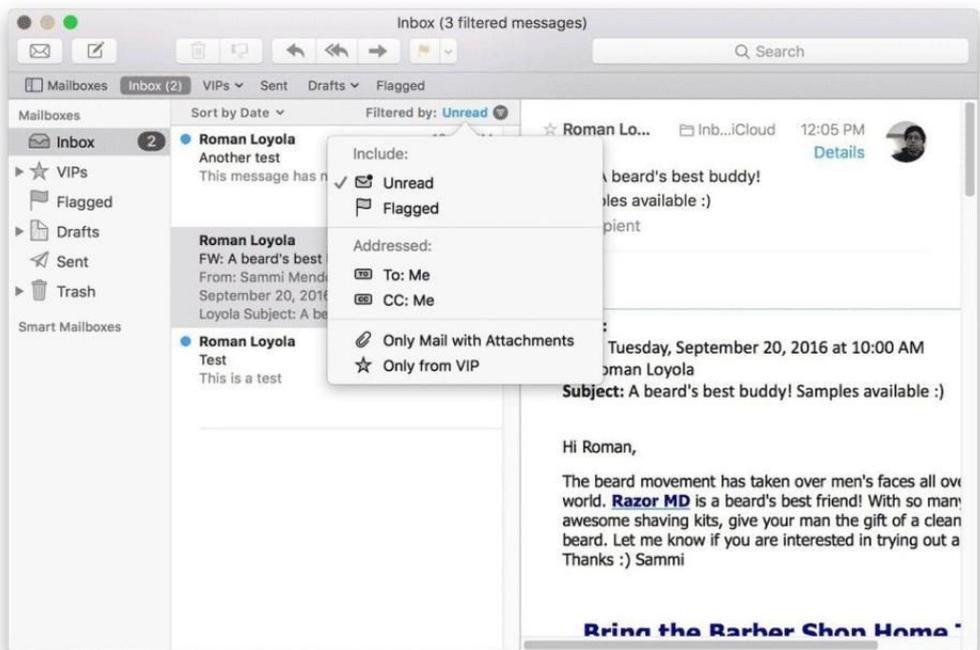
Siri, Universal Clipboard, Auto Unlock with Apple Watch—these are just three of the features that Apple showcases for macOS Sierra, the latest version of the company’s Macintosh operating system that made its debut recently. We go over the marquee features in our review, but there are a few features that go unheralded. We’ll shine a little bit of the spotlight on them in this slideshow. These are less glamorous, but they make your Mac a lot easier to use.

MESSAGES: PER-CONVERSATION READ RECEIPTS

Instead of having Messages send a read receipt for every conversation, you can do it on a per conversation

basis. During a chat session, click on the Details link at the top right of the window. You’ll see information on your chat partner, and below you will find a checkbox for “Send Read Receipts.” Check the box to activate.





APPLE MAIL: QUICK FILTER

In your Apple Mail inbox, you'll see a new icon of a circle with an upside-down triangle of lines. Click on it and "Filtered by" will appear it will filter your email based on what the blue text says. Click on the blue text to adjust the filter.

Reader @dogolaca (twitter.com/dogolaca) points out that the quick filter will not appear if you are using classic view. To turn off classic view, go to *Mail* → *Preferences* → *Viewing* and then uncheck the box for "Use classic layout."

COORDINATED ALERTS

So you're sitting at your Mac, with your iPhone in your pocket and your iPad docked to your Mac, and you get a text message. In the past, you'd get a cacophony of alerts, one from each device. Now, with Sierra and iOS 10, the alert appears only on the device you're using.



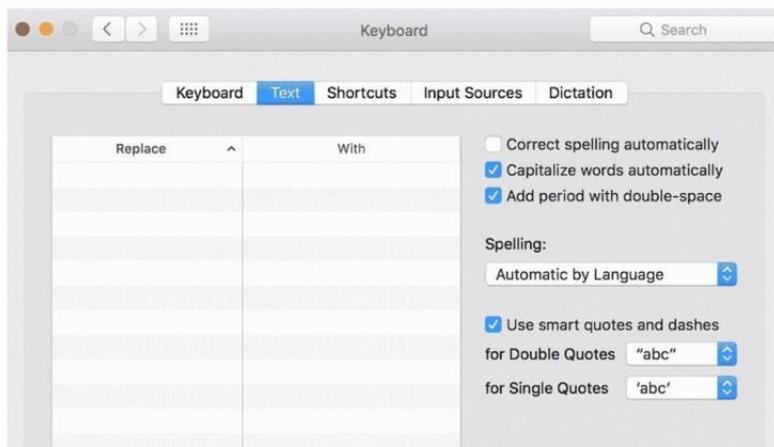
NOTES: COLLABORATION

The Notes app in Sierra has a new feature where you can invite others to edit and write in a note. Next to the Share button on the upper right is a button you can click to "Add people to this note." Invites are sent via Mail Messages, Facebook, Twitter, and other methods.



TIME MACHINE: SMB SUPPORT

Time Machine now includes support for the Server Message Block (SMB) network protocol. That means better compatibility with third-party network-attached storage (NAS) devices.



AUTOCAPITALIZATION AND PERIOD SHORTCUT

In *System Preferences* → *Keyboard* → *Text*, you have two new options: “Capitalize words automatically,” and “Add period with double-space.”

NEW DICTIONARIES

Apple has updated its dictionaries. You can activate the new dictionaries in preferences of the the Dictionary app. The new dictionaries are:

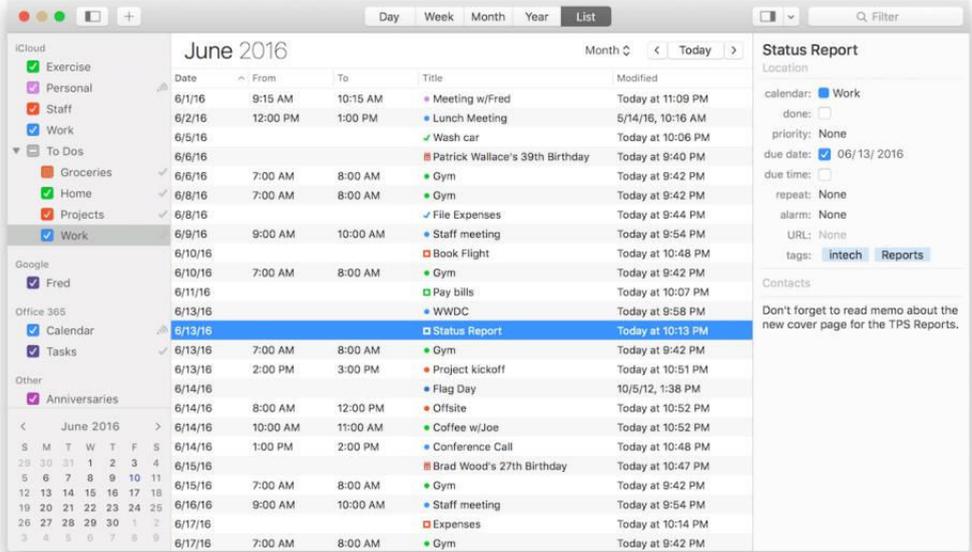
- > Traditional Chinese definition dictionary
- > Danish definition dictionary
- > Italian-English bilingual dictionary
- > Dutch-English bilingual dictionary



OTHER NEW FEATURES IN MACOS SIERRA INCLUDE:

- > Autocorrect is better at learning proper nouns and non-dictionary terms
- > Push email and calendar events for Exchange
- > Right-to-left support for Arabic and Hebrew
- > Safari extensions in the Mac App Store (coming soon)
- > Safari plug-ins enabled per website
- > Spotlight search improvements
- > Transit support in Maps for Nagoya, Osaka, and Tokyo ■





PRODUCTIVITY SOFTWARE

BUSYCAL 3: THE BETTER MAC CALENDAR EXPERIENCE, NOW ON iOS

BY J.R. BOOKWALTER

CRITICS AND USERS alike love to throw shade at those built-in macOS and iOS apps—Mail is often panned for being out of date, most of us don't want (or need) Stocks, and Maps still can't hold a candle to Google Maps, four years after the latter was unceremoniously evicted from iOS 6.

For me, Calendar is the weakest of Apple's built-in apps (with Reminders a close second). While the Mac version is passable

BUSYCAL 3 (iOS)



BUSYCAL 3 (MAC)



PRICE

\$50

enough, the iPhone app is borderline useless, even with the month and list split-screen view enabled.

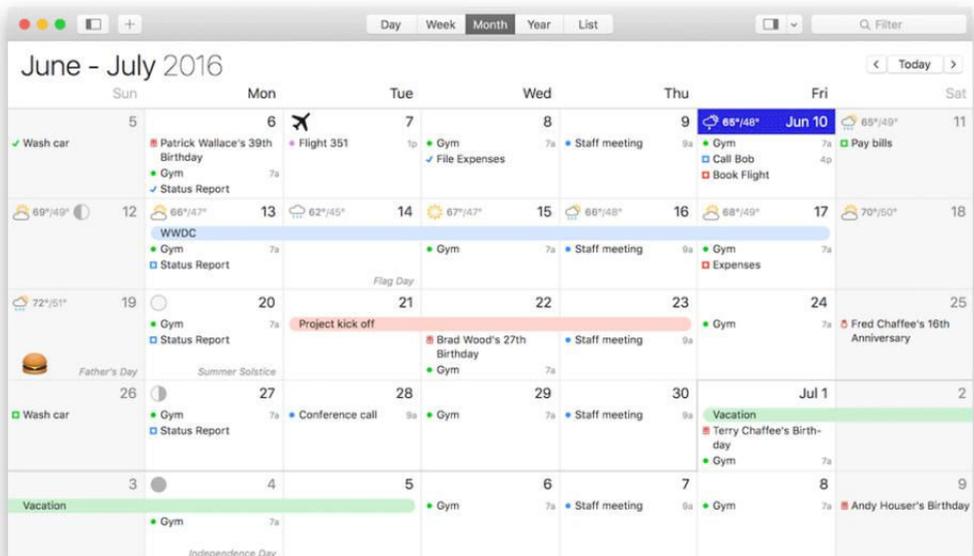
GET BUSY

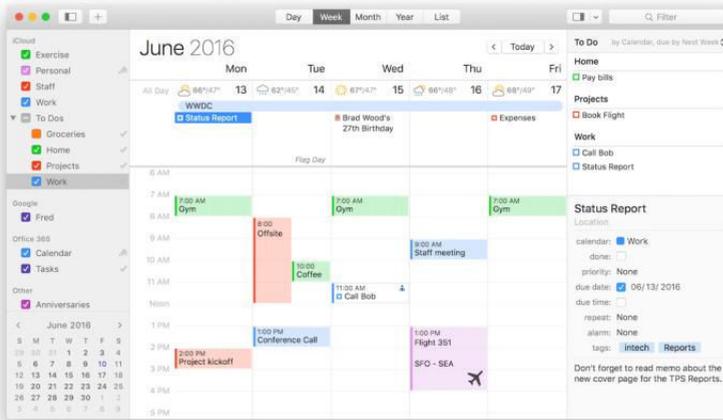
After initially cozying up to the iOS-only Calendars 5 (\$7 on the iTunes Store go.macworld.com/calendars5), I eventually settled on Fantastical 2 (\$3 on the iTunes Store go.macworld.com/fantastical2), despite initial reservations about the lack of a good month view on the iPhone. Occasional bugs with recurring to-dos aside, I've never looked back.

That is, until the recent release of BusyCal 3, a sequel four years in the making. Back in 2012, OS X Mountain Lion 10 and iOS 6 were the latest and greatest Apple had to offer, and BusyCal 2 was a refreshing change of pace from the now widely-scorned skeuomorphic look and feel of Cupertino's gaudy Calendar apps.

At \$50, I didn't pay much attention to BusyCal at the time, although *Macworld* sang its praises in a review (go.macworld.com/busycal2), calling the integration of Calendar and Reminders "far superior" to

BUSYCAL 3 IS back on the Mac and better than ever with big improvements on Apple's built-in Calendar.





THE NEWLY STREAMLINED Info panel along the right-hand side makes BusyCal 3 easier to use on the Mac.

Apple's dual-application approach. And while that's still true today, the folks at BusyMac had their work cut out for them catching up to younger rivals like Fantastical.

For the most part, they've succeeded: BusyCal 3 has been overhauled with a modern user interface that ironically takes more than a few design cues from the Calendar in OS X El Capitan, aside from the Info panel along the right-hand side, the two applications could almost be mistaken for one another.

BACK TO MAC

With version 3.0, BusyCal (\$50 from BusyMac busymac.com/busycal/index.html) plays a bit of catch-up, most notably adding travel time, a feature Apple introduced in the OS X Mavericks edition of Calendar three years ago. If you've used it before, the implementation here is identical: While adding location-based events, BusyCal displays how long it takes to drive or walk there, then uses current traffic conditions to alert you when it's time to leave the house.

This "me too" feature aside, BusyCal 3 delivers impressive enhancements in other areas, such as smooth infinite scrolling for trackpad owners (Calendar now seems downright creaky by comparison), and a revamped Info panel that integrates synced Apple Reminders as a to-do list. To-dos can be assigned specific times or dates, and now appear in the main calendar view alongside regular events.

My favorite feature is the forecast powered by Weather Underground, which displays high and low temperatures for the next 10 days, along with moon phases adjacent to the date. This data is acquired by manually entering a city, a ZIP code, or using your current location, and really helps when trying to plan outdoor activities for the week ahead.

Last but not least, BusyCal 3's menu-bar app has received a makeover, adding a mini-month calendar perched atop a scrolling event list. While it's a welcome improvement, the menu bar is mostly for show and nowhere near as functional as Fantastical, where you can not only add but also edit events without ever opening the main application.

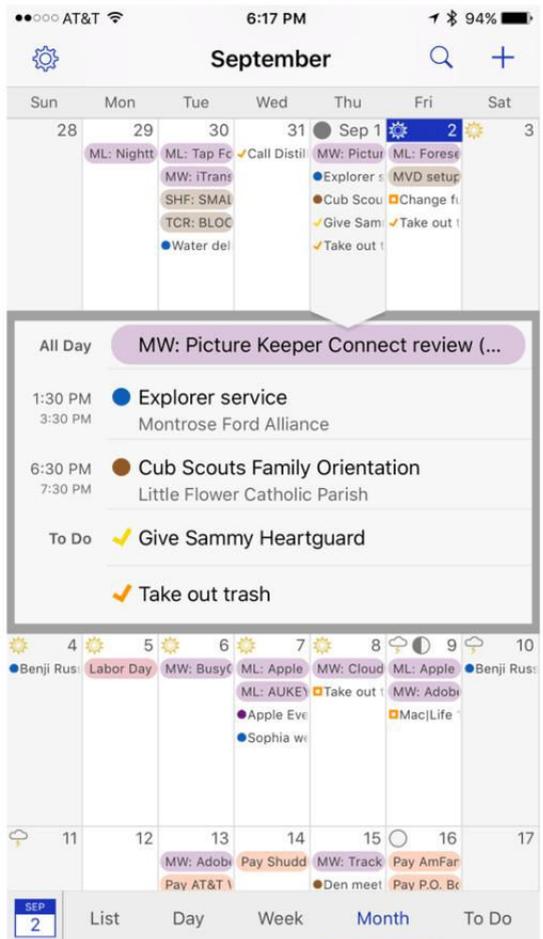
GOING MOBILE

The return of BusyCal is reason enough to celebrate, but this time it's not alone. For the first time, there's now an iOS version as well (\$3 on the iTunes Store go.macworld.com/busycalios). That means Mac users can finally have the same experience across platforms, rather than being forced to use a different calendar on a mobile device.

For the most part, the iOS app is a faithful port of the desktop edition, so there's no steep learning curve. However, it's lacking a Today widget, 3D Touch, and sharing extension support, so it doesn't feel quite feature-complete yet. You also can't sync accounts or settings, a minor inconvenience for those of us with multiple devices.

After missing a good month view on Fantastical, I was quite happy to see one in BusyCal 3, although it feels a little cramped even on my iPhone 6s Plus.

GET AN UP-CLOSE look at an entire day's worth of events while in month view with BusyCal 3 for iPhone.



| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|--|----------------------------|---|---|--|
| 12 Camping | 13 ML: GetSpace review Apple WWDC keynote Explorer service Phone conference Cancel Marvel Unli | 14 ML: FileMaker 15 rev MW: JPEGmini for Pi Pick up Benji | 15 ML: Airmail 3 review | 16 ML: Apple Watch co MW: Streets 3 review | 17 ML: Apple TV colum | 18 |
| 19 MacLife payday Zachary Metz's 23rc Final Universal Orls | 20 Paige phone call | 21 MW: External Editor | 22 HARBINGER QC rep | 23 MW: HoudahGeo 5.0 Tammie Bender-Bill Cancel Sling TV | 24 Meredith Sitko's 30T Garage sale HAPPY LOG QC rep | 25 Garage sale Family get-together |
| 26 Family get-together | 27 Lunch pow-wow | 28 MW: MailButler review | 29 | 30 Layout November w MW: TomTom Bandit CHELSEA QC report Take out trash | Jul 1 Give Sammy Heart | 2 Robert Bookwalter's Old Man birthday d |

Rotating into landscape mode helps, but it's strictly for viewing; you can't add or edit events with the iPhone held this way. I had the opposite problem on my iPad Pro; text is too small and there's a lot of excess white space, but no settings to compensate for either.

There are a few fun flourishes to be found: Emoji and icons added from the Mac's Graphics panel show up on iOS (but you can't add new ones from mobile); when adding a new event, BusyCal 3 conveniently scrolls that date to the top of the calendar for better visibility, briefly animating with a subtle confirmation.

BOTTOM LINE

While I remain partial to Fantastical 2 for its full-featured menu-bar app alone, BusyCal 3 is a winning combination for anyone looking to make a break from Apple's underwhelming built-in apps. ■

BUSYCAL 3 FOR iOS offers a more comfortable landscape view on the iPhone, but sadly you can't add or edit events this way.

WEB DESIGN

RAPIDWEAVER 7: GREAT NEW FEATURES BUT NEGLECTS EXISTING GAPS

BY NATHAN ALDERMAN

RAPIDWEAVER 7 (\$100, \$60 upgrade) offers several smart upgrades to its website-building toolkit. Unfortunately, it also inherits the central limitations of its predecessor. Between the increased price and the features that either aren't present or cost extra, RapidWeaver 7 (realmacsoftware.com/rapidweaver) still lags the competition.



RAPIDWEAVER 7



AT A GLANCE

RapidWeaver 7 is a solid, well-crafted web design program whose excellent additions don't shore up its shaky core.

PROS

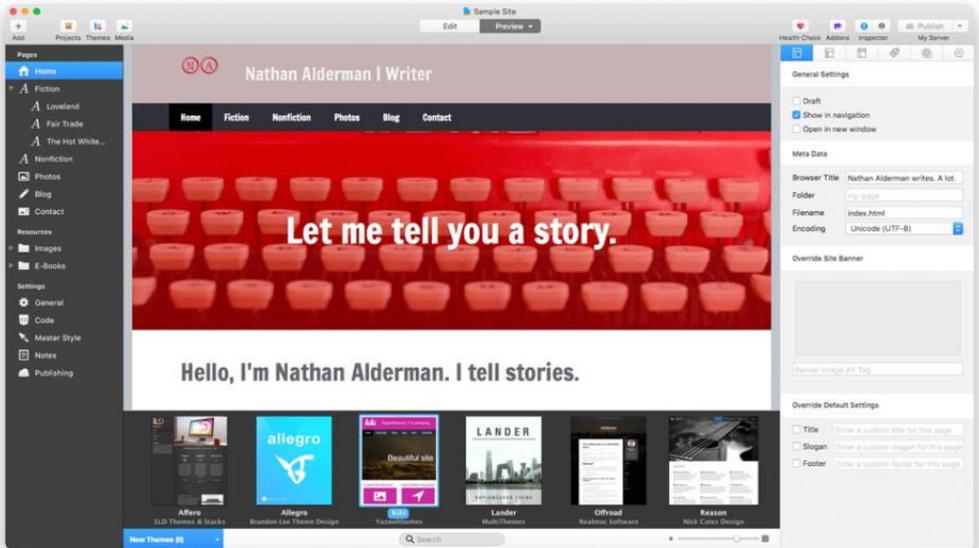
- Four new responsive themes
- Superb, souped-up publishing engine
- Health Check feature helps improve SEO performance

CONS

- Still no WYSIWYG design tools
- Themes render inconsistently on Mac and iOS
- More powerful features only available at extra cost

PRICE

\$99



WHAT'S NEW WORKS WELL

I truly liked the new features in RapidWeaver 7, particularly the SEO Health Check, which scans your site and then guides you through a checklist of steps that will help your site get noticed by search engines more effectively. (One of those steps involves another new feature: the ability to automatically shrink your site's CSS and JavaScript files for faster loading.) Each step is clearly explained, and bringing my sample site up to snuff only took a few minutes.

RapidWeaver's publishing engine was slightly shaky in version 6 but shines here. It's now easy to enter information for multiple FTP servers—including encrypted ones with public key authentication—then swiftly upload to each. I had no trouble firing off files to my FTP server, even when I told RapidWeaver to employ a faster but potentially less stable connection. For each server whose details you enter, the publishing engine can automatically back up your site files to a separate location on a regular basis, or every time you publish the site.

Version 7 builds in easier ways to add Google Analytics, meta tags, and other sophisticated features to your site's code. It also adds live site previews in Safari or the browser of your choice. It'll even automatically

REALMAC'S RAPIDWEAVER 7 offers a sleek, attractive interface and several modern themes for your sites.

find and list all the browsers on your hard drive for you, rather than making you hunt for them. The live preview worked well in my tests, both in Safari and other browsers, bringing RapidWeaver 7 up to parity with many of its higher-end rivals in this respect.

RapidWeaver 7 packages all this, plus four brand-new themes with support for responsive design, which automatically adjusts to different devices' screen sizes, in a slick, professional UI. And version 6's best features haven't gone anywhere, including its excellent and easy tools for making and editing blog entries, photo galleries, and contact forms. Realmac still offers an excellent online knowledge base, and a selection of how-to videos (many free, though even more of them cost money to access).

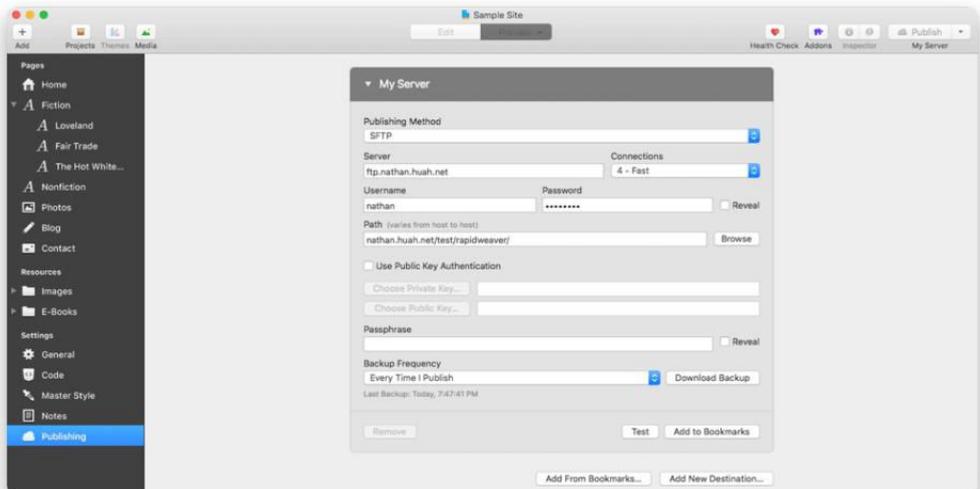
However, a lot of the biggest stumbling blocks from the previous version are still around, too. And some of those new themes aren't all they're cracked up to be.

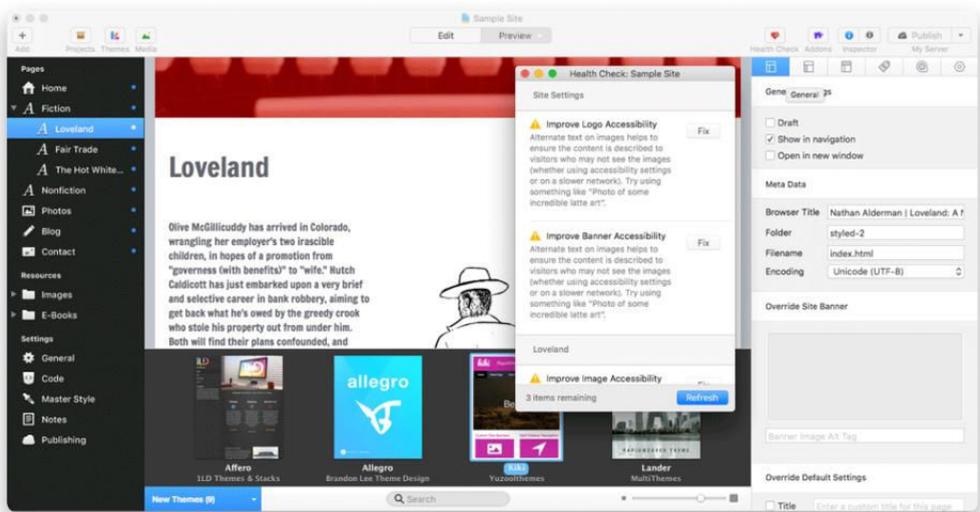
WHAT'S OLDER NEEDS WORK

I'm still not a fan of RapidWeaver's bifurcated approach to building webpages. You add text and images to a blank canvas in the Edit pane,

THE PROGRAM'S BRAWNY

beast of a publishing engine barrels beautifully through even the beefiest of uploads.





then switch to Preview to see how they look in your finished template. This makes it easier to switch templates and try different designs. But you can never view and edit your prospective site simultaneously.

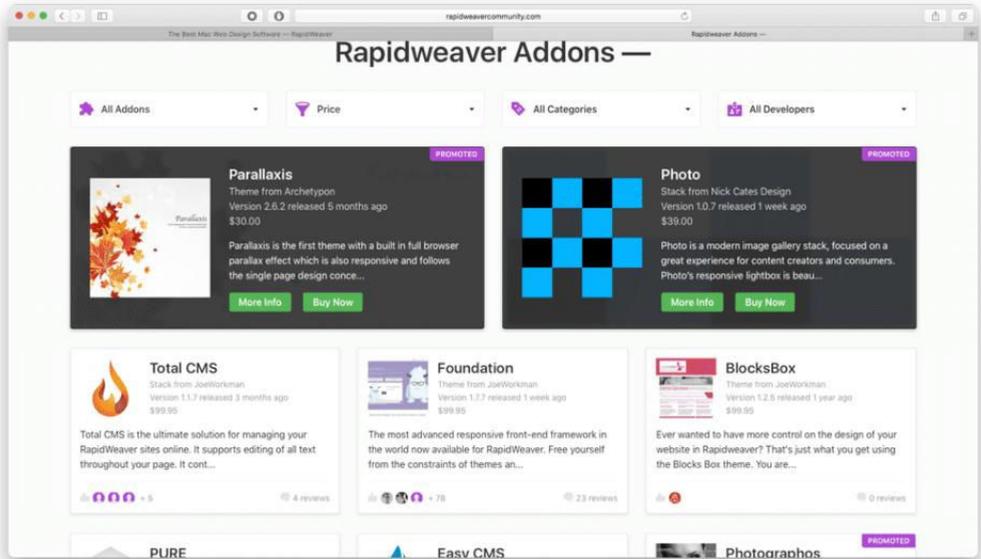
Though some of the new themes look especially great, there's still only so much you can do to customize them, mostly involving swapping colors or a limited selection of different fonts. If you want a sidebar on any page of your site, it'll have to be on every page; I couldn't find a way to toggle that feature on a page-by-page basis.

Most troubling, even my two favorite new themes had crucial flaws. For no reason I could find, Kiki's navigation wouldn't display a submenu under one section of my site, rendering those pages effectively invisible. And Voyager looked sharp and appealing on my Mac but rendered poorly on my narrow iPhone screen.

Finally, RapidWeaver's biggest strength remains its greatest hindrance. Realmac's cultivated a thriving marketplace of third-party add-ons for the program, including some that add powerful layout features and other valuable abilities. But you'll have to pay up for them; some of the most popular ones cost \$50 or more.

Several of RapidWeaver's competitors already incorporate similar features. They may not be as sophisticated, but they don't cost you

A FRIENDLY SEO Health Check walks you through easy ways to improve the odds that search engines will see your site.



extra. I can understand why Realmac wouldn't want to alienate its developers by duplicating their work in the main program's feature set. But for users who don't want to keep opening their wallets (or can't afford to) the current approach leaves RapidWeaver feeling hobbled in comparison to many of its rivals.

BOTTOM LINE

What RapidWeaver 7 does well, it does really well. And if you're willing to spend two or even three times its initial cost for add-ons, you could probably build a magnificent website-building behemoth upon its not-entirely-bare bones. But I can't give the program an unqualified recommendation when so many of its rivals do more and cost less without requiring additional purchases. ■

RAPIDWEAVER ENJOYS a robust ecosystem of third-party add-ons, but some cost as much as the program itself.



DICTIONATION SOFTWARE

NUANCE DRAGON PROFESSIONAL INDIVIDUAL FOR MAC 6.0: BETTER PERFORMANCE AND ACCURACY

BY KIRK McELHEARN

ANOTHER YEAR, ANOTHER upgrade to Nuance's Dragon (go.macworld.com/nuance) (\$300; \$150 upgrade), their speech recognition solution. I reviewed version 5 last year, pointing out that "Dragon offers some of the biggest changes since this software was first introduced, both under the hood and on the screen."

Building on the changes made to the speech recognition engine in Dragon 5, Nuance has improved Dragon's performance across the board. Boasting improvements in accuracy of either 15 or 24 percent (the company has cited both of these numbers), Nuance claims that Dragon offers "up to 99% recognition accuracy." Naturally, "up to"

DRAGON PROFESSIONAL INDIVIDUAL FOR MAC 6.0, ENGLISH



AT A GLANCE

Dragon's speech recognition is so powerful and accurate that it will change the way you use your Mac.

PROS

- Can mix dictating and typing in certain applications
- Better overall performance
- Increased accuracy

CONS

- Pricey

PRICE

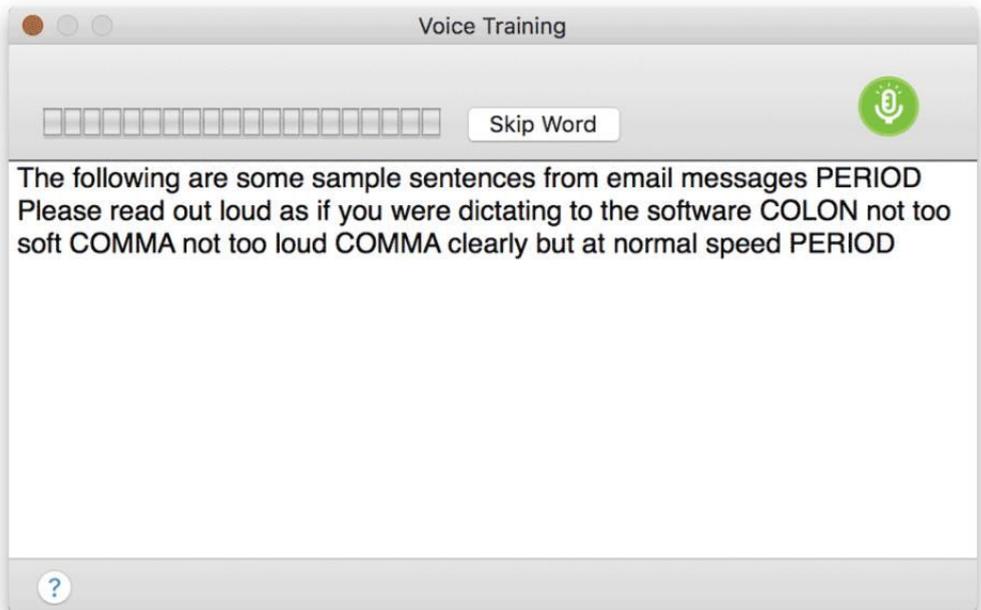
\$300

covers a wide range of results, but this version of Dragon does seem more accurate than version 5.

Nuance claims that this version of Dragon leverages “deep learning” to improve accuracy. Reading about this technology, it seems like a more powerful extension of the way Dragon already created speech models for each user. In my testing, I created a new profile and it did seem that Dragon was more efficient out of the box, with the briefest voice training, than with previous versions. It’s not perfect and probably never will be, but it seems to get better every year.

I’ve been using Dragon 6 for several weeks, and I’ve been impressed by this accuracy. I would be hard pressed to find an improvement of a double-digit percentage, but I find that I’m correcting fewer small words: prepositions, adverbs, or articles. That may not sound like much, but if you dictate often, you understand that correcting those little words takes as much time as any other correction.

DRAGON IS VERY accurate after doing only the basic setup, but more advanced voice training helps it improve your profile.



Visually, Nuance has simplified the Dragon interface. The status bar is smaller, and the correction window is separate, making these two items easy to position on your screen.

The company has improved formatting for numbers, times, and amounts, which can save time. And the transcription process—when you use Dragon to create text from a recording—is simpler.

MIXING TYPING AND DICTATING

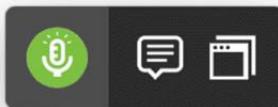
The biggest change in Dragon 6 is the ability to mix dictating and typing in certain applications. Dragon for Mac was never very happy when you combined dictating in the same document, except with just a couple of apps.

In the past, if you dictated a couple of sentences, then typed or pasted something, Dragon lost track of the text and the position of the cursor in the document, making it harder to edit text.

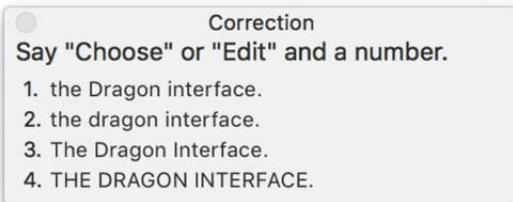
You can get over this by saying “cache document” every time you made a change; Dragon quickly reads through the entire document to know where all the words are.

In the new version, Dragon takes advantage of Apple’s accessibility framework to insert text into documents more quickly, and to keep track of what words are in a document, and where. With version 5, every time you paused after saying something, you would see the text appear on the screen one letter, one word at a time, very quickly. But now, with apps that correctly use the accessibility framework, Dragon actually pastes the text, the entire utterance, in one go. This makes dictation much faster, as long as you’re using an application that supports this, such as TextEdit; the most recent versions of Pages, Numbers, and Keynote; Scrivener; Messages; Microsoft Word; Outlook; and others. You can see a list of such applications here (go.macworld.com/nuanceapps).

Dragon 6 was designed in such a way that if a new application supports the accessibility framework it can automatically allow you to dictate and type, and insert text quickly. You won’t need to update Dragon in order to benefit from this.



DRAGON'S INTERFACE
IS minimal in this
new version.



Nuance has long recommended that one use a microphone designed for speech recognition, and, in the past, I did so. But for my tests with Dragon 6, I used a microphone that I bought for podcasting, the Rode NT-USB. The results with this microphone are nearly as good as what I have seen in the past with microphones specifically designed for speech recognition. You can even use your Mac's internal microphone; the results aren't quite as good, but they are much better than you might expect.

My only criticism of this version of Dragon is the price. While \$300 is a fair price for an app that does what Dragon does, I feel that \$150 is pretty steep for an upgrade, especially if you just bought version 5 last year, or even a few months ago; at the time, the app cost just \$200. For non-professional users, this is a pretty steep price, and is likely the most expensive app on their Macs.

BOTTOM LINE

Despite the price, I wouldn't want to be without Dragon. I don't dictate all of my work, far from it, but I take advantage of Dragon's powers to change the way I work several times a week. Instead of leaning over my keyboard, I sit back, relax, and talk to my Mac. And my words appear on screen. That's pretty magical. ■



**The "It's Only Another Beer"
Black and Tan**

8 oz. pilsner lager
8 oz. stout lager
1 frosty mug
1 icy road
1 pick-up truck
1 10-hour day
1 tired worker
A few rounds with the guys

Mix ingredients.
Add 1 totalled vehicle.

**Never underestimate 'just a few.'
Buzzed driving is drunk driving.**



AUDIO

ULTIMATE EARS MEGABOOM BLUETOOTH SPEAKER: BUILT TO BE THE LIFE OF THE PARTY

BY THEO NICOLAKIS

ULTIMATE EARS SLAMMED down the gauntlet with its Megaboom portable Bluetooth (go.macworld.com/megaboomamz) speaker. This loud-and-proud, thoroughly weatherized speaker produces enough sound to fill the average backyard, and it comes with a richly featured app that will make it the life of any party.

A pair of 2-inch full-range drivers and dual 2-by-4-inch passive radiators in a cylindrical enclosure create a near 360-degree sound field. The 1.93-pound speaker comes with a plastic carrying case that makes it easy to take just about anywhere, and its built-in rechargeable battery is rated to last up to 20 hours.

Large plus and minus buttons on the Megaboom's face let you raise or lower in the volume manually. Its cap ends are rubberized,

ULTIMATE EARS MEGABOOM BLUETOOTH SPEAKER



AT A GLANCE

Big sound and a richly featured app will make this speaker the life of any party.

PRICE

\$300

with the top end carrying the unit's power and Bluetooth-pairing buttons.

Remove the waterproof gasket on the bottom of the speaker and you'll find its micro-USB charging port and a 3.5mm aux input for analog audio sources. With that gasket in place, The Megaboom is rated IPX7, meaning it's certified as waterproof when submerged in up to three feet of water for up to 30 minutes. (The X in that IP code means it's not rated for particle ingress; but if it can withstand being submersed in water, what harm could dust do?)

The Megaboom isn't a Wi-Fi speaker, but its range sure makes it feel like one. That's largely because it's outfitted with Class 1 Bluetooth radio rated for line-of-sight wireless range of 100 feet. You'll get less than that in the real world, where physical obstacles will be between your smartphone or tablet and the speaker, but most of its competition is outfitted with Bluetooth Class 2 radios rated for a range of about 30 feet.

You can pair two Megabooms simultaneously, reducing the frustration many of us have had with older Bluetooth devices that must be paired one at a time. And support for NFC (Near Field Communication) makes pairing even easier—just tap the source against the speaker and you'll

THE UE MEGABOOM can withstand being dunked in up to three feet of water for up to 30 minutes, yet its mesh speaker grill is sonically transparent.



never have to drill down into your device's control panel.

The Megaboom has a built-in microphone, so you can use it as a speakerphone when paired with your smartphone. It won't put conference-room vendors out of business, but I used it while on vacation for a conference call and it worked as advertised.

An Android and iOS app adds even more functions, including the ability to customize the color of its user interface to match the speaker—a cool attention to detail. Three other features are particularly noteworthy: an alarm clock, EQ customization, and a Double Up mode. You can configure the Megaboom to serve as a one-time or daily alarm clock, playing either your favorite song or whichever song played last.

Since your room plays a major part in how a speaker ultimately sounds, the Megaboom's EQ allows you to tailor the speaker for the particulars of its playback environment. You can apply extra bass when you're using the speaker in a wide-open space such as your yard, for example; and there's a small-room EQ setting that tamps down those lower frequencies when you're using the speaker in a small room. If you really want to get down to brass tacks, you can create custom EQ settings to your heart's content. I found that this feature did an admirable job addressing characteristic problems in both open spaces and when I placed the Megaboom against a wall.

Removing the gasket on the Megaboom's bottom reveals the micro USB charging port and 3.5mm analog input. The gasket must be re-secured for the Megaboom to maintain its water-resistant rating.

Double Up allows you to pair two UE Megaboom speakers together. You can configure them to function as a stereo pair (great for outdoor movie night) or as a mirror of each other, which will allow you to fill even



REMOVING THE GASKET on the Megaboom's bottom reveals the micro USB charging port and 3.5mm analog input.

larger spaces or pump up the volume. This feature isn't intended to serve as a multi-room wireless option, as Bluetooth signals aren't typically good at penetrating walls, but you could give it a shot.

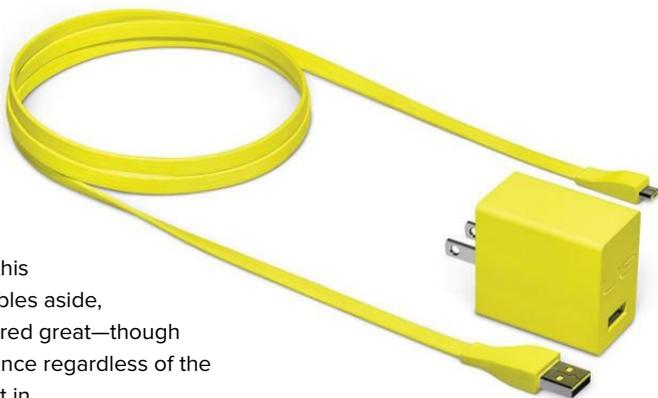
STORMING THE CASTLE

If you were to turn the Megaboom on its side and use it as a battering ram that would pretty much sum up the speaker's take-no-prisoners approach to music. Small rooms, big rooms, open spaces—the Megaboom will easily fill them with sound. No matter how loud I cranked the Megaboom—to ear-piercing volume levels, really—in my large dining room/living room space, this speaker never broke a sweat or surrendered under the weight of extreme harshness or compression. It's 360-degree design also does a remarkable job of reducing off-axis coloration.

The Megaboom's sound does accentuate the bottom end. Because of its cylindrical design, it doesn't have the precise, pinpoint imaging and open mid-range that some of its competition in this price range deliver. Those quibbles aside, this speaker consistently delivered great—though not textbook perfect—performance regardless of the environmental conditions I put it in.

Sitting on a camping facility deck in New Hampshire, my wife and I listened to several jazz, rock, and classical albums. I ran through my standard repertoire of songs for this review and whether it was Adele, Tom Petty, Dido, Patricia Barber, or Norah Jones, the Megaboom performed consistently, effortlessly filling the vast outdoors with music.

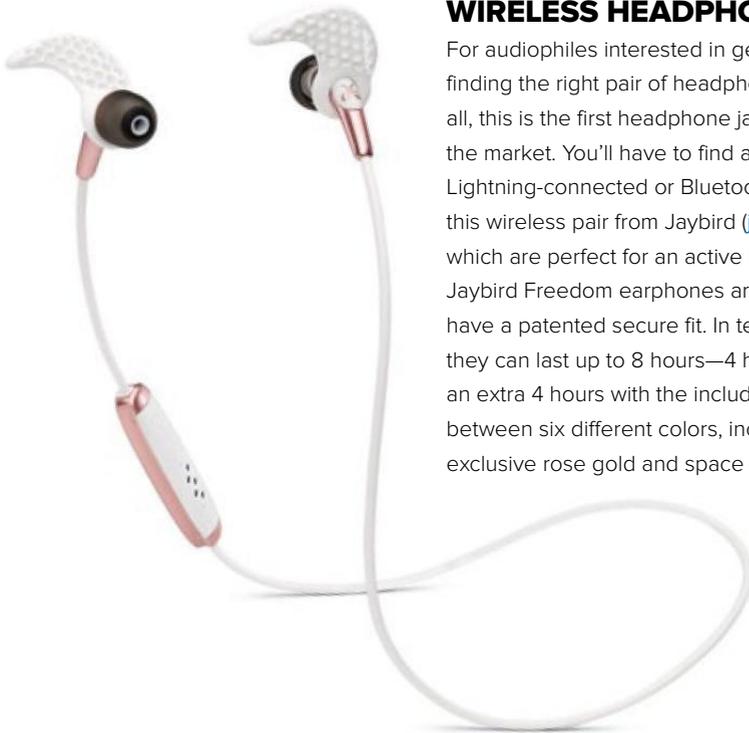
The Megaboom rocks. It's almost perfect balance of design, sound, and features make this one of the best all-around, portable Bluetooth speakers on the market for in-home or outdoor audio. ■



THE MEGABOOM CHARGES via a standard micro-USB cable. Thanks to its vibrant color, you won't lose the included cable and wall adapter on the beach or in the backyard.

Hot Stuff

What We're
Raving About
This Month



JAYBIRD FREEDOM WIRELESS HEADPHONES

For audiophiles interested in getting the iPhone 7, finding the right pair of headphones is essential—after all, this is the first headphone jack-less iPhone to hit the market. You'll have to find a pair that's either Lightning-connected or Bluetooth-compatible. We like this wireless pair from Jaybird (jaybirdsport.com), which are perfect for an active lifestyle. The \$199.95 Jaybird Freedom earphones are sweat-proof and have a patented secure fit. In terms of battery life, they can last up to 8 hours—4 hours on their own, and an extra 4 hours with the included charging clip. Pick between six different colors, including Apple's exclusive rose gold and space grey.—OSCAR RAYMUNDO

BELKIN LIGHTNING AUDIO + CHARGE ROCKSTAR ADAPTER

Belkin's latest adapter—the \$40 Lightning Audio + Charge RockStar (belkin.com)—solves a major iPhone 7 issue: It allows you to listen to music with your Lightning-based headphones and charge your phone at the same time. This device plugs into your iPhone's Lightning port, and includes two Lightning ports on the other end to plug in your EarPods and your charging cable. The adapter works with all Lightning Audio products—not just Apple's—and is also compatible with all iPhone 7 cases. It also works with battery packs and cases, including Apple's iPhone 7 Smart Battery Case. It doesn't have a traditional 3.5mm headphone jack, so if you want to use an older pair of headphones, you'll still need that headphone adapter from Apple. **—LEAH YAMSHON**



ZAGG RUGGED BOOK KEYBOARD CASE FOR THE iPad PRO

For a certain kind of user, Zagg's \$150 Rugged Book for the 9.7-inch iPad Pro (zagg.com) could be a very desirable tablet case. At 2.6 pounds and just shy of an inch thick, the Rugged Book laughs in the face of the iPad's minimalist design. The case surrounds the iPad Pro and the case's keyboard with steel plates and polycarbonate, sandwiched between layers of soft, shock-absorbing silicon. This combination of materials not only provides a ridiculous amount of protection for your expensive tablet but also provides the weight required to keep the iPad Pro in place when you're using the keyboard, in almost any position. Despite its weight and a few disappointing shortcomings—namely, it connects over Bluetooth instead of the Smart Connector, and you can't properly pair your Apple Pencil with it—the Zagg Rugged Book is a better-than-average backlit keyboard. —SEAMUS BELLAMY





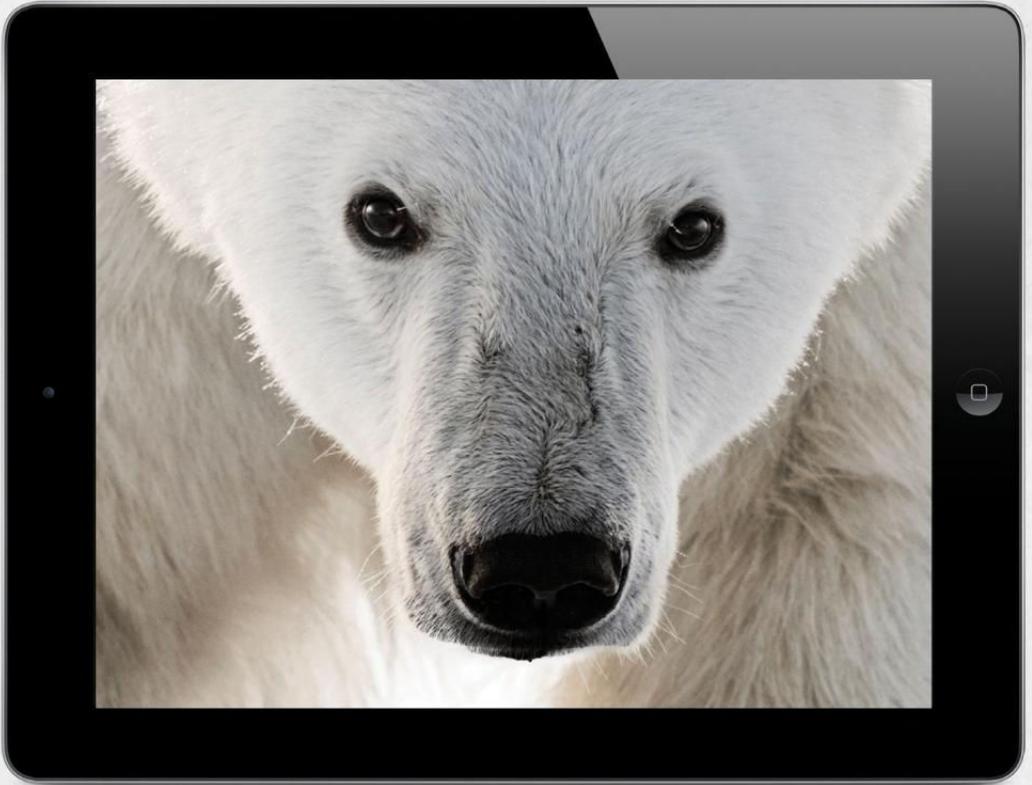
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Blow up: iPhone 7 Plus uses digital zoom instead of optical more often than you'd expect

With the maturity of the smartphone market, Apple may be taking a different approach to upgrading iOS.

BY GLENN FLEISHMAN



When you use the built-in Camera app, the iPhone 7 Plus doesn't act like it has two distinct cameras each with its own lens. Rather, it shows you a single virtual camera that combines input from two lenses. This is abundantly clear when you use the clever method (suggested by colleague Aurélien Chevaleyras) of holding your finger over one lens or the other to see what's really going on. It may surprise you!

I performed a number of tests, some of which you can see in this article, in labeled comparisons. And I found that iOS makes a lot of decisions on your behalf to obtain the best-lit photo that has the least blurriness and the least sensor noise, rather than the highest resolution. In other

words, it favors a good digitally zoomed image over an objectively bad picture, because the goal is to give you a shot you like. It's only when you blow the photo up (or look at it on a 4K monitor) that you're revealing enough resolution to spot the difference.

PORTRAIT MODE (seen here on the right) is in beta, but it automatically captures a "normal" image too (left), so you don't lose out on any shots by experimenting with it.



Let me repeat that: it'll blow up pixels if they're better than noisy ones.

For serious photographers, I've just stabbed needles in your eyes. But this explains why Apple has made the mostly unfiltered sensor data available to camera and photo-editing app developers. Digital zoom will never be good enough for pros, and third-party apps will expose the raw data they want.

HOW 2x WORKS ON IPHONE 7 PLUS

Apple described the iPhone 7 Plus's camera system at length during the September 7 keynote address, but it barely scratched the surface. As I wrote at the time, there's a lot more exploration to come (go.macworld.com/7plus2cameras) from Apple and third parties with computational photography, which combines multiple exposures or lenses or both to produce synthesized images and video. Apple's soft-focus-background (or "bokeh") Portrait mode for the iPhone 7 Plus, which just entered the beta stage as part of iOS 10.1, is just the first effect of this sort we'll see.

I also wrote recently about how third-party developers' first passes at iOS 10 (go.macworld.com/camera apps) tapped into saving unfiltered image sensor data (RAW files in DNG format) on several iOS devices and wide-color gamut images on the

TAKEN WITH THE iPhone 6s, no zoom.



TAKEN WITH THE iPhone 7 Plus at 1x, which used the 4mm wide-angle lens.



TAKEN WITH THE iPhone 7 Plus at 2x, but the Camera app used the 4mm wide-angle lens with 2x digital zoom.



iPhone 7 and 7 Plus (and 9.7-inch iPad Pro). That’s an important aspect, given how locked down the Camera app is about making choices for a photographer. (Curious about the exact capabilities of the cameras in these and other iOS devices? Apple has a very detailed breakdown with charts go.macworld.com/cameraspecs.)

On the iPhone 7 Plus, a zoom button now appears in the Camera app that you can tap to switch

between 1x and 2x. You can also hold and drag that button to adjust zoom between 1x and 2x or beyond, and use the old pinch-and-expand gestures to change zoom as well. The Camera app produces a JPEG that’s saved to the Camera Roll in the wide-color P3 gamut. (You’ll get a second image if you’re shooting in HDR and you have *Settings* → *Camera* set to retain the original photo along with the HDR version.)

TAKEN WITH AN iPhone 6s, with no zoom.



TAKEN WITH IPHONE 7 Plus with 1x zoom, which uses the 4mm wide-angle lens.



TAKEN WITH THE iPhone 7 Plus at 2x, which in this case did use the 6.6mm “telephoto” lens, for true optical zoom.



TAKEN WITH THE same camera and settings as the image on the left, but the house is in focus here (permission given).



TAKEN WITH AN iPhone 6s, with no zoom.



TAKEN WITH IPHONE 7 Plus with 1x zoom, which uses the 4mm wide-angle lens.



STEPPING BACK A bit, this was taken with iPhone 7 Plus at 1x, which uses the 4mm wide-angle lens.



TAKEN WITH IPHONE 7 Plus at 2x, which used the 4mm wide-angle lens with 2x digital zoom.



It was clear from the keynote demo and explanation that interpolations between 1x and 2x would involve some kind of computed mix of the two lenses, and above 2x would be a better but still obvious digital zoom. However, it wasn't known until afterward that 1x and 2x don't always precisely hew to the

4mm (28mm equivalent) and 6.6mm (56mm equivalent) lenses.

In the camera apps article noted earlier, I cited Apple's developer documentation, which says that the iPhone 7 Plus supports "automatic switching between cameras to obtain a higher-quality image for the current combination of zoom factor, light

level, and focus position.”

Every image from what the EXIF metadata calls the “iSight Duo” camera involves some set of choices. In good light for images more than a few feet away, 1x and 2x should correspond to the wide-angle and telephoto lenses. In every other set of conditions, some mix or swap is being used. Chevaleryrias’s finger-over-lens technique reveals a lot, coupled with examining the EXIF data

in Photos or in other software that reveals the more detailed settings.

Here’s my analysis of the choices the software makes:

- > For 1x photos, the wide-angle 4mm lens appears to be used without exception. I can’t find any case yet in which telephoto data is added in.
- > For 2x photos in good lighting, the telephoto 6.6mm lens is used for detail, but luminosity seems derived

TAKEN WITH AN iPhone 6s, with no zoom.



TAKEN WITH THE iPhone 7s with 1x zoom, using the 4mm wide-angle lens.



TAKEN WITH THE iPhone 6s, no zoom.



TAKEN WITH THE iPhone 7 Plus at 2x, which used the 4mm wide-angle lens with 2x digital zoom.



from the 4mm lens: when I covered the wider lens with my finger, the telephoto image blew out with brightness. Because the 4mm lens captures lower levels of light better, this may be used to ensure pictures aren't muddy in dark areas.

> For 2x macro shots and photos closer than about a foot, where the 6.6mm lens can't focus, the 4mm lens is used exclusively.

> For 2x in low-light conditions, when a slow shutter speed needs to be used, the 4mm lens is used exclusively.

> For shots between 1x and 2x, even though Apple discussed intelligent interpolation, in my testing it's always a digital zoom from the wide-angle lens.

The last one makes a lot of sense, because the larger aperture ($f/1.8$) of the 4mm lens lets in more than twice as much light as the smaller diameter one ($f/2.8$) of the telephoto. (F-stops are measured on a non-arithmetic scale, because they describe the ratio of the circle iris opening that lets in light on a camera. A larger number [$f/2.8$] means a smaller opening relative to the lens size, letting in less light.)

The optical image stabilizer (OIS) built into the wide-angle lens provides an additional advantage, because reducing the motion of a camera allows a slower shutter speed without making an image

TAKEN WITH THE iPhone 6s, no zoom.



TAKEN WITH THE iPhone 7 Plus at 1x, which uses the 4mm wide-angle lens.



TAKEN WITH THE iPhone 7 Plus at 2x. This time, the Camera app used the 6.6mm "telephoto" lens with 2x optical zoom.



blurry; a longer exposure lets in more light. It's the equivalent of having a wider-aperture (lower f-stop) lens. The 4mm lens with OIS in low light might be able to let in the equivalent of four times as much light as the 6.6mm lens. (Things moving in the frame will still be blurry at slow shutter speeds, but still or relatively still objects get the OIS advantage.)

This was easy to see in a twilight shot I took in which I was able to get the Camera app to switch to the telephoto by taking a few shots in succession. The 2x digital zoom photo below (left) taken by the wide-angle lens shot at what it reported as 1/15th of a second shutter speed and an effective ISO of 40. The 2x optical telephoto shot a moment later (also seen below, on the right) was ostensibly faster, at 1/60th of a second, but pushed way up to an ISO of 800 or 640 on different shots.

At that equivalent "film speed," you typically get a lot of speckling and noise. But because I was shooting at a transition, the bottom half is effectively black, and only the top has tonal values. It's arguably slightly better because of less banding in the twilight gradation. If I had shot RAW, I could have cleaned it up very nicely.

I've found some interesting edge cases where you can watch the iPhone 7 Plus snap between the two lenses as you tap to change focus above 1x mode. This is most noticeable when you're closer than a foot away with an object in the foreground. Tap to focus on the near person or object, and the wide-angle often takes over, using 2x digital zoom. Tap on the background object, and you'll see a jump as the primary image previewed leaps to the telephoto lens.

While I haven't mentioned the 2x to 10x digital zoom yet, it's actually

TAKEN WITH THE iPhone 7 Plus at 2x, which used the 4mm wide-angle lens with digital zoom. PHOTOS BY GLENN FLEISHMAN



TAKEN WITH THE iPhone 7 Plus at 2x, which used the 6.6mm telephoto lens with optical zoom.



quite good relative to the single-lens alternatives in the iPhone 7 or previous iPads and iPhones. Because 5x is only a 2 1/2 magnification of the telephoto lens in good lighting, and the wide-angle contributes information, you get something that looks substantially less artificial.

PUTTING IT INTO PRACTICE

How can you take the best photos with an iPhone 7 Plus? Plan wisely, so you can work with, instead of against, the camera systems.

Shoot at 1x instead of digital 2x.

In all the conditions noted earlier in which you know a 2x digital zoom will be used instead of the 2x optical, you can opt to set magnification to 1x and then crop later. You won't get a worse result, and the details will be sharper. You can also use third-party software to extrapolate a higher-resolution image, if you need it for some purpose, and control that effect.

Tap for exposure and focus, and even to lock it. You know that tapping on a spot in the Camera app uses the contents of that square to re-weight the image's exposure and re-focus. That's even more critical with the 7 Plus, because so much of how it chooses its lens combination has to do with lighting conditions (inside and out) and near/far focus. If possible, hold down to perform an auto-lock on exposure and focus, and

TAKEN WITH THE iPhone 6s, no zoom.



TAKEN WITH THE iPhone 7 Plus at 1x, which uses the 4mm wide-angle lens.



TAKEN WITH THE iPhone 7 Plus at 2x, which used the 4mm wide-angle lens and 2x digital zoom.



iOS won't re-evaluate how it takes the picture in the exceedingly brief interval after you tap the shutter button (or press the volume-down button).

Get ProCamera, which lets you pick a lens and shoot and export RAW. ProCamera 10 (\$5 procamera-app.com) is the first app out that has the full combination of allowing you to pick a lens and capture RAW data, which you can edit and export in a mixed-down file format like TIFF or JPEG, or export the unedited RAW. It also lets you manually adjust exposure and other settings. If you want to take immediate advantage of picking which lens to use, spend the \$5. Other apps will be out in the near future, too.

For macro shots, get closer.

Because the 6.6mm lens can't focus within a foot or so, instead of tapping to take a 2x shot from farther away, which is just a crop of a 2x digital zoom via the wide-angle lens, just move closer with 1x selected in Camera. When that's not possible, use the 1x to not-quite-2x range, and you'll still get a digital enlargement, but it will be better than pure 2x. Or, shoot at 1x from farther away and crop later.

THE UPSHOT

In looking at images at 100 percent, seeing the pixels, you can definitely understand why Apple made this the default choice. An image with slight

digital artifacts because of digital zoom that seems a little blurry but has a great color balance will be preferable to a blurry shot or one that's speckled with noise or too dark to make out details.

The one thing the Camera app could do is (even optionally) provide better signals about whether a shot is going to fit well within the parameters Apple uses to determine what a "good" photo is. When you tap the 2x button, it could perhaps light that button up in red if conditions will result in a wide-angle shot with digital zoom. Or, the Camera app could even offer some icons or text that provided advice, like "back up (look behind you first)" or "hold more still." It already has this kind of text in the Pano mode, so it's not that unusual.

Apple made a lot of hay about the image signal processor (ISP), a bit of hardware that manages all the hardware camera functions. From what I can tell and what I hope, it should be able to tweak the ISP's choices over time. The 7 Plus was certainly tested extensively in the lab and quietly in the field, but the number of photos taken by it and released into public forums—social media, Flickr, and the like—will be millions of times larger within days. Apple should be able to learn and adapt the choices it's making out of the gate. ■



How to use Messages in iOS 10, from special effects to iMessage apps

Messages in iOS 10 has new ways for you to express yourself—a lot of new ways. Here's how to get started.

BY OSCAR RAYMUNDO

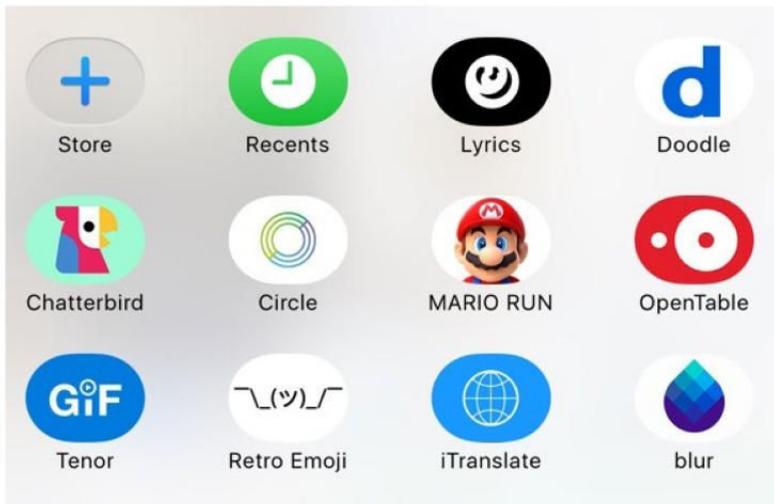
Thanks to iOS 10, your Messages app is way more than a texting app. Way, way more. Now that the official release of iOS 10 is out, here's your guide to using all the new features in Messages, from sending full-screen effects to installing your third-party iMessage apps from your favorite services like Venmo, ESPN, and OpenTable.

The first thing you should know is that the recipient of your messages will need an iPhone, iPod, or iPad running iOS 10, an Apple Watch running watchOS 3, or a Mac running macOS Sierra in order to view them in their full visual glory. Furthermore, these features are exclusively linked to iMessage, so Android users will have a hard time deciphering the animations as well. For users on Android or running a previous

version of iOS, these messages will show up as regular text with a description of what the visual should have been, like "(sent with fireworks)." Not nearly as captivating.

INSTALL THIRD-PARTY APPS

Perhaps the most profound change iOS 10 brings to Messages is the integration of third-party services, turning iMessage into a platform. Access your iMessage app drawer





i love monkeys



FREQUENTLY USED



SMILEYS & PEOPLE



by tapping on the gray arrow to the left of the input field and then on the App Store icon. This is your hub for both iMessage apps (which only live inside Messages) and extensions (which are a part of a broader iOS app). You can press down on any of these iMessage apps and extensions in the app drawer to make them wiggle so you can rearrange or delete them.

In your app drawer, you'll see your Recents, Music, Images, and Store. Recents displays your recently sent messages, whether it's a Digital

Touch creation or a handwritten message. Music lets you share your most recently played song from Apple Music, which will play in-line (more on that in the visual link section). Images lets you search the web for photos, videos, and GIFs. The image search results are powered by Bing, and the results are comparable to the GIF results in Google's Gboard (go.macworld.com/gboard) iOS keyboard.

In the Store, you can browse the Featured and Categories tabs to get more third-party iMessage apps and

extensions, including stickers, games, and services. Here's our list of 15 free iMessage apps (go.macworld.com/imessageapps) to get you started.

The Manage tab offers a quick way to see if any of your installed iOS apps have released a new iMessage extension, and here you also have the option to automatically add these extensions to your app drawer.

TAP-AND-REPLACE WITH EMOJI

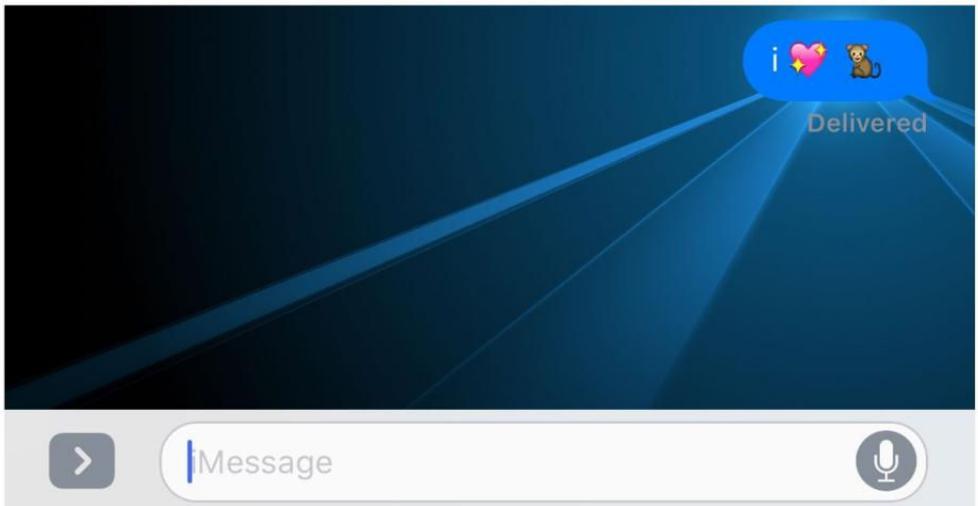
One of the biggest crowd-pleasers at WWDC this year was the announcement that emoji would show up three times bigger in iOS 10. This applies if you are sending a message with only

emoji. Text messages with an accompanying emoji retain the same size.

Messages also has a new tool for replacing keywords into corresponding emojis. For example, the text "I love monkeys" turns into "I ❤️ 🐒"—all you have to do is finish your text message and then tap on the emoji button. This automatically highlights all the words that have a corresponding emoji, giving you several tap-and-replace options if applicable. For example, you get to choose between 🐒 or 🐵 for replacing the word *monkey*.

SEND BUBBLE AND FULL-SCREEN EFFECTS

After typing your message, press and



MESSAGES iOS 10 screen effects.

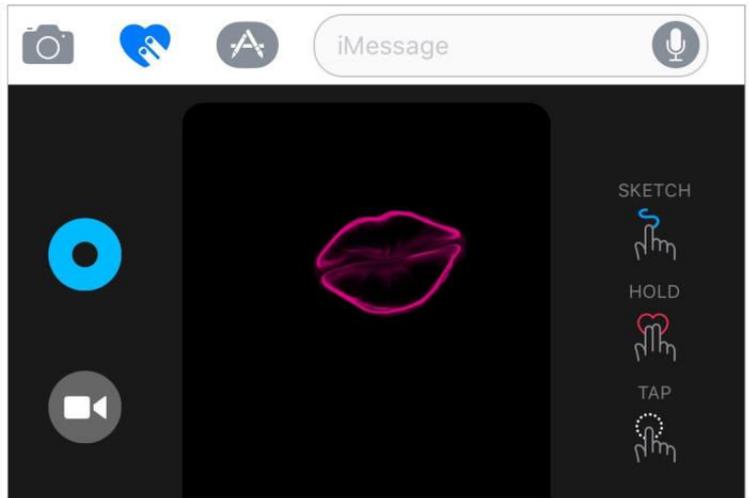
hold down on the blue up-arrow to the right of the input field. That takes you to a “send with effect” page where you can slide up to select your text to appear as Gentle (like a whisper), Loud (as if you’re yelling), or Slam (like it’s crashing down on the screen). Here, you can also choose “Invisible Ink” to send a hidden message or photo that the recipient can reveal by swiping away pretend particles.

At the top of the screen you can tap to go from these bubble effects to full-screen effects. Swipe to see all your options, like sending your message with balloons, confetti, lasers, fireworks, or shooting stars. The effects appear for a few seconds when the recipient opens the message. Lasers, fireworks, and shooting star also come with sounds, because how can anyone take a fireworks show seriously without the bursting sounds? After you’ve selected an effect, you can press the blue up-arrow again to send it or the X to cancel. You can also Tap Back on any message, either sent or received, by

pressing down on it and placing a heart, a thumbs-up, or a “ha ha.” If you’re having issues seeing bubble, full-screen, or Tap Back effects, it’s most likely that you’ve enabled the Reduce Motion feature to keep from getting motion sickness from iOS visualizations. To disable this option and try these effects, go to *Settings* → *Accessibility*.

CREATE A CARD WITH DIGITAL TOUCH

Apple Watch wearers may be familiar with Digital Touch, the feature that’s now available in iOS 10. To access it in Messages, tap the icon with the heart and the two fingers to the right of the input field in between the camera and the App icons. Here, you



MESSAGES iOS 10 digital touch card.

can doodle and insert animations on either a black canvas or on a photo or video. To the left of the canvas, you'll see a camera icon and the option to choose from seven different colors. On the right, you'll see directions for creating the following:

- > Free sketch using one finger
- > Beating heart by holding down two fingers
- > Vanishing circle by tapping gently
- > Kiss smack by tapping two fingers
- > Broken heart by dragging down two fingers
- > Glowing burst by pressing down

Messages iOS 10 digital touch

Just be aware that as soon as you raise your fingers from the black canvas, the animation will be sent to the recipient. So make sure you have a clear vision of what you want to create before putting pen to paper, or finger to screen in this case. They

show up as still attachments on iOS 9 or prior.

HANDWRITE YOUR MESSAGE

Rotate your iPhone horizontally to landscape mode to use handwriting. Here, you can select from seven pre-populated handwritten messages like “Happy Birthday” and “Thinking of you.” Or you can just keep the font and create your own message by tapping Clear toward the top. If you’ve installed another language keyboard, you’ll see pre-populated handwritten messages in that language, as well. For example, I’ve also installed the Spanish keyboard and saw that I could send “Hola” and “Pensando en ti.”

To disable activating handwriting every time you rotate your phone, simply tap on the keyboard icon on the lower right of the handwriting



screen. You can activate it again by tapping on the swirl that appears on the lower right when the keyboard is in landscape mode.

If the recipient has installed iOS 10, these messages are displayed stroke by stroke, as if they had been handwritten in real-time. The ink also has a drying effect for an authentic pen-on-paper feel. If the recipient has iOS 9 or prior, these handwritten messages show up as still attachments.

SEND MEDIA AND VISUAL LINKS

Lastly, Messages in iOS 10 has redesigned the way you attach media, whether it's a photo in your camera roll or a video you've recorded in-app on the spot. Tap on the camera icon to the left of the input field and the keyboard becomes a media hub with a viewfinder for taking photos or video right there and then. You can continue browsing your Camera Roll by swiping left, or launch the Camera

app or Photo Library by swiping right.

Also, when you send a URL to an article on the Web, Messages automatically turns it into a preview with a headline and image pulled from the link.

Similarly, you can send a link to YouTube or Vimeo and have the recipients watch the video in-line. You can also play tracks from Apple Music without leaving Messages—there's even an iMessage app for sharing songs from Apple Music. In fact, every URL we sent showed up as a visual link, from Twitter links to Spotify tracks. ■



Delivered

Claire and Dad
Cleveland, OH



Take time to
be a dad today.



SoftCozar.com

fatherhood.gov
877-4DAD411





WatchOS 3 guide: 15 essential tips to transform your Apple Watch

BY CAITLIN MCGARRY

Apple made the Apple Watch faster with the September release of two new models, the Series 1 and Series 2, which both have powerful dual-core processors. But if you bought an Apple Watch when it launched last year and don't feel like buying a new one, installing watchOS 3 will go a long way toward making your old device feel new.

There are big changes like a brand-new function for the side button, which now pulls up an app dock that launches your most-used apps seven times faster than in watchOS 2. This will completely change the way you interact with your watch. Then there are small tweaks, like automatic run-pausing for workouts, a new way to send messages in the form of Scribble, and activity-focused watch faces to keep your eye on the prize—three closed rings, of course. Read on for watchOS 3 tips and tricks that will take your Apple Watch to the next level.

CUSTOMIZE YOUR DOCK

Goodbye, Glances. Apple replaced the app snapshots that were visible when you swiped up on your watch display with a new, fast-launching app dock accessible by pressing the side button. Any app can live in the dock, regardless of whether it's built-in or third-party. Apps you place there are constantly refreshed, so you can see a live preview when you swipe from side to side in the dock. Tapping on an app from its live preview will launch it instantly (or pretty close to

instantly).

You can choose up to 10 apps to place in the dock. Open the Apple Watch app on your iPhone, then tap through My Watch → Dock. Tap the Edit option on the top right to move apps into the dock or rotate them out. You can also choose the order they appear in.



GET TO KNOW CONTROL CENTER

Now that Glances are gone, swiping up on the watch face reveals the redesigned Control Center. From this new view, you'll see how much battery life you have left, plus easy access to Power Reserve if you need to conserve juice. There's also Airplane Mode, Do Not Disturb, a lock button for locking your watch with its passcode, a Find My iPhone button so your phone will make a sound and make itself more easily discoverable, and an AirPlay button for listening to music from your Apple

Watch with wireless headphones or a set of Bluetooth speakers.

Control Center used to be hidden in Glances, which wasn't very convenient. Putting these commonly used settings a swipe away makes way more sense.



INVITE FRIENDS TO SHARE ACTIVITY

Now that Apple is doubling down on its commitment to the Apple Watch's health and fitness features (see the

brand-new Series 2 model for more evidence), it's finally adding social features to the Activity app. Activity-sharing on the Apple Watch allows you to see your friends' daily progress in meeting their activity goals, from workout details to their rings. You can send positive messages to encourage a friend who needs a boost from the watch Activity app, or if you're feeling competitive, some prewritten snark is just a tap away.

Activity-sharing isn't turned on by default—you have to invite friends to share their data with you and wait for them to reply. This is in the iOS Activity app, not the iOS Apple Watch app.

TAKE ADVANTAGE OF SCRIBBLE

I wasn't convinced I would use Scribble, a new feature in the Apple



Watch Messages app that lets you respond to texts by drawing letters on your watch screen. But I find myself using it in situations where I don't have a fitting prewritten response stored in my defaults, I can't dictate a message with my voice, and I don't want to pull out my phone to tap out a full sentence. That happens more often than I expected, honestly.

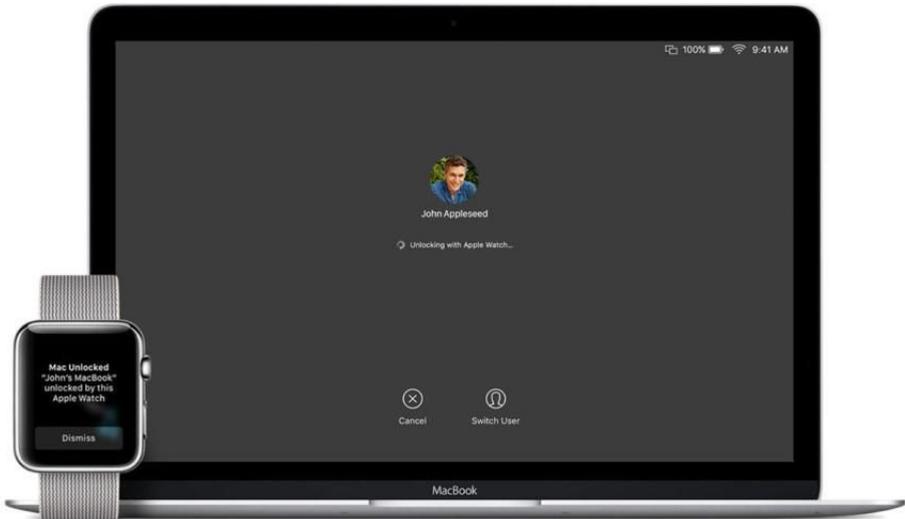
To send a message with Scribble, just tap the giant Scribble bubble in the reply options, which still include Digital Touch, emoji, voice dictation, and prewritten responses that you can customize in the Apple Watch app on your iPhone.

TURN ON AUTOMATIC RUN-PAUSING

As a runner, one of the watchOS 3 features I was most excited for was automatic run-pausing. Gone are the days of using Force Touch to pause a run while waiting for a traffic light. But run-pausing isn't turned on by default—you have to turn this on in the iOS Apple Watch app (sensing a theme with these features?). Tap through to My Watch → Workout, then toggle on the Running Auto Pause setting. Pro tip: You have to come to a complete standstill for the watch to pause your indoor or outdoor run.

If you don't want to enable automatic run-pausing, you can still pause a run by swiping right on the display to bring up options to pause, end, or lock your watch.





UNLOCK YOUR MAC WITH YOUR WATCH

Apple's signature synchronicity between its devices comes into play with watchOS 3 and macOS Sierra. You can now use your Apple Watch to unlock your Mac, no password necessary.

Take these steps first: Make sure your Mac and Apple Watch are both signed in to the same iCloud account and enable a passcode on your watch if you haven't already. On your Mac, click through to the following settings: **⌘** → *System Preferences* → *Security & Privacy* → *General*. Enable the Allow Your Apple Watch To

Unlock Your Mac option.

If you have two-step verification turned on, you'll need to switch to two-factor authentication instead, otherwise you'll find yourself running into a wall of frustration (go.macworld.com/watch2factorauth). You can see which security method you're using by signing in to your Apple ID account (appleid.apple.com).

To turn off two-step verification and instead enable two-factor authentication, follow Apple's handy guide here (support.apple.com/en-us/HT207198).

CHOOSE FROM THE NEW WATCH FACES

Apple introduced three new watch faces in watchOS 3: Numerals, a stunningly simple face with clock hands and, you guessed it, numerals; Activity, which puts your rings front and center on the display in either analog or digital form; and Minnie Mouse to join her pal Mickey.

To add these new faces to your lineup, open the Watch app on your iPhone and tap on Face Gallery in the bottom navigation bar. You can add all of the new faces, if you want, and delete or rearrange the way the faces

appear on your watch by tapping the Edit button under *My Watch* → *My Faces* in the iOS Watch app.



CHANGE YOUR WATCH FACE EASILY

In watchOS 3, you can still change your watch face using Force Touch (as before). But now you can also simply swipe from edge-to-edge either left or right on the watch display to see the faces you've loaded onto the device in the iOS Watch app.

If you want to customize a face's colors or complications, you'll still need to use Force Touch.

ACCESS WHEELCHAIR WORKOUTS

Apple has always been a big proponent of making its devices accessible to all, whether you have low vision or challenges with hearing. The company is bringing that philosophy to the Apple Watch with new settings for watch wearers in wheelchairs.

In the iOS Watch app, you can toggle the wheelchair setting under *My Watch* → *Health* → *Wheelchair*. Doing so will turn off your iPhone's automatic step-counting and prompt your Apple Watch to start tracking wheelchair pushes in both the Activity and Workout apps. There are now two specific workouts designed for wheelchair users, and stand alerts are replaced by "Time to roll!" notifications.



MOVE WORKOUT TO A COMPLICATION

Starting a workout used to be a hassle—you'd have to use the Digital Crown to get to your home screen and then find the tiny green Workout app icon. Siri made that slightly easier, but the app would launch slowly.

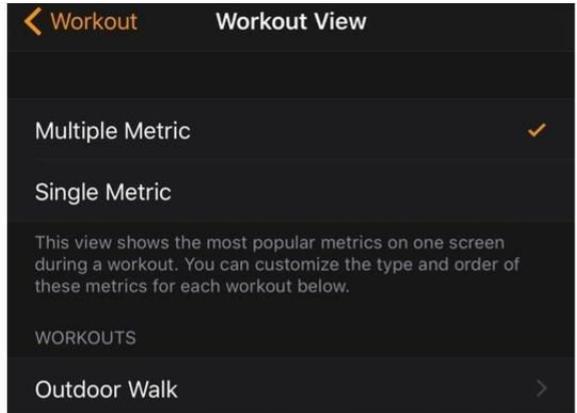
Apple's third-gen watchOS puts a Workout complication right on your watch face for easy access if you need it (you can customize complications to your heart's content and ditch Workout if you never use it). Tapping on

the new complication instantly launches the Workout app, and a new Quick Start option lets you start exercising right away, without having to set a goal.

CUSTOMIZE WORKOUT METRICS

Apple just fixed one of my biggest problems with the Apple Watch Workout app. Before watchOS 3, your exercise stats—heart rate, calories burned, mileage—were displayed on separate screens, so you had to swipe to view them mid-workout. Now the watch displays all of those metrics on one screen by default.

You can change that if you prefer the old way: Just open the iOS Watch app, then tap through *My Watch* → *Workout* and select *Single Metric*. Instead of swiping, you can use the Digital Crown to scroll through each stat. I prefer Multiple Metric, but you do you.



You can even customize which four metrics are displayed for all 12 workouts. So for instance, perhaps you'd rather see average pace than heart rate while you're on an outdoor run.



GIVE BREATHE A CHANCE

If you upgrade to watchOS 3, you'll notice a new built-in app called Breathe. Its purpose is mindfulness: The app is designed to guide you through relaxation sessions so you'll give more thought to your mental health, which often gets the short end of the stick when talking about wellness.

You can customize Breathe in the iOS Watch app—just tap through *My Watch* → *Breathe*, then choose how often you want reminders to breathe throughout the day and how many breaths per minute is most comfortable. You can also adjust Breathe's haptics, the vibrations that will walk you

through each session.

Breathe's reminders can become slightly annoying, but just like Stand, you can turn them off entirely if you're committed to having no chill.



ADD SOS CONTACTS

Apple made the side button useful with watchOS 3, giving it two functions: Just pressing the button calls up the app dock so you can quickly launch your favorite apps, but if you hold the button down, your watch will trigger an emergency phone call.

If you're worried that you'll accidentally trigger that call (or that the children in your life will), you can adjust your SOS settings in the iOS Watch app under *My Watch* → *General* → *Emergency SOS*. Instead of simply holding down the side

button to automatically call the authorities, disabling the Hold To Auto Call option will prompt you to slide the Emergency SOS trigger on your watch face to send out the alert.

You can also add up to three emergency contacts in that same section of the Watch app. Those contacts will be automatically alerted when SOS is triggered and the emergency call is placed, and your watch will even share a map of your current location so friends and family will know where to find you.



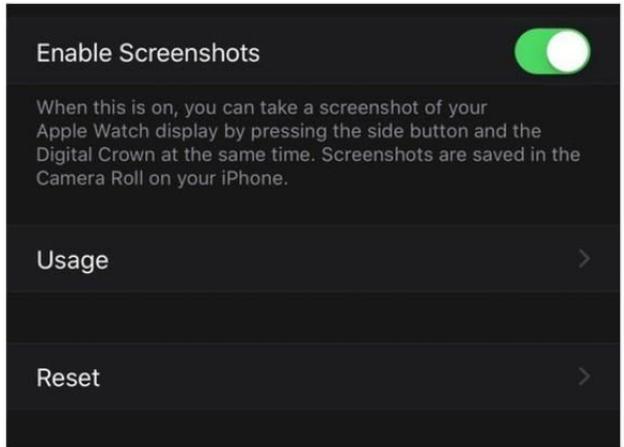
SET UP YOUR SMART HOME

iOS and watchOS both have Home apps now for controlling the HomeKit-compatible gadgets on your network. If you've set up the iOS 10 Home app, the watch app will make it easier and faster to turn on multiple devices at once or control each gadget individually. You can also add a Home complication to any watch face to launch the app more quickly. You'll also receive notifications on your watch from smart home products—say, for instance, a doorbell that alerts you with a photo when someone is at your front door.

TURN ON SCREENSHOTS

If you were used to taking screenshots of your Activity rings or Workout stats and sharing them with friends, you may have noticed that pressing the Digital Crown and side button simultaneously no longer takes a screenshot by default. If you're in the midst of a workout, pressing both the crown and the side button will pause it, and those buttons won't do anything when pressed outside of the Workout app.

But all you have to do is change that setting in the iOS Watch app. Go to *My Watch* → *General* and scroll down to *Enable Screenshots* at the bottom. Toggle that on so you can keep using the Digital Crown and side button to take screenshots that will be saved to your iPhone Camera Roll, just like before. ■





CAR TECH

AUTOMATIC PRO: BE A BETTER DRIVER WITH THIS DRIVING DATA TRACKER IN YOUR CAR

BY GLENN FLEISHMAN

AUTOMATIC STARTED LIFE as a driving-improvement device. The compact doohickey plugs into an industry-standard OBD-II port, which, in 1996, became a mandatory interface for most American cars. The first version of Automatic required a Bluetooth connection to a smartphone present in the car, and the adapter tweedled one of three tones to help you reduce gas-wasting practices, like hard stops. The second generation added GPS, to track your journeys when a paired smartphone wasn't on board, but still required a phone and Bluetooth to sync up later.

The third and latest model, dubbed Automatic Pro (\$130, automatic.com/pro) adds 3G cellular and untethers the device while shedding many of the features of the two earlier versions—at least in its initial firmware and smartphone app releases. It no longer pings when you brake suddenly, for instance. It also uses an entirely new, separate app, also called Automatic Pro, available for both iOS 9 and later (iPhone 5 or later) and most smartphones that run Android 5.0 or later. The company has gone all in, too: the previous generation adapter is no longer for sale.

The adapter has evolved into more of a hub/platform combo, still providing driving reports (via the web app only), but now adding phone-free tracking as well as continuing to promote integration with dozens of apps and services, including the popular IFTTT site that ties together disparate services into triggered sequences. These apps are more useful with an always-available data feed.

I've owned each generation and used the previous two extensively; the cellular connection bumps it into a different category of device, by providing continuous cloud access (at least in areas with cellular coverage). It doesn't quite turn your entire car into a rolling platform, but it does let you integrate your car into life and expense tracking and smart-home appliances.

**AUTOMATIC LABS
AUTOMATIC PRO**



AT A GLANCE

A handy device for tapping into your car's data feed.

PROS

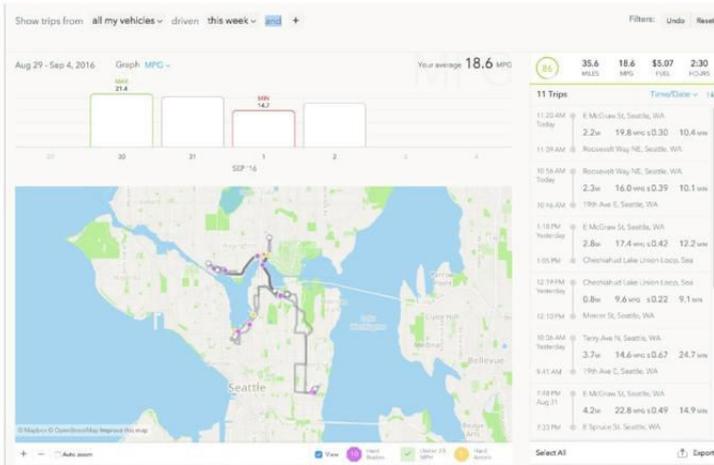
- Tracks driving and location over cellular connection
- Helps respond when crash detected
- Allows detailed mileage reporting for expenses
- Platform for other car-related and location apps, including Amazon Echo and Nest

CONS

- Missing audio driving-improvement features of previous versions
- MPG estimates may be off the mark

PRICE

\$130



THE WEB DASHBOARD provides a greater overview of driving and habits all at once, but can drill down to individual trips, too.

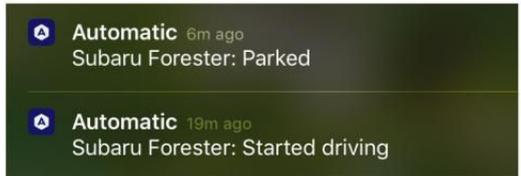
However, Automatic is still a niche product. It has to scratch a persistent itch or solve a problem that recurs for you. If so, you might find it worth the \$130 price tag, which includes all 3G network access charges. For many people, there may not be enough of a reward.

AN API FOR YOUR CAR

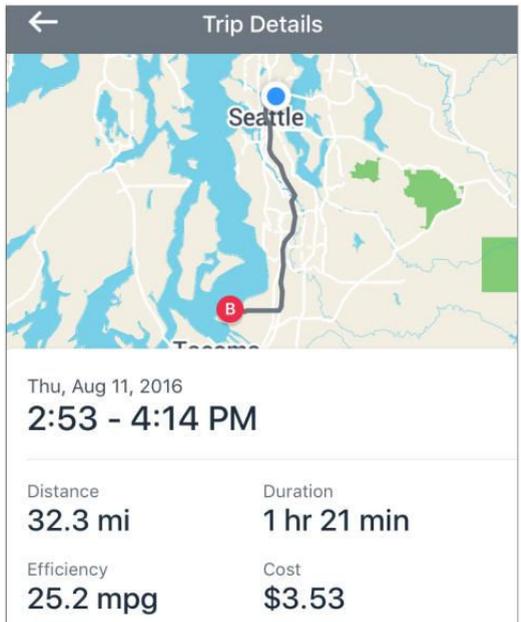
You can think of Automatic as opening up your car computer's data feed to outside inspection and analysis. While the Automatic Pro doesn't let you fiddle with car settings or remotely arm or disarm your car or lock or unlock (those options aren't available through the diagnostic interface), it does extract and make available every bit of information that's emitted over the car's data pathway, and then combines it for your utility.

The basic function tracks your car's location, marking the beginning and end of trips. While previous releases included a "brief stop" function that would combine stopovers into a single journey, the new app treats even a drive of a couple of blocks as a separate event.

The service also calculates the cost of each trip based on your fill-ups, and estimates miles-per-gallon (or kilometers-per-liter). The previous releases automatically calculated gas cost by using your GPS-determined location to figure out when the gas level went up at the gas station you were at, and then combined that with a third-party database of constantly updated gas station price information. Automatic Pro adds the welcome ability in the app to log a specific fill-up (slightly hidden in *Health* → *Fill Ups* → *Add Fill Up*) for more precision. (An out-of-gas alert was removed, but fewer than half of cars report gas-tank level through the OBD-II port.)



YOU CAN SET the adapter to notify you via its app, but this works even if you're nowhere near the car.



TRIP DETAILS REVEALS statistics for a trip, including estimated cost based on fill-ups and mpg.

If you travel for work and can or have to expense trips, if you have kids who drive, or you share rides and need to divvy up gas and maintenance costs, this basic feature can be enhanced with third-party apps. There are both conduits to expense systems and stand-alone apps you can connect.

Automatic offers License+ (automatic.com/apps/license-plus) at no cost to train young drivers into good habits with rewards and badges, while also giving insight into a paired Coach partner who can check on progress. It also offers UnMooch (automatic.com/apps/unmooch), a cost-splitting app for trips that links with Venmo to handle payments.

The “check engine” light goes on in many cars for a huge spectrum of problems. The app decodes mysterious codes and lights, possibly saving a trip to the mechanic, or at least giving you information to make the decision about a recommended repair. You can also turn off the light function, pretty much the only signal that can be sent back.

Crash alert features are also included, something found in many cellular-equipped car systems, like OnStar. The adapter is always tracking speed and can identify a sudden stop. With the feature enabled, the app notifies a driver, who can cancel the alert. If it's not canceled, an Automatic agent calls and if they get no response, will call emergency services and any emergency contacts associated with the vehicle. If the driver answers, they can also ask to have emergency services dispatched.

The adapter has to remain functioning and have a cellular connection, and you have to be at the cell number associated with your account. With fully integrated car systems, an operator can talk through the car—no phone required.

The big marketing point for the earlier Automatic adapters were three distinct audio tone patterns that went off when you accelerated suddenly, braked suddenly, or exceeded 70 mph. The tones were designed to help you reform, and reduce gas usage—back when gas topped \$4 a gallon. While you can still see how you're doing in the web app's dashboard, the new adapter doesn't make the tones and the smartphone app doesn't show detailed performance. I feel like the tones did retrain me from a moderately gas-savvy driver to a better

THE APP DECODES MYSTERIOUS CODES AND LIGHTS, POSSIBLY SAVING A TRIP TO THE MECHANIC, OR AT LEAST GIVING YOU INFORMATION TO MAKE THE DECISION ABOUT A RECOMMENDED REPAIR.

one, but I have to think it didn't play out as a sales point for most drivers.

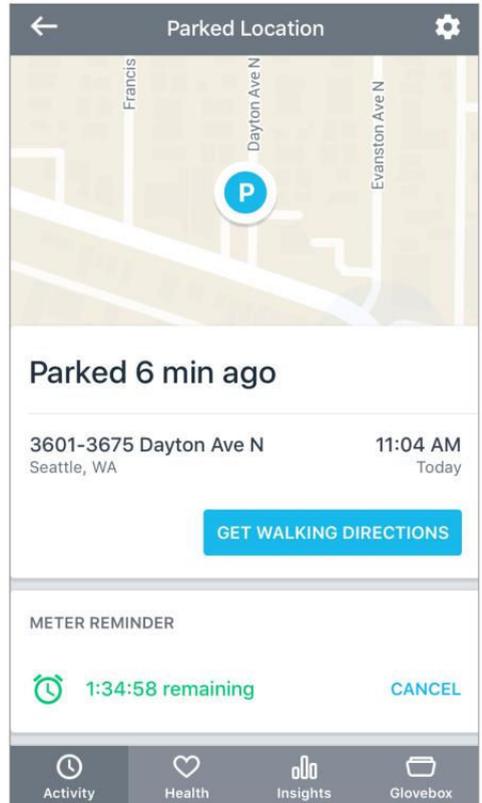
TRACKING EVERYWHERE (WHEN THERE'S AN APPROPRIATE CELL NETWORK)

The best new fundamental feature is the adapter uncoupling tracking from a phone. Even with the GPS-equipped second-generation Automatic, at least one smartphone had to be paired with the Bluetooth connection and be nearby on a regular basis to sync and upload travel information. Many drivers of the same car can receive information about a single adapter wherever it is.

This helps with parking, and the app records wherever the car was left when the ignition is turned off, with an option to set a parking timer and take a photo of the location. Automatic integrates with Spot Angels (spotangels.com) (free on the iTunes Store, go.macworld.com/spotangelsapp) to provide details on all the parking rules of the spot at which you parked, too. (Automatic says the app only works with its hardware in San Francisco and New York City, although the app lists many supported cities.)

However, if you live or travel regularly in an area in which Automatic's cellular partner, Telefonica, doesn't offer robust or any coverage, you'll find yourself stymied. My colleague at TidBITS (tidbits.com), Josh Centers, lives in an area of Tennessee with only Verizon coverage, no AT&T or other GSM providers. In his case, the adapter only uploads trips when he drives into a covered area. Automatic says no coverage map is available. The firm wouldn't comment on future plans to use an apparent internal Bluetooth radio to allow off-cellular syncing.

There's also a privacy aspect of Automatic Pro that I discussed with my wife before installing the adapter—and had forgotten to think of



A HANDY FEATURE is a view that marks your parked location and lets you set a meter timer and snap a photo. No third-party app required.

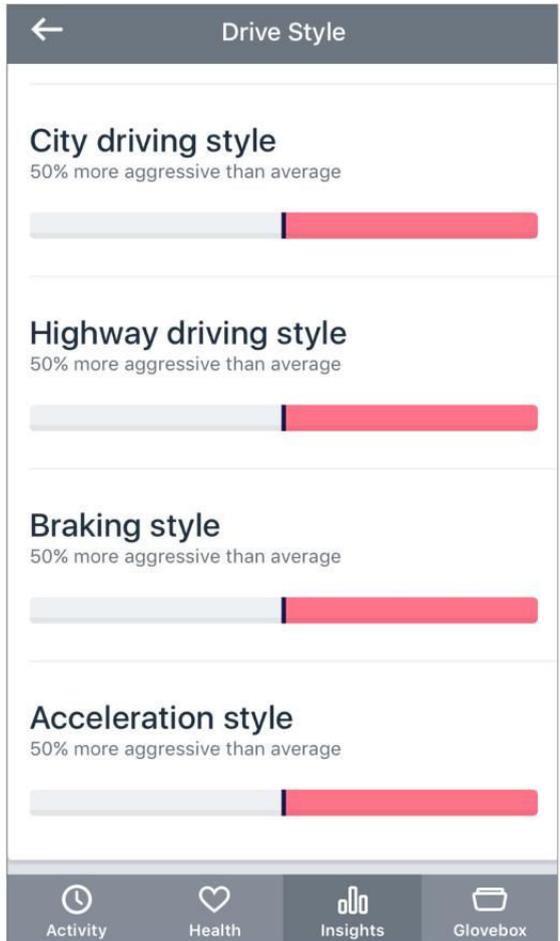
when I'd installed the previous version with GPS support. Even in a loving, supportive, frank relationship, other people may prefer their whereabouts aren't continuously available; it functions much like sharing your location continuously via Find My Friends, only limited to a car. Consider that discussion if you're not the only person who uses your car, although this is a plus if your kids use it, too.

Automatic doesn't trumpet car location as a way to aid in your car's recovery, because the adapter can be removed easily. When my wife and I had a car stolen in Seattle, the thieves at some point pulled out every protruding item from under the dash, including the Automatic adapter and something related to the electrical system. Ostensibly the word is out among the fast and the furious. Integrated car cellular systems can't be so easily disabled.

And if you're relying on it to closely track gas costs, you should know that Automatic has to approximate gas usage—the car interface doesn't provide precise gas-tank level information. With a 2012 Honda Fit that my wife and I have tracked with previous adapters whether the mile-per-gallon calculation was accurate, no two of the car's trip odometer, Automatic's gas usage, or my wife's carefully logged figures agree.

Automatic relies on a combination of engine load and mass air flow (receiving as data over the car interface) or manifold absolute pressure. It's an approximation, and it's likely a different formula than a car uses, which is

THE NEW DRIVE Style report in the app is less detailed and seemingly, after hundreds of miles of driving, not very effective yet.



based off the odometer.

The difference for us is significant: we've seen as much as a 10 mpg between the trip odometer and gas station gauge calculation and Automatic; the Fit itself reports in the middle. I haven't yet driven several hundred miles with the Automatic Pro, so I can't determine how well it's algorithm performs, and it may have improved, but the fundamental measurement limitations remain the same.

If you're worried about Automatic charging a flat rate for its adapter, and maybe making use of your data to make money, the company has a strong privacy policy (automatic.com/legal) describing all the uses to which it puts that data. Automatic makes use of some aggregate information about driving behavior, and also works directly with carmakers, insurance companies, and auto clubs (like AAA) to provide cloud-connected car services, in which its adapters play a role.

IF YOU'RE WORRIED ABOUT AUTOMATIC CHARGING A FLAT RATE FOR ITS ADAPTER, AND MAYBE MAKING USE OF YOUR DATA TO MAKE MONEY, THE COMPANY HAS A STRONG PRIVACY POLICY DESCRIBING ALL THE USES TO WHICH IT PUTS THAT DATA.

BOTTOM LINE

Automatic Pro has a lot of different features that might appeal. If you're looking for detailed, continuous location tracking, whether for general knowledge, expense reporting, or keeping tabs on kids, the flat price of \$130 with 3G service included is probably enough.

But if you're not worried about where you drive your car, how much you spend on gas, or what it's doing without you in it, dropping a pin in Apple's Maps app might suffice. ■

STORAGE

PICTURE KEEPER CONNECT: SIMPLE PHOTO BACKUP FOR THE ENTIRE FAMILY

BY J.R. BOOKWALTER

IT'S SHAMEFUL HOW Apple provides only 5GB of free iCloud storage to customers, no matter how many devices they own. It's simply not enough space for all the photos and videos we shoot these days. Now there's a plug-and-play solution that takes the burden of backing up personal media off the Cupertino-based company's shoulders.



PICTURE KEEPER CONNECT 16GB MOBILE BACKUP DEVICE



AT A GLANCE

Picture Keeper Connect combines a dual Lightning and USB thumb drive with mobile and desktop apps that make it easy to back up precious photos, videos, and contacts.

PROS

- Easy-to-use plug-and-play backup of personal media
- Multiple accounts allow storage to be shared with family members
- Options to disable iCloud Photo Library, videos, contacts from backup
- Incremental backup across multiple PKC thumb drives

CONS

- High battery consumption during long backups
- No selective restore
- No option to select which photo albums are backed up

PRICE

\$100

PLUG IN, BACK UP

At roughly 3.5 inches long, 0.75 inch wide, and 0.25 inch thick, [Picture Keeper Connect](http://picturekeeper.com) (picturekeeper.com) looks like a standard FAT32-formatted USB thumb drive—and it is, with the addition of a Lightning connector at the opposite end for use with compatible iOS devices.

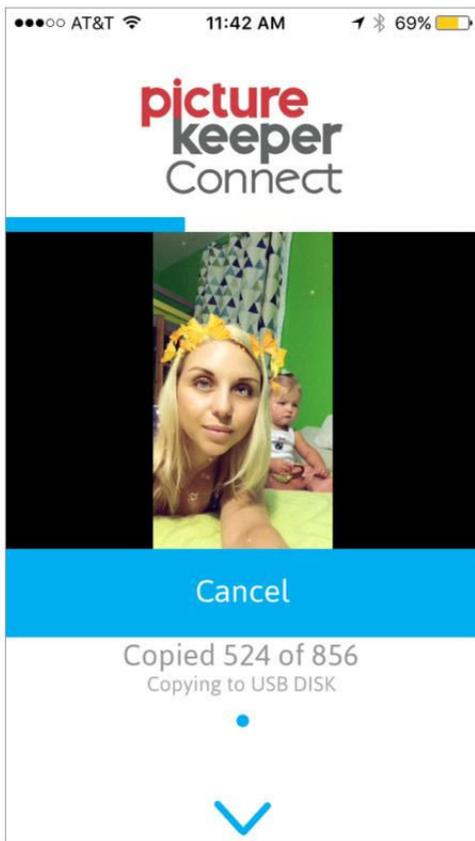
Plug it in, launch the free app, and tap Start Backup to copy all of your photos, videos, and/or contacts onto the thumb drive. The process is simple enough for anyone to do, but once content has been safely copied, you'll still have to manually clear it from your iOS device. Restoring content is equally easy, although it's all or nothing—you can't selectively choose which files are added back.

I have over 20,000 photos stored in iCloud Photo Library, and I tested the lowest-capacity 16GB model (\$49 on Amazon, go.macworld.com/pickeeper16gb); 32GB (\$75 on Amazon, go.macworld.com/pickeeper32gb) and 64GB (\$76 on Amazon, go.macworld.com/pickeeper64gb) models are also available. I had reservations, since the 16GB device certainly couldn't handle all of my data. As it turns out, there's a setting to disable backup of iCloud Photos content, instead targeting only those full-resolution files actually downloaded to the device; videos and contacts can also be independently disabled.

When a Picture Keeper Connect fills up, another can be purchased to pick up where the previous one left off. But it's not the cheapest backup method around, and the storage itself isn't upgradeable. The app scans for content each time, performing an incremental backup of only what's new.

MOBILE HELPER

Picture Keeper Connect also provides an alternate backup method that



AS PHOTOS AND videos are being backed up, the Picture Keeper Connect app displays a thumbnail for each file.

doesn't require a USB drive and is free for anyone to use. The first time you open the app, you'll be asked to register for an account, which is used for temporary backup. Within 48 hours, you can log in from the Mobile Helper application on a Mac or PC and safely download files to your computer.

Mobile Helper eliminates my biggest complaint with Picture Keeper Connect: If you have thousands of photos to back up, the thumb drive drains your battery quickly. I watched the power level drop from 75 percent to less than 25 percent after only an hour, so you'll want to charge up first. With Mobile Helper, the Lightning port can be used to stay powered, which you'll need to do since it's a much slower method.

The beauty of Picture Keeper Connect is you can set up different accounts for everyone in the family, and back up all of their content to the same USB drive. Unlike many cloud backup services, PKC doesn't rename original files; they're copied straight across, sorted into folders based on album name.

In the case of apps like Instagram, Snapchat, and Twitter, this is a good thing, because photos saved from those services get backed up. Unfortunately, iCloud Photo Sharing images also come along for the ride, even if you're the one who shared them originally I'd love to see more granular control over what gets backed up in future updates.

BOTTOM LINE

Picture Keeper Connect is a pocket-friendly product for backing up all of your iOS devices, and it's easy enough for everyone in the family to use. ■

PICTURE KEEPER CONNECT backups are incremental and can span multiple drives, and the app can even send reminders so you won't forget to back up in the future.



What's new at the App Store



SAMOROST 3

Samorost 3 (\$5, iPhone and iPad; samorost3.net) isn't as chill and minimalistic as some of the other games we're featured, but the art is startlingly beautiful. Follow a flute-playing space gnome as he travels through nine different worlds in search of his origins. (Check out the video, go.macworld.com/samorost3youtube.)

SwiftGift



SwiftGift (free, iPhone only; swiftgift.me) has also updated with an iMessage app. The makers have partnered with an array of brands, including Amazon, Apple, Beats by Dre (so, Apple), and more. You can select a gift, and the recipient will immediately receive a message to “unwrap” it virtually. Once they've done that, they can select the time and place to take physical delivery of the item. Now? The entire process can be conducted in iMessage.

Cosmic Watch



Cosmic Watch (\$4, iPhone and iPad; cosmic-watch.com) helps users understand the relationship between time and the apparent movement of stars in the sky. You can use the app to know the current real time of any location on the planet, or to determine planetary positions in the past, present, or future. It's recommended for use with the iPhone 4 or later, or the iPad 3 or later.

Bynd



Bynd (free, iPhone; byndapp.com) is an app that combines all your feeds—Twitter, Facebook, and more—into a central hub. Version 2.0 has launched with an array of new features, including private messages, push notifications, landscape mode for videos, and more

Toca TV



Toca TV (freemium, iPhone and iPad; go.macworld.com/tocatv) is a video app aimed at kids ages 5 through 9, offered in an ad-free environment. Say the makers: “No third-party advertising or sponsored content—only videos that will make your kid laugh, be inspired and simply have fun!” —JOEL MATHIS

iPhone and iPad Cases

This month's roundup of iOS cases includes a waterproof backpack, armband enclosure, and a case with with micro suction technology.

BY JOEL MATHIS



PAD & QUILL

Currently available for pre-order, the Luxury Pocket Book (iPhone 7 and 7 Plus; \$99.95 to \$109.95 MSRP; padandquill.com) secures your iPhone 7 in a birch cradle, nestled in a full-grain leather enclosure. With its gorgeous bookbound design, the folio case sports room for up to six credit cards, a photo ID pocket, and an elastic closure that prevents the cover from opening accidentally. The Pocket Book features a thick camera cutout in the back that protects your camera while still allowing you to take photos, and it comes in five color combinations for a personal touch.

BOOQ

The waterproof Pack Pro (all iPad models; \$295 MSRP, same price on Amazon; booqbags.com) is a sleek, rugged backpack that keeps all your gear dry and neatly organized. Made with ballistic nylon, the lightweight Pack Pro offers a number of padded compartments for your laptop, iPad, and iPhone, adjustable shoulder straps for a comfortable fit, and a zippered water bottle holder to keep you hydrated.



NODUS

The Access 2 (iPhone 7, 7 Plus, 6, 6s, 6 Plus and 6s Plus; \$69.95 MSRP; thenoduscollection.com) sports a handcrafted leather enclosure with a versatile cover that's perfect for carrying a few credit cards and cash. The Access 2 supports handsfree use in landscape orientation, secures your iPhone with micro suction technology, and includes a soft microfiber lining for added padding. Slated for shipping at the end of October for iPhone 7 and 7 Plus, the case comes in chestnut brown, ebony black, dark teal, taupe grey, yellow, or racing green and is compatible with Nodus' magnetic Micro Docks..



ZAGG

The Sapphire Defense (iPhone 7 and 7 Plus; \$50 MSRP; zagg.com) is a highly-resilient screen protector that you can pair with any case. The Sapphire Defense combines tempered glass and a sapphire-infused layer for advanced drop absorption. It also includes a scratch-resistant coating that helps keep smudges at bay, and offers high-definition optical clarity that lets you enjoy your screen to its fullest.

iPhone and iPad Cases



STM

For your active lifestyle, the Armband (iPhone SE; \$29.95 MSRP, \$9.51 to \$29.95 on Amazon; stmbags.com) keeps your iPhone in a soft enclosure that wraps around your arm to keep your hands free. Made with stretchy lycra material, the Armband comes with a transparent window from where you can access your touchscreen, an anti-moisture treatment to keep everythingg dry, and a back slot for cards and keys. It is available in blue, grey, or pink.

BRENTHAVEN

The Elliot (12.9-inch iPad Pro; \$49.95 MSRP, on sale for \$39.95, \$14.99 on Amazon; brenthaven.com) is a functional sleeve designed to help you carry your iPad Pro around with peace of mind. The sleeve has been manufactured with a high density foam for superior shock absorption, comes with a zippered closure for quick access, and includes a front pocket secured by a magnetic closure for your accessories.





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iPhone 7:

ITS SPEED AND CAMERA ARE
CRAZY-GOOD,
BUT IT STILL
DRIVES ME
CRAZY

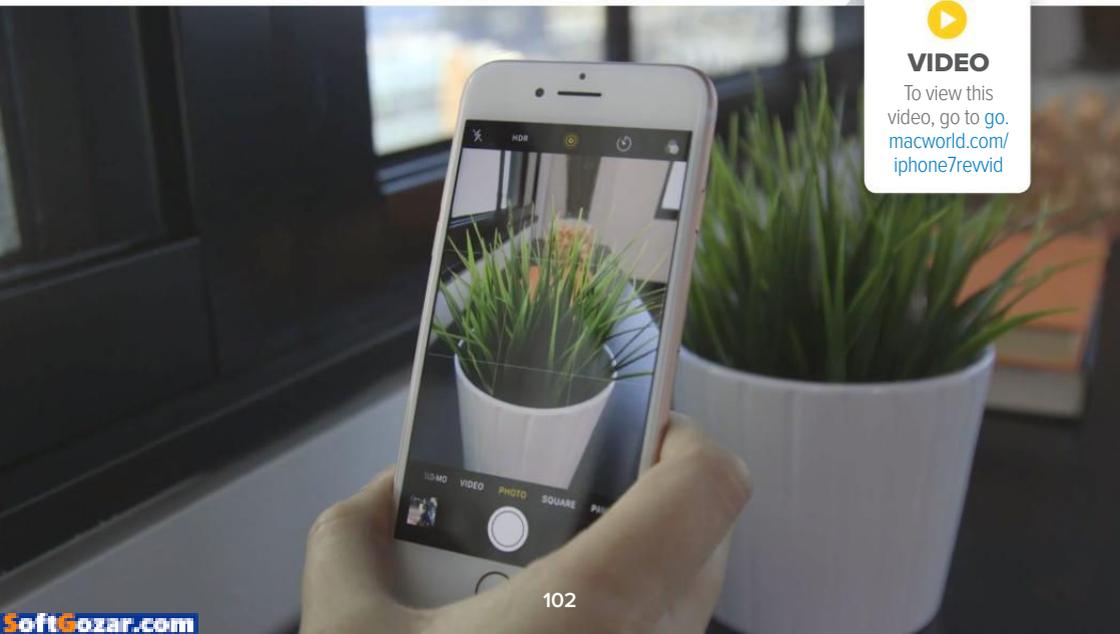
BY SUSIE OCHS



Every year, Apple releases the best iPhone ever, but the iPhone 7 feels different somehow. All of its major details leaked ahead of time, not to mention a good handful of rumors about next fall's iPhone, which could be a major redesign with an OLED screen and no Home button. For now, the iPhone 7 makes minor changes to the phone's form and bigger improvements to its function. But it adds a couple new annoyances at the same time, which makes the iPhone 7 feel a bit like a beta version of what's to come.

**VIDEO**

To view this video, go to [go. macworld.com/iphone7rewid](http://go.macworld.com/iphone7rewid)



A10 FUSION

The biggest advancement is under the hood. At the September event, Apple explained that the A10 Fusion chip powering the iPhone 7 has four cores: two high-performance cores for the most intense tasks, and two low-energy cores to handle easier jobs while saving power. All I noticed when testing the iPhone 7—we bought a 128GB rose gold model on launch day—was speed.

Apps launch quickly, updates install quickly, and the camera is ready to shoot seemingly the very instant I swipe to it from the lock screen. I didn't notice any difference in performance in a resource-hungry app like Pixelmator as in a lighter app like Mail. Everything is just faster. Geekbench scores are 3,440 for the single-core CPU test, and 5,273 for the multi-core. That's nuts—my iPhone 6s scored 1,437 and 2,411, respectively, on the same tests, while my 2013 MacBook Air (1.7GHz Intel Core i7, 8GB of RAM) scored 2,935 and 6,200.

However, despite the A10's power management features, I didn't notice dramatic battery life savings. My iPhone 7 still gives me warnings in the early evening (usually between 5pm and 8pm) that I'm down to 20 percent power, and even if I go into Low Power Mode at that point, I usually need to top off a little bit to make it to bedtime. I'm a pretty heavy user, so your



BIGGER IS BETTER. The f/1.8 aperture lens on the back of the iPhone 7 (right) takes much better photos in low light than the iPhone 6s.



THE IPHONE 7 (left) looks nicer with the relocated antenna bars.

mileage may vary, but I doubt your charging habits will change much.

BETTER SCREEN, STORAGE, AND SPEAKERS

The screen is also improved. It's brighter, which makes it easier to

read in bright sunlight. Where my iPhone SE is almost unreadable while standing in line at a food truck in the harsh midday glare, the iPhone 7 is legible enough that I can read an article in Instapaper or play another level of Two Dots. The screen also supports a wider color gamut, which makes photos and videos really pop with vibrant, saturated color—Dr. Raymond Soneira of DisplayMate recently proclaimed it “virtually indistinguishable from perfect ([go. macworld.com/sleeperhit](http://go.macworld.com/sleeperhit).)” It’s one of those things you kind of need to see

in person to appreciate, though, with an older iPhone on hand to compare side-by-side.

While Apple did remove the analog headphone port (and trust me, I’ll get way into that a little later), it did add a second speaker for stereo sound when you hold the phone in landscape mode. The extra speaker is up near the FaceTime camera, and I could hear a bit of stereo separation when streaming *The Force Awakens* in the Videos app. Watching the same passage on an iPhone 6s, it was more obvious the sound was only coming

**VIDEO**

To view this video, go to [go. macworld.com/iphone7optstable](http://go.macworld.com/iphone7optstable)

from one speaker, and the iPhone 7 was louder too.

Another nice addition is the doubling of storage sizes. The entry-level iPhone 7 is now 32GB instead of 16GB. The middle tier is 128GB, and the high-end is 256GB. That's a pretty big deal if you're always having to manage your available storage by deleting photos and videos. The iPhone SE tops out at 64GB, and the iPhone 6s at 128GB, so if you need a huge amount of storage, the iPhone 7 is the way to go.

CAMERA

This review only covers the iPhone 7—we'll follow up with a separate review of the iPhone 7 Plus, which has two cameras. The iPhone 7 has one 12-megapixel iSight camera, but its performance is much improved on the iPhone 6s's. It's got a wider aperture lens, f/1.8, which lets in more light for better photos in low-light conditions than the iPhone 6s's f/2.2 lens. The iPhone 7 also has optical image stabilization, which used to be confined to the larger Plus models. The TrueTone flash is also 50 percent brighter thanks to four LEDs, and Apple says it can even compensate for the subtle flickering of indoor lighting.

None of that changes how you actually use the Camera app—it's just easier to get a good photo without any extra effort. Colors look amazing on the screen, and the iPhone 7 captures



THE IMAGE ON the left, taken with an iPhone 6s, has lens flare, while the iPhone 7 image (on the right) has better color on the car as well as in the sky.



THE BIGGEST DIFFERENCE is in low light, where the iPhone 7 (right) captured way more detail than the iPhone 6s (left).



THE IPHONE 7 (right) better captured this fire truck's bright colors, and found more detail in the shadowy areas.

the wider P3 color gamut. (iOS 10 even lets third-party apps capture RAW data from the camera, but the stock Camera app still saves images as JPEGs.) My low-light photos show more detail, and daytime photos look better thanks to the vibrant color and the optical image stabilization.

I also loved how quickly the camera can refocus itself when you're composing a photo or shooting a video. I loved getting close up on, say, a flower, and watching how the background of the image got soft as the camera focused on the subject. Then I'd pull back until the focus snapped to the entire plant. A video I took while walking my son home from school really benefitted from the optical image stabilization, greatly reducing the bounce in my step as I tried to keep up with him.

On the front, the FaceTime camera

went from 5 megapixels in the iPhone 6s to 7 megapixels here, although it keeps the same f/2.2 aperture. It can now record video in 1080p, and its low-light performance is improved too. All in all, it just works more like the rear camera, so your selfies always look their best.

WATER RESISTANCE

I've dropped two iPhones into toilets—I'm not proud, but it happens. Luckily, both of them came back to life, but that required a whole day of keeping the phone powered down and sitting in a Ziploc bag of uncooked rice, then a vigorous cleaning with antibacterial wipes that Apple advises against using anyhow. (But come on, I just had to!)

So the iPhone 7's IP67 rating will save a lot of people a lot of time and heartbreak, even if the convenience

NO, I HAVE not yet tried this at home.



store near my office sells fewer bags of rice to panicked iPhone owners. Apple recommends (go.macworld.com/iphone7h20rec) you don't get the iPhone wet on purpose, and if you do, disconnect all cables and be sure to dry it out completely (they even suggest aiming a fan at the Lightning port) before you try to charge it again.

These warnings got me just paranoid enough to not want to test the water resistance of my brand-new phone, but I do appreciate how achieving this rating didn't necessitate any awkward design choices. I reviewed a water-resistant Sony Xperia Z (go.macworld.com/xperiaz-rev) a couple years back, for example, that had little rubber plugs shoved into the charging and headphone ports, which worked but wasn't the best experience. Today, Apple and Samsung (go.macworld.com/samsungstudiosxsw16) are able to make their phones water resistant by protecting components inside the case, so there's no inconvenience to the end user. Water resistance probably isn't reason enough on its own to upgrade, but it's a great bonus.

THE NEW HOME BUTTON

Unfortunately, not everything about the iPhone 7 is better. The new Home button is easier for me to get behind, assuming it helped Apple



waterproof the phone. Still, so far I'm not really a fan.

In past iPhones, the Home button was a real separate button that provided a physical click when pressed. Of course, that meant it was subject to physical failure, although I never had an issue with any of mine. The iPhone 7's new Home button is completely fused with the rest of the iPhone's chin, although you can still find it easily with your thumb thanks to the button's slight indentation, surrounded by the Touch ID's slightly raised metal ring.

So while the new Home button doesn't physically click, it does kind of buzz when you press it, thanks to a taptic engine that Apple added to provide haptic feedback. The effect is similar to the MacBook's Force Touch trackpad (go.macworld.com/2015mbook12) and the Magic

THE HOME BUTTON isn't a traditional button, and I suspect it'll go away completely at some point.

Trackpad (go.macworld.com/trackpad2rev), which also don't physically click but provide a subtle vibration when you press down to simulate the feeling of a click.

Developers can already use those vibrations in their Mac apps, so for example, if you're editing a photo, you could "feel" on the Force Touch trackpad when a selection box snaps to the exact center. Now on the iPhone 7, Apple and third-party iOS developers can use the taptic engine to provide feedback in their apps too. To test it out, open the Clock app, and spin the dials in the Timer app to feel a little buzz with every click of the dial. If you hate the effect, you can turn it off in *Settings* → *Sounds & Haptics* → *System Haptics*.

While the system haptics don't bother me, the new Home button just feels odd. You get three "click feels" to choose from in *Settings* → *General* → *Home Button*, so you can

customize the amount of feedback somewhat. And I'm sure I'll get fully used to it at some point. But after five days, it still feels weird. If the iPhone is ever powered off (I know, it's rare, but stick with me), the Home button doesn't provide any feedback, so you feel like you're pressing a solid wall expecting to find a hidden button. Open sesame?

And the Home button is now capacitive, meaning you can't press it through cloth or through sports armbands that physically cover the button. Based on reports, some touchscreen-friendly gloves work (go.macworld.com/capacitivegloves) on the Home button, while others work on the iPhone 7's touchscreen (go.macworld.com/ip7gloveprob) but not the Home button. (A workaround to exit an app in that case is to 3D Touch the very left edge of the phone's screen to bring up the app switcher, then swipe left-to-right to



MY TWO BIGGEST problems with the iPhone 7 are below the screen.



NOW YOU SEE it, now you don't. The iPhone 6s (top) has a headphone jack. The iPhone 7 does not.

get back to the home screen. Or just buy new gloves.)

I didn't have touchscreen gloves on hand to test—hey, it's California—but we'll follow up with a separate article later. If you live somewhere cold and rely on touchscreen gloves in the winter, you might want to bring your favorite pair to the Apple Store, if possible, to test them out on the iPhone 7 in person.

NO MORE HEADPHONE JACK

The lack of a headphone jack is more annoying than anything else. But it sucks when you just spent \$649-plus on a piece of technology and then have to deal with new annoyances that previous editions didn't have. Quality Bluetooth headphones are still expensive, all Bluetooth headphones need to be charged, and they require a trip to the Settings app

to pair them—and sometimes to re-pair them when they drop the connection with no warning.

Apple claims it's solved these problems with the AirPods, but those aren't available yet. Thanks to a W1 chip, Apple's AirPods, and Beats' Solo3, Powerbeats3, and BeatsX should pair more seamlessly and use less power, but only the Solo3 were available at launch. (AirPods are expected in late October, and the Beats just in "fall.") If you already have Bluetooth headphones you like, this isn't a problem. But if you don't, you'll find yourself in limbo with me, having to choose between what's out now from Jaybird or Bose, settling for last year's Beats, or waiting for Apple's AirPods or the new Beats to show up in stores.

Until then, Apple does provide two wired solutions in the box. I've been mostly using the Lightning EarPods,



which fit and sound exactly like the old EarPods, but have a Lightning plug on the end instead of a 3.5mm plug. As Jason Snell pointed out (go.macworld.com/nojackreasons), if most people use whatever headphones came in the box, having these in the box just might be good enough. I don't love the EarPods, but it turns out I don't hate them as much as I remembered.

As a bonus, you also get a Lightning-to-3.5mm adapter, to plug in whatever analog headphones you already have. (Spare adapters are \$9 at the Apple Store, go.macworld.com/hpjackadapter) The adapter is fine, although it's a little awkward if your headphones have a 90-degree plug instead of a straight one. We'll perform some tests a little later to see if there's much difference in sound quality between using the adapter (which must have a DAC built in) with the iPhone 7, versus plugging the same headphones directly into an iPhone 6s.

My hands-on time with the AirPods (go.macworld.com/airpodshandson) at their unveiling was promising enough that I'd like to hold out for those, and so I don't currently have a set of Bluetooth headphones that I like. So my biggest problem with the

iPhone 7 is that I can't listen to wired headphones and charge the phone at the same time, since both of those require the Lightning port. Depending on your daily routine, you might not find yourself ever needing to do that. But I find myself needing to charge while wanting to listen fairly often, typically a few times a week.

Just recently, I found myself on a commuter bus stuck in traffic, watching my iPhone 7, which was already in Low Power Mode, slip down below 10 percent. If I wanted to connect it to one of the USB battery packs I keep in my bag, I'd have to stop listening to podcasts while it charged. Instead, I popped it into Airplane Mode to squeeze as much battery life as I could. I got home with 2 percent charge left, but I missed a text message from my husband in the process—pretty annoying. I also tend to work out in the evenings, so sometimes I'll top up my iPhone with a USB battery pack while I'm also using it to stream music over Spotify while I ride my exercise bike—wearing headphones. With the iPhone 7, I have to choose: charge the phone while blasting music over the speakers, or wait to exercise with my headphones until the phone has a

THE LIGHTNING

EARPODS can tide me over until the AirPods ship, but I'm salty I can't charge my phone while I'm using them.

chance to top off? (Or get yet another adapter, like this big ol' Lightning splitter (go.macworld.com/belkinlightningsplitter) from Belkin.)

The moral of this story is that I really need some Bluetooth headphones, I realize. But I can't help feeling a little resentful when a piece of technology, in this case the iPhone 7, introduces a new problem that requires me to buy *more* technology to solve it.

BOTTOM LINE

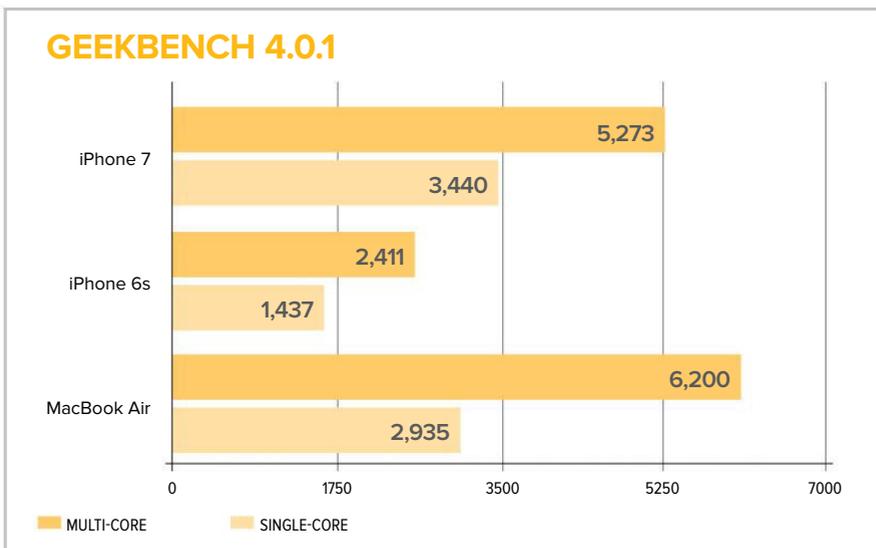
The things that are great about the iPhone 7—primarily its speed and the camera—are likely to be even better in the next generation. On the other

hand, the things that aggravate me about this iPhone—namely, the weird Home button and the aggravation of switching to wireless headphones—are likely to be improved.

If you're excited enough about the camera to upgrade, or your current iPhone is old enough that you want to upgrade, this is the best iPhone for you. But if the drawbacks make you want to sit out a year, I think that's really smart. ■



I WOULDN'T CALL this Lightning-to-3.5mm adapter an elegant solution. But it works and it's relatively cheap.



THE NEW IPHONE 7 benchmarked more like my 2013 MacBook Air than my iPhone 6s. (Longer bars are better.)



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APPLE WATCH SERIES 2 REVIEW: A FASTER, BRIGHTER FITNESS MACHINE

APPLE'S SECOND-GENERATION WATCH DOUBLES DOWN ON FITNESS WITH GPS, WATER-RESISTANCE, A DUAL-CORE PROCESSOR, AND A SUPER-BRIGHT DISPLAY.

**BY CAITLYN
McGARRY**





T

he Apple Watch is a polarizing product. Sometimes it feels like a novelty, a gadget lifted straight from *Dick Tracy* or *Inspector Gadget*. Other times it seems essential, a heart rate-monitoring device that could save your life (go.macworld.com/watchsaves). To make the watch a need-to-have instead of just nice-to-have, Apple is doubling down on its health potential.

I wore the original Apple Watch Sport almost every day (not counting the weeks following *The Incident* go.macworld.com/watchtale), and I've long argued that the device's true purpose lies in its health and fitness features (go.macworld.com/watchhealth). Apple is closer to realizing that potential with the Apple Watch Series 2 (go.macworld.com/shopwatch), which is equipped with GPS, 50-meter water resistance, a dual-core processor, and a brighter display. The Apple Watch is no longer a smartwatch that's pretty good at activity tracking. It's now a fitness band that does all that other stuff—notifications, messaging, emails, podcast playback, reminders—really well.

APPLE WATCH SERIES 2



AT A GLANCE

Series 2 isn't an essential upgrade for current Apple Watch owners, but it's our favorite smartwatch for fitness fanatics.

PROS

- Brighter 1,000-nit screen is easier to see outdoors.
- GPS tracks your routes with no iPhone nearby.
- Water resistant to 50 meters.

CONS

- Still requires nightly charging.

PRICE

\$369

COMPANY

Apple

FIND ME, SATELLITE

The Series 2's marquee feature ([go. macworld.com/watchgps](http://go.macworld.com/watchgps)) is built-in GPS, which means you can leave your phone at home and the watch will record workouts like runs, hikes, and bike rides accurately. I tested this running the same route, once with my original Apple Watch and iPhone in tow, and once with just a Series 2. The mileage matched perfectly, and the results were also comparable to the same route tracked by a Fitbit with connected GPS. The GPS signal, which can get a little lost in New York with its tall, densely packed buildings, picked up as soon as I launched the Workout app.

You can look at your workout summary in the Activity app, which retains its clean and colorful design but adds a map of your route complete with green, yellow, and red lines to denote where you were fast or slow. Your workout summary also includes a weather report, which is a nice touch.

The Apple Watch Series 2 isn't designed for hard-core, die-hard athletes. I run to stay in shape and stave off preventable diseases, not to compete in races. The Series 2 is a great workout companion that I can wear throughout the day, swapping out the Sport band for a more stylish nylon one when going from workout to work.



If you need something more heavy-duty for marathon training, then obviously the Apple Watch is not for you, but most people don't want to wear a Garmin from the gym to the office to drinks and dinner, so your mileage may vary.



THE APPLE WATCH
Series 2 accurately tracks my runs without my phone nearby.

Apple opened up GPS to third-party apps, starting with partners like Nike. The Nike+ Run Club app gets prime placement in the Apple Watch Nike+ edition, but you can take advantage of the app's features without buying a special watch model. There's also a hiking app, ViewRanger (go.macworld.com/viewranger), which uses the Apple Watch's GPS to give you turn-by-turn trail directions without your phone nearby. Presumably all of the popular running apps that have built versions for the Apple Watch will take advantage of the GPS, so you can

exercise with your favorite app completely unencumbered. (This will be a game-changer for anyone who uses a 5.5-inch iPhone—that sucker is difficult to run with.)

APPLE OPENED UP GPS TO THIRD-PARTY APPS, STARTING WITH PARTNERS LIKE NIKE.

But what about music? The original Apple Watch has on-board music storage so you can sync Apple Music playlists to the watch and listen to them with Bluetooth headphones. That

them with Bluetooth headphones. That carries on in the Series 2.

JUST KEEP SWIMMING

The Series 2 is, as promised, water-resistant up to 50 meters. This opens up the Apple Watch to a brand-new demographic, swimmers, who had no use for the device before. I confess: I'm not a swimmer. But for the sake of this review, I put a swim cap on my head, strapped the Series 2 to my wrist, and jumped in the pool at my gym to test it out.

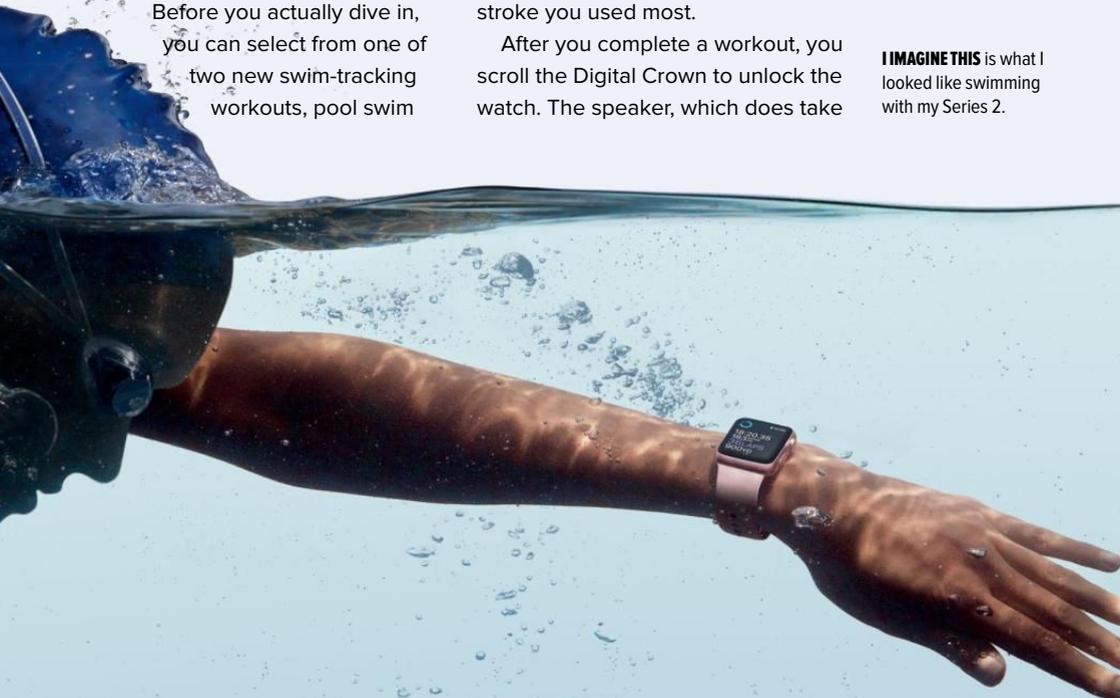
Before you actually dive in, you can select from one of two new swim-tracking workouts, pool swim

and open water swim, in the watch's built-in Workout app. The pool swim workout lets you select how long the pool is for more accurate lap-tracking. Then the watch locks up so you can still see its display but it won't respond to your touch.

If my preferred method of exercise was swimming, the Apple Watch Series 2 would be a compelling purchase. The watch tracks your distance, laps, split pace, average pace, heart rate, and calories burned, and it even tells you what type of stroke you used most.

After you complete a workout, you scroll the Digital Crown to unlock the watch. The speaker, which does take

I IMAGINE THIS is what I looked like swimming with my Series 2.





VIDEO

To view this video, go to go.macworld.com/awseries2vid



on water throughout your swim, then emits a sound that vibrates the water right back out. The watch works perfectly afterward, although Apple recommends you avoid charging it for five hours after a dip.

I didn't plan to use my Series 2 to become a swimmer, but now my inner Katie Ledecky is yearning to break free.

FASTER, BRIGHTER, BETTER

So you're not a runner, biker, hiker, or swimmer—that's OK. The Series 2 is still a huge improvement on the

original watch. Its dual-core processor is up to 50 percent faster than the first-gen model, which means that built-in and third-party apps launch and run more quickly. The September launch of watchOS 3 (go.macworld.com/watchos3faq) went a long way toward making Apple Watch apps more responsive with a new dock. Tapping the side button pulls up your most-used apps, which are stored in the watch's memory and updated in the background so you don't have to wait for information to load. But even with that upgrade, apps launch and retrieve information more

quickly on the Series 2, especially when accessed from the home screen.

The Series 2's display is also two times brighter than the original's at 1,000 nits—during September's iPhone 7 launch event, Apple COO Jeff Williams called it the brightest display the company has made for any product. This is most apparent in bright sunlight, where colors are more vivid and text is easier to read despite intense glare.

The dual-core processor can be had for \$100 less with the Series 1, a reboot of the original Apple Watch that doesn't include GPS or 50-meter water resistance.

BOTTOM LINE

If you don't own an Apple Watch, the Series 2 is the one to buy if you're

serious about exercise. If you don't swim and have no need for GPS, the Series 1 is cheaper at \$269 and has the Series 2's powerful processor (though it's missing that second-gen, ultra-bright display). If you already own the Apple Watch version 1 and are a little miffed about all the features you're missing out on, don't be: watchOS 3 adds plenty of features to your existing watch. Simply updating your device (go.macworld.com/upgradewatchos3) will give you a brand-new experience.

I've always liked the Apple Watch, but hesitated to recommend it when people asked if it was worth buying. A few hundred dollars is a lot of money to spend on a product that isn't essential and has so much room for improvement.

THE APPLE WATCH Series 2 has a brighter display so you can still see it in the harsh light of midday.





But with the Series 2, Apple is committing to what I consider its highest purpose: your health. GPS and water-resistance are must-have features for fitness enthusiasts, and they also give the Apple Watch more power to stand on its own. The Series 2 is also a perfect hardware complement to watchOS 3, which opened up all of the watch's sensors to third-party apps. In addition to the heart rate sensor, the gyroscope, and the accelerometer, developers can tap into the watch's GPS. With apps no longer hamstrung by Apple's limitations, they will only get better.

The Apple Watch isn't like the iPhone, which I can't imagine my life

without. It needs cellular connectivity to become a stand-alone device, and its battery life could be better (like the original watch, the Series 2 needs to be charged nightly). But Apple has pushed the watch so far beyond its original capabilities in the year and a half since its launch that I expect the device to become essential in another year or two. ■

LUNCH 



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The difference between backing up an iPhone to iCloud and iTunes

How to back up your iPhone or iPad so you'll have the easiest time restoring.

BY JEFFERY BATTERSBY

Recently I was hiking in the Adirondacks with my iPhone in my pocket when I got caught in a torrential rain storm. I'm not a crazy case guy, so, as is always the, uh, case, my iPhone was naked. I didn't think it was a problem. I had on a killer Patagonia rain jacket that was supposed to be completely waterproof, including the zippered front pockets, which is where I put my phone when the rains arrived.

As it happens, they weren't waterproof enough (Yeah, Patagonia, I'm looking at you) and my phone took on more than a couple drops of rain.

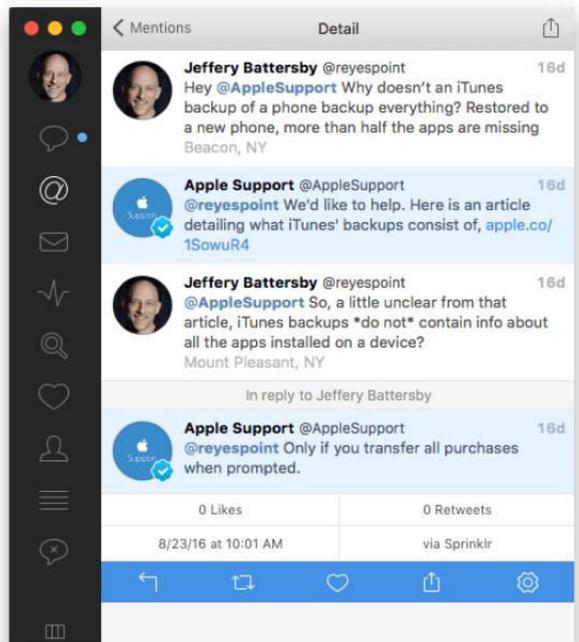
I won't go into the details of the damage, but I wasn't worried because I have AppleCare+ (go.macworld.com/acplus) and this was the first time in all my years of unprotected iPhone use that I had to take advantage of it. I also had a full iCloud backup, which put me in good stead once I had a new phone in my hands. But, an iCloud restore also meant I'd have to be near Wi-Fi and plugged in to get my phone back up to speed. So, I created an iTunes backup before I replaced my phone at the Apple Store. Yes, I could see my damaged phone in iTunes but the display was dead.

So, I plugged in, backed up, and got my phone replaced, and I restored my backup from iTunes.

To my great surprise that restore didn't include all of my apps. Some were there and up to date, but most weren't, although if I downloaded an

app I knew I had before, it would show up exactly where it had been on my old phone with all the data intact.

I kicked off a quick tweet to Apple Support and got the following response:



Which was a link to this support article (go.macworld.com/sup) on Apple's web site, but it wasn't clear from the article what the "content" that wasn't being backed up was, so I tweeted Apple Support again asking about apps and was told that I had to "transfer all purchases when prompted."

Which was curious, because I didn't recall being prompted.

I ended up restoring from my iCloud backup, but decided to play with the iTunes backup to see whether I'd missed something. And, sure enough, I had not. There was no prompt to transfer purchases.

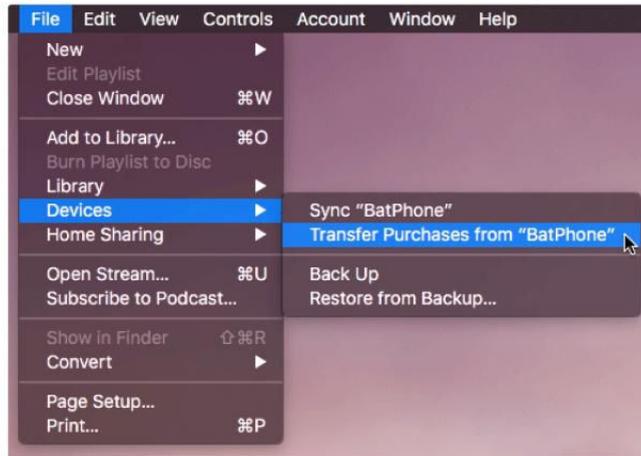
Digging further into the backup article I hit a link (go.macworld.com/bul) for transferring purchases in iTunes, which has changed from previous versions of iTunes.

In short, if you're not using iCloud to back up your iOS device and you want smooth sailing when you restore a new iOS device from a backup, make sure to perform the following steps. To restore properly, all the apps on your iOS device also need to be in your iTunes app library.

Note: Your app data is always backed up. Even if you restore an app a few days later, that data will reappear.

Every time you back up your iOS device and you know you've downloaded new content from the iTunes Store:

1. Plug your device into your Mac.
2. Click the File menu.
3. Select the Devices menu.
4. Select the Transfer Purchases From [*Your iOS Device*] menu item.

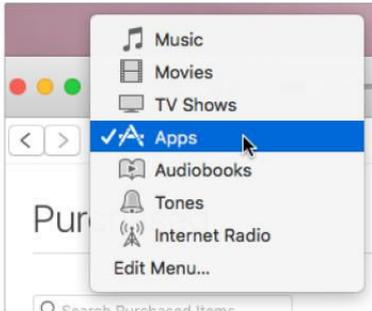


This will result in a complete backup of your iOS device when using iTunes to back up your device.

Note: iCloud always backs up all of your apps and data. If you have the option to use iCloud, do it, and use an iTunes backup as a failover.

In the event that you haven't done this prior to your restore, all is not lost. There are two ways to get your apps back:

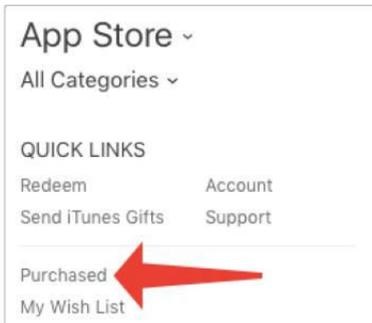
- > Remember and redownload every app fresh from the iTunes Store on your iOS device
- > Or:
 1. Open iTunes.
 2. Select Apps.



3. Click the App Store tab.



4. Click the Purchased link in the iTunes account section of iTunes.



5. Click the Not In My Library tab.
6. Locate and download all the apps you remember having on your iOS device, or,
7. Click the Download All button at the bottom of the page.



Once you download the apps you can restore your backup to your new device and all your apps and their associated data will reappear on your iOS device.

One last important note: Choosing the Encrypt option when backing up your iOS device will save passwords for all your email accounts, saving you the time and effort of having to re-enter all that information. ■

How to turn on/off read receipts in macOS Sierra's Messages

Read Receipts let the person you are communicating with know when you have received and read their message.

BY ROMAN LOYOLA



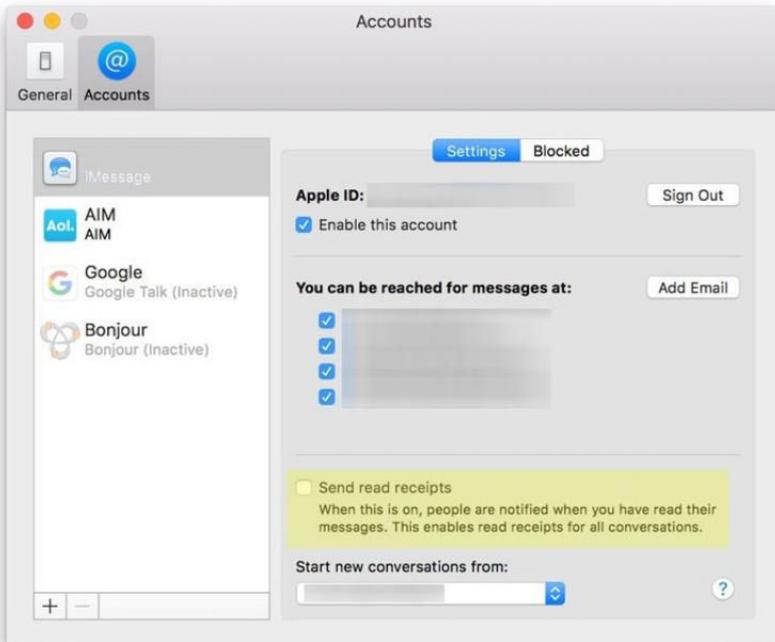
When you are using Messages, Read Receipts let the person you are communicating with know when you have received and read their message. If, for whatever reason, you want to change this so that you are not sending a read receipt, you can modify it in the Messages app.

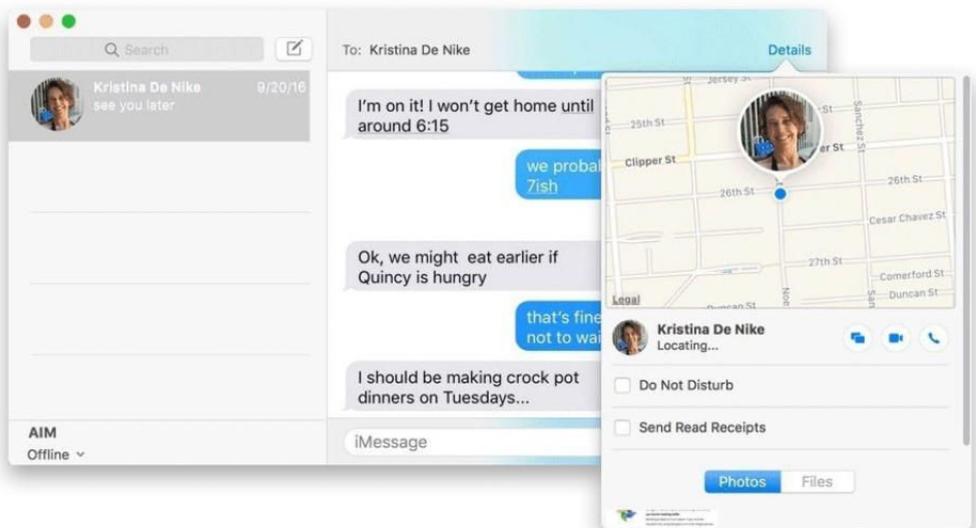
It's important to note that this works only if both users on the chat are using Messages, either on the Mac or on an iOS device. Read receipts are not available when you are using Messages and the person you are chatting with is using another platform like Android.

HAVE READ RECEIPTS ON ALL THE TIME

If you always want to send a read receipt, here's how to set it in the Messages app.

1. In the Messages app, go to *Preferences* → *Accounts*, and click on the account you use in the left pane.





2. Click on the Settings tab if it is not open.

3. Check the box for “Send read receipts.”

SEND A READ RECEIPT ON A PER CONVERSATION BASIS

If you rather have Read Receipts off and activate it on a per conversation basis, here’s how to do it.

1. When you are chatting with someone, a Details link appears in the upper right. Click on it.

2. A pop-up window showing details about your chat partner appears. At the bottom you will see a checkbox for Send Read Receipts. Check it if you want to activate this feature for the conversation you are having. ■



How to configure a software RAID in macOS Sierra's Disk Utility

The ability to set up a software RAID has returned to Apple's utility.

BY ROMAN LOYOLA

Apple's Disk Utility is usually the go-to app for reformatting, partitioning, and diagnosing storage devices on your Mac. For many years, the Disk Utility app stayed the same in terms of features and user interface.

But that changed (go.macworld.com/ch) with OS X El Capitan; Disk Utility got a major facelift, and it also had its feature set modified. One of the major changes was that Apple removed any ability to set up and configure a redundant array of independent disks (RAID). You had to turn to a third-party app to do so.

In macOS Sierra's Disk Utility (version 16.0, if you're keeping track), the RAID features are back. Here's how to set up and configure a software RAID using macOS Sierra's Disk Utility. You can use Disk Utility if you, say, bought a multi-bay drive chassis and have filled it with spare hard drive mechanisms you had sitting in

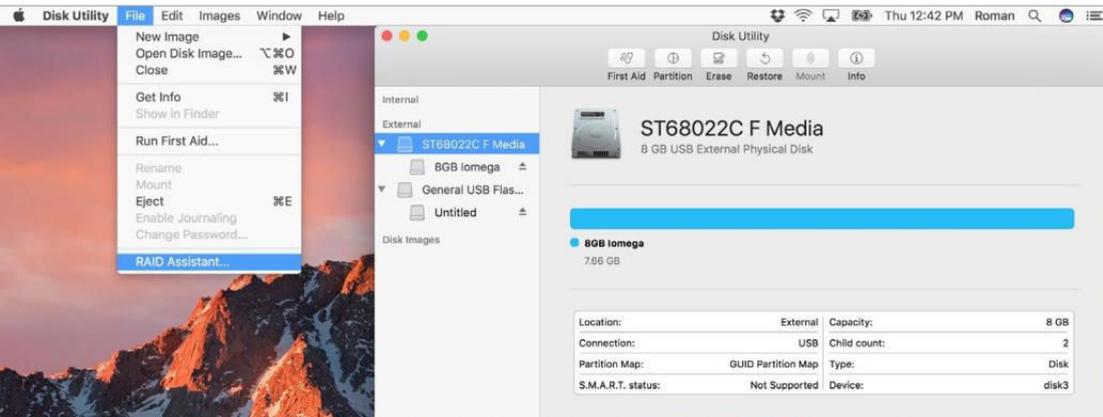
storage. Or you already have a RAID array and need to reconfigure it.

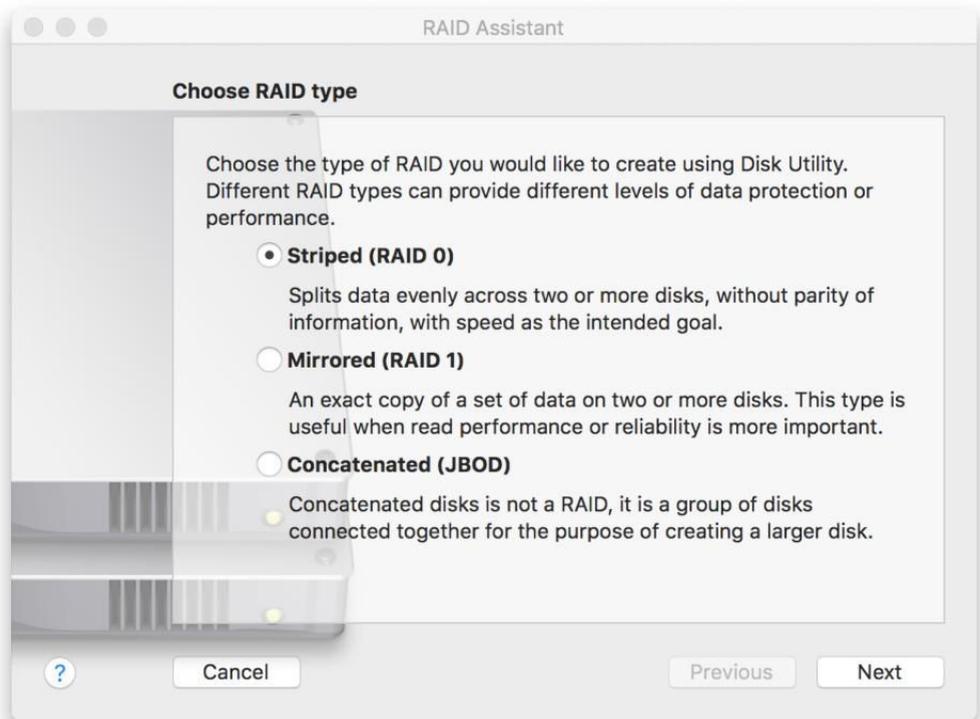
(In case you're wondering, a *software RAID* is one where the Mac manages the RAID. A *hardware RAID* is a RAID array that includes a separate computer that manages the RAID. Learn more about hardware RAIDs (go.macworld.com/hwraid). If you're new to software RAIDs, here's how to get started with the storage devices (go.macworld.com/chraid), then come back to this article to set up the RAID.)

HOW TO SET UP A RAID IN MACOS SIERRA'S DISK UTILITY

This will erase any data that exists on

HOW TO ACCESS the RAID Assistant in macOS Sierra's Disk Utility.





the disks you want to use for the RAID. Back up that data if you want to save it.

1. After you connect your storage devices to your Mac, launch Disk Utility. It's located in the Utilities folder, which resides in your Applications folder. You can also press Shift-Command-U or select the **Go → Utilities** menu while in the Finder.

2. With Disk Utility open, you should see the main window. To get to the RAID tools, click on the File menu and select RAID Assistant.

3. On the opening screen of the

RAID Assistant, you select the RAID type. Which one should you choose?

> **(Striped) RAID 0:** This one's all about speed. It doesn't offer data protection, so you'll need to rely on another backup system, like Time Machine. But if backup isn't an issue and you need the performance, go with RAID 0.

> **(Mirrored) RAID 1:** The same data is written to all the drives. If a drive fails, your data is intact. When your Mac needs to read a file, the performance is faster because the

CHOOSING A RAID format in macOS Sierra's Disk Utility.

data can be read by multiple drives.

> **Concatenated (JBOD):** This simply takes your drives and uses them to create one storage volume. It doesn't offer data protection or better speed.

Choose your type, then click Next.

1. The next step is to select your storage devices. Disk Utility will show the drives eligible for the RAID format you select. The app shows the disk, and underneath each disk is a list of the partitions on that device. (When you take the space of a storage device and divide it during formatting, you are creating partitions.)

Click on the checkbox next to the disks you want to include in the RAID.

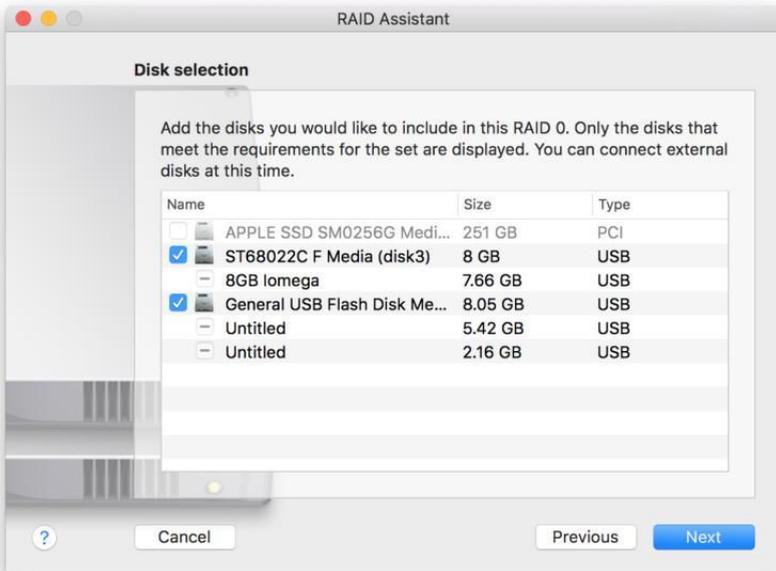
When you select a disk, all the partitions are automatically selected.

When setting up a RAID 1, you have to decide if a drive should be a *RAID Slice* or a *Spare*. A RAID Slice means the drive is an active part of the array and mirrors your data. A Spare is a drive that sits in waiting until a Slice fails, then data is mirrored to the spare automatically. If you have two drives, they each need to be set as RAID Slice. If you have more than two, you can set one as Spare.

Click the Next button after you've selected your disks.

2. Now you need to set the properties for your RAID.

> **Name:** Give your RAID a name,



SELECT THE DISKS

you want to include.

like you would your hard drive.

> **Format:** Most people should select Mac OS Extended (Journaled). Select Mac OS Extended (Case-Sensitive, Journaled) if you want files with the same name but with different case treatments (Science Report.txt and science report.txt, for example) to be saved as separate files.

> **Type:** This is what you selected back at the beginning of the procedure. To change it you have to start over.

> **Capacity:** This is based on the drives you selected in the previous step.

> **Chunk size:** Since data is written across drives, it is broken into pieces. Chunk size determines the size of those pieces. If you work with large files, like with video or 3D graphics, choose 128K or 256K. If you are a more general purpose user who does email, writes, or works in spreadsheets or databases, choose 32K or 64K.

> If you are building a RAID 1, you'll see an option to "Automatically rebuild." This means that if a drive is removed and then replaced, the data will automatically be restored to the new drive. Check this box if you want this option. If you don't, you rebuild the RAID using the Disk Utility app.

Once you click Next, your Mac will start to configure your RAID array, so don't click it until you are ready.

3. Double-check your properties,



then click Next. You'll see a screen like the one above as your Mac goes to work configuring your RAID. This involves reformatting and partitions your disks and creating the RAID.

RAID properties.

When the setup is done, you should see the screen below, and your RAID will be available for you to use. ■

CREATING RAID.





How to use iCloud Drive's new Desktop and Documents access in macOS Sierra

With this new feature, files saved to the Desktop and in Documents are automatically saved your iCloud Drive.

BY ROMAN LOYOLA

With macOS Sierra (go.macworld.com/moss), iCloud Drive has the ability to automatically save files saved on your Desktop and in your Documents folder to the cloud. Apple says these are the places where most files are saved, so this feature will be very useful for anyone who uses multiple devices.

If you want to rely on this feature, make sure you have enough iCloud Drive storage space. All files saved to Desktop and Documents count against your iCloud Drive storage allocation. For example, if you have 1GB worth of files in your Mac's Documents folder and you want to save it to iCloud Drive, your allocated storage will take a 1GB hit. Apple provides 5GB of free iCloud Drive storage per Apple ID, and it may not be enough. Here are the prices for iCloud storage upgrades:

- > 5GB: free
- > 50GB: \$1 per month
- > 200GB: \$3 per month
- > 1TB: \$10 per month
- > 2TB: \$20 per month

Apple has instructions (go.macworld.com/ins) on how to buy more iCloud storage.

HOW TO TURN ON ICLOUD DRIVE DESKTOP AND DOCUMENTS ACCESS IN macOS SIERRA

Here's an overview on how iCloud Drive's Desktop and Documents access works.

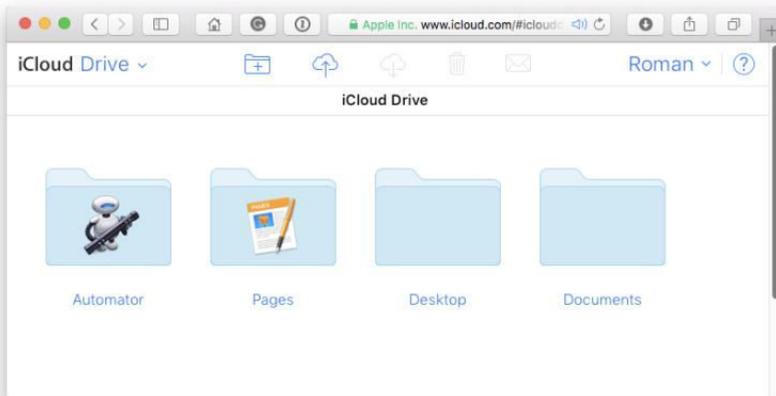


1. In macOS Sierra, got to *Apple Menu* → *System Preferences* → *iCloud*.

2. iCloud Drive appears at the top of the list in the main section of the window. Check the box for it, and click on Options.

3. In the Documents tab, there is a section labeled, “Apps that store documents and data in iCloud will appear here.” At the top of the list will be a new Desktop & Documents Folders listing. Check the box to activate it.

HOW TO ACCESS the RAID Assistant in macOS Sierra's Disk Utility.



ICLOUD DRIVE accessed through the iCloud website. The new Desktop and Documents folders show up when you activate Desktop and Documents access in macOS Sierra's iCloud system preferences.

That's all you have to do to activate it. iCloud needs a few minutes for your files to save to iCloud; how long depends on how many files you have.

DESKTOP AND DOCUMENTS: ICLOUD WEBSITE

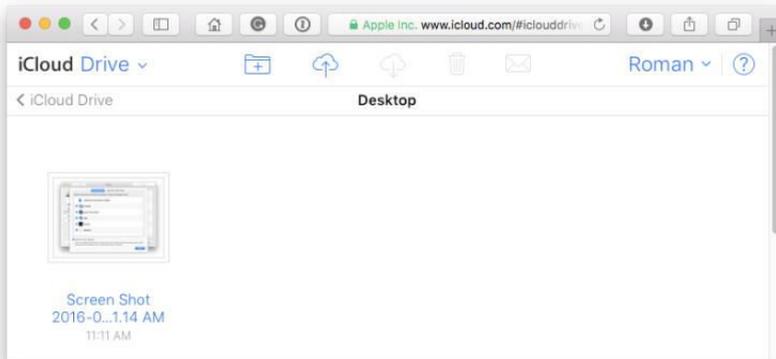
When you go to your iCloud Drive through the web, there are now Desktop and Documents folders.

The files you saved to these folders on your Sierra Mac are

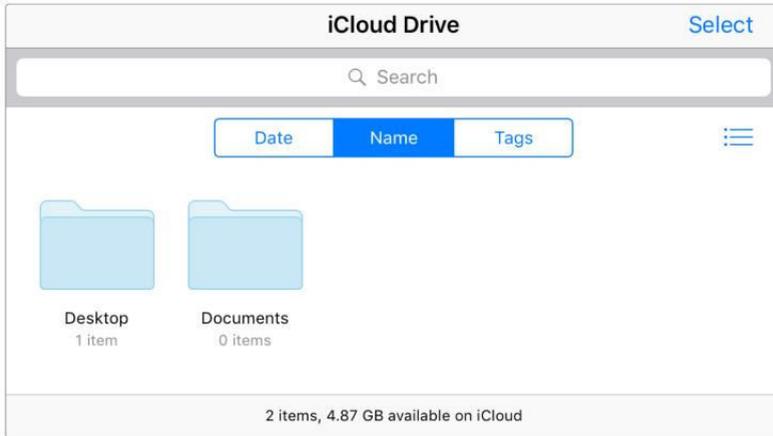
accessible through the iCloud Drive website. If you save files to the website, they will be synced to your Sierra Mac. If you delete files on the website, they will be deleted from your Sierra Mac.

DESKTOP AND DOCUMENTS: ACCESS FROM IOS

Your iOS device can access files in the Desktop and Documents folder if you have iCloud Drive turn on your



ISAVED THE first screenshot in this article to the Desktop. Here it is my iCloud Drive website.



ACCESS TO the Desktop and Documents folders on iCloud Drive through iOS 9.

device. This can be done in *Settings* → *iCloud* → *iCloud Drive*, and then turn on the Show on Home Screen setting.

Tap on the iCloud Drive app on your Home screen. You'll see the folders you can access, including Desktop and Documents. Tap on a folder, and you can get to the files.

DESKTOP AND DOCUMENTS: ACCESS FROM ANOTHER MAC

To get to the iCloud Drive Desktop or Documents folders from a different Mac, iCloud Drive access first need to be turned on through the iCloud system preference (*Apple Menu* → *System Preferences* → *iCloud*).

iCloud Drive will appear under Favorites in any Finder window. If you're in the Finder, you can also click on the Go menu and select iCloud Drive, or you can press Shift-Command-I.

When the other Mac is running Sierra

If you're using another Sierra Mac, then the files will automatically appear in that Mac's Desktop and Documents folder, provided that that Mac has internet access.

In Sierra, you may notice that in a Finder window, Desktop and Documents appear in the right column under iCloud, and not in Favorites as in previous versions of OS X.

When the other Mac is not running Sierra

If the other Mac you are using doesn't have Sierra, you can still access the Desktop and Documents folders that were created by the Sierra Mac. You will need internet access.

In a Finder window, iCloud Drive appears under Favorites. Also, in the

Finder, you can click on the Go menu and select iCloud Drive, or press Shift-Command-I. Go to the iCloud Drive, and you'll see Desktop and Documents folders. You can access the files from the Sierra Mac this way.

However, there are a few things to note:

- > Your Desktop and Documents files on your non-Sierra Mac's local storage device won't be automatically saved to iCloud Drive. Files from your non-Sierra Mac need to be manually saved to the Desktop and Documents folders on iCloud Drive if you want your Sierra Mac to access those files.

- > The default action when dragging and dropping from the iCloud Drive Desktop or Documents folders is to move the file, not copy it.

To copy files from the iCloud Drive



Desktop or Documents folders when using a non-Sierra Mac, you have to hold down the Option key while dragging and dropping, or right-click the file and select Copy, then on your non-Sierra Mac, right-click on the destination and select Paste Item. ■

IN SIERRA, the Desktop and Documents folders have moved to the iCloud section from the Favorites section.



IF YOU TRY to drag and drop copy files from iCloud Drive's Desktop or Documents to a non-Sierra Mac, you'll see this warning.

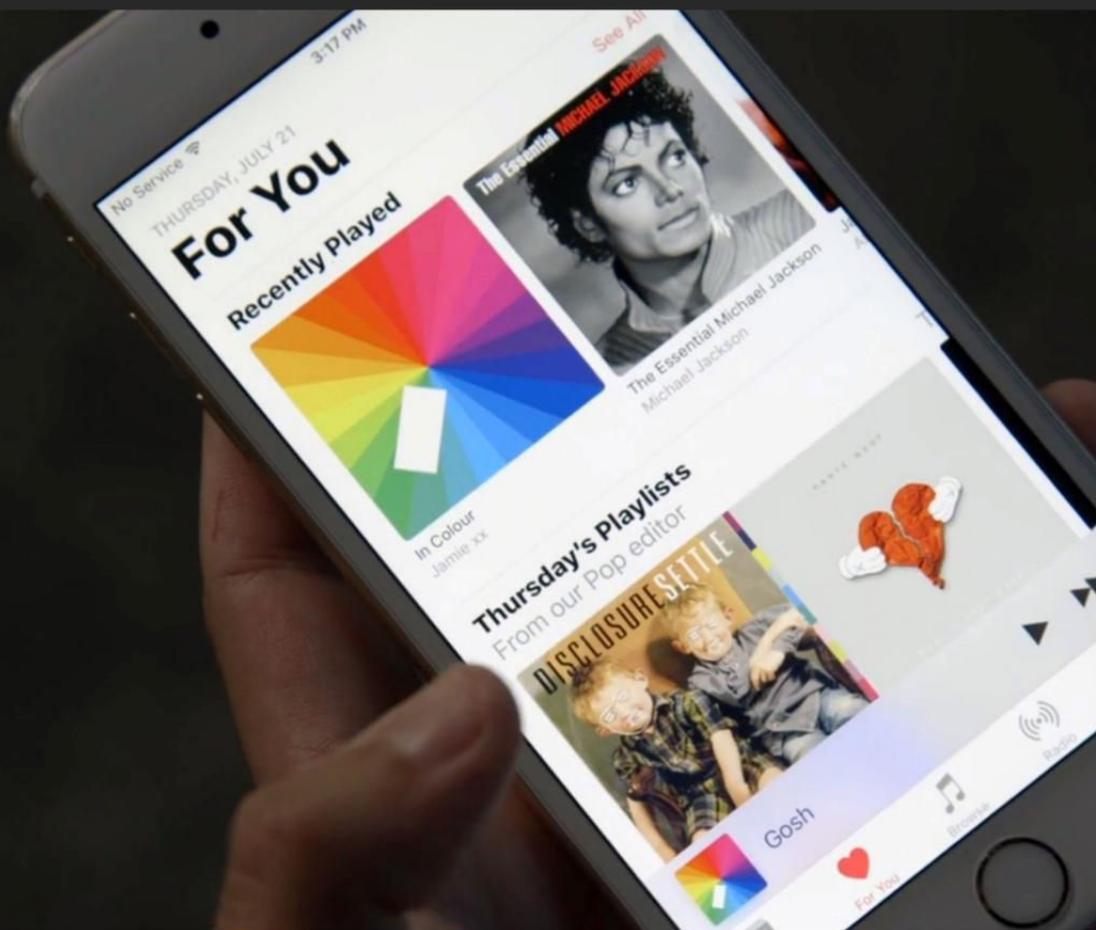
**TEXTING
AND DRIVING
MAKES
GOOD PEOPLE
LOOK BAD.**

STOPTEXTSSTOPWRECKS.ORG



PLAYLIST

Everything You Need to Know About iPods, iTunes, and Mac-Based Entertainment



Apple Music in iOS 10: Smart, simple, but still imperfect

Apple's streaming service got a much-needed reboot. Here's everything we love and what we could do without.

BY CAITLIN MCGARRY

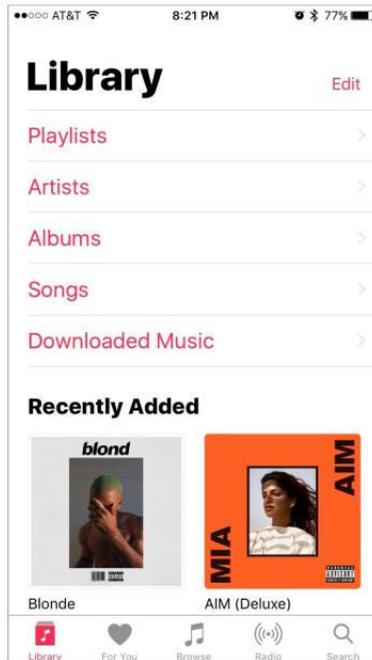
Apple Music was heavily criticized for just about everything when it launched last summer, and rightfully so—the app was needlessly complicated to use and handled your purchased songs and streaming library in an opaque, confusing way (go.macworld.com/opaque).

So Apple redesigned the Music app in iOS 10, taking all of those critiques to heart. Apple Music cleaned up the clutter, reconsidered the navigation tools, put your library front and center, and added algorithmically created playlists to rival Spotify's. It's still not perfect, but the streaming service's 17 million paying subscribers will have an easier time finding and saving the music they love.

BIGGER, BOLDER, BRIGHTER

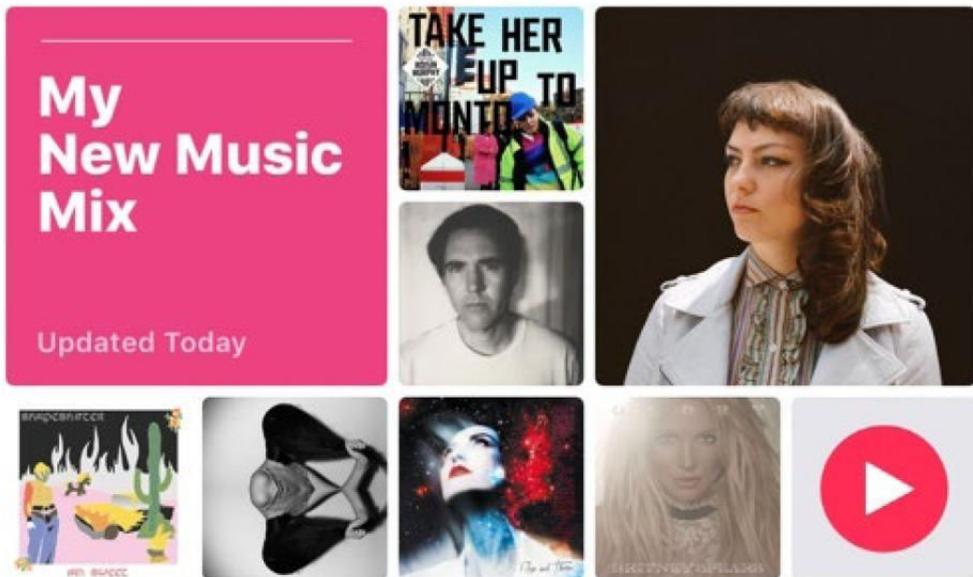
After installing iOS 10 (go.macworld.com/10launch), the first thing you'll notice when you open Apple Music is how much bigger everything is. The fonts are larger and so is the album art, with plenty of white space in between.

Then you'll see the new navigation bar, which is still pinned to the bottom of the app but now spotlights areas of the app that you actually need to see. Gone are Connect, the social network for musicians that no one uses; New, which was a catch-all for popular tracks and fresh playlists; and My Music, which had separated your



streaming library from your playlists in a befuddling way.

Apple replaced those tabs with Library, Browse, and Search, which combined make it much easier to find exactly what you're looking for without all those extra taps.



LIBRARY

We may never know why Apple Music's designers thought the best way to store your music was to divide it into your Library and Playlists, but those days are thankfully behind us.

Now your library is front and center, with shortcuts to your playlists, artists, albums, songs, and downloaded music right at the top. Recently added songs and albums live underneath those shortcuts in a two-column view that emphasizes album art. It's clean, simple, and gets the job done.

I had one complaint about how Apple Music organizes your Library, but I found a fix that was completely unintuitive. Songs and albums are by

default organized alphabetically by artist name, which made no sense to me. The fix: Go to your iOS Settings → Music, then tap on Sort Songs & Albums under Library. Switch By Artist to By Title. Thank me later.

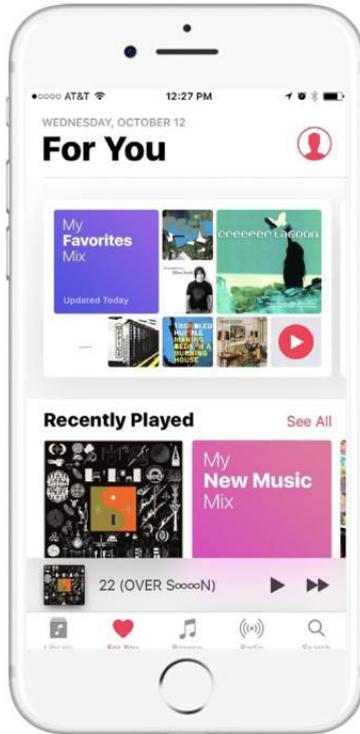
FOR YOU

At first I loved For You, which in version 1.0 seemed to know exactly which human-curated playlists I would love. But those playlists got stale, and I stopped relying on Apple Music to help me discover fresh tunes. In iOS 10, Apple has introduced algorithmically selected playlists, My Favorites Mix and My New Music Mix, which are placed squarely at the top of For You.

These are different from the Discovery Mix that Apple promised during the Worldwide Developers Conference in June, which sounded like a direct competitor to Spotify's insanely popular Discover Weekly playlists. Spotify's mix, which is refreshed every week, sounds like one your best friend would make you: deep cuts from your favorite bands combined with new music you'll probably like and tunes from

artists you've never even heard of. Discover Weekly understands your soul. I was hopeful that Apple's Discovery Mix would be the exact same.

But instead, Apple split up its algorithmic playlists into a collection of favorites, either songs I've favorited in the app or songs by artists I follow, and a mix of new songs the algorithm predicts I'll like. The favorites mix is great, obviously, because I've listened to and loved those songs before. The new music was just OK. Neither were



anything like Discover Weekly.

For You also features recommended playlists which seemed to have no relevance to stuff I like—Wednesday's Playlists featured a playlist of EDM samples and one called "Electronic BBQ." No thanks.

Then there's a section called Heavy Rotation, which features songs and albums you play too much, Artist Spotlight playlists, new releases, and

every artist post that would've gone under Connect but now is buried at the bottom of For You.

This still needs some work. Kill Connect already, Apple, and make those algorithmic playlists just as good as the ones made by humans.

BROWSE

Browse is brand new to Apple Music, and it's a tab that serves as a catch-all. From here you can navigate to New Music, where newly released

songs and albums live alongside new artists, hot tracks, and “music you need to hear.” Here you can also get to the curated playlists made by Apple Music’s editors. You can browse playlists by activity, genre, or curator/ sponsor (Shazam makes playlists, as do Pitchfork, Sonos, and Vogue).

Then there are music videos, top charts, and genres, which seem like afterthoughts. It feels like Apple should’ve kept New as its own tab, since a big reason why people use streaming music services is to quickly find the latest releases and check them out before buying them outright.

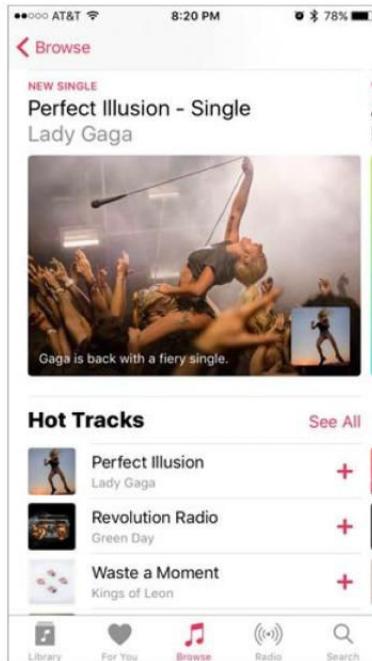
RADIO

Apple is still clinging tight to Beats 1, as it should, and its 24-hour radio station is given top billing under Radio. Finding a Beats 1 show that already aired or listening to whatever show is currently streaming is easier than ever, which might turn Beats 1 into more of a go-to when I’m in the mood to let someone else play DJ.

This tab is also where you can see the stations you’ve created based on a particular artist or song, or view Apple’s existing stations like Pop Workout, Classic Hip-Hop, or Franco-phone Indie, if you’re feeling fancy.

SEARCH

Search is...search. Start typing in the bar at the top and you’ll see an option

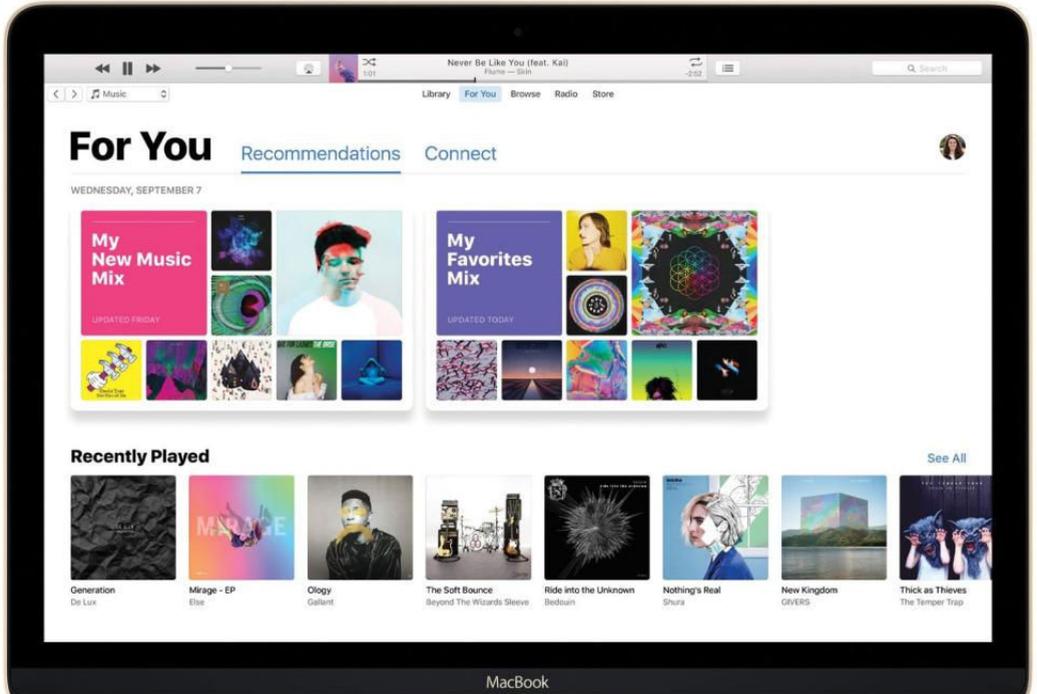


to search either Apple Music or just your library. You can view recent searches and trending searches.

Does it need its own tab? I’m not sure. If Apple put a search bar at the top of Browse and gave new music its own section, I would be much happier.

SMALL CHANGES FEEL HUGE

But overall, Apple Music’s redesign is a huge improvement over its previous incarnation, and a clear sign that Apple is listening to its customers. There are small tweaks that feel huge, like the ability to navigate to an artists’



Apple Music in iTunes just got more enjoyable and easier to use

Apple Music in iTunes 12.5 is a lot better the second time around.

BY KIRK McELHEARN

Fifteen months ago, Apple launched Apple Music, and more than 17 million subscribers are now using the service. But it hasn't been without problems. The interface Apple offered in iTunes and in the iOS Music app was confusing, and it turned music listening into a chore.

Apple paid attention to users' complaints, and has now released version 2 of Apple Music, to coincide with the release of iOS 10 and its updated Music app (see [story on page 141](#)), and iTunes 12.5 (go.macworld.com/it125), which offers a number of tweaks and changes.

I've been using the new Apple Music for several weeks now, since it was made available to beta testers of Apple's operating systems. It's a solid upgrade, with lots of improvements to make the service easier to use, and it's more enjoyable. Here's how it works in iTunes, and we have a guide for the iOS app too (go.macworld.com/10guide).

WHAT'S IN A NAME?

To start with, Apple simplified the navigation bar that displays above the content of your iTunes library and when you're viewing Apple Music. Instead of My Music, For You, New, Radio, Connect, and iTunes Store, the new navigation bar is simpler. Library is your music library, while For You contains recommendations, as before, but also the relocated Connect feature. Browse makes a lot more sense than

New, because that's where you need to go to search for music, new or old.

SIZE MATTERS

Gone are the skimpy fonts of yore; Apple Music now displays very large fonts so you can't miss what you're looking for. Whether it's the huge For You, the large "tabs" in the For You or Browse sections, or the big genre names when you view Genres in Browse, the fonts make it very clear what you're looking at.

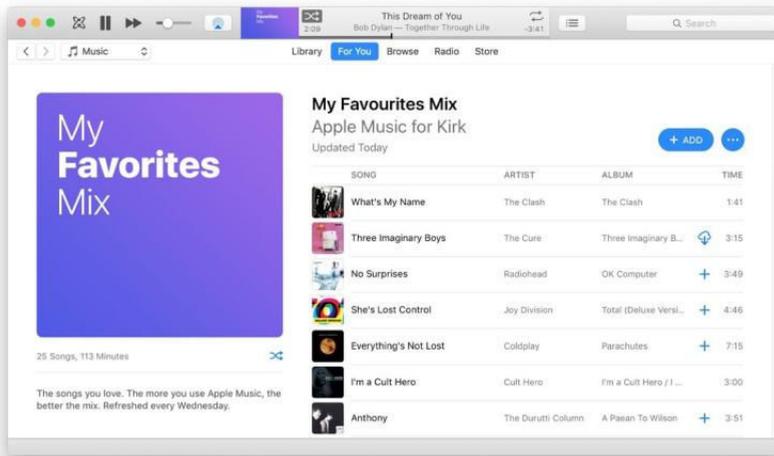
TO START WITH, APPLE SIMPLIFIED THE NAVIGATION BAR THAT DISPLAYS ABOVE THE CONTENT OF YOUR iTunes LIBRARY AND WHEN YOU'RE VIEWING APPLE MUSIC.

DISCOVERY

For You is the heart of Apple Music for many people: it contains recommendations based on your play history, ratings, and iTunes Store purchases. Apple has cleaned this up significantly:

> The top section contains My New Music Mix, a playlist of new songs you might like. Next is My Favorites

THE NAVIGATION BAR is simpler, and more logical.



Mix, a playlist of 25 songs gleaned from your favorite music. Each of these playlists are updated weekly. I find My Favorites Mix to be a great way to listen to music I know I like, and I wish it would update more often, or contain more music.

> Scroll down to see Recently Played, which shows the playlists and albums you've listened to recently. This is a good way to go back and check out something you only heard with one ear, and perhaps add it to your iCloud Music Library.

> There's a section with the day's playlists. This is similar to the playlists that For You offered before, but presented in a different way. I can't say that these playlists are any better; the six playlists I see as I'm writing this article don't interest me much.

> Next comes a selection of

albums, again linked to the current day. There are four blocks of four albums, each one related to music I like. Right now, there's one "Because you like electronic," another "Because you listen to Bob Dylan," and another "Since you're into jazz." These are a bit simplistic, but I have found some music I like there, from artists I know and others I've discovered.

> Next are Artist Spotlight Playlists, six of them, focusing on music by a specific artist, or their influences.

> Finally comes New Releases, with a row of a dozen albums Apple Music thinks I might like. This isn't a very good selection, and contains a number of albums I've told Apple Music that I dislike.

All in all, there are a dozen playlists and a few dozen albums on the For You screen, more than enough to

find something to listen to when I'm short on inspiration.

The Browse section also benefits from the cleaner display, with a number of sections for new releases, "Music You Need to Hear," "Hot Tracks," and more. There are quick links at the top of the page to Curated Playlists, Videos, Top Charts, and Genres. And hop into any genre, and you'll find more focused new music.

View an album and you're greeted with more bigness. In fact, this is a key feature of iTunes 12.5: bigger fonts and much bigger artwork. It's a bit jarring at first to see the size of album artwork in iTunes 12.5, but both in your library and in Apple Music, it makes the music stand out a bit more.

Gone are the thumbnails that made you squint; this artwork is in your face.

Apple Music Radio hasn't changed much. The content and features are the same, but it, too, benefits from the simpler interface and larger fonts.

I wasn't a big fan of the first iteration of Apple Music. The design lacked the simplicity that is often present in Apple products (with the exception of iTunes). Apple has stopped trying to cram so much content into the Apple Music display, and has allowed everything to breathe more. Looking at the Apple Music interface in iTunes, I feel less pressured to pick something, and more inclined to browse and actually check out some of its suggestions. ■

THE NEW APPLE Music features bigness all around.

The screenshot shows the Apple Music interface in iTunes 12.5. The top navigation bar includes "Library", "For You", "Browse", "Radio", and "Store". The main content area displays the album "Nearness" by Joshua Redman & Brad Mehldau, released on Sep 9, 2016. The album artwork is large and prominent. Below the album title, there is a list of tracks with columns for "SONG", "GENRE", and "TIME".

| SONG | GENRE | TIME |
|-----------------------|-------|-------|
| 1 Ornithology | Jazz | 8:40 |
| 2 Always August | Jazz | 10:57 |
| 3 In Walked Bud | Jazz | 9:58 |
| 4 Mehlsancholy Mode | Jazz | 12:39 |
| 5 The Nearness of You | Jazz | 10:47 |
| 6 Old West | Jazz | 14:39 |

At the bottom left of the album view, it says "6 Songs, 74 Minutes".

Ask the iTunes Guy: Your questions about the iOS 10 Music app

Apple new Music app has people scrambling to find features that seem to have disappeared.

BY KIRK McELHEARN



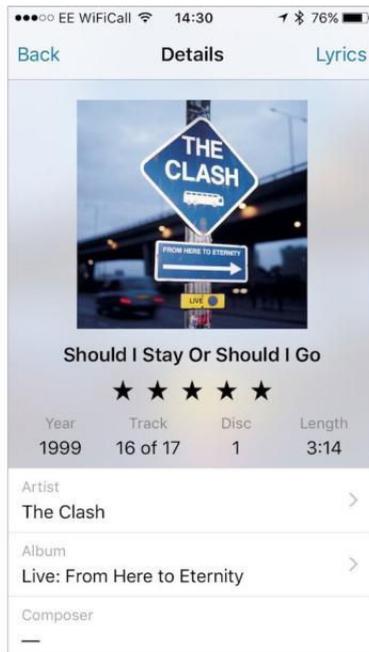
Apple just released iOS 10, and with it a new Music app, as well as an update to Apple Music. I've been getting a lot of questions in recently about the iOS 10 Music app from people who have been using it as part of Apple's public beta program. And immediately on public release, I started getting emails about some of the quirks in this new app. So this month's column looks at several issues in the iOS 10 Music app: ratings, Up Next, Genius, and more.

THANK MY LUCKY STARS

Q: I rate much of my music with star ratings, but I can't see any way to do this in the iOS 10 Music app. Have star ratings been removed from the app?

A: This is by far the most common question I've received, and for cause. Many people manage their iTunes libraries with smart playlists populated with their favorite music from certain artists and genres and with specific star ratings. I have a number of playlists for my 4- and 5-star music, and these are essential to me. They allow me to sync music that I really like to my iPhone, without having to trawl through my vast music library and choose specific albums or songs. I also sync new music to my iPhone, and rate it to decide what to keep, or what to listen to again.

Apple has indeed removed star ratings from the iOS Music app in



YOU CAN RATE songs on iOS with Cesium.

favor of Love and Dislike ratings; mostly. There are still a couple of ways to rate your music. The first is to use Siri. While a song is playing, invoke Siri and say "Rate this song

five stars,” for example. Siri will do this, but you won’t see it on your iOS device; you’ll only see it when you sync your device to iTunes. The downside to this is that invoking Siri pauses the music playback.

There are also a couple of apps you can use to rate songs. Cesium (go.macworld.com/ceslum) is a \$1 music player which lets you rate music, and which works with iOS 10. Tap the *i* button while a track is playing to bring up a display where you can set a rating.

Music Rating Widget (go.macworld.com/wid) is a \$1 app that adds a rating widget to your Today view. Swipe to display widgets, and you can rate the current track. It hasn’t been updated for iOS 10 yet, so the display isn’t perfect, but it’s a great way to rate tracks quickly.

WHAT’S NEXT?

Q: I like to use Up Next on my iPhone, and sometimes I want to clear its contents to add new music to it. I don’t see any way to do this in iOS 10. Is it possible to clear the Up Next queue?

A: Alas, no. I don’t know why Apple removed something as simple as that. And even deleting tracks isn’t easy. You swipe from right to left, as you do in many other apps, but for some reason, any vertical movement during

the swipe moves a track up or down, and doesn’t display the red Remove button. But you wouldn’t want to swipe and delete every track. The only thing you can do is just put up with it, in the hopes that Apple will restore this function.

Related to this, there is no longer a play history that you can see from the *Up Next* menu, as you could in the past. This is also a shame, since sometimes you’re listening to something and you forgot what it was, and you want to go back and check. Or you want to go back and play some of your favorite songs again. Let’s hope that Apple restores that feature too.

NOT SO SMART

Q: I love Genius. I use it often on my iPhone to create ad-hoc playlists from my favorite songs. But I can’t see how to do this in iOS 10.



A: This is a weird one. If you go to *Settings* → *Music* → *Library*, you see a toggle for Genius. But if you look in the Music app, Genius is nowhere to be found. You used to be able to create a Genius playlist by tapping the ... button, then tapping *Create Genius Playlist*. But there is no such option in iOS 10.

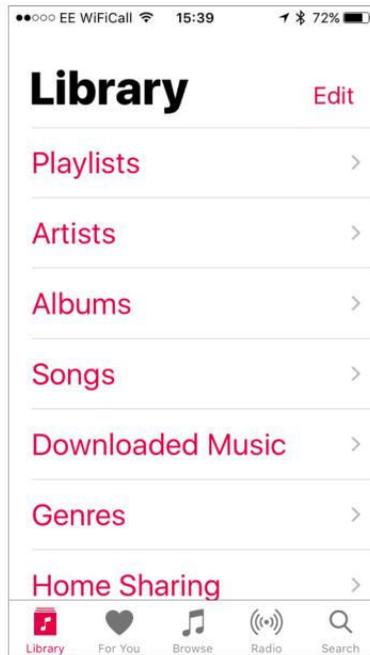
Could Apple have simply forgotten this? The fact that there's a Genius setting makes me think so. We'll see in the next iOS update.

SHUFFLE ME THIS

Q: I went to my music library in the iOS Music app, tapped *Songs*, then tapped *Shuffle All*. It started playing all kinds of music that's not on my iPhone, including purchased music and Apple Music tracks. I often want to shuffle just what's on my iPhone, so I don't pay for data. How can I do this?

A: The new Music app is tricky. When you go to Library, you see a number of big words: Playlists, Artists, Albums, Songs, etc. If you tap *Songs* → *Shuffle All*, then it plays all your music; as you say, it includes tracks in the cloud.

You need to go to *Downloaded Music* → *Songs*, then tap *Shuffle All* to shuffle only local music. Downloaded Music is a bit of a misnomer, because



GO TO DOWNLOADED Music to play music that's on your device.

it also contains synced music, for those of us who still sync their iOS devices with iTunes. ■

Ask the iTunes Guy

Have questions of your own for the iTunes Guy? Email him at itunesguy@macworld.com for his consideration.

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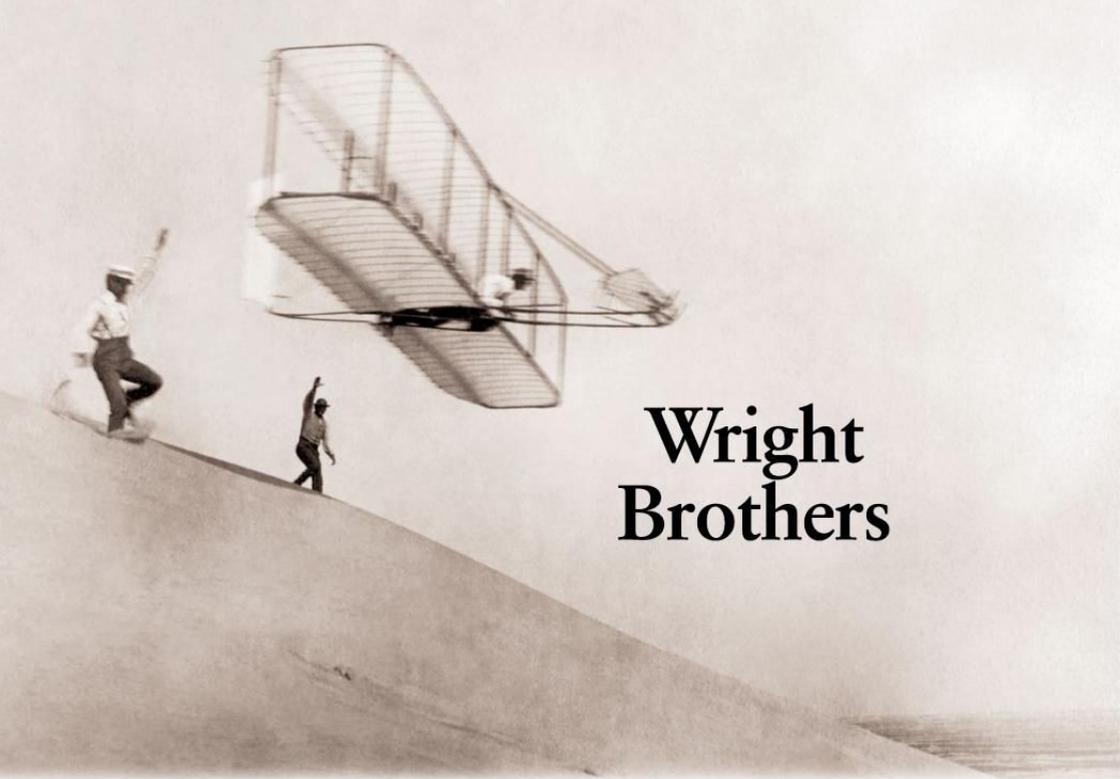
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Mac 911

Solutions to your most vexing Mac problems.

BY GLENN FLEISHMAN



How to resurrect a Fusion Drive from a destroyed Mac

Q: A very long story short, but I've an iMac that suffered catastrophic damage in shipment. I've extracted the 1TB hard drive and the 128GB SSD from the carcass of the machine, but the rest of it (save the RAM and processor) is rubbish. In the end, I simply want to pull the files off the hard drive, but none of the local computer-repair shops seem to know what to do. Any suggestions?

— Christopher Bender

A: Apple's Fusion system is a combination of a high-capacity hard disk drive and a low-capacity but superfast SSD. You can uncouple them and reformat them, but this problem was new to me. He tried mounting the hard drive, but

it's unrecoverable separate from the SSD.

Fusion Drive is a hardware-locked solution, so I suggested he beg, borrow, or, uh, rent any Fusion-capable Mac of a vintage that could run his version of OS X, stick the drives in and boot, and then clone onto a plain drive.

Without an Apple Store nearby (he lives “in the wilds of Oregon”), he was ultimately able to get one of the local shops to open up a computer they had on hand, drop the drives in, run an OS update, and recover the data.

Oops! You can't play most protected digital video on an external Mac monitor

Many years ago, High-Bandwidth Digital Content Protection (HDCP) was born because the film industry freaked out over releasing digital movies that would flow digitally—rather than through analog conversion—across a cable to a monitor or television. The standard requires a cryptographic handshake between the software in a dedicated player or on a computer or mobile device and the display. Without that handshake, no video would flow.

I wrote about HDCP most recently in March, offering a variety of troubleshooting advice for people trying to sort out why their software on a Mac wouldn't allow them to playback any

video on a connected display, or why they received a warning about degraded content because an HDCP handshake wasn't happening.

We've received a spate of additional emails since then, and I've been researching the issue further. I discovered that I was wrong about a fundamental part of the question. I've provided a corrected explanation below.

I also looked at a cheap hardware bypass for streaming video to an external monitor, and whether it works for OS X. (Sorry: it doesn't.)

Finally, I summarize what each major streaming service notes about requirements and troubleshooting, and finish up with how to fix DRM errors even with a built-in display by resetting or removing Silverlight.

Only iTunes in OS X supports external monitors.

The accurate answer to HDCP and externally connected Mac monitors has three parts:

- > iTunes can detect the connection correctly, and play the highest-resolution video on HDCP-capable monitors.
- > Non-Apple firms offering digital



streaming or other digital playback options through browser plug-ins, HTML5 video, or freestanding OS X apps will always report an HDCP or other error for an external display.

> Apple doesn't expose the required information to third parties (via an API that developers can use) to determine whether HDCP is in place, according to Adobe.

This also prevents using HDCP over AirPlay, because AirPlay-supporting devices apparently also don't expose to third-party developers whether the associated device

is an authorized device. The Apple TV works fine with HDCP and external displays, and in what should be bitter irony, fourth-generation Apple TV apps from Netflix, Hulu, and others, firms that *can't* stream DRM-protected video in OS X to an external monitor are perfectly able to while wrapped in the embrace of tvOS.

Oddly, Apple doesn't provide information about HDCP, OS X, and external displays on its site. Macworld asked Apple for more details, and we're still waiting to for more insight.

OOReader Kevin Kelly wrote in recently to report that he couldn't get

Flickster software to play on an Apple Thunderbolt Display, and that Apple customer support had told him that the Apple monitor wasn't HDCP certified, and that one needed to have a certified display. It's possible it's not HDCP certified, but it doesn't seem like the second part of that statement is correct.

I contacted the Electronic Frontier

As an Adobe employee explained

in 2014: Apple does not currently publish their APIs to detect/engage Output Protection. As such, it is currently not possible to detect if the display is HDCP compliant, nor is it possible to engage HDCP.

Foundation (EFF), an organization that works on securing digital rights for individuals, whether anyone on staff knew about this issue, as EFF has issued opinions

on and litigated about digital-rights management (DRM) control of media playback. They had none.

I recently encountered this myself on a recent sweltering day, when my family retreated into a room in the house with a window-mounted air conditioner and I set up my 2015 MacBook with an HDMI output adapter to connect to an external 1080p computer monitor. Amazon's software wouldn't let us watch the first Harry Potter movie at high-def. Fortunately, we were all wilted enough, the display was tiny enough, and we were sitting far enough away that the SD didn't rankle us.

I also tested various methods with a Mac mini and external displays of different types, and it failed consistently, as now expected.

IT'S SPLITSVILLE

One area of exploration was using a powered HDMI splitter, an inexpensive small box that takes HDMI input and then allows the output to be fed out through two or more HDMI ports. These splitters aren't designed to bypass HDCP, nor would I suggest you buy a box designed for piracy.

However, some (not all) apparently terminate HDCP handshaking within the box, satisfying the DRM software on the host device, and then output unencrypted video, so that a monitor or other HDMI-capable hardware doesn't balk. Folks who want to record themselves playing videogames have turned to these splitters with Playstations and other gaming systems.

I tested this with one recommended splitter that can handle up to 4K displays, and it didn't work. I wasn't precisely expecting it to, because OS X seems to simply not allow HDCP via external monitors at all (as noted previously), but I wondered if third-party software might somehow recognize the box differently than a monitor. No luck! I could try more splitter boxes, but it's likely the problem remains the same.

EACH STREAMING SERVICE HAS UNIQUE REQUIREMENTS

Let's review what each of the services claim about Macs and playback errors; most of the details relate to playing in a browser, not using a connected monitor:



AMAZON: Recommends (go.macworld.com/amazonvidcs) use of HTML5 video with

Chrome (version M42 or newer), Firefox (version 47 or newer), and Opera (version 31 or newer). Safari isn't in this list at all, as the Microsoft Silverlight plug-in is required to watch in Safari.



FLICKSTER: Claims complete compatibility through browsers using Flash (go.macworld.com/flixstervidcs).

Also offers its own desktop software, which reader Kevin (cited before) couldn't get to recognize HDCP playback recently from his Mac to an external monitor.



HULU: Hulu doesn't have specific browser advice (go.macworld.com/hulusysreq), and while it

says you should have the latest version of Flash and enable HTML5 video (an option in some browsers), it has no guidance about HDCP errors.



ITUNES: Apple has no documentation about HDCP or troubleshooting, except with the Apple TV.

However, in the last five years, there are almost no forum posts (at Apple or elsewhere) about Mac-related HDCP playback problems, only with Windows.



NETFLIX: No specific browser or plug-in recommendations (go.macworld.com/netflix-viderror), but it notes like Vudu, “Apple only supports playback on internal monitors or through HDCP... compatible monitors.”



VUDU: As noted in the previous troubleshooting article, Vudu (vudu.com/faq) varies from Netflix’s note by stating explicitly OS X doesn’t support HDCP for external monitors at all: “...most Apple laptops and desktops (Mac Mini and Mac Pro) do not support HDCP outputs to external monitors. If you’re using a Macbook Pro or Macbook Air, you can watch HDX using the laptop display.” While I said that was wrong in my previous article (now updated), it’s clear Vudu was ahead of the curve.

Some people report problems using an integral monitor in a laptop or iMac and across many services and

many forums, have found that disabling screen-sharing software fixed their problem. This includes third-party sharing options, like AirParrot and iTeleport, and Apple’s built-in screen-sharing (Sharing system preference pane). It apparently doesn’t have to be in active use for it to be problem; disabling the option or quitting the app running in the background or via its system menu did the trick for many people.

For many people, removing the third-party DisplayLink software sometimes required for certain external Mac monitor combinations helped, too. There’s no on/off switch, but you can use an uninstaller to remove it by downloading the full software package from DisplayLink (go.macworld.com/displaylinkdl), which includes the removal software. Then re-install it after you’re done with the video content; it’s not ideal at all.

SWITCH OFF SILVERLIGHT

Silverlight is often the common denominator for problems with internal displays that should otherwise allow playback. It’s an older Microsoft technology that must have advantages relative to Flash for playing video, because



Microsoft®
Silverlight™

many streaming services adopted it. It's no longer necessary in many circumstances, as noted.

If you want to continue to use Silverlight, try these strategies:

> Empty the Silverlight cache for the site. Amazon has detailed instructions under Resolve Silverlight Issues heading (go.macworld.com/amazonvidcs).

> Dump a cached DRM error. Silverlight apparently logs and caches any DRM problems. If you set something up the plug-in didn't like or there was a transient HDCP handshaking problem—which is extremely common—you might just need to delete a file, through the following steps.

1. Quit the active browser.
2. In the Finder, choose Go → Go To Folder.
3. Enter **/Library/Application Support/Microsoft/PlayReady**
4. Delete the file **mspr.hds** and empty the trash.
5. Relaunch the browser.

You can also delete Silverlight altogether, although that means not using Amazon Video with Safari.

1. Quit the active browser.
2. In the Finder, choose Go → Go To Folder.
3. Enter **/Library/Internet Plug-Ins/**
4. Delete the files Silverlight.plugin and WPFfe.plugin (either or both may

appear) and empty the trash.

5. Repeat steps 3 and 4 with **~/Library/Internet Plug-Ins/**
6. Relaunch the browser.

IS APPLE TO BLAME?

Yes, seemingly, although it's maddening as a technology writer and consumer to not have a definitive answer about a basic piece of protective software from the maker of the operating system and hardware that interacts with it.

It would seem that OS X supports HDCP for integral monitors, and, with iTunes, for external ones to meet licensing requirements. There's no excuse I can see for not exposing the API to third parties. And, even if it were a browser issue, it seemingly extends to Safari, which can't handle HTML5, Flash, or Silverlight protected streaming to external monitors.

Apple could easily rectify this problem. Failing that, Apple could clearly document it.

More ways to convert rich text to plain text on the clipboard

Recently, I explained how to use special paste options (go.macworld.com/pasteoptions) in several programs to remove rich-text formatting when you just want to paste



FASTSCRIPTS LETS YOU
assign keystrokes to
trigger AppleScripts.

the actual letters and symbols you've copied from one place to another, rather than preserve the font choice, type size, and other parameters. Readers had a load of suggestions for more ways to make this simple.

CREATE AN APPLESCRIPT AND ASSIGN A KEYSTROKE

Sage Humphries wrote in with this AppleScript that converts text after being copied to the clipboard into plain text. If you're not using a program to trigger AppleScripts, here's the easiest way to get started: install FastScripts (red-sweater.com/fastscripts) from Red Sweater Software, which allows free use for up to 10 script keystrokes. It's \$10 to unlock unlimited keyboard shortcuts.

1. Install FastScripts.
2. Select FastScripts from the system menu bar, and select FastScripts → Open Scripts Folder → Open /Users/[account name]/Library/Scripts.

3. Launch Script Editor (from Applications → Utilities).

4. Paste in the exactly: **set the clipboard to (get the clipboard as text)**

5. Save the script in the FastScripts user folder you opened in step 2.

6. Now select FastScripts → Preferences from the FastScripts menu, and click Script Shortcuts.

7. Double click the "(none)" to the right of your script name, and type a keystroke combination to assign. I'm using Command-Control-Option-V.

8. Close FastScripts.

Now whenever you want convert the clipboard, just press that key combination, and you can paste plain text into any app. Oddly, AppleScript has no easy way to make paste part of the operation without a very wild set of menu and keypress manipulations.

(I tried to get Apple's Automator to handle this AppleScript by creating it as a Service and then assigning a keystroke in the Keyboard system

preference pane's Shortcuts tab to make it available to all apps that handle text. But text services in OS X apparently only apply when you have a range of text selected.)

TRIGGER PLAIN CLIP WITH A MACRO

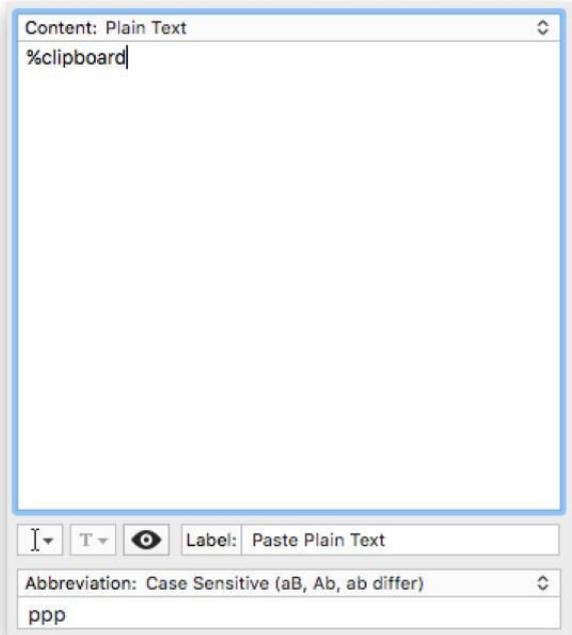
The free (donation requested; [go. macworld.com/plainclip](http://go.macworld.com/plainclip)) Plain Clip has the sole function of stripping formatting from text, but it doesn't do anything else. The developer created it for people to be triggered via launching and macro apps like QuickSilver (used by Sage), Keyboard Maestro, and the like.

USE TEXTEXPANDER.

If you're already using TextExpander (textexpander.com), it's a trivial operation to convert the clipboard to text and paste in a single step, and one that reader Guy Scott uses all the time.

1. Open TextExpander.
2. Click New Snippet (+).
3. In the Content area, make sure Plain Text is selected from the pop-up menu.
4. Type in `%clipboard` in the field.
5. Set a label, like "Paste plain text", and an abbreviation; Guy uses "ppp".

TextExpander can also launch

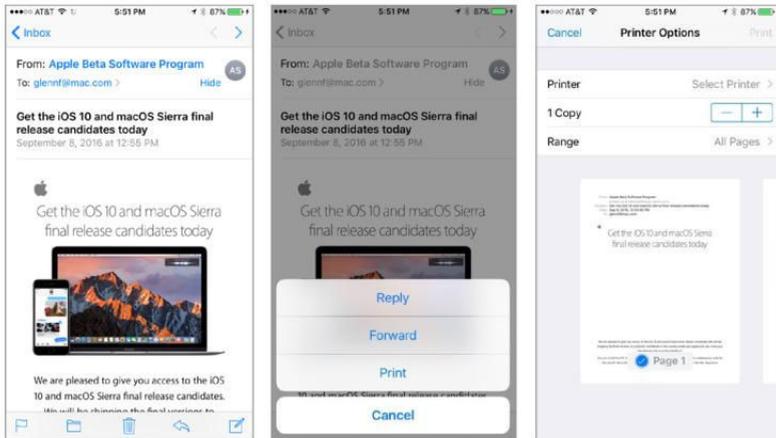


AppleScripts, but this built-in approach is superior.

THE TEXTEXPANDER SHORTCUT is a thing of simplicity.

USE A CLIPBOARD UTILITY

Readers use various clipboard utilities, some of which offer buttons, preferences, or menu items that strip formatting. Joe Kissell wrote an extensive round-up of such utilities (go.macworld.com/clipboard-mgrapps) a year ago. If you use LaunchBar (go.macworld.com/launchbarapp), one of its preferences lets you enable a clipboard history



IN A MAIL view, tap Share, choose Print, and then expand or drag the PDF preview. It opens in a separate view.

with an option to paste via a key-stroke; that paste can be set to convert to plain text.

Print an email to PDF in iOS 10 in just two confusing steps

iOS added print support years ago, and Printopia and then other software rose to meet a challenge: supporting printers that didn't use Apple's AirPrint. But they also added a nifty workaround to the missing ability to create PDFs from email and other software that supported print via a Share button, but didn't have a workflow that led to a PDF.

Printopia had to be hosted on a Mac, and it let you share any printer a Mac could access, as well as add printer and file-storage devices as printers. You could print to PDF on

the attached computer or print to Dropbox. iOS 10 finally adds a subtle way to get the same effect without needing additional software. Printopia (\$20; go.macworld.com/printopiaapp) is still pretty cool for a lot of other purposes, by the way.)

A colleague of Gabe Weatherhead, the proprietor of Macdrifter, wrote to him with the method (go.macworld.com/printpdfios10), which I share and expand upon here with Gabe's permission.

1. In Mail, view a message.
2. Tap the Share button. Select Print.
3. In the Printer Options screen, you'll see a preview. You can either pinch and expand it or poke it (the harder 3D Touch). A PDF preview window opens.
4. Tap the Share button at the

bottom of that window.

5. You can choose any Share option, including Copy to switch to an app that supports PDFs into which you can paste, share it Dropbox, add it to iCloud Drive, and the like.

6. Once it's shared, tap the back arrow (upper left), and then tap Cancel.

In my testing, images on a page don't always load. With two images from Apple, one from TestFlight and one from its beta program, the TestFlight images previewed and the beta message didn't. The beta message had a whole lot of CSS (Cascading Style Sheet) formatting, and it's possible that affected how images were loaded. (The same email previewed fine in OS X.) ■

Ask Mac 911

We've compiled a list of the most commonly asked questions we get, and the answers to them: read our super FAQ (go.macworld.com/mac911faq) to see if you're covered. If not, we're always looking for new 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.