

before upgrading to Catalina.

1. In iTunes in Mojave or earlier, add to a playlist any stations you listen to.

2. Navigate to that playlist.

3. Choose File → **You can't sync a playlist with streaming stations, unfortunately.** Library → Export Playlist.

4. From the Format pop-up menu in the lower-left corner of the Save As dialog box, select XML.

5. Choose a location to save the playlist export.

6. Click Save.

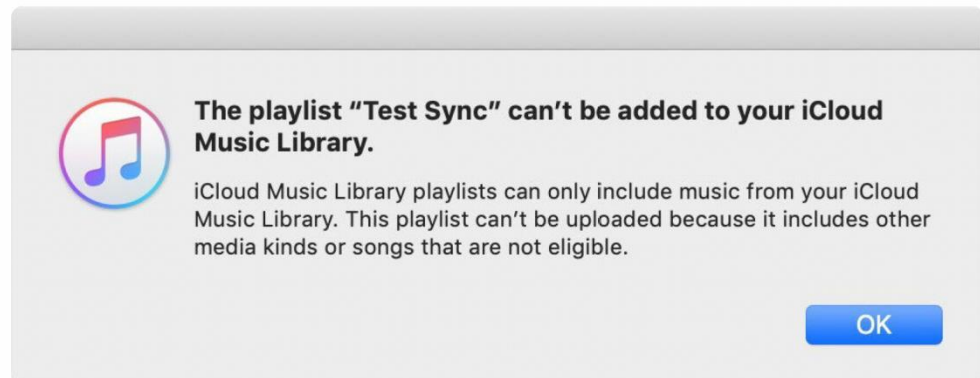
7. In macOS Catalina, open Music and choose File → Library → Import Playlist.

8. Navigate to your export radio playlist XML file and click Open.

9. A new playlist now appears in the Music sidebar.

You'd think this playlist might simply be synced between iTunes and Music if you're using iCloud Music Library. However, Apple puts a cloud with a slash through it next to the playlist to let you know that because it's not just a link to music files, it can't be synced.

If you'd like to preserve the entire current state of the Internet Radio directory, you can do that, too. In the Internet Radio view, select any items or even Edit → Select All, and then follow



steps 3 to 9 above.

The full select and export isn't broken out into categories, so you might want to take a moment to select categories and export them as individual playlists.

Music also lets you add streaming URLs directly by choosing New → Open Stream URL. ■

Ask Mac 911

We've compiled a list of the most commonly asked questions we get, and the answers to them: 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 and we don't provide direct troubleshooting advice. For that, turn to AppleCare, an Apple Store Genius Bar, or the Apple Support Communities.

THE BEST iOS GAMES OF THE YEAR

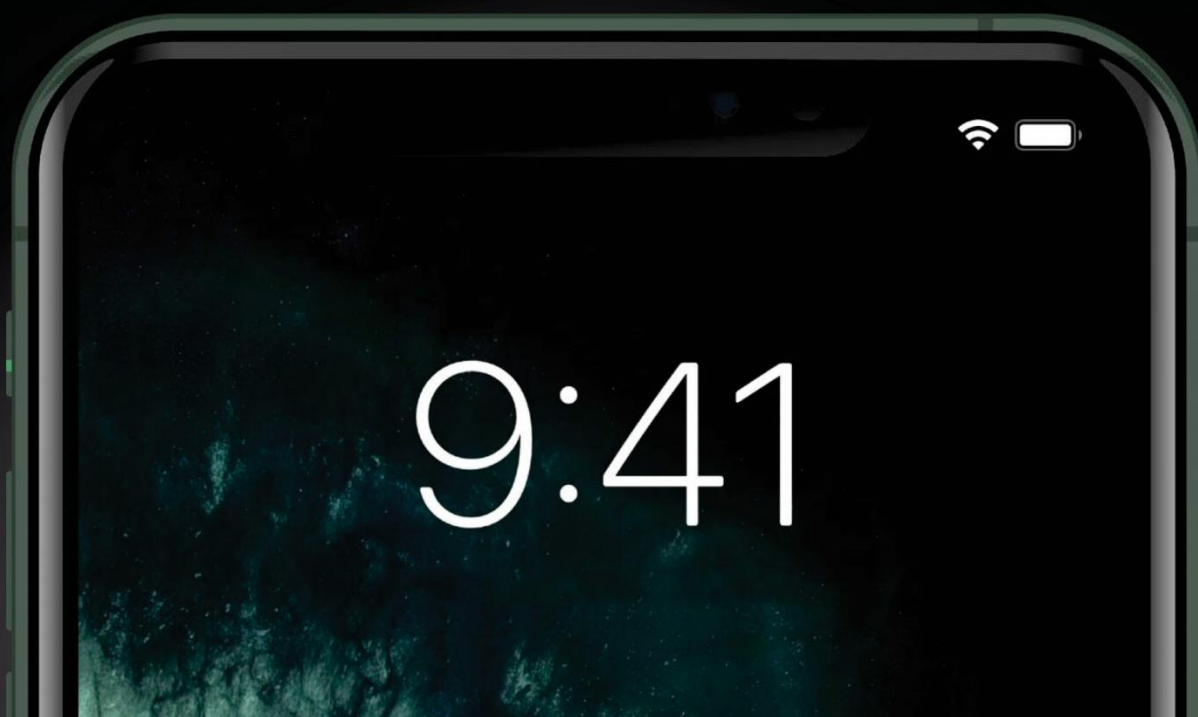
Macworld

MARCH 2020

FROM IDG

THE FUTURE OF THE iPhone

» WHAT TO EXPECT FROM THE UPCOMING A14
PROCESSOR AT THE HEART OF THE iPhone



INSIDE

iOS 14 TAKING APPLE'S MOBILE
OS TO THE NEXT LEVEL

| iPad AT 10

**I SERVE LUNCH
AT MY CHILD'S
SCHOOL, BUT STILL
CAN'T AFFORD TO
PUT FOOD ON OUR
TABLE.**

Melissa, Michigan

**HUNGER
IS A
STORY
WE CAN
END.**

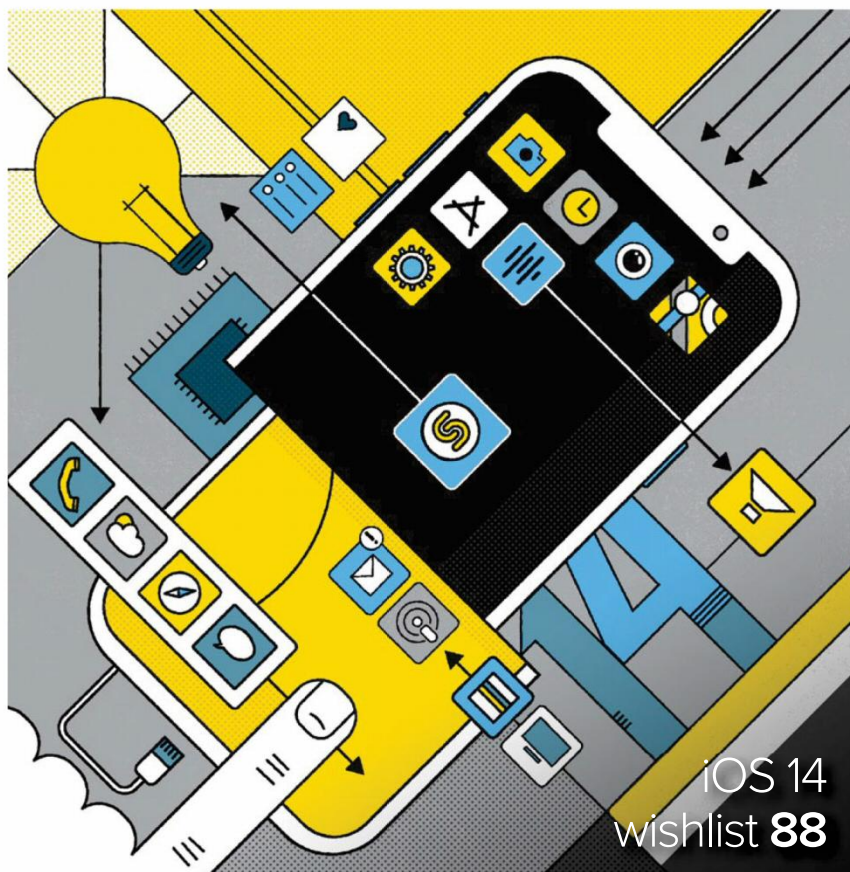
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>> How a silver lining forms

>> It starts at sea.
>> Tropical waters heat up.
>> Warm air soars skyward.
>> Cold air rushes to the void.
>> Cold air warms up.
>> Cycle repeats.
>> Faster and faster—a 50,000 foot engine of air.
>> At seventy four miles per hour it earns a name.
>> Harvey, Irma, Katrina.
>> Then landfall.
>> Roads rendered useless.
>> Buildings destroyed.
>> Families stranded.
>> But for a brief moment,
>> A silver lining appears.
>> People see neighbors instead of strangers.
>> And labels that divide are forgotten.

>> But when rains ease,
>> when clouds part,
>> silver linings need not fade.

>> Let's embrace our shared humanity.
>> Let's connect with one another.
>> Let's find our love for each other.
>> Every single day.

>> Come together at lovehasnolabels.com





It's time for new hardware at the center of Apple's home strategy

It's time for Apple to build a product that makes your home smarter and more secure.

BY JASON SNELL

Tech companies are still investing huge amounts of time and energy in smart-home products, as the recent Consumer Electronics Show displayed. A year ago, Apple hired a new head of home products (go.macworld.com/hdpr)—but it hasn't yet resulted in a lot of visible changes to Apple's strategy.

The biggest move so far is Apple's joining forces with its competitors (go.macworld.com/jnfr) to form an alliance to encourage smart-home interoperability. That's a good start, and I'm hopeful that Apple can begin to push HomeKit forward in 2020 (go.macworld.com/hk20).

Last year, I suggested that Apple make a new version of the Apple TV and

HomePod that works as a TV soundbar. I'd still like to see that product. But now, for 2020, here's another hardware suggestion: Apple can contribute to the smart-home industry and its own bottom line by doing what it does best, namely creating a new product that's a fusion of hardware, software, and cloud services. It's time for Apple to build a product that makes your home smarter and more secure. It's time for Apple Home.

THE NEEDS OF THE HOME

Apple got out of the home router game a while ago, with the discontinuation of the AirPort line. I'm recommending that Apple bring it back, because today's smart homes require rock-solid wireless connectivity, and while Apple's two biggest competitors have home-network offerings, Apple's got nothing. An Apple-built mesh networking system à la Amazon's Eero seems like a natural.

Apple also needs to consider the security and privacy of its customers. It has spent time updating its software, most notably Safari, to discourage the profiling and tracking of its users, but some of the most valuable personal information leaks out in every Internet connection through the IP address, which can act as a unique identifier and provide geolocation. Internet service providers can also snoop on the traffic being sent over their networks, and

even collect and sell that data. But this can all be thwarted with the judicious application of a VPN, or Virtual Private Network.

Now consider the security of some smart-home devices like home security cameras. Apple began to address this with the introduction of HomeKit Secure Video, a feature of iCloud that stores audio and video from home video cameras encrypted in iCloud, rather than being stored on some random camera vendor's website. It's a good start, but it does require streaming video across your home



Apple HomePod.

internet connection. What if that video could be saved locally on an encrypted device?

Finally, consider how much more intelligent a “smart home” could become if there’s a device at the center of it, orchestrating different devices through automation rules both simple and complex? Currently Apple has implemented an initial version of this concept that runs on the Apple TV or an iPad (so long as it stays in the house). Imagine a more powerful device that was always attached to your devices and could make them work in concert.

Are you getting it yet? These aren’t different products. It’s a single hardware product, the Apple Home.

A SINGLE PUCK TO RULE IT ALL

What I’m envisioning is a device shaped very much like the Apple TV, which you plug in to your cable modem or equivalent router. It would take over the administration of your home network, and you could add additional devices to spread its Wi-Fi signal across your house. (Apple could sell additional Apple Home pucks, wireless Apple Home repeaters that plug into wall jacks, and could even integrate this functionality in a future update to the Apple TV.)

But this device isn’t just a replacement for the AirPort base station. It’s running

Apple AirPort Extreme.

Apple’s HomeKit server, so it can serve as the hub for home automations.

Perhaps it could even be outfitted with a few different radios, so it would be able to act as a bridge to control other smart home devices that currently require separate hubs, like the Lutron Caseta and Philips Hue bridges I currently have in my house.

Adding optional storage for a local HomeKit Secure Video archive seems like a no-brainer—and would allow Apple to charge extra for larger storage options. I’d also suggest Apple take a page out of its old Time Machine product and offer the ability to add more storage and work as a backup server. (Even better, allow that local backup to sync itself with iCloud, which in turn will promote the purchase of more iCloud storage space.)

Apple’s always looking for new services to add to its portfolio, and given





Apple TV

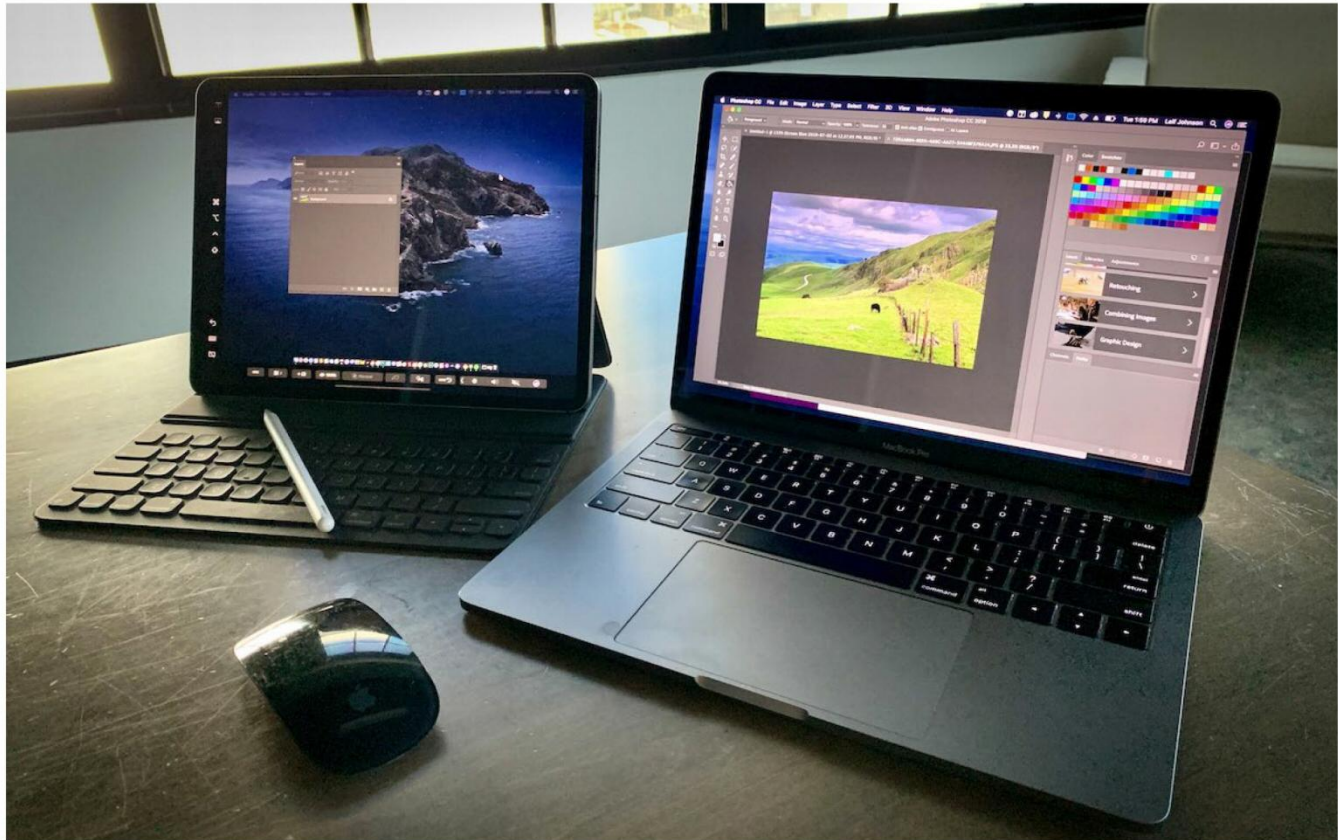
the company's security and privacy focus, why not offer an automatic VPN service? Not only could it release a software update to allow iPad, iPhone, and Mac users to automatically connect when they're away from home, but the Apple Home itself would encrypt all the data flowing into and out of the house, keeping it cloaked from any attempt to analyze the traffic or use the IP address to track users. Apple gets to protect its customers and charge them a monthly fee for the privilege.

APPLE AT THE CENTER

No, Apple doesn't need to build a security camera, or smart lock, or video doorbell,

or thermostat. Those ancillary products are exactly the sort of thing that third-party hardware companies are great at. What Apple provides is intelligence at the very center of the experience—and that means the home and the home network.

The elimination of AirPort wasn't a mistake. The real mistake was not replacing it with a next-generation product that could be the hub of a home network, a secure bridge to the rest of the internet, a device that connects a constellation of smart-home devices together and makes it all work together and make sense. It's time for Apple to return to the center of our homes. ■



Apple really doesn't want us thinking about touchscreen MacBooks—and Sidecar proves it

Apple has long said that touchscreens are incompatible with Macs. But iPadOS's new Sidecar feature suggests Apple may be overthinking the concept.

BY LEIF JOHNSON

I've been using iPads for so long that my hands automatically expect to do some things when I see one, even when I'm using one as an external display for my MacBook with Apple's new Sidecar feature (go.macworld.com/hsdc).

But Apple only indulges this muscle memory so far.

When I'm "running" macOS on my 12.9-inch iPad Pro with Sidecar, I can reach over to the iPad's display and use my fingers to scroll through websites in Safari

or documents in Pages. I can even use some iPadOS multi-touch gestures, and Sidecar performs these fluidly when the Mac and iPad are on the same network. If I'm just scrolling, it's wonderfully convenient.

But if I use my finger to try to click a link on that same page? Nothing. I have to waste time either dragging my mouse pointer over to the display or picking up my Apple Pencil. This makes no sense. The technology is clearly there. And what about if I tap on a gigantic icon on the dock or on a file on the desktop? Again, nothing.

I can't even hold my finger down on a file or link to pull up a "right-click" menu—but I can do these things with a long-press with a Pencil. I'm at the point where I think not having any touchscreen support in Sidecar at all would be better off than dealing with this unsatisfying and unintuitive teasing.

Sidecar's design comes off as deliberate half-assing. (In a more cynical mood, I'd say it's a ploy to get you to buy the Apple Pencil.) But at least it's somewhat consistent.

For years, Apple has argued that touchscreens clash with the Mac experience or, as Jony Ive told Cnet in 2016 (go.macworld.com/cnjl), that it's a feature that "wasn't particularly useful." And yes, I think reasonable people agree it'd be silly to support touchscreens on something as large as the iMac Pro.

With Sidecar, though, Apple seems determined to make us think multi-touch support wouldn't work well with something as small as a MacBook. Meh, I say. If anything, it shows how well it would work. Apple all but markets the iPad Pro as a full-on laptop these days, and the largest 12.9-inch model has roughly the same display size as the smallest contemporary MacBooks. A 12.9-inch iPad Pro running



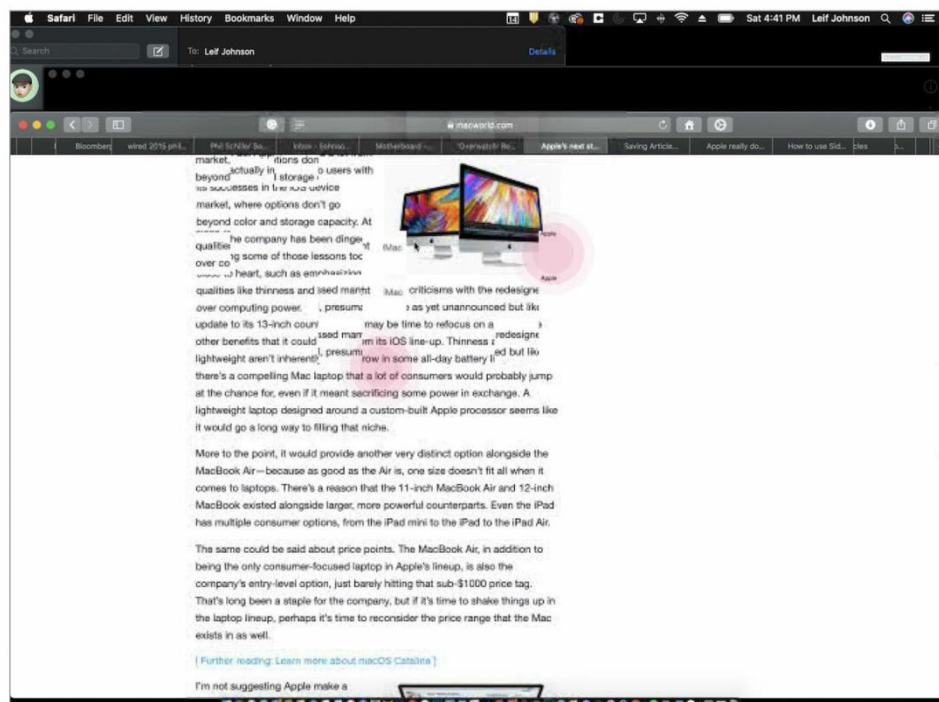
Until Sidecar came along, Luna Display was one of your best options for using the iPad as a secondary Mac monitor. If you want touch support, it still is.

Sidecar thus provides a reasonable glimpse into how well a touchscreen MacBook would work. And that's a relatively small screen. On a large laptop like the new 16-inch MacBook Pro, the presumed "problems" with touch input would be even less problematic.

We don't even have to guess at how we might interact with Sidecar or touchscreen MacBooks if Apple

unlocked the full range of touch gestures, as the third-party Luna Display ([go](https://luna-display.com/). macworld.com/lnds) service already lets you interact with the entirety of macOS with your fingers when you're using an iPad as a secondary display. Just like if you were using an Apple Pencil with Sidecar, you can press on links and apps and they'll open. You can hold down on an app or file and pull up a right-click menu. You can even select whole blocks of text with a finger swipe (which means you'll need to use two fingers if you want to scroll normally).

Such features make Luna Display more satisfying to use than Sidecar, though it's certainly not as elegant. Unlike Sidecar,



As impressive as Luna Display is, here's what scrolling through an article quickly ends up looking like. You don't get that with Sidecar. (The red dots are my fingers activating the scroll function.)

you need to plug a dongle into your MacBook before it works, and then I found the screen transitions weren't anywhere near as fluid, even working on our office's powerful Wi-Fi network. With Sidecar, the iPad registers every movement so smoothly that you'd think it was jacked directly into the Mac.

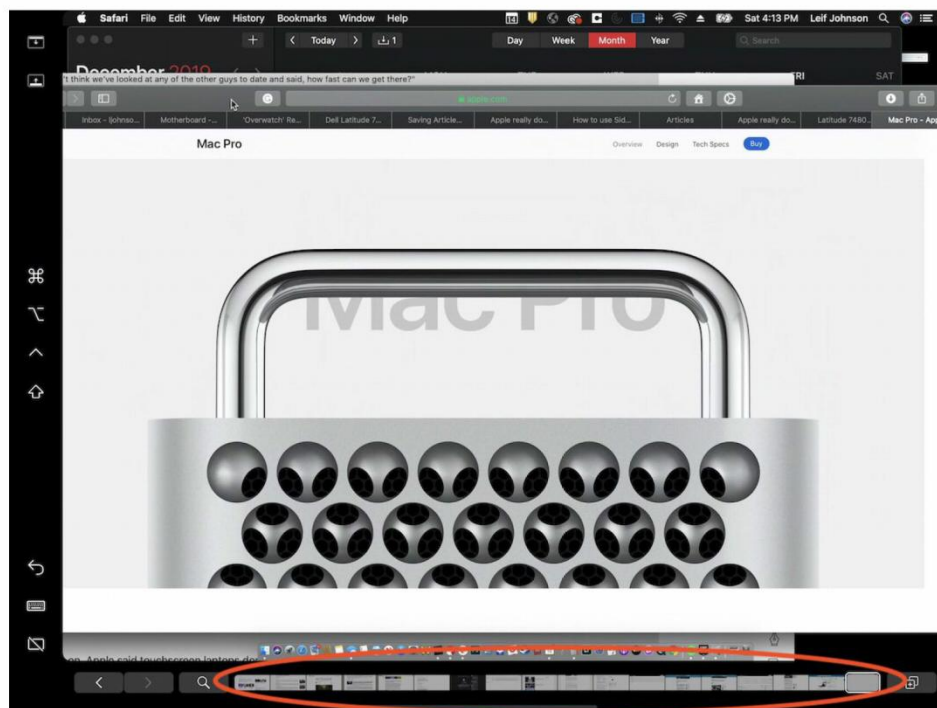
Importantly, though, Luna Display proves that using fingers to interact with a macOS interface on laptop-sized screens isn't the hassle Apple has been making it out to be. I can use it for all the lightweight tasks I'd expect to be able to use with a touchscreen laptop, whether that's opening links, opening apps, selecting

text, or simply dropping my cursor in the right spot. If Sidecar let me do these same things, I'd love it more than I already do.

LOSING TOUCH

I don't think Apple grasps this simple point. It's overthinking how people would use touchscreen laptops. Apple seems to assume users would want to use nothing but touch support on their MacBooks, but when I

see colleagues and visitors using touchscreen Windows laptops in meetings, they're not using them for complicated tasks like clone-stamping textures in Photoshop. They're usually not diving deep into menus, and they're certainly not trying to recreate one of Monet's haystacks. Instead, they're usually standing over their laptops and quickly swiping to different parts of a page or opening files or links, thereby saving a few seconds over what using a mouse or the trackpad would have taken. It's sure a heck a lot more convenient than the Touch Bar, which has been Apple's only concession to touch-based interaction on MacBooks to date. And these aren't part-time tablets or



A shot from my 12.9-inch iPad Pro running Sidecar. Apparently, Apple thinks pressing the Touch Bar for Safari tabs (inside the red oval) would be easier than just pressing the tabs in Safari? No.

rigs aimed at creating works of art. The model I see most often is a Dell Latitude 7480, which is basically an everyday Windows “business” laptop apart from the touchscreen support.

Apple, though, has long argued that bringing touchscreen support to Macs would require some kind of big overhaul of macOS. In a 2016 interview with *Wired* (go.macworld.com/part) about the Touch Bar making the Mac a “part-time touch experience,” Apple marketing chief Phil Schiller said the idea of a touchscreen Mac was “lowest common denominator thinking” because you can’t optimize the design of features like the menu bars of

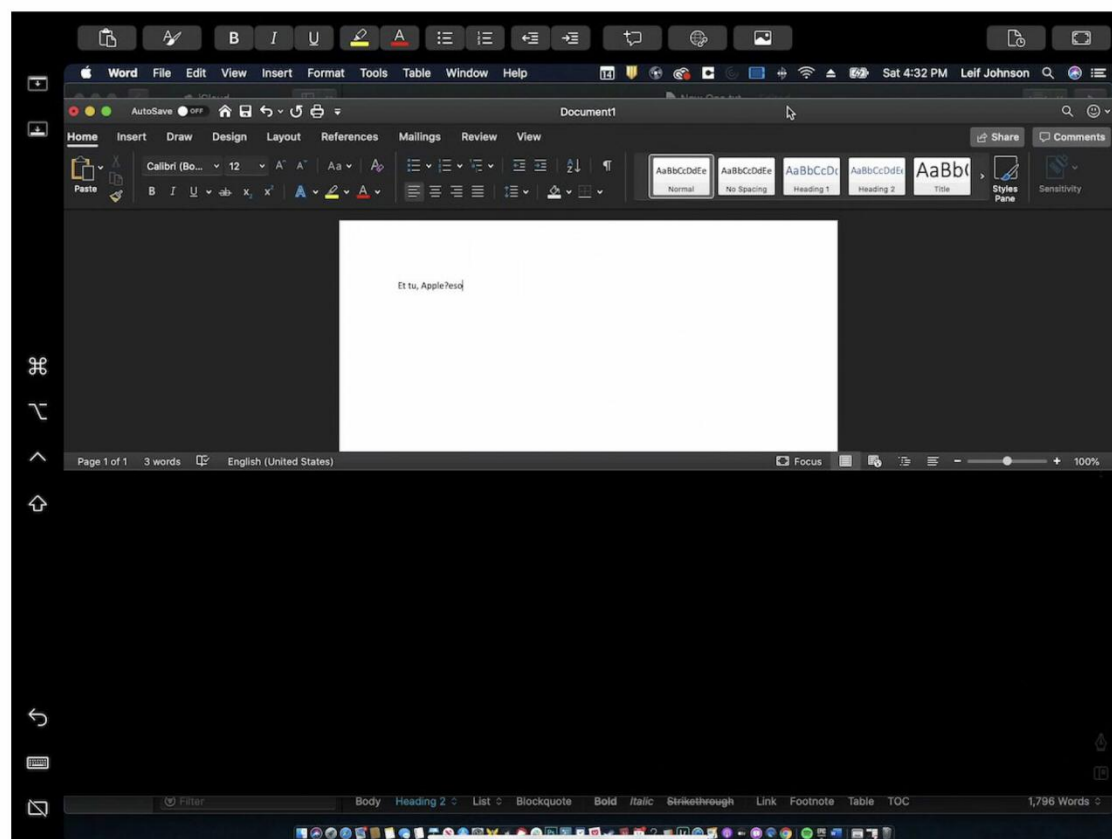
macOS for both mice and fingers.

“We think of the whole platform,” Schiller said. “If we were to do Multi-Touch on the screen of the notebook, that wouldn’t be enough—then the desktop wouldn’t work that way.”

Apple itself, though, proves that you don’t have to expect an identical Mac experience regardless of device with the Touch Bar itself. The controversial strip appears on every current-generation MacBook Pro model, sure, but it doesn’t appear on the MacBook Air or on the Magic Keyboards used for iMacs and sure as heck doesn’t appear on the new silver and black keyboard designed for the 2019 Mac Pro.

I don’t think anyone’s complaining that the Mac Pro doesn’t work the same way as a MacBook Pro because it doesn’t have a Touch Bar. It is a convenience used for simple tasks on easily transportable machines like MacBooks, much as direct touch interaction with a display would be. And unlike the Touch Bar, multi-touch interaction wouldn’t even require us to look away from our keyboards. Indeed, the ever-shifting Touch Bar defeats the entire point of touch-typing.

And Sidecar itself proves the superiority of direct touchscreen interaction over the Touch Bar in MacBooks—and, for that matter, in



Here’s the macOS version of Word running on Sidecar. You can see the Touch Bar options at the top. They’re bigger and little easier to touch, but they’re not **THAT** much bigger.

Sidecar itself. Whenever you pull up a Mac app in the Sidecar window running on an iPad, you'll get the Touch Bar options you'd expect on a MacBook along the bottom or top of the screen. This makes it easy to see that the Touch Bar options for things like bolding and italicizing in an app like Microsoft Word aren't significantly larger than you'll see in the actual Word document above, so I see little reason why you couldn't just press them in the Word document itself.

GETTING IN TOUCH

The existence of Sidecar also complicates the argument that touchscreens aren't ergonomic for Macs, as Apple's software engineering chief Craig Federighi said to *Wired* (go.macworld.com/crfd) not long after last year's WWDC.

"We really feel that the ergonomics of using a Mac are that your hands are rested on a surface, and that lifting your arm up to poke a screen is a pretty fatiguing thing to do."

Yes, maybe this makes sense in the context of a large-screened device like an iMac. But on a MacBook—a device that's meant to be portable, much like an iPad? That's silly. Think of it this way—"lifting up your arm to poke a screen" represents the entirety of the iPad experience when you're using Apple's Smart Keyboard or any other keyboard case. And I haven't

seen Apple stop selling Smart Keyboards on that account.

(This is also a good spot to address the idea that Apple would never design a MacBook that allows you to grub up the pretty screen with your fingerprints: Doesn't the entire iPad and iPhone experience involve that? At any rate, my MacBook's screen seems prone to getting dirty even when I don't touch it.)

In the same interview, Federighi said he regards all the touchscreen laptops out there as "experiments."

"I don't think we've looked at any of the other guys to date and said, how fast can we get there?" he said.

But what is the Touch Bar, if not an experiment? And if it is, it's a failed one. Apple's boldest ideas tend to be trendsetters despite initial protests—consider smartphone notches, smartphones without headphone jacks, and USB-C laptops—but no other laptop maker has made a serious effort to bring a Touch Bar-like feature to their own device.

Touchscreen laptops, though, are becoming more and more common. They're becoming the norm even in popular traditional laptops like the Dell XPS 13 (go.macworld.com/d739). They may be experiments, but they're experiments that other companies and users have found successful and desirable—much unlike the Touch Bar. At this point, Apple's resistance

makes it look like the odd man out, which is a sad fate for a company that's usually credited for making us fall in love with touchscreens in the first place.

Also, Apple doesn't need to include multi-touch support on every MacBook, and if it's really so concerned about precision, it could limit support to the larger notebooks like the MacBook Pro. It

could even charge an extra \$300 for the feature, much as Apple was fond of doing for the Touch Bar before it became standard. I'd be willing to bet, though, that more people would end up using a multi-touch MacBook display instead of a Touch Bar.

Apple's approach to Sidecar feels like a relic of an older Apple: an Apple that refused to let you use a mouse with an iPad because the tablet wasn't strictly designed to work that way. Lately Apple isn't so stubborn. We can now use mice with iPads (go.macworld.com/mcip), after all, although only as an Accessibility feature. We don't have to buy specifically designed "MFi" controllers to play games on an iPhone: ordinary PlayStation 4 ([A black Dell XPS 13 laptop is shown from a three-quarter angle, open and resting on a dark, textured surface. The screen displays a vibrant, high-resolution image of a coastal scene with a lighthouse on a rocky outcrop, a sandy beach, and turquoise water. Overlaid on the bottom left of the screen is a digital clock showing '12:32' and the date 'Monday, November 4'. The Dell logo is visible on the bezel below the screen.](https://go.</p></div><div data-bbox=)

Touchscreens have become so common in some Windows laptops like the Dell XPS 13 that the inclusion of one barely warrants news.

macworld.com/sps4) and Xbox One (go.macworld.com/msx1) controllers will do. And most remarkably of all, this year Apple stopped trying to persuade the world to embrace its “butterfly” keyboards and instead equipped its new 16-inch MacBook Pro with the scissor-switch keys of old.

After so many years of complaints and a lack of interest, maybe in the years to come Apple will ditch the Touch Bar altogether and just let us interact with our screens directly. As Sidecar and Luna Display show, that leap needn't be as great as Apple is making it out to be.

And if nothing else, Apple? C'mon, let us click on links in Sidecar with our fingers. ■



Intel's new 'Thunderbolt 4' spec quickly turns into a confusing mess

Maybe Intel should have left Tiger Lake's new feature out of its presentation entirely.

BY MARK HACHMAN

One of the key features of Intel's upcoming "Tiger Lake" processor (go.macworld.com/cftg), the next-gen Thunderbolt 4, may not be as evolutionary as the name implies.

To begin with, Intel didn't reveal all that much about the new "Tiger Lake" chip, due to ship sometime "this year." The new chip will deliver "double-digit" performance gains—though over exactly what, we don't know—as well as a "huge leap" in graphics performance. Tiger Lake

is also characterized as a "10nm+" chip.

The other feature, Thunderbolt 4, was characterized as "4x the performance of USB 3" in a promotional slide. But it appears that the new I/O spec isn't as fresh as its title would imply.

Part of the confusion should be assigned to the USB Implementor's Forum, which last spring released a nearly inscrutable branding strategy (go.macworld.com/hrbr). USB 3.0 and USB 3.1 were renamed to USB 3.2, and assigned "generational" or "Gen" names to try and differentiate them from

one another. (Recently, the USB-IF reversed course and outlined an entirely new USB branding scheme that's a little clearer [go.macworld.com/nbrn].)

Essentially, the use of “USB 3” gives Intel some rather broad leeway into what, exactly, it's referring to in making its performance comparison. What was originally, colloquially called “USB 3.0” transfers data at 5Gbps. Subsequent generations transfer data at 10Gbps (USB 3.1) and 20Gbps (USB 3.2). Under the new branding scheme, the most up-to-date 20Gbps USB spec is currently known as USB 3.2 Gen 2x2.

So what exactly is Thunderbolt 4? Intel's still not saying an awful lot.

Here's what Intel told Tom's Hardware when asked:

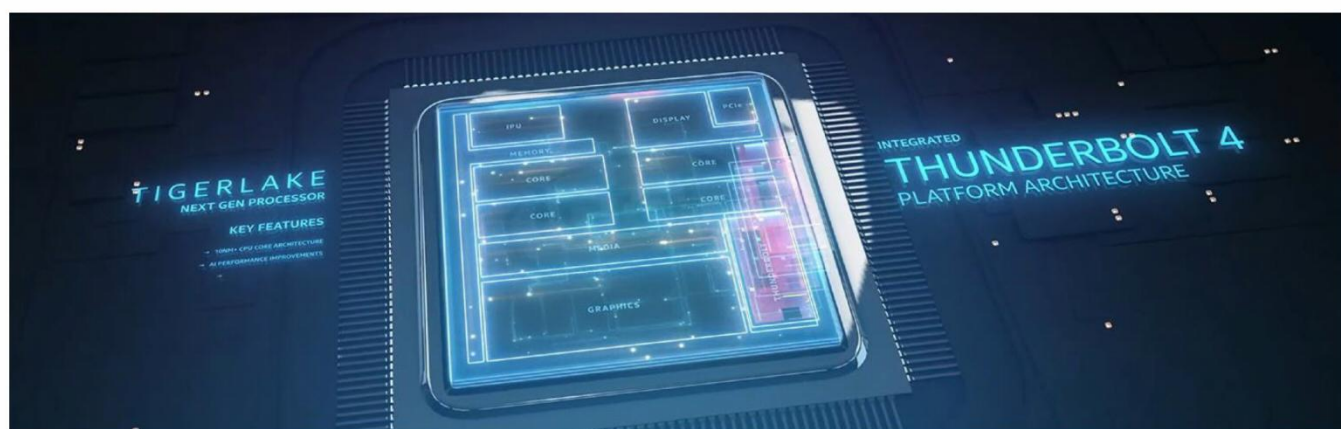
“Thunderbolt 4 continues Intel leadership in providing exceptional performance, ease of use and quality for USB-C connector-based products,” it

said (go.macworld.com/wht4). “It standardizes PC platform requirements and adds the latest Thunderbolt innovations. Thunderbolt 4 is based on open standards and is backwards compatible with Thunderbolt 3. We will have more details to share about Thunderbolt 4 at a later date.”

Then the company further clarified that it was referring to USB 3.1 when it was referring to “USB 3.” USB 3.1 transfers data at 10Gbps. Thunderbolt 3 transfers data at 40Gbps (go.macworld.com/40gb). Four times faster. Simple, right?

Not really. And when *PCWorld* asked for clarification, Intel merely replied that “more details on Thunderbolt 4 will come at a later date.”

The bottom line? Who knows. Intel hasn't done itself any favors here, and right now there's not a lot to go on where either Tiger Lake or Thunderbolt 4 is concerned. ■



Intel's Tiger Lake has Thunderbolt 4 inside. Clear as day, right?



Apple's 'The Morning Show' didn't win a Golden Globe but it's still the best show on TV right now

Put in your Apple TV Up Next queue.

BY MICHAEL SIMON

Just like the iPod, the critics got it wrong. Apple might not have won the coveted best drama award for *The Morning Show* at the Golden Globes (go.macworld.com/glgb), but the first season was nothing less than one of

the best I've ever seen, streaming or otherwise. That's despite a barely-fresh Rotten Tomatoes score and some truly scathing reviews that nearly convinced me to write it off altogether.

Slate's Inkoo Kang (go.macworld.com/

[inko](#)) called it “a giant, faultlessly tasteful gift box filled mostly with packing peanuts.” Ian Thomas Malone ([go.macworld.com/thms](#)) labeled it “an elaborate disaster.” Even our own Leif Johnson ([go.macworld.com/leif](#)) wrote that the first few episodes had him “wanting to hit the snooze button.”

Between that, the humdrum trailer, and my general disinterest in behind-the-scenes dramas, I didn’t rush to see *The Morning Show*. In fact, I only really watched it because of my job—as the marquee show of Apple’s newly launched TV service, I basically had no choice. But by the time the final episode landed, I didn’t want it to end. In fact, it’s been two weeks since I watched the season finale of *The Morning Show* and I still can’t stop thinking about it. It’s not just that it was the most compelling episode of the show’s first season, it was some of the best television I’ve ever seen.

BUILDING AND BREAKING RELATIONSHIPS

There’s a scene near the end of the final episode of *The Morning Show* where Alex Levy (Jennifer Aniston) and Bradley Jackson (Reese Witherspoon) switch roles. For the better part of eight episodes, Levy has been composed and guarded in public (despite a slow breakdown in her personal life), but here she lashes out at a passerby who wants a selfie, letting her emotions

erode her professional veneer. Jackson, on the other hand, sheds her naturally combative nature to defuse the situation before it has a chance to turn viral.

It lasts just a moment and is quickly overshadowed by the final scene, but it encapsulates the relationship between the two co-anchors and deftly illustrates how much each has learned from each other in such a short time. Like Jesse Pinkman and Walter White in *Breaking Bad* or Dana Sculley and Fox Mulder in *The X-Files*, *The Morning Show* is, at its core, a platonic relationship drama. And Levy and Jackson are equal parts counterparts and companions.

It’s that dichotomous relationship that makes *The Morning Show* so enjoyable. Aniston and Witherspoon play off each other like the veteran actors they are, and watching them manipulate, deceive, feign, and seduce each other is a joy to behold. As representatives of the foils of feminism—the wildly successful woman who bites her tongue and looks the other way in the face of a “boy’s club,” and the unapologetic idealist willing to blow it all up for the truth—they each come to the realization that their power is superficial despite the Me Too platitudes poured on them by their co-workers. Both have broken the glass ceiling only to discover there’s another one right above it.

So they join forces to wrestle their



***The Morning Show* is a safe space for Alex Levy (right) and Bradley Jackson (left), but it slowly crumbles away as the season goes on.**

deserved power in the most public forum possible: their on-air turf. It's as gripping and emotional a climax as I've ever seen, and leaves the show open to numerous paths for the second season.

POWERFUL POWER STRUGGLE

While the final episode and closing moments were among the best television I've ever seen, it's the characters crafted by Aniston and Witherspoon over the prior nine episodes that make it so compelling. Until they get on air each day, you never really know which version of Levy and Jackson you're going to get, as they each need to compartmentalize their various personas to stay relevant and real. As the season ends, their professional facade breaks too, leaving the viewer to stare

agape at what's revealed.

Even without a Me Too narrative of their own, they are victims, but also enablers to the culture that they ultimately rise up against. Alex denies her role in the cover-up until she can no longer bear it, and Bradley is too consumed by her quest for righteousness to see the human toll in her wake until it's too real to ignore. And when it all comes

crumbling down, the exposed layers beneath are raw, fierce, and genuine.

It's not just Aniston and Witherspoon who make *The Morning Show* so compelling. Steve Carell plays the arrogant, impulsive, and slightly despicable Mitch Kessler with perfection, Billy Crudup is transcendent as the equally deceitful and trustworthy Cory Ellison, and Mark Duplass shines as Charlie Black, who might be the only truly selfless and blissfully ignorant character on the show.

So, while I'll admit there are one too many Apple device cameos (surely someone at UBA must use a Galaxy phone), *The Morning Show* deserves every future nomination and award it's going to get. But more importantly, it deserves your time. ■



PICTURE SOMEONE STRUGGLING WITH
HUNGER. WHAT DO THEY LOOK LIKE? DO
YOU IMAGINE A CERTAIN AGE, ETHNICITY
OR PART OF THE COUNTRY? TRUTH IS,
HUNGER CAN BE HARD TO RECOGNIZE.
BECAUSE THE 1 IN 8 AMERICANS FACING
IT CAN LOOK LIKE ANYONE. ESPECIALLY
ME. I WAS CREATED BY ARTIFICIAL
INTELLIGENCE FROM PHOTOS OF THE
40 MILLION PEOPLE STRUGGLING
WITH HUNGER IN THIS COUNTRY. A
FACE THAT CHALLENGES YOU TO SEE
HUNGER IN A DIFFERENT LIGHT. I AM
WHAT HUNGER LOOKS LIKE IN AMERICA.
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Based on USDA food security data released in 2018



**I asked what kind of family
Amina wanted. She said,
‘A family like yours.’ That’s when I
knew I had to adopt her.**

Denise, adopted 17-year-old Amina





IMAGE-EDITING SOFTWARE

ADOBE PHOTOSHOP ELEMENTS 2020: AI-POWERED IMAGE EDITOR DOES WONDERS

BY J.R. BOOKWALTER



Over three decades, the revolutionary Adobe Photoshop has become an industry standard

synonymous with image editing and manipulation. Even if you've never used it, you know what it is.

But the full potential of the Photoshop app isn't for everyone. Despite being more affordable in a monthly Creative Cloud subscription, the feature-packed user interface and advanced tools can overwhelm novice users. That's why Adobe offers a pared-down version earmarked for regular folks, which steps out of big brother's shadow this year with several impressive new tricks.

IMAGE SENSEI

Adobe Photoshop Elements 2020 (go.macworld.com/adel) marks the sixteenth Mac release (technically 18.0, versions five and seven were Windows-only) of the annual consumer-focused edition, stripping away most of the

complexity in favor of a hand-holding approach to image manipulation. If you've been vexed trying to perform relatively simple tasks in Photoshop, then Elements is for you.

This year, Adobe infused PE2020 with more of the secret sauce baked into big brother Photoshop recently—namely Adobe Sensei, the company's artificial intelligence and machine learning technology. Sensei enables some pretty incredible features that just a few years ago would have required a lot of time, effort, and skill with the full version.

One such feature allows users to automatically select subjects in an image. This comes in handy for replacing backgrounds or extracting



One-click automatic selection of foreground subjects is a powerful addition to this year's Photoshop Elements.

objects from one photo to composite into another. What once required tediously drawing around the edge of a subject or repeatedly mashing Quick Selection or Magic Wand tools has now been (mostly) reduced to a single mouse click thanks to the Select ➔ Subject menu option.

The results aren't always perfect and



Use the Pattern Brush option to decorate photos without affecting foreground subjects.

highly dependent upon lighting, background, and other factors, but PE2020 comes awfully close even on challenging photos, at least reducing the amount of time required to make necessary adjustments. Auto selection also makes possible two of the four new Auto Creation tools to add faux depth of field or convert backgrounds to black-and-white, which helps make subjects in the foreground stand out.

PATTERN PAINTING

Automatic selection also factors heavily into Pattern Brush, another new Adobe Photoshop Elements 2020 tool which allows novice shutterbugs to spice up images by painting with one of 15 decorative brushes. This guided edit walks users step-by-step through the entire process with a Protect Subject option (enabled by default) that restricts Pattern Brush to the background only, rather than apply it to subjects in the foreground. This works effortlessly, although the patterns— hearts, balloons, fireworks, butterflies and the like— tend to be a little on the frilly side for our tastes.

One unique new feature to really show off the power

of Adobe Sensei is Colorize Photo, which does an amazing job of converting black-and-white photos to color. It's the modern equivalent of colorization, which transformed vintage Hollywood movies like *It's A Wonderful Life* to make catalog titles more palatable for a new audience during the 1980s home video boom.

Where colorization required painstaking, time-intensive labor, Colorize Photo requires little more than a single mouse click. There are four variations to choose from in automatic mode, or you can switch to manual for additional control. Keeping expectations in check, the results are remarkable—colors aren't vibrant or photo-realistic but in our tests, the software accurately colorized a red T-shirt and brown building without knowing those were correct, not to mention adding



Powered by Adobe Sensei AI, Colorize Photo intelligently colorizes even various shades of blue jeans in one click.

different shades to blue jeans worn by multiple subjects.

BETTER TOGETHER

Last but not least, Adobe Photoshop Elements 2020 adds Smooth Skin as a new quick fix option. Tools like this typically go overboard and wind up making people look like wax figures, but the implementation here is effective yet quite subtle. Once applied from the Enhance menu, the software automatically identifies faces, so all that's required is adjusting the Smoothness slider; you can zoom in and use the Before/After toggle switch to confirm results before committing to the change.

Adobe has done a good job improving the launch experience. The Elements home screen provides quick access to new features as well as those you might want to try, plus one-click access to recent files. There's even a search box where you can type real-world queries such as "I want to remove unwanted objects from a photo" to discover new techniques.

One thing that hasn't changed much is Organizer, the hub of Elements where users import photos, create albums,



A new enhancement enables subtle skin smoothing without going overboard.

order prints or other gifts, and much more. If you don't already have a way to organize a photo library, this is handy and quite serviceable—but for iCloud Photo Library users, there's still no way to integrate your existing library, nor an extension to directly edit images in Apple Photos with Photoshop Elements.

BOTTOM LINE

Artificial intelligence and a user-friendly layout make Adobe Photoshop Elements 2020 an unbeatable combination for consumers, assuming you can live without iCloud/Photos integration. ■



Adobe Photoshop Elements 2020

PROS

- One-click subject selection.
- Quickly colorize old black-and-white photos.
- AI technology for more powerful Guided Edits, Auto Creations.

CONS

- Still no image editing extension for Apple Photos.
- Elements Organizer can't integrate with iCloud Photo Library.
- Limited selection of included patterns.

PRICE

\$69.99

COMPANY

Adobe



ULTRA WIDESCREEN DISPLAY

SAMSUNG CJ791 QLED: THUNDERBOLT MEETS CURVY, ULTRA WIDESCREEN DISPLAY WITH QUANTUM DOTS

BY JON L. JACOBI

Apple makes some darn fine displays, but the company doesn't offer an ultra wide model. If you want extra horizontal screen space for productivity or gaming, or just a panoramic viewing experience, you need something like Samsung's \$800, curved, ultra wide CJ791. Quantum dots make colors super-accurate, and it has enough ports to function nicely as docking station.

DESIGN AND FEATURES

With a resolution of 3440 by 1440 spread over 34 inches of width and approximately 14.5 inches of height (21:9 ratio), the CJ791 doesn't offer quite the pixel density of most Apple displays, but it's close enough

that you likely won't care. Put another way, it's not quite Retina—you can see the pixels if you sit too close, but it didn't take long to get over that and appreciate the extra width.

The 21:9 ratio resolution is also known as Ultra Wide Quad High Definition (UWQHD), or the wide brother of the 2560 by 1440 QHD that was at the top of the HD food chain for several years before 4K UHD (3840 by 2160), 4K (4098 by 2160), and Apple's 16:9 4K (4098 by 2304) showed up. Now you also have Apple's 5K display on the iMac (16:9; 5120 by 2880) and upcoming 6K Pro Display XDR (16:9; 6016 by 3384—if you have a 5K iMac or plan to get the Pro Display XDR, you're not really in the market for a CJ791. If you're using a MacBook or Mac mini, then it's a worthy option.

The CJ791 is a 10-bit panel which means it's theoretically capable of just over a billion colors, and is touted as covering 125 percent of sRGB. That's a very good color gamut compared to most displays, but there are a lot of color

spaces, and sRGB is hardly the widest.

There are others that encompass more of the total visible spectrum such as Adobe RGB, DCI-P3, bt.2020, etc. The display does use quantum dots so its color is far more accurate than the typical LED-backlit LCD computer monitor.

The CJ791 is rated for 300 nits brightness, which is quite a bit lower than most Apple displays, but it offers a decent 4 millisecond response time with support for FreeSync gaming. With FreeSync, the display will match its refresh rate to the frame rates being delivered to it by the GPU. This can reduce lag and eliminates screen tearing, where the display starts rendering a new frame before it's finished with the old one. The only requirement is that you limit your game to 100 frames per



Thanks to a wide selection of ports, the CJ791 will function nicely as a laptop docking station.

While not quite Apple-like in elegance, the CJ791 (sexy name, eh?) is easy enough on the eye. It also allows you to split the display to run two full-screen (1,720 by 1,440) apps side by side using picture-by-picture.



second so it doesn't exceed the CJ791's 100Hz refresh rate.

Samsung provides two Thunderbolt 3/USB Type C ports, which means it's easy to hook up to newer Macs and PCs, and the inclusion of a DisplayPort 1.2 port and HDMI 2.0 will keep the rest of the Mac world happy (assuming a relatively modern computer, that is). Two Type-A USB ports for connecting peripherals are also included.

You can also leverage more than one input at a time with the display's Picture-by-Picture (PbP, 1720 by 1440) and Picture-in-Picture (PiP, 720 by 480 up to 1720 by 720) abilities. With PbP you can halve the display between two sources, or with PiP devote one quadrant to a second source.

The plastic bezel and stand are silver, while the back of the unit is glossy white. The overall appearance, comparatively, is just a tad, shall I say, less expensive than Apple with its metal casing. You can also say

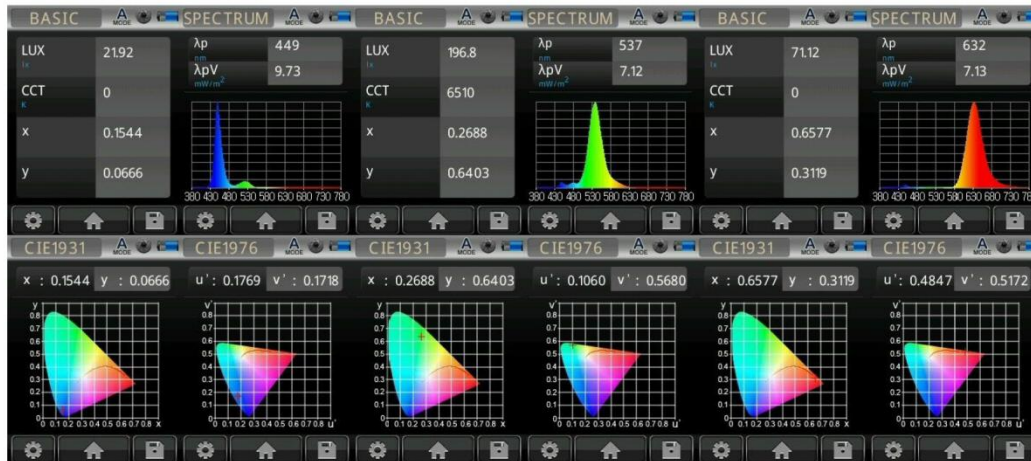
that about most every piece of non-Apple equipment, though. Samsung includes a VESA mount adapter with the CJ791, but the display ships with a round stand.

The external 24-volt power supply supplies 85 watts to the various ports, and indeed, the 2017 MacBook Pro used for some of the testing said it was charging while plugged in. My phone charged on the USB port and there were also no issues with any of the input or storage peripherals I attached.

There are two speakers on board, which is convenient for everyday work but not serious listening. There's simply not enough air available for them to reproduce the entire audio spectrum—there's no bass response.

QUANTUM DOTS

An interesting thing happened to displays



These are the readings when the CJ791 displays pure blue, green, and red images. Note that there's not a lot of any other color present. Compare with the non-quantum dot readings below.

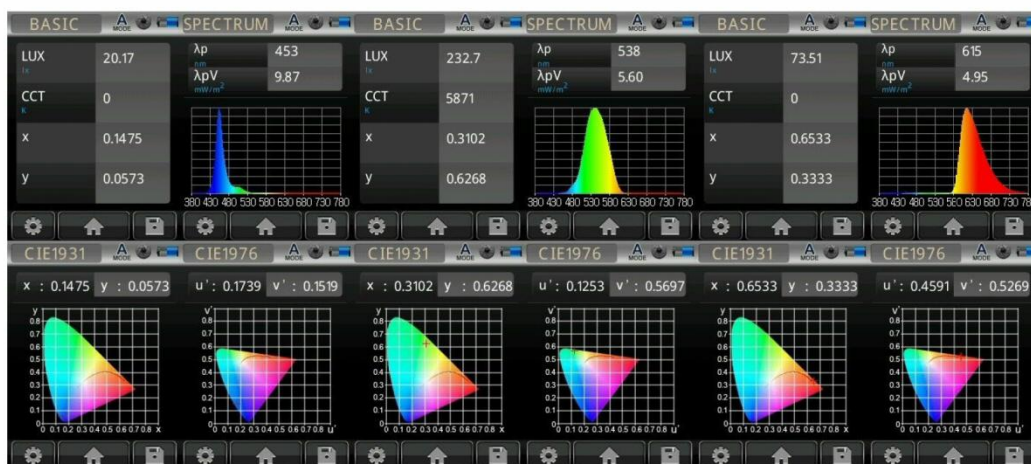
about ten years ago. When vendors switched from CFL to LED backlighting, the color spectrum produced by most displays (OLED excepted) skewed heavily to blue—the color temperature got very cold and colors commensurately inaccurate.

LED backlit LCD displays have fought this phenomenon through various means, but by far the most effective has been the

to 100nm). That means that sized properly, nearly pure blue, green, and red are produced, which can then be combined to produce other pure colors. Quantum dots are the Q in QLED, and they make a big difference.

PERFORMANCE

With the CJ791, light bleed is a bit of an



Note how much more bleed from other colors is present in this typical LED backlit display.

quantum dots like those used by the CJ791. Quantum dots re-emit any light that shines on them (lower than their resonant frequency) in a very narrow range in strict accordance with their size (20nm

issue with dark backgrounds, and the contrast isn't particularly good. With a full-screen black image, you will see more of a dark gray. Thankfully, there's never really a reason to



You'll have no complaints about the CJ791's color, which is augmented with quantum dots.

have a full-screen black image.

The CJ791 uses a matte, anti-glare screen coating that is less impressive at first glance than the glassy gloss of Apple's displays, but it can be a real eye-saver in the long run. At the very least, it means you don't have to be as careful as you do with Apple's glossy displays about how you orient the CJ791 in glare-prone environments.

The peak brightness measured right around 300 nits. That's a full 200 less than with many of Apple's displays, though the contrast is adequate for most purposes. But between the LCD leakage and low peak

brightness, you don't get a particularly dramatic picture. Watching video and

movies will be a ho-hum experience if you measure things purely by the display's contribution.



Samsung J791 Ultra Wide QLED display

PROS

- Ultra wide for more horizontal work- or game-space.
- Far more accurate color than the average display.
- Doubles as a Thunderbolt dock.
- Can display images from two inputs.

CONS

- Grayish blacks due to LCD leakage.
- Relatively weak contrast.

PRICE

\$800

COMPANY

Samsung

BOTTOM LINE

The CJ791's panoramic experience and accurate color are enticing, as well as its ability to act as a fully functional docking station and imitate a dual-display. Aside from the less than optimal contrast, the CJ791 is a very nice effort from Samsung. Definitely worth a look-see if you're on the prowl. ■

Hot Stuff

What We're Raving About This Month



NAD MASTERS SERIES M10

nadelelectronics.com

The Masters Series M10 media streamer is an integrated amplifier and media consolidator of wide scope and ability that produces pristine sound. It's also easy to set up and use and will look great nestled amid your other equipment or on its own. The amp is rated for 100 watts continuous into an 8-ohm load with less than 0.1 percent distortion. An onboard DAC handles MP3, AAC, WMA, OGG, WMA-Lossless, ALAC, OPUS, MQA, FLAC, WAV, AIFF, up to 32-bit/192 kHz PCM, as well as converted DSD playback. The M10 sounds very good; musical and distortion-free on both 4-ohm and 8-ohm. —JON L. JACOBI

BOSCH CONNECTED CONTROL BCC50

bosch-thermotechnology.us

The Bosch BCC50 should be compatible with most conventional heating and cooling systems, including two-stage heat pumps and dehumidifiers. The device itself lacks control, however, so you need to use the Bosch Connected Control iOS app to control this entirely schedule-based thermostat. The app isn't complicated to use, and creating a schedule is a simple matter of picking a time, a target temperature, and days of the week.—**JASON D'APRILE**

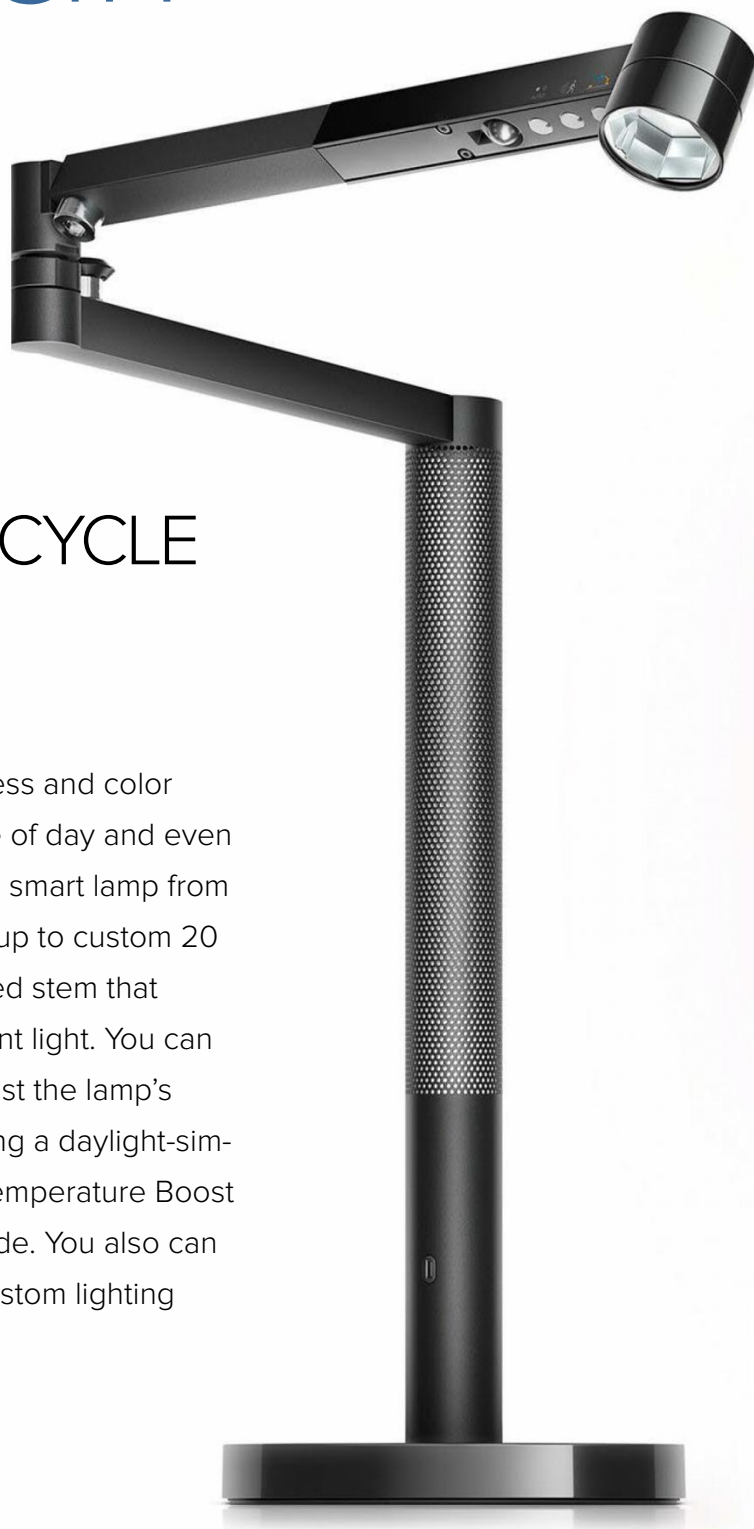


Hot Stuff

DYSON LIGHTCYCLE MORPH

[dyson.com](https://www.dyson.com)

Capable of tailoring its brightness and color temperature based on the time of day and even your age, the Lightcycle Morph smart lamp from Dyson boasts a rotating head, up to custom 20 lighting modes, and a perforated stem that doubles as a secondary ambient light. You can use the Dyson Link app to adjust the lamp's various lighting modes, including a daylight-simulating Study mode, a cooler-temperature Boost mode, and a warmer Relax mode. You also can create up to 20 of your own custom lighting modes. —**BEN PATTERSON**





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iPad at 10: Why apps made the iPad a success

The App Store and iWork saved the iPad from being “just a big iPhone.”

BY JASON SNELL

It's hard to believe that January 27 marked the tenth anniversary of the announcement of the iPad (go.macworld.com/lnip). As impressive as that first iPad was in terms of hardware, a decade later it's clear that the iPad succeeded because of Apple's focus on native iPad apps from the very first day.

SIT DOWN AND LEAN BACK

If you go back and watch Steve Jobs's (go.macworld.com/sjky) keynote introducing the iPad, you'll see the brilliance of Apple's roll-out strategy. To start it all off, there's a big comfy chair on stage, something you never see at Apple keynotes. That chair allowed Jobs and other presenters to

show that the iPad was a comfortable device meant to be used casually.

After revealing the iPad itself, Jobs sits down and spends a very long time walking the audience through the various bundled apps on the iPad. He's sending an important message, right from the start: These were apps that we were familiar with from the iPhone, but they're all bigger and better because they've been modified to take advantage of that larger iPad screen. Safari, of course, but also Calendar and iBooks and many others.

In the early days of the iPad, the most cutting criticism (go.macworld.com/ctcr) of the device was that it was “just a big iPhone.” Apple's presentation demonstrates that while this is technically true, it misses the point. The iPad was a much larger canvas, and apps that grew to fit the larger canvas were not just bigger, but better.

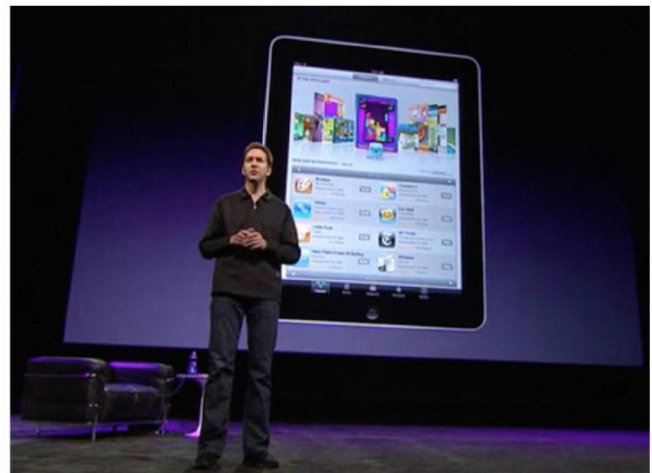


Steve Jobs introduces the original iPad.

PREPARE FOR THE GOLD RUSH

In the second part of the presentation, Scott Forstall (then Apple's software chief) invoked the App Store, which had already become wildly successful after less than two years in operation. It was the App Store's Gold Rush era, and Forstall's message was clear: There's a new Gold Rush coming, and it's in iPad apps. And if developers wanted their apps to be prominently featured on the App Store for iPad, Forstall pointed out, those apps would need to be updated to support it. iPhone-only apps would run, but they'd do so in a diminished compatibility mode and be relegated to the back pages of the App Store.

The iPad was introduced in January, but it didn't ship until April (go.macworld.com/shap)—and Apple released tools for developers to build iPad apps the very day the product was announced. The message



Scott Forstall talks about the App Store during the iPad introduction.

was clear: Build iPad apps and a flood of users will come your way. You've got three months.

Forstall was also quick to point out that good iPad apps were more than just blown-up iPhone versions. Several compliant developers were brought out to demo how they'd already begun work on reconceptualizing their iPhone apps for a larger screen, including MLB At Bat (go.macworld.com/atbt) and the New York Times.

AND TO TOP IT ALL OFF, iWORK

With a bunch of built-in apps as examples and an App Store Gold Rush stoking developers, the iPad was already set up for a solid launch. But Apple had one more revelation to make during the launch of the iPad, and it's one that has had lasting effects on the iPad ever since: The announcement of iWork apps on the iPad.

Apple bringing Keynote, Numbers, and Pages to the iPad on day one sent a powerful message. While it might be difficult to conceive of using an iPhone 3GS to edit a spreadsheet or make a presentation, the larger screen of the iPad made it possible. This was Apple declaring, from day one, that the iPad was going to horn in on areas traditionally served by laptops. How can you dismiss the iPad as a big iPhone if it has a suite of



office apps?

Even one of Apple's first wave of iPad accessories reinforced this message. People forget about it now, but Apple made a keyboard dock for the original iPad. It locked the iPad in portrait orientation and was ergonomically questionable, but it sent the message that this was a device you could do work on. (Jobs said, somewhat dismissively, that you could "write 'War and Peace' on it." I don't think he was excited about the prospect of tying his beautiful iPad down on a desk, attached to a keyboard.)

You can draw a line directly from this moment to the introduction of the iPad Pro in 2015. From the start, Apple said that the iPad should be capable of doing computer stuff, with the implication that third-party developers should follow its lead and dream bigger when it came to iPad software. (Many developers, most notably the Omni Group, embraced this message and set about bringing all their apps to iPad.)

A WORK IN PROGRESS

Ten years later, the iPad is still a work in progress. There are still people who view it as a big iPhone, and don't understand why anyone would want to use it to do the work that could just as easily be done by a laptop. It's still a device full of contradictions, something you use to lean back and watch a TV show or read a website, but also something you can attach a keyboard (and mouse [see page



43]) to and use as a laptop, or close to it.

But consider the competition. Microsoft has brought some tablet features to Windows, but PC tablets are really just PCs under it all, with an interface optimized for keyboard and mouse. And although Google tried very hard to promote Android as an operating system for tablets, it has largely failed—mostly because tablet-optimized Android apps just aren't there. There's no clearer evidence of Apple's wisdom in emphasizing the importance of developing apps specifically for the iPad than that. ■



Why the iPad needs to embrace mice and trackpads

Using an external pointing device can help make the iPad a better device.

BY JASON SNELL

Recently, Brydge, the company that makes my favorite add-on keyboard for the iPad ([go. macworld.com/adky](https://go.macworld.com/adky)), announced a new iPad Pro accessory ([go. macworld.com/keyp](https://go.macworld.com/keyp)) that includes both a keyboard and a trackpad. Adding external pointing devices to the iPad wasn't possible until iOS 13 added support for Bluetooth mice as a part of the Assistive Touch suite of accessibility features.

While some will consider the mere possibility of adding a mouse or trackpad

to an iPad to be sacrilege, I prefer to see it as an additional option that can improve the iPad's flexibility in certain circumstances. However, Apple's support for external pointing devices is very much a first draft. It needs to continue pushing this feature forward in iPadOS 14—and in doing so, the platform could reap some surprising rewards.

MOUSING IN IPADOS 13

In iOS 13, Apple added support for a cursor—with caveats. If you attach a

mouse to an iPad via USB or Bluetooth and turn on Assistive Touch, you'll see a virtual finger on the screen (it's a circle with a smaller circle inside it) that you can move around with the device. Even at its smallest size, it's still pretty large—but so is a fingertip.

Using a mouse with an iPad is a great way to understand just how smart the operating system is when it comes to intuiting what you want to do when you tap the screen with your big, fat fingers. As a Mac user, I expect to need to click precisely the right pixels on the screen or come away disappointed—but on my iPad, if I click in the general vicinity it almost invariably does the right thing.

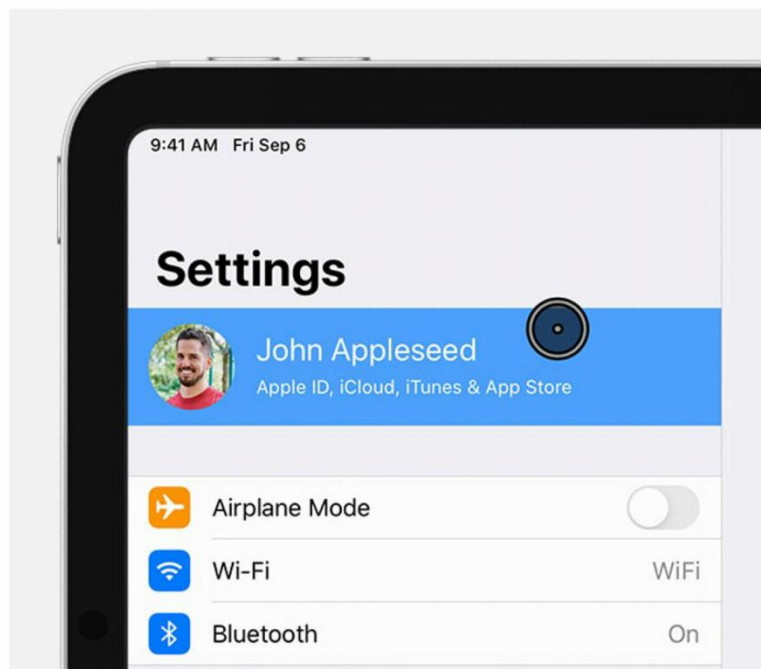
Unfortunately, the fact that the cursor is a virtual finger is also a drawback. So

many iPad interface features are based on gestures, and it's less fun to try to emulate a flick of a finger with a mouse. Using a prototype of Brydger's keyboard/trackpad combo, which makes my iPad feel very much like a MacBook, felt even worse—because I expected to be able to use all the Magic Trackpad gestures I've internalized over the years, and they're just not supported. (I'd love to connect a Magic Trackpad to an iPad and then swipe from app to app.)

I'm also disappointed that iPadOS 13 doesn't appropriately support the one cursor that's been on iOS for years—the text-editing cursor you see when you put two fingers down on the iPad's software keyboard. In this mode, the iPad is basically emulating a trackpad, letting you

precisely place a cursor, select text, and more. That feature hasn't been integrated at all, which is a shame, because it would really improve writing and editing on the iPad—and it's right there for the taking.

iPadOS 13 also introduced an upgraded version of Safari that emulates a desktop browser, so more websites are accessible on the iPad. It's a clever feature that works surprisingly well most of the time, interpreting how pages expect you to behave with a mouse connected and then emulating that



The iOS 13 Assistive Touch cursor.

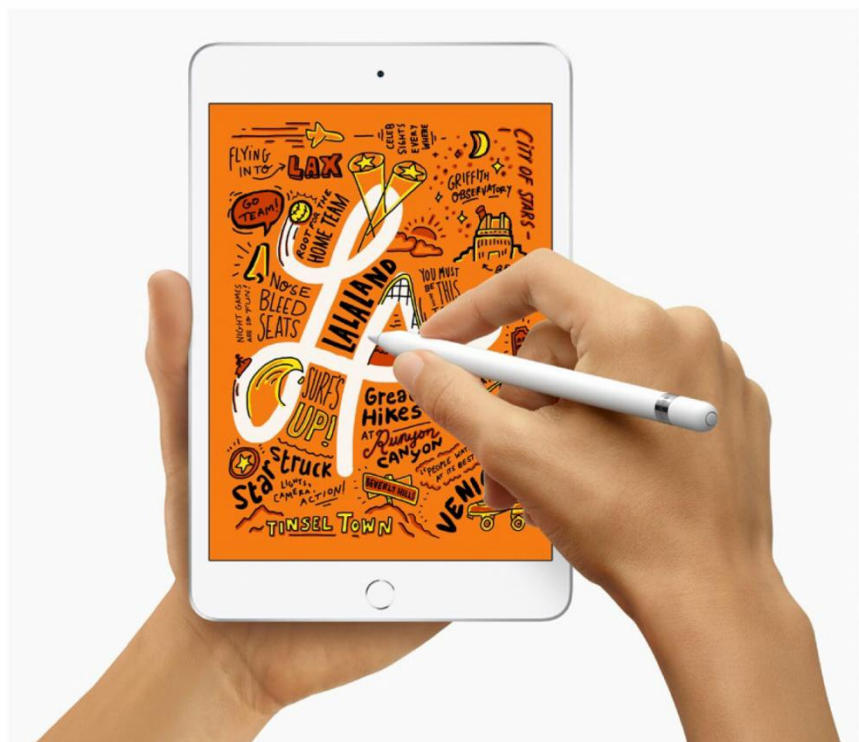
behavior with taps of your finger. The one thing it doesn't do is recognize when you've got an actual pointing device attached and just behave like a normal web browser.

In iPadOS 13, external pointing device support has to be awkwardly toggled on and off every time you want to connect a device. The iPad should be able to sense when a device is connected and use it automatically, just like it works on a Mac.

So that's a place to start with pointing device support on iPadOS 14: Automatic recognition of devices, support for text editing, support for trackpad gestures, and support for Safari desktop browsing. That's the start of a good wish list. Here's the question, though: Will Apple ever implement any of these improvements, or does it consider the current implementation one that's good enough?

THE BENEFITS OF POINTING DEVICES

The iPad is always going to be a touch-first tablet device. As it should be. But over the years Apple has expanded the input methods that are available for iPads to

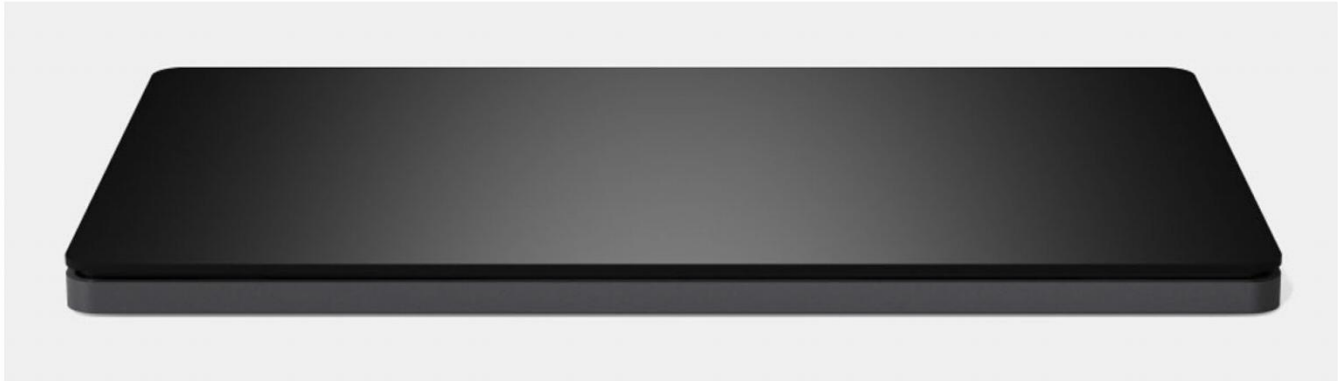


In iPadOS 13, external pointing device support has to be toggled on and off every time you want to connect a device.

include the Smart Keyboard and the Apple Pencil. If it embraces pointing devices a bit more, there are a lot of potential benefits for Apple and the iPad platform in general.

First off, let's go back to where this feature comes from: Accessibility. Providing more ways for users to use the iPad makes the iPad more usable. Everybody is different. Supporting a rich iPad experience with external pointing devices could make the difference between someone being able to use an iPad and not being able to use one.

Let's not forget, too, that accessibility reaches different people in different ways—and more of them than you might



Brydge is also releasing an iPadOS Trackpad for the iPad (go.macworld.com/itpd).

think. One of my friends uses a mouse with his iPad all the time because of his repetitive-strain injuries. In many ways, the iPad is an ergonomic miracle because at its core it's just a screen—the user decides how they want to use it. The more flexibility it can offer, the better.

Looking more broadly at the iPad product line, Apple has done a great job in the last couple of years at bringing features previously available only on the iPad Pro to the rest of the iPad line. There's Apple Pencil support across the line and Smart Keyboard support on the iPad and iPad Air. But the iPad Pro still needs ways to differentiate itself from the non-pro iPad models.

Improving support for pointing devices will help companies like Brydge push the boundaries of iPad accessories, yes—but Apple could also benefit. Imagine a next-generation Smart Keyboard that includes cursor control, via a trackpad or other touch-sensitive surface. I'm confident that Apple could make a pro-level iPad

accessory that would blow away the third-party accessory makers in terms of quality—but the software needs an upgrade to make it happen.

Finally, improving pointing-device support could potentially open the door for an entirely new category of device (go.macworld.com/ncat) in the iOS family. An iOS-based laptop would offer a rich app ecosystem, a familiar touchscreen interface, and presumably spectacular battery life. Some people prefer the shape of a laptop, but don't need the features of a Mac or PC. For them, an iOS laptop could be a great product—and it would be even better if it included a trackpad in addition to a touchscreen.

When I'm working away from my iMac Pro, I'm using an iPad Pro. I love its power and flexibility. It can be a laptop when I need it to be, and a tablet when I don't. The more flexible the iPad platform is, the better. I hope Apple sees that and does something about it in iPadOS 14. ■



Software bugs have become Apple's greatest vulnerability

Signs point to Apple changing its development practices to combat software bugginess.

BY DAN MOREN

Reports of bugs have plagued many of Apple's software releases this past fall, from iOS 13 to iPadOS to macOS Catalina. Even the HomePod received an update that resulted in some of the smart speakers becoming unresponsive, causing Apple to temporarily pull the release while it fixed the problem.

Bugs, of course, are not the sole province of the folks from Cupertino, but this year has seemed particularly bad,

especially when compared with the relatively stable release of iOS 12 in the fall of 2018. It's led to many calls for Apple to rethink its software strategies and to spend more time squashing bugs than implementing new features.

This week, a report from Bloomberg (go.macworld.com/blmb) suggests that Apple is taking steps in that direction, making changes to its software development practices that will help bring more stability to early builds of the

software. But there's more that could be done to help improve users' experiences with Apple software, and internal changes are just one component.

NO COUNTRY FOR OLD BUGS

The big tentpole software releases that Apple unveils at its annual Worldwide Developers Conference and subsequently rolls out in the fall are usually a time for the company to show off its latest and greatest features. iOS's release, in particular, is timed to coincide with the announcement of new iPhones, which have appeared like clockwork every September for the last seven years.

But while new features are certainly great for Apple's marketing machine, it's only part of the story. Updates are also a time for Apple to fix what isn't working, whether that's features that are unreliable

or interface designs that aren't quite up to snuff. With rare exceptions—such as last year's iOS 12, where Apple spent a lot of time making sure the update would work well on older devices—those bug fixes have started to feel more sparse over the years. It doesn't help that new features also often mean new bugs to go along with those that haven't yet been squashed.

Earlier this fall, former Apple engineer David Shayer wrote a post at TidBITS (go.macworld.com/tdbt) explaining some reasons why the company's software might be so buggy. One big reason, in his experience, was that Apple doesn't spend a lot of time addressing pre-existing bugs—that is, those that were already broken in previous releases. Or, to paraphrase the old saying, if it ain't fixed, why fix it?

Prioritizing new features over fixing old ones might make sense from a marketing perspective, but in the long term all of those old bugs start to add up, like interest on a loan, and end up making the entire experience less stable.

ROADMAP TO PERDITION

One way Apple might be able to combat this technical debt would be to change its development cycle. Rather than releasing one big software update every fall, then



Apple uses its Worldwide Developers Conference to unveil new features for its operating systems.

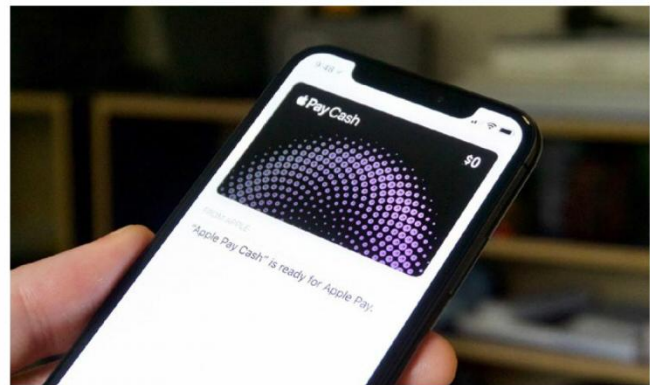
fixing things in subsequent patches, the company could roll out features gradually over the year. Apple's already taken to doing this in some cases, with capabilities like Apple Pay Cash, Messages in the Cloud, and iCloud shared folders rolling out over the course of the fall or beyond.

But in most of those cases, Apple has tried to sweep its release schedule under the rug, as though it's embarrassed that it couldn't ship those features in the initial release. In order to succeed, the company needs to embrace the approach, providing a roadmap to its developers and users about when features will appear. This is one of those things that requires a change in the company's culture—Apple, after all, is not an organization for whom transparency comes naturally. But there's no reason it couldn't simply lay out a schedule of features to come in iOS 14, iOS 14.1, iOS 14.2, and so on. It just needs to decide to do so.

Moreover, given that it's already doing this, it might as well spin it in a positive fashion anyway.

TICK TOCK

As much as it pains me to say it, iOS is getting old. Thirteen years and thirteen releases may seem normal, but it's a breakneck pace compared to, say, the classic Mac OS, which topped out at version 9 after just seventeen years.



Apple Pay Cash.

Annual releases are a fairly new development in the software world: even Mac OS X once went two and a half years between major releases.

For a long time, Apple had seemingly embraced a tick-tock strategy of releases, alternating those that rolled out major new features with maintenance releases that made sure the software ran reliably. Apple could decide to adopt a similar strategy on iOS.

I get that the iPhone is more popular than ever, but with iOS maturing, maybe it's time for Apple to slow its roll a little bit. We've come to expect technology to submit to our every whim, but we also depend on it every day, and that means that when it doesn't work, we get even more frustrated. Frustrated users, it need not be said, are not happy users. And many of us would gladly trade being wowed by shiny new features for bulletproof devices that we don't end up cursing at. ■

How to use the over-capture feature in the new iPhone camera to crop and adjust images later

Apple added a way to capture details outside your frame camera preview to aid in adjusting a picture after you snap the virtual shutter.

BY GLENN FLEISHMAN



The new iPhone 11 series of phones brings a new way to frame and shoot photos that gives you flexibility after you've snapped that shot. The iPhone 11, 11 Pro, and 11 Pro Max all bring in detail outside your framed preview from the next widest lens as you point at a scene in both

portrait and landscape.

First, you have to turn the feature on in Settings → Camera under the Composition section. Tap Photos Capture Outside The Frame to turn this over-capture mode on. By default, Apple has left the feature off, though the same option for video is enabled. (There's a potential reason for

this, which I'll get to at the end of this article.)

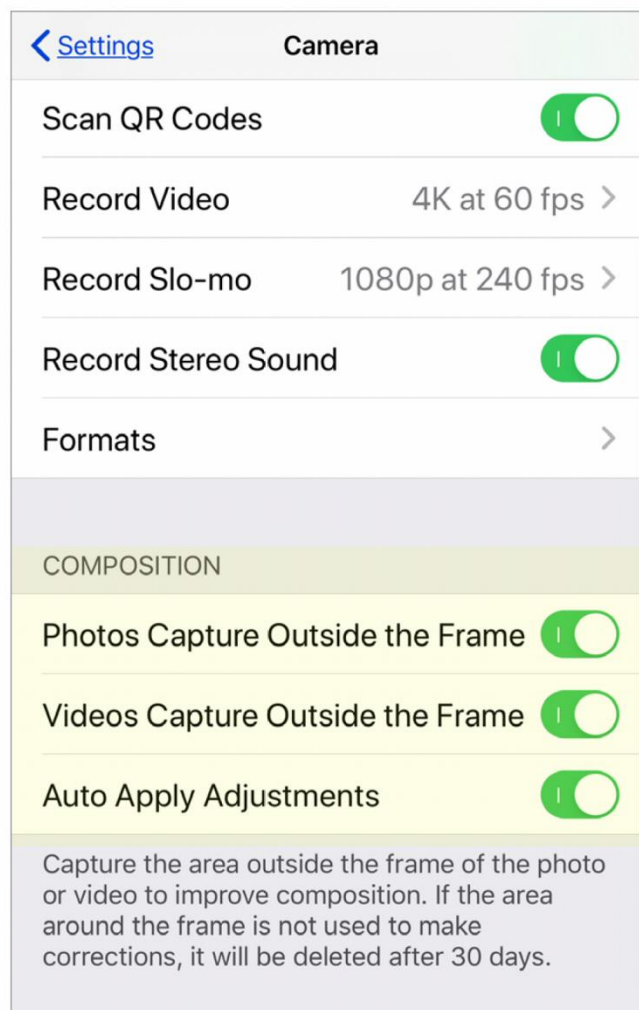
A related option works in concert with Capture Outside The Frame. Auto Apply Adjustments, a switch in the same area in Settings (turned on by default), causes the Camera app to try to straighten and improve photos and videos shot at 1x without you having to intervene at all. (Apple's documentation says if an automatic adjustment is applied, you see a blue AUTO badge in the media-browsing mode, but I haven't seen this appear in any form yet.)

There doesn't seem to be a penalty to leaving that option turned on, however, as you can still adjust images later, even if the Camera app has already applied its suggested improvement.

USE CAPTURE OUTSIDE THE FRAME

With the option enabled, you'll notice that when you're shooting either in the 1x mode on any of the iPhone 11 models or the 2x mode on an iPhone 11 Pro and 11 Pro Max, a dimmed area appears outside the main camera frame indicating the over-captured image. In portrait mode, that's above and below the framed area; in landscape, it's at left and right.

This additional information is acquired from the next wider camera on the phone and then scaled down to match—no detail



In the Camera settings in iOS 13, you need to switch on Photos Capture Outside The Frame to use the over-capture feature.

is lost, but the extra data is downsampled, or reduced in pixel density. In 1x mode, the next lens “down” is the ultra-wide-angle lens, while the primary image comes from the wide-angle one. When shooting in 2x on a Pro model, the telephoto lens is supplemented with the wide-angle camera.

When you first bring up the Camera app, that shaded area doesn't appear

instantly. Rather, it fades in. Apple doesn't explain whether that's an interface choice or a hardware one, but I suspect given the computational firepower built into the camera's processing system that the gradual appearance is designed to avoid distraction, instead of a requirement to activate the second camera.

The image area outside the frame won't appear when it's too dark for the next-wider lens to function well: the ultra-wide-angle lens captures substantially less light than the wide-angle, so without at least moderate amounts of light, it can't contribute. I've tested this in fairly dim indoor environments, and still had the out-of-frame image appear. I had to find an area that was quite dark for it to drop out.

The over-capture also disappears when you're within several inches of an object.

You can take a picture as you normally would with perhaps less worries about perfect framing. There's no extra step in capture.

HOW TO ADJUST A PHOTO AFTER CAPTURE

You gain access to this additional information in Photos after shooting. Images that have outside-the-frame data are marked with a special badge in the upper-right corner, only when viewing the image, not its preview. The badge is a dash-bordered square with a star in its upper-right corner. It's easy to miss.

Tap the Edit button and then tap the Crop button. In my testing, I've found that sometimes images that are marked with the over-capture badge don't reveal extra information in editing! This seems like a



The Camera app shows the area captured outside the frame as slightly faded detail.

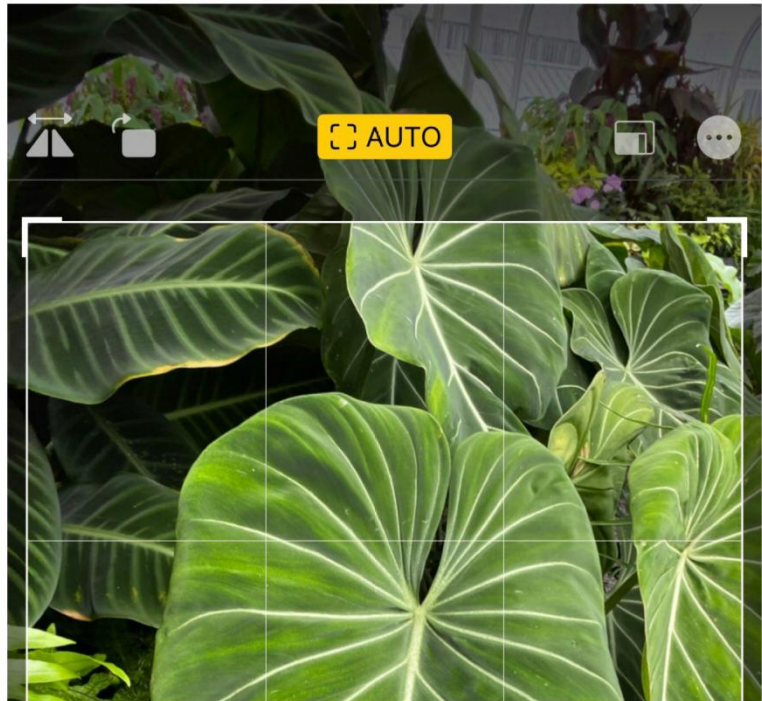
dash-bordered square with the word AUTO to its right, both reversed out of a yellow bar. If you want to override that adjustment, you can tap AUTO like it's a button (it is!) and the changes are removed.

In macOS 10.15 Catalina, even with iCloud Photos enabled, the over-captured area doesn't appear accessible in Photos for macOS. This might change, but for now it looks like the extra information is either stored or only accessible in iOS and iPadOS.

Apple says the over-capture area is retained for 30 days after the picture is taken. At that point, it effectively re-crops the photo to the frame as shot. I suspect this is handled cleverly using the HEIC (High Efficiency Image Coding) package that the company started using in OS releases in 2018. This package allows the efficient storage of multiple images, making it easier to combine them in an app for display and discard elements without rewriting the primary image.

REFUSIN' DEEP FUSION

One warning and tip about Capture Outside The Frame: If you have the feature turned on, the upcoming Deep Fusion machine-learning-based addition to the Camera app is disabled. Deep Fusion, coming in iOS 13.2, uses



If Photos decides to correct an image for you, it marks it AUTO at the top.

machine-learning algorithms to produce photos that assemble richer details and tones than even the Smart HDR feature already present.

Deep Fusion handles the controls of multiple cameras to capture multiple inputs and images simultaneously and then process them. There's a thought that Apple left Capture Outside The Frame turned off "out of the box" because Deep Fusion was coming.

By the same token, if you don't always want to use Deep Fusion, Apple provides no switch in the current beta testing stage to turn it off. Capture Outside The Frame thus becomes an implicit on/off switch for Deep Fusion, too. ■



Apple's watch faces are improving. Is it time for third-party faces?

The new always-on display makes watch faces the center of attention.

BY JASON SNELL

In 2018, when Apple unveiled the Apple Watch Series 4, I was surprised that the company didn't bother to update most of its watch faces (go.macworld.com/noup), and expressed some hope that the company would place more emphasis on faces in the Series 5.

Thanks to the new always-on display

(go.macworld.com/alon), Apple has definitely made watch faces the center of attention in a way they weren't before. There's never been a more on-the-nose Apple marketing campaign than the "This Watch Tells Time" video (go.macworld.com/tltm) that Apple unveiled during its special event on September 10. And yet, while I

want to report that as of 2019 Apple has prioritized the faces of the Apple Watch, I can't. Instead, it's given us a few encouraging new faces (go.macworld.com/nwfc)—and left a mess everywhere else.

LAUNCHED A THOUSAND WATCHES

Let's start with the good. As it did last year, Apple has introduced new faces into this year's watchOS update, and I'm encouraged by what has been done. The California face is the most customizable Apple Watch face yet, and it comes close to being my favorite Apple Watch face ever. You can choose numeral styles (Pills, Roman, California, Arabic, Arabic Indic, Devanagari), dial size (full screen, circular), more than 60 accent colors, and either two (on the full-screen dial) or five (on the circular dial) complications.

Most of Apple's new faces allow you to fill the screen if you so choose—but you'll give



The watchOS 6 Solar Dial watch face.

up some or all of your complications if you do so. The Gradient face offers gorgeous color choices, but can't display complications in full-screen mode. Two new big, colorful digital faces—Numerals Mono and Numerals Duo—are welcome additions for people who want a readable in-your-face time, but don't support complications at all.

The new round faces that do support complications, like the new Solar Dial face, generally support four complications at the edges of the display. There's a new face with support for the extra-large complication banner introduced last year, though: the new Modular Compact allows either a digital or analog face in the corner, along with the banner and two circular complications.

Viewed as a group, these new faces strike me as being pretty solid. They give users plenty of options for look and feel, analog and digital, complications around a circle or a bold full-screen design.

Unfortunately, they're almost the entire story.

FACE THE FACTS

WatchOS 6 has brought almost no modifications to existing watch faces, and it's incredibly frustrating. Utility, my favorite Apple Watch face since the beginning, remains unable to use the larger “modern” complications introduced with watchOS 5. Is it locked in stasis because it can also be

used as a face on older models with smaller displays? If so, that's a shame—users of the Series 4 and Series 5 watches ought to be able to take full advantage of rich complications across as many faces as possible. (I can actually make the new California face a pretty good clone of Utility, which says something about how flexible California is—but there's no option to let me display complications in color rather than grayscale. Oh well.)

There are also no new complication styles in watchOS 6, after watchOS 5 introduced so many. Perhaps it's worth taking a year to stabilize complication design, given that app developers had a very short amount of time to react to the new complications when they were introduced with the Series 4 watch last year. But I'm convinced that, along with Siri, complications are a primary way for people to interact with the Apple Watch. They need to keep improving. (I'd love to see dynamic complications that can display different items over time, as well as complications that appear only when they're active—for a countdown timer, for instance.)

THE BIGGEST CHANGE, AND HOPE FOR THE FUTURE

It's not fair to say that Apple didn't change most watch faces this year, because it had to modify every one of them to support the

The watchOS 6 Modular Compact watch face.

always-on display. Faces used to wink out of existence when the Watch display went to sleep, but now they must stay on—in a power-saving mode with a dramatically reduced frame rate.

That required Apple to remove most animations—most notably, the sweep of a second hand—from faces. Other faces with bright graphics simply dim the graphics away so that only the time is displayed. If you watch a dimmed face long enough, though, you'll see that there are still animations here and there. The California face completely animates the minute-by-minute tick of the minute hand, even with the second hand silenced. Every single watch face had to be analyzed and updated for the dim mode of the always-on display, and perhaps that's where Apple invested its face design time this cycle.

I've heard some developers use the





A selection of watch faces available in watchOS 6.

introduction of the always-on display and its accompanying dimmed-mode faces as proof of why Apple will never allow third-party developers to create watch faces. In fact, I believe the opposite: The coming of the always-on display is such a major change to how watch faces operate that it made no sense to allow anyone outside Apple to build them until that work was done.

Perhaps now that the new, richer complications have had time to settle down, and we're clear that every watch face needs a bright, animated active mode as well as a subdued dim mode, Apple will be ready to let third-party face developers inside the tent. I'm not sure I'd bet money on the possibility, but it seems more likely now than it did even last year. Having seen some developers mock up their face designs (go.macworld.com/mkup), I'm encouraged that third-party faces would

improve the Apple Watch overall.

As long as Apple holds a monopoly on watch-face design, it will deserve all the criticism it gets about how slowly it's moving in this area. The bar's a lot lower when Apple only has to provide base functionality and can let third-party developers noodle on designs from the grotesque to the gorgeous.

Maybe this year. ■

If you watch a dimmed face long enough you'll see that there are still animations here and there.



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PHOTO AND VIDEO-EDITING APP

FOTOMAGICO FOR iPAD: CREATE STUNNING ANIMATED SLIDESHOWS ON THE GO

BY J.R. BOOKWALTER

If you want to breathe new life into static photos with minimal effort, there's no better method than FotoMagico 5 ([go. macworld.com/ftm5](http://go.macworld.com/ftm5)) for macOS, which we hailed as “more impressive than pulling rabbits out of a magic hat” in our May, 2016, review. For nearly 15 years, this slideshow-creation software has been the go-to solution for casual shutterbugs and professional photographers alike.

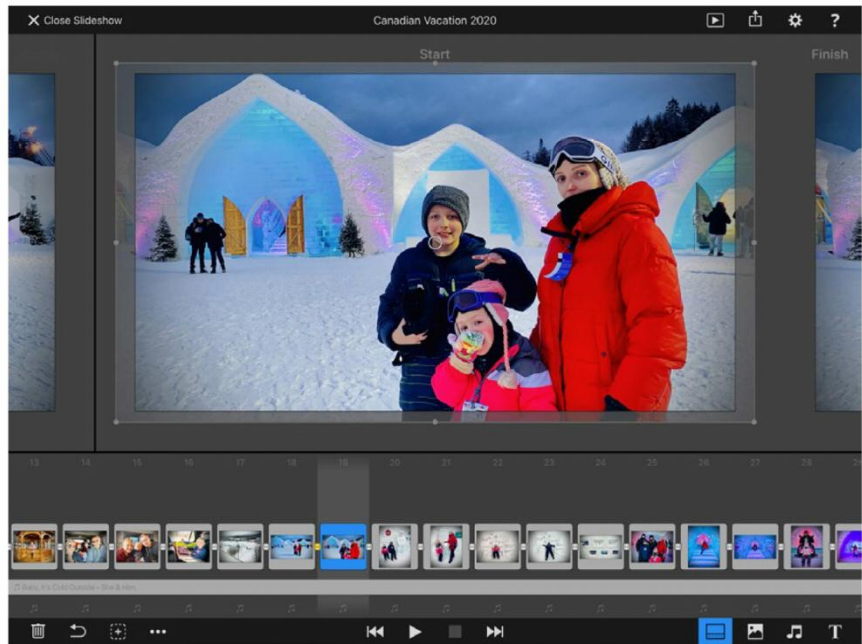
Fortunately, FotoMagico is now available for iPad, providing a way to assemble great slideshows from anywhere. Best of all, Mac project files are interchangeable with the iPad version, so you can start a project on

one device and finish on another.

The iPad app is a faithful transition, offering the same intuitive Storyboard layout for building slideshows via drag and drop with multiple layers, adjusting start and finish animation, adding titles, music, voiceovers, and more with ease. Text snippets come along for the ride, so you can quickly add frequently-used elements while retaining full control over editing individual components.

Like on macOS, FotoMagico for iPad requires no time-intensive rendering to preview slideshows in full quality, even when starting in the middle. Taking advantage of Apple's Metal graphics API, the app provided fluid, real-time playback even on our venerable first-generation iPad Pro.

The only issues came up when importing images, video, or audio from large libraries. It took upwards of 15 seconds to initially access the media browser, with photos under the Recently Added category appearing out of chronological order and no way to sort them for easier access. The situation improves marginally with audio, but the



FotoMagico for iPad adopts the intuitive, storyboard-driven user interface that made the Mac version so easy to use.

search field is glacially slow to respond, and cloud-based tracks are inaccessible until first downloaded from the Music app. (DRM-protected Apple Music tracks can't be used at all, a limitation also imposed on Mac.)



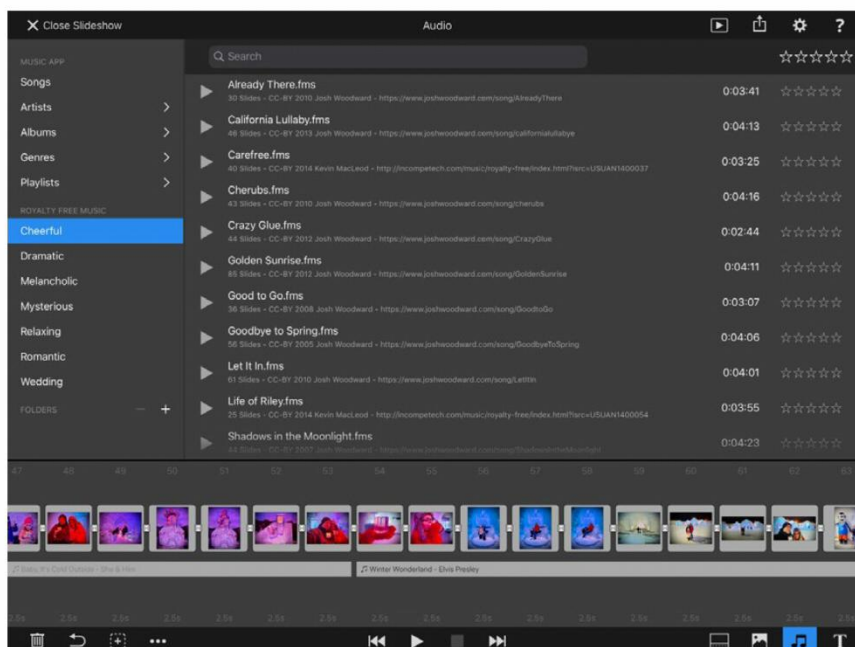
The iPad version includes the ability to add effects to photos, a feature currently unavailable on Mac.

PAY TO PLAY

Although the app lacks a timeline view to shorten or extend slides, as in FotoMagico Pro on macOS, the iPad version does include Audio Marker Assistant, which automatically syncs the duration of slides to the beat of imported songs or manually added audio markers. This works great with included royalty-free music—more than 60 tracks across seven moods—but you'll need to enter the BPM (beats per minute) for imported tunes that lack the proper metadata.

The iPad version also introduces 15 effects, which can be applied to photos and videos to change their appearance. Ranging from color correction to comic book and film grain, masks, borders, and vignettes, effects are a neat way to spruce up any slideshow, although we'd love to see Instagram-style filters added in a future update. (Effects are the one thing that don't currently work on Mac.)

FotoMagico for iPad is free for 14 days, requiring a subscription to edit slideshows beyond the trial period. That's not as limiting



Like the Mac version, FotoMagico for iPad includes more than 60 royalty-free music cues across seven different styles.

as it sounds, because \$5 unlocks all features for an entire month, with discounted three-month (\$14), six-month

(\$23), or 12-month (\$40) options for those who need them. There's no one-time purchase, nor free/discounted access for Mac users, but you can open and play existing projects without a subscription, so the pricing is fair for those with occasional needs.



FotoMagico for iPad

PROS

- Fast, easy, full-featured slideshow creation.
- Includes more than 60 royalty-free music tracks, 15 photo effects.

CONS

- Media browser sluggish when accessing large photo, music libraries.
- Applied effects aren't currently displayed in Mac version.

PRICE

Free (in-app purchases)

COMPANY

BeLight Software

BOTTOM LINE

A longtime Mac favorite successfully transitions to iPad, although importing media from large libraries could use more work. ■



FILE MANAGEMENT APP

DOCUMENTS 7: FREE iOS FILE MANAGER PUTS APPLE'S FILES APP TO SHAME

BY J.R. BOOKWALTER



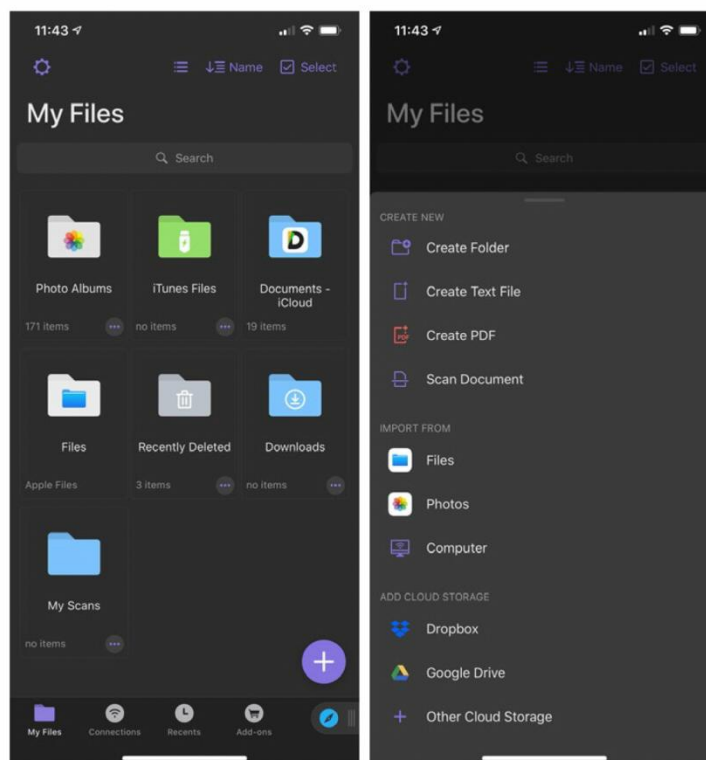
It took Apple nearly a decade to bring proper file management to the iPhone and iPad with the arrival of the Files app in iOS 11. Over the same period of time, an enterprising third-party developer based in Odessa, Ukraine, was busy refining its own file manager app, which outshines Apple's in almost every conceivable way.

Documents 7 (go.macworld.com/dcm7) is the latest incarnation of the versatile iOS utility that started as clever web app ReaddleDocs, named for the up-and-coming startup who created it. The mobile

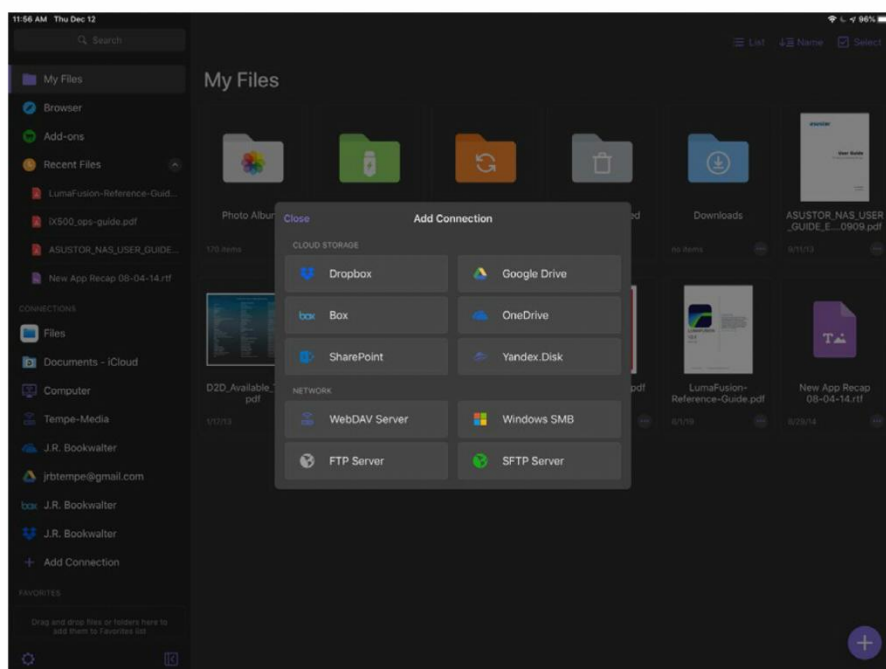
equivalent of macOS Finder, this jack-of-all-trades allows iPhone and iPad owners to browse, view, and manage files with ease, all from an intuitive user interface that puts Apple's own Files to shame.

Although there was little to dislike about the look and feel of prior releases, Documents 7 adds a fresh coat of paint inspired by the company's recent PDF Expert 7 (go.macworld.com/pdf7), a robust tool for document editing and annotation. The result is a refined UI that makes viewing and organizing files a more organic experience, with support for iOS 13's new Dark Mode and floating keyboard. iPad users can also now open more than one Documents window at a time, great for side-by-side comparison or to drag and drop content between them.

Making its way from iPad to iPhone is the Plus button, a convenient one-tap pop-up in the lower right corner which speeds up creation of new folders, text and PDF files, scanning new documents, or importing existing files from iCloud Drive, Photos, cloud storage providers, or



Documents 7 brings the Plus button to iPhone, making it easier for users to create and import files from almost anywhere.



Whether it's cloud storage, network-attached devices, or remote servers, Documents 7 makes file management a snap.

Documents 7 can effortlessly transfer files between iOS devices and personal computers using any web browser.

If you already own PDF Expert 6, those editing features are available free of charge in Documents 7. Unfortunately, three advanced tools recently added to PDF Expert 7 do not get shared, so the only way to customize the Favorites toolbar or convert



PROS

- CONS**

- PRICE**

COMPANY

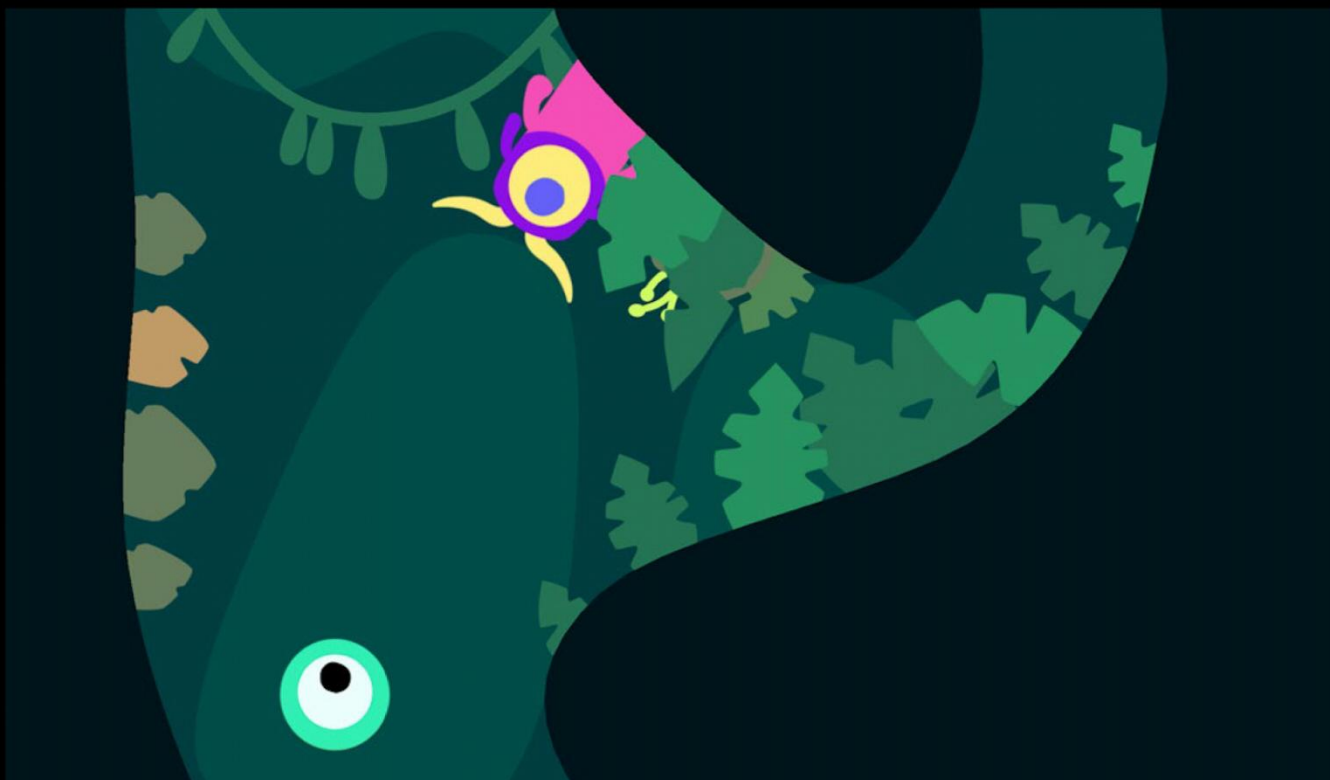
For those underwhelmed by the built-in Files app, do yourself a favor and install Documents 7, the free file manager worthy of being installed on every iOS device. ■

**PREVENT
WILDFIRES,
FOR THE
LOVE OF THE
OUTDOORS.**



BEST iOS GAMES OF 2019

Look beyond the chaff of flavor-of-the-moment, ad-riddled games and microtransaction-heavy “freemium” titles, and you’ll find games that are every bit as good as what you’ll see on Apple Arcade. Some of them are even better. And this list doesn’t even count many of the fun freemium games that dropped in 2019. **By Leif Johnson**



ORDIA

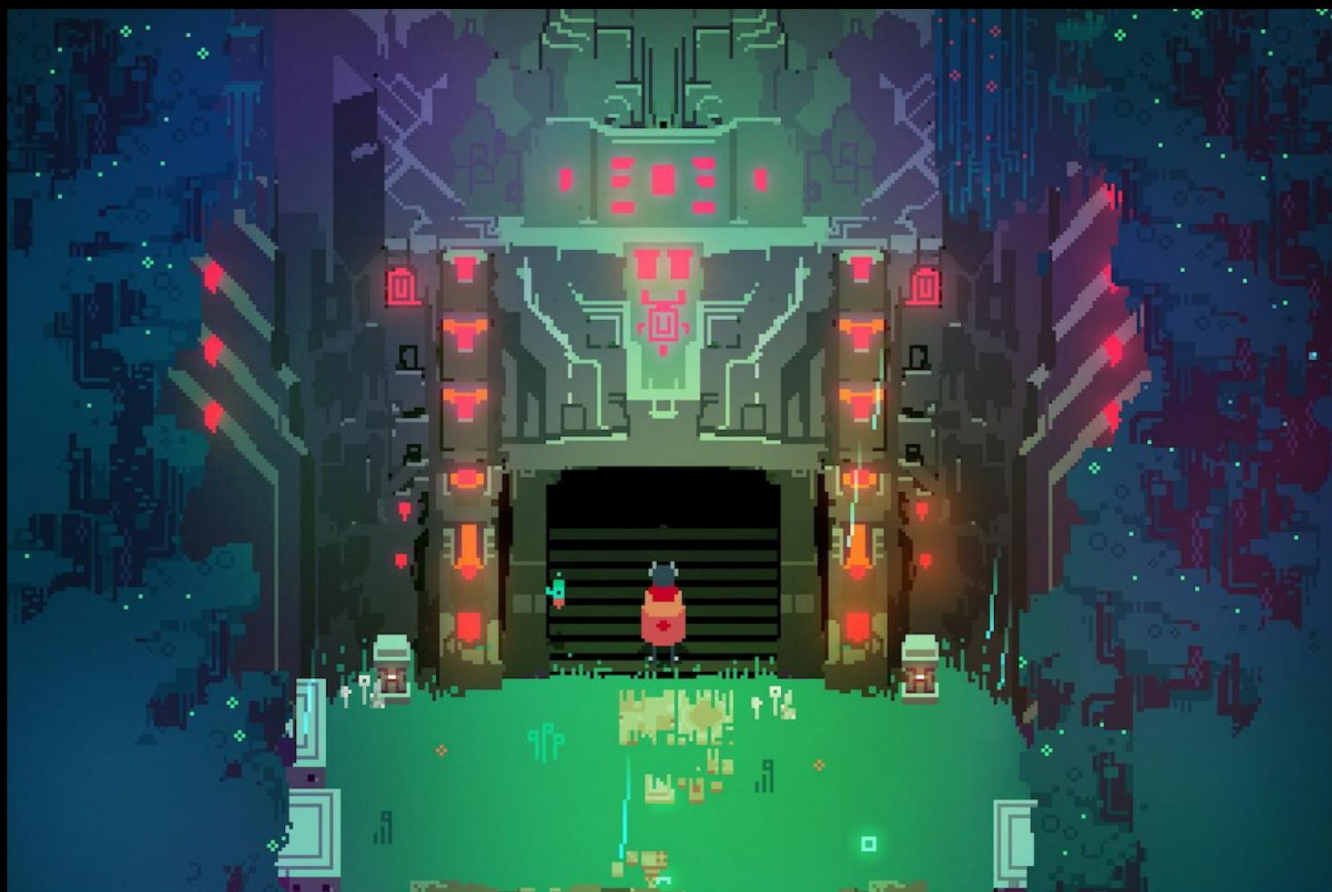
go.macworld.com/dia

Ordia plays a lot like *Angry Birds*: Pull back on your avatar with your finger, and it fires off in the direction you aimed in. But that’s about where the similarities end. Here you’re a gloopy eye-like blob ascending through the primordial ooze, so you do your platforming vertically rather than horizontally. Along the way, you plop over to other gloopy blobs for support and calculate catapults over spikes, until at last you break through the surface at the end of the stage—and, perhaps, to the next stage of evolution.

HYPER LIGHT DRIFTER

go.macworld.com/hldr

Hyper Light Drifter is an action RPG that's only three years old, although its pixel art style makes it look like a relic from my childhood. It's almost as timeless as those digital '80s adventures, and it combines artful minimalist storytelling about a "drifter" suffering from a mysterious illness with gameplay that was pulled straight from *The Legend of Zelda: A Link to the Past*.



DEAD CELLS

go.macworld.com/dc

The title *Dead Cells* refers to the hero of Motion Twin's game, who's basically a bundle of sentient cells that slithers into the bodies of decapitated prisoners in their...cells. Wordplay is fun, y'all! And so is *Dead Cells*, which, like *Castlevania*, is a 2D game that relies on exploring and backtracking through various levels. The key difference is that these levels randomly generate each time you go through. And you'll be going through it a lot. *Dead Cells* is a hard game, not least because it features a permadeath mechanic that makes you start from the beginning every time you die.

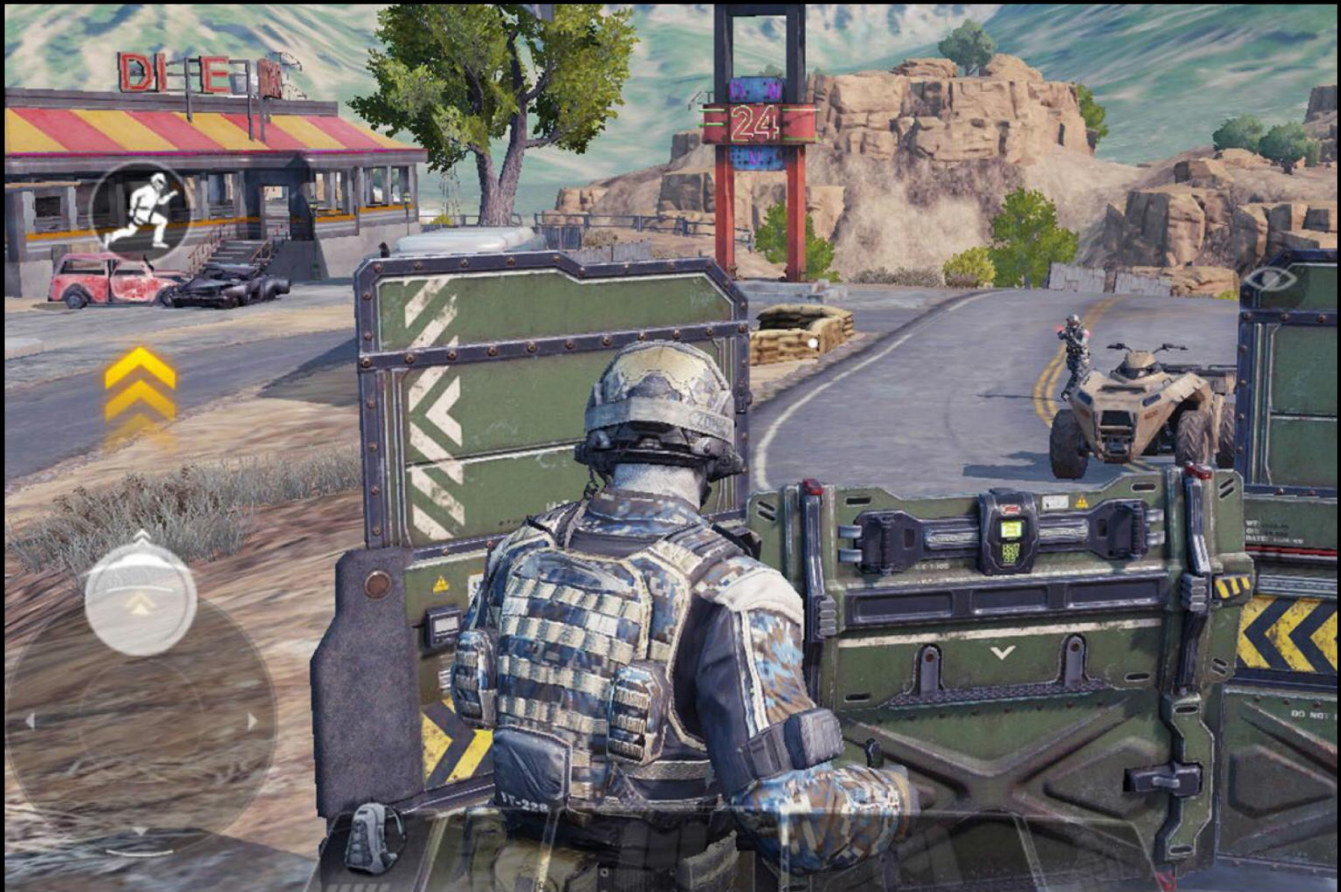




SKY: CHILDREN OF THE LIGHT

go.macworld.com/scli

Sky: Children of the Light is a visually striking game about empathy, cooperation with other players, and lightweight puzzle solving that's framed as a tale about restoring spirits to their rightful place among the constellations. As with developer Thatgamecompany's previous games *Flower* and *Journey*, its appeal springs from the intensity of emotions you feel while playing rather than competition or combat prowess. I initially worried the in-app purchases would smother the intensity of that experience, but happily they're benign.



CALL OF DUTY: MOBILE

go.macworld.com/cdm

Call of Duty is in a good place lately. In August, the new *Modern Warfare* wowed critics on consoles, and in October, *Call of Duty: Mobile* emerged as what may be the best shooter on a smartphone ever. It's not just a good phone shooter: It feels like *Call of Duty*. That especially comes through in the maps and the five-versus-five team deathmatch and domination modes, but you'll also feel it the 100-player battle royale that resembles *Modern Warfare*'s Blackout map. You can play with either touch controls or a gamepad.

STAR TRADERS: FRONTIERS

go.macworld.com/stfi

Star Traders: Frontiers' many influences suggest it should be little more than a forgettable satellite around the worlds of *Star Trek*, *Mass Effect*, and even *Firefly*, but it manages to exert a substantial gravitational tug of its own. The Trese Brothers originally released it for PC last year, but its appealing mix of strategy and roleplaying makes a fine match for mobile. And while there's a lot to do here, it rarely feels overcomplicated. *Frontiers'* star shines brightly in part because of its personality. Other spacefaring games lean too heavily on familiar sci-fi tropes, but *Frontiers* presents a galaxy where space pirates conduct trade or hobnob with fellow corsairs while dressed like gunslingers or 18th-century rajahs.



THE GARDENS BETWEEN

go.macworld.com/tgb

I spend way too much time wondering what I could have done differently with my life, and that's partly why I'm so drawn to *The Gardens Between*. This artful puzzler lets us see what big differences small changes can make. With swipes of your finger, you nudge time backwards and forwards around two friends, letting them subtly alter their actions so they can ascend the peaks of small islands made from the detritus of their memories. And therein lies another theme: This is just as much a game about learning how to move on—both from possessions and people.





TELLING LIES

go.macworld.com/tl

Telling Lies is the kind of game that'll make you want to stick a spot of electrical tape over your device's camera. You play as an NSA agent, and you're tasked with piecing together the story behind a traumatic event by watching and listening to secretly recorded one-sided video chats from a large cast of characters. Your job is to pull the most important clues from what you hear, so you'll need to pay attention to relevant references in this chatter. This isn't always easy, though, as you'll quickly realize some of these chumps are shameless liars.

FORGOTTON ANNE

go.macworld.com/fann

First off, “Forgotton” is not a typo, and that’s relatively low on the weirdness scale in this stunning narrative-driven platformer. Secondly, if you’ve ever wished for a game set in the world of a Studio Ghibli film, *Forgotton Anne* is probably about as close as you’re going to get. Anne herself is an Enforcer (a cop of sorts), and she’s one of only two humans living in a realm where all forgotten things end up when they’re lost. The citizens of this place consist of everything from talking guns to bartending refrigerators, and Anne leaps among them with some occasionally awkward platforming.





GWENT: THE WITCHER CARD GAME

go.macworld.com/gwc

If you're enjoying Henry Cavill's new *Witcher* TV series on Netflix and you're seeking a tie-in, it's a great time to check out *Gwent*. It's a standalone version of a collectible card game that was designed for 2015's *The Witcher 3: the Wild Hunt* (one of the most acclaimed roleplaying games of all time), and much like *Hearthstone* before it, it's arguably better suited for devices like the iPad than to its original home on the PC. Fair warning: It's unconventional as card games go, and I actually avoided it while playing *The Witcher 3* because I couldn't wrap my head around it.

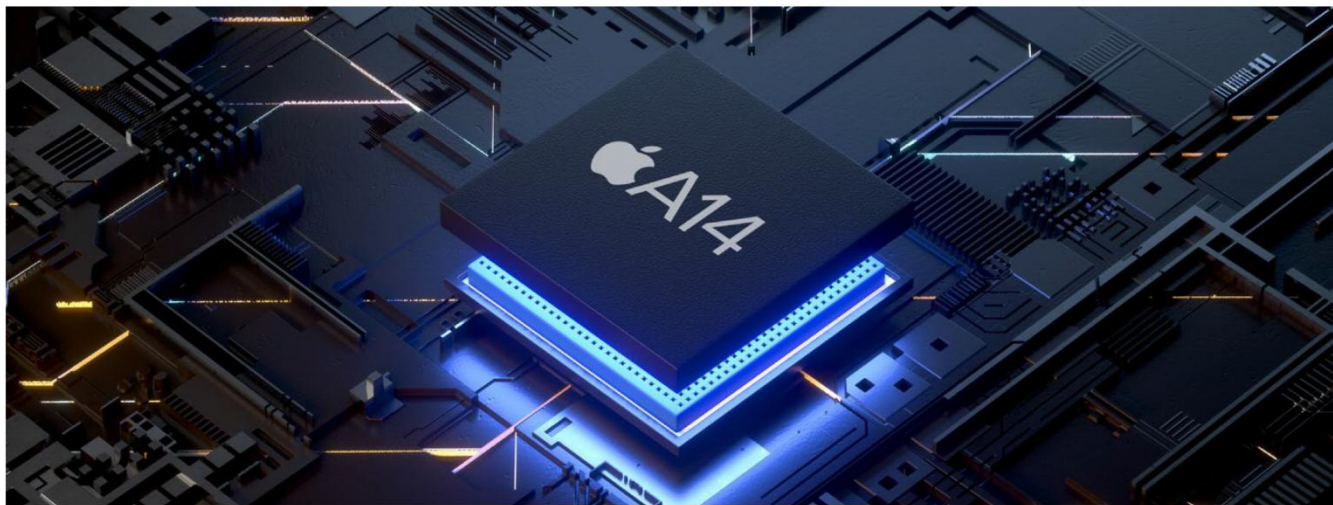
WHAT WE MIGHT EXPECT FROM

APPLE'S A14 PROCESSOR

APPLE MAKES
THE FASTEST
MOBILE CHIPS
IN THE BUSINESS,
AND WE EXPECT
NOTHING LESS
FROM THE A14
THIS FALL.

BY JASON CROSS





We aren't likely to hear anything about Apple's new phone processor until September (go.macworld.com/sp20), when the company unveils the iPhone 12 (go.macworld.com/12rm). But it takes years to design these chips and months to get production ramped up, so the A14 is likely already set in stone and has probably begun test production.

Year after year, Apple's phone chips have held the crown for overall performance, and despite some big promises from the likes of the Qualcomm Snapdragon 865 (go.macworld.com/q865), we expect Apple to hold the crown when the new iPhones are released this year.

One can never tell exactly what features or performance an unannounced A-series processor will deliver, but we can make some informed guesses. Here's what we think we might see from Apple's A14 SoC later this year.

A JUMP TO 5NM MANUFACTURING

For the third year in a row, Apple will benefit from manufacturing process improvements at its manufacturing partner TSMC. The A12 was built on a 7nm process, the A13 was made on an enhanced 7nm process that primarily allowed for faster clock speeds and lower power consumption (when running at the same speeds as chips made with the prior 7nm process).

This year, Apple could make the jump to TSMC's brand-new 5nm process. In fact, it's likely to be the first large-scale consumer chip to ship using it.

This is a big upgrade. The 5nm node is not a half-step by any stretch, but it is the next "full node" after 7nm. It uses extreme ultraviolet (EUV) lithography extensively throughout the process, and TSMC says it delivers 80 percent more logic density and can run either 15 percent

faster at the same power as its 7nm chips, or 30 percent lower power at the same performance level.

Of course, design matters, too. Apple won't necessarily meet these exact figures. But on manufacturing process alone, the A14 would be a significantly faster and more power-efficient chip.

A BIG TRANSISTOR BUDGET

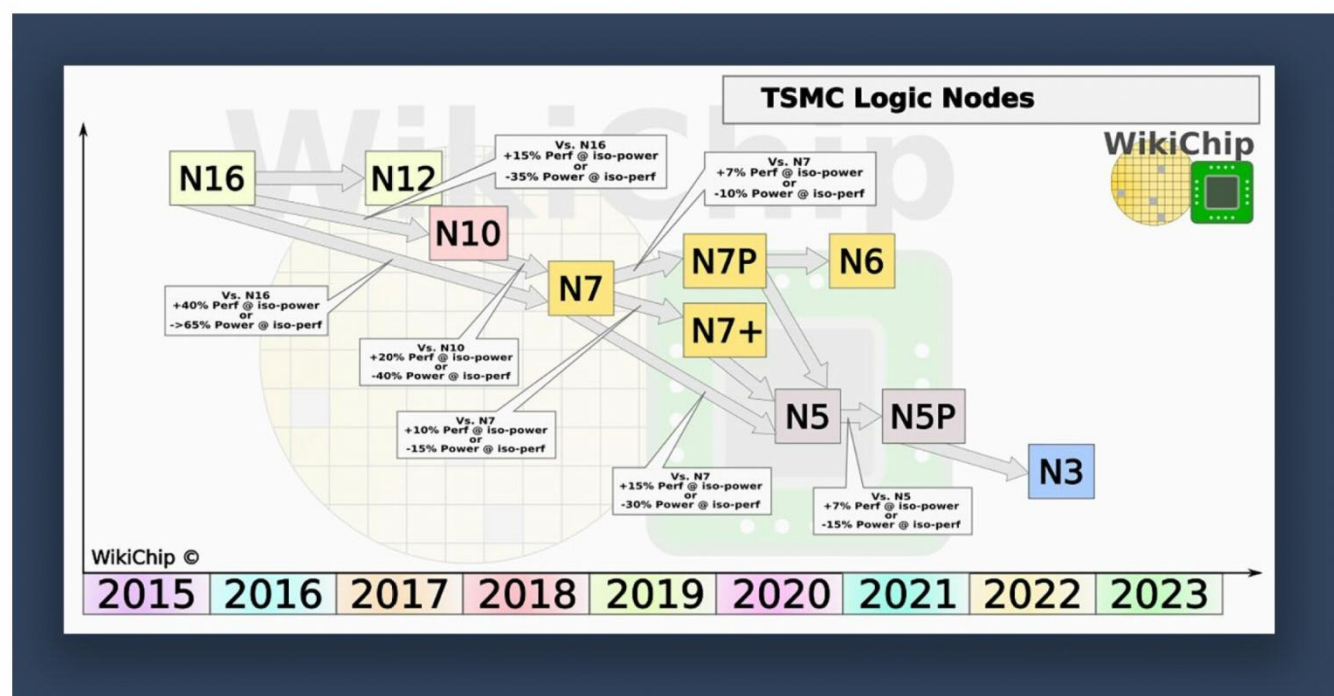
The A13 measures around 98.5mm², which is roughly 20 percent larger than the 83.2mm² A12. That's only slightly smaller than my original prediction last year (go.macworld.com/ap13), but my assumption about transistor budget was way off.

I assumed Apple would use TSMC's N7+ node, which affords increased

transistor density. Instead, Apple opted for the N7P mode, which does not. As a result, the A13 has about 8.5 billion transistors, rather than the 10 billion I predicted.

For this year, I think Apple is likely to keep the processor around the same overall size. About 100mm² is a good size for a high-performance premium mobile processor with a lot of stacked components.

If we take TSMC at its word about the improved transistor density of the 5nm process, we're looking at an incredible 15 billion transistors. That's more than all but the largest high-end desktop and server CPUs and GPUs. It's huge. It's so big that I wouldn't be entirely surprised if Apple shrunk the total chip area a bit to around 85mm² and around 12.5 billion transistors.



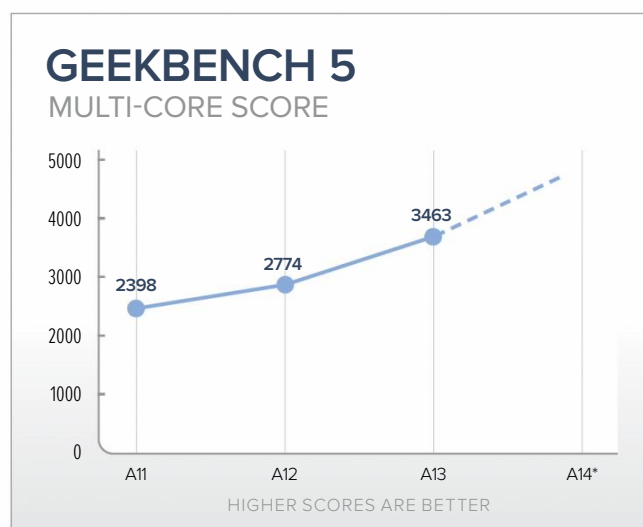
WikiChip has an excellent summary of the various process technologies from TSMC at go.macworld.com/wchp.

Transistor count by itself is a poor means of estimating processor performance, but it does tell us how much “room” Apple has to work with. It means more cores, or bigger cores, or more cache, or any combination of these improvements.

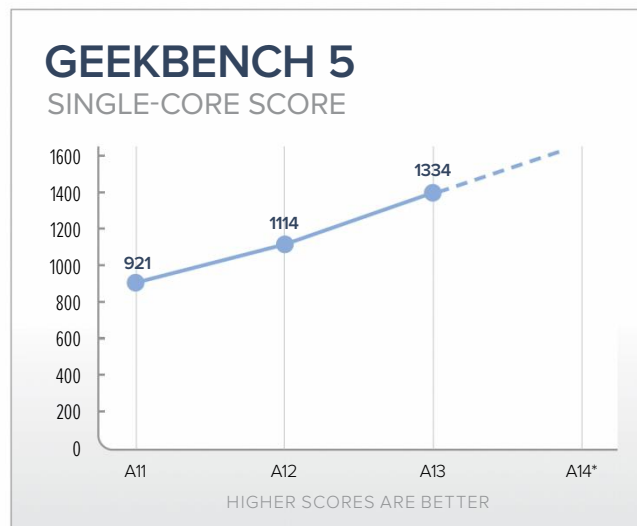
CPU PERFORMANCE

For the A13, Apple didn't do a lot to change its fundamental CPU architecture. It's still the same number of cores, and the cores aren't dramatically different. Instead, the company relied on the faster clock speeds afforded by the enhanced 7nm process to improve performance.

In single-threaded performance, the A13 delivers a 20 percent improvement on the A12 (in Geekbench 5). It's a bit more than I predicted it would be last year, and the fastest mobile CPU around.



Multi-threaded performance would go up if Apple didn't add more cores, but that's a conservative prediction. I expect more.



Single-threaded performance is expected to improve, but not as much as multi-threaded performance.

Simply following the trend line (which is quite consistent for recent A-series processors) we could expect the A14 to score close to 1,600. The 5nm process alone should be about 8 percent faster than the enhanced 7nm process Apple uses in the A13, which would give us a score in the mid-1,400s. My guess is that Apple will likely wind up in the 1,500-1,600 range, due to both higher peak clock speeds and some architectural improvements made possible by the much higher transistor budget.

Multi-core performance is harder to predict. The A12 and A13 had four small high-efficiency cores and two big high-performance cores. Apple already very efficiently schedules workloads to take advantage of all cores as much as possible, so it's unlikely that we'll see a big

improvement from better scheduling. But with the big jump in transistor density from 5nm, Apple might add a third big core, or significantly boost performance of the high-efficiency cores, which would really boost multi-threaded performance.

The trend line gives us a score around 4,500, but I think a combination of architectural changes and clock speed will give us a lot more. I wouldn't be surprised if the Geekbench 5 multi-core score creeps up to 5,000 or so.

For what it's worth, the fastest Android phones score around 3,000 on this test, and a score of 5,000 would be similar to 6-core mainstream desktop CPUs or high-end laptop CPUs. It's 15-inch MacBook Pro territory.

GRAPHICS PERFORMANCE

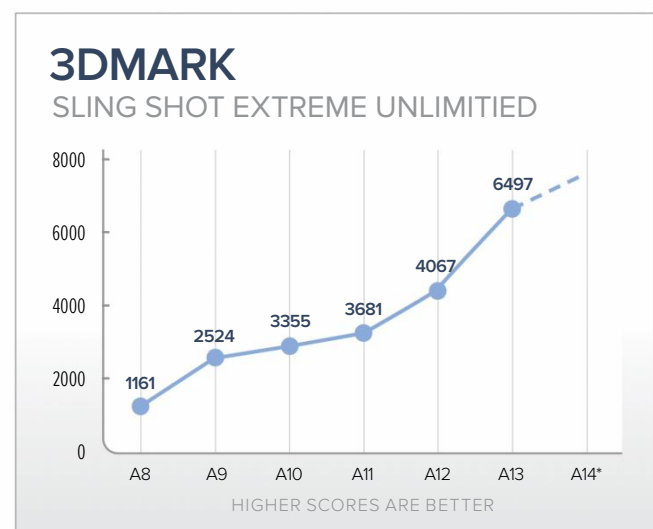
The iPhone has been, from the very debut of the App Store, a gaming device. But gaming has never been more important to Apple than it is now with its Apple Arcade service. Graphics performance makes games shine, true, but the GPU is also used for computational functions in image processing, machine learning, and plenty of other tasks.

In other words, GPU performance is critical and Apple is not going to tread water with the A14.

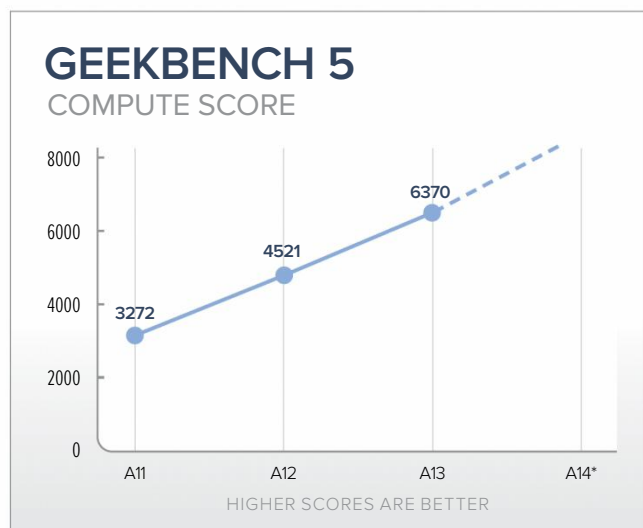
If we take a look at the 3DMark Sling Shot Extreme Unlimited test, performance

took a dramatic leap in the A13—far beyond what recent trends would have predicted. I expected a score around 4,800, and Apple delivered well over 6,000! It was enough to beat the latest Android phones, but newer models have since pushed a little higher, and top-tier Android phones released this year will go much further.

I expect Apple to expend significant transistor budget making the GPU more powerful. Along with more memory bandwidth, we can probably expect GPU performance well beyond the trend line's prediction of the low 7,000 range in this test. Barring some new performance bottleneck, I think a score over 9,500 is certainly possible. In other words, I think we can expect a 50 percent improvement in graphics performance for the kind of high-end graphics used in games.



Graphics performance took a big leap with the A13. I think the A14 will deliver a similar leap.



GPU Compute is increasingly important. I wouldn't be surprised if it's 50 percent faster in the A14.

When it comes to using the GPU for computation, I think we can expect a similar speed bump. A bigger GPU plus faster clock speeds and more memory bandwidth could give us 50 percent or more—making the Geekbench 5 compute score jump to the 9,500 to 10,000 range.

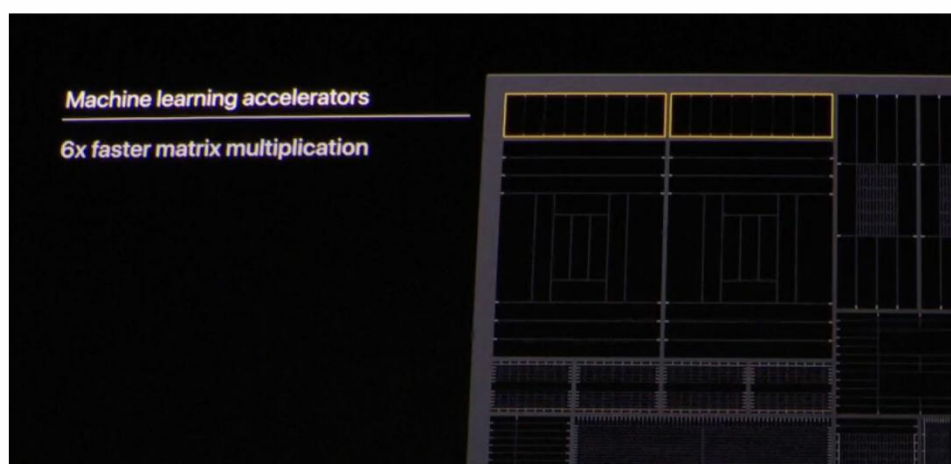
IMAGE PROCESSING AND NEURAL ENGINE

The A-series processors do a lot more than just house CPU and GPU cores. They contain specialized hardware for specific tasks like image processing (to

turn data from the cameras into stellar photos and video), video encoding and decoding, and a Neural Engine that powers machine learning tasks that are used throughout iOS.

In the A13, Apple added specialized hardware to handle matrix multiplications and an updated “machine learning controller” to balance those compute tasks among the various parts of the processor—CPU, GPU, and Neural Engine. It did not, as I predicted, add cores to the Neural Engine, but since all parts of the CPU, GPU, and NE run at higher clock speeds, performance improved.

This is an area Apple cares deeply about, and is a necessary part of improving photo and video quality, augmented reality, and many of Siri's functions throughout the operating system. With the higher transistor budget afforded by the 5nm manufacturing process, I think



Apple added new matrix math hardware to the CPU in the A13. The A14 may not have a similar “new” feature but more Neural Engine cores seems like a reasonable expectation.

Apple will add Neural Engine cores this time, and may make other architectural improvements as well.

It wouldn't surprise me to see Apple claim that machine learning tasks are at least twice as fast as on the A13.

Apple doesn't really provide performance details for its imaging processing engine, but the push for better camera quality is never-ending, so it'll probably be better, too.

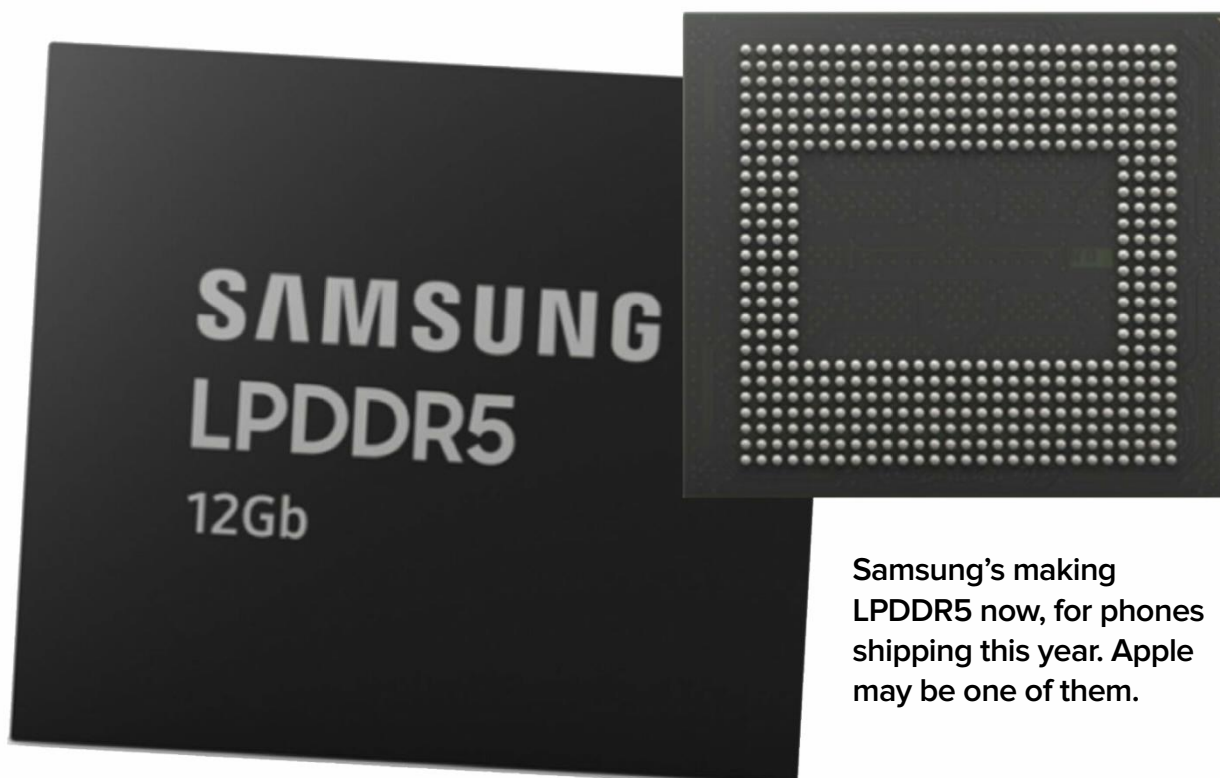
I'll go out on a limb and say that I think the A14 will be Apple's first chip with hardware decoding of the AV1 video codec (go.macworld.com/av1v), and might even have hardware encoding support. If so, expect Apple to spend some time on stage talking about how videos shot with the iPhone 12 are smaller and higher quality than ever before.

FASTER LPDDR5 RAM

Apple has been using LPDDR4 memory in its iPhone SoCs for years. It first made the jump from LPDDR3 to LPDDR4 in the A9 in 2015, and then to LPDDR4x (a faster and slightly more power-efficient version) in the A11 in 2017. The A12 and A13 used the same RAM, as far as the teardowns can determine.

But we're on the cusp of the next generation of low-power mobile memory. The spec for LPDDR5 was finalized last year, and already Samsung has begun production, with SK-Hynix (another popular RAM supplier for Apple) to begin soon. High-end Android phones will first ship with the RAM in the first half of this year, making it likely that the iPhone (at least the high-end models) will follow suit at the end of the year.

What's the benefit? Well, the current



Samsung's making LPDDR5 now, for phones shipping this year. Apple may be one of them.

LPDDR5 being produced by Samsung is about 30 percent faster than the LPDDR4x used in the iPhone 11, and at least 30 percent more power efficient. Memory bandwidth is a critical bottleneck for lots of tasks, but especially mobile graphics performance and image processing.

Of note: Samsung is currently only mass-producing 12-gigabit LPDDR5 chips. If Apple uses it as a supplier, it would likely mean an upgrade to 6GB of RAM in the iPhone 12. You can't neatly produce 4GB of RAM using 12 gigabit chips, but you can easily use four chips to produce a 6GB (48 gigabit) package.

5G SUPPORT VIA SNAPDRAGON X55 MODEM

While wireless modems and radios are part of the A14 chip itself, it's such a critical part of the iPhone that it's worth dissecting what we might expect.

This year, Apple is widely expected to

include 5G support (go.macworld.com/5gsp) in the new iPhones. It seems likely, in part thanks to the settled lawsuits and licensing agreements between Apple and Qualcomm, that all premium iPhones will have the X55 modem. Lower-end models might even have that modem, but with the 5G radio disabled via software.

This would give iPhones one of the very best cellular modems around, with support for lots of LTE features and global networks as well as the most advanced 5G available at the time. It doesn't necessarily put it ahead of anything on the Android front, though: Android phones with the X55 modem will ship throughout 2020.

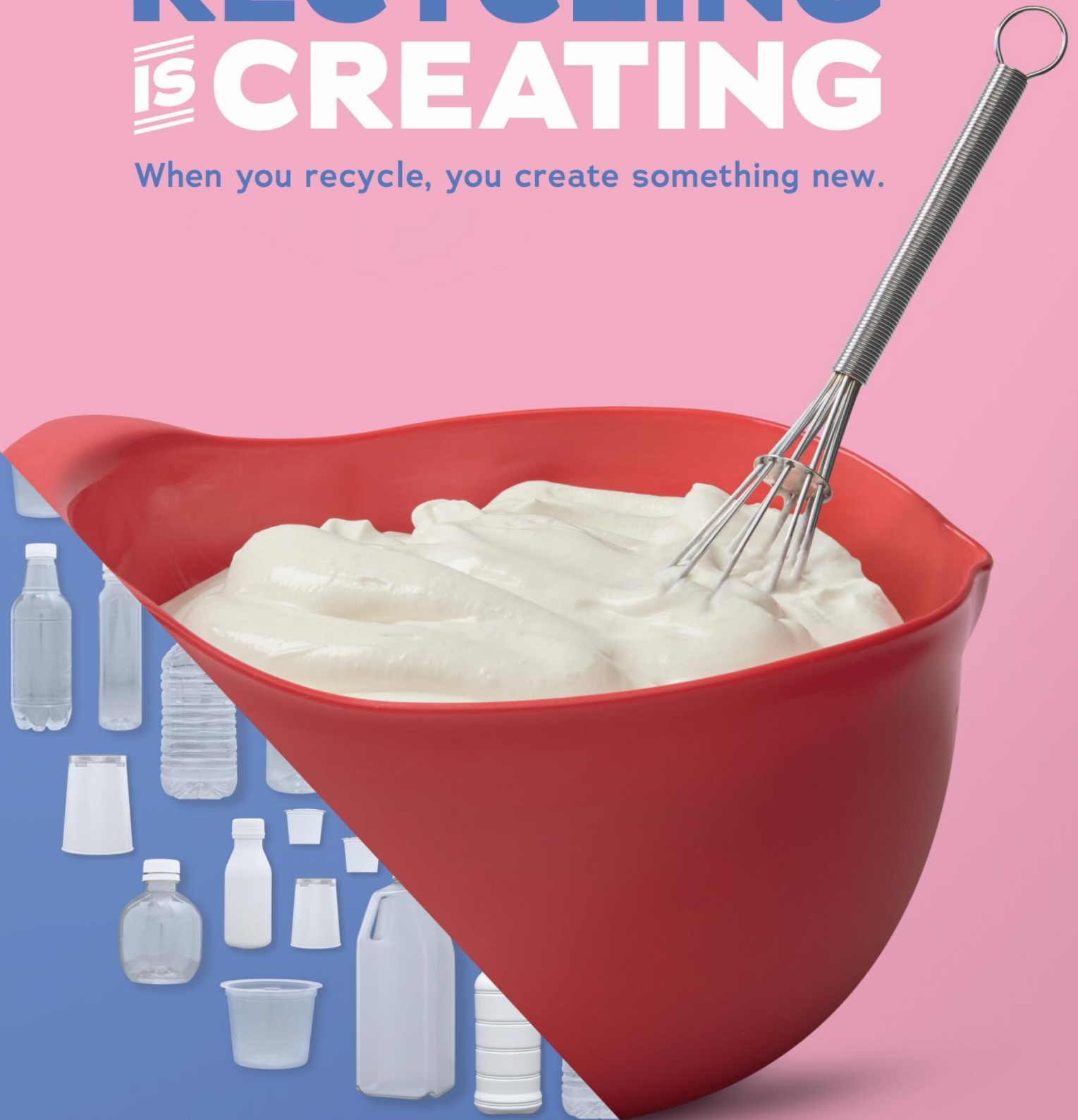
As far as other wireless features go we can expect continued support for Wi-Fi 6, Bluetooth 5, NFC, and ultra-wideband (UWB). The latter was a surprise addition for the iPhone 11, but I don't expect another wireless surprise is in the works for the iPhone 12. ■

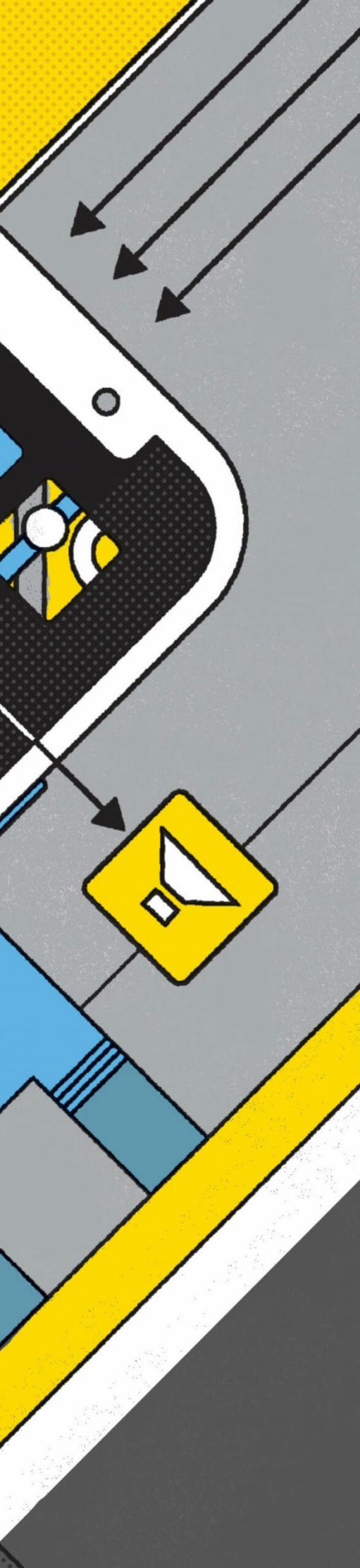


Apple will almost certainly use Qualcomm's Snapdragon X55 modem in the iPhone 12.

RECYCLING **IS** CREATING

When you recycle, you create something new.





iOS 13 DELIVERED ON
SEVERAL OF OUR
TOP REQUESTS, BUT
THERE'S STILL
PLENTY OF ROOM
FOR IMPROVEMENT.

iOS 14 WISH LIST

10 WAYS APPLE
CAN TAKE THE
iPhone TO THE
NEXT LEVEL

BY JASON CROSS | ILLUSTRATION BY SHAW NIELSEN



Last year, after the debut of iOS 12, I put together a list of features I hoped to see in iOS 13 ([go. \[macworld.com/13ws\]\(https://go.macworld.com/13ws\)](https://go.macworld.com/13ws)). And Apple listened!

Okay, it's not likely that anybody at Apple read my article and altered a single plan based on it, but the company did give several of the things I've been asking for.

There's still a lot left on the table, though. So many more features and significant changes that seem easy to identify (if not easy to develop) that would make iPhones more useful.

I want about a million things for iOS 14 (multiple timers, for example) but many are small tweaks not worth getting worked up about. Here's a list of the ten biggest and most far-reaching features I hope to see in iOS 14.

Note: Now that iOS and iPadOS have technically split, this list doesn't include iPad-specific features—that's another list! Also, there are features I'd love to see that require new iPhone hardware, which aren't included here. These are features I'd like to see for all iPhone models that could run iOS 14.

1. PRIORITIZE RELIABILITY

After a surprisingly trouble-free iOS 12 release, iOS 13 has been full of problems. The release schedule was staggered and disjointed, and Apple's still squashing significant bugs.

There are reports ([go. \[macworld.com/dvpr\]\(https://go.macworld.com/dvpr\)](https://go.macworld.com/dvpr)) that Apple has once again altered its development process to improve reliability, and it can't come soon enough. The buzzwords for iOS 14 should be "stability"

and “performance.”

More than any new feature, making sure that the first release of iOS 14 is fast, fluid, and trouble-free for the hundreds of millions of devices upon which it will run should be priority number one.

And don’t promise features at WWDC only to have them come weeks or months after release (and in a shoddy state, at that). It’s probably too much to expect all the major iOS features to release at once, but be honest about the staggered release. Let us know which features are coming in a future iOS point-release update so we can manage expectations (and so Apple’s developers aren’t rushing to meet an unrealistic ship date).

2. A SMARTER SIRI (AGAIN)

Apple improves Siri every year. In iOS 13, it gave Siri a smoother and more natural-sounding voice. It also added support for music, podcast, and other audio apps to the SiriKit framework. Both are nice (especially that second one) but not nearly what we have in mind when we wish every year, fingers-crossed, for a dramatically upgraded Siri.

Last year, I wrote this about Siri in describing my hopes for iOS 13:

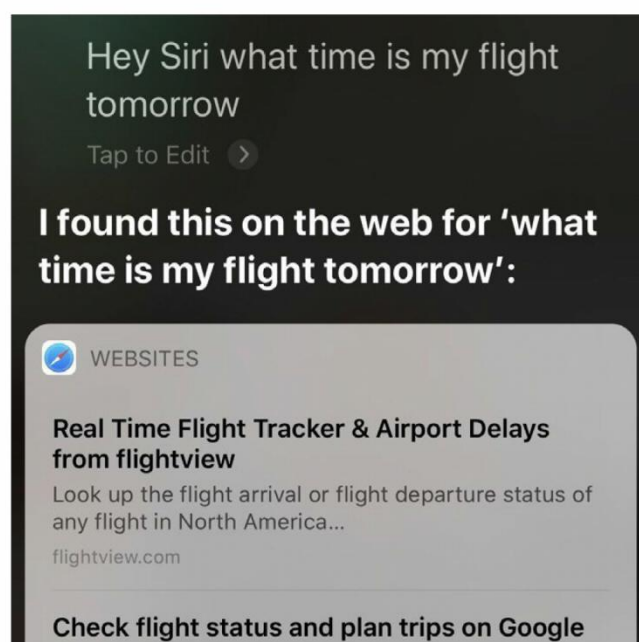
Siri still lags way behind Google Assistant and Alexa in its ability to answer general questions and

gracefully perform actions with third-party hardware and services. There are so many obvious shortfalls; you can do a Spotlight search for a flight number and get detailed flight info, but ask Siri and you just get a web search.

Siri needs better voice recognition, faster response times, and more “fun” activities like trivia and games. It needs to give more accurate answers to a much broader set of questions.

All of that is still true. Siri still needs more domains for things like Shopping, and both Siri and HomeKit need better support for more smart home gadgets and types (why can’t I arm my alarm with Siri?).

More than anything else, I want Apple



Just another example from the /r/SiriFails subreddit, whose very existence should embarrass Apple daily.

execs to get on stage at WWDC with a giant Siri 2.0 logo behind them and talk about the “all new Siri” that takes everything the company has learned over the last nine years and built a whole new digital assistant for the next decade. One that is smarter, faster, works offline (it’s shocking how often Siri does not!), better understands both your words and your

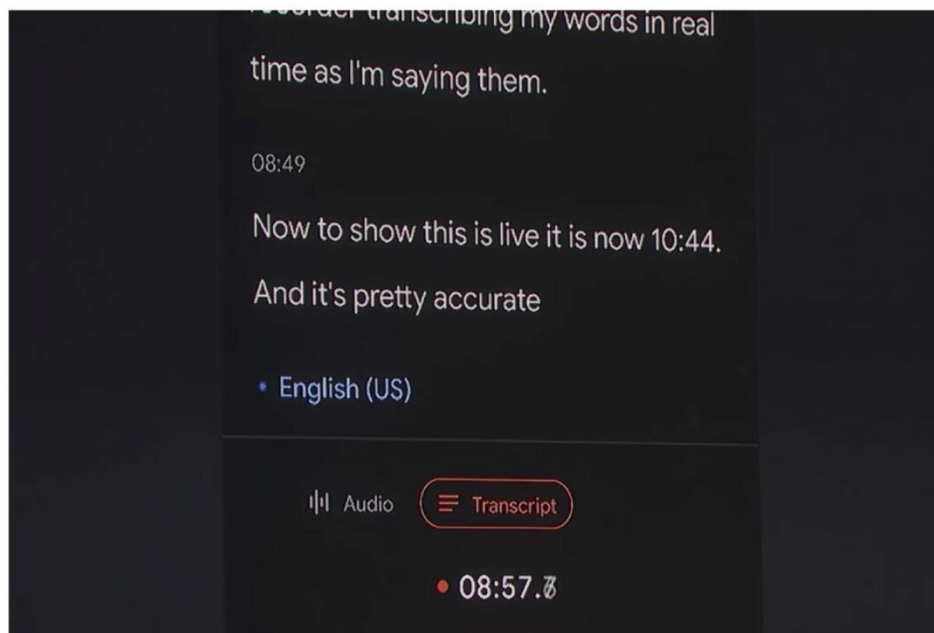
intent, and is more proactive about doing things on your behalf if you want it to.

I would also like Apple to make users choose a Male or Female Siri voice during phone setup (or when they first upgrade to iOS 14), without defaulting to the female voice.

3. IMPROVED DICTATION

When Google demonstrated its new Recorder app on the Pixel 4, we couldn’t help but feel jealous. The phone was doing exceptionally accurate text-to-speech transcription, live, and entirely on-device. It was even smart enough to put in periods between sentences.

Of course, there’s no magic hardware in the Pixel 4 to enable this feat. It’s just



Google’s live transcription is impressive, but there’s no reason Apple couldn’t do this on most modern iPhones.

software, and it’s even coming to older Pixel phones (go.macworld.com/olpx).

Apple’s dictation feature (tap the microphone on the keyboard) is a handy way to input text almost anywhere, but it’s slow and inaccurate enough that most people don’t bother. To Apple’s credit, it does work without a network connection. But it can’t keep up with a normal talking pace, and it doesn’t do a very good job of making a sentence (with proper punctuation) out of your string of words.

Apple should step up its game here. Make the dictation dramatically faster and more accurate (especially with accents), and use some intelligence to improve word choices. If I say, “you have a funny accent” and the dictation thinks I said, “you

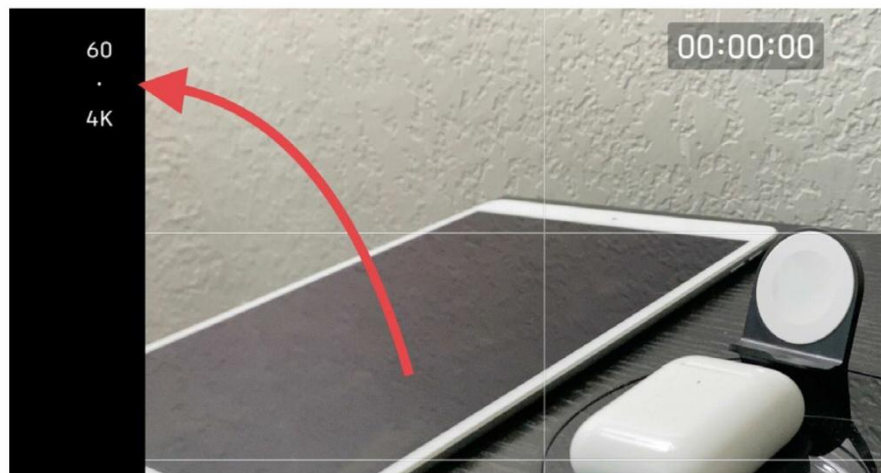
have a runny axe meant,” it should recognize that its interpretation produces a nonsense phrase and that other similar-sounding words produce a reasonable sentence.

The beefed-up speech-to-text engine should be used all over iOS, from Siri to voice mail transcriptions (which are awful) to the Voice Memos app.

4. A BETTER CAMERA FOR ALL IPHONES

With the iPhone 11, Apple made a few sensible improvements to the Camera app interface. The smooth-scrolling zoom wheel, for example, is a delightful experience that makes controlling zoom level easier than pinch-to-zoom.

Then, of course, there’s Night Mode, where several seconds of exposure are combined to produce stunning shots in dark environments.



iOS 13.2 added video frame rate and resolution adjustment in the Camera app. But why only for iPhone 11?

And in iOS 13.2, Apple added the ability to change video resolution and frame rate right in the Camera app instead of jumping into Settings—but only on the iPhone 11.

There’s really no need for any of these improvements to be restricted to Apple’s latest phone. Night Mode may not be possible on the oldest iPhone hardware, but it’s certainly something an iPhone XS and XR can pull off. And the interface changes have no business being restricted to just the new phones.

I’d love to see iOS 14 bring these and other camera improvements to older phones. Unify the interface and restrict features only to what is technically impossible on older hardware. And while I wouldn’t want Apple to make the Camera app interface too busy, I think a “Pro” mode that lets users adjust color temperature, shutter speed, and ISO, would be welcome. Put it right in line with

the Pano, Time-lapse, Portrait, and other modes, and give photography nerds as much manual control as possible.

5. A NEW HOME SCREEN

The iPhone’s home screen got a bit of an overhaul back in iOS 7, but hasn’t really changed a lot since

then. We can now long-press on app icons to get context menus, but the home screen is still a big grid of icons that you can't even freely move around, only reorder.

The grid of icons probably won't go away, and that's not necessarily a bad thing. But there are plenty of ways to change things without completely upending the paradigm.

I'd love Apple to introduce a dynamic icon API so that, for example, a weather app could change its icon to match the forecast, or an email icon could show how many unread messages you have. At the very least, Apple should let developers define separate app icons for Light and

Dark mode.

If you drag down on the home screen, you enter Spotlight search. Before you begin searching, Siri suggests a row of app icons based on your common use at the current time of day and location. Maybe this should (optionally) reside on our home screens, now that iPhones are so much taller?

And even if Apple is not going to let us hide apps in an app drawer à la Android, it can at least let us position app icons and folders wherever we want. Currently, you can reorder them, but they always fill the screen from the upper left—there's no way to leave a blank space.

6. NOTIFICATIONS NEED AN OVERHAUL

Notifications have improved in iOS, but they're still a bit of a mess. When you dig into the Settings app to change how apps notify you, you're bombarded with options. Where do you get alerts? What kind of banner style? Do you want sounds? Previews? How about the little red dot on app icons?

The average user doesn't ever go here, and suffers default settings for all their apps. Those who do change things have too many options to choose from, and they're the wrong kind of options. I'd like to see Apple reduce the choices for the many ways in which notifications are



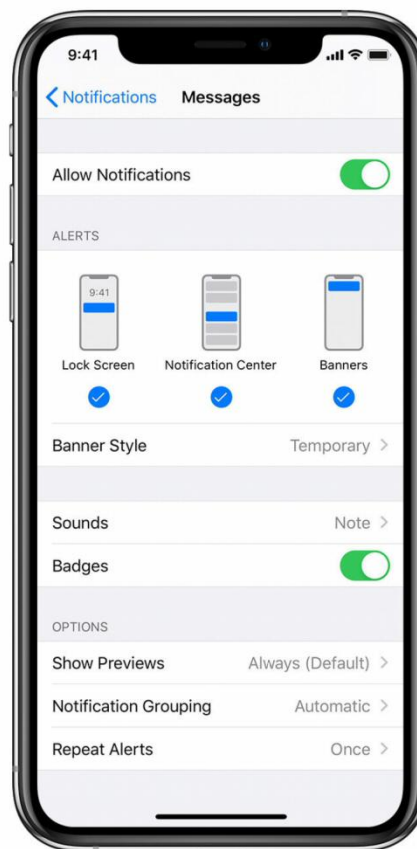
I'd love Apple to introduce a dynamic icon API so that, for example, a weather app could change its icon to match the forecast.

displayed, and instead work on a systemic means of separating notifications into two groups: critical alerts that require immediate action and casual stuff that can wait.

What the notification system on the iPhone really needs is to recognize that notifications are regularly abused by developers and are a major reason why we all use our phones too much. Apple should take the same systemic approach to reducing notification impact in iOS 14 as it did with location tracking in iOS 13. Make notifications silent and non-interrupting by default (no banners, they just appear in the notification shade). Let apps define specific “high priority” notifications, and have to request that users enable them, while telling users exactly what will produce them.

For example, Twitter’s notifications for likes, retweets, and follows would silently deliver to Notification Center, but the app would prompt you to allow direct messages to be “high priority” where they would produce alerts and sounds. The Ring app would have silent notifications for detected motion, but could request allowing high priority notifications for when your doorbell is rung or your alarm triggered.

And let’s get rid of notification badges entirely. The little red dot on app icons is a useless vestige of an old mobile world. It is



All these options, which most users never touch, and still no way to differentiate critical notifications from all the rest.

high visual impact but low information density—all it can do is provide a number, which could mean anything depending on the app. Worse, it doesn’t tell you if any actions are needed or what they should be. Their existence owes more to inertia than to actually improving our phone experience.

7. ALWAYS-ON DISPLAY WITH COMPLICATIONS

The Apple Watch has an always-on display. OLED Android phones have had always-on displays for years. There’s no reason why the OLED iPhone models can’t have them as well.



An always-on display and complications: If they're good enough for Android, and good enough for Apple Watch, they're good enough for iPhone.

The always-on “sleep” screen for the iPhone should be similar to the lock screen, with a few adjustments. It should display time, date, and battery life on a black background (to save battery life), but no notifications. Perhaps new notifications could briefly appear and go away, but we need fewer reasons to pick up our phone, not more.

To that end, I'd love to see Apple take the idea of complications from the Apple Watch and add them to the lock screen and always-on sleep screen. Perhaps four of them, flanking the clock, with standardized formats. Developers could produce complications for their apps and what they would display, and users could

choose which four they want to see.

This would be a great way to get simple information without picking up our phones and diving into apps. Some of what we need we could get without even unlocking our phones. It would make the iPhone even more useful, even when at rest, while providing an important feature to promote digital health and wellbeing.

8. CALL RECORDING

I know recording phone calls is a bit of a tricky legal issue, but it's just so useful that I want Apple to at least attempt to tackle it. The disclosure that one needs to make to legally record a phone call varies from country to country and state to state, but it seems that the most stringent requirement is for both parties to be informed that a recording is happening, and that requirement can usually be met by playing a regular audible tone (like a “beep” every 15 seconds).

Ideally, when one enables call recording we would simply hear “call recording enabled” followed by regular unobtrusive beeps, neither of which would actually be captured as part of the recording. Recordings can go into Voice Memos where they would be designated with a phone icon, and could be auto-transcribed (see improved dictation, above).

9. THOROUGHLY INTEGRATE SHAZAM

Apple bought Shazam in 2018 (go.macworld.com/bysh) but hasn't done a whole lot with it besides remove ads. Technically, you're using Shazam technology when you ask Siri to identify a song, but Apple could go a lot further.

First, build Shazam right into Apple Music. Make an easy-to-hit “identify this song” button both in the iPhone/iPad and Apple Watch interface. Keep a custom default playlist for identified songs that makes a note of the date, time, and location.

And steal a page from Google's Pixel phones and enable on-device, constant song identification. It would be an opt-in option, of course, but when enabled would show a small bar with the currently playing song on the lock screen and notification shade. Tap it to hop directly to that song in Apple Music.

10. LET USERS CHANGE APP DEFAULTS

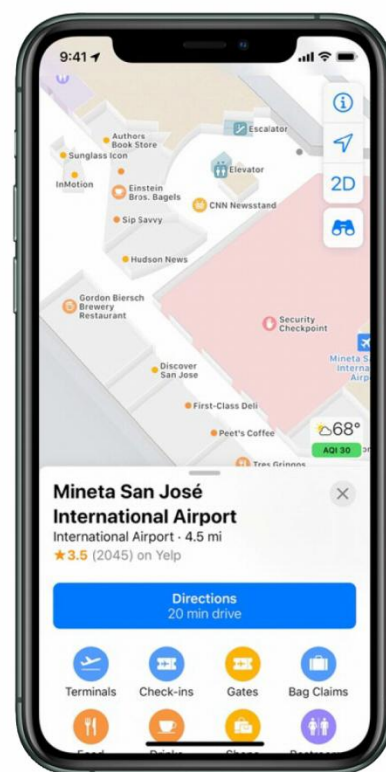
It's beyond time to allow users to choose their default apps for certain actions. When I tap on an address, I should be able to hop right into Google Maps or Waze if I want to, rather than Apple Maps. Links should be able to open in the browser of my choice, not just Safari (they all have to use Safari's page rendering, anyway!).

You can do this on a Mac (go.macworld.com/oamc)—what is Apple afraid of? Apple

already has the advantage of its apps being pre-installed and the default choice, but allowing users to go into settings and change the default apps for certain types of actions would go a long way to satisfying power users (and stemming cries that Apple is an abusive monopoly).

In iOS 14, Apple could start small, with music, podcasts, and maps, and grow support for default apps from there. And of course, these defaults would extend to Siri, so if I change my default music app to Spotify, asking Siri to simply play a given song would open it in Spotify, without having to designate that particular service (go.macworld.com/ptsc). ■

When I tap on an address, I'd love to be able to go straight to Google Maps, rather than Apple Maps (as here).



MY SHELTER PETS ARE MY BEST FRIENDS

#AdoptPureLove



OLIVIA MUNN WITH FRANKIE AND CHANCE: ADOPTED 2016 AND 2014.
They're a little bit of a lot of things, but they're all pure love.



THESHELTERPETPROJECT.ORG



How to use iCloud aliases to send and receive email

You can have up to three aliases that connect to your iCloud account.

BY GLENN FLEISHMAN

Sometimes it's useful to have an email address that's not your primary one. You might want to sign up with a service or use it to subscribe to an email list, and not trust that it won't be reused and deluged with unwanted mail you can't unsubscribe from.

Apple lets you set up to three additional email-only identities with iCloud.com, called

aliases. That lets you preserve your primary iCloud.com address for whatever purpose you like while having these three alternative identities that you can use to filter email and even delete if you want to abandon the address altogether—not an option with your primary iCloud.com address, which is often the account name for your Apple ID.

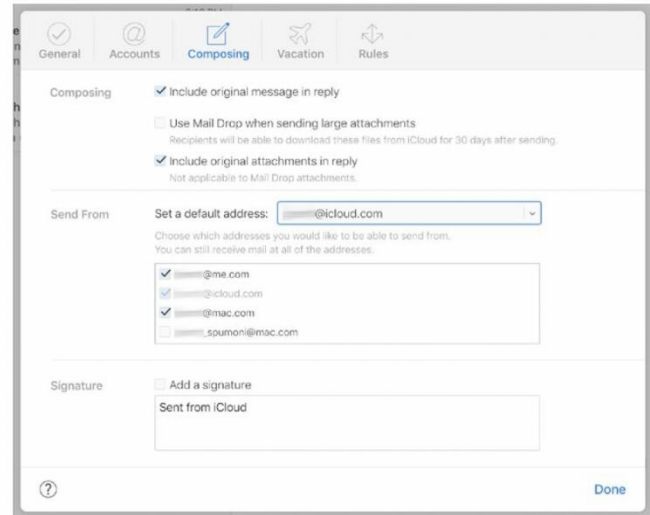
I wrote in April 2019 about setting up aliases (go.macworld.com/sual), which is handled only at iCloud.com. (In brief: Log in, click the Mail icon, click the gear icon, select Preferences, click Accounts, and click Add An Alias.)

The Accounts tab lets you manage aliases by selecting it in the list at left. You can opt to disable an alias, which keeps it associated with your account, but it stops receiving email and cannot be used as a “from” address to send messages. You can also delete it, which frees up a slot if you had three aliases allotted. (You may be unable to reclaim it later if you delete it, so take care in making that decision.)

Incoming email is tagged in the From line with the alias, which lets you use filtering in any email program or rules at iCloud.com or in email apps to decide what happens to a message based on the alias to which it’s addressed. (I offer instructions on creating such a filter in this 2019 column [go.macworld.com/rtid].)

If you want to send a message from an iCloud.com alias, you may have to enable it wherever you want to use it—iCloud.com syncs to Mail, but Mail can’t choose which addresses may be used for sending. iOS and iPadOS don’t appear to sync these changes with iCloud.com or macOS. Here’s where to find the settings:

➤ At iCloud.com, in mail preferences, click the Composing tab and then check

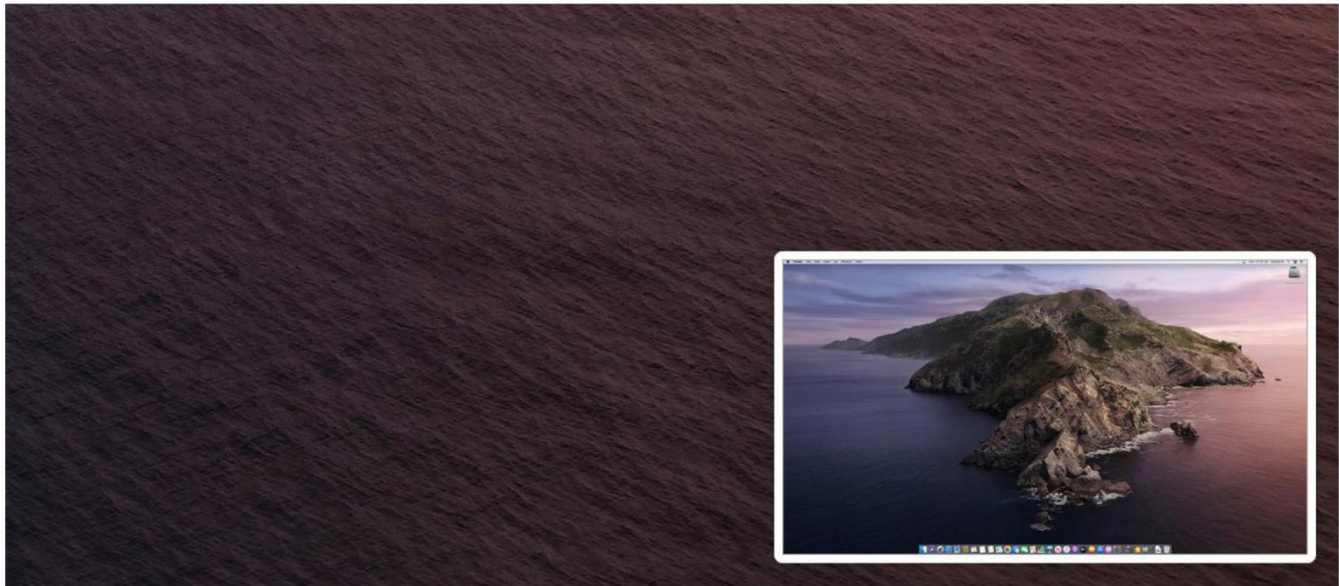


iCloud.com aliases are a powerful tool for filtering mail and creating effectively disposable addresses.

the box next to any address you want to enable sending from. You can also choose which is the default sending address for iCloud.com. Click Done.

➤ In macOS, launch Mail and choose Mail → Preferences → Accounts and then click the iCloud entry. From the Email Address list, you can select your default Send From address, but select Edit Email Addresses and iCloud is opened to the settings in the previous bullet point.

➤ In iOS and iPadOS, go to Settings → Passwords & Accounts → your iCloud account → iCloud → Mail, which is found at the very bottom. Turn on and off individual addresses in the Allow Sending From list. You can pick the default address by tapping the address next to the Email field, even though it’s grayed out and looks like it can’t be selected from. ■



Hate the screenshot floater in macOS? Here's how to get rid of it.

It's a simple option, but you have to invoke a screen capture to find it.

BY GLENN FLEISHMAN

When you make a screen capture in macOS in Mojave or Catalina, a tiny thumbnail appears in the bottom right corner of the screen for a few seconds. Click it, and a small editing suite appears that lets you modify what you captured or delete the image or images before they're saved. (We have a complete guide to using this markup tool [go.macworld.com/mktl].)

If you don't want that thumbnail, however, you have to know exactly where to change the setting. It's not found in any

System Preferences pane, and Mojave did away with Grab, the former standalone screen-capture utility built into macOS.

Instead, you have to invoke a screen-capture mode to change associated settings. You can either press Command-Shift-5 or launch Applications → Utilities → Screenshot, the not-quite-an-app that replaced Grab.

Click the Options button and deselect Show Floating Thumbnail. That's it! You can also change the default location for saving images and set a delay for screen captures and video captures. ■



How iCloud Drive works with multiple users on a single Mac

Fast user switching keeps users logged in and their activities running even though they're not frontmost, including sync.

BY GLENN FLEISHMAN

Apple introduced fast user switching years ago to allow easier shared use of a single Mac by multiple people. After logging in to an account and switching away from it, all the activities that were underway continue on their merry progress even while another user has

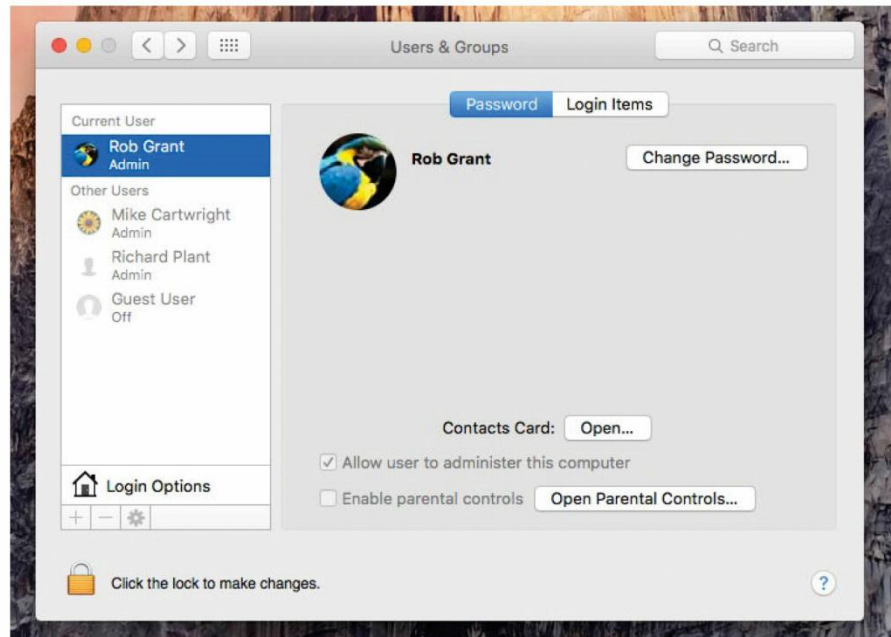
logged in or switched to the foreground.

This includes iCloud Drive, Dropbox, and other sync apps that carry out their operations in the background during a normal session. This can be useful if multiple people rely on synchronized files, preventing them from having to log in and wait for updates to occur.

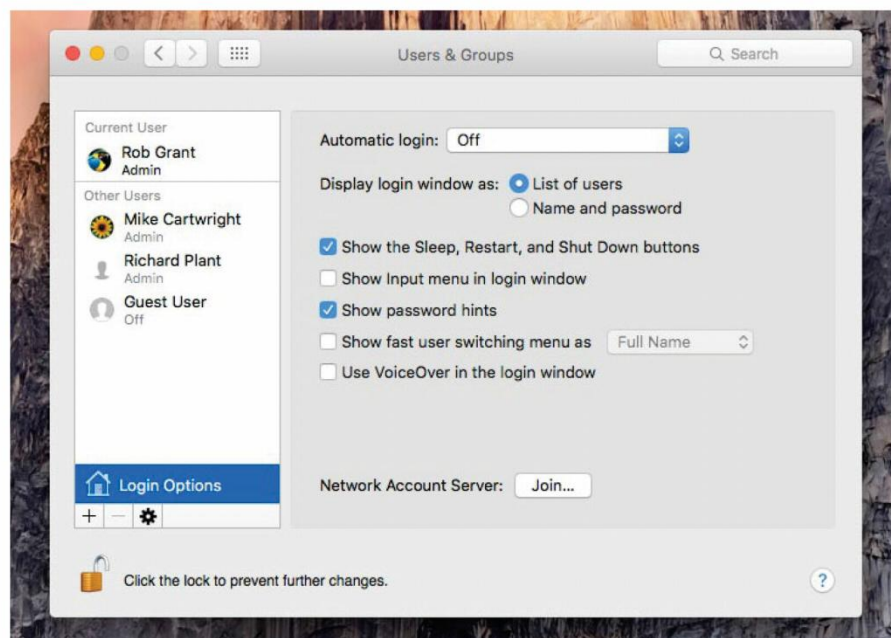
Apple assures its third-party developers in fast user switching documentation that background accounts have no keyboard or mouse input, and apps that check on screen activity will receive a response as if the screen were asleep. That is a sort of guarantee that any app or service that's running will reliably keep running.

If you're wondering if it's working in practice, there's a way you can peep on switched accounts without changing the user on that Mac. If Screen Sharing is enabled for the account and you make a remote connection from another Mac using that switched-away account, you'll be able to create a virtual session and interact with that account even as another user is working in the foreground. This can slow things down—sometimes substantially—for that user, however, as the background account has to generate all

the display information just as if it's working with a monitor. ■



To turn on fast user switching, you'll need to access Users & Groups in System Preferences.



Next, click the lock, type in the Administrator password, and click Login Options. You'll be taken to this screen where you can turn on fast user switching.

MY SHELTER PETS ARE MY BIGGEST FANS

#AdoptPureLove

LOGAN RYAN WITH LEO AND JULIUS: ADOPTED 2014 AND 2018.

They're a little bit of a lot of things, but they're all pure love.



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AirPods vs. AirPods Pro vs. Powerbeats Pro: Which wireless earbuds are best for you?

If you want wireless earbuds with the H1 chip, you have three models to choose from. Which one reigns supreme?

BY JASON CROSS

Apple now makes three sets of wireless earbuds that use its H1 chip: The AirPods (go.macworld.com/arp0), the AirPods Pro (go.macworld.com/apr0), and the Powerbeats Pro (go.macworld.com/pwbt) from its Beats division.

That H1 chip (go.macworld.com/h1cp) means easy pairing to your iPhone, hands-

free Siri, automatic pairing with all your Apple devices through iCloud, and better power management. If you have an iPhone, you probably want earbuds with it.



VIDEO: AIRPODS VS. AIRPODS PRO VS. POWERBEATS PRO

Watch now at go.macworld.com/apd

Which of the three is best?

That answer is, overall, the AirPods Pro. But maybe the better question is: which of the three is the best one for *your* needs?

AIRPODS: THE CHEAPER OPTION FOR CALLS AND PODCASTS

AirPods are now on their second generation, with slightly improved battery life and hands-free Siri support. And now that the AirPods Pro are out there, I don't think there's much reason for anyone to



Apple's second-generation AirPods have improved battery life.

buy the AirPods. The AirPods Pro are so much better and definitely worth the higher price. AirPods don't have tips to create a seal in your ear, and that means lesser sound quality, more outside noise, and they can fall out more easily.

They are the cheapest option, though. With a wired charging case instead of the wireless one (which you really don't need), AirPods cost \$159. And you can occasionally find them on sale.

The best reason to buy regular AirPods is if you just want something you can quickly pop into your ear to answer a phone call, or if you only want to listen to spoken word stuff like podcasts. If that's all you care about, save yourself some money and get the regular AirPods.

AIRPODS PRO: BEST FOR MOST USERS

If music sound quality is a priority, or you spend any time in an environment where you wish you could have a little more quiet, or if you work out often, you're going to want to step up to the AirPods Pro.

Yeah, they're more expensive than AirPods. They only come with a wireless charging case and cost \$250. That's \$90 more than basic AirPods and \$50 more than AirPods with a wireless charging case.

But you get a lot for that extra money.

Shorter stems make them more comfortable and less goofy-looking. Silicone tips create a seal in your ear that improves the sound quality, blocks outside sound, and keeps them in place. It's a lot easier to go running with AirPods Pro than regular AirPods.



The AirPods Pro are clearly the best of the three.

They're so comfortable and stay in place so well that you just put them in and forget about them. Plus, they're sweat resistant.

They're not the best-sounding wireless earbuds you can buy for \$250, but they do sound a lot better than regular AirPods. And they have active noise cancelling. Again, not the best I've heard, but it does a very solid job of diminishing noisy environments. It's a great feature you will absolutely use all the time.

Plus, the new controls where you squeeze the stem instead of tapping are a little more reliable and make you less prone to knocking your own earbuds out.

Despite the higher price, the AirPods Pro are clearly the best of the three and

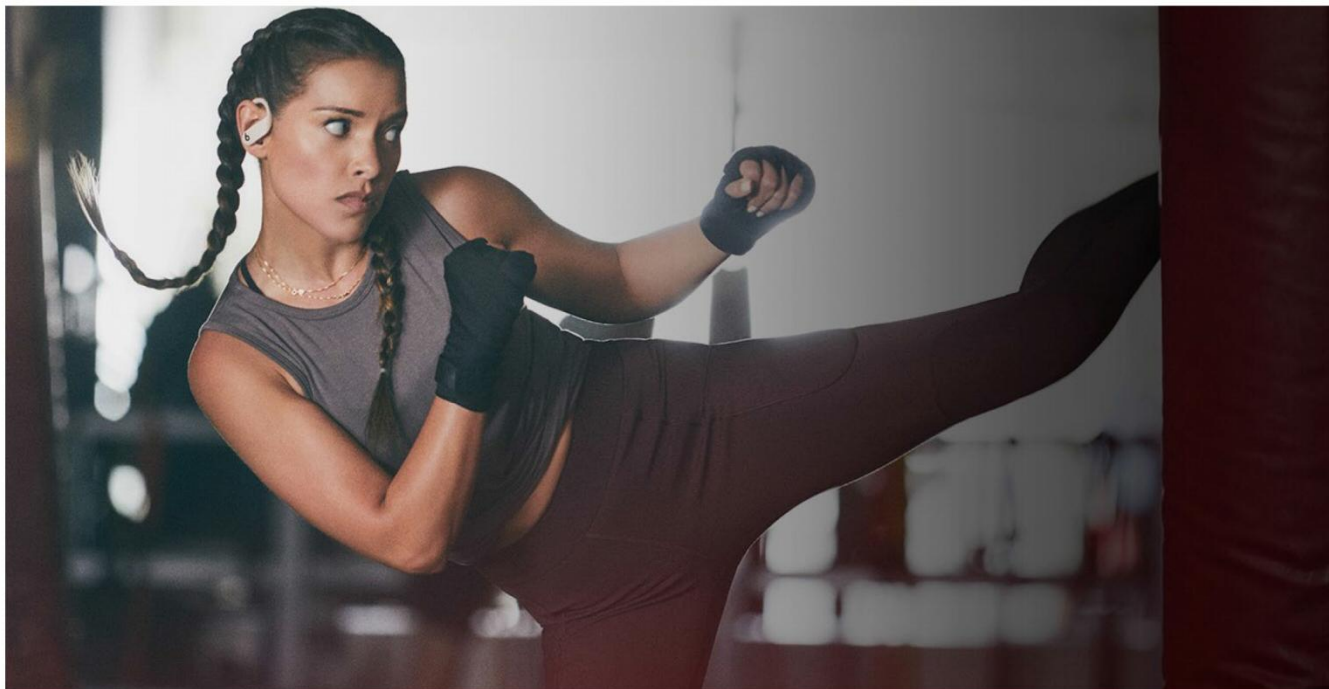
the earbuds that most iPhone users would be happiest with.

POWERBEATS PRO: FOR INTENSE ACTIVITY AND LONG BATTERY LIFE

While most users would be happiest with AirPods Pro, there are still a few reasons why you might want to pick the Powerbeats Pro instead.

They cost \$250, just like the AirPods Pro, but they have no active noise cancelling, and the charging case is too big to fit in your pocket (and doesn't have wireless charging).

But the ear hooks keep these 'buds firmly in place, even with really rough-and-tumble activities. Whatever exercise you're



The Powerbeats Pro offer 9 hours of playback.

doing, the Powerbeats Pro are not going anywhere.

I think they make your music sound just a little bit better than the AirPods Pro, too. I can also appreciate that they have physical buttons instead of fancy touch sensors.

But the real reason to get the Powerbeats Pro is battery life. All three earbuds have enough battery in the charging case to give you a total of 24 hours of playback, but the AirPods and AirPods Pro earbuds only last 4.5 to 5 hours before you need to put them back in the case to charge.

The Powerbeats Pro last twice as long. You can get about 9 hours of playback before you have to put them

back in the case. So the Powerbeats Pro are best for people who do really intense activities and need all-day battery life without a break.

For everyone else, the combination of comfort, ease of use, the tiny wireless charging case, sound quality, and active noise cancelling make the AirPods Pro the clear winner. For most iPhone users, the AirPods Pro are the best wireless earbuds you can get. ■



**AirPods
(2nd-generation)**

PRICE
\$128



AirPods Pro

PRICE
\$234



Powerbeats Pro

PRICE
\$199



Phiaton Curve BT120 NC: Great value noise-cancelling headphones

Decent active noise cancellation and great sound combine with a solid feature set and design to produce a high-value package.

BY THEO NICOLAKIS

If you're in the market for a reasonably priced, wireless in-ear headphone with active noise cancelling, then I strongly recommend Phiaton's Curve BT120 NC.

At \$79.99, these affordably-priced headphones offer basic active noise cancelling (ANC) features, decent battery life, good design, and surprisingly good sound for the price.

A FEATURE-RICH BARGAIN

Phiaton's Curve BT120 NC come in your choice of black or white. The BT120 feature 12mm dynamic drivers and a double-layered carbon film to reduce vibrations.

The headphones are designed with what Phiaton describes as a "Memory Flex" neckband. Some other wireless in-ear monitors come designed with a rigid, plastic neckband. Not here, the Phiaton's neckband is a tensioned plastic that will flex like spaghetti, but flex back to its original U-shaped design. I had no problem stuffing the BT120 into jacket pockets, front pant pockets, or throwing them into a backpack. I never worried about the neckband suffering any damage—and it didn't—at any point.

Each of the neckband's arms has a rounded, rectangular module that give the headphones a bit of balance to stay on around your neck. The one on the left serves as an inline remote for play/pause, volume up, and volume down. Those functions are

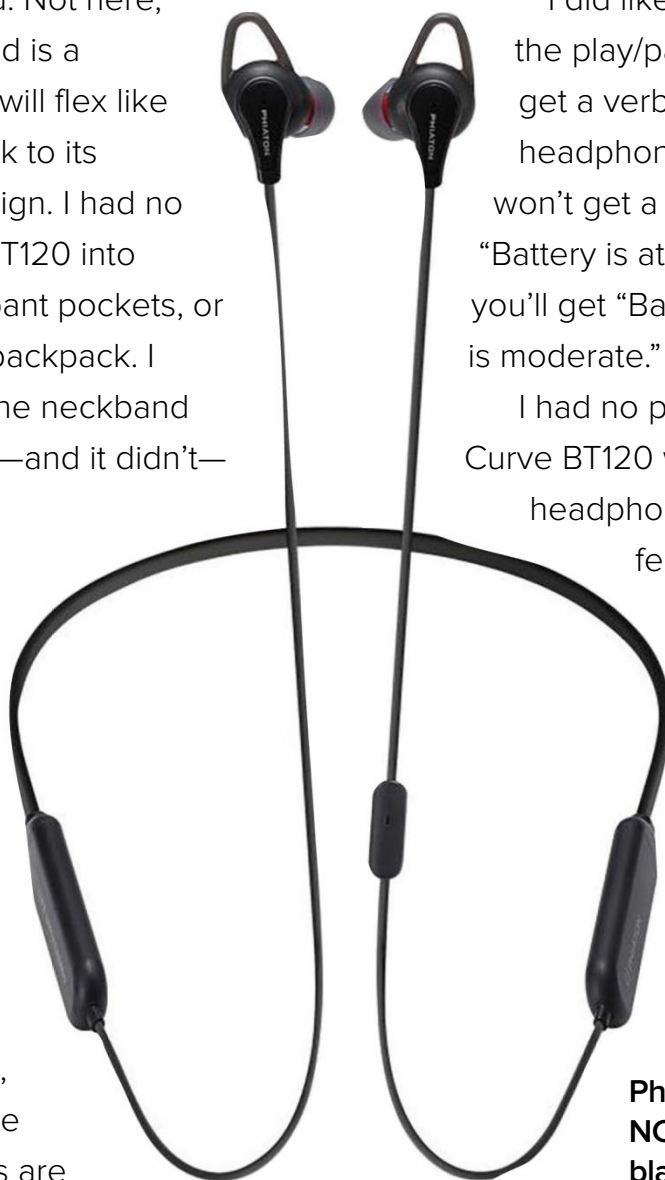
on the flat side of the remote.

I wish that Phiaton had paid more attention to the inline remote's design. The buttons aren't easy to navigate by touch. Only the play/pause button is raised—and ever so slightly at that. I had to feel around to find the volume up or volume down buttons. I'd like to see Phiaton redesign the inline remote to make it friendlier for tactile use.

I did like being able to press the play/pause button twice to get a verbal status on the headphone's battery life. You won't get a detailed answer like "Battery is at 84 percent." Instead you'll get "Battery is full" or "Battery is moderate."

I had no problems using the Curve BT120 with phone calls. The headphones have a calling feature that I loved.

When you have an incoming call, the headphones vibrate. I found this feature incredibly valuable. The



Phiaton Curve BT120 NC headphones come in black or white.

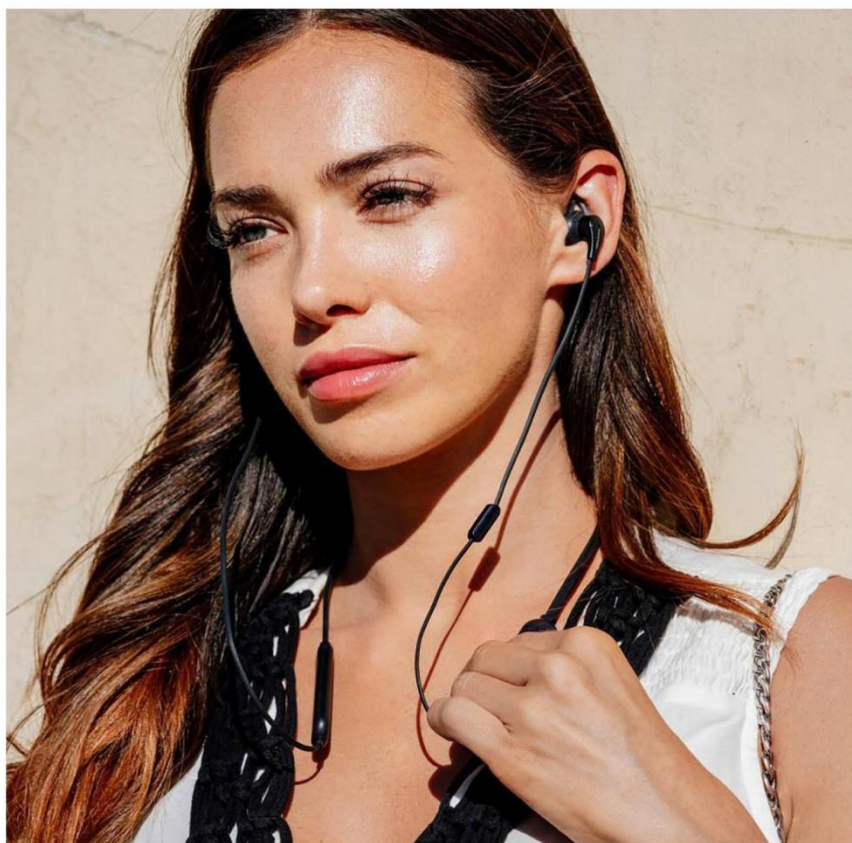
vibration alerted me to incoming calls when I didn't have the headphones in my ears and had put my cell phone on silent.

The Phiaton are rated for up to eight-plus hours of music listening. The quick charge feature makes these headphones perfect for busy road warriors. A five-minute charge will give you an hour of music listening. A full charge in about two hours gives you about eight hours of music play. Using ANC will reduce the maximum play time to about five hours.

In standby mode, the Phiaton will last for 290 hours. If you want to wear them with just ANC enabled, you'll be able to use them for about 12.5 hours—good enough for a transatlantic flight.

The BT120 are rated IPX4 for sweat and splash resistance. You can feel confident wearing them out for intense activities and not worry if you find yourself caught in a light rain.

I wish that the BT120 had magnetic clasps or magnets on the backs of the drivers, so you could clasp them together when you're not wearing them in your ears. Instead Phiaton includes a plastic clip, which I didn't like at all. Like all



The BT120 are rated IPX4 for sweat and splash resistance.

neckband headphones, if you're not careful, the Phiaton will have a tendency to slide to one side or the other and could potentially fall off without you knowing it.

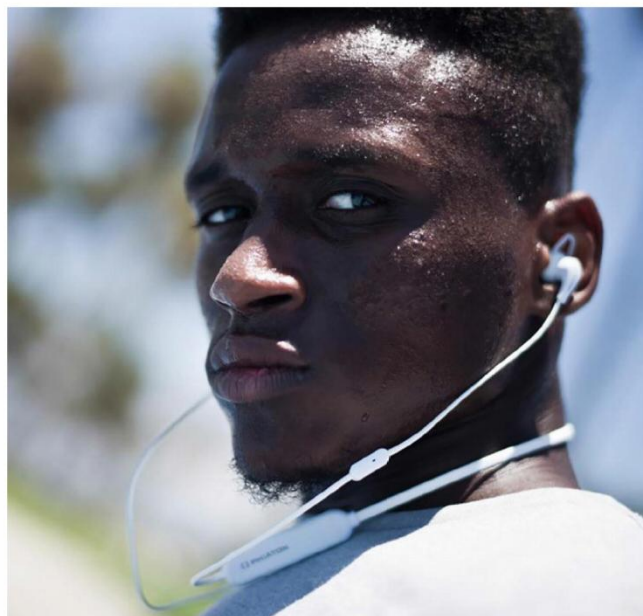
Bluetooth 4.2 with multipoint connection capabilities is onboard. You can connect any Bluetooth-enabled sources simultaneously to the Phiaton and the headphones will auto-switch between the two depending on which source is playing. This is a great feature if you have a smartphone and a laptop or a smartphone and a tablet as you travel and don't want to worry about activating the pairing on each one.

DECENT BUT NOT MARKET-LEADING NOISE CANCELLING

The real selling point of the BT 210 is its active noise-cancelling feature. There are two very important parts to noise cancelling in an in-ear monitor like the BT120. You must have a good seal with the in-ear driver for the active noise cancelling engine to work optimally. If you don't get a good seal, you'll have noise bleed that the ANC engine won't be able to process.

Phiaton includes three tip sizes that should do the job for just about every ear size. I was happy to see the silicone ear tips had good grip. Over the past two years especially, I've had some in-ear headphones come paired with super-slick ear tips that just slide out.

Once you have a good seal, activating



The Phiaton's neckband features an inline remote and microphone on the left side.

ANC is straightforward. There's a toggle button on the left inline remote. Phiaton's ANC effect is immediate and noticeable. The Phiaton's algorithm significantly reduces HVAC-related noises at the lower and midrange bands to a subtle din. There's no question that the Phiatons took the edge off of noisy environments during my tests on car rides, trains, and subways. I didn't have the opportunity to test the BT120 on an airplane during the review period.

The Phiatons fared poorly in any windy environment. The ANC microphones transferred and amplified that wind-whipped microphone noise into my ears. I had to turn ANC off when there was any wind present. Phiaton isn't alone here. There are many ANC headphones that have the same issue.

What the Phiaton didn't do as well was eliminate rumble and engine noise. The best way to describe the experience is that the Phiaton took the edge off the most prevalent and annoying environmental sounds; but they didn't put me in a complete cone of silence.

LISTENING TESTS

I tested the Phiatons with an iPhone XS with Tidal Master and Tidal Hi-Fi tracks. I have to tell you that these modestly priced headphones sounded pretty darn good—well beyond what their price point would indicate. There is no aptX or aptX HD codec onboard. The headphones also

don't have the capability of streaming at higher bit rates to better match your source. Nevertheless, you'd be hard pressed to notice at times.

Overall, the Phiaton BT120 delivered a well-balanced, punchy sound. The Phiatons err on the side of warm and euphonic. I found the midrange to be clean with high-end frequencies slightly rolled off—brass instruments and cymbals won't show off their top-end shine.

The Phiatons have an exciting bass response. It's more audiophile than "Xtra Bass." It's natural, not artificial, and I like that. The Phiaton's are rated to resolve frequencies down to 20Hz but temper that expectation. They won't reproduce subterranean bass with any authority. I tested tracks like Aaron Copeland's "Fanfare for the Common Man" by the Minnesota Orchestra Conducted by Eiji Oue. Those intoxicating bass drums fell short of their full, crisp, dynamic potential, erring into some smearing. I noted the same on Holly Cole's audiophile favorite, "Train Song." There's a slight midbass boost that adds to the euphonic character and gives you the sensation that the headphones are capable of



The curved neckband's flexible design springs back to its original shape even if tucked into a pocket or bag.

delivering deep, punchy bass. I noted this on tracks like Imagine Dragons' "Natural." All in all, the Phiaton Curve BT120 NC sound much more expensive than their price point suggests.



Phiaton Curve BT120 NC

PROS

- Affordably priced.
- Good sound.
- Attractive industrial design.

CONS

- Buttons on inline remote are difficult to use.
- The earphones just dangle when they're not in your ears.
- Not very effective at reducing rumble and engine noise.

PRICE

\$79

COMPANY

Phiaton

BOTTOM LINE

Phiaton's Curve BT120 NC headphones are a tremendous value for the frequent traveller or city dweller who wants a wireless pair of in-ear headphones with active noise cancelling. With a flexible neckband, multipoint Bluetooth connections, IPX4 rating, and fast charging, you'll be hard-pressed to find a better value at this price point. The fact that these headphones also sound good to boot is just icing on the cake. Highly recommended. ■



Anker Soundcore Motion+ Bluetooth speaker: Big sound in a rugged, compact package

Anker focused on midrange frequencies when it designed the Motion+, but neglected the importance of high-end detail.

BY BEN PATTERSON

We've heard plenty of middle-of-the-road Bluetooth speakers that try to juice your tunes with brassy, boomy sound. The Anker Soundcore Motion+ isn't one of them, but this compact, \$100 speaker could do with a little more high-end detail. Its attention to midrange frequencies, on the other hand, pays dividends when it comes to delivering rich, robust sound, with an impressive (but

not overbearing, provided a certain feature is turned off) foundation of bass response. The Motion+'s weatherized design, app-based EQ settings, and aptX support sweeten the deal.

DESIGN

Measuring a little shy of a foot wide, about three inches high and thick, the 2.3-pound Soundcore Motion+ feels heavy given its size. Encased in a virtually waterproof shell

(Anker claims an ingress protection rating of IPX7, meaning the speaker can withstand being immersed in up to a meter of water for 30 minutes), the Motion+ features a black aluminum grille that reveals its twin tweeters and woofers flanking a large passive radiator. The wedge-like design of the Motion+'s enclosure aims its drivers at about a 15-degree angle

relative to the surface on which the speaker is sitting, so the music is directed at your ears and not your chest. The rubberized sides and back of the speaker feel reassuringly rugged, although they also accumulate oily fingerprints.

The Motion+'s power button is on the right side of the speaker, while the USB-C charging port and a 3.5mm analog audio input sit just beneath, securely hidden by a water-tight rubber flap. (A USB-C charging cable and an audio cable are both included.) You'll find buttons along the top of the speakers for volume, Bluetooth pairing, and the speaker's bass-boosting "BassUp" features (which I'll get to in a moment).

A button in the center of the speaker—between the volume-down



The rubberized shell of the Anker Soundcore Motion+ (seen here with its embedded playback controls) feels reassuringly rugged, but it also attracts oily fingerprints.

and volume-up buttons—performs a variety of functions depending on whether you press it once, press it multiple times, or hold it down for a few seconds. Press the button once, for example, to play and pause your music or to answer a call on your Bluetooth-connected cellphone (in



A rubber flap with a watertight seal hides a USB-C charging port and a 3.5mm analog audio input.

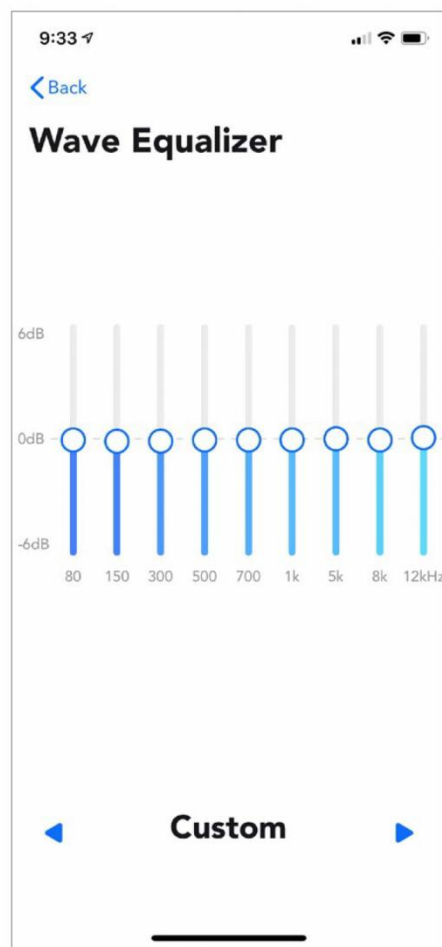
effect, turning the Motion+ into a speakerphone). Hold the button down for a couple of seconds and you'll summon Siri or Google Assistant on your iPhone or Android phone respectively. Hold the button for more than three seconds, and you can sync the Motion+ to a second Motion+ to create a left/right stereo pair.

FEATURES AND FUNCTIONALITY

Besides its Bluetooth 5.0 support, the Soundcore Motion+ also features the aptX audio codec, which can deliver near-CD-quality sound—provided the device you're streaming music from also supports aptX. Support for that codec is relatively common on Android phones, but you won't find support for it on any iOS device (although MacBooks do support it). That's unfortunate, as we like aptX (and we like aptX HD even more).

If you want to tinker with the Motion+'s EQ, you can do so using the Soundcore mobile app. Once the app connects to the speaker, you can switch between six EQ presets or fiddle with the app's nine equalizer sliders.

One of the EQ presets is called "BassUp," which is the name of Anker's bass-boosting audio technology. We'll cover the Motion+'s BassUp performance in a moment; for now, just know that you can toggle the BassUp mode using either



You can fiddle with the Anker Soundcore Motion+'s EQ settings using the Soundcore mobile app.

the Soundcore app or by pressing the BassUp button on the top of the speaker.

The Soundcore app also lets you adjust the Motion+'s automatic power-off feature, which you can set for five minutes, 10 minutes, 30 minutes, or an hour. That's a nice feature, but those are the only settings available. There's no sleep timer, either.

PERFORMANCE

The Anker Soundcore Motion+ did a good job of filling my living room with sound given its size, particularly when I placed it on the floor; indeed, connected to my

iPhone XS, the Motion+ got quite loud when I cranked the volume all the way. Since it's not an omnidirectional speaker, the Motion+'s sound became a bit muffled when I moved behind the speaker, so you should be sure to point it toward any listeners rather than plunking it in the middle of a crowd.

Switching the speaker to the custom EQ mode and sticking with a flat frequency response, the Motion+ sounded pretty impressive given its \$100 price tag, although I wouldn't have minded more high-end detail from the speaker's twin tweeters. I did appreciate the Motion+'s relatively powerful bass, even if the boomy BassUp feature was overkill for most of the tracks I tried. Crucially, the Motion+'s robust midrange kept the sound from feeling too thin.

Dialing up Vlado Perlemuter's rendition of Maurice Ravel's solo piano works on the Nimbus Records label (granted, probably not the album the makers of the Motion+ had in mind when they designed this speaker), the sound was full and relatively rich, if (again) a tad lacking in high-end detail. Skipping over to the title track of Bruce Springsteen's "The Ghost of Tom Joad," I liked the sound of the plucking acoustic guitar scenes, while the rising synth sounded appropriately warm

without being overbearing (that's with the BassUp feature turned off, mind you).

While I wish the Motion+ delivered finer high-end detail, I prefer its sound to cheaper Bluetooth speakers that sacrifice midrange sound for a shrill yet thumpy mixture of thunderous bass and a overly brassy high end. Indeed, because of its solid midrange sound, the Motion+ actually sounds better the more you crank the volume, making it ideal for outdoor playback.

Anker promises 12 hours of battery life from the Motion+'s rechargeable battery, and after several hours of playback, I'd only put a modest dent in the speaker's battery meter.

BOTTOM LINE

You can't expect perfect sound from a \$100 Bluetooth speaker, but Anker wisely

chose a solid middle ground when it came to the Soundcore Motion+, a compact, waterproof speaker that eschews goosed, flashy sound (the too-boomy BassUp mode notwithstanding) for robust midrange performance. Sure, a little more high-end detail would have been nice, but if you're hoping to take your portable sound to the next level, be prepared to shell out a much bigger chunk of change. ■



Anker Soundcore Motion+

PROS

- Robust midrange sound.
- Waterproof design.
- App-based EQ controls.
- aptX codec support.

CONS

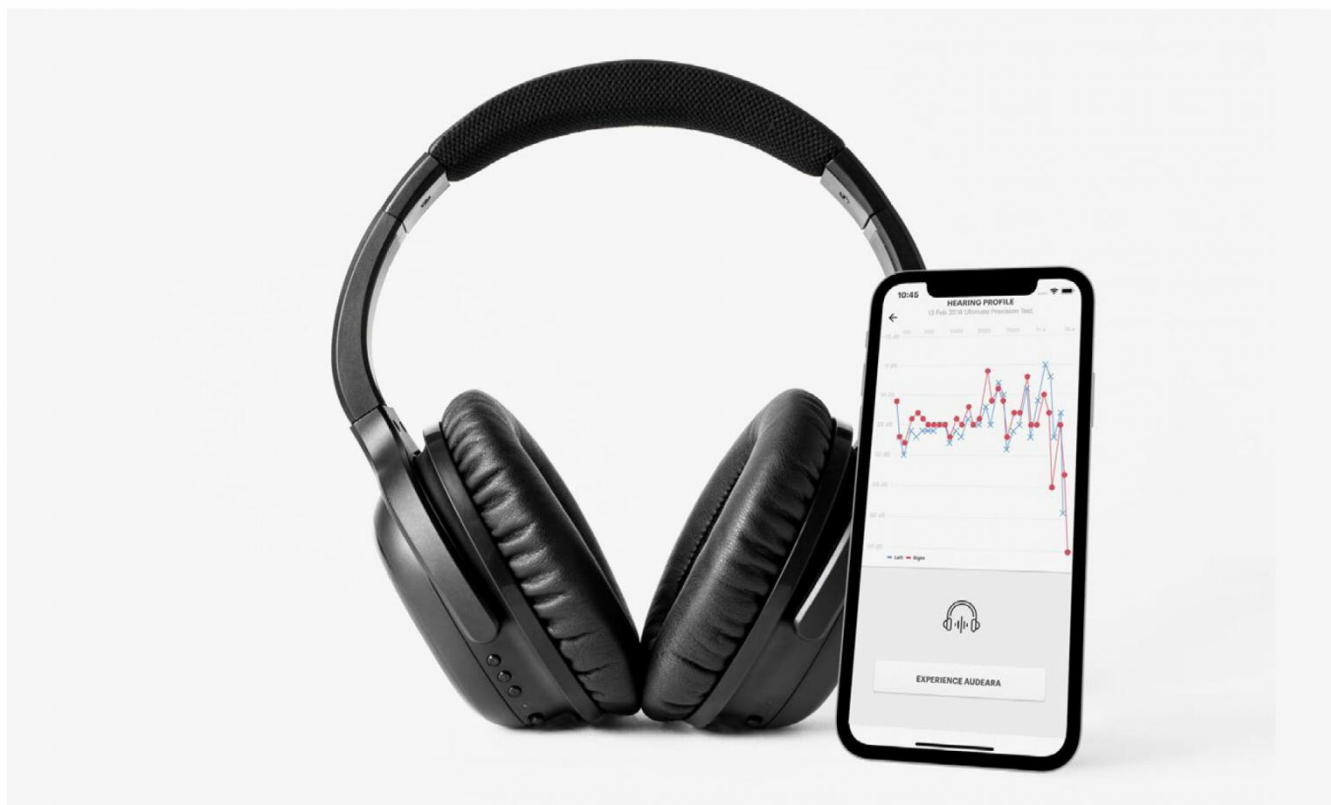
- BassUp feature is overkill.
- Lacking in high-end detail.
- No sleep timer.

PRICE

\$99

COMPANY

Anker



Audeara A-01 headphone: These ANC cans promise to compensate for your hearing deficits

It's a brilliant idea, and the tech that makes it possible works fairly well, at least when ANC is turned on.

BY SCOTT WILKINSON

Headphones with active noise cancelling (ANC) are nothing new. They include microphones that sample the ambient noise around you and then reproduce that sound after shifting its phase by 180 degrees and mixing it with

the original. The two out-of-phase sounds cancel each other out, reducing the level that reaches your ears. This works best on steady-state, low-frequency sounds, such as the constant din of engines inside an airplane.

The Audeara A-01 is just such a



The power switch is at the bottom of the left earcup. Below it is a 3.5mm analog-audio input, while the central button above it controls play/pause, skip forward/back, answer/hang up phone call, and Bluetooth pairing; the flanking buttons increase and decrease the volume. The ANC on/off switch is at the bottom of the right earcup, along with the micro USB port (not seen here) for charging the battery.

headphone, and it offers a very interesting additional benefit—custom equalization tailored to your specific hearing profile. It's a brilliant idea, and it works fairly well, at least with ANC turned on.

FEATURES

The Audeara A-01 is a circumaural (over-ear) headphone that features active noise cancelling. In addition, the built-in microphone used for ANC also lets you talk on a connected phone via the headphones.

Each closed-back earcup includes a 40mm Mylar driver, and the specified frequency response extends from 20Hz to 20kHz (no tolerance given). The 3.5mm audio input presents an impedance of 32 ohms.

The primary input, however, is Bluetooth—in this case, version 4.2. It

supports the SBC, aptX, and cVc codecs and the A2DP, AVRCP, HFP, and HSP profiles. Audeara is working on adding the aptX LL and HD codecs (low latency and high definition respectively), which will be rolled out in a firmware update.

All of that is fairly standard fare for ANC Bluetooth headphones. But the A-01 also offers one unique feature. The companion Audeara app, which is freely available for Android and iOS devices, measures your individual hearing profile and uses it to program the headphones with an equalization curve tailored to that profile. Theoretically, this lets you hear more of the music without having to turn it up. You can even store multiple profiles for your family and friends. How cool is that?

The A-01 is powered by a rechargeable 1000mAh battery. Happily, the main power and ANC can be turned on and off

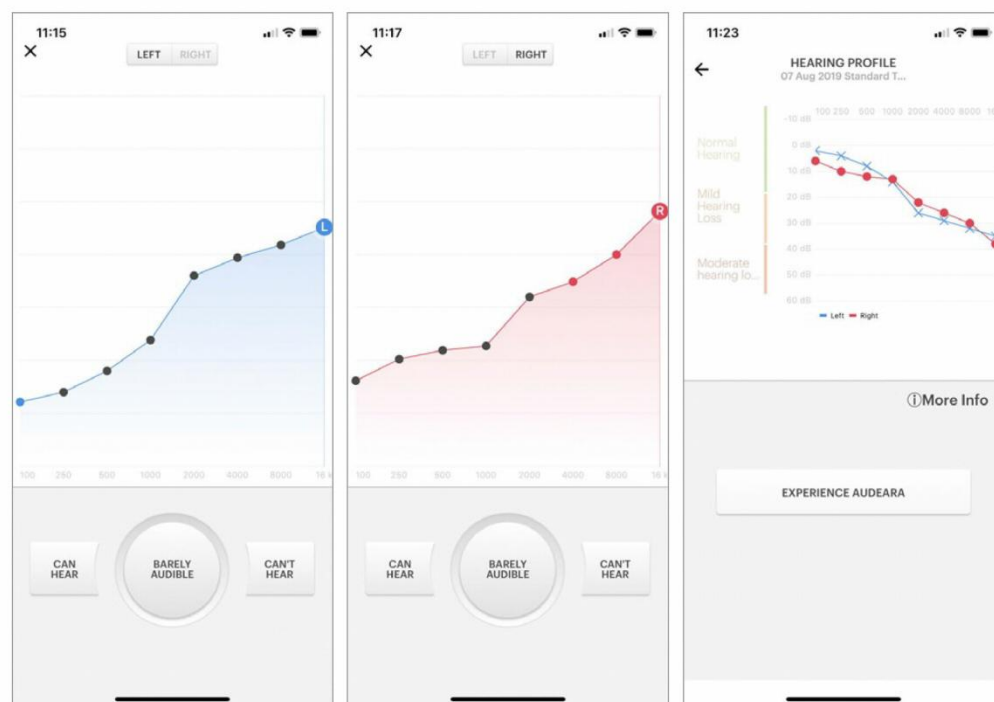
independently, letting you maximize battery life. With ANC only—and using the 3.5mm input—the battery is specified to last up to 65 hours. If you also activate Bluetooth and the Audeara EQ by turning on the main power, the battery should last up to 35 hours. Turning off ANC while keeping the main power on increases the battery life up to 45 hours.

The included charging cable plugs into a microUSB port at the bottom of the right earcup. It takes about six hours to fully charge the battery from a completely drained state.

Another cool feature is Audeara's optional BT-01 Bluetooth transceiver (\$99,

or \$40 if you buy it with the A-01). This little gizmo accepts audio from an optical TosLink cable or analog 3.5mm cable and transmits the signal to the A-01 via Bluetooth. It also comes with an adaptor with two RCA plugs on one end and a 3.5mm connector on the other end for devices with RCA outputs. It's great for people who want to listen to their TV or older stereo wirelessly on the headphones.

In addition, the BT-01 can work in the opposite direction—it can accept audio via Bluetooth and send it to non-Bluetooth gear via digital-optical or analog cables from its outputs. Very cool!



The hearing test consists of setting the barely audible level of repeating beeps at each frequency for each ear (left, center). Once you declare the test complete, the app displays your audiogram (right). Tap on “Experience Audeara” to upload your profile to the headphones.

The headphone feels very sturdy and substantial, though the extenders that pull out of the headband feel somewhat rough in their movement. In addition, it's a bit small for my admittedly large head. I had to use the maximum extension of the headband, and the earcups felt pretty tightly squeezed



The optional BT-01 Bluetooth transceiver lets you connect the output from a TV or other audio gear and send that signal wirelessly to the A-01. Interestingly, it can also receive Bluetooth signals and convert them to physical connections. A handy little gizmo!

against my head. On the plus side, this makes for a good seal, which is important for sound quality, noise isolation, and obtaining a good result from the app's hearing test.

USER INTERFACE AND HEARING TEST

The onboard controls include a main power switch at the bottom of the left earcup and an ANC on/off switch on the bottom of the right earcup, each with a tiny LED to indicate its status. The only other controls are three small buttons on the back of the left earcup. The central button is multifunction: play/pause music and answer/hang up phone call with a single tap, skip forward with a double tap, skip back with a triple tap, enter Bluetooth pairing mode with a long hold. The flanking buttons increase and decrease the volume.

After pairing the A-01 with my iPhone XS, I downloaded the Audeara app and ran the hearing test. There are three tests to choose from: Standard (eight frequencies), High Detail (16 frequencies), and Ultimate Precision (32 frequencies). Standard and High Detail test frequencies from 100Hz to 16kHz, while Ultimate Precision extends from 100Hz to 20kHz. The process begins with a short tutorial on how to perform the test, which is simple yet informative.

Once the test begins, the app plays repeating beeps in each ear at different frequencies, and you adjust the volume of the beeps at each frequency until you can just barely hear them. This requires a quiet environment so that extraneous noise does not interfere with the test.

The test display looks like a graphic EQ. You can drag the slider for each frequency up and down, but the volume

doesn't change until you take your finger off the slider. You can also tap a button labeled "Can Hear" if you can hear the beeps, which lowers the volume of the selected frequency. If you can't hear the beeps, you tap the button labeled "Can't Hear," which raises the volume. When you can barely hear the beeps at a particular frequency, you tap the button labeled "Barely Audible," which moves on to the next frequency. You can also select the frequency to adjust by tapping on its slider.

I was concerned that the phone's volume setting would affect the test, but it doesn't. The volume control is disabled during the test, so the levels you hear are completely consistent.

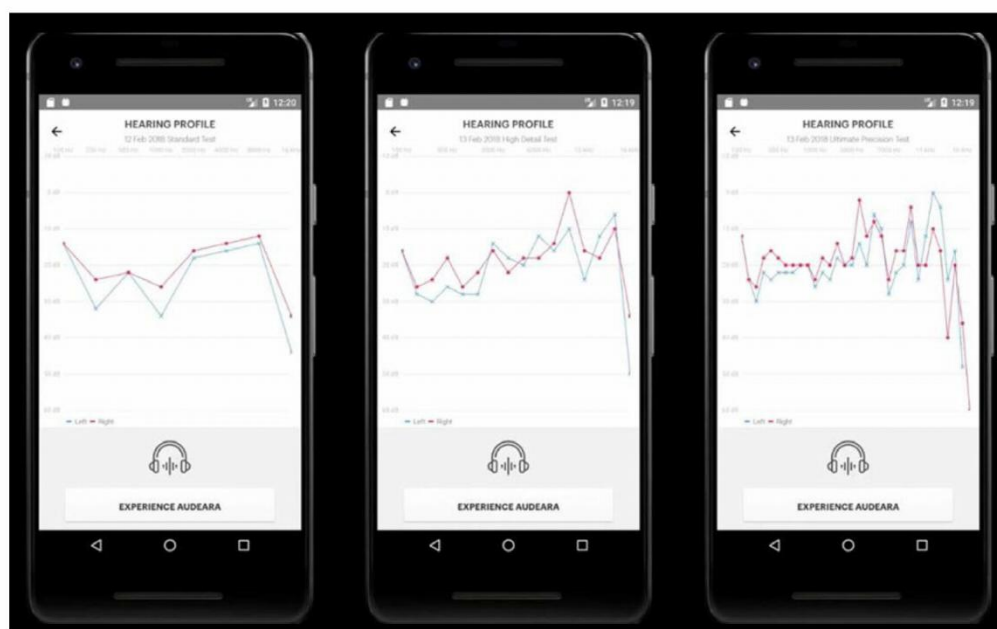
I found a few quirks in this process. For one thing, the change in volume as you tap the Can Hear and Can't Hear buttons

isn't instantaneous; it takes a moment to catch up, which was confusing at first. Also, holding those buttons does not cause the slider to scroll as I expected.

As I was playing with the test, I brought some sliders all the way to the bottom and top of their range. When I tried to push a slider below its minimum value, it simply stayed there. But when I tried to push a slider above its maximum value, the slider disappeared and the app jumped to the next frequency. An "X" appeared over the missing frequency, and tapping that brought the slider back to its maximum value. That seems like very odd behavior; I wish it would simply stop at the top and not respond to attempts to increase it further, just as it does at the low end of the slider's range.

When I asked Audeara about this, they

replied, "The X represents 'can't hear' at that particular frequency within the testing range of the headphones. This alters the way that particular frequency response is incorporated into the algorithm and ultimate sound profile."



Here you can see example audiograms for the three levels of precision.

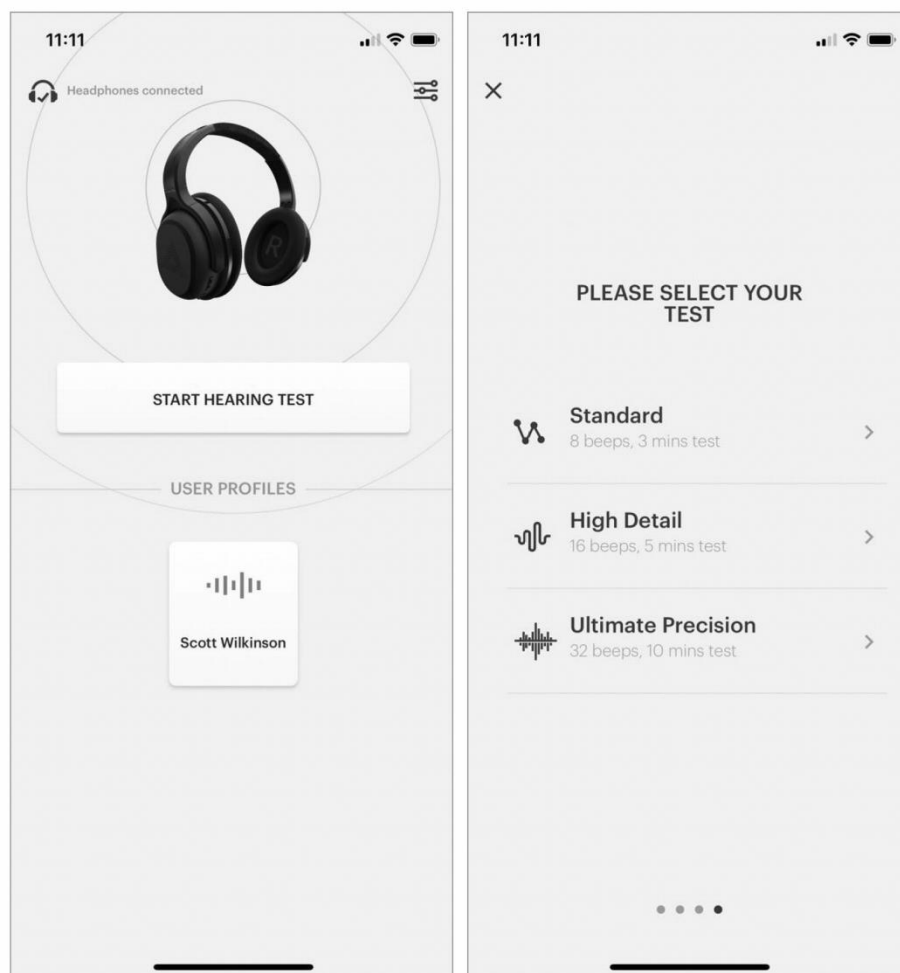
Once the test is finished for both ears, the app offers the opportunity to go back and adjust the results. This worked fine, except that the app unexpectedly played a tone very loud once in a while, which was startling. Once I was satisfied, it let me name and save the profile. I could perform and save the test with different names as many times as I wanted, and they are all associated with me as a user. Others could do the same and associate the results with them separately.

Once a test is complete and saved, it cannot be modified further. If you want to adjust the results, you must perform the whole test again. According to Audeara, this allows you to track your hearing over time.

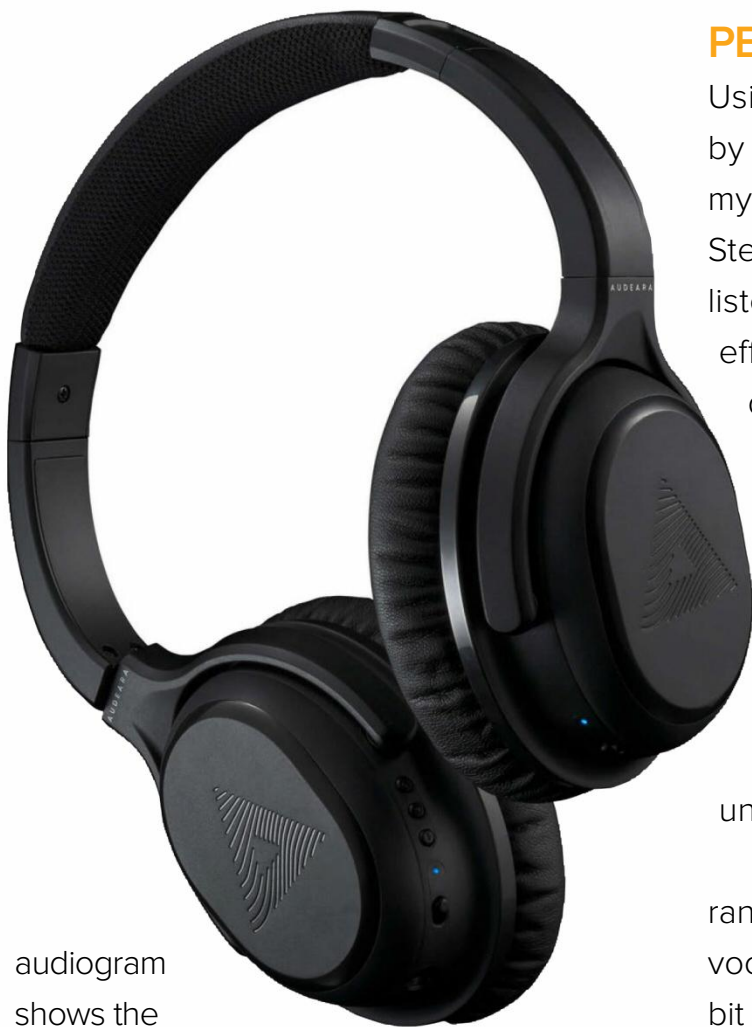
When the test is complete, the app will show you the hearing profile of your left and right ears; this graph is called an audiogram. You can tap on “More Info,” which first reminds you that this is not a medical diagnosis, it then takes you to the World Health Organization’s webpage

about hearing impairment.

I performed the Standard test twice and the High Detail test once, with similar results each time. Those results follow a roughly similar contour as the professional audiogram of my hearing that was performed only a few months ago, but there were a couple of discrepancies. For example, the Audeara results indicate that my right ear is slightly worse than my left below 1kHz, but the pro



The Audeara app’s homepage (left) lets you start a hearing test or select one of the previously established profiles. Starting a new test, you can select three different levels of precision (right).



audiogram shows the opposite.

Back on the hearing-profile page, the next step is to tap the button labeled “Experience Audeara.” This uploads the EQ derived from the selected profile to the headphones. Then, you specify the strength of the program to apply, from 0 to 100 percent in 25-percent increments; 0 percent is described as having no effect. Once the music starts playing, you can go back to the Audeara app and change the strength of the program, which let me compare different strengths on the fly.

PERFORMANCE

Using the High Detail profile established by the hearing test I performed, I started my listening with “Night by Night” from Steely Dan’s classic *Pretzel Logic*. As I listened, I tried different strengths of effect. At 0 percent, the sound was very dull with virtually no highs at all.

Moving up to 25 percent improved the sound somewhat, while 50 percent sounded much better, with reasonably balanced highs. At 75 and 100 percent, the sound was way too bright and brittle, with overblown highs that shrieked uncomfortably in my ears.

Returning to 50 percent, the frequency ranges were fairly well balanced. The vocals sounded good, but the bass was a bit tubby and loose.

Next up was “Good Lava” from Esperanza Spaulding’s excellent album *Emily’s D+Evolution*. The vocals, guitar, and cymbals all sounded good, but again, the bass was somewhat loose and muddy. The same was true on “Ladies’ Choice” by Joanna Cazden from her album *Living Through History*, which I engineered. As before, the bass was a bit bloated, but in this case, the vocals were somewhat veiled with overemphasized sibilants.

For some large-ensemble tracks, I played “Thunder and Blazes” as performed by the Eastman Wind Ensemble

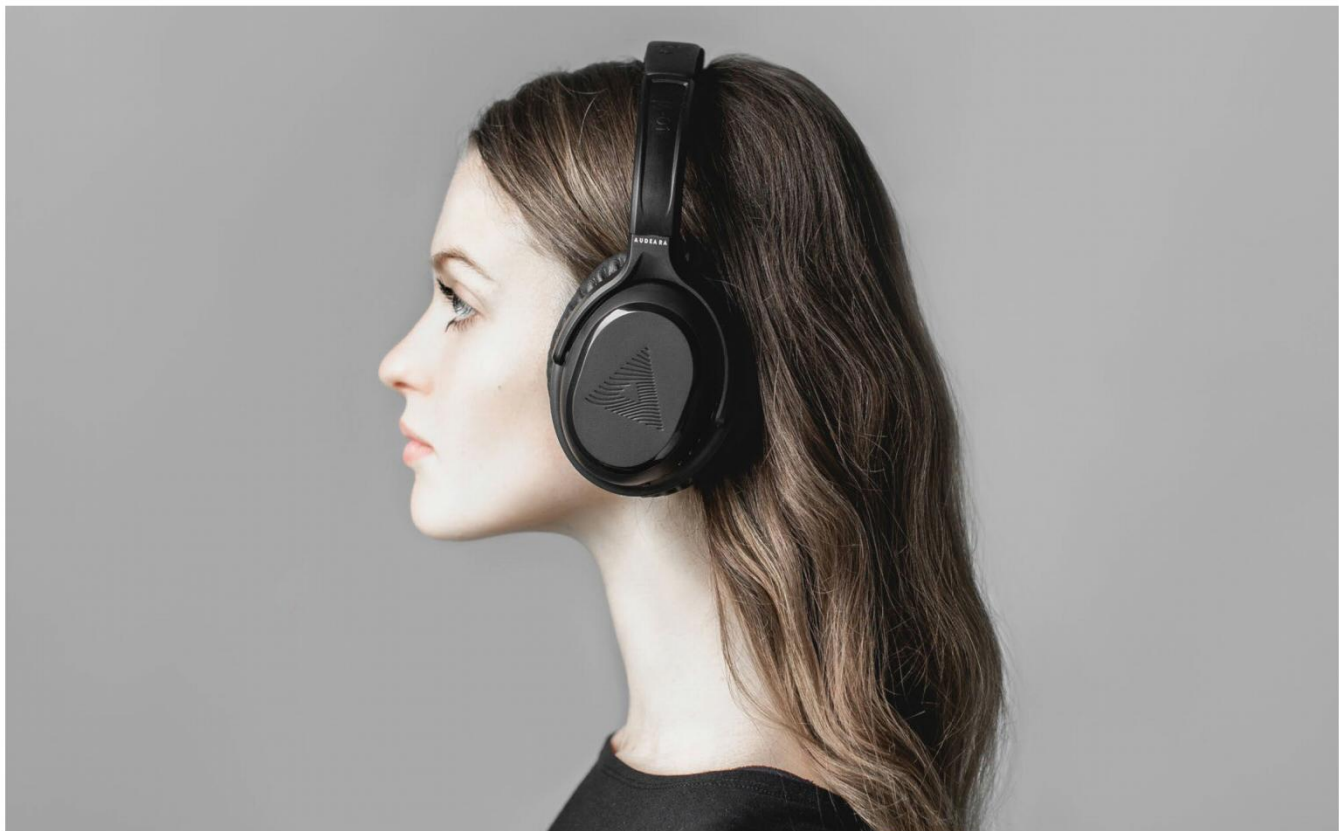
under Frederick Fennell on the album *Screamers*, as well as an arrangement of Frank Zappa's "The Dog Breath Variations" performed by the Cincinnati Wind Symphony under Eugene Migliaro Corporon on their album *Songs and Dances*. In both cases, the tubas were tubby (not in a cute way!) and slightly overbearing, while the higher parts sounded slightly veiled.

For a real torture test, I listened to "The Happy Soul" as arranged for tuba quartet by my father, Robert Wilkinson, and played by the Dutch Tuba Quartet on their album *Escape From Oom-Pah Land*. As expected by now, the tubas sounded

a bit loose and tubby.

Moving to small ensembles, I played "Lester Leaps In" from an unreleased recording by trombonist Steve Wilson and featuring guitar legend Mundell Lowe. The guitar, piano, and cymbals were good, though the acoustic bass was muddy, and the trombone was a bit veiled. I also listened to "The Fairie Round" from *A Festival of Renaissance Dances* by the Southern California Early Music Consort. I played bass sackbut (renaissance trombone) on that album, and it sounded a bit bloated and loose, though the cornett, shawms, and tambourine sounded much better.

Just for grins, I created a completely



The Audeara-01 felt a bit tight on the author's head (note: this is not the author).



flat EQ—I left all sliders at their default position, leading to a completely flat audiogram. Interestingly, different strength settings changed the sound; 0 percent was still dull and lifeless, while 100 percent was very overemphasized in the highs. A setting of 50 percent sounded best, though still a bit tubby in the bass. It seems to me that a flat EQ should sound the same at any strength setting, but it definitely doesn't, and I have no idea why.

I listened to each of the tracks with active noise cancellation off and on. As I've experienced with several other ANC headphones, the A-01 actually sounded better with ANC on. The bass was tighter and the overall sound was cleaner with less veiling. With no music playing, however, I

could hear some noise that disappeared when I turned ANC off. That shouldn't be a problem in a noisy environment.

Speaking of noisy environments, I took the A-01 to a freeway underpass as well as a spot right next to the freeway to test the noise cancellation. The ANC worked very well, reducing the level of low frequencies quite effectively.

COMPARISON TO PSB M4U 8

After hearing how dull the sound was at 0 percent, I wondered if my hearing was really that bad. So, I brought out the PSB M4U 8 Bluetooth ANC headphone, which became my reference product in this category after I reviewed it for TechHive (go.macworld.com/m4rv). I breathed a sigh of relief when I compared the M4U 8 to the A-01 set to 0 percent—the PSB sounded way better!

In particular, the PSB's bass was much tighter on all tracks, and the overall sound was more natural, even when the Audeara was set to 50 percent. By comparison, the sound of the A-01 had a slightly artificial quality.

As I noted in my review of the M4U 8, I prefer its sound with ANC off, whereas I prefer the sound of the A-01 with its ANC on. Still, I give the nod to the PSB under

this condition, though the difference is much smaller than with ANC off in both headphones. As far as noise cancellation is concerned, I thought the two models were roughly equal in lowering the level of low-frequency noise.

I found the M4U 8 more comfortable to wear, especially for long periods. As I mentioned earlier, the A-01 is pretty tight on my head, which is not a problem with the PSB.

BOTTOM LINE

The idea behind the Audeara A-01 is excellent—measure the user’s hearing profile and adjust the headphone’s EQ to compensate for any deficits. In its current iteration, however, it falls a little short. In particular, the audiogram I obtained did not match my professionally administered audiogram in some areas, though it did follow a roughly similar curve.

Still, the sound quality was certainly better with the results applied to the headphone, but that is partly due to how dull it sounds with no EQ. I found myself wondering if Audeara voiced the headphone’s native response to be so deficient in the highs. I don’t know, but in

any case, I would much prefer having a more neutral response if no EQ is applied.

Setting the strength to 100 percent resulted in a buzz saw with screeching highs, while 50 percent with ANC on provided the best sound. Of course, that will drain the battery the fastest, but Audeara rates the battery life at up to 35 hours with all electronics on, which is much more than needed to last an intercontinental flight.

By comparison, the PSB M4U 8 sounded better, with tighter bass and a more natural balance. Plus, it’s more comfortable to wear for long listening sessions. On the other

hand, the M4U 8 carries a list price of \$399, which is \$100 more than the A-01. And the Audeara sounds pretty darn good at 50-percent strength with ANC on.

I applaud Audeara for coming up with an ingenious product, which I hope will get more people interested in learning about their hearing profile. The A-01 has great potential to help those with hearing deficits to more fully enjoy music, and it goes a long way toward fulfilling that potential. If the company can refine the app to produce a more accurate audiogram and reduce the slight tubbiness of the bass, it will be a slam dunk. ■



Audeara A-01

PROS

- Unique app-based hearing test is used to program the headphones with EQ tailored to your hearing profile.
- Sound quality is quite good at 50-percent strength and ANC on.
- Slim case is easy to pack in carry-on luggage.

CONS

- Sound is very dull without EQ.
- With EQ and no ANC, bass is a bit loose and tubby.
- Not all that comfortable for extended wear.

PRICE

\$349

COMPANY

Audeara

Discover the unsearchable



Discover the forest



Find a trail near you at
DiscoverTheForest.org



Mac 911

Solutions to your most vexing Mac problems.

BY GLENN FLEISHMAN



TIME MACHINE: NO FAT OR EXFAT DRIVES, ONLY HFS+ AND APFS

To judge by a recent spate of email, Mac users are using Windows and Unix/Linux compatible drives more than ever. Many people have asked why their external drive appears and is grayed-out in the Time Machine preference pane's excluded list. (Open the Time Machine preference pane and click Options to see that list.)

That's because the drive isn't formatted in a way that Time Machine can back up files from. While I've covered this in previous columns, it's worth a quick refresher, given how many people are apparently currently dealing with this.

- Time Machine volumes must be HFS+ formatted, listed in Disk Utility as "Mac OS Extended (Journaled)".

- Time Machine can only back up volumes formatted either as HFS+ or the

newer APFS format.

➤ While Macs can back up to a networked Time Machine destination, including a Time Capsule, all drives backed up still must be HFS+ or APFS formatted.

If you're not sure how your drive is formatted:

1. Select the drive in the Finder. (If it doesn't appear, select Finder ➔ Preferences, click General, and check the External Disks box.)

2. Select File ➔ Get Info.

3. Examine the Format field.

If the Format line reads anything but APFS or "Mac OS Extended (Journaled)", Time Machine can't handle it.

The solution is to make a copy through another means—Disk Utility or a cloning tool like SuperDuper! or Carbon Copy Cloner—and then erase the original drive, reformatting it with one of the types acceptable to Time Machine. Then restore your data back over.

However, if you need a formatted drive compatible with Windows or other platforms, you will need to skip Time Machine. You can use Arq or ChronoSync for incremental backups, the above cloning software for nightly updates to

another drive, and/or an cloud-hosted backup service that archives external drives as well as your startup volume, like Backblaze.

HOW TO "CLICK ACCEPT ON THE ACCOUNT PAGE" WITH APPS IN THE MAC APP STORE

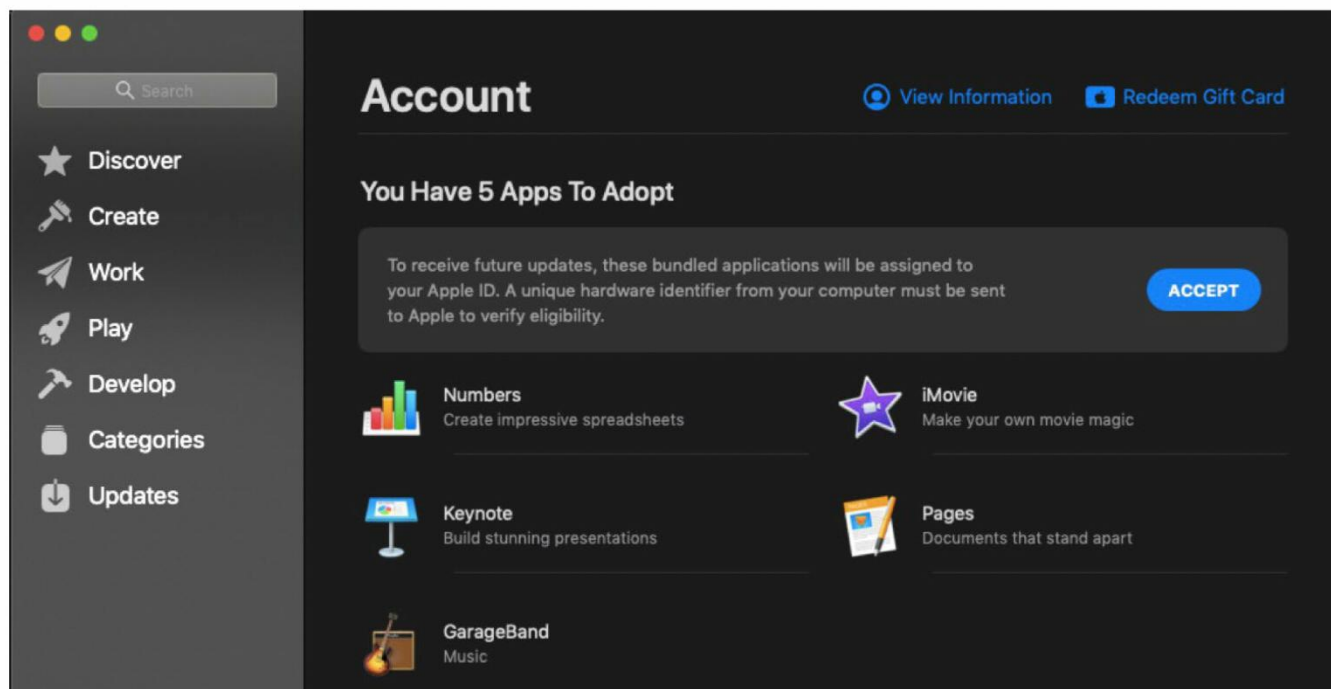
Woe to those who receive cryptic messages on their Macs. "Click accept on the account page to update this app" is one of them. Which apps? Which account page? AIEEEE! (Picture Cathy (go.macworld.com/cath) here with frizzy hair, tongue sticking out.)

Turns out that this is an easy problem to resolve, and it comes from a place of corporate generosity. Apple makes a number of apps free to macOS users, some of which were paid at one point.

This typically affects iMovie, Garageband, Keynote, Numbers, and Pages.

MacOS still registers and downloads those apps via the Mac App Store, and ownership can apparently get muddled even if don't recall using multiple Apple IDs or copying the apps across computers. It can also occur if you Mac is serviced and the drive remains in place but the motherboard is swapped.





You may be asked to adopt Apple apps because of a motherboard replacement, Apple ID issue, or seemingly at random.

Start with adoption:

1. Open the Mac App Store and select View My Account.

2. At the top, it should tell you that there are apps to adopt; it may give you a reason as in this figure. Click Accept.

3. You should receive confirmation that the apps are now connected to your account.

If you don't see an option to adopt or get an error in step 3:

1. Open the Applications folder on your Mac (in the Finder, Go → Applications is the fastest way to navigate there.)

2. Drag the five apps listed above or any that you can't launch or update to the Trash. You will be prompted for an

administrative account and password. Enter that.

3. Empty the Trash.

4. Return to the Mac App Store and re-download the apps you deleted. These are now registered properly to your Mac.

HOW TO SWITCH FROM iCloud PHOTOS TO JUST PLAIN PHOTOS

iCloud Photos provides a great service. Deeply embedded into iOS, iPadOS, macOS, and iCloud, with the feature enabled, every photo you take and every video you record is automatically uploaded to your central iCloud account and then synchronized as a thumbnail or

61,419 Photos, 2,749 Videos
(21,729 Items on This Mac Only)

Updated Just Now

Photos for macOS can let you know the status of your iCloud Photos sync.

full-resolution image to all your devices linked to the same iCloud account that also have iCloud Photos enabled.

As photo collections grow, some people balk at paying Apple for increasing amounts of iCloud storage, however, and they don't need or want synchronization across all their devices in quite this way.

You can shed the iCloud part of iCloud Photos and stick just to Photos if you like. You can then opt to sync a different way if you still want that feature—and at no cost.

Before starting, make sure you have enough storage to hold all the media if it's not all currently downloaded. Then follow these steps to make sure you have full-resolution images and videos downloaded to your Mac and then disable iCloud Photos:

1. In Photos for macOS, select Photos →

Preferences → iCloud.

2. Select Download Originals to this Mac if it's not already selected.

3. Check that the downloads have completed. In Photos with the Photos option selected in the Library list in the sidebar, scroll to the very bottom—it may be just behind the current visible bottom if you think you're at the end. The count of photos and videos should match what you see on other devices and you should see no progress bar. The text "Updated Just Now" or at a given time may appear.

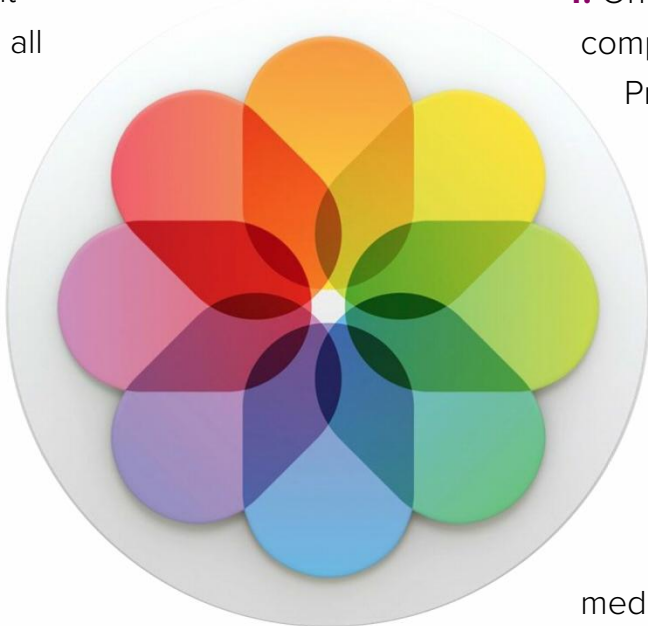
4. Once downloads are complete, in Photos →

Preferences → iCloud, uncheck the iCloud Photos box.

5. macOS may provide a warning or it may simply immediately uncouple the library from iCloud.

Apple notes that media isn't deleted from your account for 30 days in case you've made an error or something's gone wrong.

As for the free trick? Google Photos has apps for macOS (part of Google Drive) and iOS/iPadOS that can automatically upload images as you take or import them. If you can stand to limit your images to 16



megapixels (4,920 by 3,264 pixels in the standard camera frame ratio) and 1080p for videos, Google charges nothing for an unlimited number of images and videos. Any media sized above that is downsampled. (You can also use Google Photos to share an entire library with another person. See my recent column, “Why you should use Google Photos over iCloud Photos: Sharing photos and movies.” [go.macworld.com/goph])

MACOS CATALINA: HOW TO KEEP YOUR INTERNET RADIO FAVORITES PLAYING IN THE MUSIC APP

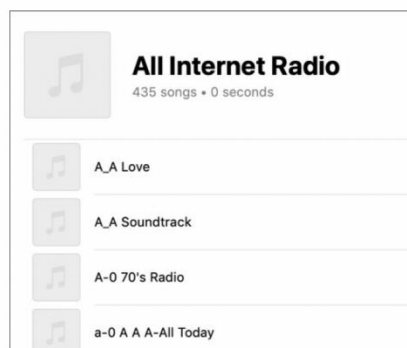
Internet radio was a wonderful idea decades ago when radio stations first tentatively entered the online world and offered often quite low-bandwidth streaming versions of their broadcasts. It also provided a way for those without a

radio transmitter to set up an online station with which they could reach people with words, original music, and recorded songs.

Apple included an Internet Radio option in iTunes for nearly two decades. A directory of streaming options, broadcast and otherwise, it persisted until macOS 10.15 Catalina. The new Music app omits the Internet Radio directory, although it can still play online streams—and import playlists that contain streaming URLs from previous versions of iTunes.

(If you don’t see Internet Radio as an option in iTunes, select Music from the pop-up menu, click the Library button, and then hover over the label that reads Library at the top of the sidebar. An Edit button appear. Click it and then check the box next to Internet Radio and click Done.)

If you’re an internet radio aficionado, make sure you preserve your choices in Mojave (or an earlier macOS release)



Export a playlist of Internet radio stations from iTunes in Mojave (left) and import them into Music in Catalina (right).

