Macworld

AUGUST 2022

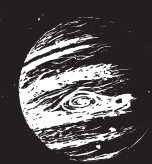# FEEL THE POWER

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M2

APPLE'S NEWEST MACBOOK PRO USHERS IN
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How the M2 will shape the next Macs and complete the Apple silicon transition

Apple's next-generation chip is here but it might take a while before it shows up in another Mac.

BY DAN MOREN

After months—if not years—of fevered theorizing over Apple's chip roadmap for the Mac, this year's Worldwide Developers Conference at last gave us a tantalizing peek at the successor to the blockbuster M1 (fave.co/3ywYjll), released a little over a year and a half ago.

We learned a bit more about the M2 this week when the first round of reviews landed (see page 46). The 13-inch MacBook Pro is identical to the M1 model

on the outside, but the inside is completely different, thanks to Apple's latest chip. Benchmarks show a nice speed boost of around 20 percent, a significant jump in graphics performance, and a very good improvement over the already speedy M1 (fave.co/3y5CGaj).

The space gray Mac mini still uses an Intel processor.

But, far more excitingly, now that we've got a second data point to work with, we can start to extrapolate a little more about the future of the M2 and when we might expect to see it make its way into the rest of the Mac lineup. (Like any professional writer, I can turn two dots into a line. Don't try this at home, kids.)

BEYOND M2

It doesn't take a crystal ball to see that the M2 is destined for most of Apple's consumer-level lineup, just as the M1 made its way into the 24-inch iMac (fave.co/3AvlV7y) and the Mac mini (fave.co/33ho0Wq). The real question is whether, as was the case with the M1, Apple chooses to use the same version of the chip in all of those machines.

In the case of the M1, Apple offered a binned 7-core GPU variant in the entry-level iMacs and MacBook Air; this time around, that low-end variant is an 8-core GPU M2, which could be a binned version of the 10-core GPU. (It is worth noting, however, that the low-end M2 MacBook Air starts at $200 more than the entry-level M1 Air did.)

Assuming Apple continues on a similar timeframe—and it must be admitted that with the global supply chain in the shape that it is, it's hard to predict anything with reliability—an M2 iMac is at the very least several months away. The real question is whether Apple will have the capacity to start shipping other M2 Macs this fall or will have to wait until next spring. The iMac's release date isn't pegged to a particular time of year and its updates often move around, appearing sometimes in the spring, sometimes midyear, and sometimes in the fall. But if Apple is only starting to ship its first M2 Macs sometime next month, the fall may be too soon, especially with supply chain constraints. My bet's on next spring, because when it comes to rumored Apple products, always take the overestimate—products rarely show up sooner than you expect.

There's also the wildcard Mac mini. When Apple announced the M1 Mac mini at the same fall event as the M1 Air, it also made the choice to leave the high-end Intel Mac mini in the lineup. As it now stands, it and the 2019 Mac Pro are the *only* Intel Macs that Apple still sells. Much of the speculation around the replacement of that high-end Mac mini has centered on the more powerful versions of Apple's chips, like the Pro and Max.

The M1 version of the Pro never made it to the desktop (fave.co/3NvDvPd). So will that change this time around? As someone who's very much in the market for an M2-Pro powered desktop, I certainly hope so (heck, it would be nice to see them in an iMac too, even if a larger model still isn't a going concern). My assessment is that Apple had to prioritize where to put the M1 Pro and M1 Max chips it had available and opted to direct them to the much more popular MacBook Pros and, in the case of the Max, the new Mac Studio.

Like the iMac, a new Mac mini could show up anytime—even if it's just an M2 version that sits above a cheaper M1-powered model. But looking holistically at Apple's roadmap, it's hard to imagine the Mac mini is at the top of the list for updates.

PRO TO THE MAX

What about those Pro and Max versions of the M2? The M1 Pro and M1 Max chips were introduced just under a year after the first M1 Macs, and not only were they a lot more powerful, but they also offered more configurations—especially for GPU cores—than the M1 did. We don't yet know how the M2 stacks up against the M1 Pro and M1 Max—Apple was, naturally, very hesitant to compare them publicly—but it seems likely that the next-generation Pro and Max chips will see the gains over their predecessors commensurate to what the M2 showed over the M1.

The M1 version of the Pro never made it to the desktop.

If the timeline continues apace, that would mean that M2 Pro or Max chips will probably not arrive until (alas) next fall, an idea supported by recent rumors about redesigned MacBook Pros (fave.co/3byCOr7). And if they do make the jump to the desktop this time around, I'd still expect Apple to be prioritizing putting them in those MacBook Pros that sell so gosh darn well—probably the same for a speed-bumped Mac Studio too. And of course, there's still one system hanging out there...

ULTRA SQUARED

Yes, the Mac Pro. Teased at the same spring event that announced the Mac Studio and its killer M1 Ultra chip, there was some hope that a revised Mac Pro would show up, appropriately enough, at a developer-centric conference. But as it

With supply restraints affecting Apple's ability to produce Macs, even the company may not know when it can start shipping the new Mac Pro.

hasn't, we're left with an unusual situation: Apple announced in 2020 that it expected to transition all of its Macs to Apple silicon within two years, which it's done—with the exception of the Mac Pro.

But if the company's still going to try and ship a new Mac Pro by the end of 2022, there's little question of what chip will power it: It would seemingly have to be the M1 Ultra. When Apple's senior vice president of hardware engineering, John Ternus, unveiled the M1 Ultra, he described it as "one last chip" in the M1 family, which seemingly rules out the possibility of an even more powerful processor.

Certainly, the Mac Pro is not going to have a processor less powerful than the Mac Studio, and given that the M2 isn't even shipping yet, the Ultra version certainly doesn't seem like it would be available this soon. So the M1 Ultra it would have to be—or, perhaps more likely, multiple M1 Ultras?

Given that Apple is keeping the M1 Air in the lineup for now, perhaps the simultaneous existence of both chip lines isn't shocking. After all, it took well over a year for the Ultra version of the M1 to show up and it's only been around for a few months, which means it'd better continue to earn its worth for all those users who invested in it. ∎

Apple's new dual charger offers smart power splitting

MacBooks and iPhones are automatically allocated a larger power share than Apple Watches and AirPods.

BY DAVID PRICE

Apple has revealed that its new 35W Dual USB-C Port Power Adapter (now on sale, fave. co/3QSHIVD), can automatically adjust its power output depending on what types of devices are connected.

A new support document (fave. co/3ny5mna) explains that when devices are connected to both of the charger's USB-C ports, the (relatively modest) 35W output is split "based on their power requirements." What that means in

The (relatively modest) 35W output is split "based on their power requirements."

charge is to focus on a single device. "If either device needs more power, unplug the other device and its charging cable from your power adapter," the article explains.

Apple's dual charger has been rumored since early April (fave.co/3NqZabm), and has finally gone on sale. As well as the standard charger, there's a compact version (fave. co/3bF4SsM) that may be more suitable for those on the move. Both versions are specced at 35W, and both cost $59. ∎

practice is that MacBooks, iPhones and iPads are prioritized over Apple Watches and AirPods.

If you connect both a MacBook and an iPad, for example, the wattage is split evenly: Each device gets up to 17.5W. But pairing one of these high-priority devices with an Apple Watch or an AirPods case means a split of 27.5W/7.5W. Note that the all-important "up to" prefix attaches to all of these figures; your mileage may vary.

Apple adds that the fastest way to

Apple also sells a compact version of the adapter.

MIT researchers warn of 'PACMAN' M1 flaw that can't be patched

A new vulnerability is built into the chip but there's no way to know if the M2 fixes it yet.

BY ROMAN LOYOLA

W hile Apple's M1 processors have helped the Mac reach new performance heights, a few reports have exposed potential security issues with the celebrated system on a chip. The latest such report comes from MIT CSAIL (fave. co/3NzWDM5), where researchers have found a way to defeat what is called "the last line of security" on the M1 SoC.

MIT CSAIL found that the M1 implementation of pointer authentication (fave.co/3ufxGyO) can be overcome with a hardware attack that the researchers developed. Pointer authentication is a security feature that helps protect the CPU against an attacker that has gained memory access. *Pointers* store memory addresses, and *pointer authentication code* (PAC) checks for unexpected pointer changes caused by an attack. In its research, MIT CSAIL created "PACMAN," an attack that can find the correct value to successfully pass pointer authentication,

so a hacker can continue with access to the computer.

MIT CSAIL's Joseph Ravichandran, who is the co-lead author of a paper explaining PACMAN, said in an MIT article, "When pointer authentication was introduced, a whole category of bugs suddenly became a lot harder to use for attacks. With PACMAN making these bugs more serious, the overall attack surface could be a lot larger."

According to MIT CSAIL, since its PACMAN attack involves a hardware device, a software patch won't fix the problem. The issue is a wider problem with Arm processors that use Pointer Authentication, not just Apple's M1. "Future CPU designers should take care to consider this attack when building the secure systems of tomorrow," Ravichandran wrote. "Developers should take care to not solely rely on pointer authentication to protect their software." As a technological demonstration, PACMAN shows that pointer authentication isn't completely foolproof and developers shouldn't completely rely on it.

MIT was able to perform the PACMAN attack remotely. "We actually did all our experiments over the network on a machine in another room. PACMAN works just fine remotely if you have unprivileged code execution," says the PACMAN FAQ (fave.co/3AiQnVZ). MIT has no knowledge of the attack being used in the wild, but Macs should be safe as long as OS updates are installed when they become available.

Apple announced the M2 chip (fave. co/3NzwOM6) at its WWDC keynote last Monday, which is a new generation that succeeds the M1 series. An MIT representative confirmed to us that the M2 has not been tested for this flaw.

MIT CSAIL plans to present the report at the International Symposium on Computer Architecture (fave.co/3OD7I03) on June 18. Apple is aware of MIT CSAIL's findings and issued the following statement: "We want to thank the researchers for their collaboration as this proof of concept advances our understanding of these techniques. Based on our analysis as well as the details shared with us by the researchers, we have concluded this issue does not pose an immediate risk to our users and is insufficient to bypass operating system security protections on its own."

PACMAN is the latest security breach discovered with the M1. In May, researchers at the University of Illinois at Urbana Champaign, the University of Washington, and Tel Aviv University discovered the Augury flaw (fave.co/3uDRVGD). Last year, developer Hector Martin discovered the M1RACLES vulnerability (fave.co/3a3IJUT). However, these flaws have been deemed harmless or not a serious threat. ∎
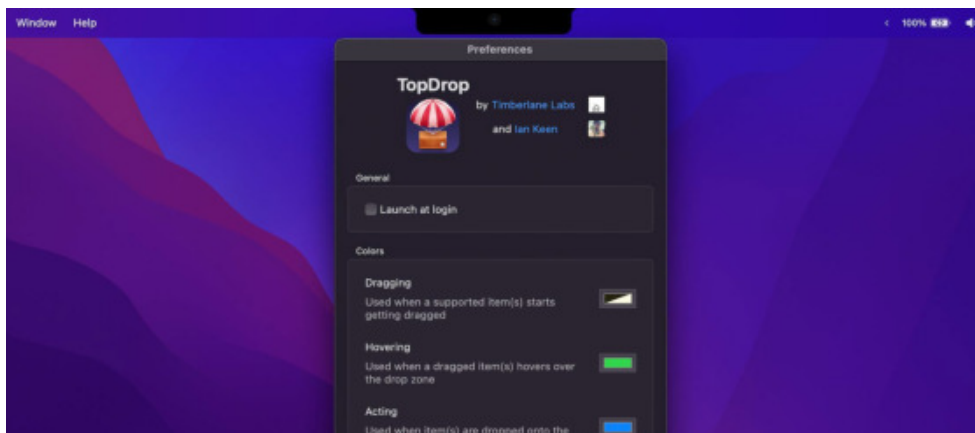
The MacBook's notch inspired this developer to make a better AirDrop

This developer used one of the MacBook's least popular features to make an improvement to one of the better macOS features.

BY ROMAN LOYOLA

Some people look at the notch at the top of the MacBook Air and MacBook Pro with disgust and see it as a distraction to an overall elegant design. Others don't even notice it. And some, like developer Ian Keen, are inspired by it.

Keen recently tweeted about his latest project: a macOS "AirDrop helper" that activates the Mac-to-Apple device file transfer feature by dragging files to the notch, which lights up, and then the AirDrop window appears. Keen has a demo of it on

Twitter (fave.co/3bMh2As). Keen is also working on a notch-less variant of the helper app for people who are buying an M2 MacBook Pro or have an older Mac. It works similarly, but the highlighted area isn't as obvious (fave.co/3yayqGw).

As someone who uses AirDrop a lot, I can't wait for Keen to release this utility for the Mac. It's also a great demonstration of original thinking, using the hardware and its design elements to create helpful software UI elements. I know that Keen's utility will be one I'll use all the time. ■

The pandemic forever changed WWDC—in the best way possible

Apple changes with the times, and so does its relationship with outside developers.

BY JASON SNELL

t pains me to admit this, but I've covered Apple's Worldwide Developer Conference for more than a quarter of a century. I've seen it go from a sleepy conference in San Jose to an electrically charged event in San Francisco to a can't-get-a-ticket event back in San Jose. And, like everyone else, I participated in

WWDC remotely for the past two years via session videos posted on Apple's developer site.

The lesson here is that WWDC is nothing if not changeable. Apple changes with the times, and so does its relationship with outside developers. But having spent a day on the Apple Park campus as a part

of the company's reimagined WWDC this year, I can say this: I don't think we're ever returning to the old WWDC, and I think that's the right decision.

APPLE'S SUCCESS CHANGED WWDC FOREVER

Before the pandemic, Apple always staged WWDC in a city at a public convention center rented out for the occasion. A few thousand developers would attend the event, which kicked off with a keynote address and branched into individual sessions detailing technical information about Apple's platforms. Because only a portion of the developer community could attend, Apple did supply videos of those sessions after the fact, first on physical media and then eventually via the internet.

But the arrival of the iPhone and the App Store changed how Apple interacted with its developers forever. WWDC became a hot ticket, and only a tiny fraction were lucky enough (and had enough money) to attend. Session videos became more important. Apple says it now has 34 million registered developers. Even the largest venue

imaginable couldn't fit more than a tiny fraction of the total.

Due to Apple's success, by 2019, WWDC as an in-person event had lost a lot of its relevance. It was a great party for those who got to participate in it, but there was a distinct sense that attendees were merely the studio audience, supplying applause and good background imagery for a production meant for the rest of the world to consume.

The pandemic forced Apple to embrace a fully online event, and the results have been impressive. Unlike in-person sessions, in which presenters were chained to a lectern and forced to adhere to strict time slots, Apple's online sessions could be as long as they needed and were more dynamically presented in bright, interesting rooms at Apple Park. Everything was on demand, released in

Tim Cook and Craig Federighi welcome developers to WWDC at Apple Park.

daily binge drops like the nerdiest Netflix show ever.

Apple even embraced the online community for WWDC. There are virtual tech talks and labs. Apple engineers are hanging out in the official WWDC 2022 Slack right now, answering questions for developers in real time. It worked almost too well. There's really no going back when it comes to the education part of WWDC.

But here's the thing: WWDC isn't just about education and developer outreach. It's also a media event, where Apple unveils its operating system strategy for the next year—and, oh yeah, perhaps it'll drop some new hardware announcements just for fun.

With WWDC22, Apple combined elements of its past in-person keynotes with the prerecorded presentations it has been making since 2020.

THIS IS OUR HOUSE

With WWDC 2022, Apple has found a good mixture of the old and the new. It invited the media to the keynote, as it would have in the old days. It also invited a smaller (but still significant) number of developers to make noise and cheer while watching the keynote from Apple Park.

Apple is a secretive company, and you'd think that the prospect of inviting all those people onto its campus might be a non-starter. But Apple's also a company that loves to control as many aspects of

what it does as it can. I can't believe the company ever enjoyed dealing with the cities of San Francisco and San Jose, California, to use their convention facilities, buy up hotel blocks, pay for expensive and substandard catering, work around other convention dates, and the rest.

Apple Park is the answer. Apple Park is Apple's own real estate, its facilities, its schedule, its food service, its parking lots, and even its security and crowd control. The company built a huge theater large enough to host any keynote event it might want to hold, and it has multiple outdoor spaces that can serve large crowds. (That last one turned out to be useful in the case of a pesky ongoing pandemic that had made it a tougher sell to bring lots of people indoors.)

OPPORTUNITY OF A LIFETIME

WWDC isn't like other Apple events because it caters specifically to developers (except for that keynote, which is not really for them but for the general public). While this year's WWDC was very different from those of past years and had a dramatically reduced number of outside participants, the people who were lucky enough to get a ticket had the trip of a lifetime.

This year's participants were among the first members of the general public to stand inside the ring building at Apple Park. (It was my first time at the big ring, and it is far more impressive than it looks from the pictures.) They got to sit on fancy wood chairs, eat at fancy wood tables, and climb fancy marble stairs. They were at the center of the Apple world—for real this time, not like when we used to say downtown San Jose, California, was the center of the Apple world during WWDC week.

Apple also used this week to unveil its new Developer Center building, located just south of the Apple Park Visitor Center and equipped with meeting rooms and a small theater. It's clear that Apple intends to have its Cupertino campus be a destination for developers for years to come.

I can't say for sure what next year's WWDC will bring, but I have a hard time imagining that it won't be very much like this year's model. The keynote will be a big media event—perhaps back in the Steve Jobs Theater—and a small number of developers will get the chance to punch their lucky ticket and eat a sandwich from Caffe Macs.

Is that a less exciting prospect than thousands of people thronging the streets of San Jose? In a way, yes. But it's the right approach for Apple, and for the 99.9999 percent of developers who will never make the trip. ∎

Attending the WWDC22 keynote at Apple Park brings with it a heightened sense of community.

>> 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

love
has
no
labels

ad
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MECHANICAL KEYBOARD

LOGITECH MX MECHANICAL KEYBOARD: GAMING COMES TO THE OFFICE

BY JASON CROSS

Logitech makes pretty good keyboards. They're a staple of our best keyboard lists, whether it's for Mac (fave. co/3I8MmVP) or iPad (fave.co/3NyVu7A), because outside of Apple's own keyboards Logitech's are the safest bet. You're almost always going to get something well built with good key action and useful software features.

It seems odd, then, with mechanical keyboards becoming all the rage among enthusiasts and working from home exploding in recent years, that Logitech's

mechanical keyboards have only been available in its gaming-focused G series.

With the MX Mechanical, the company finally rectifies that. Available in a tenkeyless Mini ($149; fave.co/3AnXcFX) and full-size ($169; fave.co/3udqPWA) variants, it combines the craftsmanship of the company's mechanical gaming keyboards with its excellent productivity features and software. It all comes in a more professional design that would be welcome in any office—home or away.

FOR THOSE WHO LOVE TO TYPE

Mechanical keyboards have become a *thing* lately. Tired of the wobbly, low-travel keys on laptop-like keyboards (such as Apple's Magic Keyboard), enthusiast users have flocked to good old clicky mechanical keys. Sure, they make more noise (even the quiet ones), but they feel so much better, with more spring and that excellent click feel when the key actuates. Gamers love them too, for their durability, faster response times, and more deliberate feel.

You can also replace the keycaps on many mechanical keyboards, personalizing your keyboard to look the way you want. Logitech uses Kailh's new low-profile Choc V2 switches in the MX Mechanical, and it's available in linear, tactile, and clicky variants. I tested the tactile (brown) switches, which I think do the best job of giving you that deliberate mechanical feel with a little less typing noise. The typing action is as good as you'd expect with a top-notch switch like this, with great response for a low-profile keyboard and minimal key wobble.

The Kailh Choc V2 uses the same round crosspoint stem as Cherry MX switches. This is probably the most popular stem design, and it gives you the greatest options for aftermarket keycaps (Logitech does not make alternate keycap sets

The MX Mechanical only comes in one color but offers both full-size and compact tenkeyless variants.

The Kailh Choc V2 switches have Cherry MX compatible stems, so low-profile keycaps shouldn't be too hard to find.

and dictation, along with staples like brightness, key brightness, and volume.

As with most keyboards these days, you can access normal Function keys by holding down the fn key. The MX Mechanical lets you lock this on by pressing fn and Esc, which will be welcome to programmers and others who find themselves wanting to press F8 a lot more often than muting their microphone.

Speaking of keys, they're backlit in a single white color, which goes well with the two-tone graphite key deck (it's not available in any other colors). There are seven levels and six different effects, so you can have a *little* fun, but not nearly as much as with an RGB keyboard. Logitech has built the deck with a proximity sensor, so the backlight turns off when your hands leave the keyboard for 30 seconds and it turns back on as soon as they get close again. An ambient light sensor adjusts the backlight brightness, too—dimmer when there's not much light, and brighter when the sunlight is streaming in through your office window.

available). But be warned: Regular keycaps don't work well on low-profile switches. They technically do work, but with the shorter key travel, they will slap into the keyboard deck all the time. Low-profile keycaps compatible with the Cherry MX stem are harder to find but should work fine on the MX Mechanical.

MADE FOR WORK, NOT GAMING

While you can of course use this keyboard when playing games, it is deliberately designed for office productivity.

That means no macro keys or macro programming in the bundled Options+ software, though I hope that's coming in an update. The Fn keys have shortcut keys including microphone mute, emoji,

Switch between three paired devices, including phones and tablets, at the touch of a button.

handle up to six compatible Logitech devices, so you only need to use one of your precious USB-A ports for multiple mice and keyboards.

The keyboard itself can pair with three different machines (Bolt or Bluetooth) and switch between them with dedicated keys. It's the kind of thing multi-device users will appreciate. And yes, that includes serving as a Bluetooth keyboard for your iPad or iPhone, both of which work great. Switching between typing on my Mac and iPad with the tap of a key has been a joy.

It's all in service of longer battery life. Logitech says you can expect about 15 days of typical use with the backlight on and 10 months with the backlight off. I left the backlight on but set sort of low, and the battery only dropped from 100 percent to 85 percent after five days. When you need to recharge, there's a lone USB-C port in the back right corner.

PRODUCTIVITY TRICKS

As with much of Logitech's other MX gear, you can connect the MX Mechanical via either Bluetooth or Logitech's own Bolt USB-A wireless dongle. A Bolt dongle can

The Options+ software is simple and intuitive, and it provides per-application control over special key functions (if you want).

Then there's the
Options+ software,
which effectively
replaces the old
Logi Options Mac
app. Options+ lets
you reassign the
functions of all the
Fn keys, the Insert/
Home block of keys,
and the top keys of
the number pad.
There are both
global and optional
per-app settings for

The MX Mechanical is attractive, well built, and has a great key feel.

all of these, and they sync in the cloud if
you sign in to a Logitech account.

The software is intuitive, attractive, and
useful (and it's a Universal app, ready for
your next Apple Silicon Mac), but
somewhat limited compared to some of
the functions you get in the G
Hub software for the
company's gaming keyboards.
Keyboard macros, in particular,
would be a welcome addition.

BOTTOM LINE

The MX Mechanical probably
won't satisfy the hobbyist that
wants to fully customize their
keyboard, but it's not intended
to. It's meant to combine that
great mechanical feel with the

software features of Logitech's existing MX
Keys products while looking "office-ready,"
and it does a great job.

It's attractive, well built, and has a great
key feel. The battery lasts a long time, and
the software to customize key functions is

thoughtful and simple. It pairs
with up to three devices (Mac,
PC, Linux, even iPad or iPhone)
via USB or the company's Bolt
USB-A wireless dongle, which
it comes with.

Mechanical keyboards
aren't for everyone, but if you
want a nice low-profile option
with features tailored for
productivity rather than gaming,
you'd be hard-pressed to find a
better solution. ■

$\frac{1}{2}$

**Logitech MX
Mechanical Keyboard**

PROS
- Pair with and switch
  between three devices.
- USB-A wireless dongle and
  Bluetooth support.

CONS
- No macro support.
- Pricey.

PRICE
$169

COMPANY
Logitech

MOUSE

LOGITECH MX MASTER 3S: THE BEST MAC MOUSE GETS BETTER

BY JASON CROSS

Since its debut about two years ago, we have considered Logitech's MX Master 3 (fave.co/3NyEjTt) to be the best overall Mac mouse (fave.co/3a8uU7A) for productivity.

Now it has been updated to the MX Master 3S, and the improvements, though minor, are enough for it to hold on to the top spot. The MX Master 3S is virtually identical to the MX Master 3 but features an improved 8000dpi sensor and quiet-click buttons. There's a new Options+ app as well, though that will work with a lot of Logitech mice, including older models.

A COMFORTABLE DESIGN (FOR RIGHT-HANDED USERS)

Logitech's design for the MX Master 3S is identical to the MX Master 3. It's got a nice sculpted shape that fits well in the hand, with a gentle left-to-right slope and a thumb rest for a more comfortable resting position.

There are still two primary buttons, which are now incredibly quiet. They still have a nice clicky feel, not mushy at all as some quiet-click mice are, but they make almost no sound. Your co-workers will thank you.

Between the left and right buttons is a metallic knurled scroll/click wheel, with a toggle button to switch it from smooth scrolling to a ratcheted feel. I prefer the ratcheted mode, and if you scroll really fast it's as if a clutch releases that allows the wheel to spin freely for a few seconds, with some flywheel-like inertia. It's a great way to scroll down really long documents or web pages quickly while preserving the line-by-line precision of moving slowly.

Above the thumb rest, you'll find another scroll wheel of sorts, made for left/

right scrolling in spreadsheets or the like, along with two more mouse buttons. The thumb rest itself can be pressed downward, toward your desk, as another programmable mouse click. By default, it is set to gestures—click down and drag the mouse up, down, left, or right to perform one of several gestures, as you would do with a touchpad.

I found the thumb-rest button a bit tricky to click, but it seems to be something you're meant to use sporadically, and it's nice to have an alternative to all those two- and three-finger trackpad gestures when you jump from a trackpad to a mouse.

The mouse is wireless only, using either Bluetooth or the Logi Bolt USB dongle (which is included). The Bolt adapter is used for lots of Logitech

The sloped design is comfortable in the hand if you're right-handed, but almost impossible for left-handed users to manage.

wireless products—in fact, a single adapter can be paired with up to 6 simultaneously. What's more, the mouse can be paired with three different devices (Bolt or Bluetooth), and you can flip between them with a small switch on the underside. It's handy for those who want to use their mouse with multiple computers; Mac or Windows/Linux PC.

Battery life is claimed to be 70 hours and is recharged via a USB-C port in the front of the mouse. In my experience, that battery life estimate is reasonably accurate. In five days of on-and-off use, my mouse battery has only dropped to 90 percent. Plus you can use the mouse while

it charges without issue (I'm looking at you, Apple Magic Mouse [fave.co/3yyg57u]).

IMPROVEMENTS OVER THE MX MASTER 3
With the exception of the nearly silent buttons, all the features of the MX Master 3S are more or less identical to those of the MX Master 3. There's one other minor improvement: The optical sensor, which does a great job of tracking across all kinds of surfaces, has doubled to 8000dpi from 4000dpi.

That will be a welcome switch for those who use multiple 4K or 5K monitors. Moving around all those pixels can mean dragging your mouse all over the desk, or picking it up and moving it often, and the high-res sensor really cuts down on the mouse travel necessary.

OPTIONS+
To go along with the launch of the MX Master 3S and new MX Mechanical keyboard, Logitech has a new Logi Options+ software to replace the old Logi Options software.

It's primarily a facelift, with the same broad-

You can pair it with three different computers and switch between them with the touch of a button.
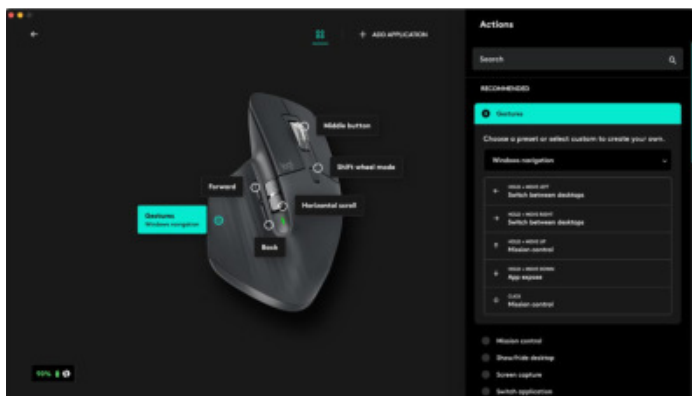
The new Logi Options+ software makes gives you lots of control over how the buttons and wheels operate.

stroke features as before: Choose mouse buttons and reassign their functions, even selecting OS features or specific shortcuts or keystrokes. There are global settings and you can assign new settings and button assignments per application.

Your options are saved to the cloud (with a Logitech account) and follow you to other systems you use Options+ on. The software also enables a feature called Flow that lets you move control from one computer to another just by moving the cursor off the edge of the screen (assuming your devices are paired to both and have Options+ installed

on both). You can even copy and paste between machines at the speed of your local network.

It works well enough, and I was even able to move easily between my iMac and Windows 11 PC. Thankfully, Options+ is a Universal app (good news for M1 Mac users), while the old Options app is Intel-only and runs under Rosetta emulation.

But it's not without faults. For starters, it only supports specific Logitech productivity gear, while Logitech gaming gear, Blue microphones, and webcams use the similar-but-a-little-different
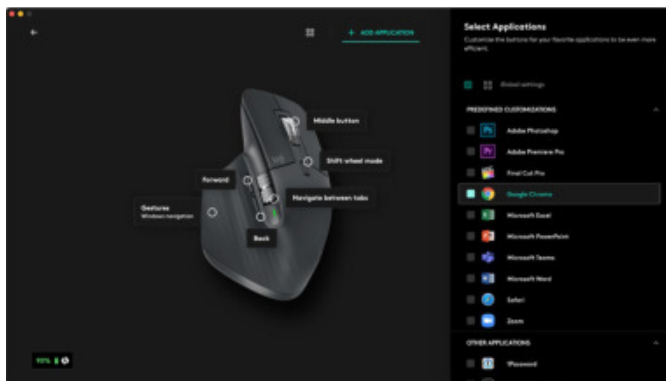
Per-app control allows you to make the mouse behave differently in different apps.

Logitech G Hub. I shouldn't have to run Options+ for my mouse and keyboard and G Hub for my webcam and Blue Yeti, but that's how it is.

What's more, there are features available in G Hub that seem arbitrarily missing from Options+, such as the ability to create multi-step macros. This isn't just a gamer feature—programmers would probably love that option, but you can't get it without buying a Logitech gaming peripheral to use G Hub (or relying on third-party mouse or keyboard macro software).

Logitech does say that Options+ will get features and support that Options never had. We can only hope that control over webcams and Blue microphones, as well as full macro control, are high on the list.

BOTTOM LINE

The MX Master 3S isn't much of an upgrade over the MX Master 3, but it doesn't need to

Logitech has taken what we still think is the best all-around mouse for Mac users and made it even better.

be. Logitech has taken what we still think is the best all-around mouse for Mac users and made it even better with a higher-resolution sensor and awesome quiet-click buttons that still feel great.

The new Options+ software is a nice facelift, and while we wish it would do more, it's some of the best first-party mouse and keyboard control software around. If you often use more than one computer, you'll especially appreciate how easy it is to use the MX Master 3S with up to three machines. ∎

🐁🐁🐁🐁½

Logitech MX Master 3S

PROS
• Quiet clicking.
• New 8000dpi sensor.
• Pairs with multiple computers.

CONS
• Right-handed only.
• Software could be more flexible.

PRICE
$99

COMPANY
Logitech

Hot Stuff

What we're raving about this month

SAMSUNG THE SERIF QLED 4K UHD HDR SMART TV

samsung.com

Samsung has a penchant for creating off-the-beaten-path TVs, and The Serif is perhaps furthest from the straight and narrow. This 120Hz, 4K UHD quantum-dot TV has a sculpted white bezel and case with protruding edges are reminiscent of the serifs on a font. The screen's matte coating is excellent at glare reduction and enhances the appearance of blacks. Overall, the Serif's picture quality is first-tier—but at the bottom of said tier—so you don't give up anything in exchange for its design.**—JON JACOBI**
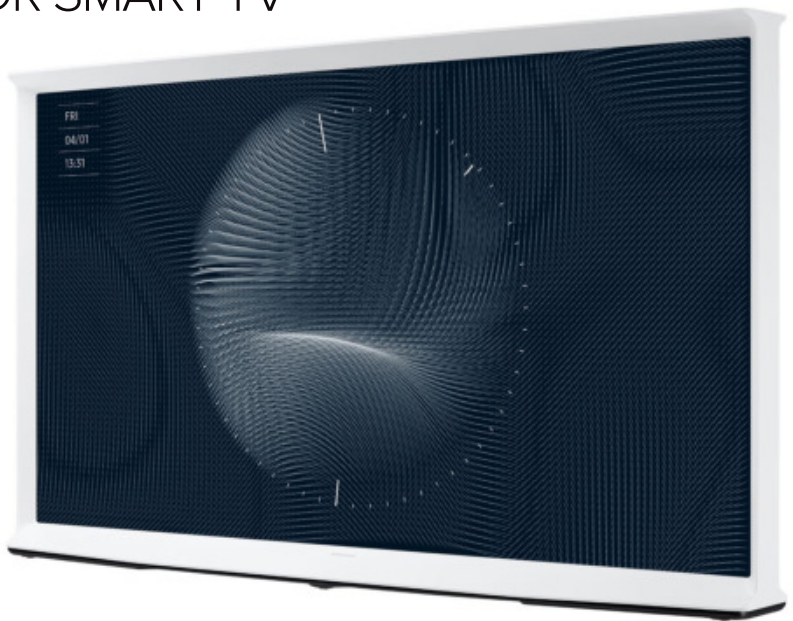
Hot Stuff

PHILIPS HUE GO PORTABLE TABLE LAMP

philips-hue.com

The Go portable table lamp comes with a circular charging dock that begins charging the lamp as soon as it's placed on the charging contact (the lamp isn't compatible with Qi wireless chargers). The charging base can give the Go lamp a full charge in about three or four hours, while the rechargeable battery can deliver up to 48 hours of battery life on the lamp's dimmest setting, or about six hours on its brightest setting.**—BEN PATTERSON**

WYZE SCALE X

wyze.com

Available in both black and white, the Scale X measures vital statistics such as weight, body fat percentage, lean body mass, BMI (body mass index), muscle mass, visceral fat, bone mass, metabolic age, and body water percentage. The Scale X also has three new modes: baby, pet, luggage, and pregnancy. The first three let you stand on the scale with a tyke, a small animal, or a packed suitcase, with the scale calculating the weight by subtracting your poundage. In pregnancy mode, the scale disables its electric currents to prevent any possible harm to an unborn child.**–ROMAN LOYOLA**

It's Up

to Us

#MaskUpAmerica

Help keep America open for business.

idsociety.org/masks

ad COUNCIL

IDSA
Infectious Diseases
Society of America

How to fix a water-damaged iPhone

Emergency tips to get water out of an iPhone that's been dropped in water and fix any damage. Here's how to dry out a wet iPhone.

BY DAVID PRICE

Water and technology are not usually happy bedfellows, so suddenly seeing your precious iPhone plummet into the sink, bath, or any other body of water can be a heart-stopping moment. Don't panic. All may not be lost, as modern phones are far more robust than those of yesteryear. In this article we explain the best strategies for dealing with a wet or water-damaged iPhone.

IMAGE: FOUNDRY

IS MY iPHONE WATERPROOF?

If you've purchased a new iPhone in the last few years, then there's a very good chance that it will be water-resistant, meaning it should happily survive short dips and the odd spilled beverage or two.

Smartphones, and other electronic devices, can be certified with something called an Ingress Protection or IP Rating (fave.co/3NzzB83). This instantly lets you know how water-resistant the product is, so you don't have to freak out if it slips out of your back pocket and drops into the loo (it happens!). There are multiple types of IP rating, but the two main ones that apply to iPhones are IP67 and IP68.

Here's what they mean:

IP67: Can survive submersion in up to 1 meter of water for a maximum of 30 minutes

IP68: Can survive submersion in up to 2 meters of water for a maximum of 30 minutes

Since the iPhone XS and XS Max, Apple has usually released its devices with IP68 protection. Here's the last few generations have lined up:

iPhone 6s and earlier: not rated
iPhone 7/7Plus: IP67
iPhone 8/8 Plus: IP67
iPhone X: IP67
iPhone XR: IP67
iPhone XS/XS Max: IP68
iPhone 11 range: IP68
iPhone 12 range: IP68
iPhone 13 range: IP68
iPhone SE 2020: IP67
iPhone SE 2022: IP67

Of course, things can still go wrong even with an apparently waterproof iPhone. If there is any residual water on or in your device after the incident, you should follow the advice below.

WHAT TO DO IF AN iPHONE GETS WET

1. Get the iPhone out of the water right away.

2. Do not plug in the iPhone. If it's plugged in already, unplug it (very carefully).

3. Do not turn it on. This can cause short circuits.

4. If the wet iPhone is in a case, take it out. Remove the SIM card too. Water can linger in these nooks and crannies.

5. With a soft towel or cloth, wipe liquid off everything you can reach.

6. Turn the iPhone upside down and give it a gentle shake to clear the ports and sockets.

7. Power off the iPhone—but read the below first.

SHOULD YOU TURN OFF A WET iPHONE?

As well as the above, we recommend that you turn your iPhone off. This should

enable you to avoid activating the circuits inside the iPhone, because this is likely to cause short circuits and long-term damage.

If the iPhone is switched off already, leave it off. Don't be tempted to power it on to see if it still works. It might, and then it might promptly stop working forever precisely because you took a look.

If your iPhone is switched on, you're looking at two unappealing options: Power down (but in the process cause the screen and operating system to wake up briefly before switching off), or leave the device in sleep mode and hope you don't get any notifications.

It's your decision, but after discussions here in the Macworld offices, we've decided that the lesser of two evils is to

If your iPhone is switched on, wake it briefly to do a full power off.

wake the iPhone briefly in order to do a full power off.

If you were lucky enough to be in Airplane Mode when you dropped the device, however, or you are confident that nothing will wake your iPhone in the next 48 hours, leaving it alone might be the better option.

HOW TO DRY OUT AN iPHONE WITH UNCOOKED RICE

Now we need to draw as much interior liquid out as possible. Resist the temptation to use a hair dryer or other heat treatment, as this can damage the iPhone's internal components.

To get moisture out of the iPhone's interior, you need a desiccant. Many people swear by uncooked rice, advising owners to put their damp iPad or iPhone in a big bowl of the stuff (cover it completely) and leave it there for 48 hours or so.

The rice will absorb the moisture effectively, and most of us have some uncooked rice in our homes (or can get hold of some fairly easily). But the process may get dust or even entire grains into the ports.

We discuss this method in more detail in our article: Rescue a soaked iPhone with the rice trick (fave.co/3IajlJt).

HOW TO DRY OUT AN iPHONE WITH SILICA GEL

A better option than uncooked rice, if you've got it, is silica gel—those little (inedible) packets that you'll find inside new handbags, packed with some electronic components, particularly if they've been shipped from a country with a humid climate, and most recently in COVID-19 test kits (let's face it most of us have plenty of those lying around).

You need enough gel packets to cover the iPhone. You may be able to buy them en masse from a craft shop, but you can easily buy multipacks on Amazon (fave.co/3bKHYk1). Silica gel sachets should dry a wet iPhone out more efficiently and less messily than rice, but you'll still need to give the iPhone at least 48 hours to dry out completely.

SHOULD YOU DISMANTLE AN iPHONE TO DRY IT OUT?

If you're really worried that there's liquid inside your iPhone, and confident about DIY repairs, there is always the option of opening up the device and drying it out. iFixit (fave.co/3PdgYrV) is a great site that takes you step-by-step through repairs and lets you know how tricky they may be.

Just bear in mind that this is likely to invalidate any warranty coverage you've got, and there's a risk that your DIY work

If you're really worried that there's liquid inside your iPhone, there is always the option of opening up the device and drying it out.

will cause damage rather than repair it. Still, the most effective way to get water from the inside of an iPhone is to get right in there and dry it out from within.

If it's possible, it could be worth your while to take the battery out (as it minimizes the potential for short circuits), but this can be quite a challenge with the adhesive approach Apple usually adopts for internal components. If you can, apply a soft, dry cloth to all interior surfaces, endeavoring to be as gentle as possible.

To be honest, we wouldn't recommend this approach, primarily because of its potential to exacerbate the problem, but in some situations it may be the only way to save the day and at least recover some of your data. If nothing else works and you're out of warranty, you may find yourself with nothing to lose.

HOW TO EJECT WATER FROM AN iPHONE SPEAKER

There is a last thing you can try if you find that water may be in your device. While most iPhones are water-resistant, that doesn't stop water from getting into the speaker grilles. Apple Watches come with a built-in feature that can be toggled to eject the water by playing a specific frequency, clearing out the speaker grilles in the process. Why iPhones don't feature a similar option is something of a mystery, but there is a relatively easy way to get the same results via a free app called Sonic (fave.co/3ODozzT; the Tone Generator, not the hedgehog).
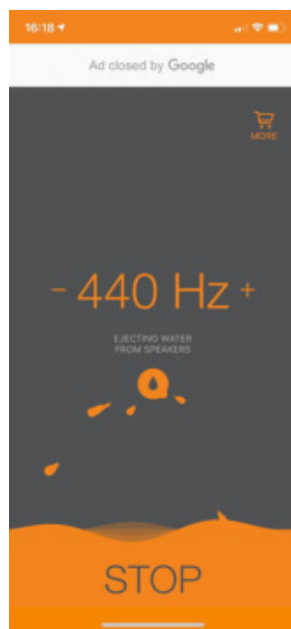
The Sonic app will play a specific frequency that ejects water from the speaker grille.

Simply download the app and tap the water droplet icon in the middle of the screen. This should cause the water to jump from the speaker so you can absorb it with a tissue. A paid version offers other frequency ranges, so if your music or podcasts sound a bit garbled after the iPhone takes a dip, this is worth a go.

WHAT TO DO NEXT

OK, so you've had your iPhone buried in rice or silica gel sachets for a couple of days. What next? If you think the device has successfully dried out, you can try switching it on. Should this not work, you can try returning it to the rice or silica and give it more time. If that doesn't do the job, then you'll want to get the internals checked out. Book an appointment with an Apple Genius (fave.co/3R4DtAY) to see if they can help rescue the device.

One final warning: Sometimes iPhones can be resurrected temporarily, but then succumb to the liquid damage at a later date, so we would advise that you back up (fave.co/3OYiKNp) all important files on the device in case it packs it in sometime in the future. As we said, its recovery, may only be temporary—although we hope not. If it turns out to be a terminal case, though, you can always browse our roundup of the best iPhone deals (fave.co/3sUMNg3) to see if you can find a bargain for its replacement. ■

U.S. lawmakers back push to force iPhone to switch to USB-C

EU rule to take effect this year.

BY MICHAEL SIMON

Following a move by the European Union (fave.co/3a4O3Hk) to force all smartphones and small electronics to use USB-C for charging instead of proprietary methods such as Lightning, U.S. lawmakers are urging the Commerce Department to enact a similar strategy.

In a letter to Commerce Secretary Gina Raimondo (fave.co/3l8ldRT), Sens. Ed Markey (D-MA), Elizabeth Warren (D-MA), and Bernie Sanders (I-VT) pressed for the agency "to coordinate with offices and agencies across the Department of Commerce to develop a comprehensive plan that will protect both consumers and

The move follows a similar ruling by the EU.

the environment by addressing the lack of a common U.S. charging standard."

The move is clearly aimed at Apple and the iPhone. While the letter calls out smartphones, tablets, portable speakers, and e-readers, the biggest device by far is the iPhone, which uses the proprietary Lightning cable over USB-C. The senators point out that the average consumer owns approximately three mobile phone chargers, while 40 percent of consumers report that, on at least one occasion, they have been unable to charge their mobile phone because of a lack of compatible chargers.

Therefore they want to establish "uniform charging accessory standards" that, if enacted, would force the iPhone

to switch to USB-C. Apple already uses USB-C on most of its other devices, including the Mac and iPad, and there are rumors that even the entry-level iPad will switch to USB-C (fave. co/3y14xZ6) this fall. That leaves the iPhone and a handful of accessories that still use Lightning.

The senators say the policy "has the potential to significantly reduce e-waste and help consumers who are tired of having to rummage through junk drawers full of tangled chargers to find a compatible one, or buy a new one."

By the time it makes its way through the legislative bodies, however, it might be a moot point since the EU is expected to enact its own USB-C rules later this year. ∎

There are rumors that even the entry-level iPad will switch to USB-C this fall.

You can now watch YouTube videos on your Apple Watch

WatchTube isn't quite the ideal viewing experience, but it's a cool idea.

BY DAVID PRICE

t's probably never occurred to you to watch videos on your Apple Watch's tiny screen, other than the occasional text movie. There's no browser, and Google hasn't shipped an official YouTube app (even though it does offer YouTube Music for Apple Watch). We're not going to say it's a good idea, but that problem has been solved. A new third-party app called WatchTube (fave.co/3OUNNcJ) has arrived with one mission: to let you watch YouTube videos on Apple's smartwatch.

The app is pretty simple, which makes sense given the limitations of the screen you'll be using to navigate the interface. There are four swipeable panes: an
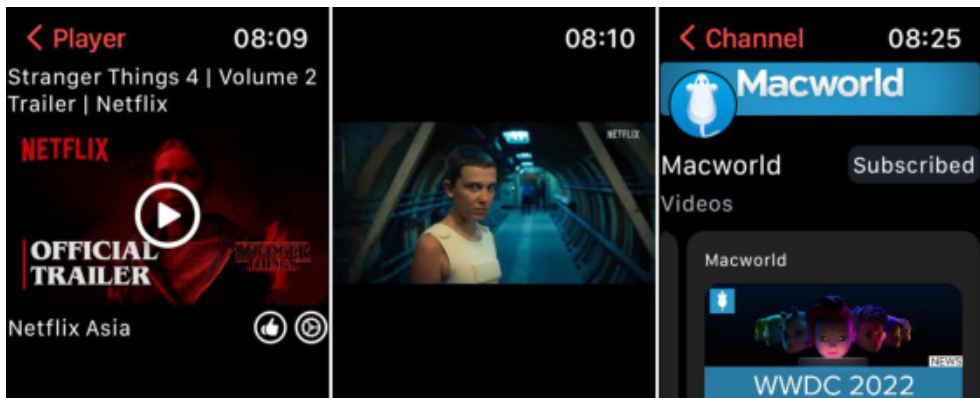
We found WatchTube a little awkward to use.

algorithmic home page, a search page, a personal library, and settings. It won't take long to get the hang of things. You can also see comments and enable captions.

While the app is simple in concept, we found it somewhat awkward to use. Entering searches is fiddly on the small keyboard, and it isn't always clear whether you need to tap a second button to trigger certain actions: Tapping on one of the suggested searches, for example, or pressing play on a video that you might expect to have started playing when you opened it. Videos and search queries frequently hung or returned errors, despite no apparent connection issues.
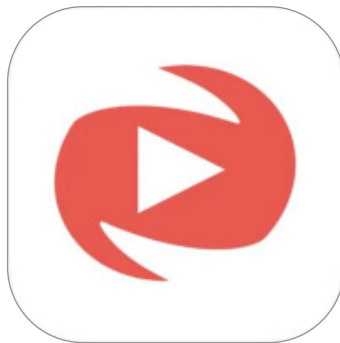
It's early days for the app, which at the time of writing is still on version 1.1.1, and some or all of these issues may be resolved in the future. The most recent update released on June 15 fixed several bugs and issues.

But it mostly works. You can find a video and watch it on the watch's 2-inch screen. Since the Apple Watch is square, videos will seem even smaller since the formatting will add black bars, so it doesn't feel quite as immersive as it does on your iPhone.

It's definitely a cool idea, but it's probably not going to become an essential part of your app library for the Apple Watch. ◼

Italian spyware iPhone attack: Why there's probably no need to worry

The attack underscores the importance of keeping iOS up to date.

BY ROMAN LOYOLA

Google's Threat Analysis Group (TAG) has published an article about spyware from RCS Labs (fave.co/3bLTYIn), an Italian company that targeted iPhones and Android phones in Italy and Kazakhstan. When installed, the spyware would monitor the user's messages and contacts.

However, Apple has fixed the exploits used by RCS Labs—some as far back as iOS 12's cycle from 2018 to 2019. iPhone users who regularly update iOS are not in danger of having their iPhone exploited by RCS Lab's spyware.

Google TAG listed the following exploits used by RCS Labs. We've listed

the iOS version when Apple issued a security patch and the links to its security notes. Apple also patched iPadOS, macOS, watchOS, and tvOS when applicable.

iOS 12: CVE-2018-4344 (aka LightSpeed); fave.co/3OEQS0M

iOS 12.3: CVE-2019-8605 (aka SockPuppet); fave.co/3RdKgZc

iOS 13.3.1: CVE-2020-3837 (aka TimeWaste); fave.co/3ugVEtq

iOS 13.6: CVE-2020-9907 (aka AveCesare): iOS 13.6; fave.co/3OE9D4H

iOS 15.0.2: CVE-2021-30883 (aka Clicked2); fave.co/3a7XndD

iOS 15.2: CVE-2021-30983 (aka Clicked3); fave.co/3a9FQBS

Google's article specifically states that users in Italy and Kazakhstan were identified as affected, but how widespread the attack was is not covered in the article, nor whether there was any possibility that users outside those two countries could have been affected.

According to Google, the attack started with sending a unique web link to a user. When the user activated the link, "the page attempted to get the user to download and install a malicious application." Google also believes the attack would disable the phone data connection, and the attacker would then send an SMS that told the user an attached link would restore the data connection. But the link was malicious and would install the spyware.
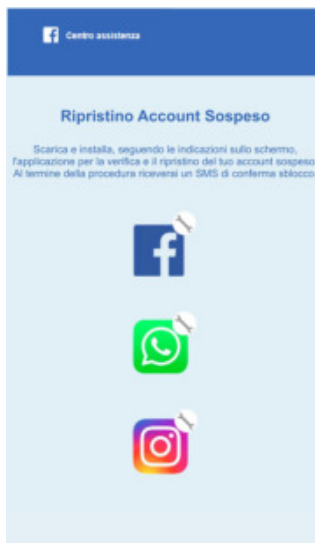
This is a screenshot of one of the sites controlled by the attackers.

HOW TO UPDATE THE OPERATING SYSTEM

Google's article is a good reminder of the importance of installing OS updates as soon as it's feasible. Updates usually include important security patches to protect you and your device. If you're not familiar with how to update your device, here are the steps:

iPhone and iPad: Tap Settings ➜ General ➜ Software Update.

macOS: Click the Apple menu ➜ System Preferences… ➜ Software Update.

watchOS: On your iPhone, open the Watch app. Then tap General ➜ Software Update.

tvOS: Open Settings. Then go to System ➜ Software Updates. ∎

REVIEW: 13-INCH M
A POWERFUL TWEEN

APPLE'S
NEW LAPTOP
IS STUCK
BETWEEN
THE LOW-
END AIR
AND THE
HIGH-END
M1 PRO/MAX
MACBOOKS.
**BY ROMAN
LOYOLA**

MACBOOK PRO M2

ER IN APPLE'S LINEUP

The new 13-inch MacBook Pro is a unique Mac laptop. It has the distinction of being the first Mac with the M2 system-on-a-chip, the second generation of Apple silicon for the Mac. And considering that the M1 made such a tremendous impression, the new 13-inch MacBook Pro has a little bit of a burden in following such a successful debut.

It does leave an impression, but it's not a jaw-dropping, awe-inspiring one. Maybe that's unfair because, after all, following the originator of the Mac rebirth is a tough task. And the new 13-inch MacBook Pro does offer better performance than its M1 predecessor.

What tempers the enthusiasm for the new 13-inch MacBook Pro is everything else about it—besides the M2, it's the same laptop as its predecessor. It's a good

PODCAST: SHOULD YOU BUY THE 13-INCH M2 MACBOOK PRO?
Listen now at fave.co/3adbpKW

laptop, but when you look at the other MacBooks in Apple's lineup that have gotten new enclosures and fancy eye-popping new displays to accompany their new chips, it's befuddling to see the 13-inch MacBook Pro still sporting a years-old design.

AN M2 SPEED BOOST

This review takes a look at the new 13-inch MacBook Pro with the following specifications:

> M2 system-on-a-chip with 8 CPU cores

> 10-core GPU

> 16GB of unified memory

> 1TB SSD

This configuration is priced at $1,899, $400 more than the $1,499 standard configuration that comes with 8GB of memory and 512GB of storage.

The marquee feature of the new 13-inch MacBook Pro is the M2. Its CPU architecture is based on its predecessor, the M1, with an 8-core CPU, but the four performance cores and four

efficiency cores have improvements that enhance performance. We have an article that examines the key differences between the M1 and M2 (fave.co/3OYkQgb) if you're interested in diving into the details.

Naturally, we benchmarked the new laptop and compared the results to its predecessor, but we also took a look at how it compares to the 2020 M1 MacBook Air and the 14-inch MacBook Pro with an M1 Pro SoC. In the table below are the specs for those MacBooks.

Before we take a look at the benchmarks, this one important point needs to be made: The MacBook Air in our testing here is, as noted in the spec table, the M1 model released nearly two years ago. Apple announced an M2

M1 SPECS COMPARED
Here's how Apple's MacBook Pros compare.

	13-INCH MACBOOK PRO M2	13-INCH MACBOOK PRO M1	MACBOOK AIR M1	14-INCH MACBOOK PRO M1 PRO
Chip	M2 (8-Core), 4 performance cores, 4 efficiency cores	M1 (8-Core), 4 performance cores, 4 efficiency cores	M1 (8-Core), 4 performance cores, 4 efficiency cores	M1 Pro (10-Core), 8 performance cores, 2 efficiency cores
Unified memory	16GB	8GB	8GB	32GB
GPU	10-Core	8-Core	7-Core	16-Core
SSD	1TB	256GB	256GB	1TB
Release date	June 2022	November 2020	November 2020	October 2021

GEEKBENCH 5
Single-core

13-inch MacBook Pro (2022) M2 8-Core	1,943
13-inch MacBook Pro (2020) M1 8-Core	1,724
MacBook Air (2020) M1 8-Core	1,730
14-inch MacBook Pro (2021) M1 Pro 10-Core	1,761

HIGHER SCORES ARE BETTER

GEEKBENCH 5
Multi-core

13-inch MacBook Pro (2022) M2 8-Core	8,908
13-inch MacBook Pro (2020) M1 8-Core	7,569
MacBook Air (2020) M1 8-Core	7,454
14-inch MacBook Pro (2021) M1 Pro 10-Core	9,944

HIGHER SCORES ARE BETTER

MacBook Air (fave.co/3NFo4nO) at the same time they revealed the 13-inch M2 MacBook Pro—in fact, the M2 Air was the marquee hardware announcement during the WWDC 2022 keynote, and the M2 MacBook Pro got a "by the way" mention. The Air won't be available until July and we hope to review it soon.

When it comes to performance claims, Apple doesn't usually exaggerate its numbers. The company claims an 18 percent improvement in general CPU performance for the M2 over the M1, so to test this we used Geekbench 5 (fave. co/3g8CyNZ), a popular benchmark for gauging a system's overall performance. In

the multi-core CPU test, we are able to confirm Apple's 18 percent claim. The single-core CPU test showed a lower 13 percent increase for the M2.

The M2 MacBook Pro is 10 percent slower than the 14-inch MacBook Pro with a 10-core M1 Pro—as far as general-purpose performance goes, that's actually noteworthy for the M2 MacBook Pro. But as we'll see in other benchmarks, the 14-inch MacBook Pro certainly validates its value.

Cinebench R23 performs 3D modeling and is a multi-threaded test that puts constant stress on the CPU and is not intended to gauge performance bursts. The more cores a CPU has, the better. In

CINEBENCH R23
Single-core

13-inch MacBook Pro (2022) M2 8-Core	1,623
13-inch MacBook Pro (2020) M1 8-Core	1,513
MacBook Air (2020) M1 8-Core	1,496
14-inch MacBook Pro (2021) M1 Pro 10-Core	1,526

HIGHER SCORES ARE BETTER

CINEBENCH R23
Multi-core

13-inch MacBook Pro (2022) M2 8-Core	8,733
13-inch MacBook Pro (2020) M1 8-Core	7,778
MacBook Air (2020) M1 8-Core	6,838
14-inch MacBook Pro (2021) M1 Pro 10-Core	9,428

HIGHER SCORES ARE BETTER

the Cinebench Multi-Core test, the M2 MacBook Pro posted a 12 percent boost over the M1 MacBook Pro. And the M2 MacBook Pro is 8 percent slower than the 14-inch MacBook Pro with the M1 Pro.

An interesting point of comparison is the M2 MacBook Pro and the M1 MacBook Air—the M2 laptop is 28 percent faster. Looking back to a comparison of the two M1 laptops, the M1 MacBook Pro was 14 percent faster than the M1 MacBook Air, so the new MacBook Pro doubles the performance. Even though the 13-inch MacBook Pro and the MacBook Air have the same processor, the Pro has an internal fan and the Air doesn't. That fan helps the MacBook Pro maintain a proper operating temperature so the CPU can keep chugging along. On the other hand, the MacBook Air's CPU has to throttle down when it starts to get too hot, affecting performance.
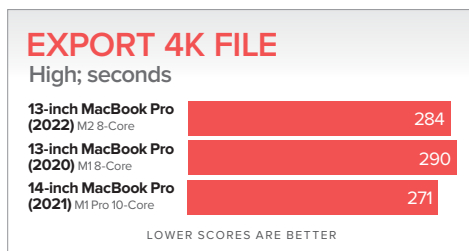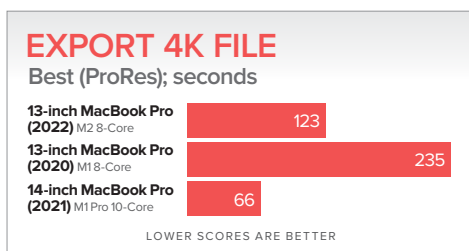
We have to wait and see how the M2 13-inch MacBook Pro and the MacBook Air compare with sustained CPU activity, like that in the Cinebench R23 test. But we'll probably see a difference similar to what we saw with the M1 laptops.

One of the CPU enhancements that Apple made to the M2 is an upgrade to the chip's media engine. It does a better job of encoding and decoding audio and video, and the results of our iMovie tests show a great improvement. The media

STABILIZE SHAKY VIDEO
Seconds

13-inch MacBook Pro (2022) M2 8-Core	271
13-inch MacBook Pro (2020) M1 8-Core	334
14-inch MacBook Pro (2021) M1 Pro 10-Core	231

LOWER SCORES ARE BETTER

EXPORT 4K FILE
Best (ProRes); seconds

13-inch MacBook Pro (2022) M2 8-Core	123
13-inch MacBook Pro (2020) M1 8-Core	235
14-inch MacBook Pro (2021) M1 Pro 10-Core	66

LOWER SCORES ARE BETTER

EXPORT 4K FILE
High; seconds

13-inch MacBook Pro (2022) M2 8-Core	284
13-inch MacBook Pro (2020) M1 8-Core	290
14-inch MacBook Pro (2021) M1 Pro 10-Core	271

LOWER SCORES ARE BETTER

engine includes acceleration for ProRes video and we saw a drastic change when exporting a 4K video at Best (ProRes) quality: The M2 MacBook Pro exported the video in nearly half the time of the M1 MacBook Pro. When exporting the same video at High quality (not ProRes), the performance was practically the same.

On the same video file, we also timed how long it took to stabilize shaky video. The M2 MacBook Pro cut the time it took

HANDBRAKE 1.4
H.265 x265; seconds

13-inch MacBook Pro (2022) M2 8-Core	935
13-inch MacBook Pro (2020) M1 8-Core	931
MacBook Air (2020) M1 8-Core	1,415
14-inch MacBook Pro (2021) M1 Pro 10-Core	675

HIGHER SCORES ARE BETTER

HANDBRAKE 1.4
H.265 VideoToolbox; seconds

13-inch MacBook Pro (2022) M2 8-Core	250
13-inch MacBook Pro (2020) M1 8-Core	273
MacBook Air (2020) M1 8-Core	326
14-inch MacBook Pro (2021) M1 Pro 10-Core	190

HIGHER SCORES ARE BETTER

for the M1 MacBook Pro to process the video by 19 percent.

The M2's media engine is the same as the one found in the M1 Pro/Max, but the 14-inch MacBook Pro in our testing has a lot of other components to help it zoom past the M2 MacBook Pro, such as more CPU cores (and more performance cores), more RAM, and more memory bandwidth.

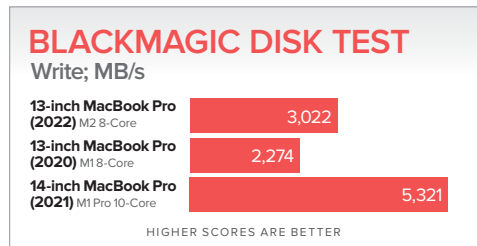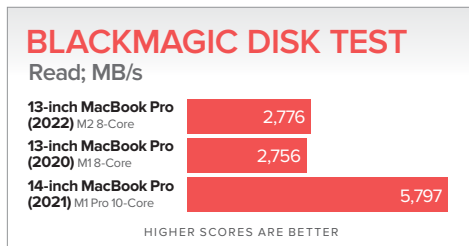To further gauge CPU performance, we used Handbrake to encode the Tears of Steel (fave.co/2SWqjfx) video from 4K to a 1080p H.265 file. When doing the encode completely in software, the M2 and M1 MacBook Pros finished at the same time. Handbrake has a setting called H.265 VideoToolbox, which takes advantage of

available hardware acceleration, and when using VideoToolBox, the M2 MacBook Pro had a 9 percent improvement.

When it comes to the SSD, there's definitely an improvement in write speed for the 13-inch M2 MacBook Pro's SSD. In the Blackmagic Disk Test benchmark, we saw a 33 percent increase with the M2. The M2's read results were the same as the M1's. This was with the 1TB SSD.

Update June 27, 2022: Created Tech (fave.co/3OGRhjj) and Max Tech (fave. co/3P4T6Xl) tested the $1,299 13-inch MacBook Pro with a 256GB SSD and their results show that the SSD's read speeds are significantly slower (fave.co/3P3gLqS) than the M1-based 13-inch MacBook Pro.

BLACKMAGIC DISK TEST
Read; MB/s

13-inch MacBook Pro (2022) M2 8-Core	2,776
13-inch MacBook Pro (2020) M1 8-Core	2,756
14-inch MacBook Pro (2021) M1 Pro 10-Core	5,797

HIGHER SCORES ARE BETTER

BLACKMAGIC DISK TEST
Write; MB/s

13-inch MacBook Pro (2022) M2 8-Core	3,022
13-inch MacBook Pro (2020) M1 8-Core	2,274
14-inch MacBook Pro (2021) M1 Pro 10-Core	5,321

HIGHER SCORES ARE BETTER

GEEKBENCH 5 OPEN CL

13-inch MacBook Pro (2022) M2 8-Core	27,284
13-inch MacBook Pro (2020) M1 8-Core	19,309
MacBook Air (2020) M1 8-Core	16,804
14-inch MacBook Pro (2021) M1 Pro 10-Core	34,946

HIGHER SCORES ARE BETTER

GEEKBENCH 5 METAL

13-inch MacBook Pro (2022) M2 8-Core	30,001
13-inch MacBook Pro (2020) M1 8-Core	21,842
MacBook Air (2020) M1 8-Core	19,283
14-inch MacBook Pro (2021) M1 Pro 10-Core	38,688

HIGHER SCORES ARE BETTER

The new M2-based laptop has SSD read speeds that are 50 percent slower, while write speeds take a 30 percent hit. It turns out that Apple is using a single 256GB NAND flash storage chip instead of a pair of 128GB chips that are working in parallel and provide faster performance.

The problem with this slower performance goes beyond simply opening and saving files. When the CPU runs out of unified memory, it moves items it's not using into a swap file on the SSD. The CPU will swap items back and forth between the unified memory and the SSD until it doesn't need to anymore. If the SSD is slow, then the CPU takes longer to swap, and that affects the overall performance of the Mac. So if you are thinking of getting the 256GB SSD, consider upgrading the unified memory to 16GB or 24GB to minimize swap memory issues.

The M2 MacBook Pro has two more GPU cores than its predecessor, so it's no surprise that it's faster. Apple touts a 35 percent increase in speed, and our

Geekbench 5 Metal results were a couple of points better with a 37 percent boost. In Geekbench 5's OpenCL test, the M2 MacBook Pro had an even bigger boost of 41 percent—but Apple wants developers to use Metal (fave.co/3ujjjJC) for graphics, and even devoted a good amount of time in the WWDC 2022 keynote to promote the benefits of Metal 3 (fave.co/3peNCO1), the update to the Metal rendering engine.

The video game benchmarks we ran involved older games, but *Rise of the Tomb Raider* and *Civilization VI* were popular. However, older games mean older graphics implementations. We did see increases in frame rates for the M2 MacBook Pro over the older M1 laptops, but we want to see what kind of frame rates we'll get with games using Metal 3.

STILL GOOD BUT NOT BETTER BATTERY LIFE

When the M1 was released, a lot was said about its power efficiency and the long battery life of the 13-inch M1 MacBook Pro.

RISE OF THE TOMB RAIDER
1,920x1,200 (High); Frames per second

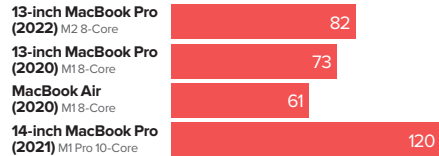|	
13-inch MacBook Pro (2022) M2 8-Core	52
13-inch MacBook Pro (2020) M1 8-Core	30
MacBook Air (2020) M1 8-Core	37
14-inch MacBook Pro (2021) M1 Pro 10-Core	87
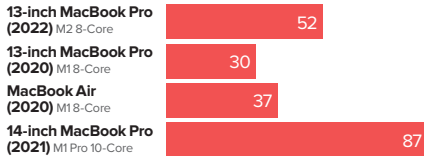
HIGHER SCORES ARE BETTER

RISE OF THE TOMB RAIDER
1,280x800 (Medium); Frames per second

13-inch MacBook Pro (2022) M2 8-Core	82
13-inch MacBook Pro (2020) M1 8-Core	73
MacBook Air (2020) M1 8-Core	61
14-inch MacBook Pro (2021) M1 Pro 10-Core	120

HIGHER SCORES ARE BETTER

CIVILIZATION VI
1,920x1,200 (High); Frames per second

13-inch MacBook Pro (2022) M2 8-Core	53
13-inch MacBook Pro (2020) M1 8-Core	38
MacBook Air (2020) M1 8-Core	34
14-inch MacBook Pro (2021) M1 Pro 10-Core	50

HIGHER SCORES ARE BETTER

CIVILIZATION VI
1,280x800 (Medium); Frames per second

13-inch MacBook Pro (2022) M2 8-Core	69
13-inch MacBook Pro (2020) M1 8-Core	53
MacBook Air (2020) M1 8-Core	55
14-inch MacBook Pro (2021) M1 Pro 10-Core	66

HIGHER SCORES ARE BETTER

The new M2 is faster than the M1, but even Apple's own benchmarks show that the M2 uses more power, though it's still much more power-efficient than other CPUs out there.

Apple claims 20-hour battery life for movie playback in the Apple TV app, and in our video playback test, it fell short at 16 hours. That's 2 hours less than what we experienced with the M1 MacBook Pro, but it's still 6 hours more than what we found with Intel-based 13-inch MacBook Pros from 2019 and 2020.

The 13-inch MacBook Pro ships with a 67W power adapter with a single USB-C port. If you're looking at Apple's new 35W Dual USB-C Port Power Adapter (fave. co/3nz4P4G) or a 35W Dual USB-C Port Compact Power Adapter (fave. co/3R9bMqt; both are $59) so you can charge two devices at the same time, know that Apple doesn't list the MacBook Pro as a compatible device—the only laptops listed are the MacBook Air (2018 and later) and the 12-inch MacBook that was last sold in 2017.

The 13-inch MacBook Pro doesn't have MagSafe, which is on the new MacBook Air and the higher-end MacBook Pros. That's unfortunate because that means you have to use one of the two USB-C ports on the laptop to charge. If you need

to use both of the ports for external devices and you need to charge, you have to disconnect one of the devices. It's a good idea to get a USB-C hub, and we have some recommendations.

If you're looking for a multi-port power adapter, we highly recommend going with a third-party one—they're more affordable, smaller, and have more features. For example, the Anker 736 Charger is $80 (available on Amazon; fave.co/3OWWyTE), so it's more expensive than Apple's dual-port chargers, but it's a 100W charger with three ports. Its laptop port charges at 100W when only a laptop is connected, at 60W or 80W when another device is connected, and at 40W when all three ports are in use. Plus, it's smaller than Apple's 67W charger.

The 13-inch MacBook Pro charges through one of its two USB-C ports.

EVERYTHING ELSE IS THE SAME AS BEFORE

Earlier, I said that the M2 SoC is the marquee feature of the new 13-inch MacBook Pro. Actually, it's the only new feature of the new 13-inch MacBook Pro other than Spatial Audio support and a slightly better headphone jack (read: M2 MacBook Pro versus M1 MacBook Pro [fave.co/3P5hYxR]). It's not an exaggeration to say that Apple simply took out the M1 and replaced it with the M2, and voilà—you have a new laptop. (Editor's note on June 28, 2022: YouTuber Luke Miani found out that is it a bit of an exaggeration [fave.co/3yabFlY].) But here's the thing: Back when Apple released the M1 MacBook Pro in 2020, it did the same thing. It took the Intel infrastructure out of the 13-inch MacBook Pro and placed the M1 inside it. Essentially, the M2 is in a laptop body that has been in use since 2016 (not counting the whole keyboard debacle [fave.co/3nB4D4G] as a design change).

There's nothing functionally wrong with the 13-inch MacBook Pro design, but when you sit it next to the 14-inch MacBook Pro, it looks dated with its big bezels and sharper

The 13-inch M2 MacBook Pro (left) and its big ol' bezels make it look dated next to the 14-inch M1 Pro MacBook Pro.

edges, and the 14-inch model has brushed metal that's smoother to the touch. Even the M2 MacBook Air got a redesign that gives it a modern look and makes it a more attractive buy than the 13-inch MacBook Pro. During the Mac portion of the WWDC 2022 keynote, a picture of the MacBook lineup appears, and the 13-inch MacBook Pro stands out among the four laptops—and not in a good way.

The keyboard and display are the same as before, and they're still good-quality components, but the M2 MacBook Air now has a Liquid Retina display that's bigger (thanks to smaller bezels). The laptop still has only two Thunderbolt/USB 4 ports on the left side, and a headphone jack on the other side. You still get the Touch Bar, the LCD touch input strip that sits atop the keyboard where the function keys usually are.

A major knock against the M2 MacBook Pro (as well as the $999 M1

MacBook Air [fave.co/3Icyp9o] that Apple sells) is that it has a 720p FaceTime camera, not the 1080p version in the M2 MacBook Air and the 14- and 16-inch MacBook Pro. The best thing to say about the 720p camera is that it works. Otherwise, it's a major step down from the 1080p camera. Users of the M2 MacBook Pro will want to upgrade to macOS Ventura (fave.co/3yFUF8E) in the fall to take advantage of the new Continuity Camera feature that lets you use an iPhone as a webcam.

BOTTOM LINE

Throwing a wrench into the buying considerations for the M2 MacBook Pro is the upcoming M2 MacBook Air. We haven't seen it yet, but by the looks of it, its specs, and its price, the MacBook Air could be a better buy.

We have a couple of articles that cover why you should wait for the MacBook Air before deciding. Lloyd Coombes covers the key differences between the two laptops (fave.co/3NFgWaL), and Jason Snell examines why the M2 MacBook Pro even exists at all (fave.co/3If20PD). But in a nutshell, here's why the MacBook Air is a better choice:

> The M2 MacBook Air is a better value.

> The M2 MacBook Air has a bigger and better display.

> The M2 MacBook Air is lighter.

> The M2 MacBook Air has more color choices.

> The M2 MacBook Air has a MagSafe port.

And here are the reason why the 13-inch MacBook Pro is the laptop for you:

> The M2 MacBook Pro has a cooling fan, enabling it to have better performance with extended CPU tasks.

> The M2 MacBook Pro has the Touch Bar, and Touch Bar haters (fave.co/3qa7N1V) need to shut up.

> The M2 MacBook Pro has a slightly bigger battery and thus it has a slightly longer battery life.

> The M2 MacBook Pro has the "Pro" name if "Air" just doesn't do it for you.

The 13-inch MacBook Pro is something of a misfit in the MacBook lineup. Starting at $1,299, it's $100 more than the base M2 MacBook Air that has the same SoC, and it looks like a laptop from 2020, not 2022.

The Touch Bar lives to see another day.

The 13-inch MacBook Pro is a good, solid laptop, but it's not as compelling as the other models Apple sells.

While we haven't seen the M2 MacBook Air yet, if history is any indication, then the 13-inch MacBook Pro will continue in its role as a lower-priced laptop made for handling sustained CPU-intensive tasks for users who find the $1,999 14-inch MacBook Pro M1 Pro too expensive. Cost-conscious media producers, developers, graphic artists, and other users who want speed on a budget will get what they need from the 13-inch MacBook Pro—but they'll look at the other Mac laptops longingly. ■

13in M2 MacBook Pro

PROS
- M2 provides speed and graphics boosts.
- It's the only model with a Touch Bar.

CONS
- Other MacBooks have displays with better quality and smaller bezels.
- Mediocre 720p FaceTime camera.

PRICE
$1,899

COMPANY
Apple

WHY APPLE'S NEWEST CHIP ISN'T THE BEST

BUT THAT SHOULDN'T STOP YOU FROM BUYING ONE. BY JASON CROSS

M1
PRO

M1
MAX

M1
ULTRA

M2

Apple's M2 is here…or it will be shortly, when the 13-inch MacBook begins shipping on June 24. As expected, the M2 is a nice upgrade over the M1 (fave.co/3OYkQgb), but not revolutionary. There are improvements in every part of the system-on-chip; the CPU, GPU, memory system, Neural Engine, and media engine.

Clearly, the M2 is superior to the M1 (fave.co/3OYkQgb), but it now begs the question: Is it worth buying a Mac with the M1 Pro, M1 Max, or M1 Ultra anymore? Just because the second generation of Apple silicon is here, does that mean the first generation has reached the end of the line?

We don't have benchmarks yet, but in general, the answer to that is going to be yes, with the differences becoming starker as you move up the performance stack. If anything, it's those considering the M1 Pro simply to get more memory or GPU performance that might be tempted by the M2. Here's how the products stack up.

M2 VS M1 PRO

The M1 Pro has a CPU with up to eight performance cores (twice that in the M2) and two efficiency cores (half that of the M2). It's 10 cores for the M1 Pro versus 8 for the M2, but with the M1 Pro leaning more heavily toward performance cores.

The M1 Pro generally offered CPU performance about 60 percent higher than the M1's. Apple says the M2's CPU is 18 percent faster than the M1's (and recently leaked benchmarks [fave.co/3yF3AHi] back up those numbers), so there's still a pretty substantial gap there. When the benchmarks arrive, we suspect the M1 Pro will still deliver multi-core performance that is around 35 percent higher than the M2's.
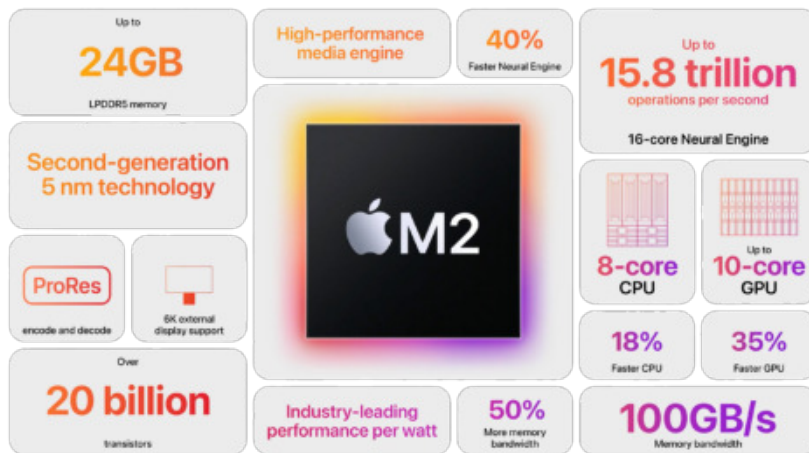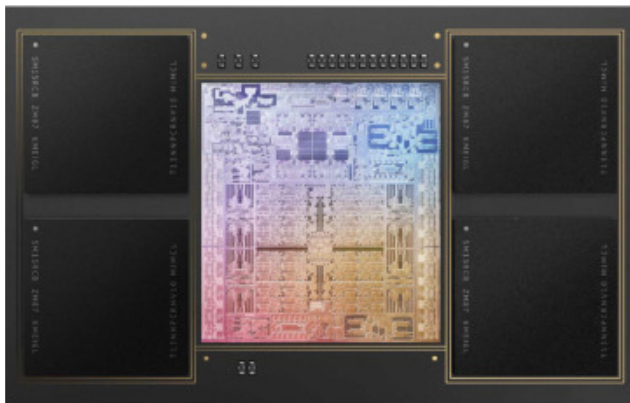

There are improvements in every part of the system-on-a-chip.

The M2's GPU is 35 percent faster than that of the M1, according to Apple. But the M1 Pro, with up to 16 GPU cores and way more memory bandwidth, is about twice as fast as the M1. So expect the M1 Pro to still come in around 40 percent faster than the M2.

Similarly, the M2 offers more maximum memory (24GB) and memory bandwidth (100GB/sec) than

Apple's M1 Max has the same CPU as the M1 Pro but adds more graphics power.

the M1. But the M1 Pro allows up to 32GB of memory and up to 200GB/sec of memory bandwidth.

Interestingly, the M2's upgrade to the media engine actually appeared in the M1 Pro. You get improved H.264 and HEVC encode and decode performance and ProRes support in the M1 Pro, while you didn't in the M1. As far as we can tell, it's the same media engine—it just landed in the M1 Pro first.

The one area where the M2 has a clear performance advantage over the M1 Pro is in the Neural Engine—Apple's custom hardware to accelerate machine learning and AI software. They both feature a 16-core Neural Engine, but the M1 Pro has the same Neural Engine as the M1 (and A14), capable of 11 trillion operations per second. The M2's newer-generation 16-core Neural

Engine can handle a reported 15.8 trillion ops, making it more than 40 percent faster.

In sum, expect a Mac with the M1 Pro to be a good 30 to 40 percent faster than the M2 in every way, with the exception of the media engine (which appears to be the same) and the Neural Engine (in which the M2 is 40 percent faster).

M2 VS. M1 MAX

If the M1 Pro is faster than the M2 in most ways, the M1 Max certainly will be. It has the same CPU, so performance there won't change—still likely about 35 percent faster than the M2.

The GPU is twice as big, and it offers twice the maximum memory with twice the memory bandwidth of the M1 Pro. Expect GPU performance roughly 2.5 times that of the M2. The M1 Max has two media engines,

giving it similar features but double the performance of the M1 Pro or M2.

But the M1 Max only has one 16-core Neural Engine, of the same generation as that in the M1 and M1 Pro, which means the M2's Neural Engine is likely 40 percent faster.

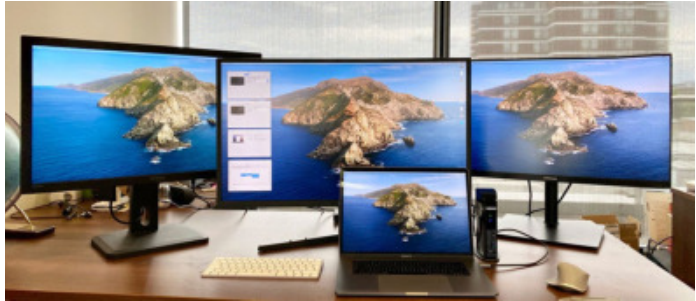**You'll still need an adapter to plug the new M2 MacBook Pro into more than one display.**

M2 VS. M1 ULTRA

The M1 Ultra is essentially two M1 Max chips sewn together with a super-fast interconnection, so you can take everything about the M1 Max and double it. You get 20 CPU cores, so it'll be more than 2.5 times faster than the M2's CPU. The GPU is up to 64 cores, and is likely 5 times faster than the M2. There are four media engines, too.

In fact, the M1 Ultra will actually beat the M2 in *every way*, including the Neural Engine, because it has *two* 16-core Neural Engines. While they each do 11 trillion ops, the combined 22 trillion ops is still about 40% faster than the next-generation Neural Engine in the M2.

M2: EXTERNAL DISPLAY SUPPORT

If you really care about hooking your MacBook up to multiple external displays,

you should know that the first products to include the M2—the new MacBook Air and the updated 13-inch MacBook Pro—only support a single external display with a resolution up to 6K at 60Hz. In this respect, it is just like the M1. You can work around the limitation with DisplayLink adapters and drivers (fave.co/3RbaED1), but you can't simply plug in two monitors.

It's unclear if this is a limitation of the chip itself or the products it is used in so far. A hypothetical updated Mac mini or other product with more than one pair of Thunderbolt ports might support more displays, but such a product might never exist. The current M1 Mac mini has one pair of Thunderbolt ports that support a single 6K display and one HDMI port that supports up to 4K at 60Hz.

The M1 Pro supports two external 6K displays and the M1 Max supports three 6K displays and one 4K display on the MacBook Pro. The Mac Studio supports

four 6K displays and one 4K display over HDMI whether you have the M1 Max or the M1 Ultra.

SHOULD YOU WAIT FOR M2 PRO, M2 MAX, OR M2 ULTRA?

We certainly don't know exactly what to anticipate from the M2 Pro, Max, and Ultra (fave.co/3NzwOM6). It seems reasonable to expect that Apple will follow the same strategy it did with the M1, increasing CPU and GPU core counts, memory bandwidth, and media engines while keeping the Neural Engine the same (save for the M2 Ultra). But we don't really expect these chips to come soon. It will likely be at least late 2022 before an M2 Pro and/or an M2 Max is announced, and at least another six months after that before we get the M2 Ultra. It's possible that we won't see any of those chips until mid-2023.

And of course, they will appear in more *expensive* Macs, while the M2 Ultra, like the M1 Ultra, will probably not appear in any laptop. If you are thinking of buying the entry-level $1,999 14-inch MacBook Pro (fave.co/3akP8ea),

with an M1 Pro that has an 8-core CPU and 14-core GPU, along with 16GB of RAM and 512GB of storage, you might want to seriously consider the upcoming M2 MacBook Air instead. Similarly configured, it would cost $1,699 (fave.co/3NBgb2A), and you'd only give up a couple of ports, a tiny bit of screen size, and a tiny bit of performance. It could well be worth the lower price, not to mention size and weight.

If you want a MacBook Pro with the full 10/16-core M1 Pro setup, or anything more powerful than that, you probably shouldn't let the existence of the M2 concern you just yet. It's only when the M2 Pro, Max, and Ultra hit the scene that it will really matter, and that's probably at least six months away. ■

If you are thinking of buying the entry-level 14-inch MacBook Pro, then you might want to consider the M2 MacBook Air instead.

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WORKINGMAC

Apple Preview vs. Adobe Acrobat DC: Should you pay to edit PDFs?

Let's see how Apple's Preview app compares to Adobe Acrobat for PDF handling.

BY CHRIS BARYLICK

For years, a quiet-but-present arms race has been happening between Apple's Preview application and Adobe's Acrobat Reader for PDF supremacy. The conflict surfaces whenever a user has to open and work with a PDF file on their Mac, the long-running suggestion for both Mac and Windows users being to download and install Adobe Reader.

Apple's Preview app has gone a long way with its PDF support, and for most people, it offers all the tools needed. Adobe Acrobat may be the better app if
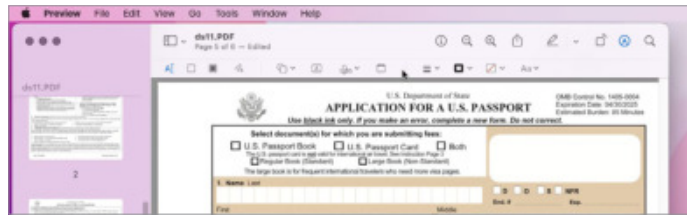
you're working with PDFs on a regular basis. Let's investigate the main differences between Apple Preview and Adobe Acrobat for PDF handling. You might also take a look at our roundup of the best free PDF editors for Mac (fave.co/3udofzG).

Preview has a toolset that will satisfy most people's needs: form filling, signatures, text boxes, and more.

APPLE PREVIEW

Apple's Preview application is free and bundled with macOS. It began as a small, handy jack-of-all-trades graphics app and has become much more useful over the years.

We used version 11.0 of Preview under macOS Monterey 12.4, which comes with editing tools that allow for fairly easy markup of PDF files, as noted in this Apple support document (fave.co/3R39Hwd). Some of the edits you can make to PDFs while using Preview include:

> Easily remove or rearrange individual pages in a multi-page PDF file

> Merge and add pages

> Annotate and highlight specific text

> Add shapes and text boxes

> Redact text

> Fill out fillable PDF forms

> Sign documents by creating a signature with your mouse, trackpad, or stylus

It's not the perfect editing tool for editing PDFs outside of Adobe Acrobat, but it gets you most of the way there and undercuts some of the need to sign up for Adobe's subscription-based service.

Additionally, Preview loads quickly and opens just about every file format you can throw at it, including some surprising formats such as Adobe Illustrator, EPS, FAX, Microsoft PowerPoint, Adobe Photoshop, RAW, and TIFF. Many of the edits that you can make to PDFs using Markup you can also do to image files, and you can use other image editing tools such as color adjustments (exposure, contrast, saturation sharpness, and more).

Preview is an excellent tool to open and export files to just about any file format. For example, you can open a TIFF and convert it to a JPEG. While Preview doesn't currently open the WebP graphics file format (and neither does Adobe Acrobat), you can work around this by removing the .webp file

extension in the file name and changing it to .jpg, .gif, or whatever file format works best for you.

ADOBE ACROBAT READER DC, STANDARD DC, AND PRO DC

Adobe offers three apps for PDFs: Acrobat Reader DC, Acrobat Standard DC, and Acrobat Pro DC. First, here are quick summaries of each app. Then we'll go more in-depth.

Acrobat Reader DC: This app is more like Apple Preview, but it has a smaller set of features. It allows you to read, comment, sign, and print PDFs. It also tracks feedback notations. That's it. It's free.
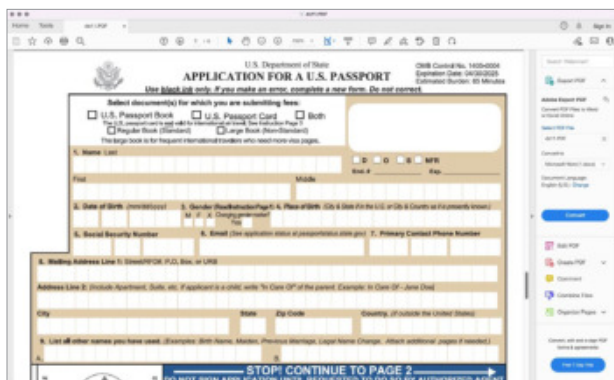
Acrobat Standard DC: This app has more creation tools than Reader DC, such as editing tools, export tools, and more. It costs $13 per month.

Adobe Acrobat Reader DC's tools are limited and the app feels more like a means to get you to upgrade to Acrobat Standard or Pro DC.

Acrobat Pro DC: Pro has even more creation tools than Standard DC, including comparison tools, conversion of scanned documents into PDFs, and more. It costs $15 per month.

Although Acrobat Reader DC and Acrobat Standard and Pro DC are tied into Adobe's subscription programs, there are a lot of good things to be said about them. Reader's speed has improved in recent versions, and while Reader brings up memories of absolutely needing to download and install Adobe's Creative Cloud software to have a hope of opening a critical PDF file, the current versions of Reader DC and Acrobat Standard and Pro DC can open and export to a stunning array of file formats, including Microsoft Word document, text files, HTML files, Corel WordPerfect files, OpenOffice and StarOffice files, 3D files, Autodesk AutoCAD files, Microsoft Project files, and assorted video formats.

Adobe does have, however, a pesky subscription request alert, regardless of which Acrobat DC app you use. Upon opening your first PDF file in Acrobat and unless you make a decision and click the "Do not show this message again" box, Acrobat DC will endeavor to make itself your

default application for opening and working with PDF files. Follow-up ads promote subscriptions to the Adobe Acrobat DC platform to gain access to editing, markup, export, and security features for your documents. This built-in advertising can drive users out of their minds.

A subscription to Adobe Acrobat Standard or Pro DC gives you the benefit of being able to cleanly mark up and edit PDF files and having part of a suite that plays nicely with other Adobe programs such as Illustrator, Lightroom, InDesign, and others. Your subscription fee gives you access to features such as editing PDFs, adding comments, text recognition, file conversion to PDF format, and signing features such as requesting signatures, creating areas of a PDF file that can be

signed, and form creation that have become staples of web-based business.

If your infrequent needs for PDF editing tools make Adobe's subscription fee seem excessive, there are other apps that allow for comprehensive PDF file editing and offer one-and-done software payment. Skim functions as a free, open-source PDF reader and editor, and Smile Software's excellent PDFpen software adds a comprehensive set of PDF editing and markup tools for a one-time payment of $80.

BOTTOM LINE

If your PDF needs are limited to completing forms, signing documents, and other basic functions, Preview should be enough and it's on every Mac. Adobe Acrobat Reader DC is free but has a smaller feature set than Preview.

But while Apple has snuck up and taken on a lot of Adobe Acrobat's functionality in recent years, Adobe has made itself an iconic brand name for professionals. If your PDF needs are more production-oriented and happen regularly, then you can really use the tools offered in Adobe Acrobat Standard or Pro DC. ◼
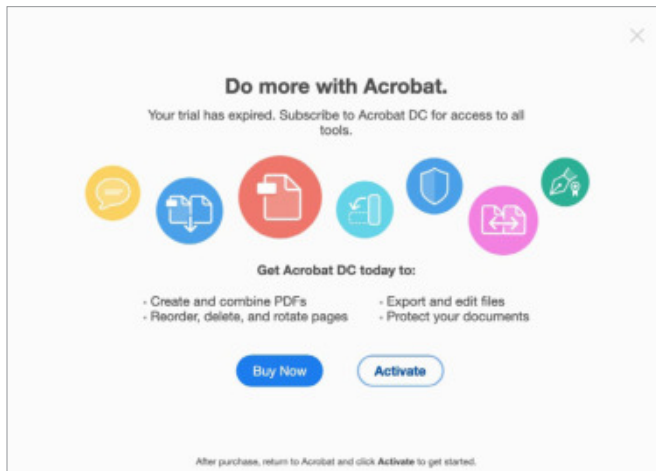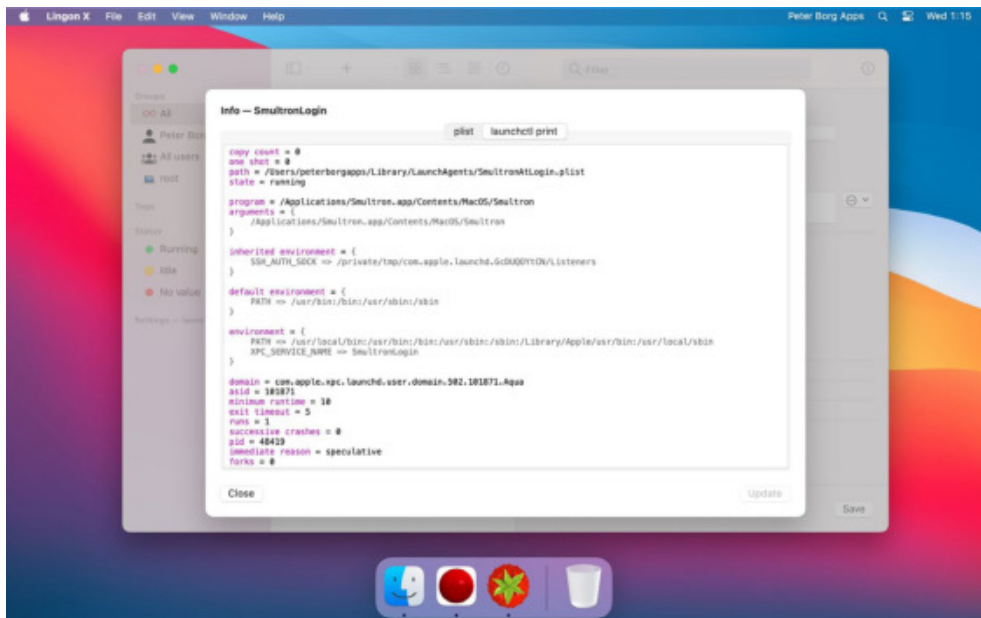

Adobe heavily promotes its subscription services.

Lingon X: Powerful job scheduler for your Mac

While its main purpose is scheduling, Lingon X provides valuable insight and control over startup and recurring events on your Mac.

BY GLENN FLEISHMAN

A Mac is like an ant colony: An army of tireless workers carries out tasks beneath the surface to keep the whole operation running, none of them with particular knowledge of the whole. And macOS's ants include agents, background daemons, scheduled jobs (called *cronjobs* after the *cron* tool [fave.co/3yhsXO2]), startup scripts, and more.

Lingon X 8 (fave.co/3P2PhSg) is like the sheet of glass on the side of an ant farm, offering visibility into the seemingly manic chaos that keeps the colony alive. The app lets you schedule recurring tasks to launch an app, run a script, execute a

Set up recurring schedules for actions, like a Shortcut or script.

command, or, in macOSMonterey, invoke a Shortcut. This is a mix of options anyone can benefit from up through the most technically proficient. Creating recurring jobs in macOS and modifying entries can be a bear. Having a simple interface is a dream come true.

In Lingon, click the plus (+) icon at the top of the window, and the app guides you through four steps:

1. Name the scheduled action and pick whether it should run for just your logged-in macOS user, all users, or as root. (That last option may be required for certain low-level tasks and should be used with care.)

**2.** Select Application, Script, Command, or Shortcut.

3. Enter the text for a script or command or select an application or shortcut.

4. Control how and when it's run at one or more recurring intervals, whether it's launched at startup, and whether it restarts if it crashes.

For instance, if you always want a specific app active whenever you're using macOS, setting it as a startup application should work—but it could crash, you could quit it by accident, or macOS could decide it's not active. Choosing "Launch again if crashes" in step 4 above can ensure it's always available.

Programmers and those who work directly with Unix commands, PHP scripts, shell scripts, and other code will find the ease of setting up and scheduling jobs enormously better than working at the command line.

I was directed to Lingon by a colleague for a reason other than scheduling, though: to troubleshoot startup problems. While this isn't its primary focus, Lingon X is the best tool I've found for
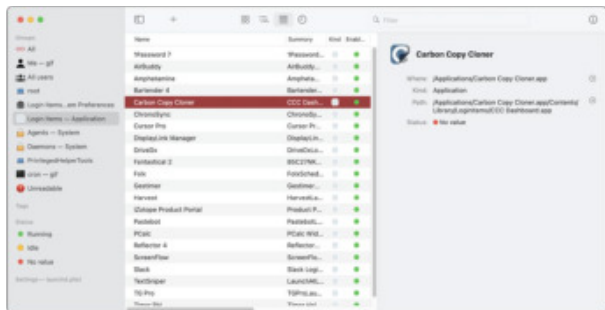

Browse a list of startup items, many of which don't appear in System Preferences ➜ Users & Groups for your account.

beginner through advanced users. The app offers insight into all the apps, scripts, agents, and other software that launches when you start your Mac, and that relaunches automatically if macOS finds any of it isn't running due to a crash or an intentional action by a user.

Lingon's main window includes a list of items under Groups that let you see everything macOS has set to launch at startup, relaunch after crashing, run in the background, or run on a schedule. You can choose View ➜ Timeline, and Lingon lays out in order all upcoming actions, including how long until they next occur.

With View ➜ List chosen, you can browse lists and find items associated with software you thought you stopped using or uninstalled years ago. One of the most common hidden causes of poor system performance, crashes, and unexpected disk operations are agents and similar items that restart themselves constantly after failing because they contain outdated code, but macOS keeps relaunching them.

Lingon comes in two versions: Lingon X ($14.99), downloadable from the
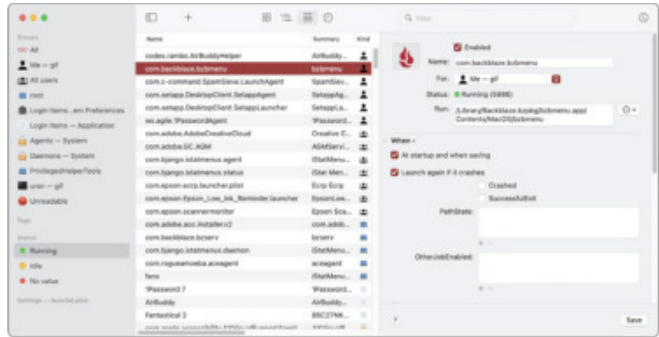
Manage all the startup and relaunchable items installed on your Mac.

developer's site, with full system functionality, including root access; and Lingon 3 ($3.99), a still-useful but more limited Mac App Store program. Creator Peter Borg offers a feature comparison on the Lingon site (fave.co/3nBShJN).

You can download Lingon X and use it at no cost to examine settings, but a paid license is required to save or delete items.

Lingon X requires macOS Mojave 10.14.4 or later but offers earlier versions starting with Mac OS X 10.11 El Capitan. Lingon 3 requires Mac OS X 10.9 Mavericks or later.

Lingon X makes scheduling recurring tasks a breeze. But it also lets you remove unwanted recurring actions and leftover cruft that could be having an impact on your Mac's performance. ■

👤👤👤👤👤

Lingon X

PRICE
$14.99

COMPANY
Peter Borg Apps
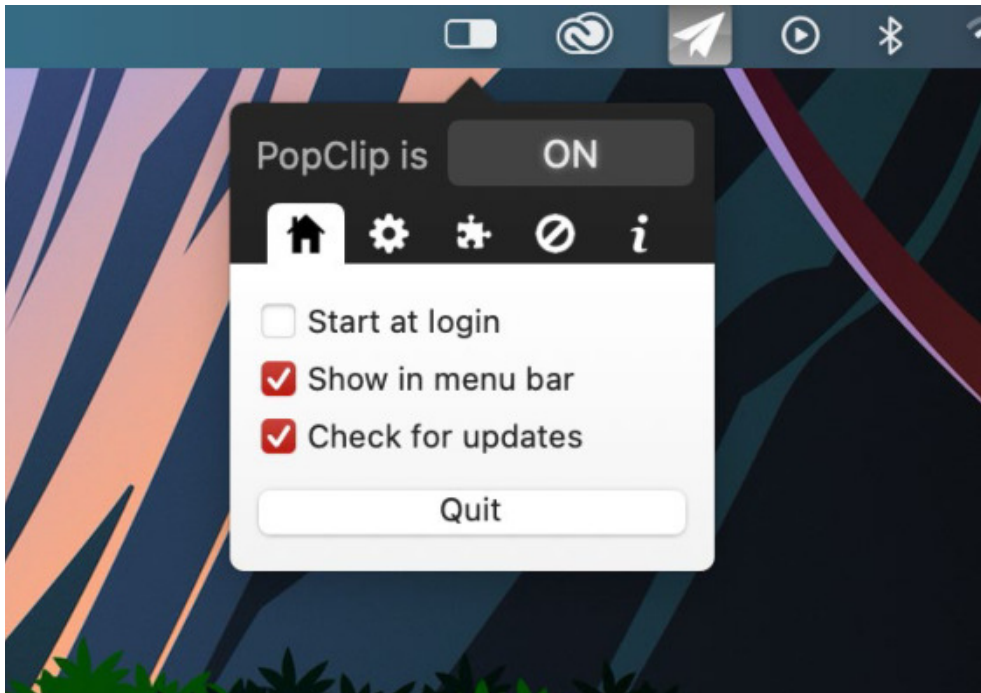
PopClip: Supercharge your ability to select and paste text on a Mac

Any selection or text field gains customizable actions with PopClip installed.

BY GLENN FLEISHMAN

Macworld EDITORS' CHOICE While macOS has gradually adapted features once found only in iOS and iPadOS, contextual selection tools remain trapped in the past. Select text, and you have to Control-click to have a contextual menu appear with a jumbled-up set of options to act on the text. It's difficult to customize or organize that list.

PopClip (fave.co/3bQfQf2) offers an iOS and iPadOS–like pop-up bar that appears whenever you make a text selection in any app. With the app dating back to 2011, it's developed right alongside

Apple's evolution of iPhone and iPad options. PopClip includes several options by default, including searching on Google, looking up a word or phrase in the macOS Dictionary app, offering to open a URL as a link, and providing spelling suggestions.

Why turn to a pop-up bar? It speeds the time from selection to outcome, making it an intuitive drag-and-click operation instead of requiring menu navigation or copying and pasting into an app or Web site. For actions you perform many times a day, you're shaving off friction and time.

The app also helps with paste operations. In any location in which you can type, PopClip provides a single-click paste operation and the ability to add a paste-and-match-style button. Pasting with the app is just a little unintuitive: It requires double-clicking at the insertion point, clicking and holding for at least half a second, or Shift-clicking.

PopClip becomes substantially more powerful when you install any of the dozens of extensions developer Pilotmoon Software makes available at no cost. These extensions can act on text and links, perform translation through third-party sites, hand off searches to a large array of search, commerce, and information sites, and shorten links.
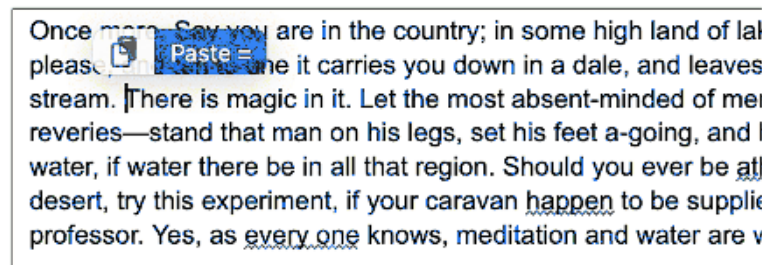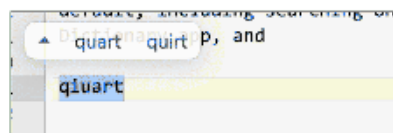
PopClip adds a clickable pop-up bar that appears whenever you select text in macOS (top). It offers suggestions for misspelled words (middle). It can also paste into text fields (bottom).
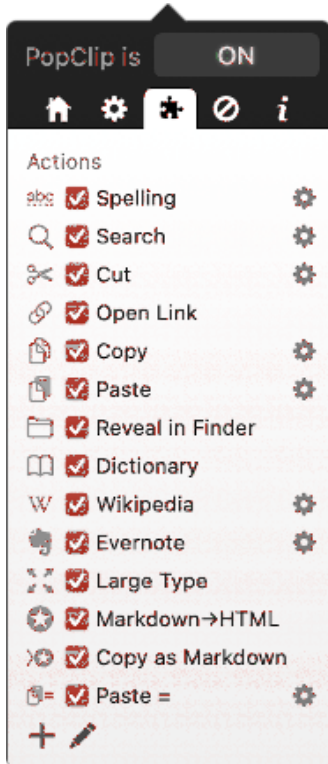
Add PopClip extensions to unleash its full power.

even place phone calls via FaceTime or Skype. The list is so extensive that I can barely skim the surface in this summary. Just about every popular productivity app, browser, and search site is included for starters.

You can install up to 25 extensions at a time and rearrange them by dragging their icons in the PopClip system menu, which orders how they appear in the selection or paste pop-up bar.

Pilotmoon offers a fully functional demo version on its site that's good for 150 uses. The full version is $14.99 via the Mac App Store; macOS 10.13.6 or later is required. A free trial is available on the developer's website (fave.co/3bQfQf2).

When editor Dan Frakes reviewed an early version of PopClip in 2012, just a year after its initial release, he noted, "I find PopClip to be easier—and quicker—than using traditional menu commands. It's even more convenient than right-clicking selected text to access similar options from the contextual menu."

PopClip has built on that strength in the last decade by extending its reach

For instance, you can use PopClip to convert text to title case, copy rich text from a Web site or other document and have it converted to Markdown, send it for translation at Bing Translator, shorten a link in Bitly, or look up a movie title in Rotten Tomatoes or IMDb.

Extensions also connect PopClip to dozens of other apps so you can create notes, to-do items, calendar entries—

PopClip

PRICE
$15

COMPANY
Pilotmoon Software

without requiring you to stretch further. Its long list of extensions combined with single-click ease puts a quiver full of useful arrows ready to be fired from your Mac selection bow. ■

#Dadication

fatherhood.gov

Apple Music has betrayed its most loyal listeners

The ad-free, all-music service now has ads in radio stations and interviews in playlists.

BY JASON SNELL

My wife is a saint. She has to put up with me complaining every time we're in our car listening to satellite radio and a DJ comes on. "You just don't want to hear people talking," she says, and she's absolutely right. I accept that other people like listening to the prattling DJs, but I hate it and I will keep changing the channel until there's a song I want to listen to
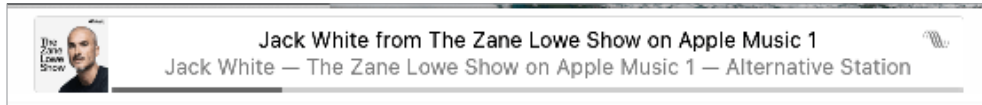
This Jack White interview was inserted between songs in Apple's Alternative radio station.

again. I don't want to hear about who is touring where, or who said something interesting at a show, or even the behind-the-scenes detail about how a song came to be written. Not when I'm just trying to listen to music.

That's the great thing about streaming music services like Apple Music: Whether you're listening to a curated playlist or even a "radio station," you can skip songs you don't like and there's no intrusion from voices. It's all about the music.

Or at least it was. But recently, Apple Music has made some changes, and they're disastrous. A new tastemaker has apparently rolled into Apple Music HQ and decided that aggressive marketing to paying customers is the solution to a problem that literally nobody had. The end result is a degraded Apple Music experience.

AD-FREE...EXCEPT FOR OUR OWN ADS

As my former Macworld colleague Jim Dalrymple pointed out (fave. co/3bNqmE5), Apple has taken to inserting ads into its "ad-free" on-demand radio stations. Yes, they're ads for other

Apple Music radio shows, but does it matter? The fact remains that if you listen to an Apple Music streaming radio station like Classic Rock or Alternative, you will eventually hear a 40-second ad for Zane Lowe or Strombo or other pre-recorded Apple Music radio episodes. What was once an ad-free music experience is now punctuated by...promo copy.

There are plenty of ad-supported music services out there. What's different about Apple Music's curated playlists and radio stations is that we *pay* for them, and we expect them to be about the music and nothing but the music.

Now, couldn't Jim solve this problem by keeping his finger close to the skip button (or the equivalent keyboard shortcut), so that when a promo appeared in his radio show, he could just skip over it? Sure, although I'll point out that you're not always in a context where you can immediately force a skip–if you're nowhere near the remote, or your keyboard, or if you don't want to be forced to shout at Siri to go to the next track.

But that misses the point entirely. Whether we listen to music to focus while writing, relax at the end of a long day, or

anything in between, it's disruptive to be taken out of the music and forced to listen to an ad. It doesn't matter if the ad is for other Apple Music programs, or the Kars for Kids song (fave.co/3R8zymz), or even an offer to give away free gold bars—an ad is an interruption, no matter what its content.

PLAYLISTS, PLUS EXTRA JUNK

Jim's complaints rang true to me because I recently complained (fave.co/3OLilsy) about discovering another new Apple Music marketing technique: inserting promotional interviews inside Apple's curated playlists. I spent an inordinate time working while listening to Apple's ALT CTRL playlist, which highlights the latest in Alternative Rock. It was once a fantastic playlist filled with the newest alternative tracks from Maneskin and Maggie Rogers

A while ago, Apple Music redesigned its playlist pages to highlight blurbs about artists featured in the playlist that week, along with pictures of the featured artist. It seemed a little odd to me—and gives off the faint whiff of oily musical-artist

marketing—but I could just choose to not read it, so I didn't let it bug me too much.

Then came step two of the process: Apple began inserting a "spoken-word" track into the playlist, featuring a brief mini-interview with that week's featured artist. The entire fundamental concept of a playlist is that it *contains songs*. Now Apple's playlists also contain promotional fluff for whatever artist is making the rounds this week.

THERE'S AN INTERFACE FOR THAT?

None of this would be that offensive if Apple just had a way for people like me to opt out. Apple likes to boast about its connection to music, and of course, everything it does is delivered via its software. This means Apple Music lives at the intersection of music and technology. And yet, does the Music app provide any features to help me avoid Apple's ads and promos? It does not.

Let's start with the dumbest one of all: Though Apple carefully places its artist interview track right above a song by that

1	Virginia (Wind In The Night)	· · ·	3:25	The Head and the...	Every Shade of Blue	Alternative
2	SUPERMODEL	♥ ♥ ♥	2:28	Måneskin	SUPERMODEL - Si...	Pop
3	Bob Moses on "Love Brand New"	♥ ♥ ♥	0:45	Bob Moses	Bob Moses on "Lo...	Spoken W...
4	Love Brand New	· · ·	3:18	Bob Moses	The Silence in Bet...	Dance
5	The Foundations of Decay	· · ·	6:01	My Chemical Rom...	The Foundations o...	Alternative
6	Clarity	· · ·	3:47	Vance Joy	In Our Own Sweet...	Alternative

One of these things is not like the other: a Spoken Word interview in a curated playlist.

If you turn on "Songs list checkboxes," you can deselect songs and they won't play.

artist, I *shuffle* the ALT CTRL playlist. The Music app doesn't attach the spoken track to the music track or skip the spoken track during shuffles. It does the dumbest thing possible: shuffles the spoken track so it appears randomly during a session and thus makes no sense.

Longtime iTunes users remember that there used to be the concept of an unchecked song, a song you kept in your library that would never be played. As I was reminded by reader Mario P. after this story posted, this feature still exists–if you check "Songs list checkboxes" in the Music app on macOS. While you can't delete a song from a curated playlist, you can uncheck a song—either by switching that playlist to Songs view (View: As Songs) or by right-clicking on a song and choosing Uncheck Selection. The song will gray out and won't play.

Unfortunately, Apple Music is always adding new songs—and new audio interstitials—to its playlists. So you will have

to play a constant game of Whac-A-Mole if you want to avoid the interview pieces.

On the Mac, you also have ability to "dislike" a track, but while that feeds Apple's algorithms (in iOS it's inconsistently though accurately called "play less like this"), it doesn't stop the disliked track from playing.

So this is where we are: Apple's decision to put things that are not songs amid its collections of songs have made Apple Music's curated playlists and algorithmic radio stations substantially worse. And at the same time, the Music app has proven unhelpful for people who don't want their music mixed in with promos and happy talk.

The way forward for Apple Music is simple: Turn off the ads and promos until your app is capable of letting us opt out from hearing them in all circumstances. But until then, if you insist on foisting this not-music on us, I curse you to an eternity of listening to nothing but the Kars for Kids jingle. You heard me. ◼

Apple TV+ will be the only place to watch every MLS match for the next decade

The partnership will begin with the 2023 season and some games will be free.

BY ROMAN LOYOLA

Apple on Tuesday announced that it has a deal with Major League Soccer for exclusive rights to broadcast MLS matches for the next 10 years. Starting with the 2023 season, Apple will offer an MLS streaming service that will be accessible through the Apple TV app, and the service will show all MLS matches live without blackout restrictions so you can watch any match from anywhere.

The MLS stream includes all MLS, Leagues Cup, and select MLS NEXT Pro and MLS NEXT matches. The stream will

also feature a weekly live highlights show, game replays, recorded highlights, analysis, and other original programming. According to Apple's press release (fave.co/3OFCxkM), Apple TV+ subscribers who are not signed up for the MLS stream will be able to watch a limited number of matches.

According to The Athletic (fave.co/3Iax6b8) fans will not be able to watch matches of their local teams on a local TV broadcast. To watch these matches, fans will need to sign up for the Apple TV MLS stream. MLS full-season ticket packages will also include access to the MLS stream. Also, users can subscribe to the MLS stream without having to subscribe to Apple TV+.

At launch, MLS and Leagues Cup matches will have English and Spanish announcers, and matches involving Canadian clubs will have French announcers. The Athletic reported that

there is a possibility that only one set of commentators will eventually be used for Apple TV+ matches.

Apple has not yet released details on pricing, how to sign up, and specifics on programming—those details will be revealed before the start of the 2023 MLS season in late February or early March.

Awful Announcing says Apple's deal with MLS is worth a minimum of $2.5 billion (fave.co/3IaPqkk), with the rate flexible depending on subscribers. The deal reportedly leaves room for MLS to negotiate with "linear partners" such as ESPN, Univision, and Fox, which it is currently under contract with until the end of the current season. Those three networks reportedly paid $90 million per season—so Apple's deal is a very aggressive move for the company to grow its sports coverage on Apple TV.

The Apple-MLS deal follows the announcement of the July 2022 schedule (fave.co/3NAHN80) for its Friday Night Baseball showcase. Apple also made WWDC announcements that highlight sports coverage in the new Live Activities feature and is rumored to be negotiating with the NFL (fave.co/3ydX2ya). ■
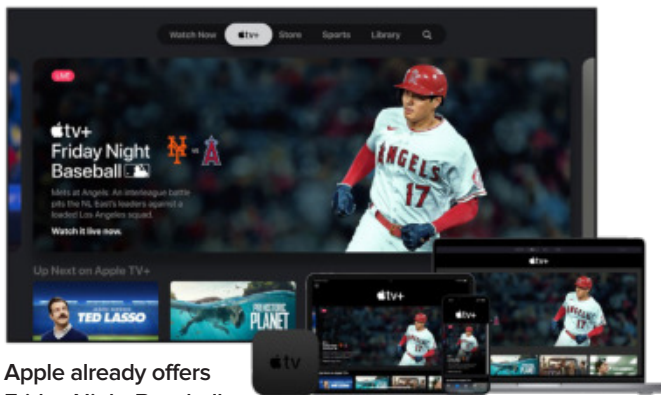
Apple already offers Friday Night Baseball.

How the HomePod can be Apple's new iPod: Fun, popular, and simple

The iPod was recently laid to rest. Now it's time for the HomePod to rise.

BY JASON SNELL

The original HomePod flopped (fave.co/3ApnOWM). But Apple wasn't discouraged. It reconceived the product and released the HomePod mini, a less high-tech—and more affordable— iteration that seems to have been more successful in the market and suggested Apple had larger home ambitions (fave.co/3GjZdDe).

Now come rumors that Apple's planning on building a new HomePod. In fact, there are rumors that as many as three new HomePods could be headed our way. Could it be, in the same year that the iPod finally faded away, that the HomePod will transform itself from a failure into a key Apple product line?

It's time. Not just for a HomePod comeback, but for HomePod domination.

Two HomePods? I want more. I want four. It's time for Apple to rush back into the smart home game, and the HomePod can lead the way.

RETURN OF THE HOMEPOD

Analyst Ming-Chi Kuo reported (fave. co/3OH6a5r) that Apple's working on a new HomePod for later this year or early in 2023. The logical assumption here is that the HomePod mini will once again be given a non-mini counterpart, a larger speaker that sounds better—but perhaps is more like a scaled-up HomePod mini than a revision of the original, expensive HomePod.

It makes sense. The HomePod mini, as fun as it is, can't fill larger rooms with high-quality audio and lags behind the original HomePods in terms of acting as speakers for an Apple TV. There's room in Apple's speaker line for a more powerful model. Will it satisfy fans of the original HomePods? Probably not, but all it needs

Could we soon see a rebirth of the larger HomePod?

to be is a bit better than the HomePod mini for not a lot more money. All of a sudden, the HomePod is a product line again.
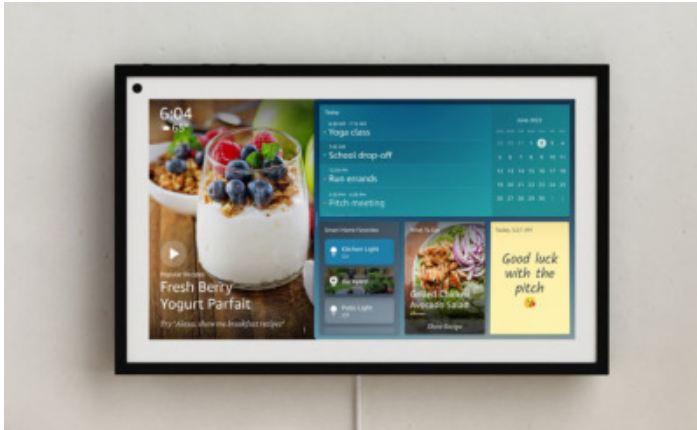
NEXT STOP: LIVING ROOM

Could it be true? As someone who has advocated again (fave.co/3aePhA2) and again (fave.co/3AusGKB) for Apple to smoosh the Apple TV and HomePod together, I'm excited to relay that Bloomberg's Mark Gurman thinks this product may finally be on the way.

Perhaps arriving next year, it would be a single device that would act as an Apple TV and Soundbar in one. Attached to your TV, it would fill your room with audio from streaming movies and TV shows as well as from Apple Music, including Spatial Audio. Step 1: Plug the HomePod TV in. Step 2: Plug it into your TV. Step 3: There's no step 3!

Gurman also suggests that this HomePod might also feature a Center Stage–style camera, which also makes sense. Imagine being able to kick off FaceTime conversations with family members from your living room couch, with a camera that's smart enough to zoom in on wherever you're sitting in the room. (It's actually a more fitting use of Center Stage than the Studio Display!)

What's more, there's nothing in this product that goes particularly

Amazon's Echo Show is a decent product, but Apple could do better.

for all the streaming services via their Apple TV apps. The real challenge would be in figuring out the interface for such a device. Would it just be…an iPad stuck to some speakers? An Apple TV you can drive with simple gestures?

Here's my idea: Just as Amazon does, keep it simple. Offer a remote control and an Apple TV mode for simple navigation—in other words, don't replicate iPadOS, because these sorts of devices are not ones you want to spend a lot of time touching. Besides, the killer app for a device like this isn't one with heavy interactivity—it's one that dispenses ambient information. Allow me to populate that screen with iOS-style widgets, and you're on to something good.

As someone who has two original HomePods still in use to this day, I don't hold anything against the product despite its failure in the market. And with the iPod now officially buried, it seems like the right time for the HomePod brand to come into its own. That's a good thing since it's long past time that Apple spent more time focusing on its smart-home product line. ◼

beyond the technology Apple's shipping today. All Apple has to do is integrate it into a single convenient device—and it might be a great way to drive tvOS into many more homes.

THE KITCHEN HOMEPOD?

Another rumored HomePod is one that would be more akin to the Amazon Echo Show and the Meta Portal: a smart speaker with voice control that also has a display and a camera. Again, this is all tech that Apple currently offers—it would just need to be remixed into a new product that would find a home on a table or in the kitchen.

I keep an Echo Show in my kitchen, and it's not a bad product, but it just makes me wish for something better. Imagine a Center Stage–style camera, with support

Tribit Starlet01 kids' headphones: Astounding sound for a pittance

This wired $19 headset sounds great, is very comfortable, and offers decibel limiting for sensitive young ears.

BY JON JACOBI

First things first: The Starlet01 (Tribit's model number TR-KH01) children's headphones sound far better than a $19 headset (there's a microphone) has any right to sound. Indeed, the sonics are comparable to those of many products costing five times as much. Even better, the Starlet01 are exceptionally comfortable. Color me impressed.

DESIGN AND FEATURE SET

As for their color scheme, I'm claiming supreme sacrifice for wearing an off-pink headset around the house while testing. Tribit didn't send me the more masculine

The Tribit Starlet01 features a TRRS connector for stereo and mic signals. This is fine for most tablets, cellphones that have headphone jacks, and similar devices, but it can present problems with older, stereo-only TRS connections. You'll find TRRS-to-TRS adapters available online, but Tribit does not include one.

mint green headset (fave.co/3nAaerZ), but I soldiered on. (The neighbors had a good laugh.) And if you're a gender studies major, don't bother—I don't care.

Something you need to know right off the bat is that the Starlet01 is actually a headset with an inline microphone (and a dB switch) on the captive cable. Said cable is tipped by a TRRS (Tip/Ring/Ring/Sleeve) connector, so the microphone output is available to headset jacks. This will work fine on most cell phones (the ones that have jacks, that is), tablets, PCs, and similar hardware. But without a TRRS-to-TRS (that is, normal stereo Tip/Ring/Sleeve) adapter (fave.co/3AoXThV), you might have issues.

The Tribit Starlet01 features a TRRS connector for stereo and mic signals. This is fine for most tablets, cellphones that have headphone jacks, and other similar devices, but it can present problems with older, stereo-only TRS connections. TRRS-to-TRS adapters are available online.

There is, however, a 3.5mm auxiliary connector on the opposite cup that can be used for normal stereo connections as well as daisy-chaining several Starlet01s. You'll need to provide your own 3.5mm stereo cable. As you're only spending $19 to begin with, you can afford good ones. (Make them long, unless you want a good laugh at the kids' expense.)

Sadly, using the auxiliary port, you'll lose the 94dB/85dB switch/resistor on the captive cable that limits the headphones' output to 85db for child listeners. You might want to tape over said switch after setting it to 85dB, as any normally inquisitive child will monkey with it. Don't tape over the multi-function button, however, because that's used for phone calls (answer, hang up), as well as playback control (play/pause

and track forward/back).

Like the similarly cheap ThinkWrite Ultra Durable Pro (fave.co/3bGHfjz), the Starlet01 uses a straight cable with a braided cable. Unlike ThinkWrite's product, however, this cable isn't microphonic. That means bumping it or scraping against won't create any noise in the headphones.

The round button is multifunction, while the pinhole is the microphone.

PERFORMANCE

If I'd heard the Starlet01 before I'd reviewed the ThinkWrite, I might've used weaker adjectives for the latter. While the ThinkWrite headphones sound very good, the Starlet01 sound as good or better. I'm sure that is at least in part due to the non-microphonic cable. It's close, but I'm calling it in Tribit's favor because of the lack of microphonic artifacts.

As to the specifics of "sounds good," I mean there's a decent amount of bass and it's tight, not floppy as with some cheapo cans. The mid-range is reasonably well defined, and there's enough top end so you don't get the sense of dullness so many cheap headsets suffer from.

The Tribit Starlet01 are not up to the standard of Marshall Major IV's (fave.co/3bO8OaW), or the Edifier Stax Spirits (fave. co/3bOCB3h), but I had no problem listening to them for a good hour. Indeed, I found them more sonically pleasing than the

headphones I've heard from major audio interface vendors in their podcasting packs. If I'm being picky, I'd like a tad more definition and instrument separation in the mid-range. But for 19 bucks? Sheesh.

There's no wireless Bluetooth, so obviously no battery life to report. Revisiting comfort for a moment: There's plenty of padding in both the ear cups and on the headband. Considering they're sized for smaller ears and skulls, my feeling comfortable wearing them is a testament. There was just enough extension in the foldable ear cups to allow this.

BOTTOM LINE

I was absolutely astounded at the sound and comfort of the Starlet01, even though they're designed for smaller heads and ears. It would be nice if Tribit put a TRRS-to-TRS adapter in the box, but at $19 I'd buy these for any child in a heartbeat. ◼

Tribit Starlet01

PROS
- Amazing sound for the price.
- Very comfortable.

CONS
- TRRS-to-TRS adapter not included.
- Wired connections only.

PRICE
$19

COMPANY
Tribit

JBL Charge 5 Bluetooth speaker: Big sound from a small package

Waterproof and dustproof, JBL's portable speaker is ready to shine in any environment.

BY JAMES BARBER

Perched in the middle of JBL's Bluetooth speaker lineup, the JBL Charge 5 surprises with its big sound. It's incredibly loud for its size and far easier to stuff in a backpack than other footlong outdoor speakers. If you're looking for a single speaker to use at home and on your outdoor excursions, it's easy to find a spot for the Charge 5 on a bookcase or tabletop.

JBL has embraced a single-use philosophy for the Charge 5. It's a Bluetooth speaker, full stop. There's no microphone, so it doesn't double as a speakerphone. There's also no AUX or USB input, so you can't plug in another music source. All your audio must be streamed from a Bluetooth device, most likely your phone.

To be completely fair, it's a slight oversimplification to say that the JBL Charge 5 is only good for one thing; after all, the speaker can also charge a second device via a rear USB charging

port that's hidden beneath a flap. But other than that, the Charge 5 is single-minded in its purpose.

The JBL Charge 5 doesn't quite best our current Editors' Choice for portable Bluetooth speakers, the Sonos Roam (fave. co/3bOg32l), which boasts Sonos's vaunted multi-room capabilities, a rugged design, and Auto Trueplay room-correction functionality for roughly the same price as the JBL. That said, it was a close call.

HOW DOES THE JBL CHARGE 5 LOOK AND FEEL?

The Charge 5 is a tube-shaped speaker that weighs 2.11 pounds and measures 8.7x3.76x3.67 inches (WxHxD), with a slight discrepancy in height due to the rubber strips that act as feet for the speaker. That puts the Charge 5 in a somewhat in-between slot. The $129.95 JBL Flip 5 (fave.co/3R8iVal; 7.12x2.91x2.71 inches, WxHxD) is more of a personal-sized speaker, while the $319.95 JBL Xtreme 3 (fave.co/3OLFfFE; 11.75x5.35x5.2 inches, WxHxD) comes with a shoulder strap and seems more like the outdoor party choice.

JBL has revised the design for the latest version of the Charge speaker, enlarging the JBL logo and making it

The JBL Charge 5 pictured with a soda can for scale.

roughly the same color as the speaker while giving the sides of the raised letters an orange tint. The speaker ships in black, blue, camouflage, gray, red, and teal flavors.

The row of controls across the top of the speaker is raised and the PartyBoost (more on PartyBoost in a moment), volume down, volume up and play/pause buttons each have a unique shape, so it's easy to access the controls in the dark. The power on/off and Bluetooth pairing controls are located on a smooth strip in the middle, but each control is easy to select because the shape of the logo is ever-so-slightly depressed into the strip. It's an elegant and useful design touch.

The JBL Charge 5 boasts an IP67 rating for complete protection from dust ingress, and it should also withstand being dunked in a meter of water for 30 minutes. In other words, it should be able to survive a trip to the beach or even a dunk in the pool.

WHICH VERSION OF BLUETOOTH DOES THE JBL CHARGE 5 SUPPORT?

The Charge 5 supports Bluetooth 5.1 along with the A2DP 1.3 and AVRCP 1.6 streaming profiles. Output power is 30W RMS for Charge 5's woofer and 10W RMS for its tweeter. JBL promises 20 hours of battery life, which matches my experience, and 4 hours for a full charge.

The Charge 5 supports JBL's aforementioned PartyBoost feature, which allows users to pair with up to 100 speakers at once, including other JBL speakers like the Flip 5, Pulse 4 (fave.co/3OOsF8E), and Boombox 2 (fave.co/3ybKxmJ). Unfortunately, PartyBoost doesn't work with older JBL speakers (like the Charge 4) that use the now deprecated Connect+ protocol.

The good news is that anyone using the JBL Portable app for iOS or Android has the choice of using two PartyBoost speakers as a stereo pair instead of just cloning the mono output from the first speaker. The app also offers a basic equalizer that has studio-style sliders to control bass, mid, and treble frequencies. The app is also required for firmware updates to the Charge 5.

HOW DOES THE JBL CHARGE 5 SOUND?

I've been using the Charge 5 as a general-purpose speaker over the past few weeks, streaming baseball games via the MLB app, audiobooks via Audible, my college radio airchecks that someone posted on YouTube, and playlists on Apple Music.

On Apple's '60s Rock Essentials playlist, the Charge 5 consistently impresses. On songs like the Byrds' "Mr. Tambourine Man," the Charge 5 delivers exceptional detail and separation between voices and instruments, whereas lesser speakers tend to turn the midrange into an indistinguishable wall of sound.

On notoriously low-fi recordings like Question Mark and the Mysterians'

The well-designed controls on the top of the JBL Charge 5 allow you to control the speaker by touch.
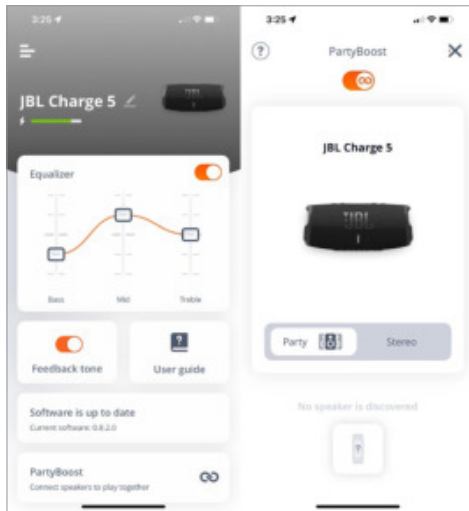
The JBL Portable app allows a user to tweak the equalization or alter the settings when the speaker is in PartyBoost mode.

"96 Tears" and the 13th Floor Elevators' "You're Gonna Miss Me," the Charge 5 doesn't sand off the rough edges that give garage-rock classics like these their sonic teeth.

If your tastes run to more contemporary hits like those by Bad Bunny, Harry Styles, Kendrick Lamar, and Kate Bush, the Charge 5 sounds so good that I wouldn't be surprised to learn contemporary mix engineers use the JBL portables as reference speakers during their mix sessions.

It's also worth noting that tracks from services that offer lossless streaming (such as Apple Music [fave.co/3NVnkLv], Tidal [fave.co/3nV84DP], Qobuz [fave.co/3P5gbcu], and Amazon Music [fave.co/3AlGFIK]) sound noticeably better on the Charge 5 than the lossy tracks available from Spotify (fave.co/3R8XA0F) or YouTube Music (fave.co/3OYYCuq).

BOTTOM LINE

The JBL Charge 5 is a Bluetooth speaker that can double as a powerbank for another device. That's it. There are no racing lights, there's no speakerphone, and you can't plug in another audio source. What you do get is a speaker that gets incredibly loud for its size without distorting and has solid battery life, easy-to-use controls, and excellent protection against dust and water.

There are plenty of very good speakers that don't offer the same fit, finish, or volume that you get from the JBL Charge 5, and many of those cost a lot less. If you care about subtle touches, like the well-designed controls and distortion-free sound that JBL has built into its entire line of speakers, then that extra money will be well spent. ∎

JBL Charge 5

PROS
- Dustproof and waterproof.
- Gets incredibly loud without distortion.
- Solid battery life.

CONS
- Expensive for its size.
- No speakerphone.
- No AUX input.

PRICE
$179

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Mac 911

Solutions to your most vexing Mac problems.

BY GLENN FLEISHMAN

HOW TO RECEIVE TEXTS TO A PHONE NUMBER ACROSS ALL YOUR APPLE DEVICES

The oldest parts of the cellular phone system are figuratively held together with chicken wire and chewing gum, and wireless carriers have little motivation to change it because it works and nets them billions upon billions of dollars. Apple created iMessage for an improved (and secured) messaging ecosystem and married it on the iPhone with "traditional" SMS (text) and MMS (multimedia) cellular messaging systems.

On your iPhone, you can send and receive cellular texts and iMessages. Apple extended the iPhone's phone network capability to your other iCloud-linked devices many years ago to provide that same access to non-Apple texting.

To make sure it all works just as you like, you may need to check and change

Text Message Forwarding links the cellular network with your other devices via iCloud accounts and your iPhone.

your message settings in several different places.

First, on your iPhone in Settings ➜ Messages:

> You need to enable iMessage.

> Tap Send & Receive to choose the phone number and iCloud-linked addresses you can receive messages at on this iPhone.

> Also under Send & Receive, check Under Start New Conversations From. You may want to choose the iPhone's number instead of an email address to ensure people outside Apple's iMessage ecosystem receive your messages correctly.

> In Text Message Forwarding, enable all of your devices that can send and receive cellular texts.

On all of your other devices, make sure that the iPhone's phone number is selected as a valid way to receive messages:

> In iOS and iPadOS, go to Settings ➜ Messages ➜ Send & Receive and choose the iPhone's number under You Can Receive iMessages to and Reply from. (Even though it says iMessage, it seems to apply to text messages.)

> In macOS, open Messages and choose Messages ➜ Preferences ➜ iMessage. In Settings, check the box next to the iPhone number. (Note that here Apple says "You can be reached for messages at" not just iMessages.)

Make sure your Mac is set to receive messages from your iPhone's associated phone number.

HOW TO TELL IF AN UPDATE APPLE ID SETTINGS MESSAGE IS LEGIT

For reasons best known only to Apple, you may see a message from time to time or even frequently that says:

> *Update Apple ID Settings. Some account services require you to sign in again.*

Macworld Editor Karen Haslam offers extensive troubleshooting for this problem (fave.co/3R69iJv), with an update in January 2022 due to a spate of people seeing the message during an outage of Apple's iCloud servers.

However, beyond fixing the problem Apple identifies, readers ask if the message is legitimate because it resembles exactly the sort of phishing message they've been warned about for many years. The prompt often appears in the middle of another activity and displays a message that asks you to enter your password.

It is intentional on Apple's part, but you can make sure what you're seeing is a message from Apple with a few tests:

> In iOS and iPadOS, do you see it in an app other than Safari or Mail (or another browser or email app)? Because HTML can be used to mock up the general appearance of an iOS or iPadOS

dialog, I would exercise a healthy degree of skepticism.

> In macOS, are you seeing it outside the Notifications area? When you hide and show notifications, does it reappear?

For the highest level of confirmation, open Settings ➡ *your name* ➡ iCloud in iOS or iPadOS, or System Preferences ➡ Apple ID or click iCloud in macOS 10.15 Catalina or later. (In 10.14 Mojave or earlier, go to System Preferences ➡ iCloud.)

You should see a line item with similar text, such as "Update Apple ID settings" or a pop-up message in any of those locations. If so, re-enter your Apple ID password.

HOW TO MAKE A PHONE CALL WITH LIVE TEXT

Live Text (fave.co/3w3wZIN) in iOS 15 and iPadOS 15 lets your iPhone or iPad almost instantly turn text on objects viewed through the Camera app into something you can copy and paste. Apple also offers other kinds of content identifiers, one of the most useful being a phone number.

With an iPhone XS or XR model or later or a recent enough iPad (see list; fave. co/3lfMfI4), follow these steps:

1. In the Camera app, point at any text on a printed object or display that contains a phone number.

2. When rounded yellow-orange corners surround the text in question, tap
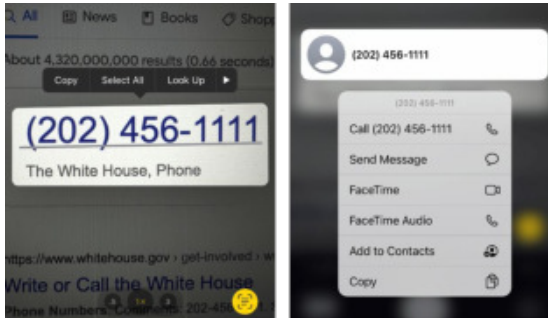
Point the camera, tap the icon, and make a call.

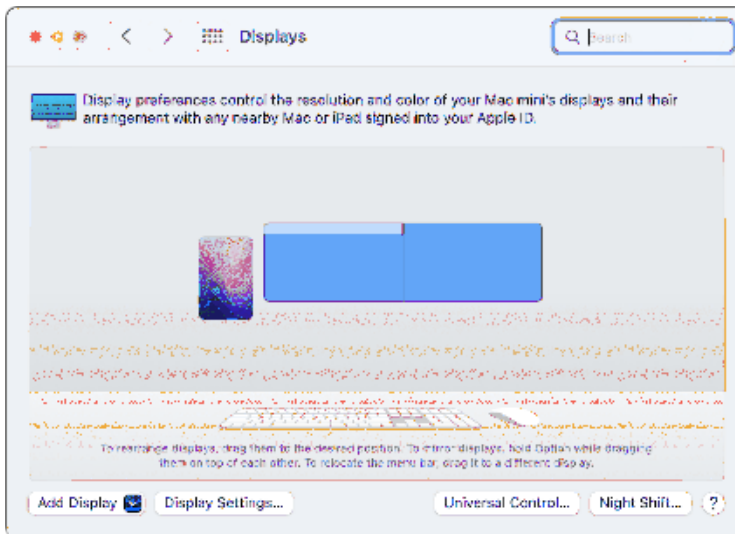the Live Text button, which looks like text inside rounded corners.

3. A phone number will have a gray underline beneath it. Tap it.

4. From the menu that appears, tap Call [phone number] if the number is correct.

IS YOUR MAC'S POINTER DISAPPEARING MYSTERIOUSLY? IT MIGHT BE UNIVERSAL CONTROL

Universal Control (fave.co/ 3R6M8CW) extends your mouse, trackpad, trackball, keyboard, and other input devices across multiple Macs and iPads that you have logged in to the same iCloud account. Put your devices near each other, and you can seamlessly mouse from one screen to another and use your Mac to manage input on an iPad or another Mac. This enables you to share a keyboard or mouse with more than one Mac (fave.co/3bKNmn6).

But you might run into a confusing scenario if you forget that you have Universal Control on and your devices aren't that close together. Recently, both I and a colleague had the same mystery: The cursor kept leaving the screen. What strange journey

With Universal Control active, you can slide from one device to another, gapped ostensibly by no more than about three feet of actual space.
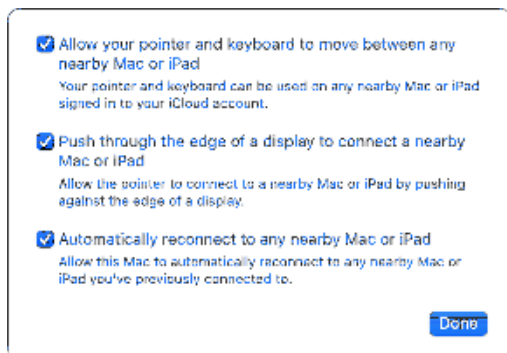
Disable the bottom two settings to prevent accidental connections.

was it on? It turned out that it had visited another Mac we had active in a different part of the house.

This situation only happens occasionally, because it requires that multiple conditions are met:

> Both Macs are unlocked and active.

> They're located within a few feet of each other.

> Universal Control's "Push through the edge of a display to connect a nearby Mac or iPad" setting is enabled (see below).

In both my and my friend's case, our Macs were dozens of feet apart—mine was an entire floor away—yet Universal Control still considered them close enough. And both of us also typically have our Macs enable their lock screens or sleep when not in use for a reasonable period. We happened to hit a window in which the two Macs were unlocked and

decided they were close enough to trade inputs.

You can prevent this scenario from happening if it becomes a bother by choosing ➜ Sleep or ➜ Lock Screen from the Mac you don't want to be using.

You can also disable the setting in System Preferences ➜ Displays in Universal Control, noted above "Push through," and the one below it, "Automatically reconnect to any nearby Mac or iPad," to prevent automatic connections. Then, to connect to a nearby Mac (or iPad), click Add Display in the Displays preference pane and choose the other device under the Link Keyboard and Mouse section. ∎

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.

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