



New HomePod:
now smarter &
better sounding

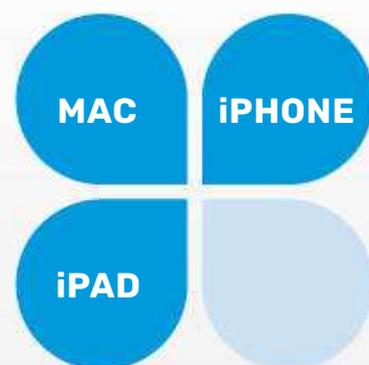


The ultimate
guide to
Apple Music



The history
of **Apple**
gaming

Mac | Life



APRIL 2023 NO.204

THE FASTEST EVER

MACBOOK PRO

On test! Now featuring earth-shattering
M2 Pro and M2 Max performance

+
NEW MAC MINI
M2 AND M2
PRO RATED



HOW TO:

- Find and fix duplicates in Photos
- Use alternative keyboards in iOS
- Handle Complications in watchOS 9
- Set startup apps the way you like

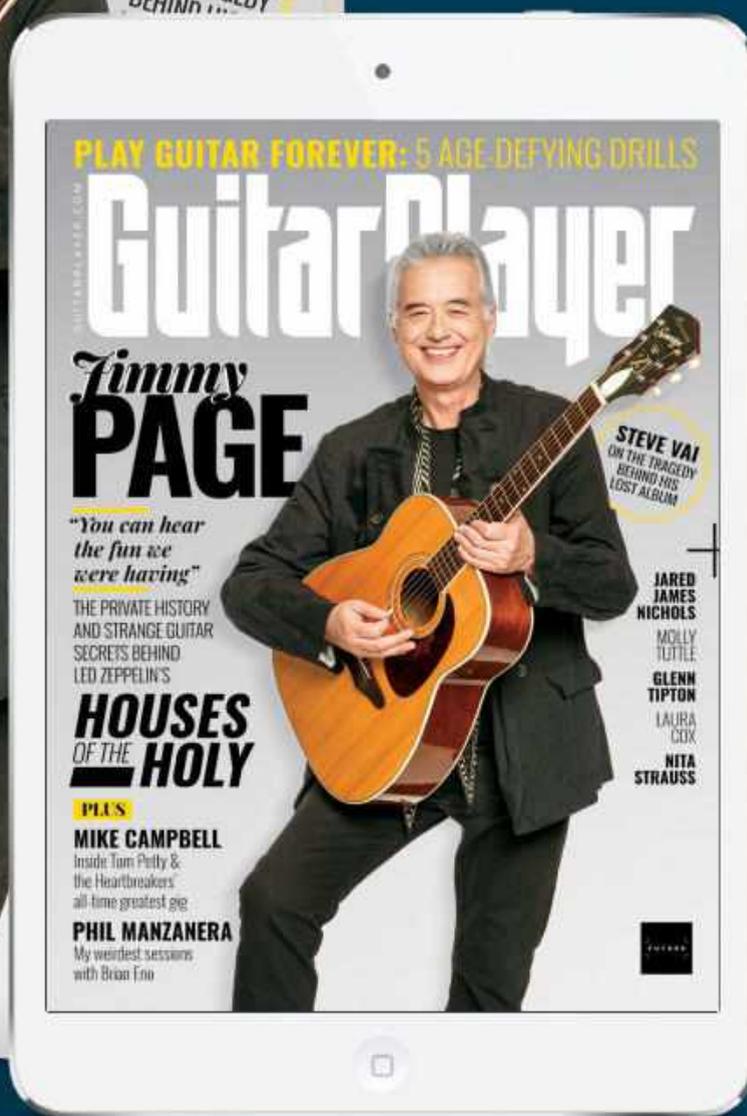
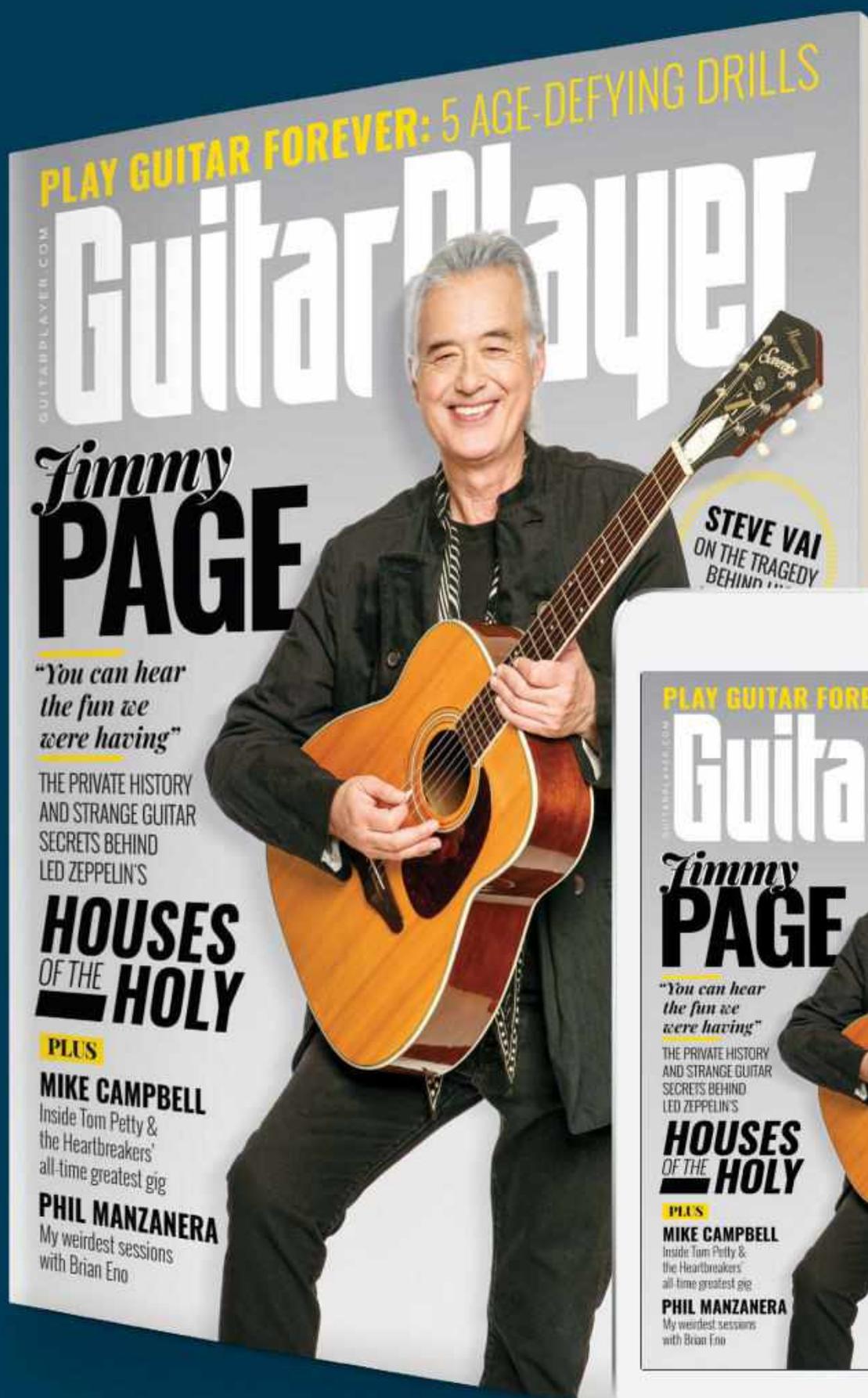


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NEW IS NOT "NEW" ANYMORE



ARE WE STARTING to feel the long-term effects of Jony Ive's departure from Apple? It was recently revealed that Apple is removing the role of VP of Industrial Design that was previously held by Ive (which Evans Hankey filled thereafter until late last year). Perhaps I'm reading too much into it, but it feels like this is a sign that Apple is losing its way in the design department — although maybe I'm late to the game here and it already has.

Case in point are the latest hardware launches on test in this issue. The new MacBook Pro 14- and 16-inch (2023)

shares the same shell as the model two years prior, and the Mac mini (2023) has an identical form to its 2020 predecessor. Last year's MacBook Pro 13-inch (2022) was a body double of the 2020 version, but it felt even more odd given it also had the old Touch Bar which we all thought we'd seen the back of.

Of course, all these new models are more powerful than before and therefore more appealing thanks to the new M2 chips, but even that is becoming a harder sell. Apple set the bar high with Apple silicon, and the jump from M1 to M2 is steady progress rather than a giant leap, which makes it hard to justify upgrading an older model. When the new machine looks the same as the older one, there's very little incentive at all. Don't get me wrong, these are still amazing machines, and if you're rocking a much older model, then it's a no-brainer.

It's not just Macs that seem to be falling foul of a lack of design ingenuity — the new HomePod (p6) replaces the model launched five years ago, but put the two next to each other and you'd never know it. Come on Apple, at least make us feel like we're getting something different. I recall the iPod Classic, which brought me into the Apple fold back in the noughties. Every new model was an evolution, and to me it felt exciting every time. When was the last time a new Apple product made you feel genuinely thrilled? Let me know at the usual address: letters@maclife.com. ■

Nick

NICK ODANTZIS, Editor

Twitter: @maclife

»» THE TEAM



Matt Lochrie

Art Editor

Matt's favorite product from CES was Sony's first accessibility controller "Project Leonardo".



Rachel Terzian

Production Editor

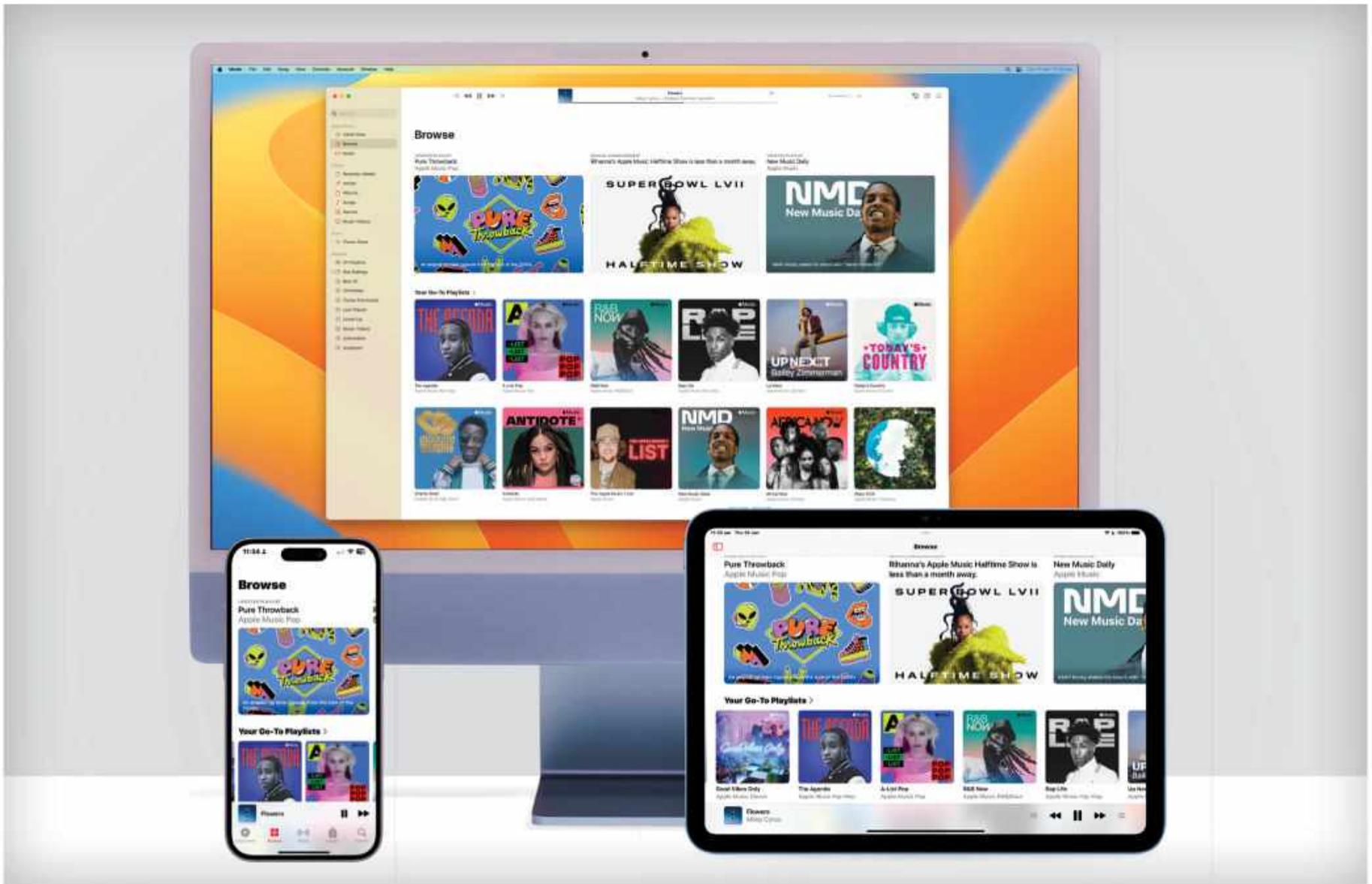
As an avid note-taker, Rachel found this issue's group test (p50) very handy — so much choice!



Craig Grannell

Contributor

Craig shows you why Macs don't really like to play nicely, in a history of Apple gaming (p26).



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The Ultimate Guide to Apple Music

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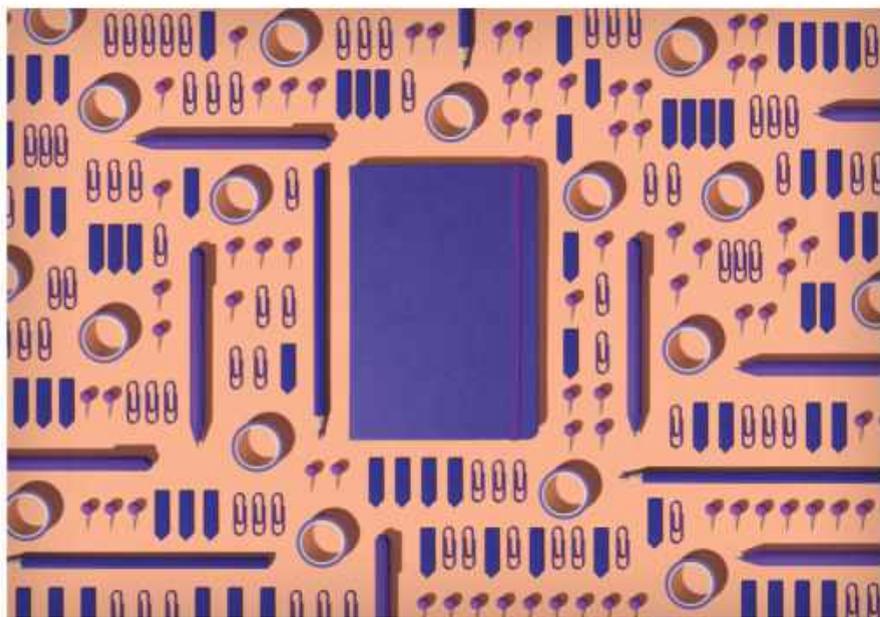
History of Apple gaming

Learn how a technological revolution was kickstarted by two people in a garage, and how the history of gaming is intricately linked to Apple's success.

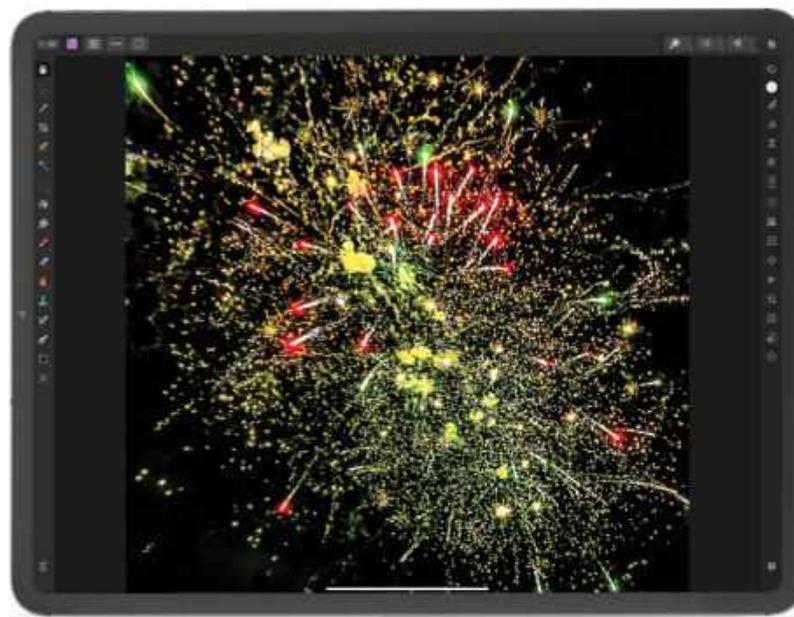
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Adventures with Apple Watch Ultra

An in-depth guide to the most durable Watch ever, designed to keep you safe as you run, hike, dive, and much more.



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START

THE LATEST NEWS FROM THE WORLD OF APPLE

HomePod is back

Smart speaker revived with “breakthrough sound and intelligence”

BY ALEX SUMMERSBY

APPLE HAS RELEASED a second-generation HomePod smart speaker, in a design virtually identical to the original introduced in 2018 and discontinued in March 2021. It costs \$299, the same as the original (which launched at \$349 but was widely criticized as expensive even after its price cut). The HomePod mini remains available at \$99.

Apple says the HomePod (2nd generation) has next-level acoustics with advanced computational audio, including support for immersive Spatial Audio tracks. With “all-new” room sensing technology, it detects sound reflections to determine whether it is against a wall or in the open, then adapts its soundscape in real time. Precise directional control of its beamforming array of five tweeters separates and beams direct and ambient audio for a much more immersive listening experience.

You can also create a stereo pair with two HomePod speakers in the same space. This won’t just separate the left and right channels; the pair will communicate with each other to balance their output and create a wider, more immersive soundstage

than traditional stereo speakers. Note that this requires two speakers of the same model — two HomePod mini, two HomePod (2nd gen), or two HomePod (1st gen).

The second-gen HomePod is available in white and midnight, a new color made with 100% recycled mesh fabric, with a color-matched woven power cable. This cable is removable, not fixed like the first-gen HomePod’s. The new model is 5.6 inches wide, the same as the first-gen, but slightly shorter and lighter. The backlit touch surface on top is larger than the original’s and illuminates from edge to edge, like the HomePod mini’s.

IT’S NEW, BUT IS IT IMPROVED?

Inside, there are five tweeters (down from seven in the first-gen model) and four far-field beamforming mics (down from six), optimized to pick up voice commands even when loud music is playing.

Unlike the original, the new HomePod has a U1 ultra-wideband chip for a smooth handoff of songs, podcasts, or even phone calls from nearby iPhones (U1-equipped and running iOS 16.2 or later). It has an Apple S7 chip for computational audio, the same chip as the Apple Watch Series 7. This would seem a step down from the A8 chip in the first-gen HomePod, the same chip as in the iPhone 6, but the S7 tech is nearly a decade newer. It’s also two generations newer than the S5 chip in the HomePod mini.

While the original HomePod had Wi-Fi 5 (802.11ac), the new model has the slower Wi-Fi 4 (802.11n), the same as the HomePod mini, but this



News in brief

A bite of the Apple

> APPLE WIRELESS CHIPS?

Apple is reportedly working to phase out Wi-Fi and Bluetooth chips made by Broadcom, plus 5G modem chips by Qualcomm, replacing both with its own all-in-one wireless chip. This could save it a lot of money: last year Broadcom earned almost \$7bn (20% of its revenue) from Apple, its largest customer, and Qualcomm nearly \$10bn (22%). It may not be easy, though: a source says Apple canceled plans to release a fourth-gen iPhone SE in 2024 because of problems with its first in-house 5G modem.

> COLOR-SAMPLING PENCIL

Apple has applied for a patent on a Pencil with optical sensors that can sample the color and texture beneath it, then transmit the data wirelessly to a paired iPad or other device, for use in a drawing or painting app. Texture-sampling and the simplicity of this could beat any color sampler apps, like Adobe Color, or a paint app's eyedropper tool — but, as ever, there's no clue when or whether the concept might become an actual product.

> LASTPASS HACK MORE SERIOUS

Password manager LastPass says a security breach it first reported in November was far worse than it said, exposing unencrypted user info along with encrypted data. A "bad actor" could use the former for phishing attacks, as well as run brute force attacks on the latter. LastPass didn't reveal how many of its 25.6m users are at risk, but the best advice is to immediately reset all your passwords site-by-site and activate two-factor authentication wherever possible. Watch for a new group test of password managers in *MacLife* soon.

is more than fast enough for audio, experts are saying, and less prone to interference from home appliances. All models support Bluetooth 5.0.

Unlike the original, the second-gen model (like HomePod mini) has built-in temperature and humidity sensors. This promises new smart home functions, such as asking Siri

what the temperature is in the room, and setting up automations to close the blinds or turn on the fan when it reaches a certain level.

Speaking of the smart home, the new HomePod boasts compatibility with (HomeKit- or Matter-enabled) Thread accessories, and can act as a Thread-enabled home hub — as can HomePod mini, Apple TV 4K, or a third-party Thread border router.

As you'd expect, HomePod easily pairs with Apple TV 4K for a great home theater experience including Dolby Atmos audio, and you can make HomePod the audio system for all devices connected to the TV. Plus, with Siri on HomePod, you can control what's playing on your Apple TV hands-free.

DRIVEN BY SIRI

As well as access to a catalog of more than 100m songs via Apple Music, Siri allows search by artist, song, lyrics, decade, genre, mood, or activity. It can also recognize up to six voices, so all the household can hear their own playlists, ask for reminders, and set calendar events.

Using multi-room audio with AirPlay, you can simply say "Hey Siri", or touch and hold the top of HomePod, to play the same song on multiple HomePod speakers, play different songs in different rooms, or even use them as an intercom to broadcast messages to other rooms.

Find My on HomePod makes it possible to locate Apple devices by playing a sound on the device. You can also ask Siri for the location of friends or loved ones who share their location via the Find My app.

Sound Recognition is coming to the new HomePod and HomePod mini in a software update due soon: if the speaker detects a smoke or carbon monoxide alarm, it can send a notification direct to your iPhone.



> THE SHIFT

MATT BOLTON thinks that in a world where phone upgrades can't be exciting anymore, maybe they should be boring



TOWARDS THE END of 2022, I took a holiday. I haven't done a full-on "Get on a plane, go somewhere where you have to speak another language" trip since 2019, and so naturally my iPhone was the MVP. It was my boarding pass, in-flight entertainment, connection schedule finder, map, museum ticket, live translator, tour guide, and, of course, camera.

It did all these things in 2019 for me too, but now I'm several versions on compared to the

THE MOST NOTICEABLE DIFFERENCE BETWEEN MY OLD AND CURRENT IPHONE? BATTERY LIFE

iPhone 11 Pro I had at that time, and what was the difference I noticed compared to then? Connectivity? Cameras? Screen? All have changed in that time, but none felt drastically different. There was only one major improvement that really felt like it

changed my experience, but not because of what it added, but what it took away. The difference I noticed was battery life.

I'm using an iPhone 14 Pro, which got a huge leap in battery life over previous models, and what its glorious longevity did for me on this trip was to remove anxiety. I've written here before that if Apple wants the iPhone to be the center of our digital lives, we have to get to a point where we're not worried about it dying while we still might need it. Now, this certainly could have happened on this trip if I'd used it even more... but it didn't happen, and even more importantly, I wasn't worried about it happening. I felt totally confident that I'd have my map, tickets and so on available to me in the evening, even after a full day of use.

It made me think more about the future of phone upgrades, and what Apple can possibly change when they're so mature as devices. Feature changes tend to come with splashy additive options, even if some of what they add isn't splashy. The ProMotion display in my Pro iPhone is a big part of why its battery life is so good — not because it does swish 120Hz



Why should a refresh rate of just once per second be a Pro-only advantage?

refresh rates, but because it can do dull 1Hz refresh rates.

Did you know that the Apple Watch also features ProMotion-like tech, so that it can drop to 1Hz refresh rates, to save power in the always-on display? But it doesn't go up to 120Hz refresh rates — it has the dull part, but not the swish part. I wish we'd see more of that spirit in the iPhones. Apple hasn't been keen to give its less expensive phones the swish 120Hz experience so far, but could it please give them the dull 1Hz experience? Upgrades don't always have to be additive — they can also take things away. They can remove weight, they can remove confusion, they can remove battery anxiety. These can be a game-changer too. I'd love to see an iPhone upgrade that's the same, but less.

>>> Matt is Managing Editor at Future's flagship technology website TechRadar and has been charting changes at Apple since his student days. He's skeptical of tech industry hyperbole, but still gets warm and fuzzy on hearing "one more thing."

LETTER OF THE MONTH

I see that you are still recommending LastPass for password management in the “Best of the Best” section. Given the recent security breach of LastPass and the consensus that they were not exactly forthcoming in the seriousness of the breach, do you continue to recommend them? If not, what would be your preferred alternative?

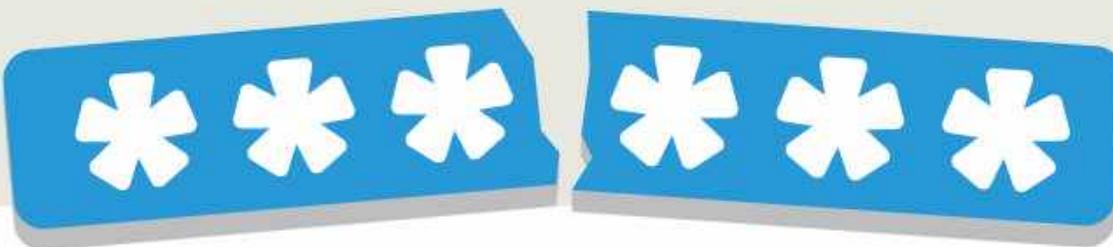
DANIEL

We certainly did Daniel, but thanks for the heads-up anyhow. Due to the massive amount of time between things happening and the magazine hitting the shelves/landing at your door/pushing to your iPad, we weren't able to do

anything about it. I've rectified it in this issue, though, pulling LastPass from our recommended products for the time being.

What with the LastPass revelation, and 1Password 8 still not gaining approval on the Mac App Store, now feels like a good time to revisit the password managers that are available. We'll be looking at the alternatives (some of which we didn't cover last time), and seeing which is now the one to go for in a future issue of *MacLife*.

In the meantime, we'd recommend taking a look at the Secrets app, which we awarded 4.5/5 in the same group test where LastPass won, and is available on the Mac App Store.



No longer tasty

Can you tell me what's happened to Delicious Library? It used to be a great app but now I cannot even arrange my items, any kind of help is gone, even the forums are not available. I have been looking around but nothing has what Delicious Library has.

JOHN POLJACK

Delicious Library, which as you say is a really great app. If you look on the developer's own blog it appears he's moved on. It does say he will try and keep Delicious Library up to date, but that doesn't seem to be the case. Though it can't match Delicious Library's iBook-style shelving display, Home Inventory has many of the same features – including the ability to scan barcodes on CDs, DVDs and more.

Disc memory

Agreeing with your invitation to email you, I'll take this time to say this: I love your magazine and

have always been very happy with its content. I am currently on my 8th Mac, had my first 128K Mac back when I was selling them, and now have a Mac mini. I was saddened when you deleted the free disc option, and I chalked it up to cost saving, but I still have an old Mac that takes discs and would love to have some new games and utilities. Thanks Nick.

JOHN W. COBB

What a lovely, heartfelt letter John! Sadly, the disc was a feature of the previous incarnation of *MacLife*, *MacAddict*, and has been sorely missed since we relaunched in 2007. I do miss the days of a physical “freebie” with magazines, though one of our sister titles in the UK, *Linux Format*, was actually still producing a disc every month until recently.

Which ones?

Is there a way to determine which apps on a Mac computer are unnotarized? Reading your piece “Notarize now very crucial” left me wondering.

BRIAN R NEWMAN

According to our tech expert Howard, “ArchiCheat, free from <https://bit.ly/3jnrlPg>, tells you that and more, but my favorite is Mothers Ruin's superb Apparency, free from <https://bit.ly/3WMMWTW>. It is puzzling that the Finder doesn't give this information in the Get Info dialog. Given the importance Apple has given to notarization, it seems a glaring omission.”



It's a sad situation when you see an app fall by the wayside, as seems to be the case with

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CRAVE

THE BEST GEAR FROM THIS YEAR'S SUPER TECH SHOW



Samsung ViewFinity S9

\$TBC From www.samsung.com

>>> Apple's Studio Display is an excellent monitor, but Samsung reckons it can do better with its ViewFinity S9. Right from the off, it's clear that Samsung is aiming squarely at Apple.

The ViewFinity comes with a 27-inch 5K panel that hits 99% of the P3 gamut. There's a built-in color calibration tool, a matte coating to ensure optimal viewing, plus DisplayPort, USB-C and Thunderbolt 4

ports. There's also a detachable 4K webcam for pixel-perfect video calls.

Samsung's new monitor gets zero points for design originality (you may have noticed that the S9 looks eerily similar to the Studio Display), but that's probably of little concern when it packs in so many impressive features. We'll have to wait for pricing to see if this alternative is truly competitive with the Studio Display.

Razer Project Carol

\$TBC From www.razer.com

>>> Razer's Project Carol takes headrest functionality to an extreme. We've never seen a cushion quite like this.

Project Carol includes both built-in surround sound and haptic feedback, presumably to help make you even more immersed in whatever game you're playing or movie you're watching. Razer says it does this without annoying cables or additional software setup, and the headrest is entirely battery powered.

The haptics are provided by Razer's HyperSense tech, which has been seen before in the company's gaming headsets. It converts audio signals into vibrations, so when you get deafened by an explosion you also feel it vibrating across your skin. Time will tell how comfortable that is!



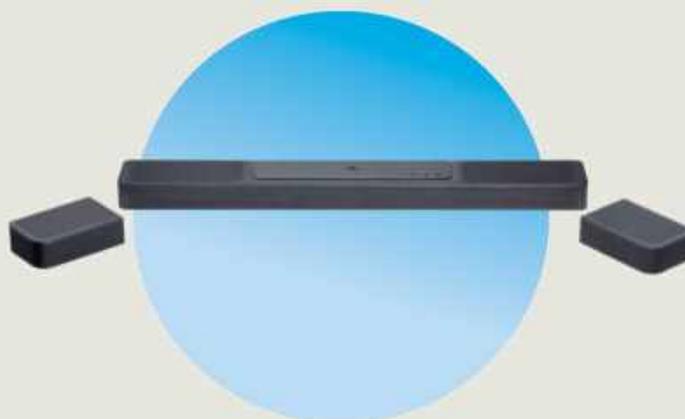
OWC Thunderbolt Go Dock

\$399 From www.owc.com

>>> OWC is releasing a new Thunderbolt Go Dock that claims to be the first full-featured Thunderbolt dock with a built-in power supply.

Instead of coming with a bulky, heavy power brick or relying on your laptop for juice, the internal power supply means the device can offer up its 11 ports without gobbling up space on your desk or in your bag.

Those 11 ports comprise three Thunderbolt 4 slots, one USB-C port, three USB-A slots, an HDMI port, 2.5Gb/s Ethernet, an SD card reader, and a 3.5mm headphone jack.



JBL Bar 1300

\$1,555 From www.jbl.com

>>> The key selling point of this high-quality soundbar is the inclusion of a whopping 15 audio channels. But it's no one-trick pony – it comes with detachable speakers and a separate subwoofer, helping it approach proper surround sound territory.

That's bolstered by the inclusion of Dolby Atmos and DTS:X 3D audio surround sound trickery, plus MultiBeam technology that bounces audio off your walls. It's topped off by Harman's PureVoice tech that optimizes speech even when it has to compete with loud aural effects.



Samsung The Premiere 8K

\$TBC From www.samsung.com

>>> The Premiere 8K ultra-short-throw projector can project an image up to 150 inches across, giving you a huge amount of screen real estate to enjoy movies and games. In fact, it's the first 8K projector to hit the 150-inch mark – previously, similar projectors had only managed 130-inch displays.

Right now, Samsung is keeping tight lipped on The Premiere 8K's other specs, including brightness, ports, support for variable refresh rates and Dolby Vision, and practically everything else. There's also no word on the price, but don't expect it to be cheap.



HTC Vive XR Elite

\$1,099 From www.vive.com

>>> While the tech world gets in a flurry about Apple's top-secret mixed-reality headset, HTC has gone ahead and unveiled its own version: the Vive XR Elite. It's clearly taking shots at the Meta Quest Pro and aiming for the flagship headset crown.

As the "mixed reality" term suggests, the Vive XR Elite combines virtual reality (which immerses you in a digital realm) with augmented reality (which overlays data onto the real world). It features four 4K displays with 90Hz refresh rates, a modular design that can be either battery powered or tethered, and adjustable lenses that are able to accommodate glasses wearers, letting you leave your spectacles behind.

With all that and much more, Apple could have its work cut out if it wants to sit pretty as the mixed-reality champion.



Nanoleaf Sense+ Controls

\$TBC From www.nanoleaf.me

>>> Nanoleaf's funky lights are a popular way to get creative with the lighting setup around your home. With the introduction of the company's Sense+ Controls line, they could become even smarter than before.

The Sense+ Controls consist of a hardwired Smart Light Switch, a Wireless Smart Light Switch, and a Nala Learning Bridge. All three have motion and ambient light sensors, which let them learn from your daily routines and automatically adjust your home's lighting.

What that means is your home tweaks the lighting arrangement for you, with no input required on your part. That includes switching lights on or off, adjusting colors and color temperatures, and selecting new lighting scenes. It's personalized lighting with none of the tedious programming.

TCL RayNeo X2

\$TBC From www.tcl.com

>>> The latest news from the rumor mill is that Apple's super-secret augmented reality (AR) glasses project is floundering, but you can sate your AR appetite with the TCL RayNeo X2.

They are what the company calls "the world's first binocular full-color Micro-LED optical waveguide AR glasses." A bit of a mouthful, but the company claims you'll get bright, high-resolution imagery with a 100,000:1 contrast ratio and up to 1,000 nits of brightness.

There's a built-in GPS navigation system with gesture controls, on-screen notifications, AI translation with subtitles, and a built-in camera with image stabilization. If you want to be at the forefront of the AR ecosystem, they could be worth keeping an eye on.



Ring Car Cam

\$199.99 From www.ring.com

>>> The Ring Car Cam is small and unobtrusive, yet still comes with plenty of top-notch features. It has forward and backward facing cameras, both of which can work in the dark to detect and record motion. If the sensors detect a break-in while your car is parked, it will start recording and send you an alert. You can even communicate with the burglar to tell them to buzz off.

Both cameras capture 1080p footage. There's Wi-Fi and LTE connectivity, a privacy cover and indicator lights for the camera and microphone, plus a GPS locator too.



Aqara Smart Lock U100

\$TBC From www.aqara.com

>>> The Aqara Smart Lock U100 is a deadbolt lock with HomeKit integration. It supports Apple Wallet's home key feature, letting you unlock your door with just your iPhone or Apple Watch. You can also authenticate with your fingerprint, password, NFC card, mechanical key, or the Aqara Home app.

There aren't many HomeKit-compatible smart door locks on the market, so this might be a good choice if you want to marry robust security with the convenience of Apple's software. That should work wonders to keep your home protected.

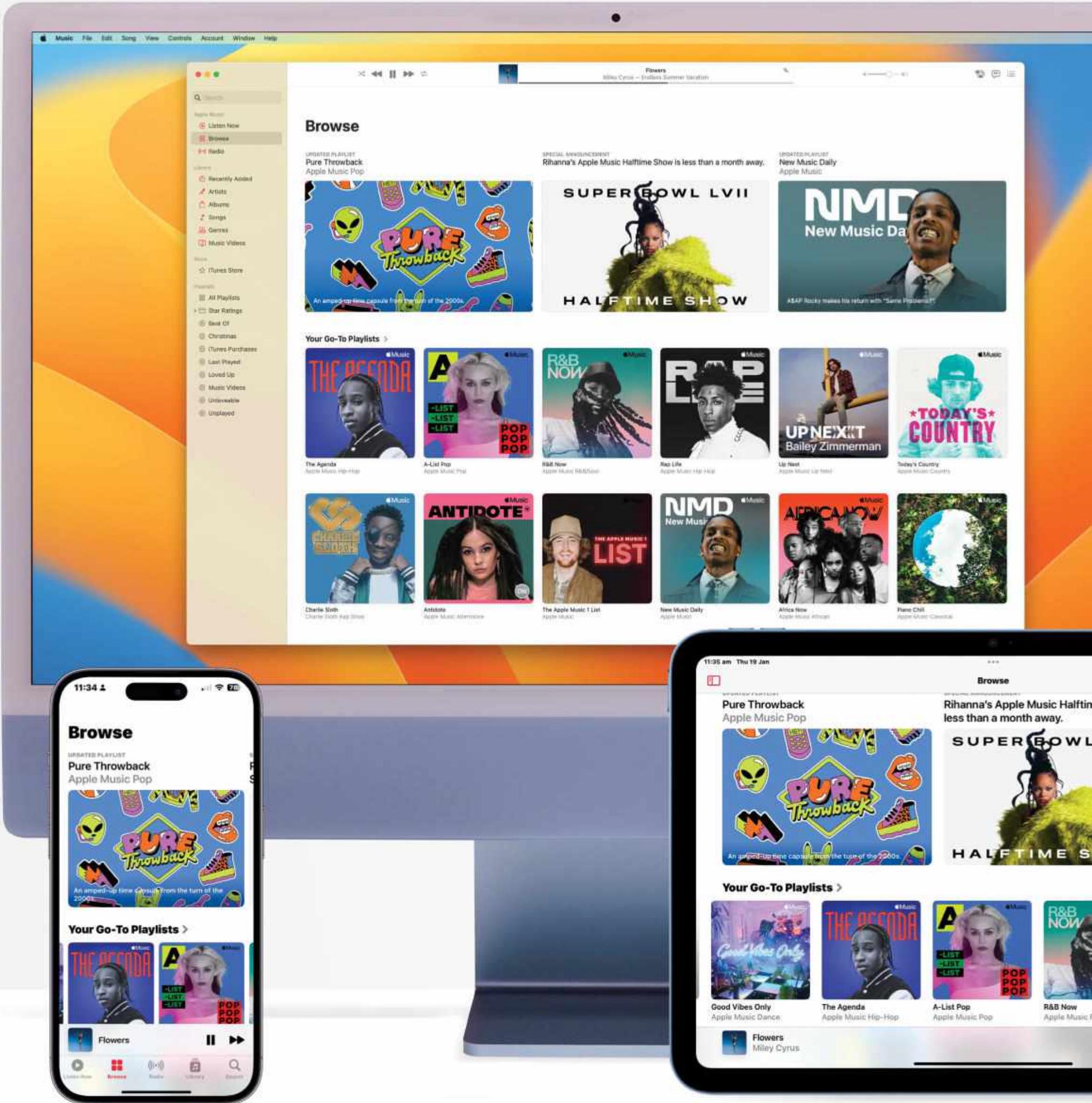


Brava Glass

\$1,995 From www.brava.com

>>> Take the guesswork out of cooking with the Brava Glass smart oven. This clever device comes with an internal, heat-resistant camera that lets you monitor the progress of your meals through the Brava companion app. That will help you know exactly when your food has had enough time in the oven.

The Brava Glass can also cook different food groups at different temperatures, meaning you can put everything on one tray and heat it simultaneously. And it does all that while using less energy than it requires to preheat a regular oven.



THE ULTIMATE GUIDE TO APPLE MUSIC

Take back control of your music collection, with our in-depth guide to the Music app for Mac and beyond...

WRITTEN BY ROB MEAD-GREEN

When Apple finally did away with iTunes with the release of macOS Catalina in 2019, it replaced it instead with Music — which was iTunes, but with the movie, podcasting and syncing bits hived off into TV, Podcasts and Finder instead. While that's certainly been great news in some ways — iTunes became an increasingly bloated mess — it's sown confusion in others, especially since Apple has shifted its focus away from simply enabling you to manage your personal music collection (including purchases bought from the built-in iTunes Store), and towards subscription-based streaming, with the launch of Apple Music.

This can mean that despite the removal of the movie and podcasting elements from the old iTunes, the Music app for Mac still feels, at times, like it's trying to do too much.

So, we've compiled an in-depth guide to pull the Music app apart and talk you through all its constituent pieces, and help you achieve a greater understanding of what the app does, including what it does well and what it does occasionally very badly.

We'll also explore some other great ways to enjoy your music, and we'll take into account your other devices too. So sit back, pour yourself another drink and stick some tunes on — the Apple Music party is about to begin... ■



Your music library

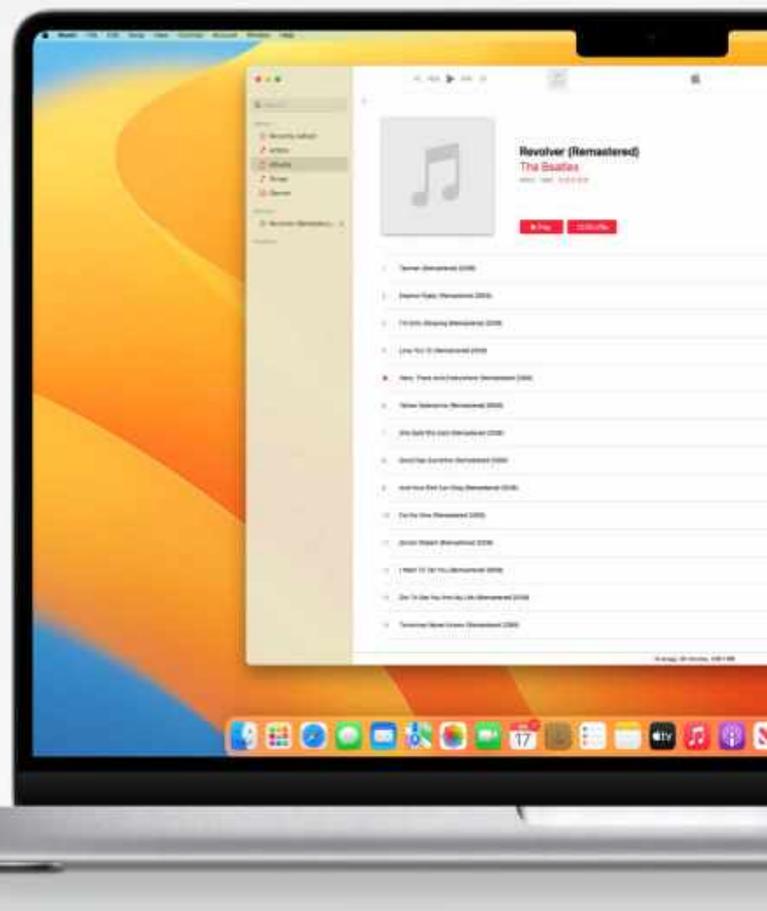
Import and manage your personal audio collection

With vinyl records often outselling CDs, and streaming services thrashing both, your optical disc-based music collection might feel like its time has come and gone. Apple is partly to blame, of course. While it didn't invent the digital audio player (DAP), it certainly popularized it, with various flavors of iPod selling in their millions since the very first model promised to enable "1,000 songs in your pocket" when it launched in 2001.

With the iPhone, iPad, Mac and even the Apple Watch capable of storing more songs than entire music collections, it's no surprise that old media formats have largely fallen out of favor. Audio streaming services account for the majority of music listening now — Apple Music gives you access to hundreds of thousands of songs in an instant from almost any period in recorded music history. All you need is an internet connection, and a valid subscription.

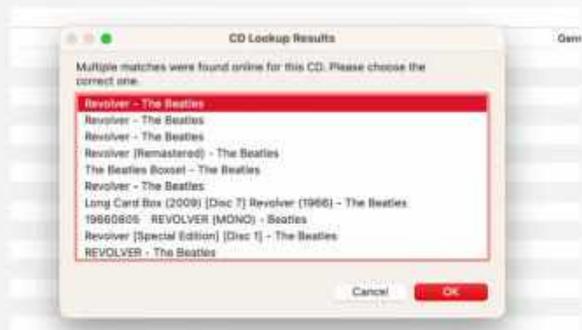
While you could consign your CDs to that big old charity shop in the sky, it's sensible to hang on to them, and make them the basis of your own personal music collection — available on your Mac, of course, but also on your other devices, as we'll show you later on.

To import your CDs you'll need a CD drive, which modern Macs do not have. Apple's USB SuperDrive (\$79) can play and burn CDs and DVDs,



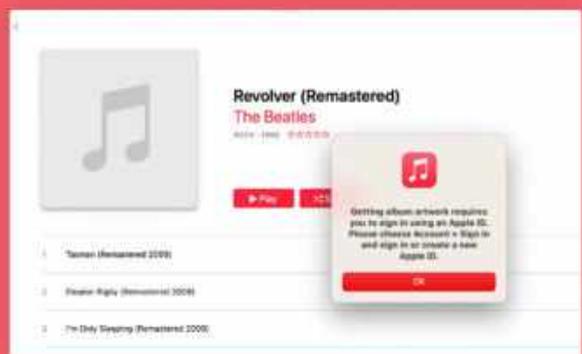
plus third-party CD/DVD drives are widely available [we have a review roundup on page 44]. If you own a USB-C only Mac, you'll need an adaptor as the USB SuperDrive only comes with a short USB-A cable. You'll also need to connect it directly to your Mac as, for some reason, it won't play nicely when used with an external dock or hub.

With that out of the way, what do you do when you insert your first CD? By default, your Mac should offer to import it for you, automatically

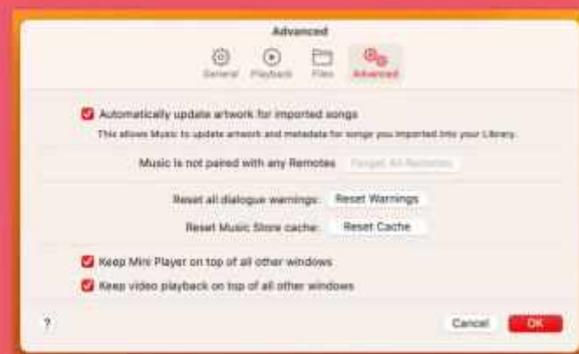


The Music and iTunes apps will automatically look up CD track listings. Edit them using Get Info.

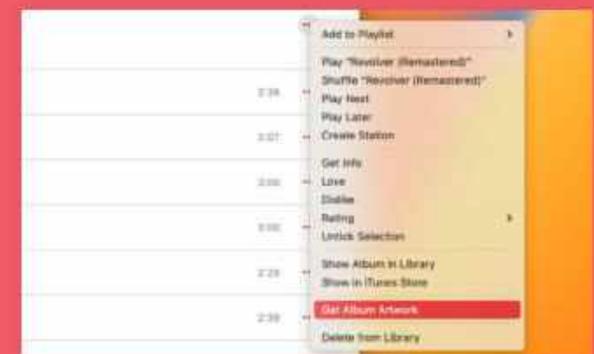
HOW TO Add artwork to albums and tracks



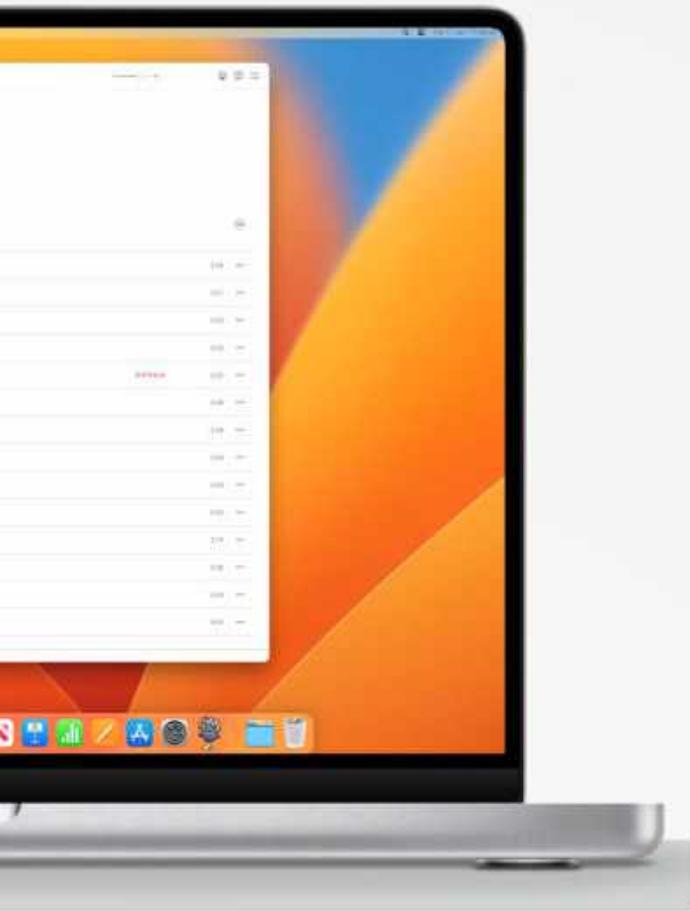
1 Your Music, your way
Apple tries to push you towards its Music streaming service by default, but you can stop both it and the iTunes Store from appearing in your Library if you wish. The catch is that you won't be able to fetch artwork without them.



2 Add artwork easily
To fetch artwork, you'll need to be logged in to the iTunes Store (Music > Account > Sign In). You should also ensure Music > Settings > Advanced > "Automatically update artwork for imported songs" is checked.



3 Do it manually
Sometimes Music messes up and either adds the wrong artwork or none at all. You can add it manually by selecting an album or track, clicking "...", then Get Info > Artwork. Delete existing artwork, then click Add Artwork.



offering to fetch artist, title and track details from an online database, and even artwork if you've logged in to the Music app using your ID. However, you can change this behavior. With the Music app open, head to Music > Settings > General > "When a CD is inserted". From the menu there, you can choose from Show CD (which shows the disc in the Music app, but doesn't play it); Play CD, which does just that; Import CD, which automatically copies the contents of the CD to your Music library; and Import CD and Eject, which spits the CD out of the drive once it's finished importing.

While in Music > Settings, head to Files and ensure that "Keep Music Media folder organized" and "Copy files to Music Media folder" are checked. This helps bring order to your Music library and keeps

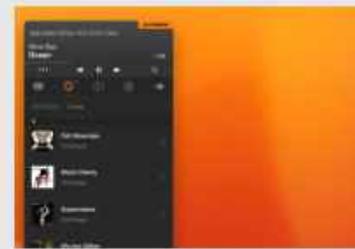
Top 5 Alternatives to the Apple Music app

While the Music app is great at many things, you may prefer something more streamlined or with additional functionality. Each of our picks here bring something different to the party, and some even support third-party streaming services too.



Strawberry

<https://bit.ly/3wrPLdq>
This open-source music player for Mac, Linux and Windows looks and feels incredibly dated with an interface that's reminiscent of old-school iTunes, but it works well. Old-fashioned, but decent.



Vox

<https://bit.ly/3WCdjXA>
Available for Mac and iOS, Vox is a slim-looking audio player that's big on functionality, although some features come at a cost. The premium version costs \$4.99/month from the Mac App Store.



IINA

www.iina.io
Although it's primarily designed as a video player, IINA can handle music too. Its interface and music features are incredibly minimalist, so don't expect any of the features you normally find in the Music app.



Pine Player

www.digipine.com
Fans of high-quality audio may be pleased by Apple Music going lossless, but for true audiophile support, including for DSD, you'll need Pine Player. It's a little quirky to look at, but is incredibly capable, and free.



Fidelia

<https://bit.ly/3XL6Fzs>
With an interface designed to look like a piece of hi-fi gear, Fidelia is a gorgeous premium music player for 10.14 Mojave or later. There is a catch though — it's only available from the Mac App Store for \$29.99.

the music you download or import in the same place. On Mac, this is usually in Users > [Your Username] > Music, but you can move the library to an external drive, or even move it to the Users > Shared folder so others can access it.

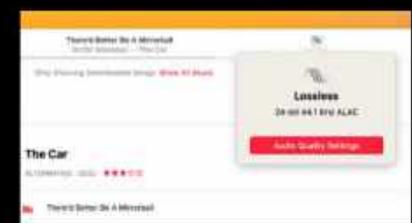
Next, head to Settings > Import Settings. The default here is iTunes Plus, an AAC format which carefully balances audio quality with convenience. However, we're going to plump for Apple Lossless — you can find out why below. ■

Apple Lossless vs iTunes Plus

Apple Lossless delivers CD-level sound quality without taking up huge amounts of storage (like uncompressed WAV can) and it's also the format

that Apple Music supports (iTunes Store downloads are AAC-only). This means you no longer have to sacrifice sound quality for convenience — unless one

of your devices (your car's audio system, say) prefers AAC or MP3 formats. Both options are still available in Music > Settings > Files > Import Settings.



Apple Lossless is everywhere on Apple Music — and is the best format for importing CDs too.

Sync your songs across all devices

How to store your music with Sync Library

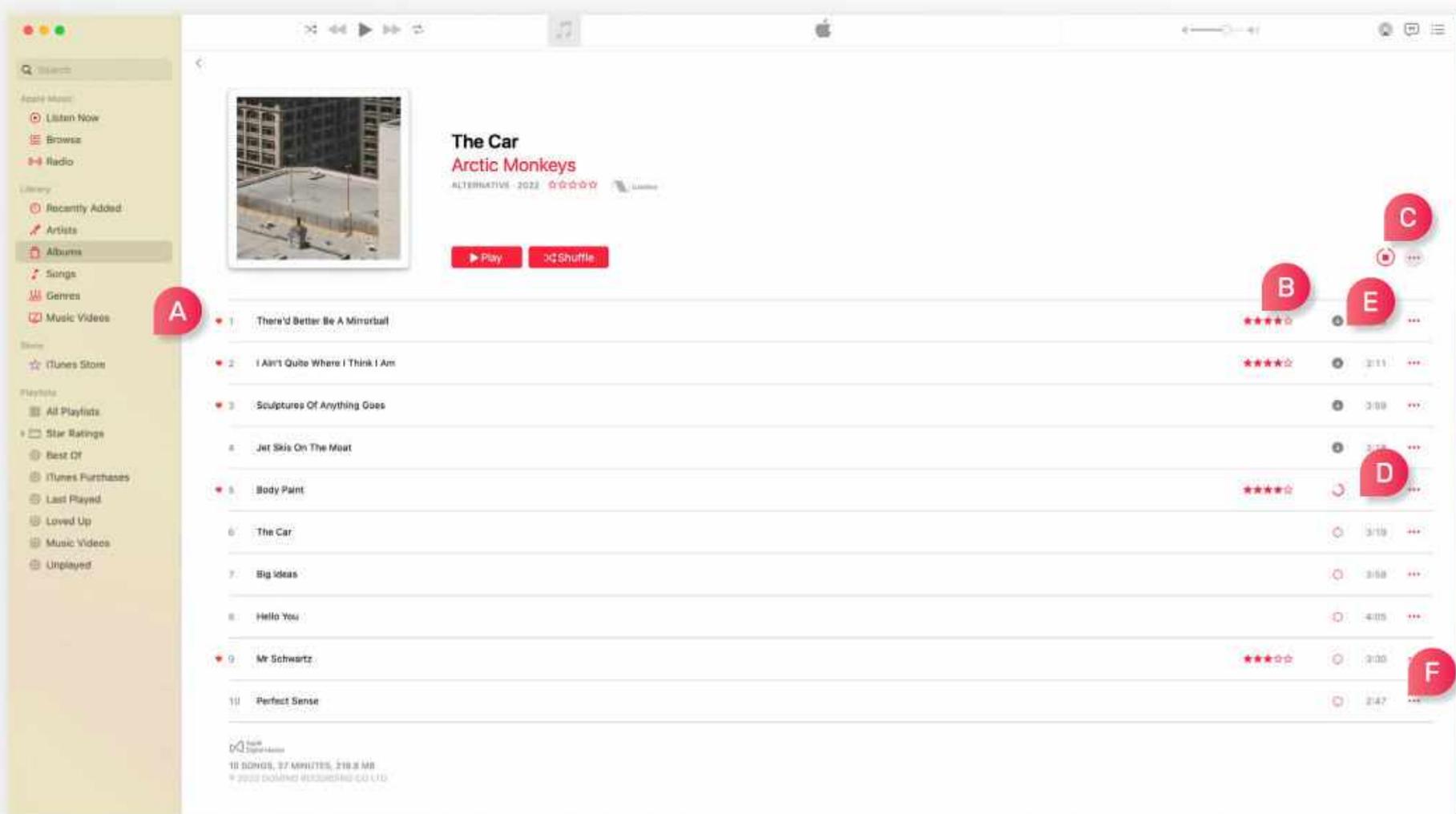
While having your music collection on your Mac is great, it can be a little limited. Sure, you can sit at your Mac to listen to music or even stream it from that Mac to any AirPlay speakers you have at home — but what if you want to listen to your music on your iPhone, iPad or Watch, or on another

computer when you're away? Now you could connect your iPhone or iPad to your Mac and sync your music collection that way. Or, for even greater convenience, you could use Sync Library. Subscribe to Apple Music or iTunes Match and your music is available everywhere. Here's how... ■

Sync Library limits

An important factor to keep in mind when using the Sync Library: if you're an Apple Music subscriber, the maximum number of songs you can store in the cloud is 100,000 (not including songs or music videos purchased from the iTunes Store). The same limit applies to iTunes Match subscriptions.

QUICK LOOK Sync Library



A LOVED
Click “...” next to a song and “Love” it — you can then create a Smart Playlist of your top favorite tunes.

B STAR RATINGS
You can rate individual tracks and even entire albums. They come in handy for playlists too.

C STORE SONGS
This icon means the album is downloading. A check mark shows the album is already stored locally.

D DOWNLOADING
An incomplete circle shows how much of the track's been downloaded; same on the iPhone.

E TRACK STATUS
If you can't see a solid arrow here, Ctrl-click the “...” icon to download the track.

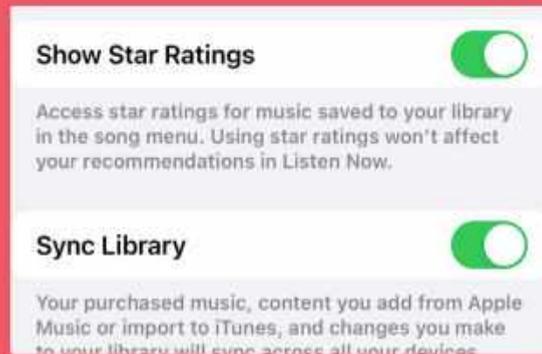
F MORE OPTIONS
Click here to remove a track, view it in Finder, play it, see it on the iTunes Store or share it.

HOW TO Sync and share your Library



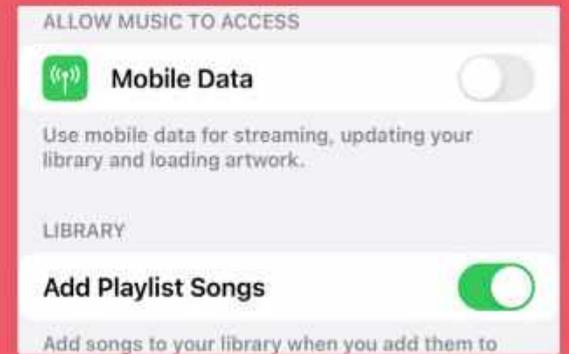
1 Check your settings

When you subscribe to Apple Music or iTunes Match, you get a new Sync Library setting in Music > Settings > General. Make sure this is checked otherwise the songs in your library won't sync.



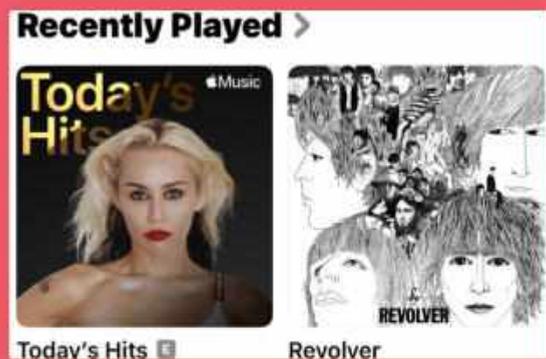
2 Other devices

Now do the same for your other devices. On iPhone or iPad, the option can be found in Settings > Music > Sync Library. You can turn syncing off for any device you don't want your music on.



3 Watch your data

On iPhone (or WiFi+Cellular iPads), be sure to toggle the "Download over Mobile Data" switch to Off if you only want those devices syncing your library when you're in reach of home Wi-Fi.



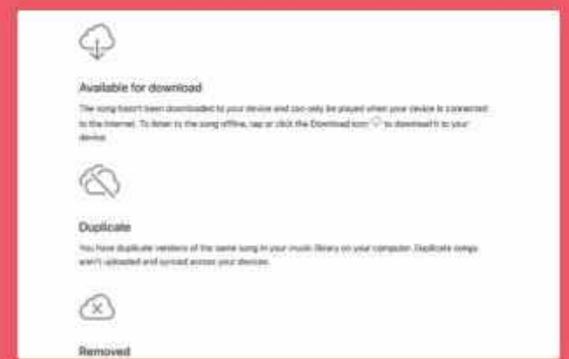
4 Easy access

With Sync Library active on your selected devices, the Music app on your iPhone or iPad will soon be populated with the artists, albums and tracks found on your Mac's music library. Handy!



5 Make a Match

If you don't want to pay monthly for Apple Music, but do want to use Sync Library, head to the iTunes Store in the Music app and select iTunes Match from the right-hand column to subscribe to it.



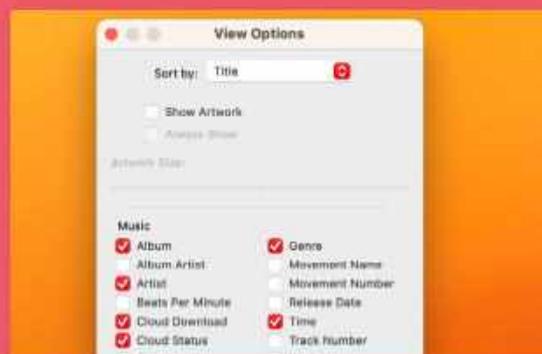
6 Know the code

As the music library on your Mac begins syncing with your Sync Library, you'll notice little cloud icons appearing alongside each track – these can give you useful status indicators, as in the image above.



7 Look for errors

The icons to worry about are those that tell you whether a track is Ineligible (larger than 200MB or of poor audio quality). A dotted-line cloud icon often means the track is still uploading.



8 Watch this space

If the Cloud Status icon isn't appearing in your Library, go to View > View Options and make sure the Cloud Status Icon option is checked. It might be helpful to add Cloud Download here too.



9 Keep a backup

Because licence agreements with record labels can change, you may find that some of your iTunes purchases are marked "Illegible" for syncing. Another reason to make regular library backups.

Listen your way

Become a Music genius — we show you how!

The Music app for Mac is packed with a host of handy features, some of which may initially be tricky to get your head around. It not only offers multiple ways to view your personal music library, but also includes the iTunes Store (where you can make music purchases), and Apple Music. Apple's paid-for streaming service also throws a whole range of other options into the mix, from live music stations to Apple Music Sing — Apple's hot take on karaoke, which enables you to

mute or reduce vocals during playback, while you sing along to the real-time lyrics onscreen.

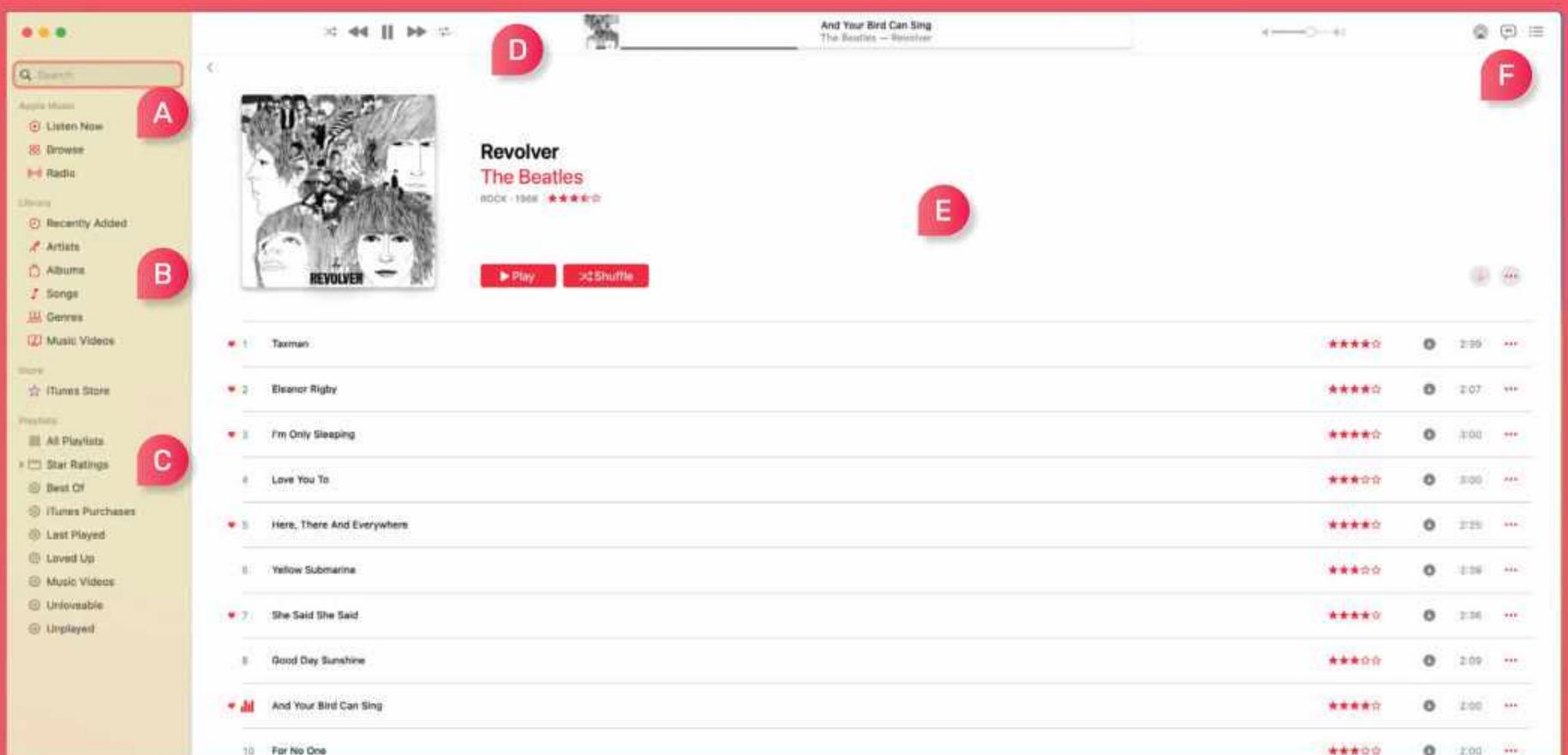
Then there's Sync Library (see p18), which takes almost all the music you've imported or purchased and makes it available in the cloud — either as part of an Apple Music subscription, or as part of iTunes Match (which costs \$24.99/year).

Here we'll share some nifty tips and tricks for making the most out of the app, for a convenient and personalized listening experience. ■

Display only your downloads

By default, the Music app will show you all of the tracks you have added to your Music library — both the ones you've downloaded or imported, and any you've added to the library in other ways; these can be tracks that have yet to be downloaded from your Sync Library, or songs you've added from Apple Music. To see tracks you've downloaded to your Mac, choose View > Only Downloaded Music.

QUICK LOOK The Music library interface



A APPLE MUSIC

Subscribe to the streaming service to see the Browse option, and reveal what's inside Listen Now.

B LIBRARY

Music on your Mac is arranged by Artists, Albums, Songs and more, for quick and easy access.

C PLAYLISTS

Think of these as compilations you've created yourself. You can even create rules-based smart playlists.

D PLAY CONTROLS

At the top are Music's play controls. The currently playing track is shown with artwork.

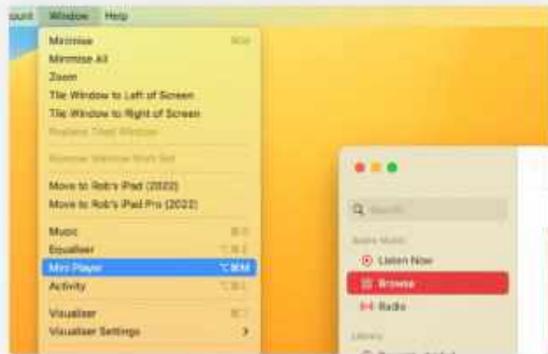
E MAIN WINDOW

What you see here depends on what you have selected in the sidebar. Here you can see the Album view.

F MORE OPTIONS

The icons top right are for AirPlay, lyrics, and a list of either upcoming tracks, or recent play history.

HOW TO Master key features of the Music app



1 The Mini Player

As well as being able to view the Music app in either a windowed or full-screen view, you can also switch to its Mini Player, by selecting Window > Mini Player from the menu. You'll also find the Equalizer here too.



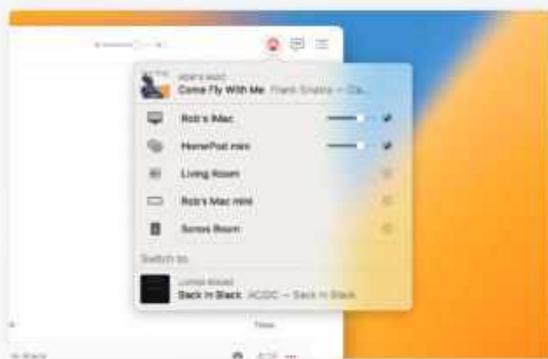
2 Change the sound

The Equalizer enables you to change the way music sounds coming from your Mac, external speakers or connected AirPlay speakers. You can either use one of the available presets, or click Make Preset to make your own.



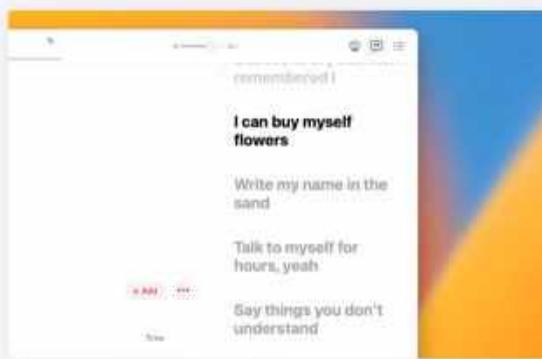
3 View the Visualizer

This is a throwback to the iTunes era and displays trippy visuals that change color and pattern to match the track that's playing. Choose between Visualizer or, for a truly old-school vibe, select Classic Visualizer instead.



4 Use AirPlay

If you have any AirPlay speakers on your network, tap the AirPlay icon on the top-right of the main Music window to show this pop-up. Choose one or more AirPlay speakers to play through, and adjust their volume.



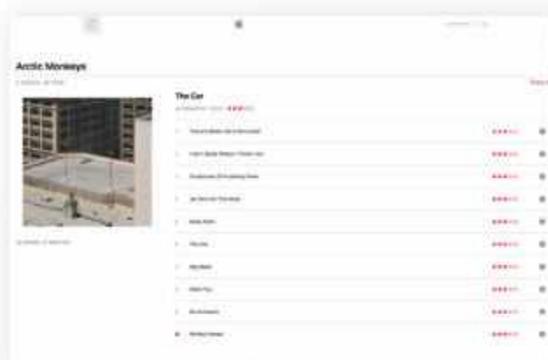
5 Sing along with lyrics

In the top-right corner of the main view, click the speech-bubble Lyrics icon. You need an Apple Music subscription to view lyrics – although you can add your own.



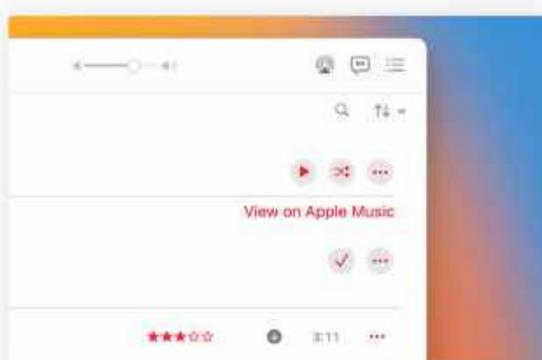
6 Cue and review

The final icon in the top-right corner shows you which songs Music is going to play next – you can add/remove songs, and change the order. Any songs you've recently played will appear in the Play History tab here.



7 Play current artist

To play all the songs for a particular artist, select Artists from the left-hand sidebar, scroll down to an artist, then press the Play button to the extreme right of the artist name. The songs will play in order.



8 Mix it up

The middle icon here in the same Artists view lets you shuffle the playing order; so instead of the track listing playing from the first track to the last, the songs will play in random order. Press the Play icon to stop playback.



9 More options

Click the "..." icon to the right of Shuffle to reveal a menu with a list of options, including playback controls and download options. You can also view more of the artist's catalog on Apple Music or the iTunes Store.

Worth your money?

Why should you consider subscribing to an Apple Music plan?

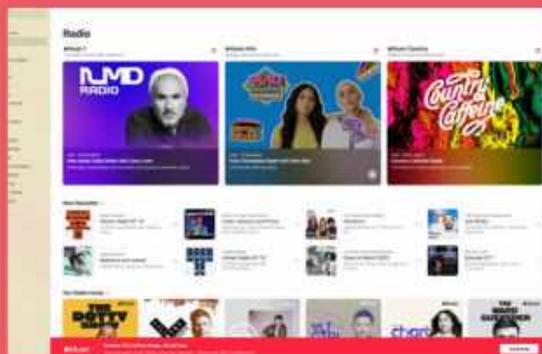
Apple Music is a brilliant way to get millions of songs on tap — right on your Mac, iPhone or iPad. And it comes with two unique features: Apple Lossless and Spatial Audio. Apple Lossless gives you CD-quality streaming, enabling you to listen to your favorite tracks in the very best sound quality; while Spatial Audio delivers a three-dimensional immersive listening experience, putting you right at the heart of the music. And it sounds particularly good on AirPods, AirPods Pro and AirPods Max.

With the arrival of Apple Music Sing last December, you now have another option: you can sing along to any song that has live lyrics, while also being able to adjust (or even completely mute) the vocal track, letting you set your karaoke free!

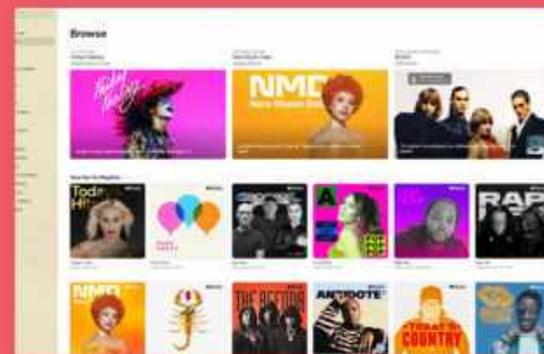
There's a lot more to Apple Music than that though — it hosts everything from radio shows to live performances from major artists, and it's brilliant at serving up custom "stations" based on your listening habits, meaning you'll always have something to listen to, whatever you're in the mood for.

Prices start at \$4.99/month for the more limited Voice Plan, which can only be controlled by Siri, rising to \$10.99/month for an Individual Plan. Family Plans cost \$16.99/month. ■

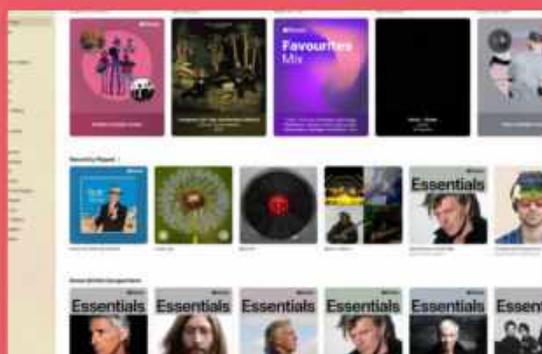
HOW TO Get started with Apple Music



1 Sign up for Music
You can sign up on your Mac, iPhone or iPad. On Mac, make sure Apple Music is enabled in Settings > General. You should see three options under Apple Music in the sidebar: Browse, Listen Now and Radio.



2 Have a look around
Click Browse and you'll be shown a range of curated playlists, from new releases and current hits to those based on your listening habits. You'll also find playlists by mood, genre, and for Apple Music Sing.



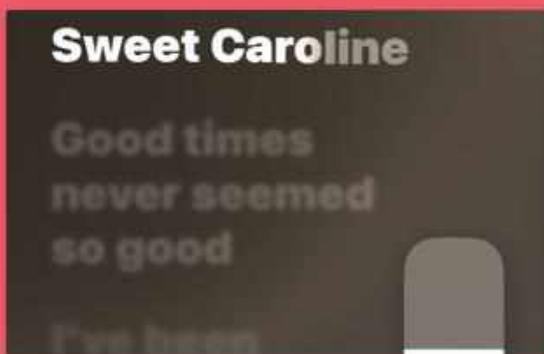
3 Explore playlists
Playlists work just like the ones in your regular library, with lists of songs, the option to "Love" your favorites, and even to download or share them using the "..." icon to the track's right.



4 Playlist limitations
Create a playlist on your Mac, iPhone or iPad and the Music app won't be able to differentiate between songs you own, and those added from Apple Music. Stop paying your sub and some songs might not play.



5 Get downloading
Apple Music is a streaming service — and that means anything you listen to will simply play over the internet. To listen without an internet connection, you will need to download tracks instead.



6 Apple Music Sing
You can also turn your iPhone, iPad or Apple TV into a karaoke machine with Apple Music Sing. On a compatible track, click the "magic microphone" icon to mute the vocal of the current track or adjust its volume.

Buy music on the iTunes Store

Avoid monthly fees and own all of your favorite tracks

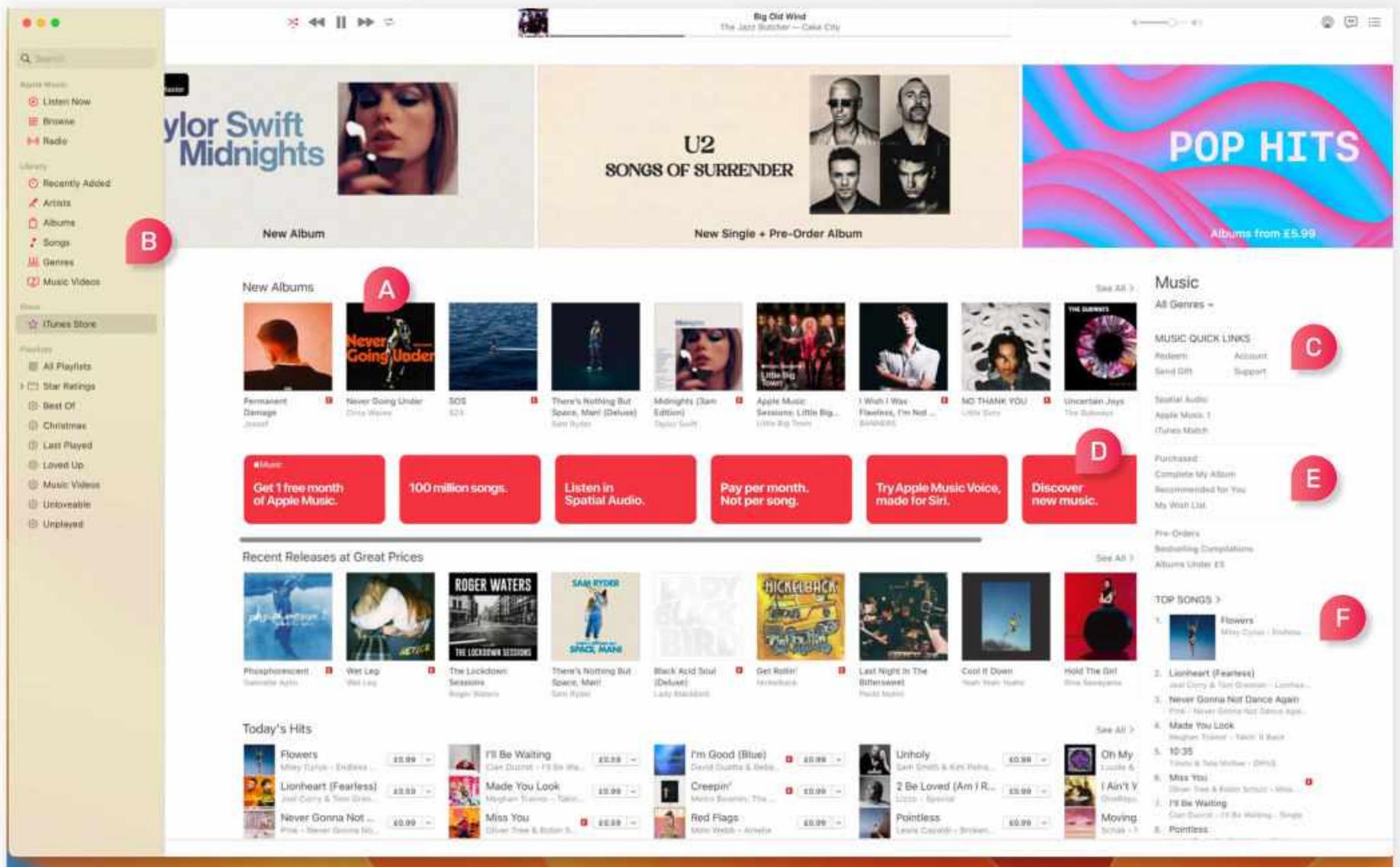
While **Apple Music** gets all the headlines, the iTunes Store remains a core component of Apple's Music offering. First launched 20 years ago, it remains one of the best places to buy music and music videos online, with tracks available with Spatial Audio, and it's built into the

Music app on Mac, or as a dedicated app on iOS/iPadOS.

All the content you purchase should remain available for you to re-download at any time, but that's not always true in practice — which is why we recommend making regular backups of your library.

Any content you buy from the store is associated with your Apple ID, so if you use multiple Apple IDs or have a family, you might want to investigate Purchase Sharing, which is available in System Settings > Family on Mac or Settings > Family on iPhone or iPad. ■

QUICK LOOK The iTunes Store explained



A NEW RELEASES

From top-notch stars to one-hit wonders, you'll find all the new releases here or in the above carousel.

B GENRES

Whether you're after grunge, rock or heavy techno, the iTunes Store has your genre needs covered.

C ACCOUNT INFO

Head here when you want to check your account, view your purchases or redeem any gift cards.

D PROMOS

This is usually where Apple plugs features such as Apple Music, Spatial Audio, and iTunes Match.

E HISTORY/TIPS

The place to see what you have bought from the store already, and get suggestions for what to buy next.

F TOP SONGS

Discover the most popular songs, albums and music videos that are topping the iTunes charts right now.

Mac|Life

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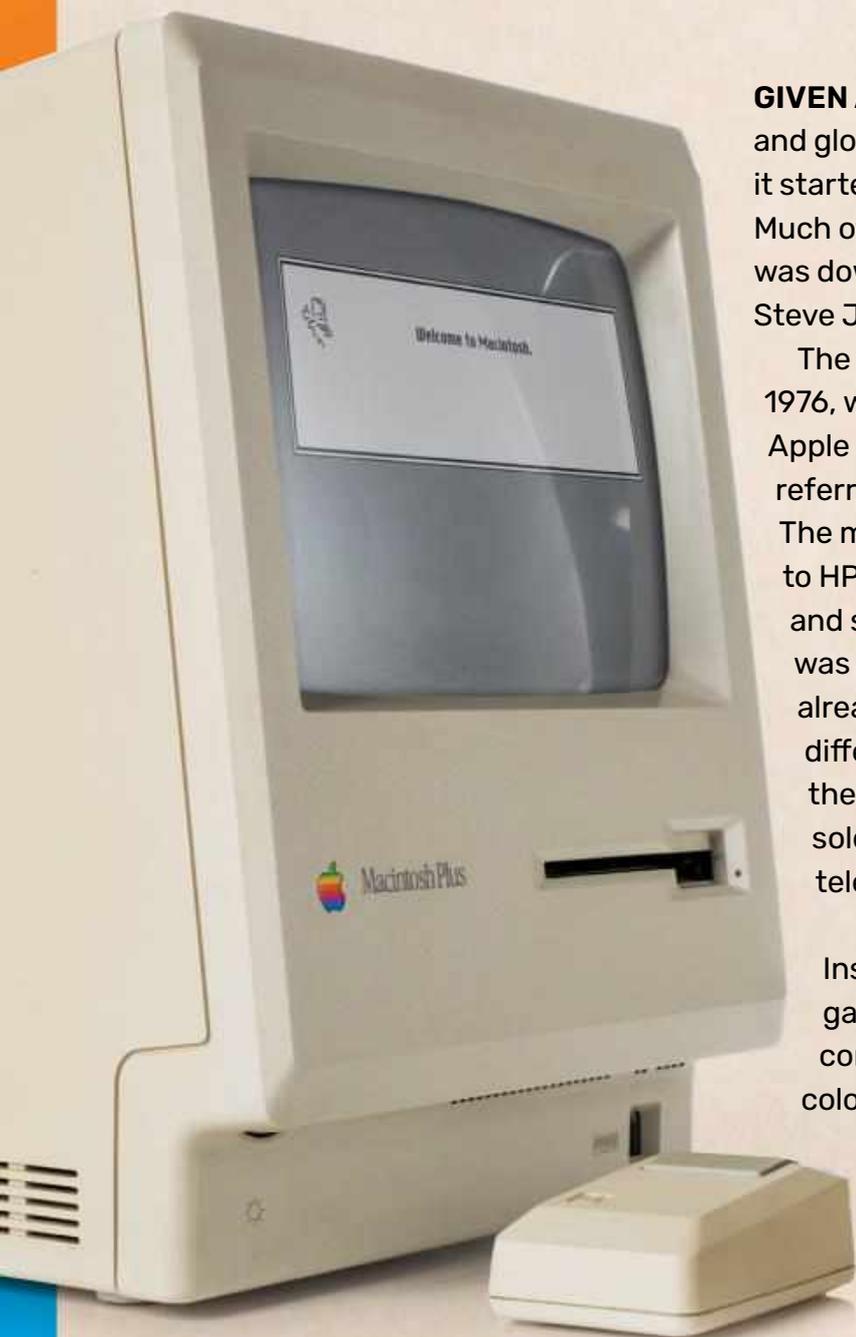
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History of Apple Gaming

With Apple now in its fifth decade, we explore key products from its history, the impact they had on the gaming industry, and the sometimes surprising impact that gaming had on Apple itself

WRITTEN BY CRAIG GRANNELL



GIVEN APPLE'S GARGANTUAN profits and global reach, it's easy to forget that it started life as two people in a garage. Much of the tech wizardry back then was down to Steve "Woz" Wozniak, while Steve Jobs was tactician and visionary.

The first breakthrough occurred in 1976, with what would become the Apple Computer 1 (later referred to as Apple I). The machine was offered to HP, which declined, and so Apple Computer was born. Apple was already "thinking different", its debut hardware being the first single-board computer sold fully assembled and utilizing a television for output.

But Woz was thinking bigger. Inspired by his work on arcade games, he wanted to create a computer that was faster, more colorful and noisier than anything else. Ultimately, as he recalled in a 1986 interview with *Call-A.P.P.L.E.*: "A lot of the features of the Apple II went

in because I had designed *Breakout* for Atari. I had designed it in hardware. I wanted to write it in software now."

With Apple rarely being equated with gaming, it's surprising to discover its foundations rest on one man's desire to "program a BASIC version of *Breakout*". But soon Woz was tinkering with his computer, adding color, BASIC commands, paddle controllers, and sound. Building primarily for himself, he was also kickstarting a computing revolution – the Apple



II soon captured the imagination of wannabe home programmers, and the machine's initial success bankrolled Apple for years.

Ultima creator Richard Garriott had previously battled with teletype terminals, but then found himself sat before an Apple II. "I was in wonder. Suddenly, instead of invoking a command and waiting minutes for it to process and print the results, I had a computer that in real time could visually display to me any fantasy worlds and

other fantastical ideas I could think about to program. I immediately saw it as the key to the future – or my own future, at least!”

FUTURISTIC WORLD-BUILDING

Many programmers found much of the pleasure in using an Apple II came from working out how to coax tiny gaming universes out the machine. “It was the first computer with decent graphics yet also simple enough that you could hold a model of the entire machine in your head,” explains *Wizardry* creator Robert Woodhead. “Programmers knew everything about the platform, and part of the fun was figuring out ways to get the machine to do stuff.”

The hardware continued to evolve, but internal politics eventually derailed the Apple II. An attempt at a business-focused followup, the Apple III, was a failure. And although the Apple II line eventually transformed into the next-generation Apple IIGS, it lacked a champion and was superseded by the Macintosh. Even so, that didn’t stop people wanting to create games for the Apple II in its twilight years. Having used his Apple II to create *Karateka*, Jordan Mechner unveiled *Prince Of Persia* on what was considered to be a dying platform. His reasoning? “The Apple II was a platform I understood – it was a lovely machine.”

The early days of the Macintosh were fraught with problems. The project was started by interface expert Jef Raskin, who wanted to create a consumer-oriented, low-cost computer named



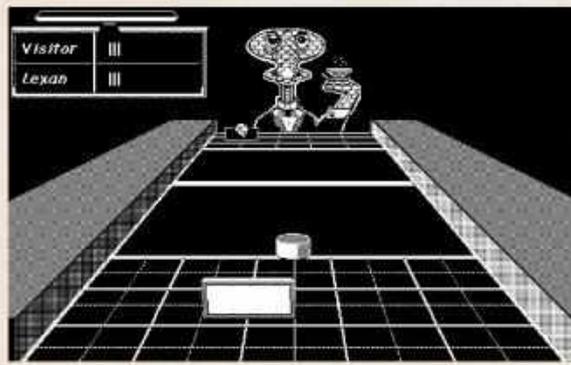
I remember being disappointed at how few games were made for the Mac

Christopher Gross

▶ after his favorite apple, the McIntosh. Over time, the scope of the Mac shifted, Steve Jobs jumped on board from the beleaguered Apple Lisa project (causing Raskin to quit), and the boxy little Mac finally said “hello” in 1984.

Although the Mac was different from Raskin’s concept, aspects of his vision remained intact. Inspired both by technology developed at Xerox PARC and also in-house at Apple, the Mac boasted a revolutionary operating system, based around a now-familiar desktop with windows and folders. The all-in-one main unit had a small but sharp 512 x 342 pixel display, and the only things you needed to plug in were a power cord, keyboard and mouse.

Much like the Apple II before it, the Mac offered a bold take on the future of computing, and people couldn’t help but be seduced. “It struck me as a qualitative shift,” recalls Christopher Gross, who designed air hockey titles *Shufflepuck* and *Shufflepuck Café* for the system. “The graphical interface and mouse allowed a shift from ‘asking



Shufflepuck Café was a killer app for the early Macs.

the computer to do something’ to just being able to do it.” In other words, this was a computer designed to enable users to perform actions directly, rather than type commands and hope for the correct interpretation to take place. Gross was so taken aback that he quit a computer science grad program, because “programming for the Mac was so much more interesting and real than anything I was doing in school.”

THE MAC GAMING EXPERIENCE

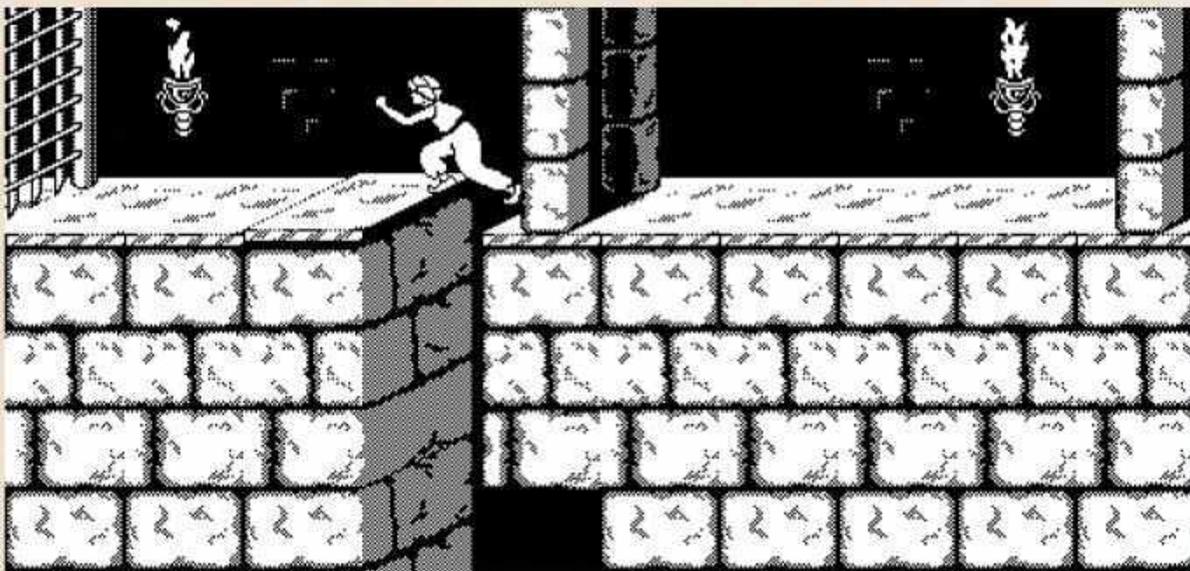
Quickly, though, the Mac found a niche in desktop publishing and artwork. In wanting to stop its computer from failing, Apple did little to dispel this notion, reasoning that any focus

on games might find its hardware dismissed as a toy. Gross notes those few who did start working on Mac games rarely tried to innovate with the controls available to them: “Having a mouse by default didn’t really shake things up. I remember being disappointed at how few games were made for the Mac, but also how few used the mouse beyond the obvious ease of being able to directly point at things on the screen.” This was in part what drove Gross to use the mouse as a games controller in *Shufflepuck*.

Bill Dugan, at the time a producer at Interplay, also recalls issues with Apple’s lack of interest and the system’s reliance on the mouse. “Computer games were developed on a lead platform, released immediately and ported to whatever other platforms would sell,” he begins. “The Apple II or C64 was usually the lead platform in the USA, and you’d then see ports to the PC, Mac, and other systems. Publishers wanted ports to be fast and cheap.”

For some platforms, a low-cost approach worked reasonably well, but this was less so for more powerful platforms, due to the expectations of those who owned them. And with the Mac, the default interaction was pointing and clicking, not keyboard commands. Direct game ports to Mac therefore had a tendency to feel alien, lacking a mouse interface, or having a “fake” one awkwardly welded on.

The display was a brighter spot. Gross notes that it was “high-res, which allowed a relatively high mouse resolution”, and Dugan says its monochrome nature forced anyone porting games to take care. “The Mac’s



Prince Of Persia had stunning animation. A color version was eventually released on later Macintoshes.

Selective timeline

1 APRIL 1976

The now-corporate giant that is Apple is founded by Steve Jobs, Steve Wozniak, and Ronald Wayne.

11 APRIL 1976

Apple Computer 1 (later known as the Apple I) is released, with each unit being hand-built by Steve Wozniak.

10 JUNE 1977

Apple II is launched. Its success bankrolls Apple for a decade, giving the company breathing space.

19 MAY 1980

The Apple III is unveiled. It fared poorly, not least due to iffy Apple II compatibility.

19 JANUARY 1983

The Apple Lisa launches. The UI was revolutionary, but the computer was sluggish, and sales were poor.

22 JANUARY 1984

The Ridley Scott-directed *1984* ad plays at Super Bowl XVIII. It’s hailed as one of the best adverts of all time.

black-and-white monitors made it unconscionable to copy and paste graphics from another platform. You'd have ended up with an awful, lumpy mess of unacceptable gray. So pretty much everyone recreated graphics for the Mac." Having noted all these things, and with the Mac press howling at terrible ports, Interplay hit upon the idea of making an effort on presentation, UI and graphics, thereby making games more Mac-like and attractive. The MacPlay label was born. But, from a games perspective, the port was something the Mac would now only rarely escape from.

As years passed, the Mac solidified its hold on desktop publishing and creative industries, but ceded most other ground to PCs. "And as a big fan of the Mac and an avid games player, I became frustrated I couldn't play more games," says Peter Tamte, who co-founded MacSoft to redress the balance. Tamte's team approached publishers to license rights and bring their games to the Mac. "And after showing how these games generated profits for their original publishers, and brought in new fans without diluting their brands or PC revenues, we were able to bring more and more games to the Mac from a wider selection of developers."

Apple wasn't blind to the issues, and there had been efforts to boost the company's profile in gaming. Craig Fryar worked in evangelism at Apple during the Nineties and exposed senior management to key games. "When they saw the likes of *PGA Tour* and *SimAnt*, they were amused, and the point wasn't lost on them that games could show off a system's horsepower." ▶

Key players

The people who shaped Apple



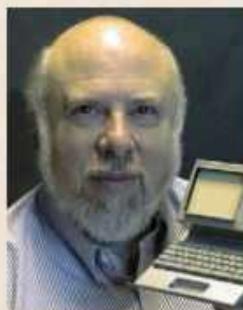
STEVE "WOZ" WOZNIAK
CO-FOUNDER,
ENGINEER

An amazing engineer, Woz was the brains behind the Apple I and Apple II computers. Although he's still technically an Apple employee, Woz has had little to do with Apple since the mid-Eighties.



STEVE JOBS
CO-FOUNDER,
CEO

Steve Jobs saw the potential in Woz's work, and became Apple's vision and taste arbiter. Ousted in 1985, he went on to found NeXT, then triumphantly returned to Apple as CEO in 1997, reinvigorating the flailing company.



JEF RASKIN
INTERFACE
EXPERT

Although many people were responsible for the original Mac, Jef Raskin instigated the entire project, noting computers at the time were for geeks, and wanting to create something that was much more usable and friendly.



SUSAN KARE
GRAPHIC
DESIGNER

Graphic designer on the original Mac computer line, Susan Kare created the icons, typeface and interface conventions that permeated throughout the entire tech industry and that are still in use today.



JONATHAN "JONY" IVE
DESIGNER,
CHIEF DESIGN
OFFICER

An Apple employee since 1992, British-born Jony Ive flourished after Steve Jobs returned. Chief designer of the iMac, iPod, iPhone and more, Jony Ive's creations have influenced the entire tech industry.



24 JANUARY 1984
The first Mac arrives, providing the foundation for Apple's computing endeavors.

17 SEPTEMBER 1985
Steve Jobs resigns, and starts work on new venture NeXT; he returns as CEO in 1997.

15 SEPTEMBER 1986
The Apple II hits its zenith with the IIGS, which blends the Apple II and Mac experiences.

2 MARCH 1987
The Macintosh II arrives, bringing color displays to the Macintosh line of computers.



17 MARCH 1988
Apple sues Microsoft for copyright infringement relating to the Mac OS and Windows interfaces.



20 SEPTEMBER 1989
The Macintosh Portable becomes Apple's first battery-powered portable Mac.

The influence of Steve Jobs

Steve Jobs' impact is still felt today. Here are just a few of the developments he was involved in...



APPLE MACINTOSH

A huge influence during the Eighties, and has continued to evolve. At the time it was the first

commercially successful computer to feature both a mouse and a GUI.



APPLE II

The Apple II was first released in June 1977 and had various revisions. Many American developers, such as John Romero, Richard Garriott and Jordan Mechner learned to code on it.



PIXAR

Formed in 1979 as the Graphics Group, Steve Jobs bought Pixar from Lucasfilm in 1986. He later sold it to Disney for \$7.4 billion, making him Disney's largest shareholder.



iPOD

The iPod not only revolutionized the way we listened to music, but also the music industry itself. It was continually refined over the intervening years.



iPHONE

The iPhone had a massive impact on the cellphone market, and was one of the first devices that enabled you to play "proper" videogames without any fiddly buttons.



iPAD

Apple's iPad wasn't the first tablet device, but it did, however, change the way tablet devices were perceived by the general public. It has gone on to sell millions of units.

Fryar says things started changing, and he was able to secure hardware to feed to developers, along with demonstrating new technology in exchange for games incorporating key features. One example was *Hellcats Over The Pacific*, a flight sim developed by Parsoft Interactive: "They were shown a system able to support multiple monitors out of the box. In return for them getting the hardware, they created a three-display, 180-degree version of *Hellcats*, which was great for showing off the system. We got serious bragging rights; at the time this just wasn't possible on a PC."

Eric Klein was working as an evangelist at the time, and remembers a slow turnaround in perception. "Games companies fondly remembered the Apple II days, but didn't think they could make money on the Mac. It was a difficult task, because you had new audiences to market to, different channels to sell the product, and different press to woo. But we did prove there was a market, which almost doubled in terms of sales during my time at the company. This was especially the case during the transition to PowerPC chips, which helped the Mac become a powerful system that could run state-of-the-art PC ports."

Although ports remained the most common kind of Mac game, the platform did get the occasional first. Pioneering immersive CD-ROM adventure *Myst* debuted on the Mac, primarily because it had been developed on the platform, utilizing HyperCard (a sort of localized proto-web, with a card-based system housing interactive components) and Apple's QuickTime video technology. Another Mac first was *Marathon*, an



21 OCTOBER 1991

Three new PowerBooks, with dark-grey cases and built-in trackpads, provide a blueprint for notebooks.

16 AUGUST 1993

Digital assistant Apple Newton is released. Innovative but flawed, it would be axed by Steve Jobs in 1998.

25 OCTOBER 1993

Macintosh TV becomes Apple's first crack at integrating computers and TVs. Few are sold.

14 MARCH 1994

Power Macintosh arrives, based on the PowerPC processor created by AIM (Apple-IBM-Motorola).

28 MARCH 1996

Pippin appears to universal indifference. Apple's first stab at gaming hardware is quickly discontinued.

7 FEBRUARY 1997

Apple finalizes a deal to acquire NeXT, which brings Steve Jobs back to the company he co-founded.

Core gaming

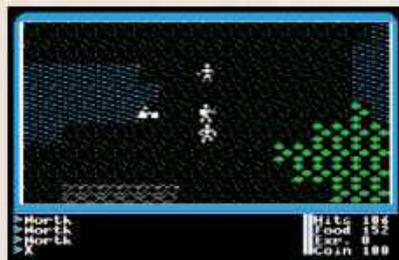
Ten releases that defined Apple systems



CASTLE WOLFENSTEIN

APPLE II • 1981

Silas Warner's stealth-based arcade game had a combination of tense moments, strategy and arcade smarts that won it plenty of fans.



ULTIMA

APPLE II • 1981

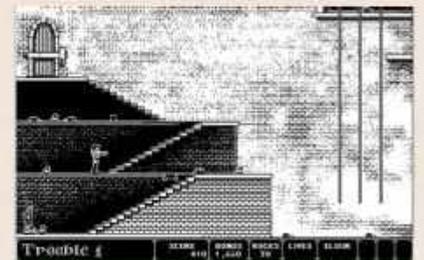
Following up on debut title *Akalabeth*, Richard Garriott's *Ultima* series is one of the earliest open-world RPGs, and has influenced countless games.



CHOPFLIFTER

APPLE II • 1982

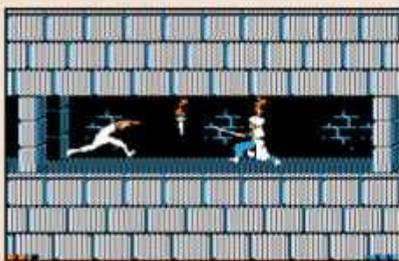
Initially an experiment in creating a controllable helicopter on an Apple II, *Choplifter* soon integrated *Defender*-style rescues.



DARK CASTLE

MAC • 1986

This game took advantage of Mac hardware, utilizing both keyboard and mouse, the latter used to launch projectiles, the former for movement.



PRINCE OF PERSIA

APPLE II • 1989

The realistic animation and challenging gameplay of this platformer by Jordan Mechner cemented the game's classic status.



MYST

MAC • 1993

For this adventure puzzler game, Apple's release of QuickTime enabled an extra degree of immersion through the integration of video.



MARATHON

MAC • 1994

Marathon brought cutting-edge FPS action to the platform. Developers Bungie would, of course, go on to create *Halo*.



ESCAPE VELOCITY

MAC • 1996

With Mac games being few in number as Apple hit its nadir, space opened up for enterprising indies, including space trading game *Escape Velocity*.



ANGRY BIRDS iOS • 2009

Obviously inspired by online flash game *Crush The Castle*, *Angry Birds'* bite-sized gameplay was perfect for brief mobile sessions and quickly catapulted towards iconic status.

Is this thing working?

Can anyone read me?

Who is this?

LIFELINE Apple Watch • 2015

Lifeline is a game that actually works better on Apple Watch than a smartphone. Essentially a Choose Your Own Adventure with you assisting a stranded astronaut, the narrative is compelling and has emotional clout.



7 MARCH 1997

The eMate, based on the Newton, finds Apple attempting to appeal to the education market.

20 MARCH 1997

Twentieth Anniversary Macintosh is released. It's ostentatious, yet foreshadows future consumer tech.

6 AUGUST 1997

Microsoft comes to the aid of a struggling Apple, giving it a cash injection of \$150 million.



15 AUGUST 1998

Apple wows the tech industry with the iMac G3. Its translucent shell becomes a meme.

21 JULY 1999

The iMac goes mobile with the iBook, a colorful, friendly notebook with surprising tech smarts.

19 JULY 2000

The Power Mac G4 Cube proves a step too far regarding marrying design and computing. Sales are poor.

Pipsqueak

Apple versus its rivals

Pipsqueak

APPLE VS. MICROSOFT

Microsoft started out as an Apple ally but Windows drove a wedge between the companies. Apple fumed at Microsoft's perceived plagiarism, but many lawsuits later Apple was almost bankrupt. In 1997 Microsoft injected cash and shored up its ailing rival, seemingly to retain "competition". Apple subsequently blazed past, predicting and driving consumer hardware trends in a way Microsoft couldn't match.

Pipsqueak

APPLE VS. IBM

Big Blue killed any hope Apple had of mainstream success in the Eighties. The PC's arrival in 1981 provided an affordable alternative to anything Apple had to offer. But, over time, the rivalry thawed, showcasing the tangled relationships between tech companies. For years, PowerPC chips from an Apple-IBM-Motorola alliance were found in Macs. Today, Apple and IBM are increasing the iPad's corporate reach together.

Pipsqueak

APPLE VS. SAMSUNG

One of the oddest modern-day tech relationships, Samsung and Apple are both butting heads and yet are reliant on each other. Samsung still manufactures many Apple device components, and has spent many years merrily being "inspired" by the iPhone and iPad. Additionally, Samsung's TV ads often rip into Apple, arguing its customers are brainless fools taken in by Apple's marketing machine. Long-term, expect Apple to split entirely from Samsung.

Pipsqueak

APPLE VS. DELL

One of the most famous tech quotes of all time occurred in 1997 when Dell CEO Michael Dell opined if he was put in charge of Apple he would "shut it down and give the money back to the shareholders". He argues this was misunderstood and that he was mulling from the position of still being Dell CEO. Still, it showcased a stark difference in thinking between the two organizations.

Pipsqueak

APPLE VS. ADOBE

Once, Apple and Adobe were close. But as Apple's grip on the design industry loosened and Adobe became more bullish, cracks appeared in the relationship. This came to a head when Steve Jobs refused to support Flash on iOS, arguing it was unstable technology. Adobe griped Apple was taking away people's freedoms, but, in reality, Flash was terrible on mobile. Apple eventually won the battle, and Flash's presence online is rapidly diminishing.



9 JANUARY 2001
iTunes appears, initially as an MP3 player. It evolves to be a cornerstone of Apple.

23 OCTOBER 2001
Apple revolutionizes portable music with the iPod, bettering existing players in terms of UI and storage.

31 AUGUST 2004
The iMac goes all-in-one, essentially a monitor with a chin. All subsequent iMacs follow this design.

9 JANUARY 2007
Apple TV kickstarts Apple's so-called "hobby" product, muscling in on the space under your telly.

29 JUNE 2007
iPhone upends the mobile phone industry with a revolutionary interface others soon clamor to ape.

15 JANUARY 2008
Steve Jobs pulls a notebook, the MacBook Air, out of an envelope at a keynote.

innovative and exciting FPS that you'd have usually expected to instead arrive fully formed on the PC.

Bungie co-founder and *Marathon* developer Alexander Seropian remembers being drawn to the Mac because of how visual it was. "I was jealous of all the games you could get on the PC. Gaming on that platform was growing tremendously, and there was this pent-up demand for games on the Mac that wasn't being addressed."

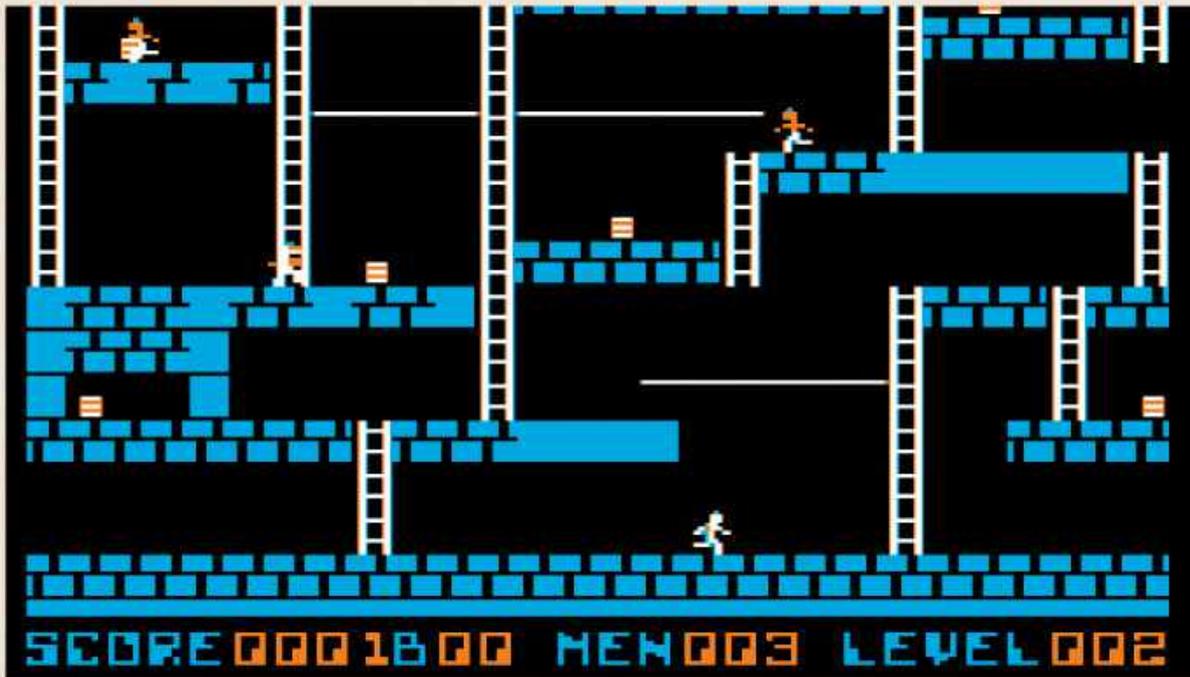
The Mac community was very receptive to *Marathon*, and it became a major influence on Bungie's *Halo*, although it didn't go as far as to revolutionize Mac gaming. Instead, Mac ports would increasingly arrive when PC originals hit the bargain bin, and Apple in 1996 made a misstep with its only full foray into Mac-based dedicated gaming hardware, the risible Pippin, which was poorly architected, overpriced, and lacking in developer support and consumer interest.

In fact, around that time it looked like Apple might vanish entirely, and buy-out rumors regularly circulated. Questions started to be asked whether Apple could recover, and its future looked bleak.

A NEW HANDHELD GAMING PLATFORM

It was co-founder Steve Jobs who arguably saved Apple from the brink. Having in 1985 quit the company he founded, he returned, ruthlessly culled a messy product line, and set Apple on the course it still finds itself on today. This sleeker, leaner Apple prized high-quality hardware that appealed to consumers and pros alike. From a games perspective,





The superb *Lode Runner* is one of the Apple II's most recognizable games.

though, it's arguable the Mac never bounced back. "By the time Apple recovered, there was no-one left, except for a few companies porting two-year-old PC games, and a few of us still making original Mac games," recalls Pangea's Brian Greenstone. "Games development had gotten so expensive and the Mac's market share was so small that it wasn't feasible to keep developing games for it."

It would need an entirely new platform to transform Apple's fortunes in gaming. It would need the iPhone. Initially dismissed by the tech industry and pundits alike as an overpriced trinket, the iPhone and its multitouch display was an instant hit with consumers. The groundbreaking smartphone marked a turning point in the industry, forever changing how you interacted with devices. Initially, third-party apps weren't part of the picture, although a community flourished to support "jailbroken" iPhones freed from Apple's restrictions. A year after the

iPhone's release, all bets were off: the App Store arrived and with it a gold rush that the software industry had never before experienced.

Steve Demeter's *Trism* utilized the iPhone's accelerometer, the player moving triangular tiles about in a variation on popular match puzzlers. Within two months, Demeter had made over \$250,000 from an investment of some spare time and paying a designer \$500. Elsewhere, rhythm game *Tap Tap Revenge* hit a million downloads two weeks after launch, reaping huge rewards from in-game advertising. Major developers also clambered on board, trying to make sense of this new platform, Sega perhaps doing so most successfully with a tilt-based *Super Monkey Ball*.

iOS has many positives, not only for Apple (given that the games category is typically the App Store's most profitable), but also for developers. Veteran coder Ste Pickford reasons that iOS lacks gatekeepers in the way

most other platforms don't: "There's no concept approval, where someone decides whether or not your game can be released. We became indies because we wanted the freedom to design videogames without being limited to what marketing departments wanted to sell!" Vlambeer's Rami Ismail adds that iOS also remains a way to potentially reach a huge audience, without requiring massive investment: "There are few barriers to entry, although the platform does have a problem with clones, which can seriously knock your motivation if your game is ripped off."

Despite its success, there are many who question iOS's validity as a gaming platform. "Anyone who says that is out of touch with gaming," argues games creator and artist Zach Gage. "Just about every major studio is developing for iOS, as are thousands of talented indie developers. And often, the freshest IP comes out on mobile."

Now, Apple is setting its sights towards the living room again, with the Apple TV. The little black box is far from revolutionary, but could it herald another gaming revolution from the company that often pretends games don't exist, despite its first hardware hit being built to play one? "I do find it ironic that in the Mac days, gaming was such a low priority for Apple, but now with its mobile systems, gaming is the biggest usage and revenue driver on those platforms," says Seropian, now CEO of mobile games developer Industrial Toys. "While a flooded market means it's a lot harder to get noticed, it's still a great time to be making games. And Apple's now a major player in that ecosystem, which is great to see." ■



10 JULY 2008

The App Store radically transforms the iPhone's scope, ushering in an age of mainstream mobile apps.

3 APRIL 2010

iPad is launched. More or less a giant iPhone, it kickstarts a revolution in tablet computing.

5 OCTOBER 2011

Apple co-founder Steve Jobs passes away at the age of 56, having since 2003 battled pancreatic cancer.

24 APRIL 2015

The Apple Watch releases and becomes Apple's first foray into wearable computing for the masses.

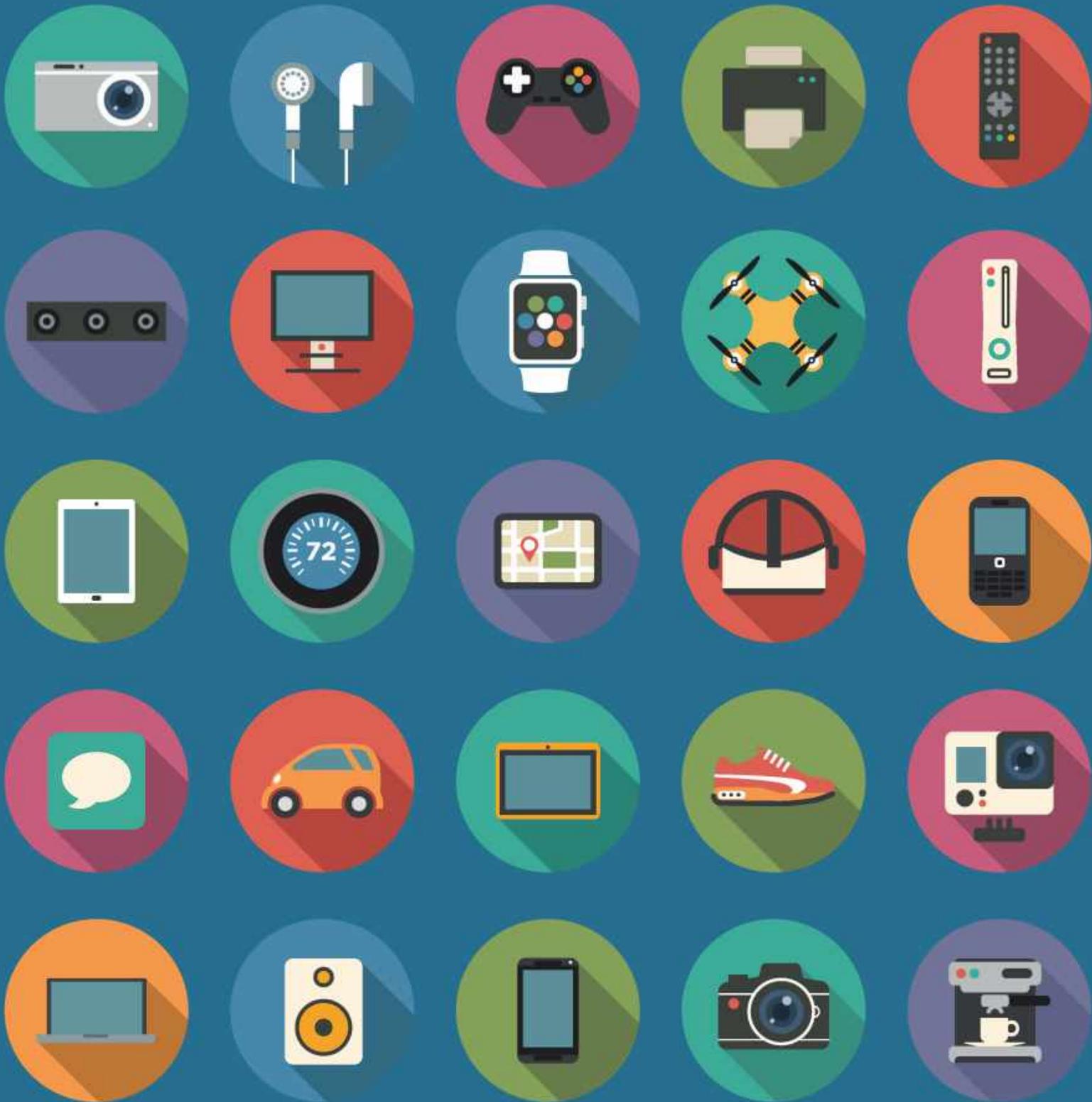
26 OCTOBER 2015

The fourth-gen Apple TV brings Apple apps to your television, games sharing progress with their iOS siblings.

11 NOVEMBER 2015

iPad Pro and Apple Pencil positions themselves at the high-end iPad as a device for creators.

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REVIEWS

TOUGH TESTING, TRUSTED RATINGS



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MacBook Pro 16-inch (2023)

A productivity beast, but don't sweat it 2021 MBP fans

From \$2,499 (model tested \$3,499) From www.apple.com

Features M2 Pro chip (12-core CPU, 19-core GPU), 512GB storage (2TB tested), 16GB of unified memory (32GB tested), 16.2-inch Liquid Retina XDR display (3,456 x 2,234), MagSafe 3, 3x Thunderbolt 4 (USB-C) ports, 1x HDMI port, Wi-Fi 6E (802.11ax), Bluetooth 5.3

THE MACBOOK PRO 16-inch (2023) gets the latest and greatest M2 Pro and M2 Max chips from Apple, making it the fastest MacBook ever. But how much of an upgrade is it over the 2021 M1 Pro/M1 Max counterpart?

When it comes to price, there's good news as the new MacBook Pro 16-inch isn't getting a big price increase. \$2,499 gets you the base configuration: that's an M2 Pro chip with a 12-Core CPU and 19-core GPU, 16GB of unified memory, and 512GB of SSD storage. An extra \$200 gets the version with a 1TB SSD. If you want to step up the power, there's a version with the M2 Max chip, with a 12-core CPU and 38-core GPU, 32GB unified memory and 1TB SSD for a hefty \$3,499. Naturally, all options can be configured to change chips, add more memory (up to 32GB with the M2 Pro and up to 96GB with the M2 Max) and storage up to 8TB. If you want the highest-end model, with a massive 96GB of memory and 8TB of storage, it'll cost a huge \$6,499. Needless to say, this kind of power will only be needed by extremely intensive enterprise-level workloads.

From the outside, the Apple MacBook Pro 16-inch (2023) is identical to the 2021 model, with the same dimensions of 0.66 x 14.01 x 9.77 inches and a weight of 4.7 pounds for the M2 Pro model, and 4.8 for the M2 Max model. So, this is still a big and heavy laptop that's been built to mainly be used on a desk. The new MacBook Pro 14-inch (2023) offers the same specs, but in a smaller overall package.

IF IT AIN'T BROKE

That the new MacBook Pro has the same design as the previous one should be praised, because in this shell the new MacBook Pro solves many of the problems that cursed the 2022 MacBook Pro 13-inch model. You won't see a Touch Bar, and rather than two measly Thunderbolt/USB 4 ports and a 3.5mm headphone jack, the new MacBook Pro 16-inch comes with three Thunderbolt 4 (USB-C) ports, an HDMI port, and an SDXC card slot. That all being said, as with the previous generation MacBook Pro 16-inch (and 14-inch) the controversial notch on the screen remains.

The 16.2-inch screen is unchanged, and that means this is still the best display you'll get on a MacBook. It's a Liquid Retina XDR display featuring mini-LED tech, and offers 1,600 nits of peak HDR brightness and a 1,000,000:1 contrast ratio. Along with P3 wide color gamut and one billion colors, this is an incredibly bright and vibrant display.

As for the rest of the design, the MacBook Pro 16-inch (2023) has a large and comfortable keyboard. It manages to feel tactile and responsive, and the days of faulty MacBook Pro keyboards are in the past. The keyboard also comes with a Touch ID button that allows you to log in to macOS, as well as pay for items using Apple Pay, just by using your finger.

ALL-POWERFUL

The M2 Pro and M2 Max chips are, on paper, big steps up over the M1 Pro and M1 Max chips that came with the MacBook Pro 16-inch (2021), with Apple claiming that the M2 Pro 

All the ports you need, including three Thunderbolt 4 (USB-C), HDMI, SDXC, and a 3.5mm audio jack.





The notch on the MacBook Pro 16-inch (2023) remains. Will it stop you from purchasing this beast? Probably not.

This is still the best screen in the laptop game, boasting a bright and vibrant display.

offers 30% faster GPU performance than the M1 Pro, and twice the memory bandwidth of the M2 chip, which launched in 2022. The M2 Max, meanwhile, according to Apple, offers 30% faster GPU performance compared to the M1 Max thanks to the increased number of GPU cores, and four times the memory bandwidth of the M2 – leading the company to claim it’s the world’s “most powerful and efficient chip for a pro laptop”. Efficiency is the key word here. The M2 Pro and M2 Max MacBooks offer impressive performance without draining the battery. Crucially, the new

MacBook Pro doesn’t throttle its performance when on battery power either. Both plugged in and on battery, there was no noticeable change in performance, even when running complex video editing tasks.

The rest of the performance of the MacBook Pro 16-inch (2023) is also impressive. The model on test comes with the M2 Pro, 32GB memory and 2TB SSD. While we would have liked to have tried the M2 Max model, the M2 Pro model is going to be far more popular with most people, as it’s more affordable, while also promising the kind of performance most users require. The 32GB of memory is also a good choice for most people – it’s a minimum for creatives, and the more future-proof option over 16GB.

M1 VS M2

The MacBook Pro 16-inch (2023) was put through a number of real-life tests to see how well it performed. We had Safari and Chrome web browsers up, with multiple tabs in each; performed photo editing and video editing in Adobe Photoshop and Premiere Pro respectively; and plugged in a MIDI keyboard and recorded several multi-track projects in GarageBand and Ableton Live, using virtual instruments and effects from Native Instruments’ recent Complete Kontrol



Benchmarks: Our analysis explained

> GEEKBENCH 5 SINGLE-CORE TEST

This tests the capability of a single processor core. Many more common tasks on a Mac will only use a single core at a time. Geekbench 5 is a universal app running on Ventura.

Index score (higher is better)

MacBook Pro 16in 3.3GHz M2 Pro (2023)	1961
MacBook Pro 13in 3.49GHz M2 (2022)	1903
MacBook Pro 16in 3.22GHz M1 Pro (2021)	1757

> HANDBRAKE VIDEO ENCODING

We transcode a 6.5GB 4K video to 1080p using HandBrake to test the multicore processor performance. Handbrake is available as a universal binary.

Time taken (lower is better)

MacBook Pro 16in 3.3GHz M2 Pro (2023)	4 mins 3 secs
MacBook Pro 13in 3.49GHz M2 (2022)	6 mins 51 secs
MacBook Pro 16in 3.22GHz M1 Pro (2021)	4 mins 51 secs

> RISE OF THE TOMB RAIDER (1,920 X 1,200)

For a real-world gaming test, we use the benchmarking tool in this game, with the graphics quality set to High, and the resolution set to 1,920 x 1,200. Not yet optimized for Apple silicon.

Frames per sec (higher is better)

MacBook Pro 16in 3.3GHz M2 Pro (2023)	49
MacBook Pro 13in 3.49GHz M2 (2022)	25
MacBook Pro 16in 3.22GHz M1 Pro (2021)	39

> DAVINCI RESOLVE

In Blackmagic Design’s editing tool for video professionals, we exported an effects-laden, 2.5-minute project to the H.264 format. The latest version of the app (Version 18) now runs natively on Apple silicon Macs.

Duration (lower is better)

MacBook Pro 16in 3.3GHz M2 Pro (2023)	9 mins 23 secs
MacBook Pro 13in 3.49GHz M2 (2022)	19 mins 38 secs
MacBook Pro 16in 3.22GHz M1 Pro (2021)	10 mins 57 secs



M2 PRO OFFERS IMPRESSIVE PERFORMANCE WITHOUT DRAINING THE BATTERY

package, and the new MacBook Pro 16-inch kept up easily – even with multiple raw 8K video streams in Premiere Pro. Without needing to render previews, you can quickly add effects and instantly play them back to see how they’ll look in your finished creation, potentially speeding up your workflow.

Overall, performance is excellent, but if you have the M1 Pro or M1 Max model from 2021, the real-world difference isn’t as major as the stats suggest. That is, until you go back to the efficiency point. Apple claims you can get up to 22 hours of battery life with the 16-inch MacBook Pro (2023). The MacBook Pro 16-inch (2021) lasted 18 hours and 48 minutes in testing, though the new model aces it with a huge 19 hours and 39 minutes in the same test. With a few tweaks, we could easily see the machine lasting the promised 22 hours.

The MacBook Pro 16-inch (2023) charges via a MagSafe charger that clicks into the proprietary port via magnets, which makes it easy to plug in, and safe if it gets pulled out. Using that and the large 140W USB-C Power

Adapter charges the MacBook quickly – it took less than an hour to go from empty to 100%.

Another benefit of the more efficient M2 chip is that the new MacBook Pro is virtually silent in use. Since the M2 Pro efficiently manages its power consumption, it rarely gets hot enough for the MacBook’s fans to kick in.

The six-speaker sound system inside the new MacBook Pro 16-inch offers excellent sound quality. While the speakers won’t replace studio-quality speakers and monitors, it means you can still get good audio without having to plug into anything.

The FaceTime HD webcam is the same 1080p camera from the previous model, and it does a good job of producing clear footage, even in low-light conditions. It doesn’t seem any better than the 2021 model, though.

The MacBook Pro 16-inch (2023) is another triumph from Apple. While it isn’t the revelation that the 2021 model was, it’s now the most powerful workstation laptop around with an industry-leading screen and battery life.

MATT HANSON

THE BOTTOM LINE

Not a huge upgrade over the 2021 model, but a powerhouse nonetheless.

- M2 Pro and Max chips are hugely fast
- Great design
- Improved battery life
- It’s big! Check out the 14-inch model

EXCELLENT ■■■■■



The new Mac mini looks identical to its predecessor.

Mac mini (2023)

Apple has maximized the potential of its mini

From \$599 (model tested \$1,299) From www.apple.com

Features M2 chip with 8-core CPU, 10-core GPU, 8GB of unified memory (16GB/24GB available), 256GB storage (512GB/1TB/2TB available), two Thunderbolt 4 ports, 2.6lbs; M2 Pro chip with 10-core CPU, 16-core GPU (12-core CPU, 19-core GPU available), 16GB of unified memory (32GB available), 512GB storage (1TB/2TB/4TB/8TB available), four Thunderbolt 4 ports, 2.8lbs; HDMI port, Gigabit Ethernet port (10Gb Ethernet available), 3.5mm headphone jack, Wi-Fi 6E (802.11ax), Bluetooth 5.3, built-in speaker, 1.41in x 7.75in x 7.75in

THE MAC MINI with an M1 chip arrived in 2020, and nearly three years down the line Apple has released a new version featuring both the "entry-level" M2 chip and the even more powerful M2 Pro chip. Although the M2 chip is by no means a slouch – in our testing it was noticeably faster than its entry-level M1 predecessor – the option of the M2 Pro chip offers users the flexibility to dip their toes into power-user capabilities, without the bulk (or cost) of a Mac Studio. The base Mac Studio with M1 Max is still faster, and the main limiting factor with the Mac mini is the memory cap at 32GB versus the Studio's 128GB.

The design remains virtually identical to the 2020 model, which isn't exactly a bad thing – it's compact enough to allow it to be hidden away unnoticed, if you want. On show, it looks unassuming, but the metal case with large Apple logo on top oozes quality. Dimensionally, it's also the same size and weight of the M2 version, though the M2 Pro is slightly heavier at 2.8lbs versus 2.6lbs.

Unusually, for Apple, the new Mac mini is not only not more expensive than the 2020 model, it's actually cheaper – \$100 cheaper when you compare the base model with M2, which makes it incredible value for money.

MORE MAXI THAN MINI

Along with an M2 chip in the entry-level Mac mini (2023) (also found in both the MacBook Air [2022] and the MacBook Pro 13-inch [2022]), you get 8GB of memory, along with a 256GB SSD. That's a really great starting point that will happily offer plentiful performance to suit most people. Those looking for a bit more from the base package would do well to look at the usual upgrade options. Apple offers a pre-selected version with 512GB SSD for \$200 more. Alternatively, you can select 24GB of memory, an extra \$400, or 2TB of SSD is an \$800 premium.

As we've mentioned, those looking for a bit more power to handle more demanding creative projects in their day-to-day ought to consider the Mac mini with M2 Pro. This is an exciting option if the Mac Studio is a little out of reach, but the base model Mac mini doesn't cut it. This starts at a palatable \$1,299, and gets you a 10-core CPU and 16-core GPU, along with 16GB memory and 512GB SSD storage. For an additional \$300, you can get a more powerful M2 Pro chip with a 12-core CPU and 19-core GPU. Upgrading to 32GB memory will cost you \$400, and is the only memory upgrade option. Unlike the base model, the



▶ M2 Pro version's SSD storage can be upgraded to a massive 8TB, which will set you back a mammoth \$2,400. A more sensible option, the 2TB upgrade will cost \$600, which is \$200 cheaper than with the base model. We received the M2 Pro version of the Mac mini (2023) for review, with the 12-core CPU and 19-core GPU, 1TB storage, and 16GB of memory, which will cost \$1,799. In testing, which included editing 8K movie files and making projects in Ableton Live 11 using a MIDI keyboard, the new Mac mini performed like a champion. Running synthetic benchmarks, such as Geekbench, which puts the chip

More ports (M2 Pro) and better display support with both M2 and M2 Pro models, compared with the Mac mini (2020).

under heavy graphical and computational loads, showed just how close the new MacBook Pro 16-inch and Mac mini perform.

Apple has made big strides in improving the efficiency of the M2 Pro chip, and while that is arguably more important when it comes to the MacBook, as better efficiency can lead to longer battery life, it's also welcome here. Due to its compact size, the Mac mini (2023) can keep working without producing too much heat, and that means it also doesn't need to use its fans that often, leading to a pleasingly silent machine. In these days of ever-higher energy bills, the efficiencies brought in by the M2 and M2 Pro are certainly welcome, especially if you're planning on using the Mac mini for long periods of time.

PAY TO DISPLAY

In terms of connectivity, the new Mac mini has two Thunderbolt 4 ports (four for the M2 Pro version), two USB-A ports, and one HDMI port. It also has a Gigabit Ethernet port for internet (10 Gigabit Ethernet is a \$100 upgrade) and network connectivity (Wi-Fi 6E is also built-in).

Crucially, the Mac mini (2023) has excellent support for multiple displays. The M2 can simultaneously output to one display with up to 6K resolution at 60Hz over Thunderbolt, and one display with up to 5K resolution at 60Hz



Image rights: Apple Inc.

Benchmarks: Our analysis explained

> GEEKBENCH 5 SINGLE-CORE TEST

This tests the capability of a single processor core. Many more common tasks on a Mac will only use a single core at a time. Geekbench 5 is a universal app running on Ventura.

Index score (higher is better)



> HANDBRAKE VIDEO ENCODING

We transcode a 6.5GB 4K video to 1080p using HandBrake to test the multicore processor performance. Handbrake is available as a universal binary.

Duration (lower is better)



> RISE OF THE TOMB RAIDER (1920X1080)

For a real-world gaming test, we use the benchmarking tool in this game, with the graphics quality set to High, and the resolution set to 1,920 x 1,080. Not yet optimized for Apple silicon.

Frames per sec (higher is better)



> DAVINCI RESOLVE

In Blackmagic Design's editing tool for video professionals, we exported an effects-laden, 2.5-minute project to the H.264 format. The latest version of the app (Version 18) now runs natively on Apple silicon Macs.

Duration (lower is better)





THE M2 PRO CHIP OFFERS USERS THE FLEXIBILITY TO DIP THEIR TOES INTO POWER-USER CAPABILITIES

over Thunderbolt or 4K resolution at 60Hz over HDMI. This is a decent improvement over the 2020 M1 version, which lacked the ability to output to a second display over Thunderbolt, and so was limited to the 4K @ 60Hz over HDMI option.

The M2 Pro goes a step further and supports up to three displays: two displays with up to 6K resolution at 60Hz over Thunderbolt and one display with up to 4K resolution at 60Hz over HDMI. Or, for up to two displays it outputs to one display with up to 6K resolution at 60Hz over Thunderbolt, and one display with up to 4K resolution at 144Hz over HDMI. The final option is outputting to one

display with up to 8K resolution at 60Hz or 4K resolution at 240Hz over HDMI.

The Mac mini (2023) also features built-in speakers, giving you sound notifications and text-to-speech capabilities via Siri, which is particularly useful for accessibility.

If you want an affordable entry into M2 Mac life, the new Mac mini is the cheapest way to do it. On the flip side, if you were considering the Mac Studio, but couldn't stretch to the asking price for the base M2 Max model, or you simply didn't like the size of the machine, then the M2 Pro version of the new Mac mini is a very powerful alternative, for a lot less money. **MATT HANSON**

Mac Studio too big? The Mac mini (2023) is smaller, but almost as capable with M2 Pro chip (vs M1 Max).

THE BOTTOM LINE

The Mac mini (2023) is an incredible machine, offering both good value, and pro-level capabilities.

- Powerful but compact
- M2 Pro option
- Excellent connectivity
- Great value

AWESOME ■■■■■



ROUNDUP The best CD/DVD drives for the modern Mac

No optical disc drive? No problem, check out our pick of the best drives to keep those discs spinning on modern Macs

> ASUS ZenDrive U9M

\$34.99 From www.asus.com

Features Max read speeds: 8x DVD-ROM, 24x CD-ROM. Max write speeds: 6x DVD+R DL, 6x DVD-R DL, 8x DVD+R, 8x DVD-R, 24x CD-R. Max rewrite speeds: 8x DVD+RW, 6x DVD-RW, 24x CD-RW. 5.6" x 5.3" x 0.54", 8.3 oz

This super-slim drive from Asus has plenty of features to offer those looking for a great drive to upgrade their Mac. It comes in three different colors: gold, black or silver, and the concentric-circle hairline finish looks very premium. At just over a half inch thick, it's the slimmest drive here, though it's not quite as light as the LG Ultra Slim, nor is it quite as inexpensive (though it's still very reasonable at around \$35).

Unlike LG's offering, the Asus ZenDrive U9M comes with both USB-A and USB-C cables, so out of the box it can be used with both new and old MacBooks without having to buy a dongle.

Like most of the drives here, it has impressive read and write speeds, which is great if you have lots of burning to do.

👍 Light, slim and inexpensive 👍 Works with old and new Macs

EXCELLENT ■■■■■

> NOLYTH External DVD Drive

\$39.99 From <https://amzn.to/3lgFDSD>

Features Max read speeds: 8x DVD-ROM, 24x CD-ROM. Max write speeds: 6x DVD+R DL, 6x DVD-R DL, 8x DVD+R, 8x DVD-R, 24x CD-R. Max rewrite speeds: 8x DVD+RW, 6x DVD-RW, 16x CD-RW. 5.4" x 5.4" x 0.63", 11.8 oz

At half the price of the Apple USB SuperDrive, yet with virtually the same looks, the NOLYTH External DVD Drive is worth a look if you want a drive that matches the aesthetic of your Mac. It's designed to look like an Apple product, slot-loading with a full aluminum exterior, though it's actually marginally slimmer.

Unlike the USB SuperDrive, the NOLYTH drive comes with a USB-C cable so you can connect it to your later Mac without needing any additional adapters. However, if you own an earlier model with USB-A ports instead of USB-C (or you'd rather just use this connector), it also comes with a USB-A adapter, which is pretty convenient. You also get a protective hard case included with the drive, which is a nice touch.

👍 Apple looks, for half the price 👍 Comes with an extra adapter

AWESOME ■■■■■



A CD/DVD DRIVE is essential if you have an iMac or MacBook that doesn't have an optical disc drive built into it – which is most of the newer models these days as Apple discontinued optical disc drives back in 2016.

An external optical disc drive enables you to easily use discs with your Mac. You can import your movies and music from a disc to your Mac, or the other way round. You can also back up important documents, photos and anything else

you want to keep safe on a disc, and you can watch your favorite DVD movies.

The good news is external drives are relatively cheap as the need for them begins to wane. We've selected the best drives below. **LORY GIL**

> Apple USB SuperDrive

\$79 From www.apple.com

Features Max read speeds: 8x DVD-ROM, 24x CD-ROM. Max write speeds: 6x DVD+R DL, 6x DVD-R DL, 8x DVD+R, 8x DVD-R, 24x CD-R. Max rewrite speeds: 8x DVD+RW, 6x DVD-RW, 24x CD-RW. 5.47" x 5.47" x 0.67", 11.8 oz

Apple's branded playable/burnable CD/DVD drive is the perfect complement to your iMac or MacBook Pro unless you have a late 2016 or newer MacBook Pro. Out of the box, the USB SuperDrive is compatible with 2008 and later Mac models. If you do have a later model with only USB-C ports, you'll need the USB-C to USB adapter (sold separately for \$19 via Apple).

It's not much larger than the size of a CD case, so it fits snug in your computer bag without taking up a lot of room. All you have to do is plug it into your computer using the USB cable and you're ready to go. It's the most expensive of the bunch, but in exchange you get a high-quality product that looks like it was made for your machine.

👍 Great aesthetics 📌 Needs an adapter for later models

GREAT ■■■■

> LG Ultra Slim Portable DVD Writer

\$28.95 From www.lg.com

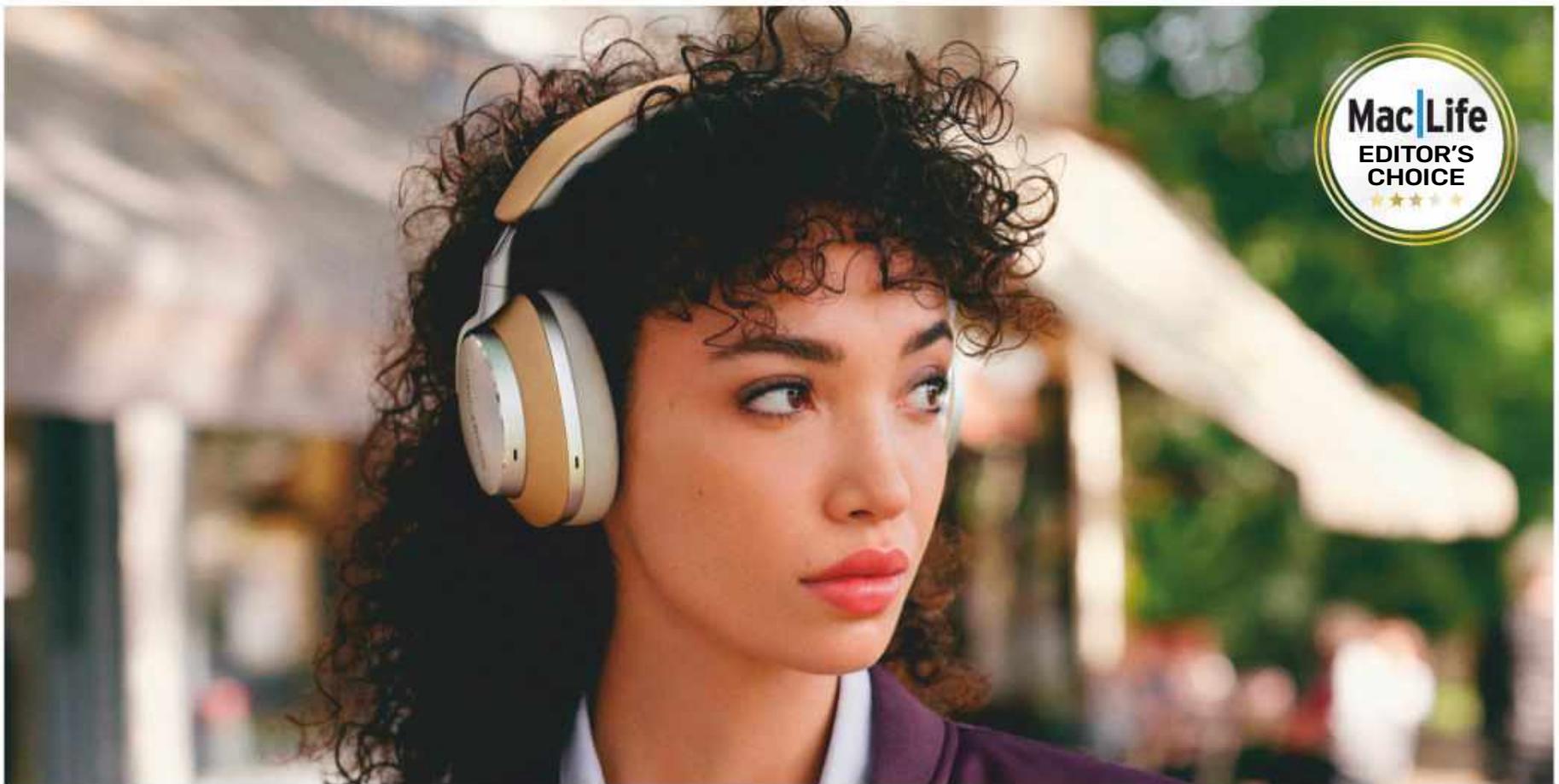
Features Max read speeds: 8x DVD-ROM, 24x CD-ROM. Max write speeds: 6x DVD+R DL, 6x DVD-R DL, 8x DVD+R, 8x DVD-R, 24x CD-R. Max rewrite speeds: 8x DVD+RW, 6x DVD-RW, 24x CD-RW. 5.6" x 5.4" x 0.55", 6.4 oz

LG makes a CD/DVD drive that is lightweight, fast, and doesn't cost much – in fact it's the cheapest model here by a few bucks, so you really won't be spending much. It's made of a hard shell plastic material, so it will not feel as sturdy as Apple's SuperDrive or NOLYTH USB-C drive. However, in exchange, you get something that's about as light as a CD in its case, and it's also incredibly slim, which you might expect from a drive called "Ultra Slim". It's just 0.55in in height.

It's also available in a variety of colors, including black, gold, silver and white, so you can easily match it your machine. The LG Ultra Slim connects via a Mini USB to USB-A cable, so you'll need a USB-C to USB adapter for later Mac models.

👍 Great value 📌 Need an adapter for later Macs

GREAT ■■■■



The Px8's battery life of 30 hours is pretty great, and just 15 minutes of charging is good for seven hours of playback.

Bowers & Wilkins Px8

The Px8 headphones bring the fight to rival AirPods Max, with even better audio quality and longer batter life

\$699 From www.bowerswilkins.com

Features Drivers: 2 x 1.57-inch dynamic full range. Connectivity: USB-C, Bluetooth 5.2 with aptX Adaptive. Microphones: 6 (4 x ANC, 2 x voice). Battery life: 30 hours. Weight: 11.3 oz

THE BOTTOM LINE

A worthy, if pricey, alternative to AirPods Max, and an upgrade over the Px7 S2.

⊕ Energetic, poised, convincing sound

⊕ Great build and finish

⊕ Effective noise cancellation

⊖ Control app is less than perfect

AWESOME ■■■■■

THE PX8 ARE a deeply accomplished pair of headphones, as the asking price insists they should be. The low frequencies they can generate are very deep, hit hard, are beautifully shaped, packed with detail both broad and fine. At the opposite end, treble sounds have authentic bite and plenty of shine to them — but they're substantial, rather than airy. The Px8 use the same active noise-canceling (ANC) platform as that fitted to the Px7 S2 — a sensible move, given the Px7 S2 are among the more effective noise-cancelers around.

Bowers & Wilkins has specified soft, hard-wearing and nicely tactile Nappa leather to cover the inner and outer parts of the headband, as well as the memory foam of the ear cushions. It's beautifully applied, looks and feels the part, and along with an all-in weight of just 11.3 oz, it helps the Px8 remain comfortable in situ for hours on end.

As with the Px7 S2, the Px8 goes without touch controls, relying instead on some nicely implemented physical control buttons, access to your source player's native voice assistant, and the recently spruced up Bowers & Wilkins Music control app.

Bowers & Wilkins has made a sufficient sonic upgrade with the Px8 to make the price difference between it and the Px7 S2 seem entirely reasonable. At this price range, they're now in direct competition with Apple's AirPods Max, though they're even pricier, at \$150 more, which somehow makes the AirPods Max seem like a good deal.

If you're looking for features that work specifically with Apple devices, such as Spatial Audio, then we'd recommend sticking with Apple's noise-canceling option, but if you want a better audio experience and longer battery life then B&W's offering is superior. **SIMON LUCAS**



Creative Pebble Pro

Proof that big things come in small packages

\$59.99 From www.us.creative.com

Features Bluetooth 5.3, USB audio/power, 3.5mm AUX-in, headset and mic ports, volume control, USB-C to USB-C/USB-C to USB-A/3.5mm AUX-in cables, 13.4 oz (L) 14.8 oz (R)

OUTWARDLY, THE LATEST addition to Creative's Pebble family, the Pebble Pro, looks almost identical to the Pebble V3, with the same signature 45° angled firing position, and rose gold speaker domes. But that's it — the new version has been outfitted with a host of useful upgrades.

The most obvious of these is the RGB LED lighting ring on the base of each unit. Lighting is easily adjusted via the controls on the front panel of the right speaker. You can set it to cycle through the color range, pulsate as it does so, or manually choose a solid color. It adds a wonderful touch of ambience to your desk space.

The new model comes in smart Alpine Green, unlike the V3's so-so black or white. The adjoining cable is now also 5.9ft, contrasting the V3's 4.43ft, for greater placement flexibility, which owners of wide desks will appreciate.

Creative has, understandably, focused its attention on audio, with overhauled 2.25-inch full range drivers, BassFlex technology, integrated digital amps, as well as a welcome boost in power up to 10W RMS (20W peak), or 30W RMS (60W peak) when connected to a 30W USB PD adapter (not included). Although the Pebble Pro speakers are too small to go low, the mid-range is impressive, as is clarity in the upper spectrum, and stereo separation is delightful.

Connectivity is plentiful — Bluetooth 5.3 for easy wireless connection to a device. Alternatively, you can connect via USB-C for both power and audio, or there's 3.5mm AUX-in. There's also now a port to plug in a headset or mic.

At \$60, the Pebble Pro speakers offer so much for so little. The ambient lighting is the icing on the cake. **NICK ODANTZIS**

The Pebble Pro speakers might be diminutive, but they offer a powerful, high-quality sound.

THE BOTTOM LINE

A fantastic all-round performance from these tiny desktop speakers.

- 🔊 Brilliant audio quality
- 💡 Ambient lighting
- 🔌 Loads of connectivity
- 💰 Great price

AWESOME ■■■■■

Amazon Echo Studio

With its sound revamped to make it even more immersive than ever, Amazon's most powerful smart speaker has a lot to offer

\$199.99 From <https://amzn.to/3lgFDSD>

Features Drivers: 3 x two-inch mid-range speakers, one-inch tweeter, 5.25-inch woofer. Connectivity: 3.5mm jack, Wi-Fi 5, Bluetooth. Audio features: Dolby Atmos, Sony 360 Reality Audio, automatic room adaptation. Voice assistant: Alexa. Dimensions: 8.1in x 6.9in x 6.9in. Weight: 7.7 lb



AMAZON HAS QUITE an extensive portfolio of smart speakers now, ranging from the inexpensive Echo Dot to the people-pleasing Amazon Echo. But the new Amazon Echo Studio is its best yet, offering the most immersive sound.

The actual design won't be for everyone. A meshed fabric covering wraps around the curved edges of the speaker with a gap stretching across the width of the base. It also has a big circular panel around the top that houses the control buttons and has a light ring on the inside, which you can barely see at all when it's not lit up.

Like other Echo devices, there are four buttons on the control panel: two volume controls, a microphone mute button and the action button. Each one triggers the light ring, which turns red when the mic is switched off, tells you the volume level around the ring in white, goes orange in set-up mode, and lights up blue when Alexa is listening out for you.

POWER TOWER

Inside the Amazon Echo Studio, you'll find a one-inch tweeter, three two-inch mid-range speakers, and a 5.25-inch woofer delivering 330 watts of power, complemented by custom-built spatial audio processing technology and frequency range extension, with support for both Dolby Atmos and Sony 360 Reality Audio.

Each element is positioned strategically around the device so the sound comes out from every direction, and what that does is create an experience that is exactly the same no matter where you are stood in relation to it. That's also helped by the fact that it automatically analyzes the acoustics of the space you put it in, and adjusts the audio accordingly – resulting in immersive and room-filling sound.

The actual quality of the audio was clear and relatively precise as well, with thumping bass and distinct treble although the mids could sometimes get a little lost in translation. You still don't get the level of hi-fi sound that you'd find on a Bose or Sonos but despite that, we were really pleased with what the Amazon Echo Studio had to offer especially given its sub-\$200 price tag.

For the most part, Alexa was able to do what we wanted, but when it came to playing music from Spotify or from Amazon Music it didn't always quite pick up the name of some songs or would sometimes play something entirely different. With more complicated artist names it was actually easier just to pick our phone up and find the song.

If you already use Alexa devices and want a powerful speaker for your living room or kitchen, but you don't want to spend more than \$200, then the Amazon Echo Studio is a no-brainer. All in all, it'd be hard not to recommend it. **YASMINE CROSSLAND**

THE BOTTOM LINE

If you're looking for an Alexa speaker with huge sound, that's exactly what you get here.

- Powerful, room-filling sound
- Adapts sound to space
- Alexa built in
- The sound sometimes lacks precision

GREAT ■■■■

Tough testing, trusted ratings

In terms of features, you get everything the Alexa assistant has to offer.



GROUP TEST

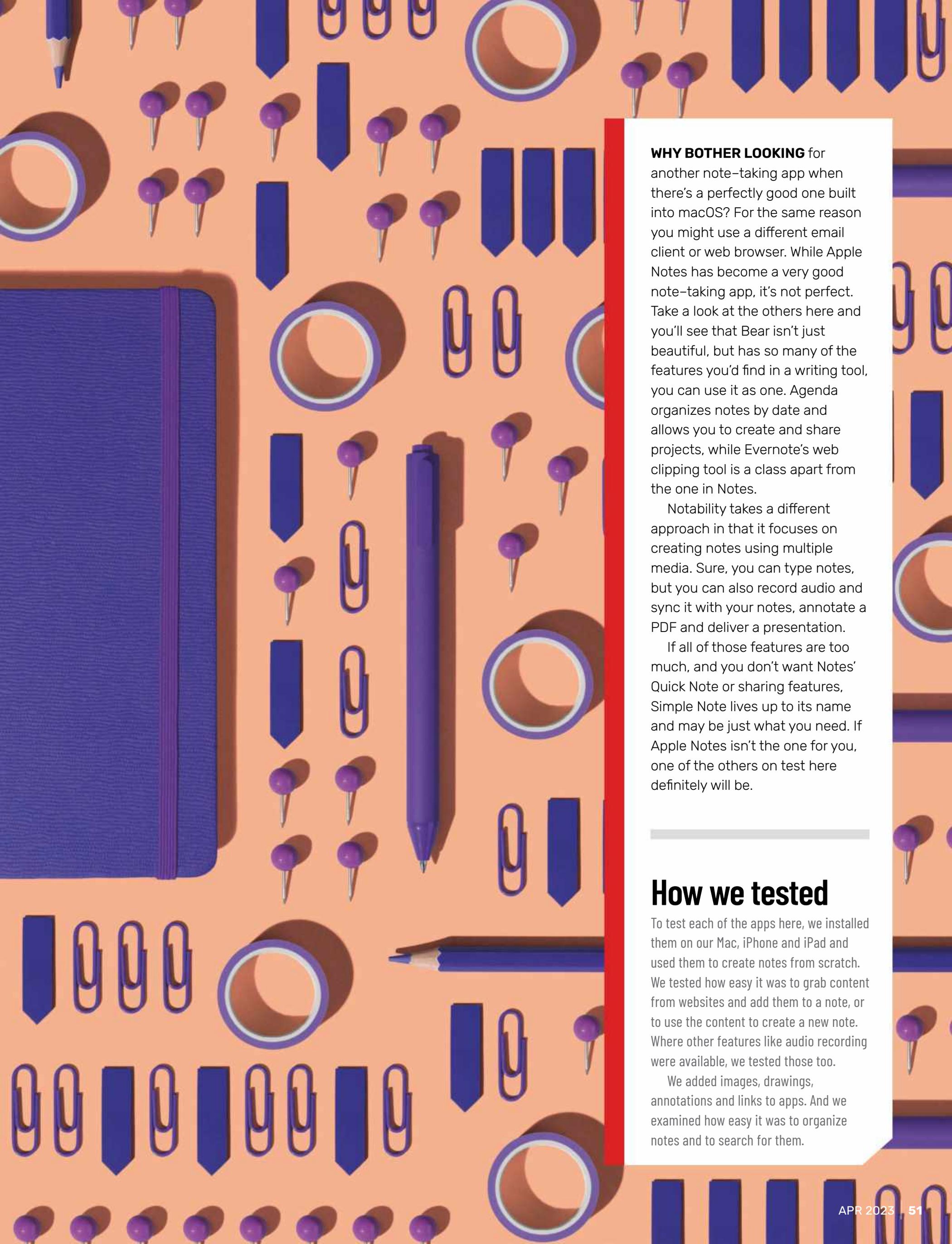
REVIEWED BY KENNY HEMPHILL

ON TEST...

- > Apple Notes
- > Agenda
- > Bear
- > Evernote
- > Notability
- > Simple Note

THE BEST NOTE-TAKING APPS FOR MAC

Apple may have improved its Notes app, but there are plenty of other options if it's not for you



WHY BOTHER LOOKING for another note-taking app when there's a perfectly good one built into macOS? For the same reason you might use a different email client or web browser. While Apple Notes has become a very good note-taking app, it's not perfect. Take a look at the others here and you'll see that Bear isn't just beautiful, but has so many of the features you'd find in a writing tool, you can use it as one. Agenda organizes notes by date and allows you to create and share projects, while Evernote's web clipping tool is a class apart from the one in Notes.

Notability takes a different approach in that it focuses on creating notes using multiple media. Sure, you can type notes, but you can also record audio and sync it with your notes, annotate a PDF and deliver a presentation.

If all of those features are too much, and you don't want Notes' Quick Note or sharing features, Simple Note lives up to its name and may be just what you need. If Apple Notes isn't the one for you, one of the others on test here definitely will be.

How we tested

To test each of the apps here, we installed them on our Mac, iPhone and iPad and used them to create notes from scratch. We tested how easy it was to grab content from websites and add them to a note, or to use the content to create a new note. Where other features like audio recording were available, we tested those too.

We added images, drawings, annotations and links to apps. And we examined how easy it was to organize notes and to search for them.

Things to consider...

>>> Syncing with other devices

You may want to make sure the note-taking tool you choose has an iPhone or iPad version, that it syncs and whether there is an additional cost.

>>> Web clipper

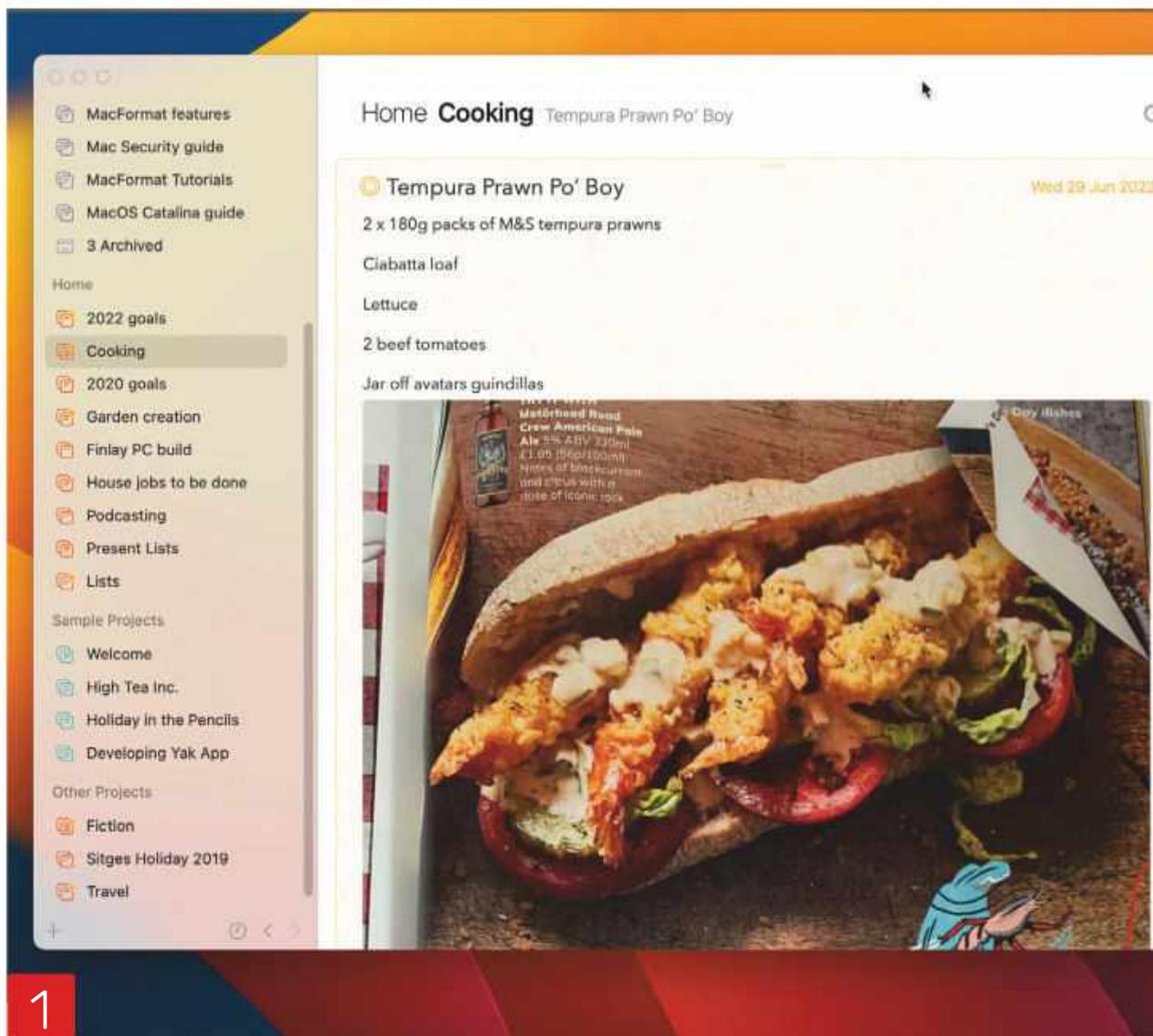
Grabbing a recipe from a website is one of our favorite uses of notes apps and the easier it is to grab, the better. Some apps here use Share sheets to do that, others have their own browser extension.

>>> Tagging

Tags are a simple but effective way to organize notes. Add a tag to a note in an app that supports them, and you can then filter notes for a specific project.

>>> Shortcuts

Apple's Shortcuts enable you to automate all kinds of workflows and processes for extra efficiency.



> Agenda

Free; \$29.99 (Premium) From www.agenda.com

1 The main difference between Agenda and the other note-taking apps here is that it is “date-focused”. This means that you can assign dates to notes and set reminders for them. You can also import Calendars and Reminders from the respective macOS apps. The Today view shows you all the notes assigned to today, and you can mark notes as On the Agenda – usually those you need to work on now.

Agenda notes support rich text formatting, images, links and tags. You can create multiple projects and save notes to them. You can also save a note as a template

and use it to create new notes in future. You can add URLs from Safari’s Share menu, although only the link is inserted, not content from the page.

Agenda is free, with a fee for additional features such as collaborating with others and full-color notes. Plus, one of our favorite things about Agenda is the active online community, which shares tips and tricks.

➤ Excellent support for rich text and images

➤ Templates

➤ Active community

➤ Difficult to add web content

EXCELLENT ■■■■■

> Bear

Free; \$14.99/yr (Bear Pro) From www.bear.app

2 Bear is by far the prettiest note-taking app on our list. But don’t let its cutesy aesthetic fool you: this is a powerful note-taking and writing tool. It has full support for Markdown and when you’re done writing a note, you can export it either as the Markdown original, or as rich text, a Word document, PDF, or HTML.

As well as using Markdown to format notes, you can add images, URLs, and format blocks of text as code. Support for tagging is excellent. Tags appear in the sidebar, and you can group them, use nested tags, and add an icon to make a tag easy to pick out. We like that

you can choose to ignore tags when you export notes in other formats.

Bear has its own web clipper, which means you can select whether to include images and URLs when you add a web page to a note.

Bear Pro syncs via iCloud, allows you to secure notes with a password, and gives you access to lots of different themes. There are also Shortcut actions for creating new notes.

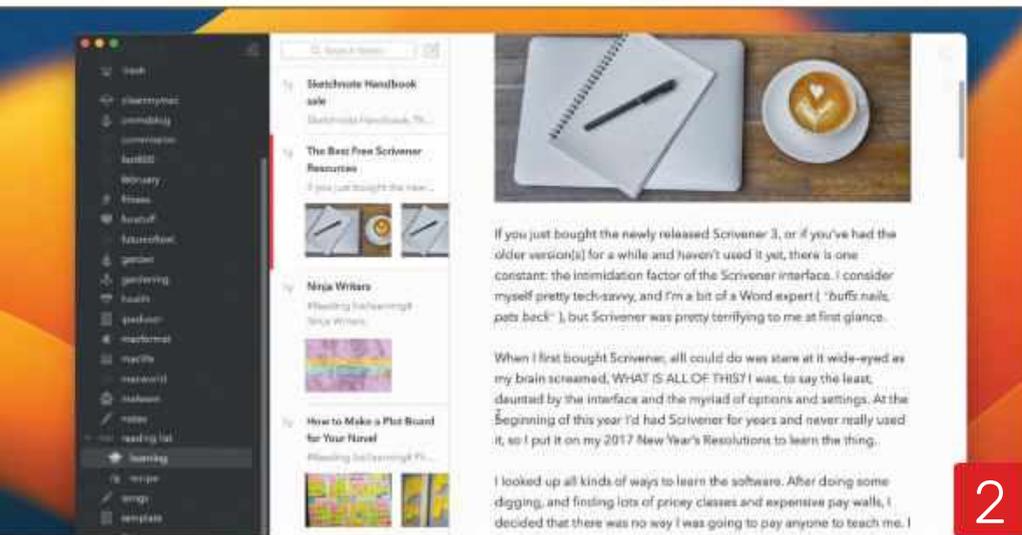
➤ Excellent Markdown support

➤ Web clipper

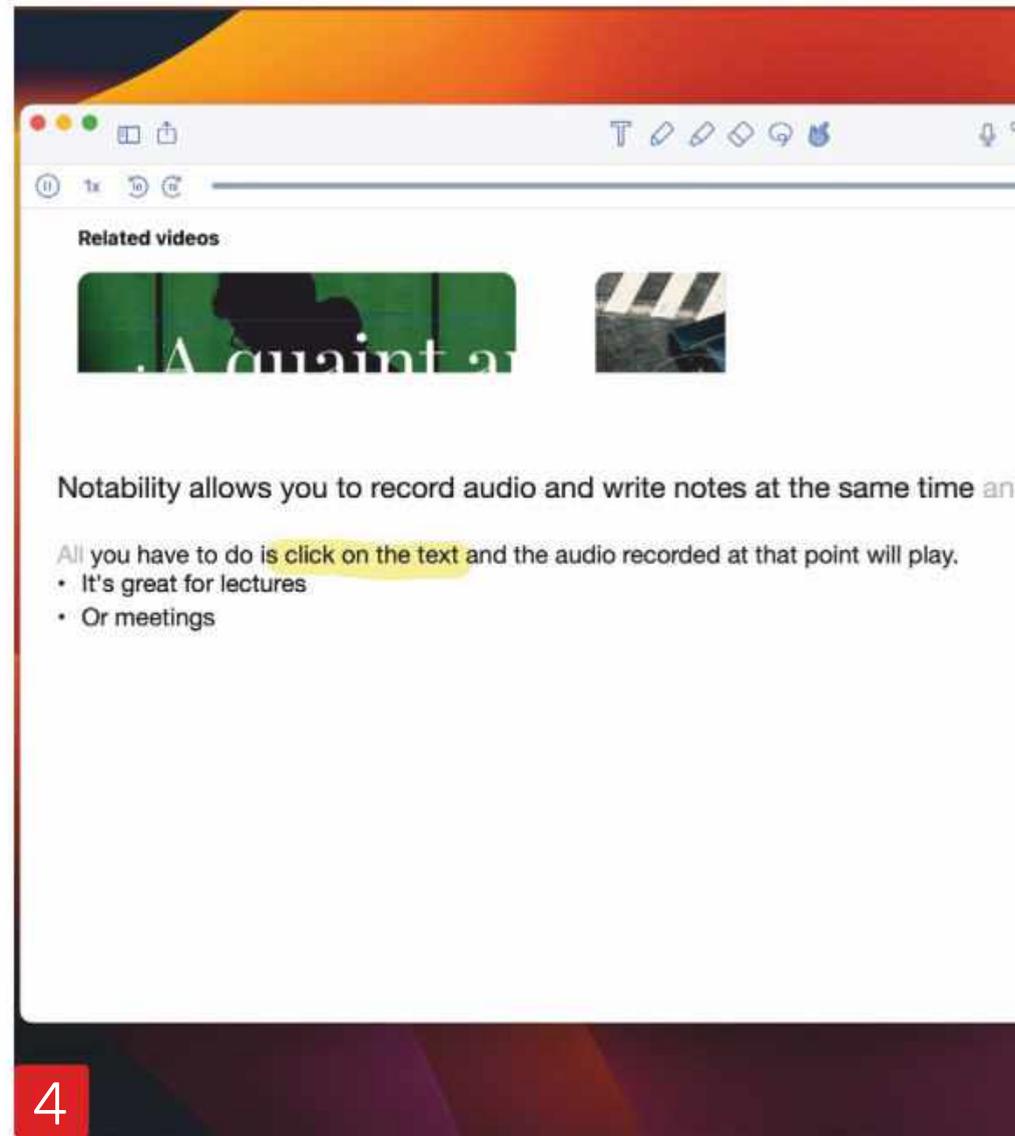
➤ Good export options

➤ Free version very limited

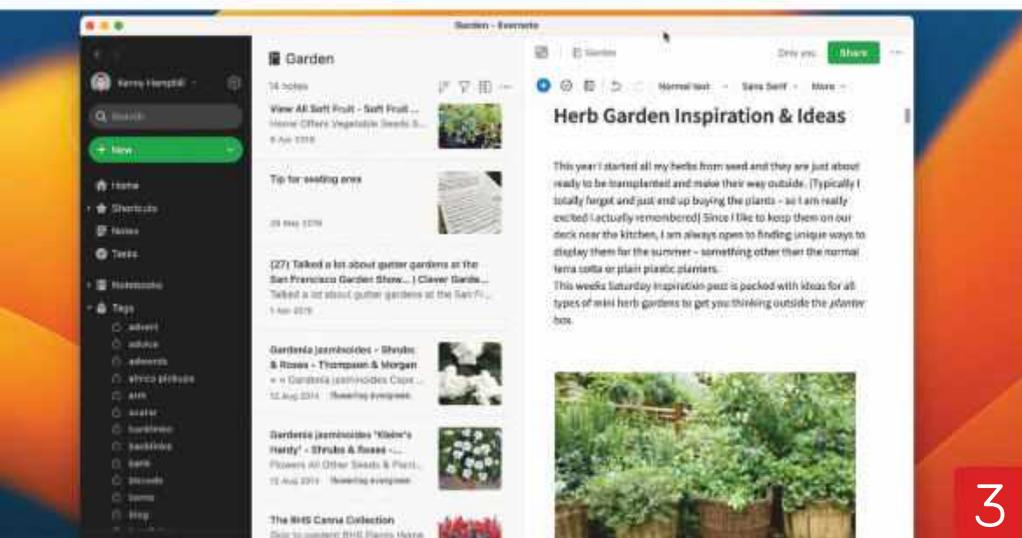
EXCELLENT ■■■■■



2



4



3

> Evernote

Free; \$8.99/month (Personal) From www.evernote.com

3 If you mainly want to use a note-taking app for grabbing and saving articles or recipes from the web, then Evernote is the standout app here. Its web clipper is second to none, and allows you to choose each time you clip whether to save the full page, an article on the page or a simplified version. When you make a choice, you will see a preview of the clip before you save it.

Evernote is also the notebook to choose if you sometimes need to use non-Apple platforms, as there are versions for Android and Windows, and a web app that looks just like the desktop version.

Evernote syncs across all your devices, though the free version is limited to two. Your data is stored on its servers, so there's a limit on how much you can upload, depending on your chosen subscription plan.

There's full support for tagging and creating rich-text notes, as well as adding images and links. The search tool is excellent and the paid-for version allows you to create task lists, too.

- +** Works on any platform
- +** Excellent web clipper
- +** Excellent formatting options
- Expensive

GREAT ■■■■■

> Notability

Free; \$12.99/yr (Plus version) From www.notability.com

4 Need to take lots of notes in meetings or lectures? Notability should be top of your list. It enables you to record audio as you make notes and syncs the audio with the written note. You can then click on a word in the note to hear the audio at that point.

Notability also lets you present your notes and view one note on your screen while another note is presented. You can add images and links to notes, and on the iPad version handwrite or draw using Apple Pencil. The free version also enables you to use templates from a gallery, import and annotate PDFs,

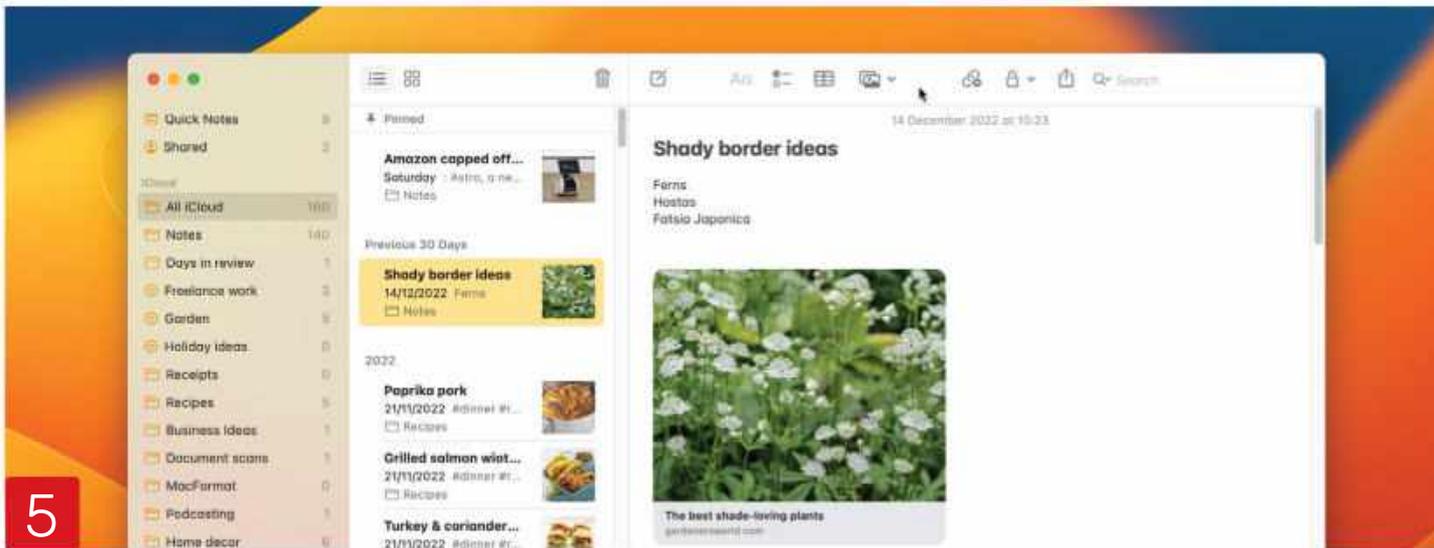
scan documents and sync via iCloud.

Upgrade to Notability Plus to convert handwritten notes to text, access additional templates, and convert hand-written equations to hi-res images.

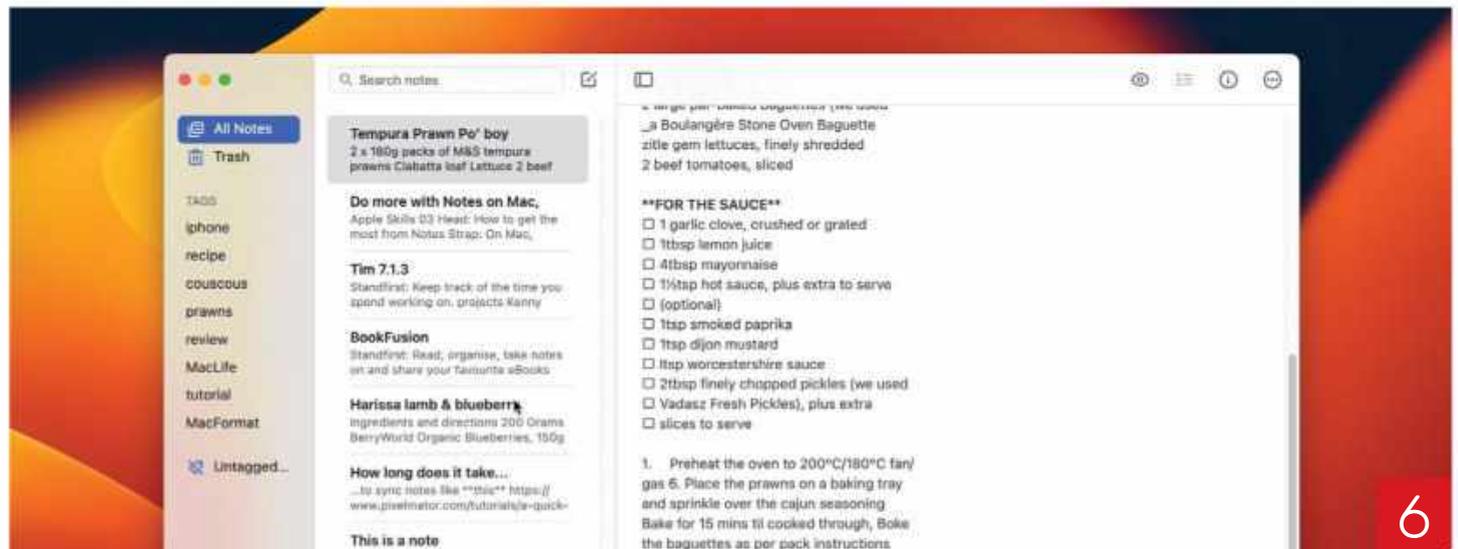
When it comes to sharing, you can export notes as PDFs and password protect them. Or, you can share them as images, notes, or text documents using Notability's Share sheet.

- +** Audio recording and syncing
- +** Presentation mode
- +** Templates
- No easy way to grab web pages

GREAT ■■■■■



5



6

> Notes

Free From www.apple.com

5 Apple's Notes has evolved into a very capable note-taking tool. Of course, it syncs with iPhone and iPad, but it also allows you to share notes with others and collaborate on them. An Activity view shows you the changes others have made to your notes, and when you "@" someone you're collaborating with, they'll get a notification.

Quick Note enables you to create or add to notes without launching the app, and without leaving the app you're currently using; just move the cursor to the corner of the screen or use the sharing extensions in apps that support it.

When you grab a web page from Safari, Notes shows you a thumbnail preview of the content as well as embedding a URL.

Notes allows you to organize notes folders, and create Smart Folders to sort based on criteria you specify. And tags mean you can search for and filter notes easily. If you create notes that you need to keep away from prying eyes, secure them with a password.

- Quick Note
- Collaboration features
- Smart Folders
- Limited to Apple devices

GREAT ■■■■

> Simple Note

Free From www.simplenote.com

6 If you want a Markdown-friendly note-taking app that dispenses with fancy features in favor of speed in jotting down and retrieving notes, this is the tool for you.

Simple Note is purely about creating and storing text notes. There are no templates or audio recording features here. And the only way to clip web pages is to manually paste a URL, which remains a URL, rather than a page preview.

However, it's very easy to use and you can preview the Markdown output at the click of a button. Another button lets you quickly see how many words or characters

are in a note. You can publish notes to Simple Note's web platform, as well as share them as text in an email, message or to another app. You can even collaborate on notes by adding an email to the tags box. You can filter notes by clicking on a tag in the sidebar.

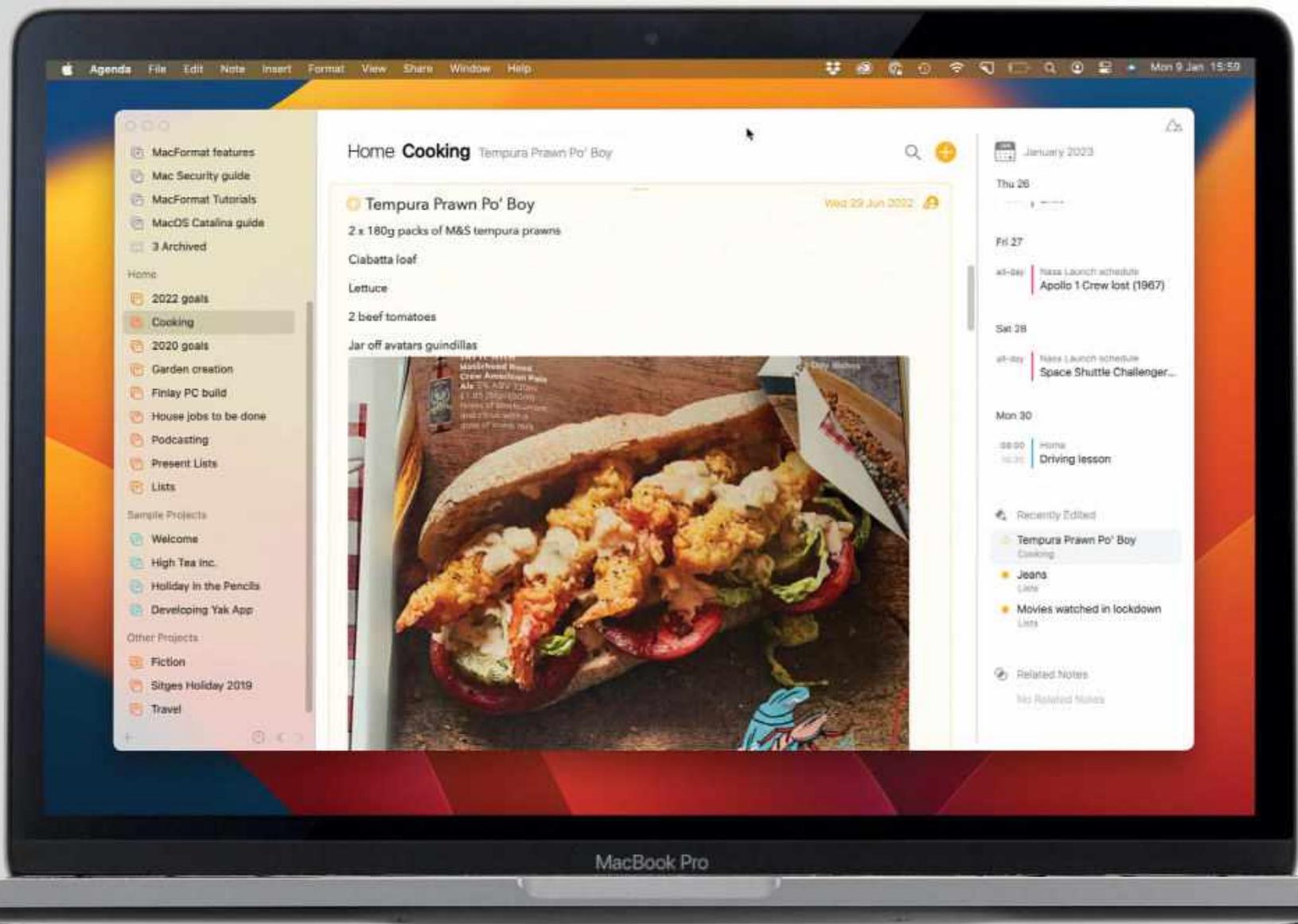
Notes are synced via Simple Note's own server, meaning you can also sign in to your account and access your notes in a web browser.

- Fast search
- Good Markdown support
- Completely free
- Can't pull in web pages

GREAT ■■■■



THE WINNER



AGENDA

A note-taking app that will keep you focused and help with managing your day

WE COULD MAKE a case for at least four of the apps featured here to be the winner of our group test. Bear is not just visually beautiful, but has a powerful set of features that make it both simple and very capable. Notability is unique in allowing you to record audio and sync it with typed or handwritten notes, and then deliver them as a presentation. And Simple Note provides everything you need in a basic, easy-to-use note-taking app at no cost.

However, there can be only one winner and, in this case, that's Agenda. The date-based approach and On the Agenda view are a powerful way to keep you focused on what needs to be done, and the integration with Reminders and Calendar are excellent. Add to that the formatting options, image support and collaboration features, and Agenda is hugely powerful. Plus, it has excellent support for Shortcuts, with several actions ready to be included in your workflows.



Affinity Photo 2

Serif's powerful editing app gets a serious update

\$19.99 (universal licence \$169.99) From www.affinity.serif.com

Needs iPadOS 15 or later



SERIF'S AFFINITY SUITE rivals Adobe in bringing pro-grade image editing without a subscription to Macs and iPads. The latest releases of the three Affinity apps, released as version 2 rather than a free update, may mean you have to pay once more, but a universal licence — which gets you all apps on all platforms with no extra costs — is about the same as one year of equivalent Adobe apps. There's a 30-day free trial too.

The iPad version of Photo 2 is probably the most interesting of the apps, as it has the broadest appeal and is cheaper than the desktop app if you buy it separately. Photo 2 takes on Photoshop directly, as while it has raw image processing capabilities it lacks the organizational tools of Lightroom or the browsing of Bridge, two things that are missing from the whole Affinity suite.

So, you get a layer-based image editor that's split into

“personas”. The Photo persona is a straightforward image editing app, though a powerful and complex one that will require time spent in the online manual and tutorials to master. The Develop persona is for processing your raw files. Liquify is for heavy retouching that's more like sculpture in the way it moves pixels about, and Tone Mapping is for HDR. Then Export is for creating the perfect output file for your needs. Personas take over the interface, changing the

APP TIPS

Getting started with Affinity Photo 2: handy hints



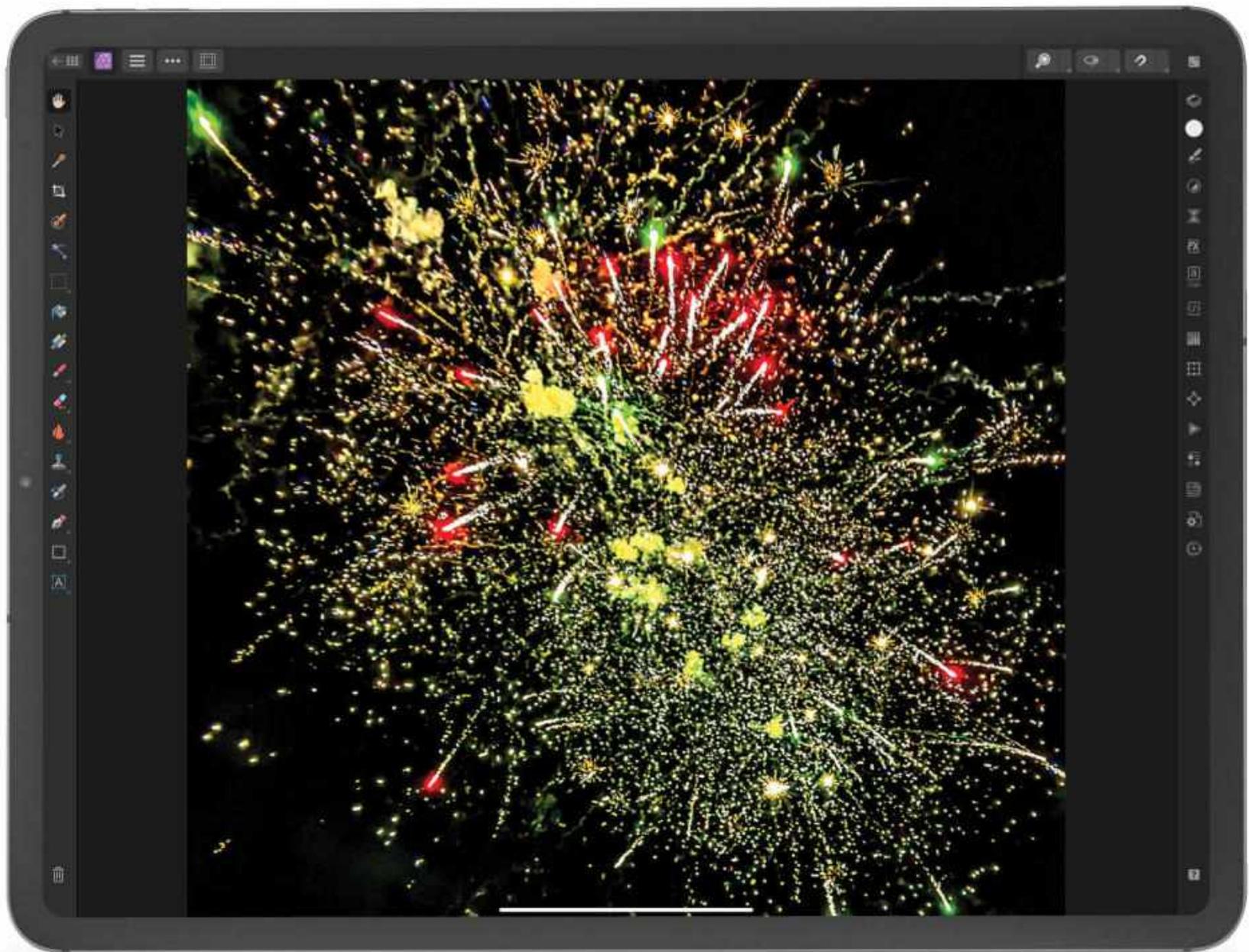
Hold the “?” button in the bottom right of the iPad interface, and you'll get a help overlay that makes up for the lack of tooltips.



Panels usually close automatically when you tap on your image, but you can keep one open with the pin icon at the top right.



Swipe down with three fingers on your document and a customizable quick menu will open, with shortcuts for common tasks.



available tools and options, rather than appearing in a floating window.

Users of the first version of Affinity Photo will find a great deal of refinement but little that's actually new, though the iPad version now features quick menus and a command controller to speed up workflows, a compact mode to make the best use of limited screen size, and a resource manager for linked content. The Layers palette has had an overhaul, making masking, clipping and reordering clearer; plus, there are a great many more non-destructive options when masking (the entire Develop persona is non-destructive too, appearing as a layer with adjustable

settings, and is GPU-accelerated). Additionally, you have the option to export straight to the WebP format or open the HIF files from recent Canon cameras.

While Adobe is pushing Photoshop in an interesting direction with its neural filters and Sensei-powered smarts, you won't find any of that in Affinity Photo. The most automatic thing is the selection of a correction profile for your raw files. Otherwise, you're doing everything by hand, with Apple Pencil, Force Touch and Touch Bar support to assist. It's not just an image editor though, as natural media brushes, vector illustration, and type handling all come under its purview.

As part of the Affinity suite that centers on Publisher — which is now available on iPad for the first time — Affinity Photo 2 fits in nicely, but works well as a standalone app too. While not an app for absolute beginners, the ability to dip in and learn without worrying about an ongoing subscription is hugely valuable.

IAN EVENDEN

THE BOTTOM LINE

Serif's pro-grade image editing app is now even more essential.

➤ A very capable app gets even better

➤ Pay once, no subscription

➤ Steep learning curve for newbies

➤ No asset management component

EXCELLENT ■■■■■

The revamped interface does a good job of getting out of the way, especially on iPad.



A 14-day trial allows you to test apps you want to run before committing to a purchase.

CrossOver 22

Run (some) PC apps on your Mac without Windows

\$74 (12 months support), \$494 (lifetime support) From www.codeweavers.com

Needs macOS 10.13/11.1 or later (Intel/Apple silicon), 1GB of free disk space plus more for installed Windows apps



THERE WILL ALWAYS be apps, mostly games, whose publishers won't port them to the Mac for financial or contractual reasons. CodeWeavers' CrossOver offers a simple, convenient way to run many of those apps. The result isn't as reliable or universal as other solutions, but it's a lot cheaper and easier, and with CrossOver's helpful database of app functionality and generous try-before-you-buy period, you can see whether it'll run the apps you want to use before you commit your hard-earned cash.

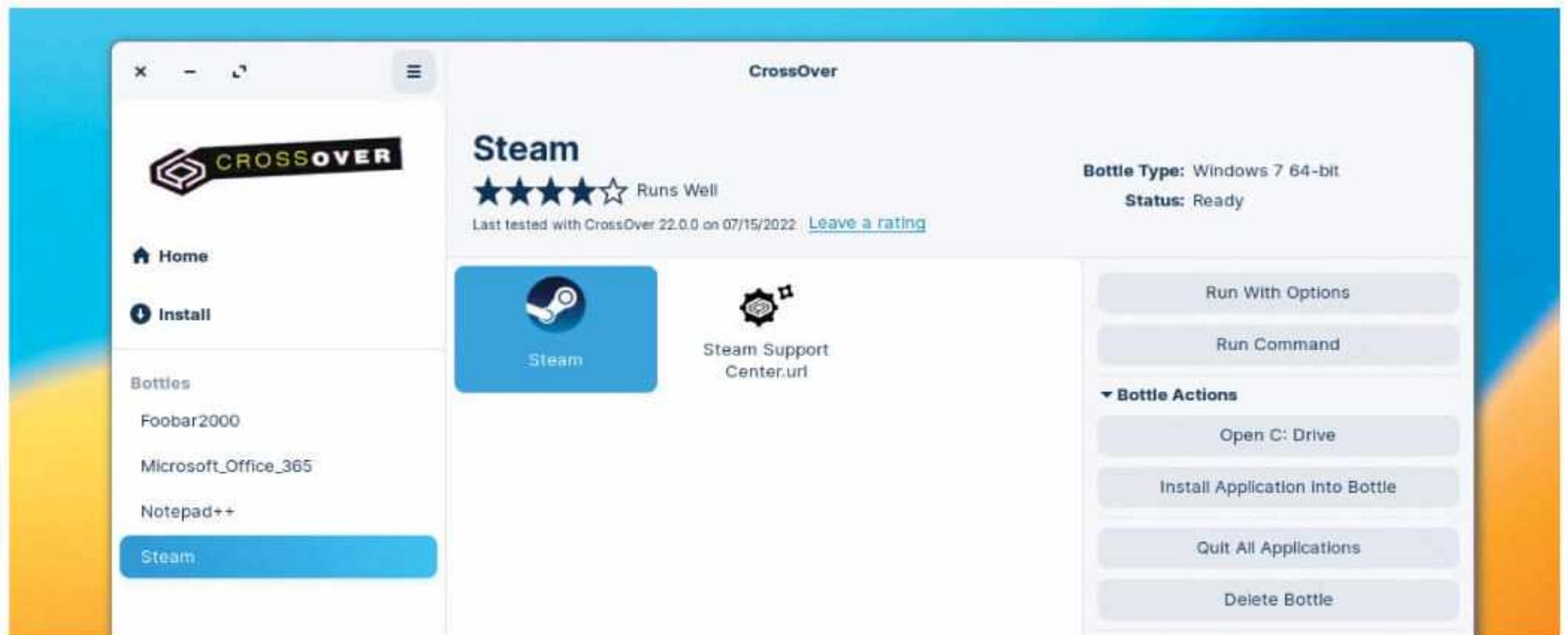
CrossOver translates Windows commands into Mac ones on the fly. It's based on the open-source WINE project, but its improvements to standard WINE make it a lot easier for everyday users to successfully run. CrossOver 22 is only available from CodeWeavers' website.

After installation, CrossOver does most of the hard work. It sets up a "bottle" — a contained virtual environment — in which you can install basic Windows or Linux underpinnings, plus any apps you'd care to run. CrossOver builds in shortcuts to install

popular apps like Steam, and it can seamlessly install apps from the internet, from downloaded ISO files, or from a physical disc, should you have an external drive.

You can have multiple separate bottles for different apps, or put all the apps you use in a single vessel. As with containerized software setups like Docker, this makes CrossOver easier and less stressful to use. In the event that something goes wrong inside a bottle, it won't affect your larger system. Just delete the bottle and start fresh.

Each new version of CrossOver offers performance improvements,



but CrossOver 22's biggest leap forward lies in its overhauled interface. Previous versions hid important toggles and features behind poorly designed contextual menus. CrossOver 22 takes design cues from the Mac App Store, with crucial options in full view. It's now easier than ever to run apps you've already installed, or add new ones.

CodeWeavers' database of popular apps and their compatibility, maintained by volunteer testers, is now more directly integrated into the app itself, rather than requiring a separate visit to CodeWeavers' website. That database isn't comprehensive but it's a good place to start when you're curious.

More processing power equals better performance. Even though it's an Intel native app, it runs best on Apple silicon under Rosetta 2 emulation, thanks to the sheer horsepower of the M1 and higher. (CrossOver plans to eventually support Apple silicon.) Popular launcher apps like Steam, and simple 2D games like *Guacamelee!* ran without a hitch in tests, but more sophisticated titles had various degrees of trade-offs. On a

If you need every Windows app you run to work well, if not perfectly, on a Mac, CrossOver isn't for you.

stock M1 Mac mini, 2017's *Star Wars: Battlefront II* looked great. But depending on the game mode and the size and type of the environments, performance ranged from fast and fluid to an unplayable crawl. If you want to game with CrossOver, more than 8GB RAM or a more powerful chip than a basic M1 will serve you well.

Furthermore, Metal has different aims and priorities than DirectX, trading some measure of tech sophistication for the ability to run across macOS, iOS, and tvOS. Even under Apple's new Metal 3, there are just some things DirectX does for which Metal lacks an easily translated equivalent. And even if everything else goes swimmingly, there are facets of Windows software that just won't work outside that platform.

CrossOver 22 is impressive in its simplicity, at least in terms of how easy it is to get select Windows applications up and running on macOS. It's by no means perfect, and your mileage will vary dramatically depending on the complexity of the apps you're looking to run, not to mention the power of your Mac computer itself.

NATHAN ALDERMAN

THE BOTTOM LINE

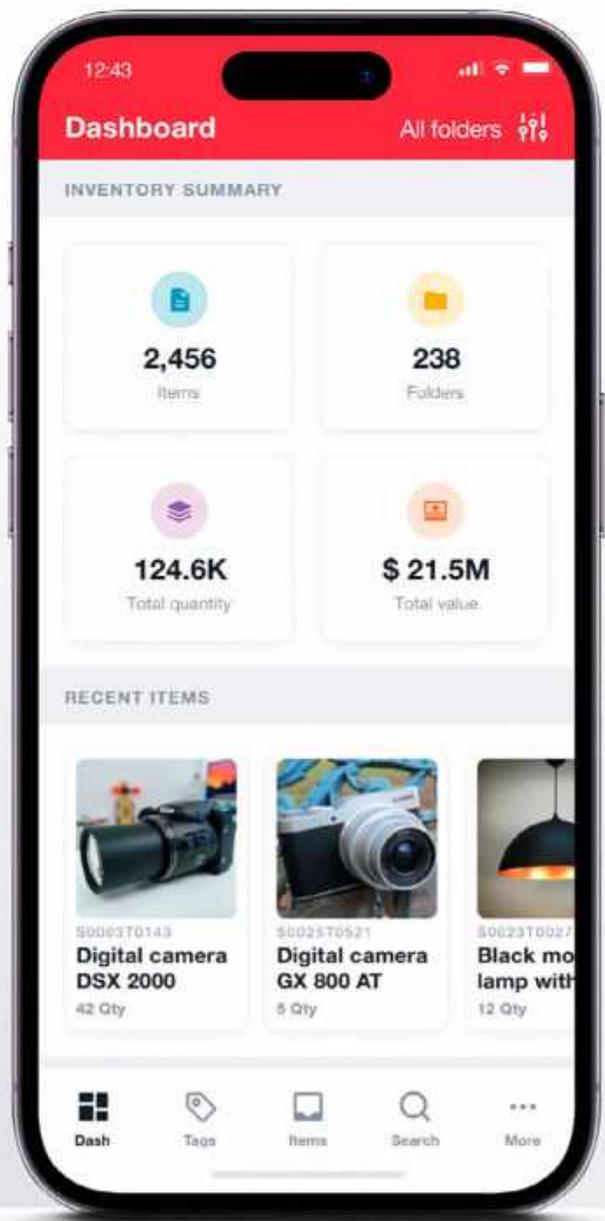
CrossOver is an easy way to experiment with Windows games and apps on your Mac.

- Lightweight solution to running PC apps on Mac
- Easy to install and use
- No need to buy Windows
- Requires a fast processor and lots of memory

GOOD ■ ■ ■ ■ ■

6 APPS To help with your spring cleaning

Clear out the clutter and keep your home organized **BY ALEX BLAKE**



Spotless

Free (IAPs) From Reach HPI

Needs iOS 13.0 or later

 The first step towards a cleaner home is making a plan of action. Once you've worked out what needs to be done and when, you will be much more equipped to tackle your tasks head-on. Spotless is the perfect way to do that, as it lets you divide up your home into rooms, set jobs for each area, then track your progress and get reminders when it's time for a little elbow grease. With it by your side, you'll never forget a cleaning chore again, helping your home stay spotless for longer.

Tody

\$6.99 From LoopLoop

Needs iOS 15.0 or later

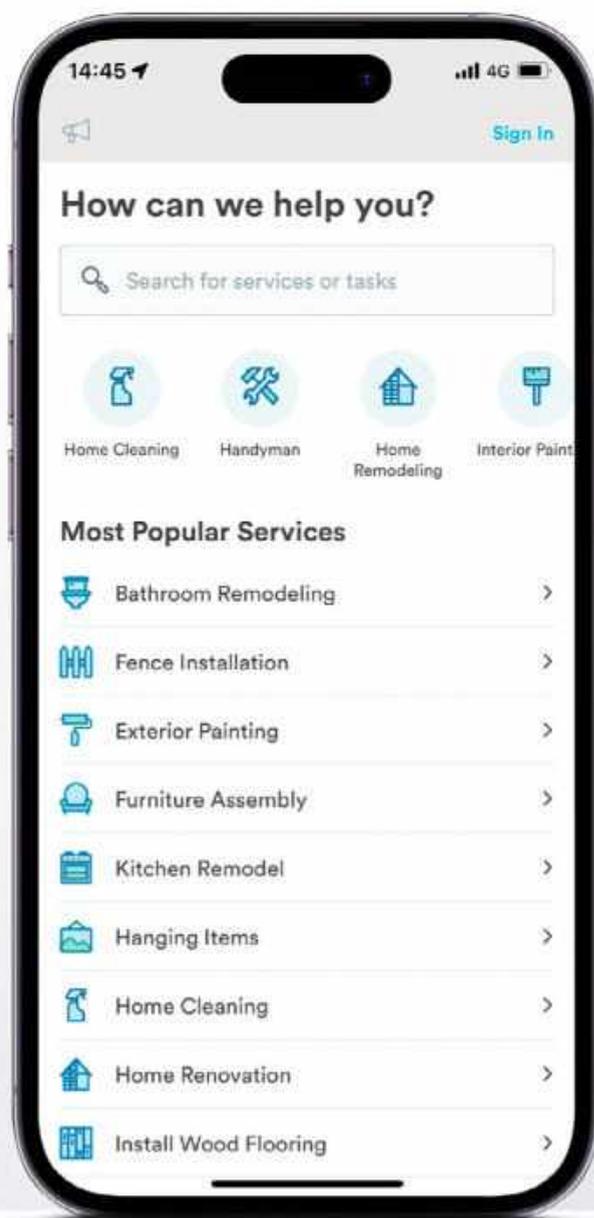
 Sometimes, it can feel as though your cleaning routine is in control of you, rather than the other way around. Fortunately, you can take back control with Tody. This handy little app helps you keep on top of every room in the house, but instead of nagging you to clean up, it lets you decide when to get started. Each task has a dirt meter to help motivate you without flooding your device with reminders and notifications. And you can assign tasks to other family members to help share the load.

Sortly

Free (IAPs) From Sortly

Needs iOS 14.0 or later

 You can't clean out your house if you don't know what you've got in the first place – and that's where Sortly comes in. With this app in your arsenal, you can catalog your items and quickly create an inventory of your home. Just snap a photo or scan the barcode and add it to the app to get started. You can then add tags, notes, prices and more, giving you a complete picture of your contents. And once you know that, you can easily see what you should keep and what you can get rid of.



Handy

Free From Handybook

Needs iOS 11.0 or later

 Feel like there's more on your plate than you can handle? Sometimes it's best to get the professionals in. Whether you need some help with cleaning or want a plumber to fix up your pipes, Handy can put you in touch with the best person for the job. Just tell the app what you need and when you need it and you'll be connected with a host of excellent options. When you're ready, just pay in the app and you'll be on your way. That's great for when you need an extra helping hand around the house.

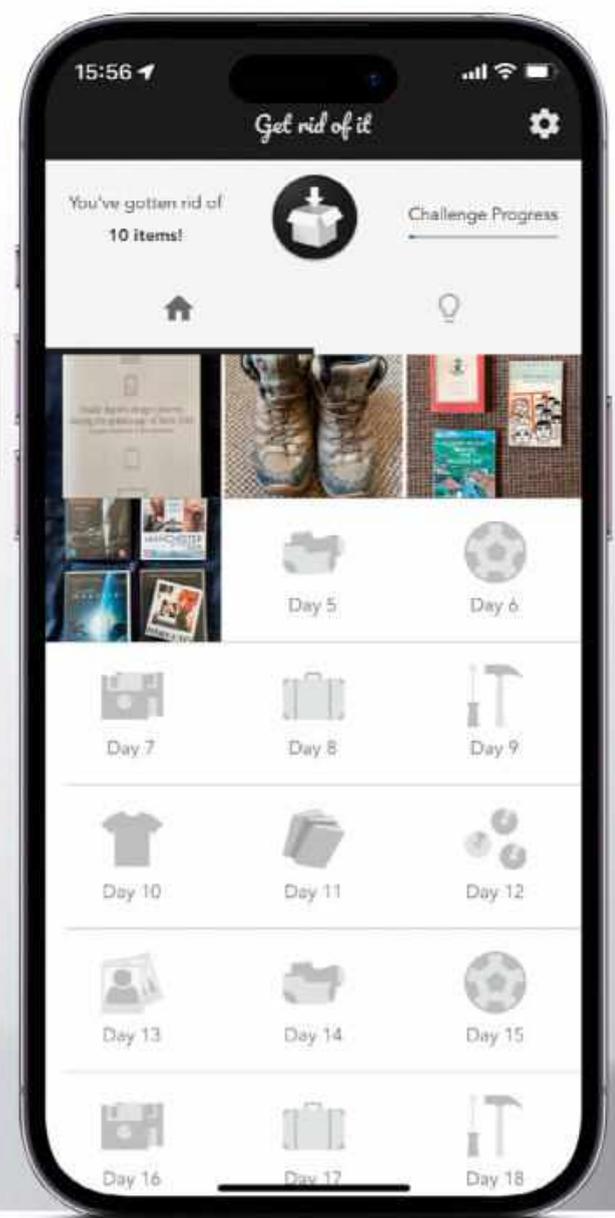


Centriq

Free From Centriq Technology

Needs iOS 12.0 or later

 As you accumulate devices in your home over time, you might find yourself throwing out the manuals to save space. But what if one day you need them? No need to worry, as Centriq is a clever solution to this problem. Simply scan your device's product label and the app will chase down its manuals, guides, parts information, helpful videos, and more. If you've ever found yourself at a loss for how to fix a product, Centriq can find the answers for you — no online searching necessary.



Get rid of it

Free From Mauro Garcia

Needs iOS 9.0 or later

 Inspired by influential podcasters The Minimalists and their 30-Day Minimalism Game, the idea behind this app is very simple. On day one, you find one thing to get rid of. On day two, you increase it to two things. And so on, until the end of the month. You can sell, trash, or give away your excess, and when you're done, you'll be amazed at how much stuff you didn't need — and how much better you feel without it. Instead of being overrun with needless possessions, your home feels lighter.



Best of the best

Can't find the hardware or app you're looking for in our reviews section? Then check in here – we've highlighted the best in every major category, as voted for by us

> HARDWARE				
CATEGORY	PRODUCT	WEB	PRICE	ISSUE
MESH ROUTER	ASUS ZenWiFi XT9	asus.com	\$449.99	#201
4K USB-C MONITOR	BenQ EW3280U	benq.com	\$799.99	#169
THUNDERBOLT DOCK	CalDigit Thunderbolt Station 4	caldigit.com	\$379.99	#199
KEYBOARD	NuPhy Air75 Wireless Mechanical	nuphy.com	\$109.95	#189
PORTABLE PRINTER	Epson WorkForce WF-110W	epson.com	\$299.99	#185
PORTABLE HDD	Toshiba Canvio Flex 2TB	storage.toshiba.com	\$79.99	#197
NAS DEVICE	Asustor Drivestor 2 Pro AS3302T	asustor.com	\$249	#190
WIRELESS CHARGER	Belkin BoostCharge Pro Portable	belkin.com	\$59.99	#197
DESKTOP SPEAKERS	Klipsch ProMedia Heritage 2.1	klipsch.com	\$349	#196
IN-EAR HEADPHONES	Beats Fit Pro	beatsbydre.com	\$199.99	#190
SECURITY CAMERA	EufyCam 2C (two-pack kit)	eufylife.com	\$239.99	#171
SMART SPEAKER	HomePod mini	apple.com	\$99	#176
OVER-EAR HEADPHONES	Sony WH-1000XM5	sony.com	\$399.99	#197
AIRPLAY SOUNDBAR	Sonos Beam	sonos.com	\$449	#187
WEBCAM	AnkerWork B600 Video Bar	ankerwork.com	\$219.99	#191
PHOTO PRINTER	Liene 4x6 photo printer	amazon.com	\$136.99	#190
PORTABLE BATTERY PACK	Anker 533	us.anker.com	\$49.99	#198
MOBILE DOCK	Kensington 8-in-1 USB-C Mobile Hub	kensington.com	\$77.55	#190
OFFICE CHAIR	Branch Verve	branchfurniture.com	\$549	#201
MOUSE	Logitech MX Master 3S	logitech.com	\$99.99	#198
ACTION CAMERA	GoPro Hero 11 Black	gopro.com	\$500	#202
SMART TV PLAYER	Roku Streaming Stick 4K	roku.com	\$49.99	#190
PORTABLE DAC	iFi Go Blu	ifi-audio.com	\$199	#189
PORTABLE SSD	Crucial X8	crucial.com	\$219.99	#203

> iOS/iPadOS APPS				
CATEGORY	PRODUCT	WEB	PRICE	ISSUE
TO DO (PRODUCTIVITY)	 Things 3	culturedcode.com	\$9.99	#194
WRITING	 Scrivener	literatureandlatte.com	\$19.99	#138
EMAIL	 Spark	sparkmailapp.com	Free	#190
PHOTO EDITOR	 Pixelmator Photo 2	pixelmator.com	\$4.99	#193
VIDEO EDITOR	 LumaFusion 3.0	luma-touch.com	\$29.99 (IAPs)	#186
CAMERA	 Obscura 3	obscura.camera	\$9.99	#196
RSS READER	 Reeder 5	reeder.app	\$4.99	#176
IDEAS ORGANIZER	 OmniOutliner3	omnigroup.com	Free (IAPs)	#141
NOTE-TAKING	 Notability 10	gingerlabs.com	\$8.99	#174
MIND-MAPPING	 MindNode 7	mindnode.com	\$14.99	#184
DOCUMENT SCANNER	 Genius Scan 6.0	thegrizzlylabs.com	Free (IAPs)	#182
CALENDAR	 Fantastical 3	flexibits.com	\$4.99/month	#198
WEATHER	 Carrot Weather 5	meetcarrot.com	\$0.99/month	#180

> macOS APPS				
CATEGORY	PRODUCT	WEB	PRICE	ISSUE
TO DO (PRODUCTIVITY)	 Things 3	culturedcode.com	\$49.99	#194
WRITING	 Scrivener	literatureandlatte.app	\$49	#200
EMAIL	 Spark	sparkmailapp.com	Free	#190
PHOTO EDITOR	 Luminar Neo	skylum.com	\$79	#194
VIDEO EDITOR	 Wondershare Filmora	wondershare.com	\$109.99	#202
SCREEN CAPTURE	 ScreenFlow 9	telestream.net	\$129.00	#164
MUSIC CREATION	 Logic Pro	apple.com	\$199.99	#141
PASSWORD MANAGER	 Secrets	outercorner.com	\$19.99	#188
DESKTOP PUBLISHING	 Adobe InDesign	adobe.com	\$20.99/month	#162
BACKUP	 Carbon Copy Cloner	bombich.com	\$39.99	#136
VIRTUALIZATION	 Parallels Desktop 18	parallels.com	From \$99.99	#201
TIME-TRACKING	 Tyme 3	tyme-app.com	\$3.99/month	#169
VIRTUAL PRIVATE NETWORK	 NordVPN	nordvpn.com	\$11.95/month	#186



Adventures with
Apple **WATCH**
ULTRA

How to get the most out of Apple's smartest,
most durable Watch ever

WRITTEN BY SHAUN MCGILL



The Apple Watch Ultra represents the first redesign of the most popular timepiece in the world since its launch back in 2015. It has slightly changed in size in recent times, but the Ultra is a completely different Watch and one which has intentions above and beyond what has come before. For some it fixes areas that had previously held back their Apple Watch experience, and for others it simply adds a new look to a software experience that is very familiar, but Apple is aiming the Ultra at those who want to be a little

more adventurous. With this comes a raft of new software features and sensors that can be used every day or only when they are needed, and in the right circumstance they could save your life. The added functionality for diving is highly impressive as is the ability to alert others when you are in trouble, but there is much more to understand and take advantage of.

We will show you every major feature and explain how to make the most of them, all with the intention being to ensure that you take full advantage of what is arguably the best modern sports watch of all.

FIND YOUR WAY

The Wayfinder watch face is only available on the Ultra and is designed to aid you when undertaking more extreme adventures, and especially in adverse conditions. The face is laden with data, but still easy to read no matter the conditions.

A

WHERE ARE YOU?

Tap the bezel and you will be presented with a live compass that moves around as the Watch changes location. The exact direction is displayed in the top sub-dial so you can be certain of the way forward.

B

MULTIPLE PURPOSES

The bezel can be set by default to display the latitude/longitude, elevation/incline or nothing but the time markers. The compass directions will appear when it is tapped to create an exceptionally practical multi-purpose design.

C

TIME MATTERS

Despite the busyness of the Wayfinder face you can still tell the time with ease. The ability to choose from a variety of color themes is included for you to adjust it according to your specific needs and activities.

D

COMPLICATIONS REMAIN

Up to eight complications can be included in the Wayfinder face, which should be enough to cater for every essential data point that you require for your outings. It makes for the perfect adventure setup on your wrist when you need it.



CUSTOMIZE WAYFINDER

Almost all Apple Watch faces can be tweaked to your preferences, but for the Wayfinder it is especially important. The layout can become very crowded, and because it is a face you'll need during harsh activities, you should spend time making it work for you.



1 Boss the bezel

If you do not need to have real-time access to latitude/longitude or elevation/incline, you can choose "none" for a cleaner-looking bezel.



2 Colors matter

Changing the color scheme to a more consistent and lighter option will enable the important data to stand out more, lessening the visual density.



3 A unique Night Mode

The Night Mode feature, which is only available in the Wayfinder face, will save eye strain in low-light conditions. It also works very effectively in the day.

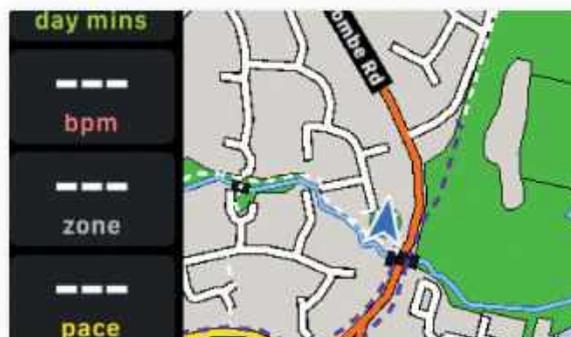
TAKE FULL ADVANTAGE OF PRECISION DUAL-FREQUENCY GPS

The L1 standard is the oldest GPS and contains two codes, and the L5 standard is designed for high-performance needs – together they make a formidable team to help the Ultra provide the best possible location data at all times.



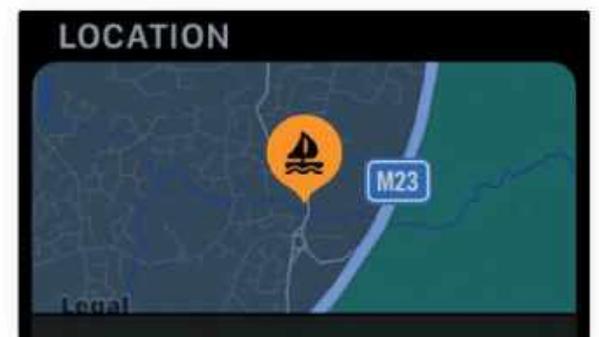
1 No phone needed

If you are navigating without your phone, the use of precision dual-frequency GPS means that you are much more likely to get guidance instructions in a timely fashion.



2 Track your activity in real time

Third-party activity apps can show your place in the world in real time. This is another area where new GPS technology helps improve the experience.



3 Your exact position

If you are in trouble and need to mark your current location to share with others, your position will be detailed even more accurately than before. A potential life saver.



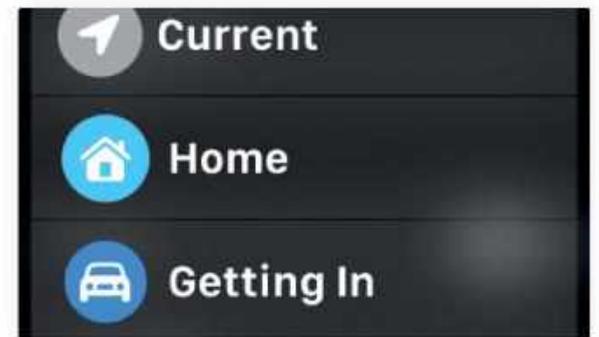
4 More accurate activity

When you are undertaking longer walks and runs it is important to have very accurate GPS tracking. Any inaccuracy can quickly add up to skew the amount of exercise you have done.



5 Get around buildings

Buildings are especially problematic for navigating when walking, but precision dual-frequency GPS will help. It's particularly good at picking up your start position.



6 Task management

When creating location-based tasks or other alerts that will activate when you arrive somewhere, the need for accurate GPS is even more apparent. It helps in almost every area.

TAKE THE BATTERY EVEN FURTHER

The Ultra offers twice as much battery performance as all other Apple Watches and this goes a long way to justifying the extra size of the device. Plus with Low Power Mode activated, you can almost double the battery life again.



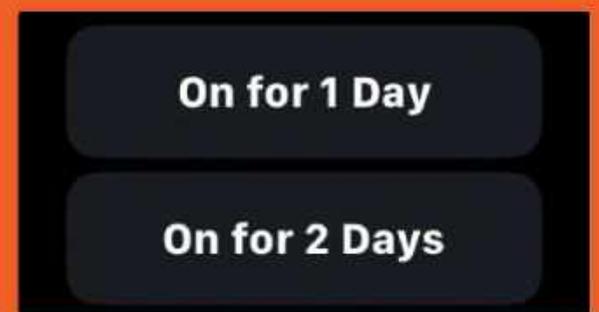
1 A quick change

Swipe up from the bottom of the screen and tap the battery icon to see the remaining percentage and a Low Power Mode option.



2 Make it last

Low Power Mode will turn off the always-on display, limit sensor usage and tweak other features to improve your daily battery performance.



3 Fit your schedule

You can turn on Low Power Mode for a set number of days to suit when you are working and when you are exercising hard.

TRACKING BACK TO YOUR SAFE POSITION

The Ultra is marketed as an adventure watch, and when you are exploring a location with very few people around it helps a great deal to know where safety is – this is where the clever Backtrack function will come in extremely handy.



1 Hit the footprints

Open the Compass app and you will see a simple interface displaying your current position. Tap the footprints icon bottom-right to start recording your steps.



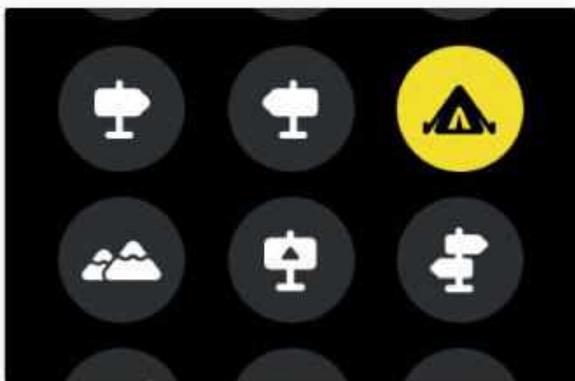
2 See the trail

The route you are taking will be displayed in the main circle. You can use the crown to zoom in and out if you need to check a specific location.



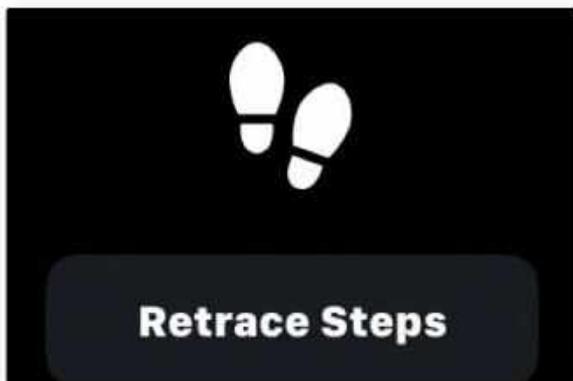
3 It follows you

You will see the route move in real time to show how it relates to your current position and the direction you are traveling. It's a highly reassuring experience.



4 Mark a point

Tap the bottom-left icon to mark a place in your current location. The ability to choose an icon and color is included to ensure it always stands out.



5 Time to return

Tap the pause icon bottom-right to reveal an option called Retrace Steps. Tap it and you will be directed to the position you were at when you initiated recording.



6 Find the flag

The destination will always be displayed on-screen and when you are on the right path it will change to a flag. It's surprisingly intuitive in use.

TRACK YOUR CYCLE WITH THE TEMPERATURE SENSORS

The Apple Watch Ultra includes two temperature sensors that can be used to measure skin temperature. This can in turn be utilized to help keep track of your ovulation cycle, so it could be crucial in the right circumstances.



1 Greater accuracy

Set up Cycle Tracking and enable Track Sleep with Apple Watch and Sleep Focus. Run them for five nights for more accurate data.



2 On the phone

In Apple Health on your iPhone you can enable period predictions and the detecting of cycle deviations. This can alert you to potential health issues.



3 Know your state

Understanding your cycle and your estimated fertile window are crucial if you are planning to get pregnant, so it's certainly a useful tool.

MORE WORKOUT DATA WHILE YOU EXERCISE

The larger Ultra display enables you to view more metrics at the same time, and in a way that still makes each one instantly understandable. With the Ultra, the information flow and display of real-time data is even smoother.

A

TEXT AND IMAGES

The activity interface is dominated by numbers and small text, which makes perfect sense if you are taking your exercise seriously. The only image is the icon displaying the activity you are undertaking.

B

MULTI-TASKING EXERCISE

You can still swipe left to manage music or podcasts that are playing while you exercise, and you can still swipe right to pause or end the activity instantly. It is bigger than before, but still familiar.

C

IN THE ZONE

The heart rate zones are presented in a colorful bar that you will get used to as you undertake repeat exercises. It is a subtle and logical way of gaining inspiration to try just a little harder, and it works well.

D

TIMING THE ZONES

You can see how long you have been in the current zone, which specifies further how much effort you are making. The effort you need to put into the activity will naturally vary each day, so this will be very useful information.



STAY ULTRA SAFE

The Ultra takes your safety many steps further with a selection of easy-to-use features that could actually save your life one day. Through hardware innovation and software that fits your needs, Apple has added some big functionality in a small space.



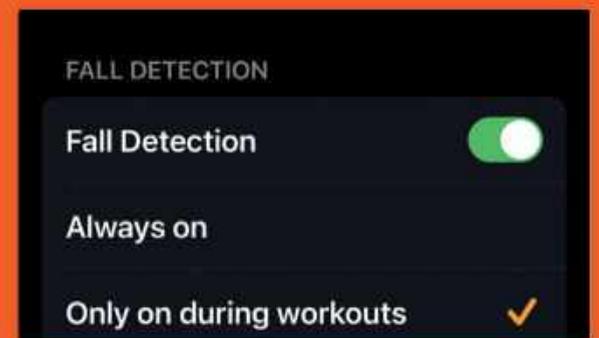
1 I am here!

The siren can be heard up to 600 feet away thanks to the specific sound pattern it uses. Astonishingly, the Watch can emit an 86-decibel siren.



2 Crash and dial

Crash detection is included by default and a countdown will start automatically, ready to call emergency services to get you help if unconscious.



3 Fall detection

If you fall and are unable to get to your phone, the Ultra will make an emergency call for you. You can set it to activate only during workouts.

HOW DEEP IS YOUR DIVE?

The Depth app is designed to start working from the moment the Ultra is submerged. You need to enable “Auto-Launch App” in Settings > General where the Depth app will be listed, and from this point on it will kick in the moment the Watch is under water.

A

THE BIG NUMBER

Dominating the interface is the main number you need, which is the depth in feet or meters. You choose which you prefer and the number will guide you as you dive deeper. Crucially, it is also very accurate.

C

CLARITY IS KING

The clarity of design, colors and digits in the Depth app interface is obvious to see. It gets even better under the water because it should be clearly visible in all but the most dense of conditions.

B

FAMILIARITY

The way the display is split in two is not only visually appealing, but it will soon become second nature to anyone under the water. A quick glance should be enough to understand exactly where you are.

D

KNOW YOUR LIMITS

You will always be aware of the limits you can dive to, how far you have left, and the display will change as you go deeper under the surface. The alerts are timely and obvious enough to notice.



IMPROVED HEALTH TRACKING

It is undeniable how focused Apple has been in protecting the health of its users. As the health-tracking features become more honed you can start to have more trust in the results, to the point that serious illnesses may even be spotted much earlier.



1 Check your heart

The ECG app can detect potential problems with heart rhythm. It does not have accreditation everywhere, but it could prove vital to you.



2 A deep breath

Understanding your blood oxygen is important, especially in a time of COVID, and a quick look on the Ultra could bring reassurance or alert you to get checked.

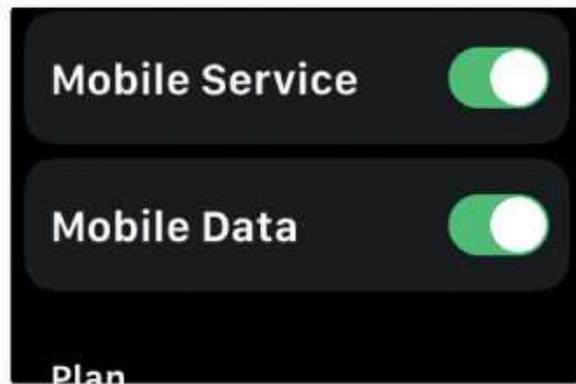


3 Going deeper

The Ultra can track a huge number of important metrics; data such as walking steadiness can indicate potential serious health issues.

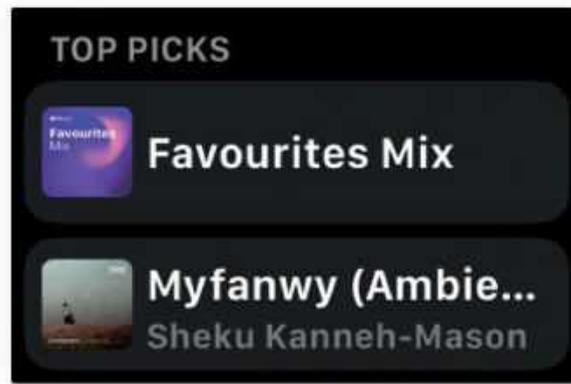
CELLULAR CHANGES EVERYTHING

All Ultra Watches have cellular functionality built in, and there's so much you can do without ever taking your iPhone out of your pocket. With low monthly prices, a longer battery and a bigger screen, it could be time to leave your phone at home more often.



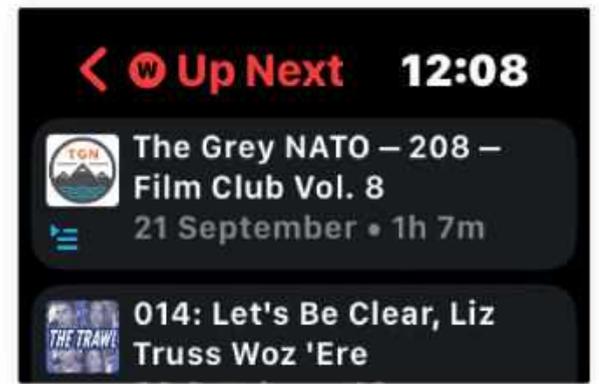
1 Check the charges

The cost of using cellular on the Apple Watch Ultra should be much lower than on your iPhone. It is worth checking the charges from your provider.



2 Music everywhere

Streaming music is a big boon on the Ultra and the entire Apple Music library will be available to you anywhere. You can also download tracks and playlists to the Watch.



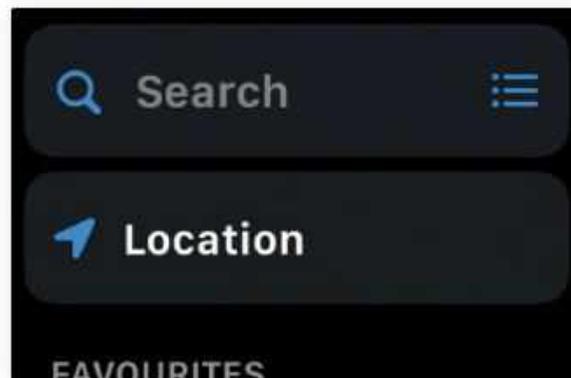
3 Listen while you walk

A long walk accompanied by an interesting podcast will make the cellular cost worth it on its own. It is a feature that will make you walk even further.



4 Stay in touch

You can take phone calls and manage messages wherever you are. It also adds an element of safety when you are exercising and exploring in more rural locations.



5 Find your way

The Ultra is surprisingly adept at letting you navigate on foot on complex routes. The connectivity will ensure that you never lose your way with Apple or Google Maps.

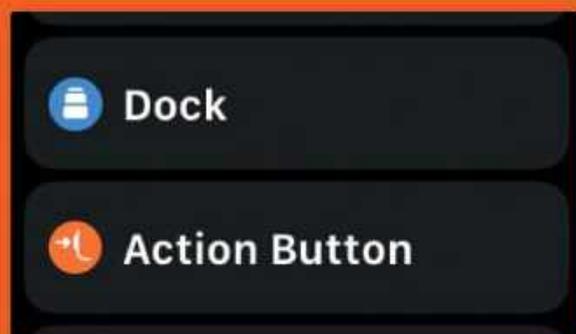


6 Greater functionality

You can also check the weather and do so much more by connecting handy third-party apps on the Ultra. It's like wearing a mini iPhone all of the time.

THE ACTION BUTTON

The new Action button on the Ultra is the first new input mechanism on an Apple Watch since it was originally launched. It can be used in emergency situations or for extremely quick access to a task you need very often.



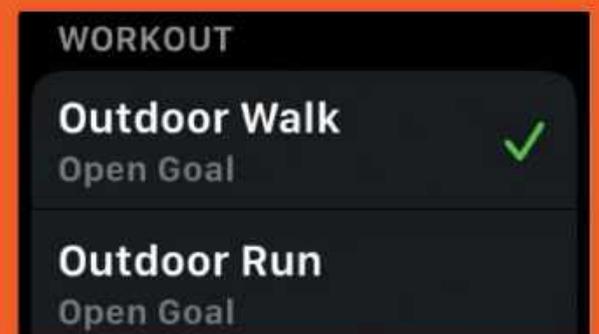
1 Simple settings

Go to Settings > Action Button to access the options. You should only need to do this once, but you can amend the shortcut later as needed.



2 A limited list

Currently the list for the Action button is limited, but you should be able to find the option you need. It is particularly useful for regular activities.

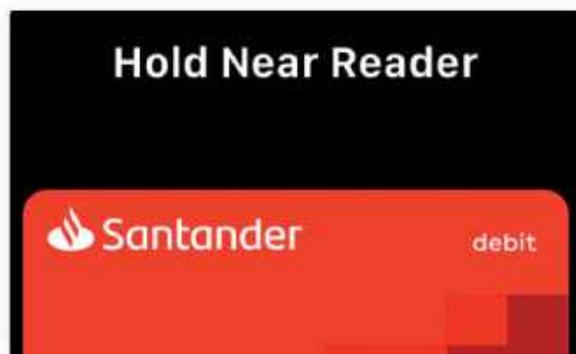


3 Define an activity

A specific activity can be selected and will instantly start when you press the button. Holding the button will cause the siren to sound.

THE BEST FEATURES REMAIN, AND SOME ARE EVEN BETTER

The more powerful battery and improved GPS mean that you can enjoy the classic Apple Watch features even more on the Ultra. The device is fast becoming a tool that can handle the majority of your digital needs no matter how busy your days are.



1 Lose your wallet

Apple Pay has become the default tool for purchases for millions of users, and it works just as well on the Ultra as it always has. The bigger screen also helps.



2 Capture some thoughts

Record your voice and have the recording saved in iCloud so it's available everywhere. The new microphones improve the audio quality substantially.



3 Control your home

If you have compatible smart devices in your home the Ultra will be the most practical tool to manage each of them. The controller will always be with you.



4 Win or lose?

Understanding stock prices is all about timing and with the Ultra, the Stocks app can show even more detail than before. Lift your wrist and trade.



5 Greater functionality

The Ultra is completely flexible and the uses for it can be expanded exponentially thanks to the large selection of quality third-party apps available.



6 Find your family

If you need to find a loved one or friend quickly you can do so with the Find My solution. The relatively complex interface is cleaner on the larger Ultra screen.

TOUGHER THAN EVER

A watch by its nature will be prone to knocks and scrapes, and this is magnified when it is used in harsh environments. The Ultra Watch is designed for outdoor adventures and the build quality is obvious from the moment you unbox it.



1 Titanium is the solution

The titanium case not only looks good, but it is built from a highly durable material that should be able to withstand almost any knocks it takes.



2 Stay strapped in

Apple offers a selection of straps designed for many strenuous activities. The clever designs and materials should withstand the test of time.



3 Protecting the crown

A smart-looking crown guard has been added to ensure the digital crown is protected, and yet it is still perfectly usable thanks to its larger diameter.

A GENUINE DIVE COMPUTER

The Oceanic+ app will effectively turn the Ultra into a fully fledged dive computer and bring with it a host of features to keep you safe. It has the potential to replace expensive standalone equipment and to completely change the way you dive.

A

WHEN TO RISE

The app tells you when you need to surface so that you can avoid any unwanted side effects. If you dive and want to remain safe, the Ultra is certainly a handy tool to have on your wrist.

B

THE WORLD AROUND YOU

The current temperature will be displayed and many other metrics will adjust in real time as you start to descend. The bright screen will help to ensure that you are fully aware of your surroundings.

C

ACCURACY BUILT IN

When diving you will have perfect accuracy and understand exactly how deep you are. This is the most important metric of all and the Ultra has the sensors to enable true accuracy for extra reassurance.

D

DON'T OVERDO IT

Understanding the time you have been diving for is crucial and the interface of the Oceanic+ app ensures that all metrics are displayed clearly. They can be viewed in all but the most dense of conditions.



SUPERIOR SPECIFICATIONS

The main reason to purchase an Apple Watch Ultra over the previous offerings, or even the Series 8, is because of the improved specs. These work together to make the Ultra more usable in a variety of conditions, and they add a great deal to the value.



1 A brighter screen

The Ultra is able to display up to 2,000 nits of brightness, perfect for low-light conditions. To save battery, it only reaches the top level when needed.



2 IP6X certified

The IP6X rating of the Ultra means it is dust tight, allowing you to travel to locations where you might encounter heavy dirt or dust particles.



3 Improved audio

The three microphones help capture speech in high winds and a much-improved speaker setup enables the siren to sound over great distances.

ASK

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macOS patches

EVER SINCE BIG Sur, system software on our Macs has been almost impregnable from attack by malware. Its protection is so good that macOS updates, even small security patches, have been onerous. Although these have improved, as shown by Ventura 13.0.1, they're still hefty downloads, requiring at least ten minutes of preparation, followed by black screens and a restart.

There's now a better alternative, in Rapid Security Responses (RSR) — tiny by comparison and applied without restarting macOS. They're simpler for Apple engineers to assemble and release, cutting the time between discovery of a vulnerability and patching it. They can also be removed, should they break something else.

From Ventura 13.1, RSRs should help to defend our Macs until bug fixes are built into the next update.

> First Aid from the top or bottom?

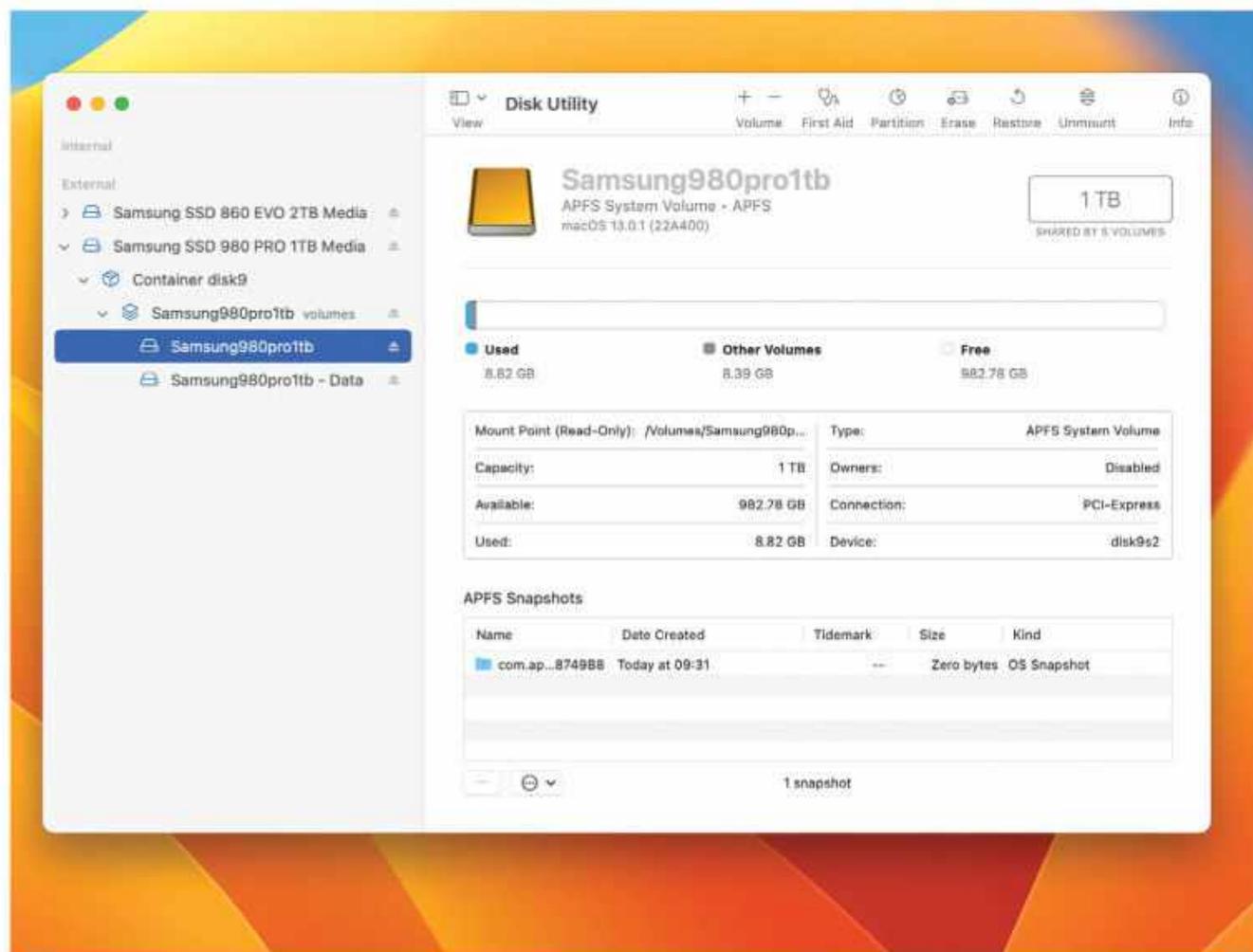
When running Disk Utility's First Aid, which should I check first: the disk, or its volumes?

Conventional best practice argues that, before you verify or repair volumes, you need to know there's nothing wrong with the disk's partition table. Following that, you should run First Aid on the disk first, then on each container, and finally on each volume within the containers.

Maybe Apple File System (APFS) is different though: Apple has consistently recommended applying Disk Utility's First Aid on volumes to start with, and once they're repaired, checking containers, leaving the disk's partitioning until last. For more info, this is described explicitly at www.apple.co/3kqloRT.

One important feature that Apple doesn't mention, which may influence its recommendation, is that running First Aid on a volume also checks all of its snapshots. For volumes storing Time Machine backups, that's time-consuming, and better done before checking that container. Problems are also most likely to occur in volumes, and less so in the disk's top-level partitioning, so working from the bottom up does indeed make sense.

Disks still using the older HFS+ format can be checked and repaired either way, and don't have containers in any case, as HFS+ volumes are partitions in their own right.



Apple recommends you run Disk Utility's First Aid on volumes before containers, and disks last of all.

Get official documentation at support.apple.com | Get help with hardware at support.apple.com/repair

> Reconnect to your mobile network

After I updated my iPhone XR to iOS 16.1.1, it shows No Service as its status. How can I reconnect it to its network?

If you're out of the country and relying on roaming, ensure Data Roaming is enabled in Settings > Mobile Data. Then, wherever you are, check that others nearby connected to the same network have a strong signal. If your phone still has no service, turn it off, wait ten seconds or so, and turn it back on.

It's possible that you didn't get notified of, or apply, a network provider update. Before you can receive that, you'll need to connect your iPhone to a Wi-Fi network. Then tap Settings > General > About. If there's an update available, it should be offered there. That's also a good opportunity to check the SIM information at the foot of that section, which should include your network and its service provider.

Further network settings are given in Settings > Mobile Data, which should be turned on at the top. If it's not, turn it back on to restore service. The last step to consider is resetting your network settings, which will also reset all Wi-Fi networks and passwords, and any VPN, so it isn't something to try casually. To do that, go to Settings > General > Transfer or Reset iPhone > Reset > Reset Network Settings. Be particularly careful there to avoid resetting your entire iPhone. After those steps, you're best arranging for help from your provider. They should be able to confirm account status and run further checks.



Provided your iPhone has a Wi-Fi connection, it should still offer network updates in Settings > General > About.

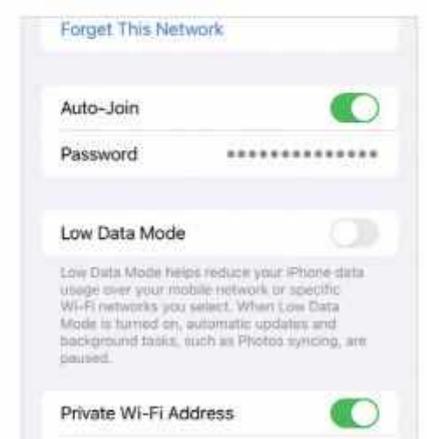
Quick-fire questions & answers

WHY DOES CONTINUITY CAMERA SOMETIMES LOSE WI-FI CONNECTION?

Sometimes when an iPhone uses its mobile data connection to fetch email or messages, it can drop its Wi-Fi connection. Prevent that either by connecting the phone to your Mac using a USB cable and setting your phone to trust your Mac, or by turning off mobile data in Settings > Mobile Data.

WHY AM I ASKED EVERY TIME TO JOIN MY HOME WI-FI?

Wi-Fi networks you want to connect to automatically should have Auto-Join enabled. Tap Settings > Wi-Fi, then the Info icon for your home network. At the top, the Auto-Join option should be enabled. If it is but doesn't stick, check your Wi-Fi router's settings.



> Connect a video projector

I'm due to give a talk in Keynote using my M1 MacBook Pro with a video projector. How can my Mac connect to that projector?

To a Mac, a video projector is just another display. When it has been connected and the Mac has synced with it to deliver the correct format of video data, it will appear as a second display in System Settings (or System Preferences) > Displays.

There you can select whether to mirror your Mac's internal display to the projection screen, or to operate it as a separate display altogether. When giving Keynote presentations, most speakers will find it easiest to mirror the internal display. When you then click the Play tool in Keynote, it should helpfully switch to full-screen mode ready for you to give your presentation.

The biggest problem is usually working out how to connect your Mac to one of the video projector's input ports, which will at least require an adaptor cable. Modern projectors almost invariably support HDMI connections, for which your Mac may need a specific USB-C or Thunderbolt to HDMI adaptor. Similar cable adapters are also



Most modern video projectors support HDMI input, requiring an adaptor cable for many models of Mac.

available to connect to older DVI and even VGA input ports.

Whatever you need, make time to check it all works well before you're due to give your talk. Sometimes getting a Mac notebook to sync with a video projector can be tricky. If it just won't work reliably, and there's no better option, you can always export your presentation from Keynote to PowerPoint, and show that on an inferior laptop PC as a fallback option.

Syncing a Mac notebook with a video projector can be tricky.



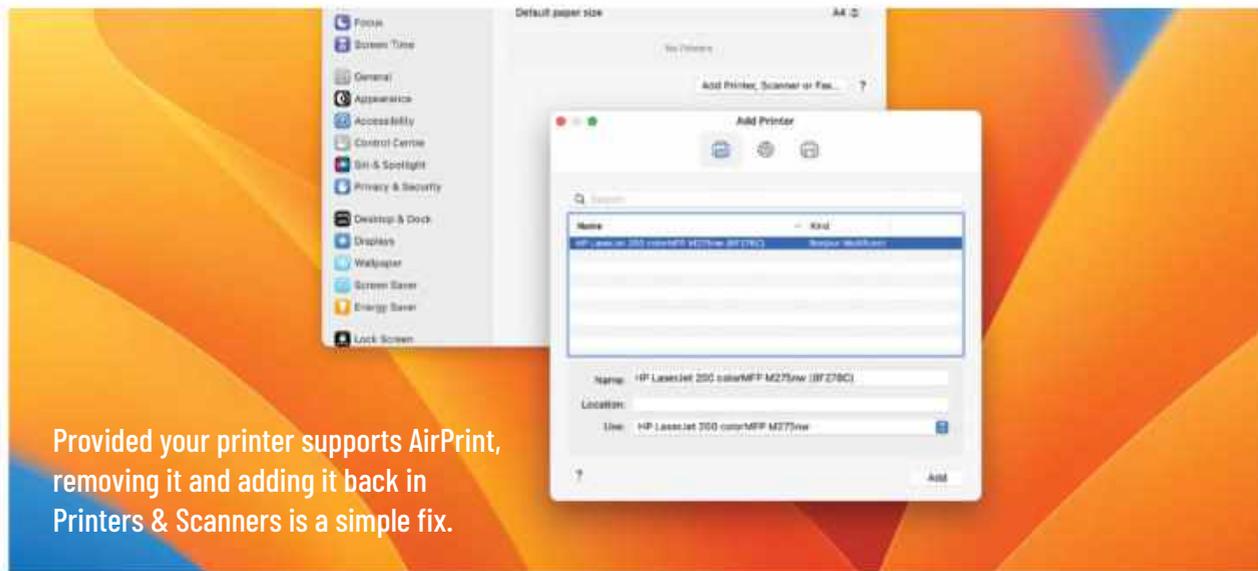
HOW TO PRINT FROM A MACOS VM ON MY M2 MAC?

Peripheral devices like printers aren't supported by the lightweight virtualization provided by macOS on Apple silicon Macs running Monterey or Ventura. If you want to print a document in a virtual machine, print it to PDF and transfer it back to the host Mac for printing from there.

WHICH CABLE TYPE IS BEST TO CONNECT A USB-C DISK?

While most branded USB-C external drives come with their own cables, which should work perfectly well, those are usually extremely short and limited in use. More reliable, versatile and longer are branded and certified Thunderbolt 4 cables, which you can use to connect all devices to USB-C ports.





Provided your printer supports AirPrint, removing it and adding it back in Printers & Scanners is a simple fix.

> macOS Ventura printer error

After upgrading my Mac to Ventura, trying to connect it to my Epson XP-750 printer fails with an odd error. Is it now incompatible?

Ventura makes no substantial changes to printer support provided that yours includes AirPrint, which Epson XP-750 series printers do. However, if you've installed Epson's own software for the printer, that might be causing this error.

If you do have Epson software, uninstall that first, if possible using the uninstaller provided with it. Then click on the existing printer in System Settings > Printers & Scanners to open its settings in a dialog.

Click on the Remove Printer button at the foot, and shut your Mac and printer down.

Start your Mac up first, let it settle for a couple of minutes, then turn the printer on, open Printers & Scanners again, and add the printer back by clicking on the Add Printer, Scanner or Fax button there. That should restore normal printing functions. As Epson hasn't updated its own support software since Feb 2022, it's possible that installing that will bring problems again.

DO MACS SUPPORT USB 3.2 GEN 2X2 EXTERNAL SSDS?

Recent Macs, including Apple silicon models, support USB 3.1 Gen 2, providing transfer rates up to 10Gbps, but they don't support the full 20Gbps offered by USB 3.2 Gen 2x2. Instead of read and write speeds approaching 2GB/sec, you'll only see half that.

WHY WON'T A USB-C PLUG FIT MY MAC STUDIO'S PORTS?

Mac Studios have secure Thunderbolt ports requiring full insertion to click into place. Some USB-C plugs can't be pushed in far enough to activate that retention mechanism, so won't connect. Thunderbolt cables are better.

> Missing Target Display

My iMac 27-inch running High Sierra won't connect to my M1 MacBook Air using Target Display mode. What am I missing?

Target Display Mode is only available with specific combinations of Macs running certain versions of macOS. The Target, to be used as a second display, must be an iMac introduced between 2011 and mid-2014, or a 24- or 27-inch iMac introduced in 2009/10. That must be running no version of macOS later than 10.13 High Sierra.

The Mac connecting to that must have been introduced in 2019 or earlier, and also be running macOS 10.15 Catalina or earlier. Connecting the two requires a Thunderbolt or Mini DisplayPort cable depending on the models. Apple provides full details at www.apple.co/3H2LQZI.

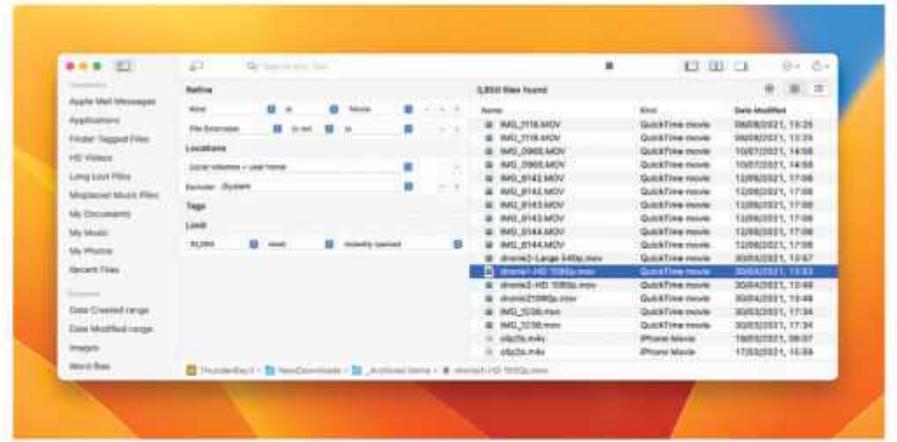
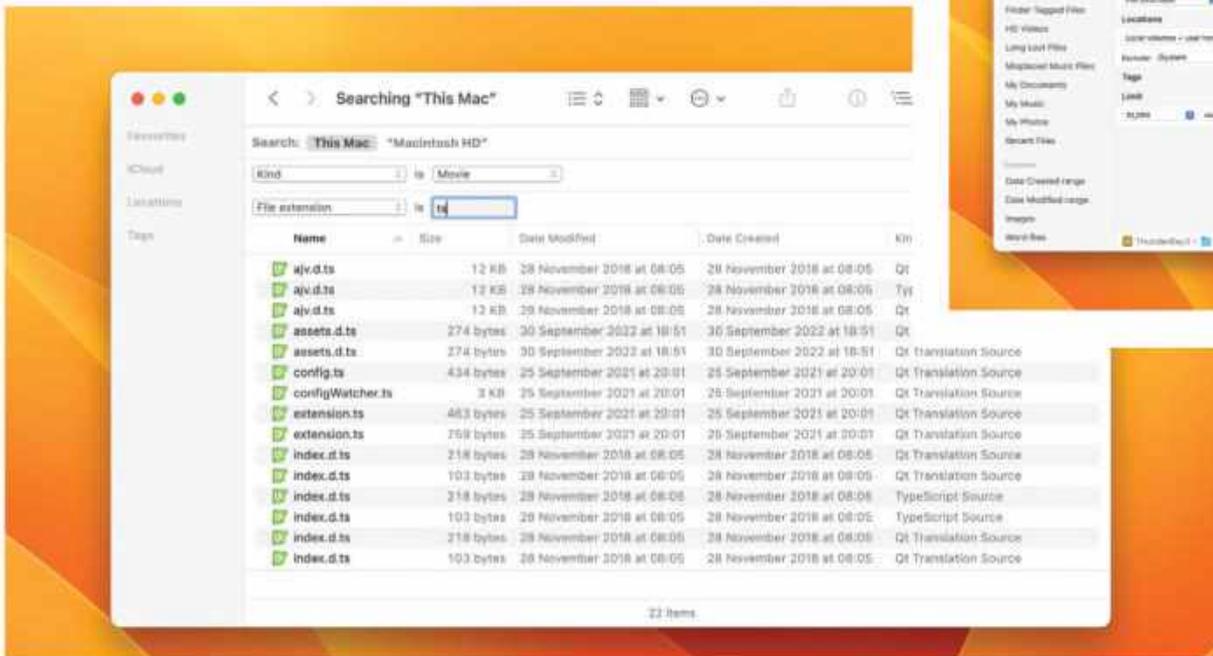
You thus can't connect any Apple silicon Mac to a Target iMac, as it's not a

supported model, nor can it run Catalina.

Modern Macs are intended to use AirPlay Display instead, which is far more flexible and available on most models, but it works best with a more recent iMac, introduced in 2019 or later, and both Macs must be running macOS Monterey or Ventura. Some older iMacs can work at lower resolution. Compatible Macs can be connected by Wi-Fi on the same network, or using a USB cable, which largely eliminates lag between the displays.



Macs running Monterey or later should support AirPlay Display, with its convenient wireless connection, through Display settings.



HoudahSpot can exclude .ts files from its search, as well as omitting results from System folders.

The Finder's Find feature lists .ts files, but you can't exclude them with a file extension filter.

> Find proper movie files

When I use Find in a Finder window to look for movies, why do I see .ts files? How can I remove them from those results?

macOS defines types of file that it considers to be movies in Spotlight search, including those with the .ts extension, which are MPEG-2 transport streams. A simple solution would be to set the search criteria to be movies,

except those with the .ts extension. While Find in the Finder lets you include results with a specified extension, it can't exclude them.

This is unfortunate as Spotlight does have the ability to use more

sophisticated search criteria, but not in its Finder interface. For that you need HoudahSpot, which opens up far more powerful searching, can readily exclude .ts files, and much more. It costs around \$35 from www.houdah.com.

HOW TO COLOR MAILBOXES IN THE MAIL APP?

Sadly, Mail doesn't enable you to color its mailboxes yet. What you can do, though, is add colored flags to individual messages, to help you distinguish them quickly. Some third-party mail clients should be more flexible in features.

WHERE TO FIND THE MACOS BUILD NUMBER IN VENTURA?

From the menu bar, go to > About This Mac, then hold Opt and click on the version number shown for macOS. You can also find it in the Software item of System Information, where it appears with the Darwin version too.

> Lost accented characters

When I updated macOS, I lost the ability to enter accented vowels in all my apps. How can I restore that?

This is most probably the result of a keyboard misconfiguration occurring in that update. Open System Settings > Keyboard (Keyboard pane). In its Text Input section, click on Edit for Input Sources to open a dialog with a list of keyboards at its left. Ensure All Input Sources is selected there, and the top item is enabled, to show the Input menu in the menu bar.

Then check the list of keyboards on the left of that dialog, to ensure it includes your preferred keyboard layouts. If not, click the "+" and add them from the list. Then click Done and select your preferred keyboard layout from those listed in the menu bar.

You should then be able to add accented characters using the main methods. To input an e-acute (é), press Opt+E first

then the E key alone. Or, select it from the range that pops up when you press and hold the E key.

The third choice is in the Emoji & Symbols character viewer, accessible below the list of keyboards in the menu bar. With the I-beam cursor at the correct place in your document, double-click the character in that window to insert it.



> Permissions gone haywire

After a file-sharing session, permissions on files in my Home folder have gone haywire, and I'm asked to authenticate before I can move them. How can I return them to normal?

Permissions set on key files in the Home folder can have pervasive effects, and at worst may even stop apps from functioning correctly. In the past, these became so severe that Apple provided a tool to repair them, particularly those in the Preferences folder in the Library, accompanied by a tech note describing the procedure.

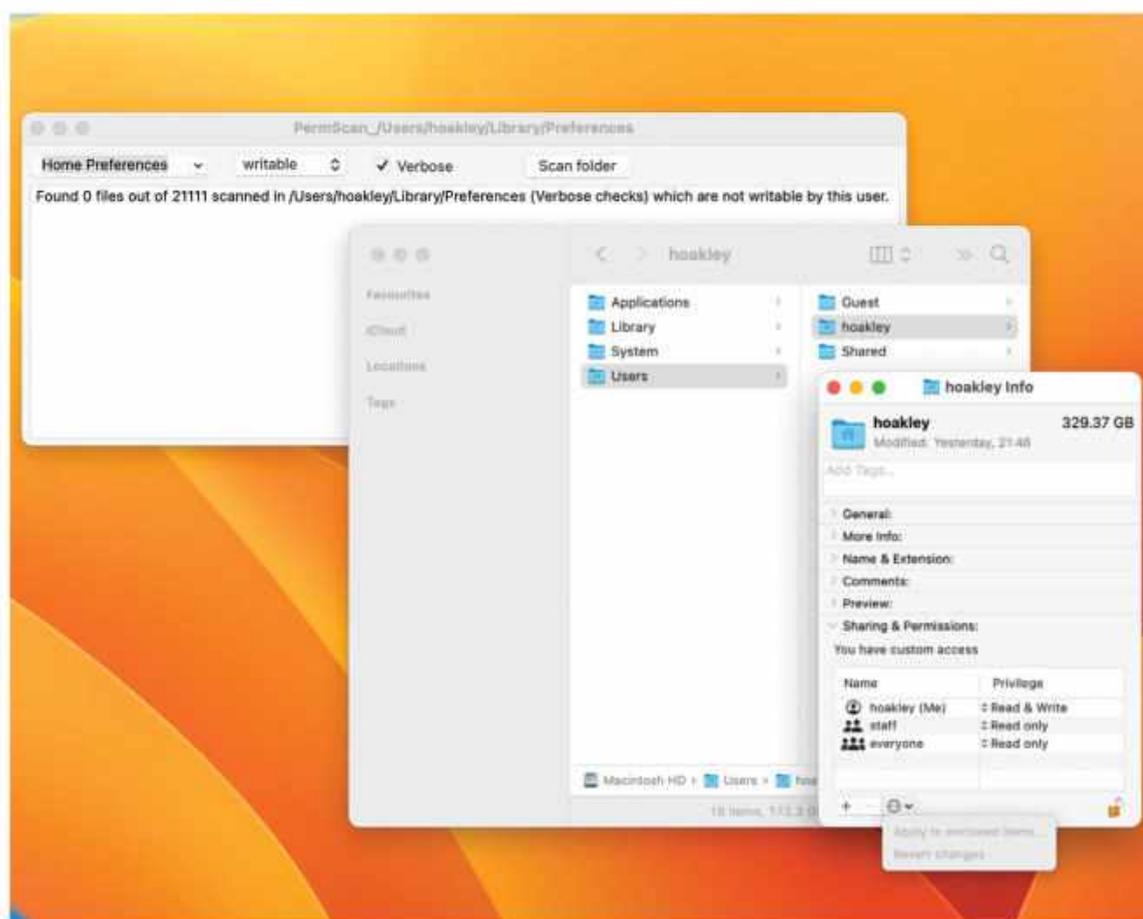
Three years ago, users were recommended to reinstall macOS. That was soon replaced by a command tool, `repairHomePermissions`, that had to be run in Terminal in Recovery mode, followed by reinstalling macOS. Although that's still available, it's now completely undocumented and Apple does not explain its use in any of its tech notes.

Probably the safest solution is to select your Home folder in the Finder, open the Get Info dialog (Cmd+I), then set your username as the owner in permissions, giving yourself read and write access, and selecting Apply to enclosed items in the menu.

Another method is to make use of the free PermissionScanner tool from <https://bit.ly/3iLR1Fi> to identify files

with incorrect settings and correct them in the Finder. If those don't help, provided that you have full backups in case you need to restore your Home folder afterwards, you could put your

Mac into Recovery, open Terminal there, and type `repairHomePermissions` to run Apple's secret tool. Hopefully that will get your files back to a working state again.



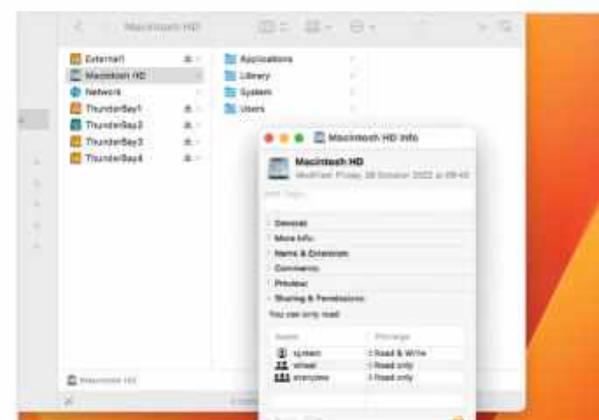
Fixed permissions in the Finder's Get Info dialog can be propagated to the contents of your Home folder. This is one of the safest ways to get your file permissions working again.

IS HIGH SIERRA'S APFS COMPATIBLE WITH VENTURA?

Only backwards, so that Ventura understands High Sierra's older version of APFS. There are many features in Ventura's APFS that High Sierra doesn't know about at all, so be careful when working with them on the same Mac.

HOW TO CREATE FOLDERS AT THE TOP OF MACINTOSH HD?

You can't do this from Catalina onwards as Macintosh HD has become two separate volumes. The root level is on the System volume, which can't be modified except by Apple, to ensure that it remains safe from malware. You can only add folders to the Data volume, which in practice means inside your Home folder as much as possible.



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MacLife

CREATE

HOW TO DO ANYTHING ON YOUR MAC, IPHONE & IPAD

Master login items on Mac

The Login Items feature gets an important makeover in macOS Ventura

REQUIRES

macOS 13 or later

YOU WILL LEARN

How to select login items and background items

IT WILL TAKE

15 minutes



WHENEVER YOU SHUT your Mac down, it always asks if you want to reopen any apps or windows that are currently

open when you turn the Mac back on again. This is a handy way of carrying on any work that you were doing when you last shut your Mac down. However, there's another way of setting all your key apps to open automatically when you turn on your Mac.

Hidden in the depths of System Preferences — now renamed System Settings in Ventura — is an option to select login items. These are apps that automatically open every time you log in to your account on your Mac, ensuring that your Mac is ready for you to start work as soon as you turn it on. It's a very useful option, but macOS Ventura

has completely redesigned the new System Settings panel, moving Login Items to a new location — and added an important new feature too.

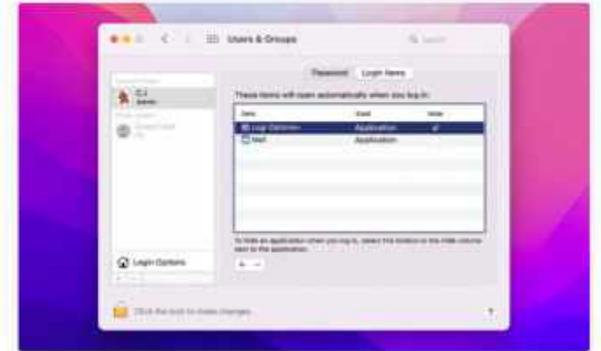
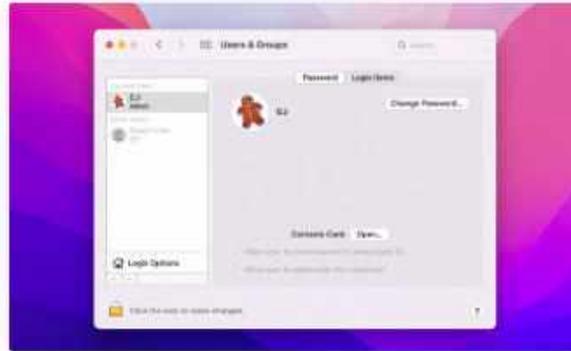
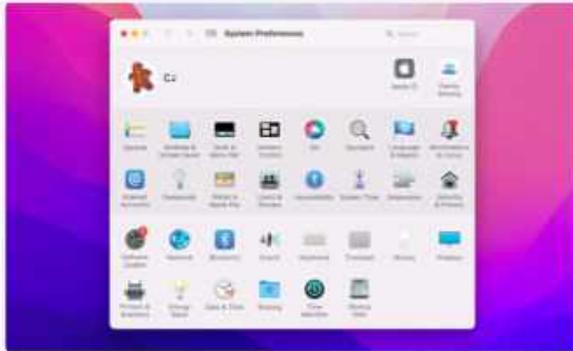
BACKGROUND TASKS

As well as setting up your favorite apps as login items, Ventura now displays a list of “background items”. These aren't proper apps, but they can perform tasks in conjunction with other apps — such as the ever-annoying Microsoft AutoUpdate background item that works with Microsoft Office. Login and background items are very useful for anyone who needs to work with a key set of apps every day, so this is a great opportunity to explore the redesigned System Settings on the Mac to see where everything is now located. **CLIFF JOSEPH**

GENIUS TIP

Having a lot of background items running on your Mac can make it slow down, so it's a good idea to turn off any that aren't essential.

HOW TO Manage login and background items



1 All change

For many years, System Preferences stuck with the same familiar design (shown here in macOS Monterey), with your Preferences options arranged in horizontal rows. However, Ventura changes all that, as we'll see...

2 Login location

Traditionally, the controls for Login Items that we're looking for were located within System Prefs > Users & Groups. You needed to select your own Admin account, and then click on Login Items in order to see the list of apps.

3 You have mail

These are the login items set up on an office iMac. We have Mail set to start automatically when logging in, so that we can check emails. We've also got the Logi Options+ app set as a login item, in order to control a Logitech mouse.



4 System Settings

System Preferences gets a major redesign in Ventura. It's now called System Settings and, like Settings on an iPhone or iPad, shows a list of the main Settings categories (left), and a view of the selected category (right).

5 Location, location

The Settings option for Login Items has moved from Users & Groups, and is now located within the General pane shown here. You can also find it simply by typing "Login" into the Search tool at the top left of the window.

6 Login lists

The Login Items pane now shows two different lists. The top list is for apps that "Open at Login" and, as before, we have Mail and Logi Options+ set as login items so that they launch automatically when we log in to this Mac.



7 Adding apps

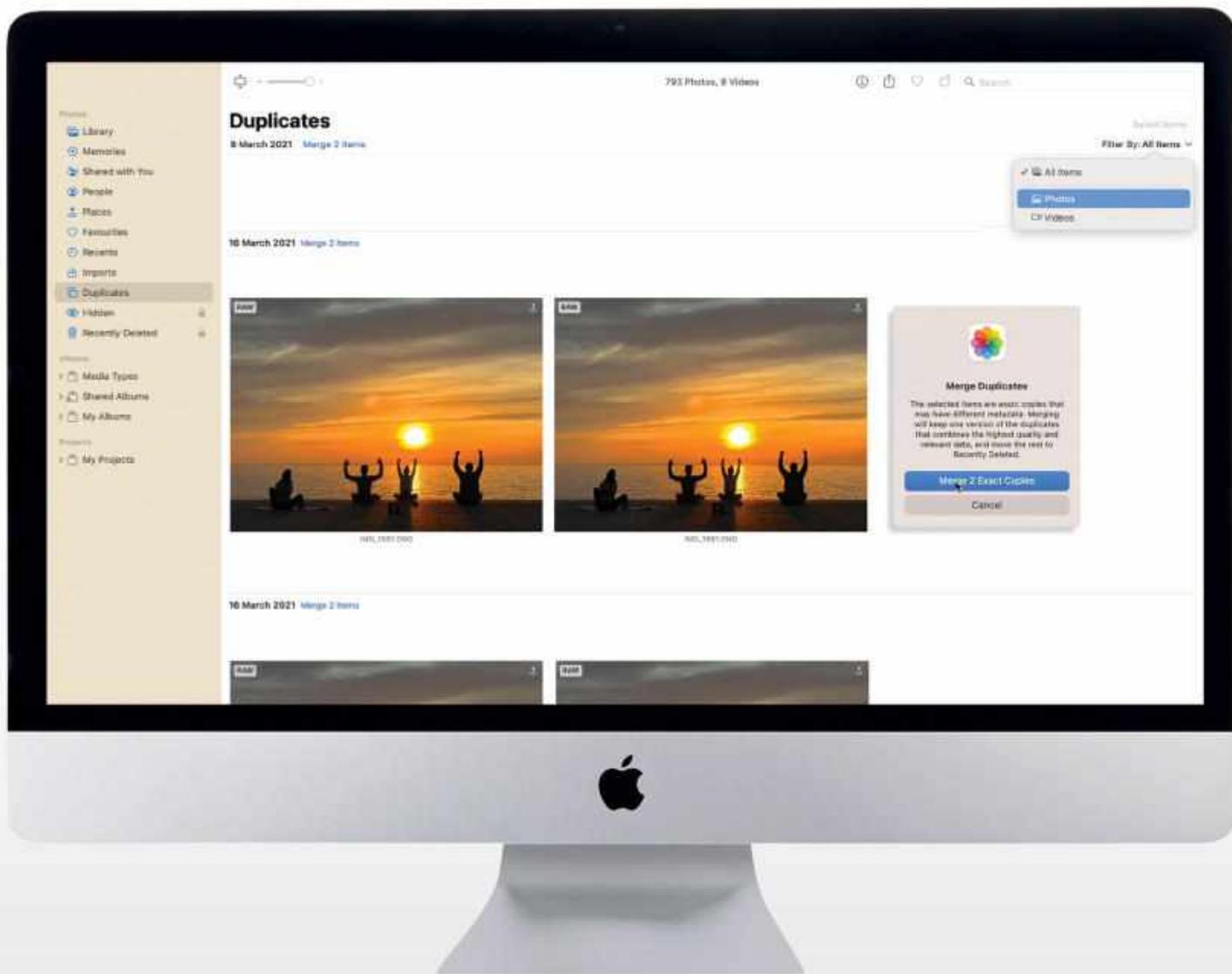
You can add other apps to the list simply by clicking the little "+" button below it. This opens a window that lets you select the app you want, such as Safari. You can also remove apps from the list by clicking the "-" button.

8 In the background

A new list of "background" items run automatically when you start your Mac. These aren't "apps" per se – they're bits of software that work with other apps, such as Microsoft AutoUpdate, which is part of Microsoft Office.

9 Background blocker

Items like Microsoft AutoUpdate can be annoying – popping up on your Mac even when not using Microsoft apps – thankfully, Ventura lets you switch background items off. We'll keep the Logitech one, though, for the mouse.



Manage duplicate images

Discover and sort duplicate clips and stills for a cleaner Photos library

REQUIRES

iOS 16, macOS 13 or later

YOU WILL LEARN

How to discover duplicate images and save the best-quality versions

IT WILL TAKE

10 minutes



WE TAKE SO many videos and stills on our iPhone that we run the risk of filling it up, leading to the dreaded “Storage Full” notice popping up just as we are about to take an amazing photograph. By the time we’ve scrolled through our library, and manually deleted a few shots to free up storage space, our photo opportunity will have passed. To avoid such storage issues, your Photos



Delete duplicates so you can capture the perfect moment without running out of iPhone storage space.

app’s Optimize iPhone Storage setting offers the option to sync your shots with iCloud Photos and store the full versions there. You can then store lower-quality, lighter versions on your iPhone, only downloading full-size shots when you need to edit and share them.

SYNC OR SWIM

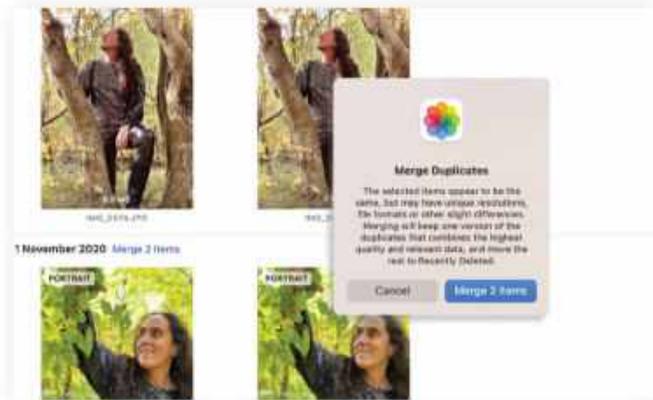
Syncing and importing issues may cause a surprising amount of duplicates to clog up your Photos library. You might send photos to your Mac via AirDrop (or physically connect your iPhone to it via USB), and then import shots into the desktop version of the Photos app without realizing they’ve already synced to iCloud Photos via Wi-Fi. You may have also snapped similar shots in quick succession, which take up space. Third-party apps, such as Gemini Photos: Gallery Cleaner, help discover and delete unwanted duplicates, but thanks to iOS 16 and macOS Ventura you can do it with ease within the Photos app. **GEORGE CAIRNS**

HOW TO Find and merge duplicates



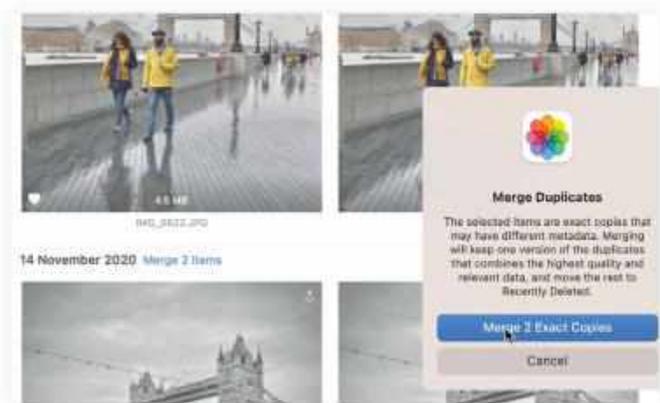
1 Discover duplicates

You can discover and delete duplicate photos and clips in both the iOS and macOS version of Photos. We'll use macOS for this walkthrough. Launch Photos. In the main panel, click on the new Duplicates section.



2 Merge duplicates

Duplicates will be displayed together. The file size appears below each thumbnail. Click Merge 2 Items. The merge will create the largest version with the most metadata, such as the scene's GPS coordinates.



3 Seeing double

Here we have two image files that have the same file size. After clicking Merge 2 Items we get a slightly different command – Merge 2 Exact Copies. If there is any difference, the best-quality version will be retained.



4 Don't merge

If you edit a photo in a third-party app such as Facetune, it might save the edited version back to Photos. This creates apparent duplicates. In this instance, you'll want to keep both the original and the edited copy.



5 Second chances

You can review images that have been deleted and restore them if necessary. In the Photos pane, go to the Recently Deleted album. Click a thumbnail and then Recover. Or click Delete to remove it immediately.



6 Similar shots

As well as finding duplicate shots, third-party apps such as Gemini Photos: Gallery Cleaner can collect similar shots (such as multiple snaps of the same subject), and let you choose the best while deleting the rest.



GENIUS TIP

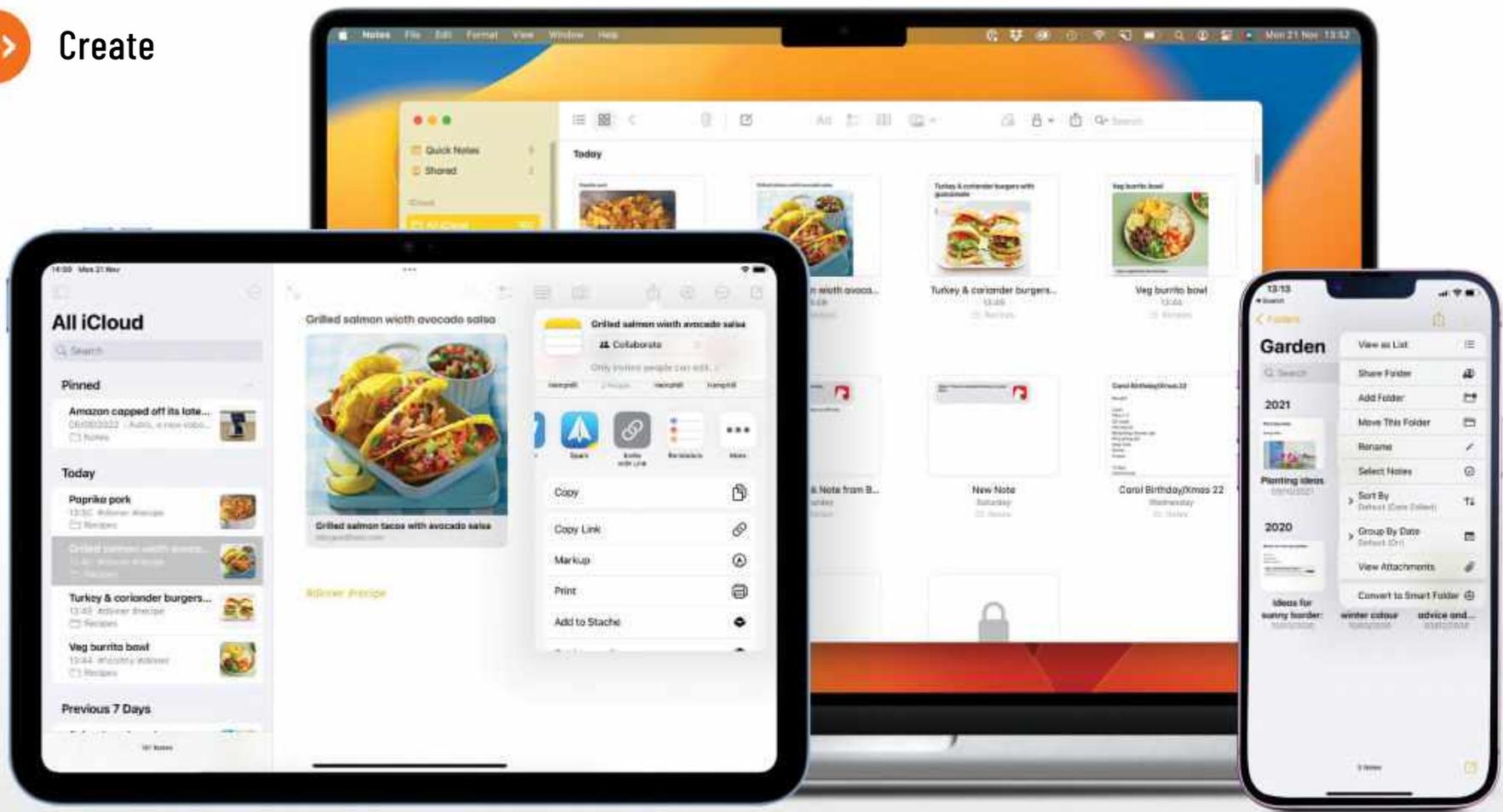
Photos only looks for duplicate files when you're not using the app. Leave the Photos app open so that it can continue scanning the library for duplicates.



GENIUS TIP

Photos hunts for duplicated stills and videos. Videos can take up more space so, to find them fast, click the Filter By: All Items menu and choose Videos.





Make the most of Notes

Discover all the new and useful features on offer in the Notes app

REQUIRES

macOS 13, iOS 16, iPadOS 16 or later

YOU WILL LEARN

How to use the new features in Notes

IT WILL TAKE

30 minutes



GENIUS TIP

To enable access to Quick Notes from Control Center, go to Settings > Control Center and tap “+” next to Quick Note.



APPLE’S NOTES APP was, for a long time, unloved both by users and, seemingly, by Apple itself. Updates were uninspiring and did nothing to help it compete with the dozens of other note-taking apps available for Mac, iPhone and iPad. And there was a disastrous dalliance with skeuomorphism when Apple decided it would be a good idea to make digital notes look more like paper.

All that has changed, though. And the last couple of updates to all Apple’s

platforms have seen the Notes app improve in leaps and bounds, with the addition of many useful and time-saving new tools.

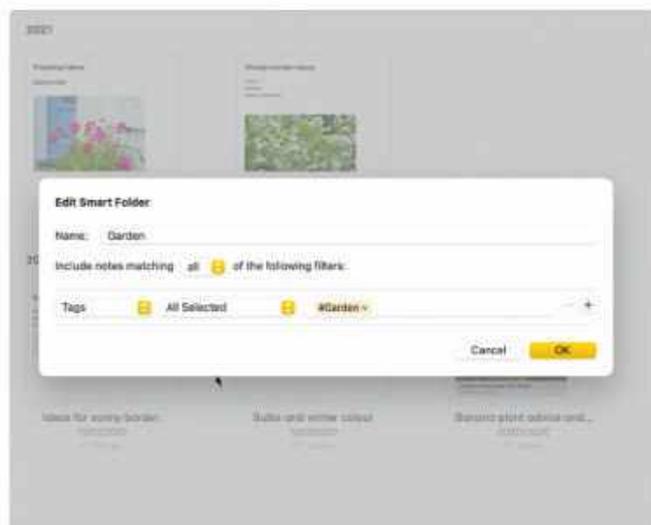
platforms have seen the Notes app improve in leaps and bounds, with the addition of many useful and time-saving new tools.

MORE EXTENSIVE FEATURES

The ability to share, lock, create and add to notes from anywhere using Quick Notes, and organize them using tags and folders have all made the app a genuinely useful tool and a serious option for anyone who has previously only ever considered using the likes of Evernote or Microsoft’s OneNote.

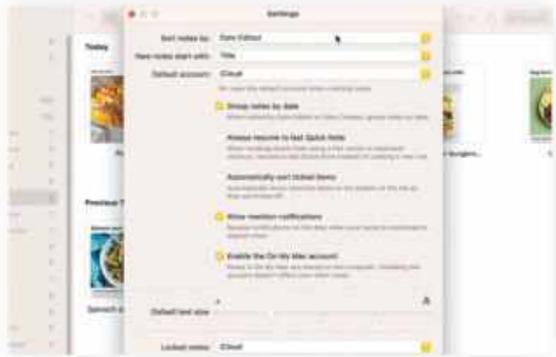
Smart Folders now enable you to specify the conditions a note must meet to appear in the folder. And you can even collaborate on notes with other people and get updates on changes they have made to a note since you last viewed it.

Notes also has a bunch of Shortcut actions, and there are several pre-cooked Shortcuts in that app’s gallery that use Notes. We particularly like Day in Review which asks you questions about how your day has gone and what you hope for the following day, and records it as a note in Notes. **KENNY HEMPHILL**

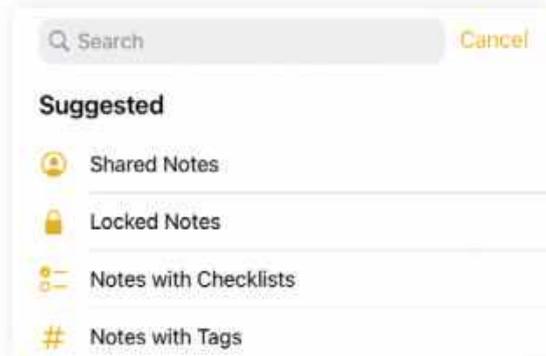


Notes now enables you to customize filters in Smart Folders to make it easier to find the note you need.

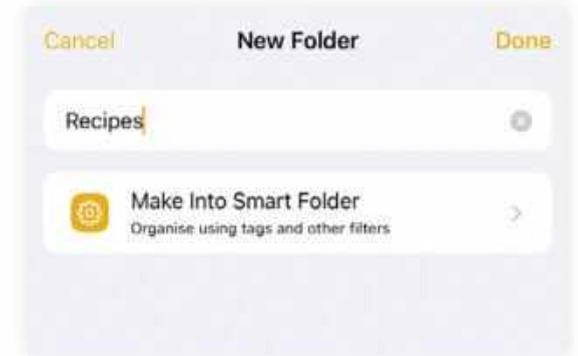
HOW TO Use the latest features in Notes



1 Lock a note on Mac
Go to Notes > Settings and, in the Locked Notes section, choose options for locking notes. The default is to use your login password. Select the note you want to lock, click the padlock in the toolbar and choose Lock Note.



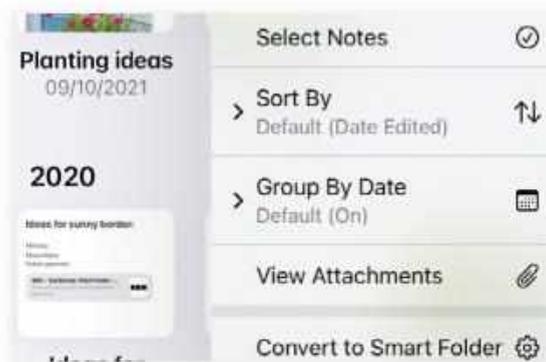
2 Search for a note
Tap or click in the search field. To look for notes in one of the Suggested groups, tap or click on the search term. Otherwise, type a term in the search field. You can use natural language like “notes created last week”.



3 Add a Smart Folder
In the Mac version of Notes, click New Folder at the bottom of the sidebar; in iOS or iPadOS, tap the new folder icon, then On My Phone or iCloud. Type a name for the folder, and tap Make Into Smart folder.



4 Define conditions
After naming the folder, click or tap “all” to choose whether all or any conditions need to be met. Tap a filter, choose the options, and then select the parameters, like Tags > Any Selected Tag > [tag names].



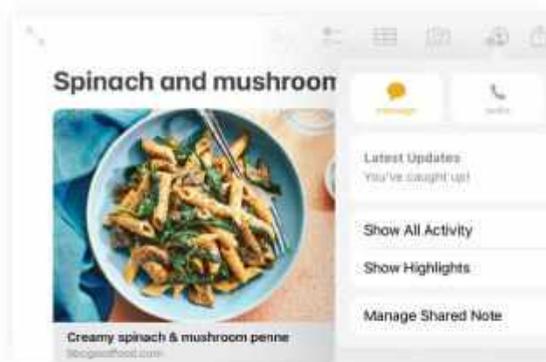
5 Convert a folder
On Mac, select a folder then click the “...” button next to it. On iOS, go to the Folder view and tap Edit, then tap More. Choose “Convert to Smart Folder”, read the advice and, if you want to proceed, choose Convert.



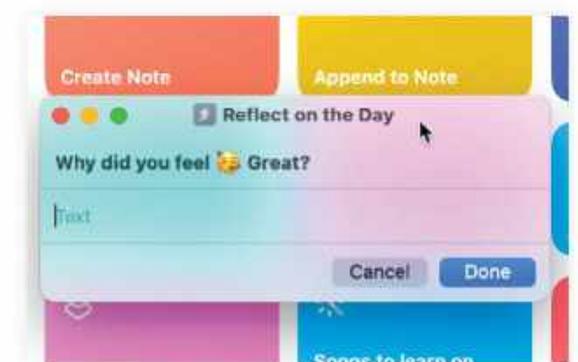
6 Quick Notes on iOS
From any app on iPhone, tap the Share menu and choose “Add to New Quick Note”. A Quick Note will open with a link to the document in the app. Add your own text, images or links to the note, then tap Save.



7 Collaborate
Select a note and click or tap the Share icon. Choose Collaborate then tap or click “Only invited people can edit” and choose your options. Click Invite with Link, type a name, then select Copy Link.



8 Shared notes
Select a shared note and click the head and shoulders icon. To see what has changed since you last worked on it, choose Show All Activity or Show Highlights. To change sharing options, select Manage Shared Note.



9 Reflect on the Day
Launch the Shortcuts app and go to the Gallery. Search for Reflect. Click the “+” to add it to your Shortcuts. Activate Siri and say “Reflect on the Day”. Answer the questions and the results will be saved to Notes.

How to use Live Text

Edit and translate image text on your iPhone

REQUIRES

macOS 13, iOS 16,
iPadOS 16 or later

YOU WILL LEARN

How to use Live
Text on iPhone,
iPad and Mac

IT WILL TAKE

30 minutes



NOT SO LONG ago text was text and an image was an image.

You could copy, paste and edit text, but if the text you wanted to work on was part of an image, then tough luck. But all that changed with Live Text on iPhone, iPad and Mac. Now, even if the text is in an image, your device will recognize it and convert it to text for you to manipulate in any way you like. The tech is similar to the optical character recognition (OCR) that we've become used to over the past couple of decades. But in real time, with no lag, it feels like magic.

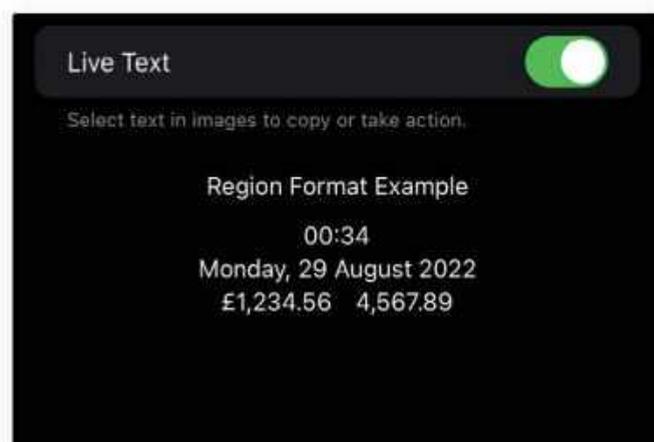
Live Text also enables you to translate the selected text in an image to a different language, and you can use Quick Actions to call a phone number in a photo, or get directions to an address. And you can do all of that for images in a still video frame too — you don't even need a photo to work from. Simply hold your iPhone up to printed text, with the Camera app open, and use Live Text to capture the text in the frame. **KENNY HEMPHILL**



HOW TO Work with Live Text

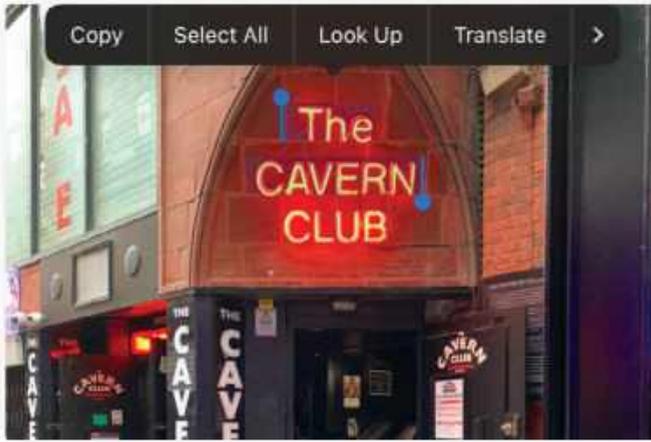
GENIUS TIP

If your iPhone doesn't recognize text in the Camera app, try moving closer or further away, or improving the lighting.



1 Turn on Live Text
On iPhone or iPad, launch the Settings app and go to General, then Language & Region. Toggle Live Text to On. On Mac, go to **Apple** > System Settings > General > Language & Region. Turn on Live Text.

2 Copy text in a Photo
Open the Photos app and find a photo with text in it. Tap it to open it, then tap the Live Text icon — a box with lines in it. You should now see a Quick Action, Copy All. Tap it to copy the text onto the clipboard.



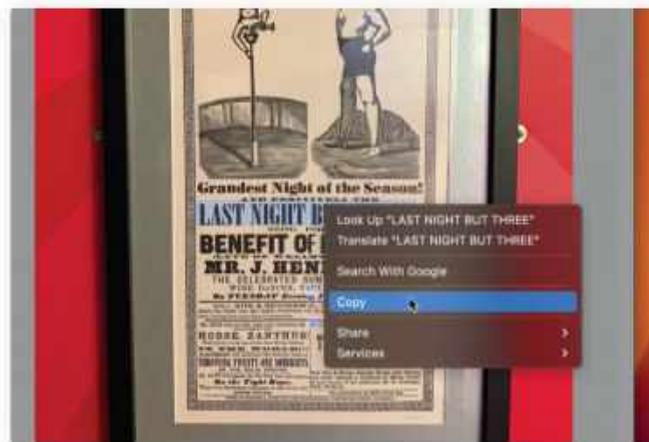
3 Copy selected text
 If you don't want to copy all the text, instead of tapping the Live Text button, tap and hold on the text you want and then use the grab handles to select it. Once highlighted, tap Copy from the options that appear above.



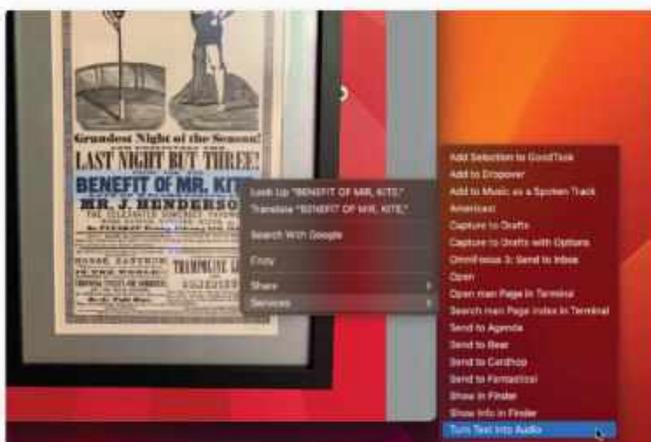
4 Convert something
 To convert measurements or a currency, open the Camera app and hold your iPhone up to the price or measurement and tap the Live Text button. Look for the Quick Action with the measurement in it and tap it.



5 Call a number in a video
 Open the video in the Photos app and navigate to a frame that has the phone number in it. Tap pause when the number is clear. Tap and hold it, then tap the Quick Action with the phone number on it to make the call.



6 Copy text in Preview
 You can work with text in Preview on a Mac in the same way as in Photos on iPhone or iPad. Open a photo in Preview. Click and drag over the text in the image. Press Cmd+C or Ctrl-click on it, then choose Copy.



7 Turn text to audio on Mac
 Open the image with the text you want to turn into audio. Click on it and drag the cursor over it until it is selected. Ctrl-click the selection to see available options and choose Services > Turn Text Into Audio.



8 Translate text
 On iPhone or iPad, tap the text you want to translate and use the handles to select it. When the menu appears, tap Translate. In Preview on Mac, select the text with the cursor, Ctrl-click on it and choose Translate.

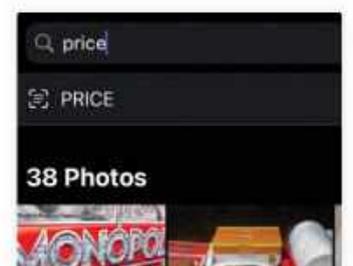


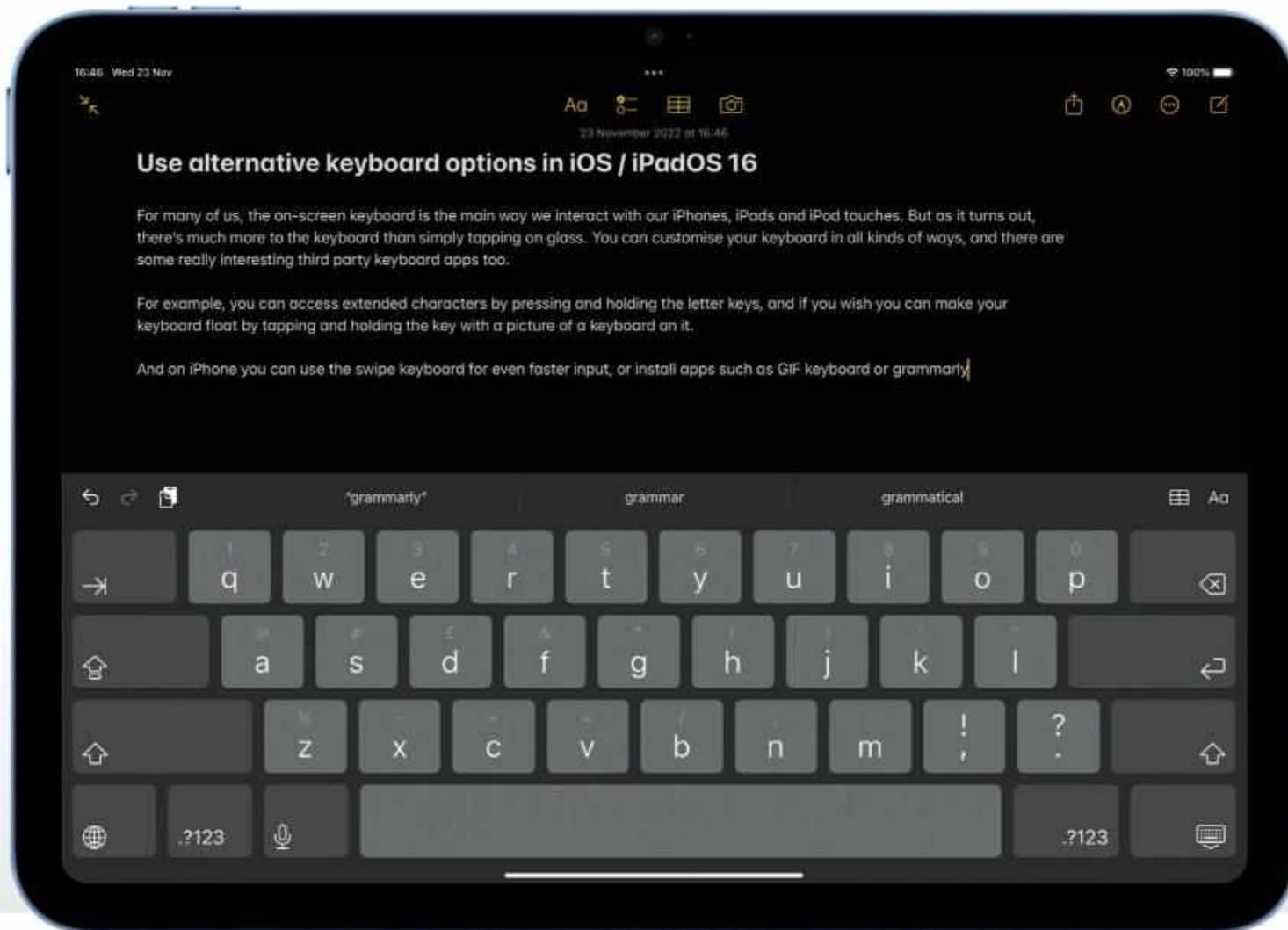
JARGON BUSTER

Quick Actions are commands that become available on iPhone or iPad, when you tap and hold on something. On Mac, they are accessed in a Finder window.

GENIUS TIP

You can search for text within images in Photos. Type what you're looking for in the search field, and you will see images containing that text.





Type smarter on-screen

Set up shortcuts, send images, and more with Apple's on-screen keyboard

REQUIRES

iPadOS 16 or later

YOU WILL LEARN

How to make the on-screen keyboard even more useful

IT WILL TAKE

10 minutes



GENIUS TIP

If you find it hard to see lowercase letters on the keyboard, go into Settings > Accessibility > Keyboards and disable Show Lowercase Keys.



IT'S EASY TO take for granted now, but when the iPhone was launched many people were unsure about the prospect of tapping on glass. "Typing is done by pecking on the screen with thumbs or fingers, something hardly anyone outside of Apple has experienced yet," *The New York Times* reported, while also describing the virtual keyboard as "the biggest worry" about Apple's yet-to-be-launched smartphone.

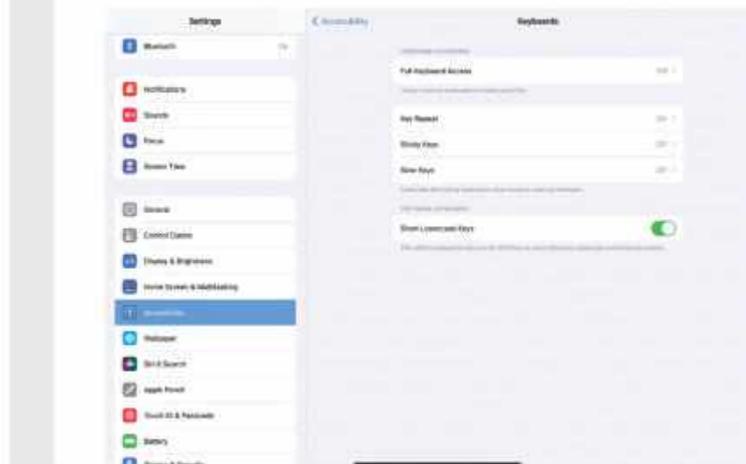
"There has never been a massively successful consumer device based solely

on a touchscreen," warned one network CEO; unlike the iPhone, his company disappeared over a decade ago... While it's easy to mock, the iPhone and iPad keyboard hasn't always been perfect, and the feature has seen improvements bit by bit over the years.

LETTERS, NUMBERS AND MORE

The latest version is arguably Apple's best yet, and the chances are you might not be aware of all its features — or that you can expand them even further with third-party keyboard apps. In this tutorial we'll look at the most useful features and customization options, as well as some of the apps you can add to give your fingers even more power.

In most cases the tips and features here will work on both iPad and iPhone, but there are some exceptions. Some third-party keyboard apps aren't available for iPad, and the swipe keyboard of the iPhone only works on iPad if you put the keyboard into floating mode; we'll show you how to do that too. **CARRIE MARSHALL**



HOW TO Use alternative keyboards



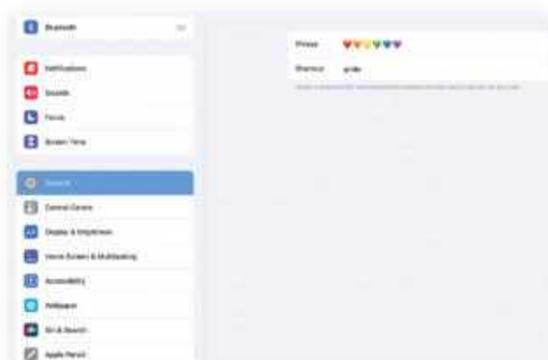
1 Use it as a trackpad

On both iPhone and iPad, pressing and holding the Spacebar makes the keyboard labels disappear and turns the keyboard area into a trackpad. Swipe around to move the cursor to the place you want it.



4 Swipe your words

Swipe rather than tap to the next letters of a word and your iPhone will work out what you're trying to spell. We're swiping the word iPhone here; the grey check mark you can faintly see is us moving from H to O.



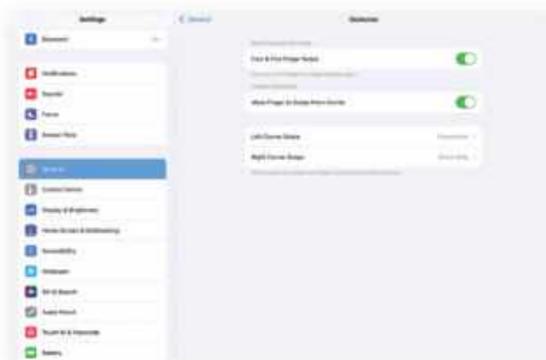
7 Set shortcuts

One of our favorite keyboard features is text replacement, which is more than just autocorrect: you can paste in phrases or strings of emoji, like we've done here, and trigger them when you type a particular bit of text.



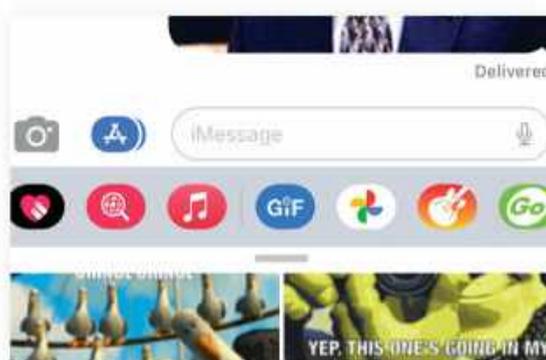
2 Add accents instantly

Pressing and holding a key brings up accents for different languages, and on iPad you can swipe from the top of a key downwards to enter the character above the letter it displays.



5 Get gesturing

On iPad, Settings > General > Gestures enables you to add gesture shortcuts for swipes. Move between apps with four or five fingers, and customize corner swipes to take screenshots or add a Quick Note.



8 Third-party apps

Some apps add more features to your keyboard. This iPhone-only app, GIF Keyboard, enables you to add a GIF image search to your Messages and other chat apps. Search for the image you want, then tap Send.



3 Make it float

Holding the Keyboard key on iPad turns the keyboard into a floating, swipearable one; drag it to the bottom to reverse it back. On iPhone, Settings > General > Keyboard enables a one-handed keyboard for faster typing.



6 Use alternative keyboards

Enable multiple keyboards for different languages and third-party apps in Settings > General > Keyboards. You can activate and choose a keyboard by long-pressing the globe key.

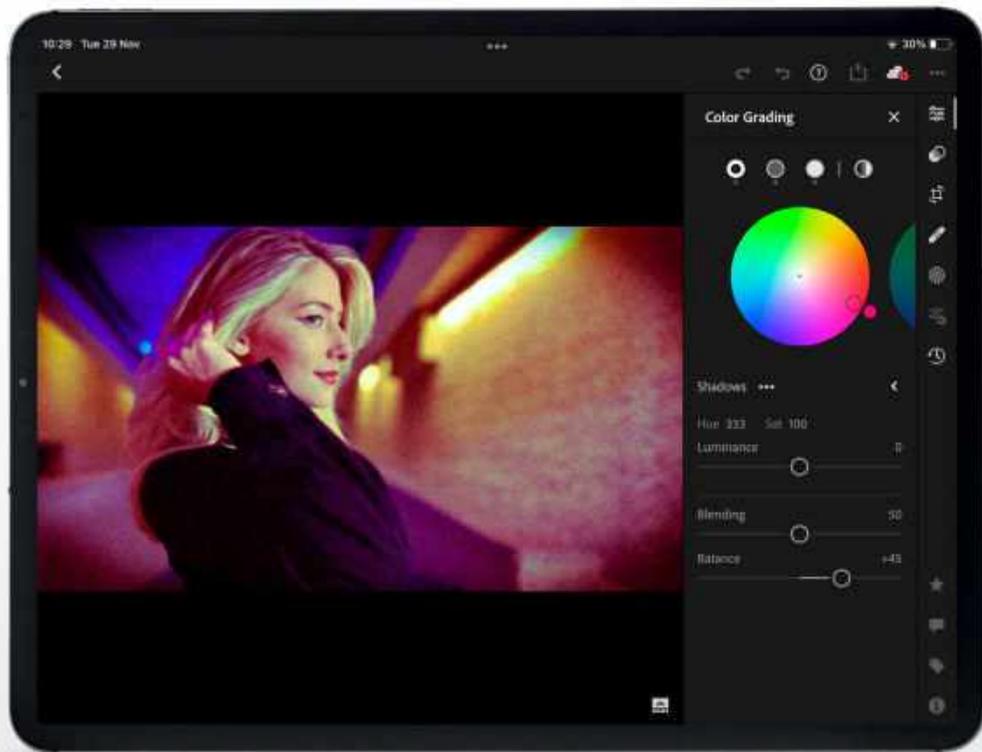


9 Get a little help

Some apps, such as Grammarly, work on iPhone and iPad and help by suggesting improvements to your writing as you type – although this particular app requires a subscription to unlock all of its helpful features.

Grading on the go

How to give your colors, tones and composition a cinematic makeover



REQUIRES

Lightroom Photo & Video Editor, iPadOS 14 or later

YOU WILL LEARN

How to use color grading tools for a more stylized Hollywood look

IT WILL TAKE

15 minutes



THERE ARE MANY ways we can use Lightroom on our iPhone or iPad to give a photo a more cinematic look. We could

simply slap on a preset to change colors and tones, but this runs the risk of making our processed shot look just like one produced by other Lightroom users.

Movie makers use a process called grading to change the tone, hue and saturation of a shot's colors to give them a more striking appearance, such as accentuating the green hue of a cityscape's neon lights for example.

By using Lightroom's powerful color grading tools, we can target specific tonal ranges (such as shadows or highlights) and change the hue and saturation of the colors in these areas. This manual grading process creates far more distinctive and unique-looking images than those produced by one-tap presets.

We'll also show you how to give your shots cinematic properties such as clumps of film grain, as well as changing their composition to add widescreen letterbox bars that evoke the big-screen experience. **GEORGE CAIRNS**

QUICK LOOK How to grade using color wheels

A

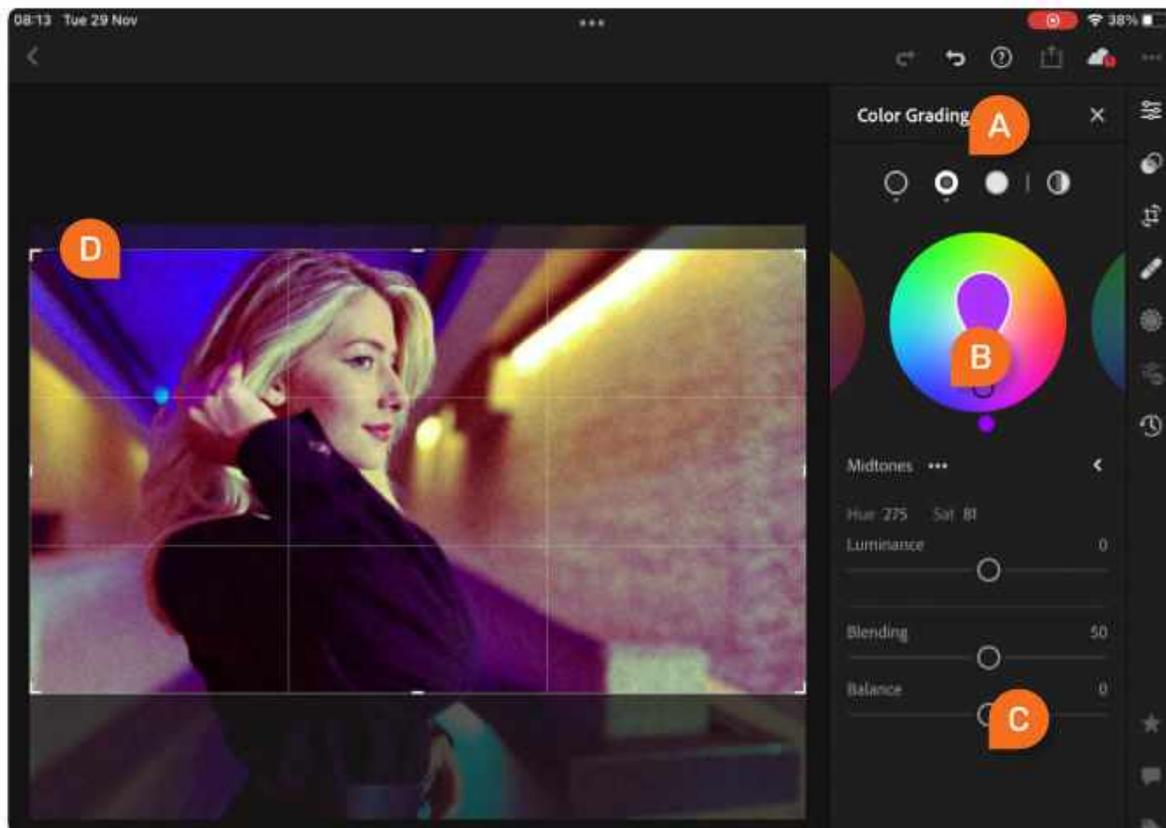
TARGET TONES

You can adjust the colors in a specific tonal range by tapping on the Shadow, Midtone or Highlight icons.

B

COLOR WHEELS

We've dragged the sampler inside a color wheel to adjust the Hue and Saturation of the midtones.



C

BALANCE

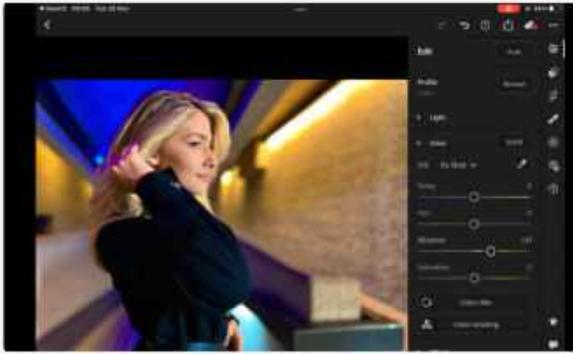
Drag left to adjust the shadow colors. Drag right to bias the color changes towards the highlights.

D

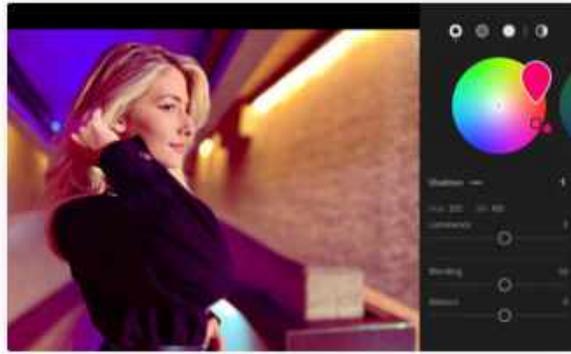
WIDESCREEN

Use the Crop tool's 16:9 aspect ratio to give your graded shots a cinematic widescreen proportion.

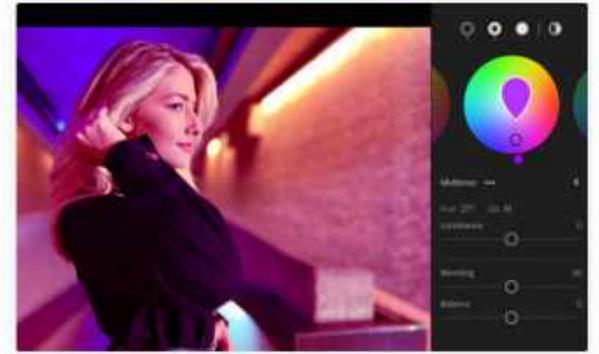
QUICK LOOK Achieve a cinematic look



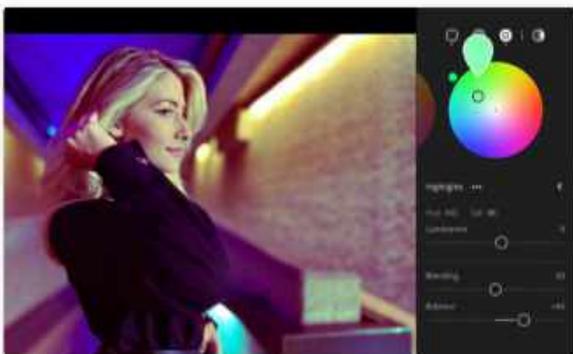
1 Boost vibrance
Browse to a shot in Lightroom. In the Edit panel tap to toggle open the Color label to access its tools. Drag the Vibrance slider right to boost the saturation of weaker colors without oversaturating stronger ones.



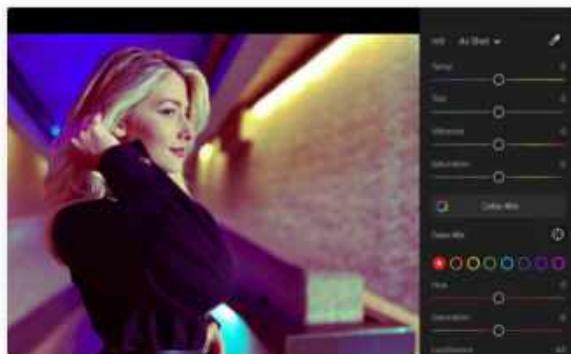
2 Adjust shadow color
Tap on the Color Grading button. Tap to choose the Shadows color wheel. Drag inside the Shadows color wheel to change the Hue to 335 and the Saturation to 100. This adds a neon pink hue to the image's darkest areas.



3 Tweak midtones
Swipe to choose the Midtones color wheel (or tap the Midtones icon). Drag inside the wheel to change the Hue of the midtones to a purplish 277. Drag the sampler near the edge of the wheel for a weaker Saturation of 81.



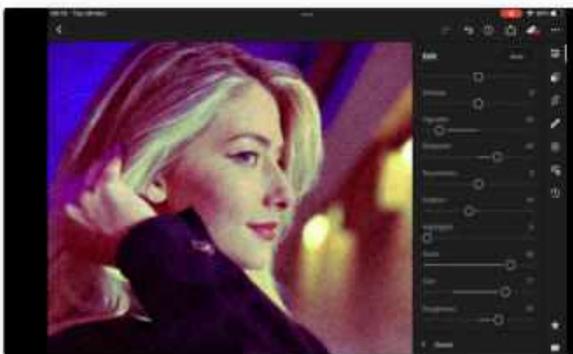
4 Edit highlight color
Go to the Highlights color wheel. Set Hue to 143. Drag towards the center of the wheel for a lower Saturation of 48. Then, drag the Balance slider to 45 to make the changes affect the highlights more than shadows.



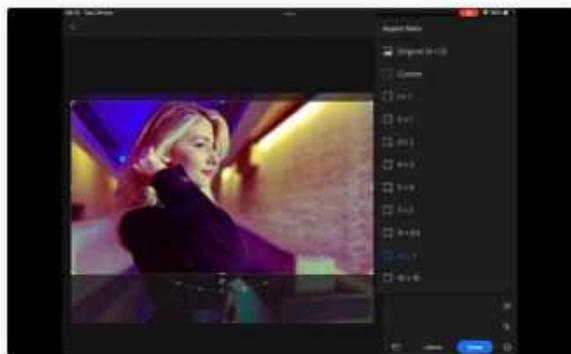
5 Darken reds
Tap the "X" next to Color Grading to close that panel. Tap the Color Mix button. Tap the red swatch to select it. Drag the Luminance slider left to -65 to dramatically darken any reds in the shot such as the lipstick.



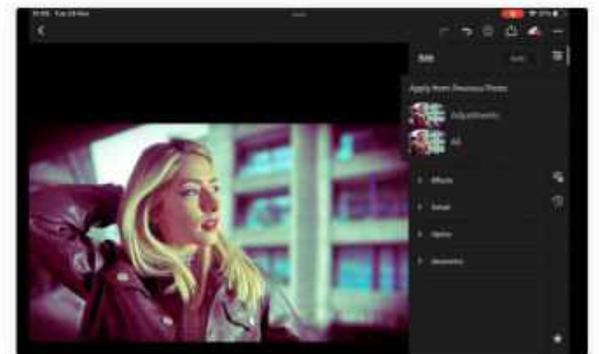
6 Vignette the edges
To make the edges of the frame darken dramatically, toggle open the Effects panel. Drag the Vignette slider left to -76. Push the Midpoint right to 69. This pushes the darkened areas towards the edge of the frame.



7 Go with the grain
To make the clean digital shot look like it is a frame of analog film, drag the Grain slider to 82. Pinch to get a closer look at the grain. Set Size to 77 and Roughness to 70 to simulate clumps of film grain.



8 Crop to widescreen
Tap the Crop icon. Tap on Aspect and choose a cinematic widescreen shape (aspect ratio) of 16:9. This crops the top and bottom of the image. Drag to reposition the image to include our subject's head within the frame.



9 Transfer edits
Once you've spent time creating your custom grade, you can apply it quickly to other shots. Swipe to another photo. Tap the Apply From Previous Photo icon. Tap All to include the adjustments and the 16:9 crop.

Control the Home app from Mac

The long-neglected Home app finally gets a welcome revamp for macOS Ventura – we take a look at what's new

REQUIRES
macOS 13, and a HomeKit-compatible smart device

YOU WILL LEARN
How to control your smart home devices in the Home app on Mac

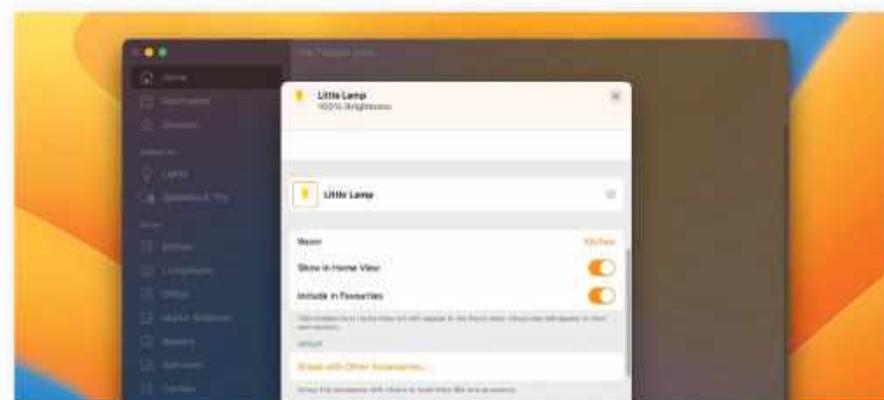
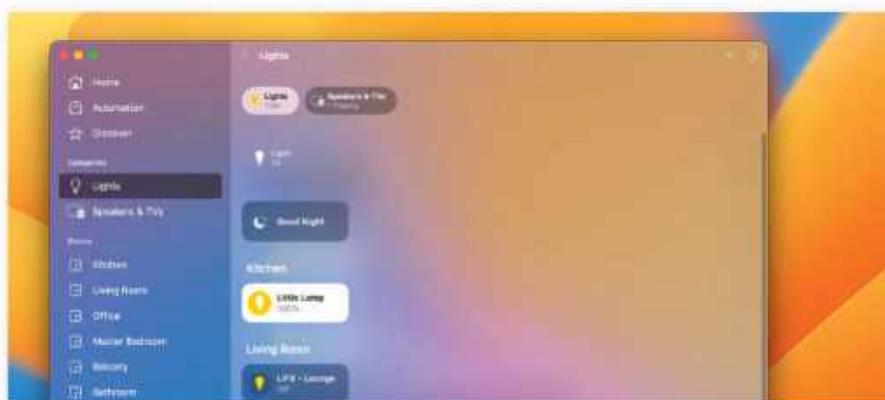
IT WILL TAKE
30 minutes



THE MAC VERSION of the Home app has always seemed like a bit of an afterthought — especially as it was only released with Mojave in 2018, two years after the app first appeared on the iPhone. And, to be honest, it hasn't made much progress since then, with Amazon's Alexa attracting far more support from manufacturers of smart lights, security cameras and other smart home devices.

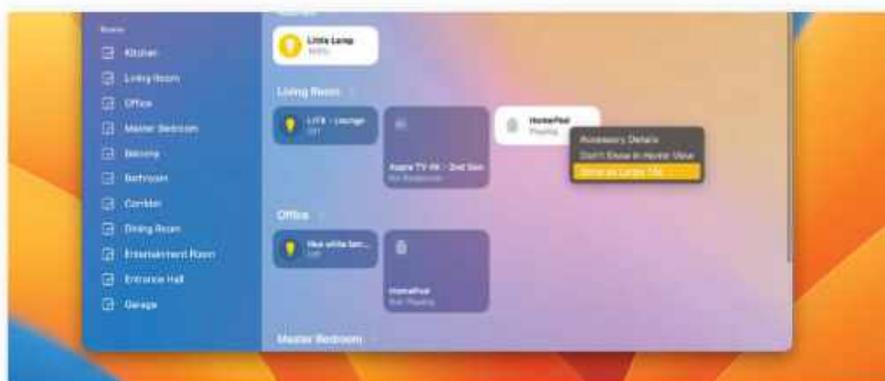
But, behind the scenes, Apple has been working with Amazon and other companies over the last couple of years to develop a new smart standard called Matter, that will allow smart devices from a wide range of different manufacturers to work together more easily. So, in anticipation of a new generation of Matter-compatible devices, Apple has given the Mac version of Home a revamp for the release of Ventura. **CLIFF JOSEPH**

HOW TO Manage your smart devices



1 Categories list
The new Categories view displays groups of devices, such as lights or speakers, arranged by room. There's also an overview that shows the status of those devices, and any scenes or automations used to control them.

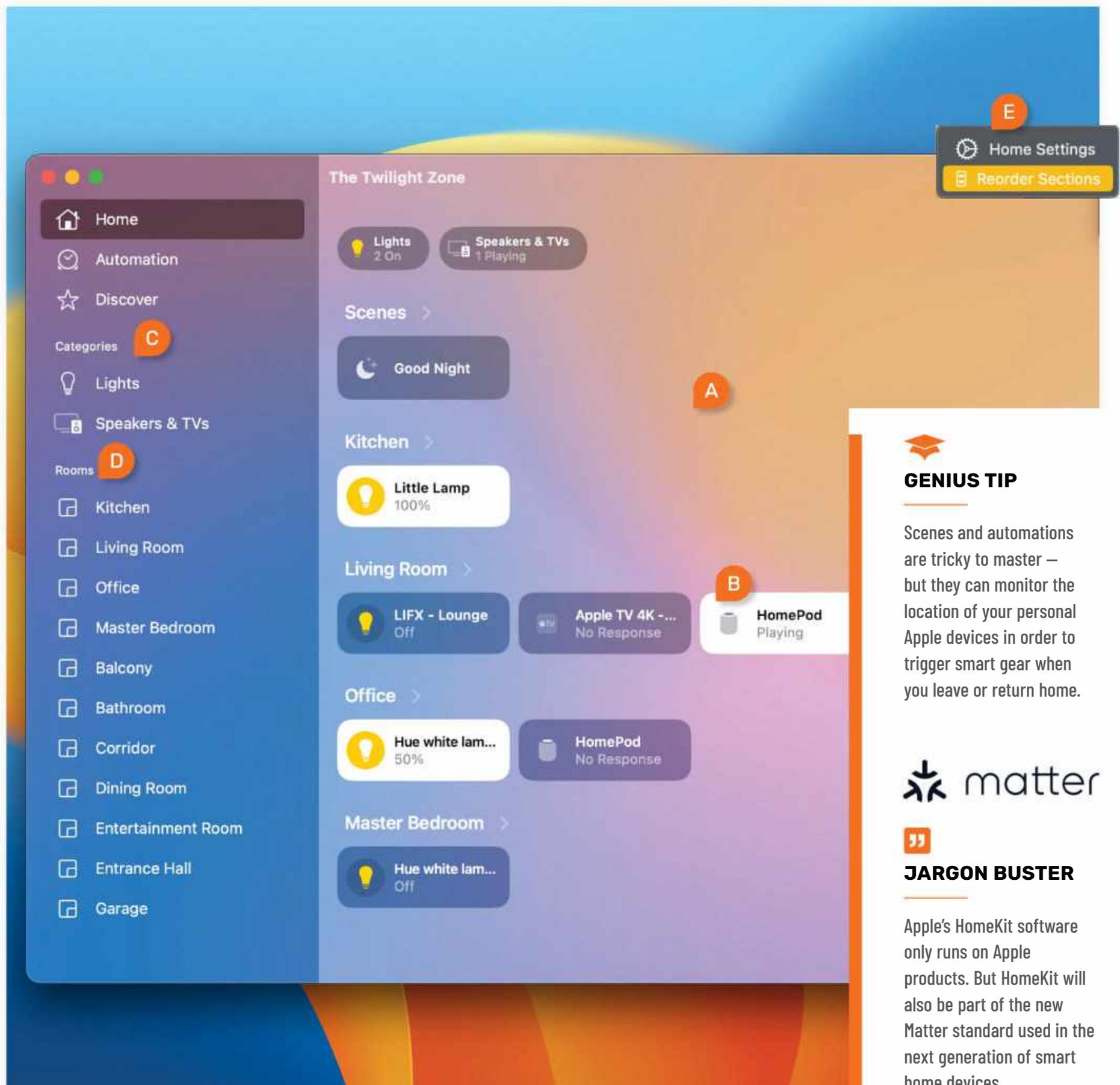
2 Choosing favorites
The Favorites list hasn't gone altogether — but it's a bit hidden. Click on a device tile to view its information, and click on the gear icon to show Device Settings. Then just click the Favorites button to add it to the list.



3 Going large
You can also highlight individual devices by making their tile larger. Just Ctrl-click on the device tile and select Show as Large Tile. Alternatively, you can hide devices by choosing Don't Show In Home View.

4 Making a scene
Unfortunately, Apple hasn't made it any easier to use scenes and automations that control multiple devices all at the same time. This is too much like programming for most people — check out *MacLife* (#203) for more on that.

QUICK LOOK The Home interface



GENIUS TIP

Scenes and automations are tricky to master – but they can monitor the location of your personal Apple devices in order to trigger smart gear when you leave or return home.



JARGON BUSTER

Apple's HomeKit software only runs on Apple products. But HomeKit will also be part of the new Matter standard used in the next generation of smart home devices.

A

MORE DEVICES

Rather than just showing your favorite devices, the main Home window now displays all the devices in all your rooms.

B

ON THE TILES

Apple wants us all to buy lots of new smart accessories, so smaller tiles leave room for neatly adding more devices.

C

IT'S CATEGORICAL

A new Categories list provides a quick overview of different groups of devices, such as lights, speakers and TVs.

D

ROOMS WITH A VIEW

The Rooms list hasn't changed, and still lets you view just the devices located in each room.

E

HOME SWEET HOME SETTINGS

The Home Settings button has been moved, and now enables you to change the order of rooms.



Master complications

Complications in watchOS 9 make your Apple Watch even more “you”

REQUIRES

Apple Watch S4 or later, watchOS 9

YOU WILL LEARN

How to personalize your Apple Watch

IT WILL TAKE

10 minutes



GENIUS TIP

If you use iOS 16's Focus modes on your iPhone and Watch, you can assign different watch faces to each Focus mode in Settings > Focus.



ONE OF OUR favorite things about watchOS 9 is that you can customize the way your Apple Watch looks. In addition to four new watch faces — Lunar, Metropolitan, Playtime, and the redesigned Astronomy — there are also big improvements to the complications you can use and where you can use them. Complications are little bits of apps, by Apple or a third party, that live on your watch face, for example to show you the weather forecast, what's

next on your Calendar, or how close you are to closing your Activity rings.

In many cases you can choose from multiple options, such as what weather information a complication will display, and you can often choose different shapes for different bits of your watch face. Sticking with the weather complication, for example, you can have it as a round icon or a rounded corner that displays more information.

COMPLICATION-FRIENDLY

The range of complications has been improved across multiple faces, and the Utility, Simple and Activity Analog faces have all been given new complications to make them more personal. And all the complication-friendly faces from before are still present and correct, often with new options too — so in addition to having tons of room for complications, the Modular, Modular Compact and X-Large faces now enable you to apply a background color to make them even more you. **CARRIE MARSHALL**



HOW TO Personalize your Apple Watch with complications



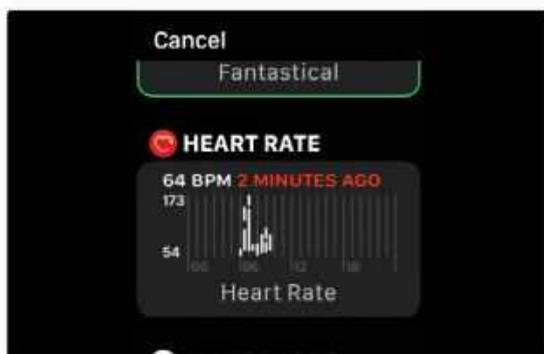
1 Find your face
Press and hold your current watch face. Swipe to choose from installed faces or choose New; if a face supports complications, you'll see them in the preview. Tap Edit to customize the face.



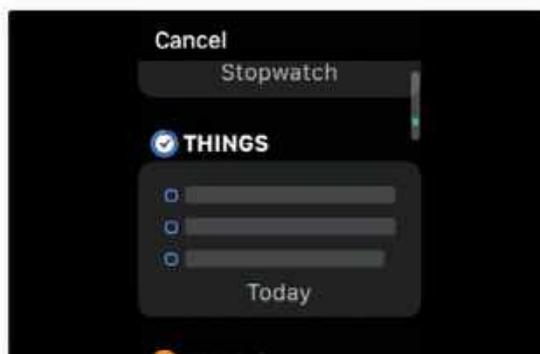
2 Pick your colors
The first editing screen you'll see is the one that enables you to change the color of the watch face. The Multicolor option (where available) is very good for complications, many of which use colors to highlight content.



3 Your complications
Swipe from the right and you should now see the complications screen, which shows you the location of each complication in the watch face. As you can see here, this face has two large complications and one little one.



4 Customize it
To change a complication, simply tap on it. You'll now be taken to a list of the available complications for that slot, so for example here we're looking at the complications for the large slots in our selected face.



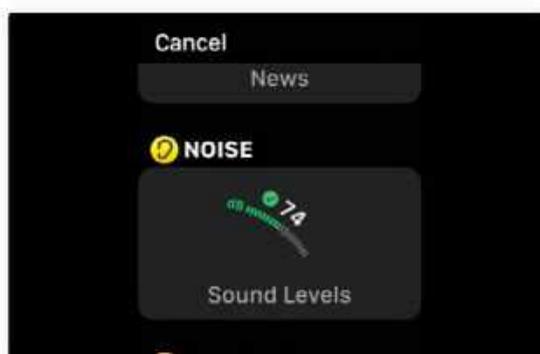
5 Third-party apps
Many third-party apps have complications too, such as the excellent Things productivity app shown here; this displays our Things to-do list so we can see at a glance what we've got planned for the day.



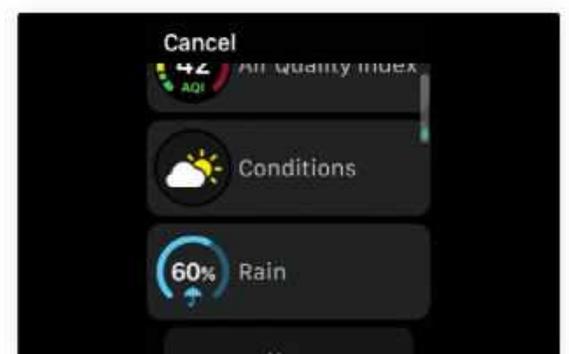
6 Use an app twice
You can use multiple complications from the same app – here we've got two charts from the Weather app. This is also really useful for fitness apps, enabling you to see multiple data types at once.



7 More complicated
Faces such as the Infograph have tons of room for complications: four in the corners and four in the center. Again you can use Multicolor for readability or set everything to the same color for something less bright.



8 See the shapes
With Infograph and other round faces, many complications are available as curved indicators for the corner of the screen – such as this noise level monitor, which lets you see how noisy your environment is.



9 Center icons
As well as corner complications, you can choose round icons for the center area. Many of these small complications still provide info, such as the weather icons here that show the current conditions and chance of rain.



Like the Apple TV, the Eve Motion security sensor supports Thread and Eve has announced plans for an update to add Matter as well.

Matter – the allied standard

The smart home tech of the future is coming to Apple devices



YOU WILL LEARN

What Matter is, and how it works with smart devices from different manufacturers



KEY FACT

The Matter website (www.csa-iot.org) includes a list of all the companies that plan to support Matter. As mentioned, this includes Apple, Amazon and Google, along with other big names like Samsung, Philips, Belkin and British Telecom. One notable absentee is Microsoft, with its Cortana voice assistant, which could be left out in the cold if Matter takes off.



THERE'S AN OLD saying in the computer industry: “The great thing about standards is that there’s so many of them.”

Unfortunately, there are times when having too many competing standards prevents new technologies from taking off and gaining widespread acceptance.

For years, people have been talking about smart homes full of smart devices such as lights, thermostats and security cameras, all connected and controlled via the internet (although Apple seems to prefer the term “smart home accessories”). Of course, many of us do now have smart lights and other devices in our homes, but the “smart home” hasn’t really taken off in the way that many people, including Apple, had hoped.

This is primarily because all these smart devices are based on different standards and technologies that don’t work together very well. The clear leader in smart home technology at the moment is Amazon’s Alexa, which is thought to be supported by around 100,000 different devices. Google Home takes second place

with around 50,000 devices, but Apple’s HomeKit technology is lagging way behind in third place and is only thought to have a few hundred compatible devices.

OUT IN THE COLD

HomeKit’s lack of success is disappointing, as it actually works very well, allowing you to control all your HomeKit-compatible smart devices using either Siri voice commands or the Home app on your Mac, iPhone or iPad. HomeKit also has strong security features, whereas many people are wary of Amazon Alexa and Google Home, given the way those companies Hoover up personal data and use it to sell advertising. Unfortunately, Apple failed to promote HomeKit in its early days, almost a decade ago, and allowed Amazon to establish a strong lead in this particular market.

This means there are several competing smart home technologies — and none of them are designed to work together. HomeKit works well if everyone in your household only uses Apple devices. But, as mentioned, there’s a limited selection of smart devices that work with HomeKit, and if anyone in your household also uses a Windows PC, an Android smartphone or an Amazon Echo speaker, HomeKit leaves them out in the cold.

So, in 2019, Apple got together with Amazon, Google and other companies to develop “a new smart home connectivity standard” called Matter, that would work across a variety of smart devices. It took longer than expected (the original release date was 2020) but Matter 1.0 was finally announced on 4 October 2021.



Some Apple TV 4K models already support Thread — and should be able to be upgraded to add Matter too.

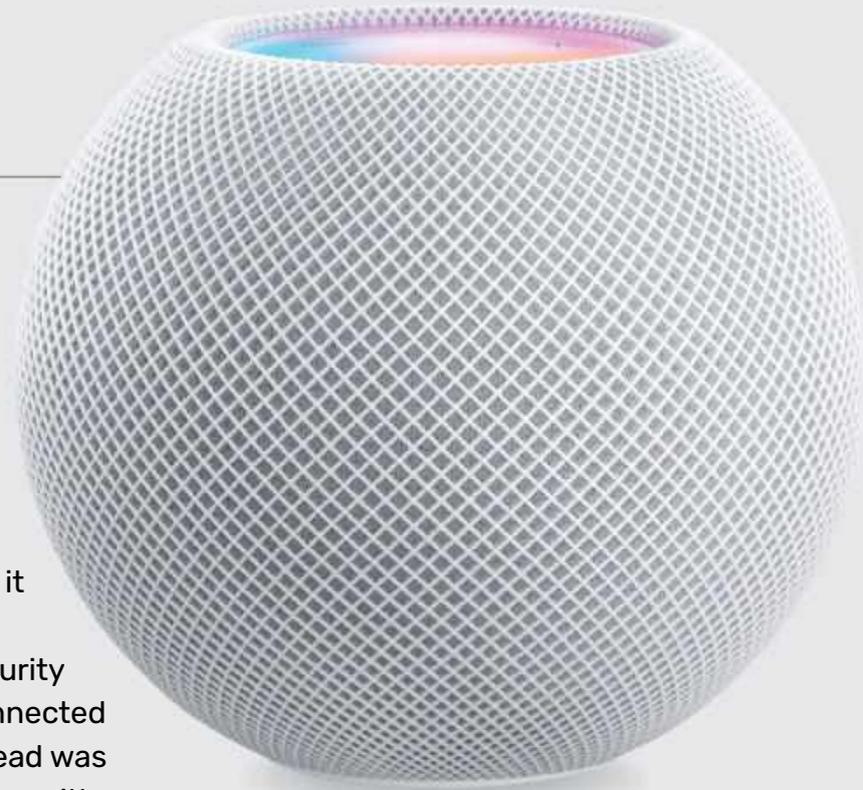
> WHAT IS THREAD?

Matter goes hand in hand with another new technology called Thread – in fact, people often talk about Matter and Thread as though they are one and the same thing. However, Matter is the common language that enables smart devices to talk to each other, while Thread is a wireless networking technology that creates the actual connection between the devices.

Many smart devices use Wi-Fi to connect to your home network. Wi-Fi is fast enough to handle streaming audio and video, and provides good range throughout your home, but it does require quite a lot of power. Some smart

devices opt for Bluetooth instead – which uses less power, but has limited range and can't connect to your wider home network.

Thread is the solution, as it provides good speed and range, but requires a lot less power than Wi-Fi. That makes it ideal for smaller, battery-powered devices, such as security sensors, that need to stay connected for months at a time. And Thread was actually available before Matter, with Apple including Thread in the HomePod mini that was launched back in 2020.



The HomePod mini includes both Wi-Fi and Thread, ready to use with Matter.

“Matter enables smart home accessories to work together, across platforms,” said Corey Wang, Apple’s Producer for Human Interface Design, at WWDC in June 2022. If Matter works properly, then a Matter-compatible light bulb can be controlled using Siri or the Home app on Apple devices, but will also work with Amazon’s Alexa and Echo speakers, Google Home, as well as devices from other manufacturers, such as Samsung’s SmartThings range. Other companies that have announced support for Matter include Philips (lights), Yale (locks), Arlo (security cameras) and even IKEA, which makes a number of smart lights and speakers.

THE MATTER ALLIANCE

Apple paints itself as a leader in the development of Matter but, in fact, this new technology was originally called Project CHIP — Connected Home Over IP — and that project was started by the Zigbee Alliance, which had developed yet another smart home technology, simply called Zigbee. It was the Zigbee Alliance that pulled off the magic trick of bringing together Apple, Amazon and Google to agree on a common smart home standard. With those big names on board, Zigbee changed its name to the Connectivity

Standards Alliance (CSA), and Project CHIP became Matter.

It’s the CSA group that now controls the development of Matter, but Corey Wang stated at WWDC that Apple has contributed its HomeKit technology as “the foundation of this new standard”. The use of HomeKit also addresses some of the security concerns that many people have about using smart devices in their homes. Matter “maintains the highest level of security,” says Wang. “Data about how you use your accessories is processed and stored by default in a way that even Apple can’t see.”

Now that it’s finally here, Matter certainly looks like it could be a game-changer for the smart home market, although we’ll still have to wait to see what sort of Matter-compatible accessories and devices appear in coming months. Wang has stated that there are “more than 130 products in the pipeline”, and Apple added Matter support in a beta version of iOS 16.1. And, if you take a look at www.csa-iot.org/members, you will see a long list of electronics companies that have also announced support for Matter. Now it’s just a matter of time as we wait to see if the standard really does usher in a new era for the modern smart home.

CLIFF JOSEPH



Products that support Matter will display the Matter logo – three arrows pointing together.



KEY FACT

Matter can work with Wi-Fi or Thread networking (see above). Devices such as security cameras, that need a very fast connection, can still use Wi-Fi, while smaller battery-powered devices, such as security sensors, can use Thread instead. Apple’s \$99 HomePod mini supports both Wi-Fi and Thread, and can act as a “border router” that connects Thread devices to your main Wi-Fi network.

iCloud

Tips, tricks & secrets

Discover the best ways to sync and share files
and data across all your devices

ISSUE 205
ON SALE
28 MAR
2023



ALSO INSIDE...

30 of the best Safari secrets

Think you've got the hang of Safari? We show you how to
dramatically improve your web browsing experience

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Contents subject to change

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PAPER LOVES TREES

U.S. forests, which provide wood for making paper, paper-based packaging and many other products, have been growing by over 1,200 NFL football fields every day!

Source: According to the UN Food and Agriculture Organization's 2020 Global Forest Resources Assessment, U.S. forest area expanded by an average of 605,000 acres per year between 1990 and 2020. An NFL football field is 1.32 acres in size.



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