

# PCWorld

FEBRUARY 2023

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FROM-  
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# PCWorld

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CONTRIBUTOR Adam Taylor  
COPY EDITOR Gail Nelson-Bonebrake

## DESIGN

ART DIRECTOR Steve Traynor  
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## CONTACT

PHONE 415/243-0500; FAX 415/442-1891

MAIL Editorial: 501 Second Street #600, San Francisco, CA 94107

STAFF ADDRESS To contact any *PCWorld* staff member, simply format the address as follows:  
*firstname\_lastname@idg.com*

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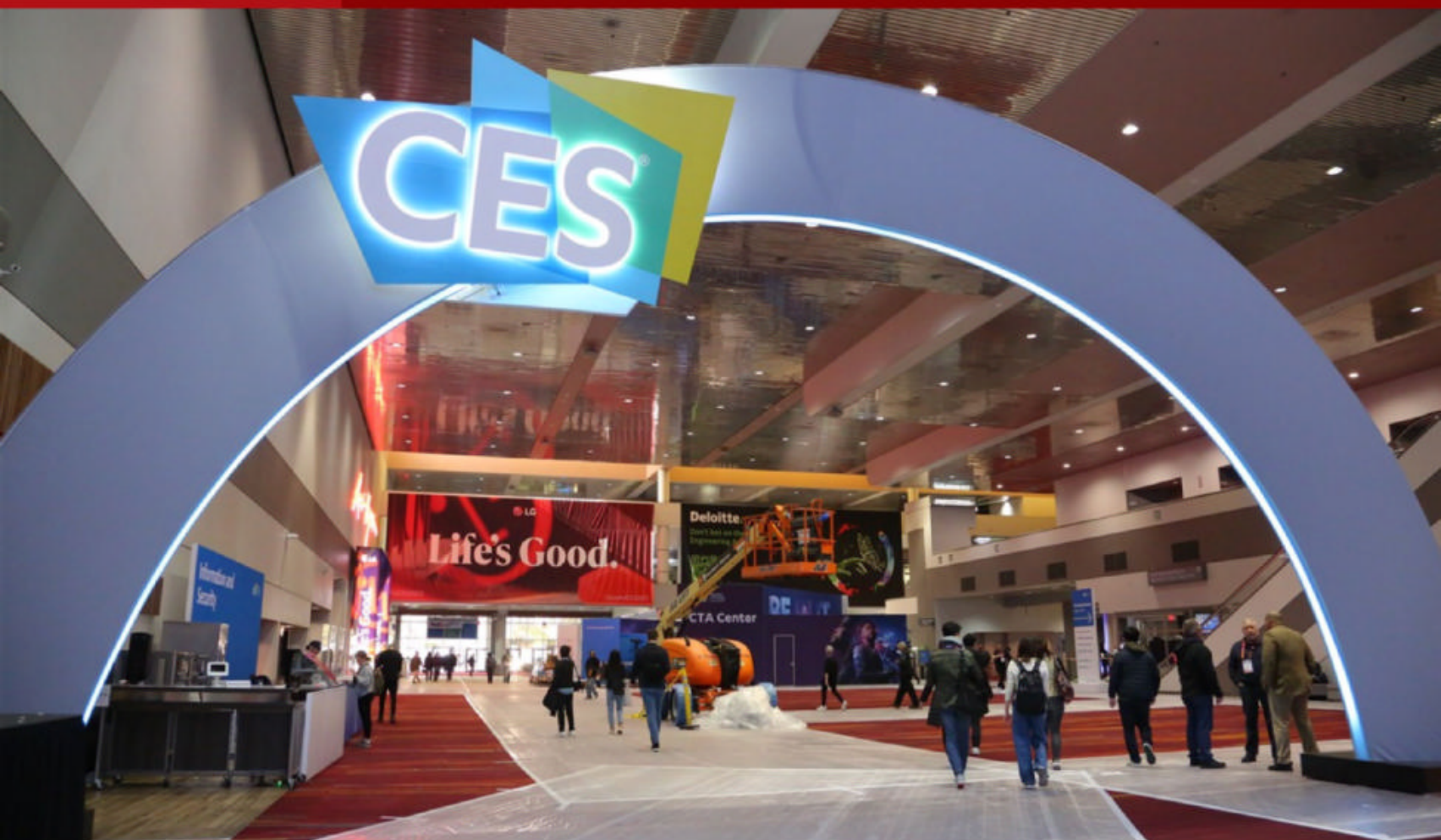


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# The 10 best laptops from CES 2023: These stunning notebooks stole the show

Dozens of powerful laptops were revealed this year—but these 10 stood out from the crowd.

**BY MATTHEW S. SMITH**

**T**he Consumer Electronics Show remains a singular event for PC laptop enthusiasts. Aside from Dell, which ditched the show in recent years, every major PC laptop maker is present, and most use it to reveal their best and brightest for the coming year. AMD ([fave.co/3WnH8ev](https://fave.co/3WnH8ev)), Intel ([fave.co/3Ws0jUx](https://fave.co/3Ws0jUx)), and

Nvidia ([fave.co/3XLPFje](https://fave.co/3XLPFje)) also come packing new mobile hardware heat. Dozens of powerful laptops were revealed this year—but these 10 stood out from the crowd.

## ACER SWIFT X 14

Arguably the least glamorous laptop on this list, Acer's Swift X 14 still showcases key



**The Swift X has a gorgeous display.**

processors. A high-resolution 1440p webcam is thrown in for good measure.

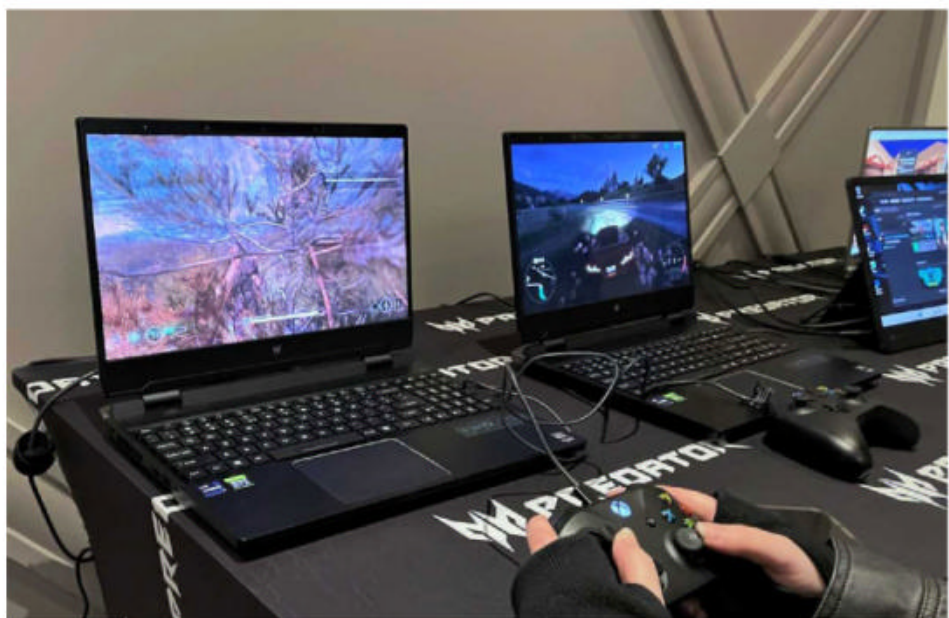
Pricing is what seals the deal. The Swift X 14 will hit stores in April starting at \$1,099.99. That's great value and positions the Swift X 14 as a budget alternative to more expensive 14-inch workstation and gaming laptops.

trends of CES 2023: the broad reach of OLED displays and newer, quicker hardware from Intel and Nvidia.

Let's talk displays. The Swift X packs an optional 14-inch OLED screen with 2,880 x 1,800 resolution and a refresh rate of up 120Hz, as well as VESA DisplayHDR 500 certification. It's a truly gorgeous screen. And though not a massive laptop, the Swift X 14 finds room for Nvidia RTX 4050 discrete graphics and Intel's new 13th-gen Core H-Series

## ACER PREDATOR HELIOS 300 SPATIAL LABS EDITION

Acer SpatialLabs View PCs offer glasses-free 3D on LCD screens—a bit like Nintendo's



**Acer's laptop offers glasses-free 3D on LCD screens.**



3DS, but larger and at a much higher resolution. Initially targeted at professional use, Acer brought SpatialLabs to gamers with the Predator Helios 300 SpatialLabs Edition.

Technically, the laptop itself isn't new. What's new is SpatialLabs TrueGame's 3D Ultra mode, which mitigates problems earlier versions of the technology encountered (interface elements and text were sometimes blurred or didn't appear with a correct sense of depth). I had a blast playing *Forza Horizon 5* on the SpatialLabs display. The glasses-free 3D effect is convincing—I felt as if I was playing with a fantastic slot car set or guiding a ludicrously fast RC car.

Now, I know what you're thinking: Will it work with my favorite game? You can check for yourself on Acer's SpatialLabs website ([fave.co/3WroTVF](https://fave.co/3WroTVF)).

## ASUS PROART STUDIOBOOK 16 3D OLED

Asus is getting in on glasses-free 3D as well with the ProArt StudioBook 16 3D OLED ([fave.co/3ksPpAz](https://fave.co/3ksPpAz)). It has a 16-inch 3.2K OLED screen with a maximum refresh rate of 120Hz and, like Acer's Predator Helios 300 SpatialLabs Edition, can deliver glasses-free 3D with the flip of a switch.



**Asus' ProArt StudioBook can deliver glasses-free 3D with the flip of a switch.**

The experience is similar to that provided by Acer, as both rely on technology built by Dimenco ([fave.co/3ksJaNa](https://fave.co/3ksJaNa)). Asus' OLED display does offer some benefits, however, with better contrast and excellent color gamut. I saw both at CES and found Asus' image quality superior. Asus seems to be a step behind Acer in game compatibility, though, instead focusing more on professional use.

The ProArt is a real powerhouse, too. It boasts Intel's 13th-Gen Core H-Series processors, Nvidia RTX 40-series graphics, and up to 64GB of memory. It also has dual Thunderbolt 4 ports for connecting multiple bandwidth-intensive peripherals and a dial control, which lurks near the touchpad, for quick and easy scrolling through video timelines or color palettes.



**The G14 delivers the top-tier hardware expected from the Zephyrus model line.**

The Asus ProArt Studiobook 16 3D OLED will arrive in Q2 2023. Pricing isn't announced.

## ASUS ROG ZEPHYRUS G14

Several Windows laptop makers came to CES 2023 boasting laptops with Mini-LED displays, but Asus' ROG Zephyrus G14 is the smallest. This compact 14-inch laptop, which was already among the best compact gaming laptops available ([fave.co/3qL4oHf](https://fave.co/3qL4oHf)), has found room for a vibrant Mini-LED screen that delivers over 600 nits of brightness and a refresh rate up to 165Hz.

The ROG Zephyrus G14 also delivers the top-tier hardware expected from the Zephyrus model line. This includes up to AMD Ryzen 9

processors and up to Nvidia RTX 4090 series mobile graphics. It also supports USB-C charging up to 100 watts and even has a 1080p HD webcam with support for Windows Hello facial recognition login. And, yes, Asus' LED matrix display lid remains, letting you show off jazzy animations to anyone nearby.

Asus will announce pricing closer to release, which should be in Q2 of 2023.

## LG GRAM STYLE (16 AND 14)

LG's feathery Gram laptop line has long been among the lightest available, but now they have style. Seriously! It's in the name!

The Gram Style does look quite ravishing with the optional pearl iridescent finish. It's attractive, but not so flashy that it becomes



**The Gram Style looks ravishing and maintains the slim appeal of its predecessors.**



garish. Looks aside, the Gram Style maintains the slim appeal of its predecessors. The 16-inch model weighs about 2.7 pounds, while the 14-incher is only 2.2 pounds, and both measure a tad more than six-tenths of an inch thick.

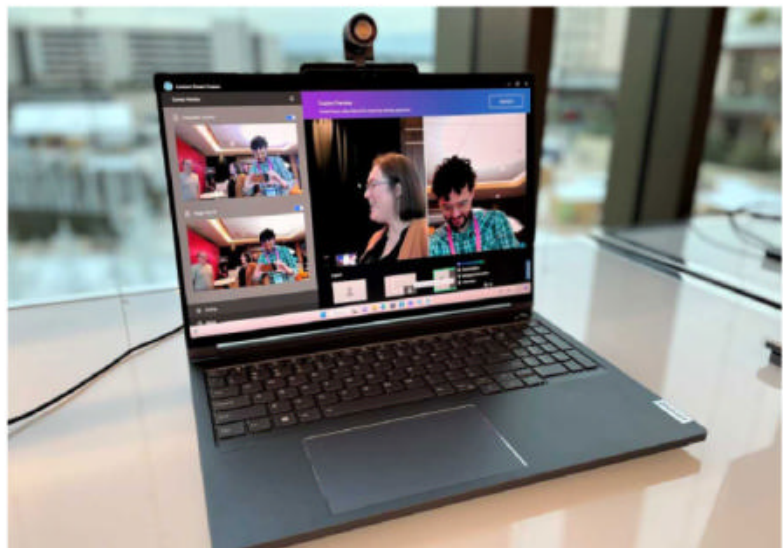
They're well equipped, too, with Intel 13th-gen Core P-Series processors, up to 1TB of solid-state storage, and up to 32GB of RAM. The 16-incher has a beautiful 3,200×2,000 OLED display with a refresh rate up to 120Hz, while the 14-incher has 2,880×1,800 OLED screen that refreshes at up to 90Hz.

LG says the new Gram line, including the Gram Style, will launch next month, but pricing is not yet available.

## LENOVO THINKBOOK P16 GEN 4

The Lenovo ThinkBook p16 has a little bit of magic—a Magic Bay, to be precise. That's Lenovo's name for a magnetic connector on the top of the display that supports accessories like a webcam, LED light, or 4G LTE modem. The webcam accessory is the start of the show, with 4K resolution at 30 FPS, a 270-degree mount, and a built-in privacy shutter.

But the Magic Bay isn't the only reason to like this laptop. It's a durable, attractive, and powerful laptop boasting Intel's 13th-Gen



**The ThinkBook p16's Magic Bay supports accessories like a webcam, LED light, or 4G LTE modem.**

Core H-Series processors, Nvidia RTX 40-series mobile graphics, and up to 32GB of RAM. This is a classic all-rounder, capable of day-to-day productivity, photo and video editing, programming, gaming, and just about anything else you can throw at it.

It's also competitively priced. Lenovo says the ThinkBook p16 will hit stores at \$1,349 in May 2023.

## LENOVO YOGA BOOK 9I

I'll be honest: I burst out laughing when I first saw this laptop. The dual-screen Lenovo Yoga Book 9i ([fave.co/3J71LJ7](https://fave.co/3J71LJ7)) looks a bit absurd in its vertically stacked configuration (can you imagine breaking it out at Starbucks?).

But it's no joke and there's a lot to like. This is a beautifully sculpted, luxurious 2-in-1 laptop with two stunning 13.3-inch 2.8K OLED screens. They can be used vertically



**The Yoga Book 9i is a luxurious 2-in-1 laptop with two stunning 13.3-inch 2.8K OLED screens.**

stacked or, more likely, side by side. The Yoga Book 9i also supports clamshell and tent modes with the optional to use a virtual keyboard on the lower display or a detachable physical keyboard. The internals include Intel 13th-gen Core i7 U-Series processors, yet, surprisingly, the 2-in-1 weighs only a hair over 3 pounds.

The Lenovo Yoga Book 9i will arrive in June 2023 at \$2,099.99.

## MSI STEALTH 14 STUDIO

The all-new MSI Stealth 14 Studio is a looker, sporting an (optional) two-tone vibe, slim design, and clever LEDs that spell out “Stealth” hidden in the fan vents. It also feels robust in the hand and has a 1440p,

240Hz IPS screen that seems a perfect fit for the laptop’s hardware.

So what’s it packing? The Stealth 14 Studio has an Intel Core i7-13700H and is equipped with Nvidia GeForce RTX 4060 and 4070 graphics. That’s impressive performance for a laptop this size, and the laptop does seem to get pretty toasty—but that’s true of every compact laptop at CES 2023. The MSI can also handle up to 64GB of RAM and 2TB of solid state storage. Pricing starts at \$1,499.99 and preorders should be live by the time you read this.

## MSI TITAN GT77 HX

Apple’s Mini-LED displays give the MacBook Pro 14 and 16 an edge over Windows competitors with bright, vivid screens that pack an HDR punch. But MSI’s huge Titan GT77 HX might finally have them beat. It delivers a 4K, 144Hz Mini-LED screen with



**MSI’s Stealth 14 Studio offers impressive performance.**





**The Titan GT77 HX is a powerhouse that leaps ahead of every other laptop on this list.**

VESA DisplayHDR 1000 certification, meaning it can hit a peak brightness above 1,000 nits.

Display aside, this laptop is a true powerhouse that leaps ahead of every other laptop on this list. It can be equipped with Intel's Core i9-13980HX, which delivers 24 processor cores, and Nvidia's RTX 4090 mobile. Memory tops out at 128GB of DDR5 RAM and storage support includes up to three PCIe solid-state drives.

The MSI Titan GT77 HX will start at \$4,299 when it arrives later this year.

## RAZER BLADE 18

Razer has jumped aboard the big laptop bandwagon ([fave.co/3kpfHUh](https://fave.co/3kpfHUh)) with the new Blade 18, a massive machine that's just a bit less of a beast than its competitors. It packs a 18-inch IPS LCD display with 2,560×1,600 resolution and

a refresh rate up to 240Hz, but weighs just a smidge over 7 pounds and measures 0.86 inch thick. That's not tiny, of course, but it undercuts most competitors. And while the laptop is large, it can be charged using a relatively compact GaN charger (delivering 280 or 330 watts, depending on the Blade 18's configuration).

The Blade 18 otherwise sticks to Razer's tried-and-true formula for success. It supports the latest Intel 13th-Gen processors up to the Core i9-13950HX, as well as up to Nvidia

RTX 4090 graphics. Memory stacks up to 64GB and storage up to 8TB, which should meet the demands of most professional creators. Despite its hardware and larger size, the chassis remains sleek and minimalist, and feels luxurious in the hand.

Pricing is luxurious, too. Razer says the Blade 18 will start at \$2,899.99 when it arrives in Q1 2023. 🔌



**The Blade 18 is massive, with an 18-inch display.**



# Microsoft 365 Basic is a gift for cheapskates

The new plan is just \$1.99 a month. **BY MARK HACHMAN**

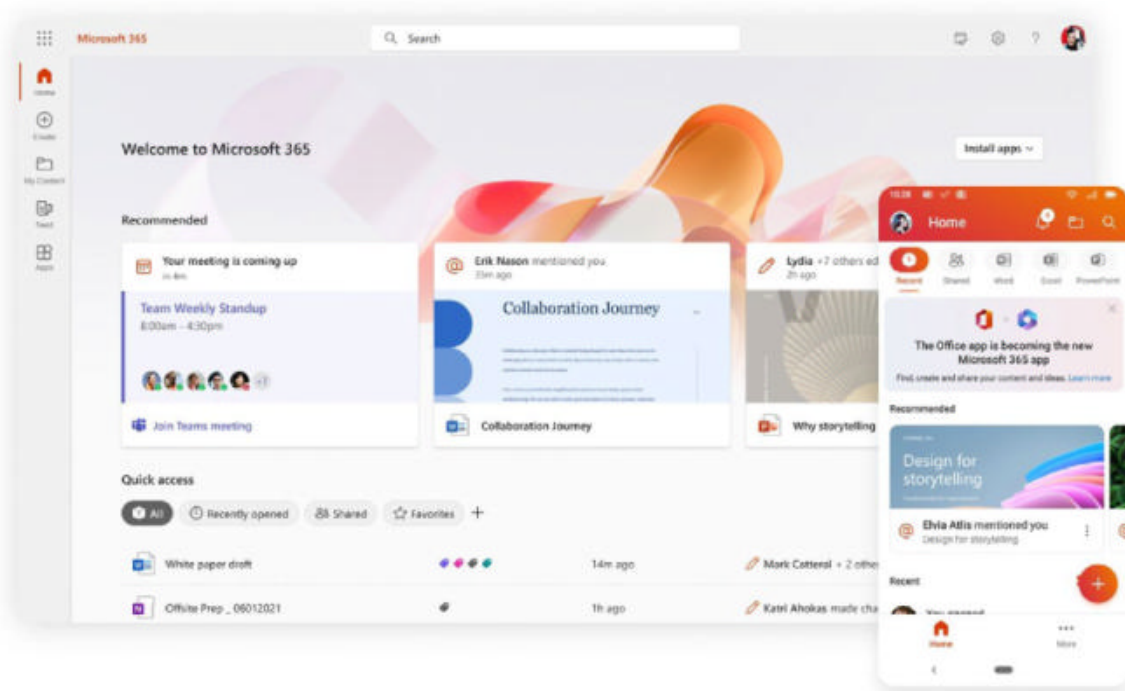
**M**icrosoft is celebrating 10 full years of Microsoft 365 by adding a new Microsoft 365 tier: Microsoft 365 Basic, which will cost just \$1.99 per month or \$19.99 per year when it launches on January 30.

It's clear that Microsoft 365 Basic is designed to add new users to the ongoing treadmill that is Microsoft's subscription model. But the offerings aren't half bad,

though there's a catch: Subscribers won't have access to the desktop versions of Word, Excel, and PowerPoint—just the web and mobile versions of those apps. Apart from that, Microsoft is making 100GB of OneDrive cloud storage available, rather than the 1TB that accompanies the Microsoft 365 Personal (\$6.99 per month) and Microsoft 365 Family (\$9.99 per month) plans.

Microsoft's pitch is that the new Basic plan






**Subscribers won't have access to the desktop versions of Word, Excel, and PowerPoint, just the web and mobile versions of those apps.**

will bring with it peace of mind, and the company points to the ability to back up one's photos as part of that. The Basic plan also offers access to Microsoft support for both Windows 11 and the Microsoft 365 (formerly Office 365 apps), too. The free version of Microsoft 365, which includes the web and mobile versions of Microsoft 365 and just 5GB of cloud storage, does not.

Microsoft 365 Basic will add both ransomware recovery and password-protected sharing links in OneDrive later in 2023, Microsoft said.

In addition to offering the new Microsoft 365 plan, Microsoft also plans to better communicate how OneDrive files are stored. "With this

update, you get a simplified overview of your storage usage across Microsoft 365, including OneDrive, Outlook, and more," Microsoft said.

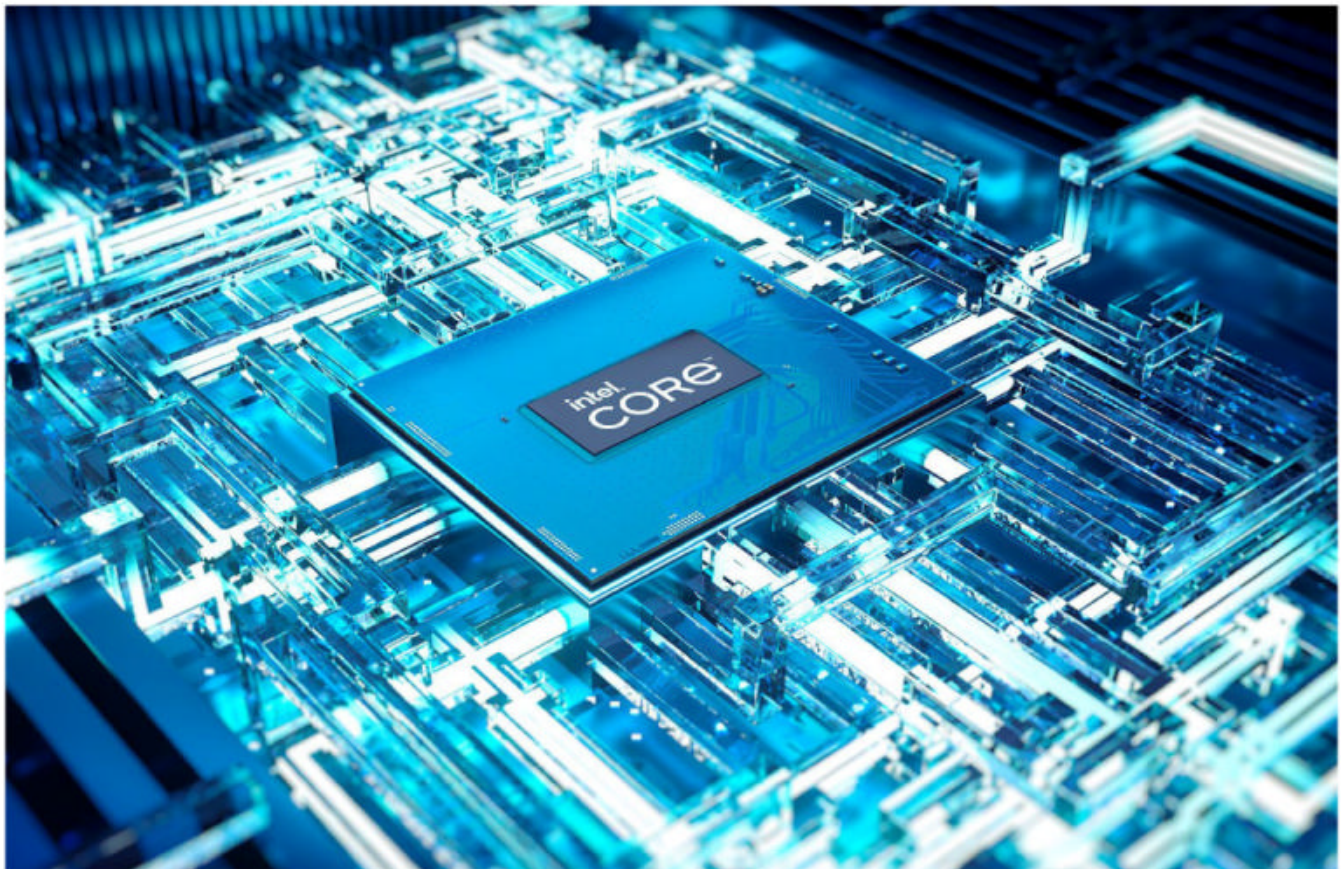
The key appears to be that Microsoft will now break out various components of your storage quota. In an example, Microsoft showed how the storage quota could be separated into general OneDrive storage and also attachments sent along with Outlook email. That's another useful way to help you clean up your Outlook inbox ([fave.co/3J1VKNy](https://fave.co/3J1VKNy)) beyond the ways Microsoft already provides. 



**How your OneDrive storage quota will eventually look.**

# Intel's Core i9-13900KS breaks the 6GHz barrier, launches today

Core i9-13900KS will be first CPU to reach 6GHz in stock form. **BY GORDON UNG**



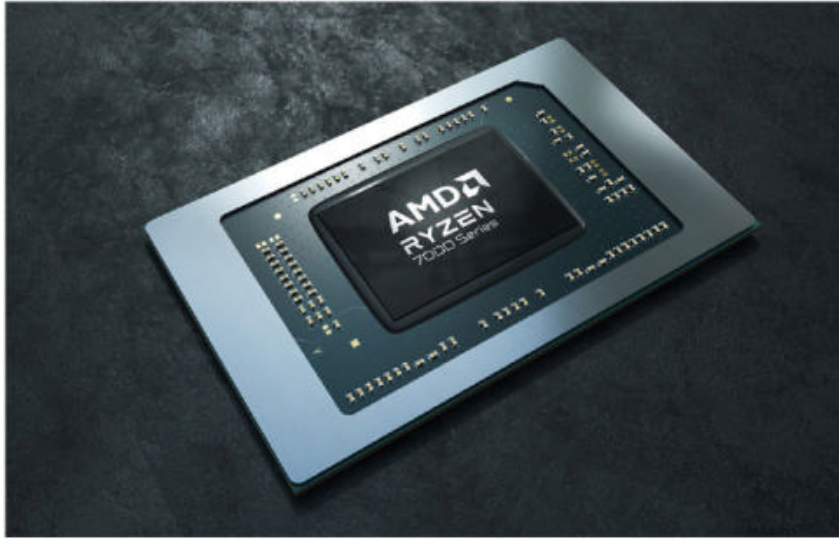
Intel's long-awaited Core i9-13900KS will officially be the first x86 consumer CPU to hit the 6GHz barrier. You will pay a premium for the barrier-breaking privilege, as the chip will cost \$699.

The 24-core Core i9-13900KS is essentially a special-edition version of the already released (and unapologetically fast) Core i9-13900K ([fave.co/3v8rWqE](https://fave.co/3v8rWqE)). It features eight performance cores and 16

efficiency cores. The original Core i9-13900K could reach 5.8GHz on single-core loads, while the Core i9-13900KS will round that up to a smooth 6.0GHz on single-core loads.

"The Core i9-13900KS continues our 13th Gen Intel Core desktop processor family excellence, showcasing the new performance heights made possible by our performance hybrid architecture," Intel





**The Core i9-13900KS will likely go toe-to-toe with AMD's new Ryzen 9 7950X3D chip.**

Client Computing Group manager Marcus Kennedy said in a statement. "Extreme gamers and enthusiasts can now push their everyday performance further than ever before with the first desktop processor in the PC industry to provide 6.0GHz speeds at stock."

So how much does a 200MHz boost in turbo speeds buy you in performance? On the face of it, the new Core i9-13900KS might outpace the now plain-Jane 13900K by about 4 percent in some tasks. It's also possible the new KS chip might offer a small advantage elsewhere, too. Companies typically sort CPUs based on quality, a process called "binning" that usually means the the top binned chips are the

cream of the crop, which brings other qualities besides the best stock speeds.

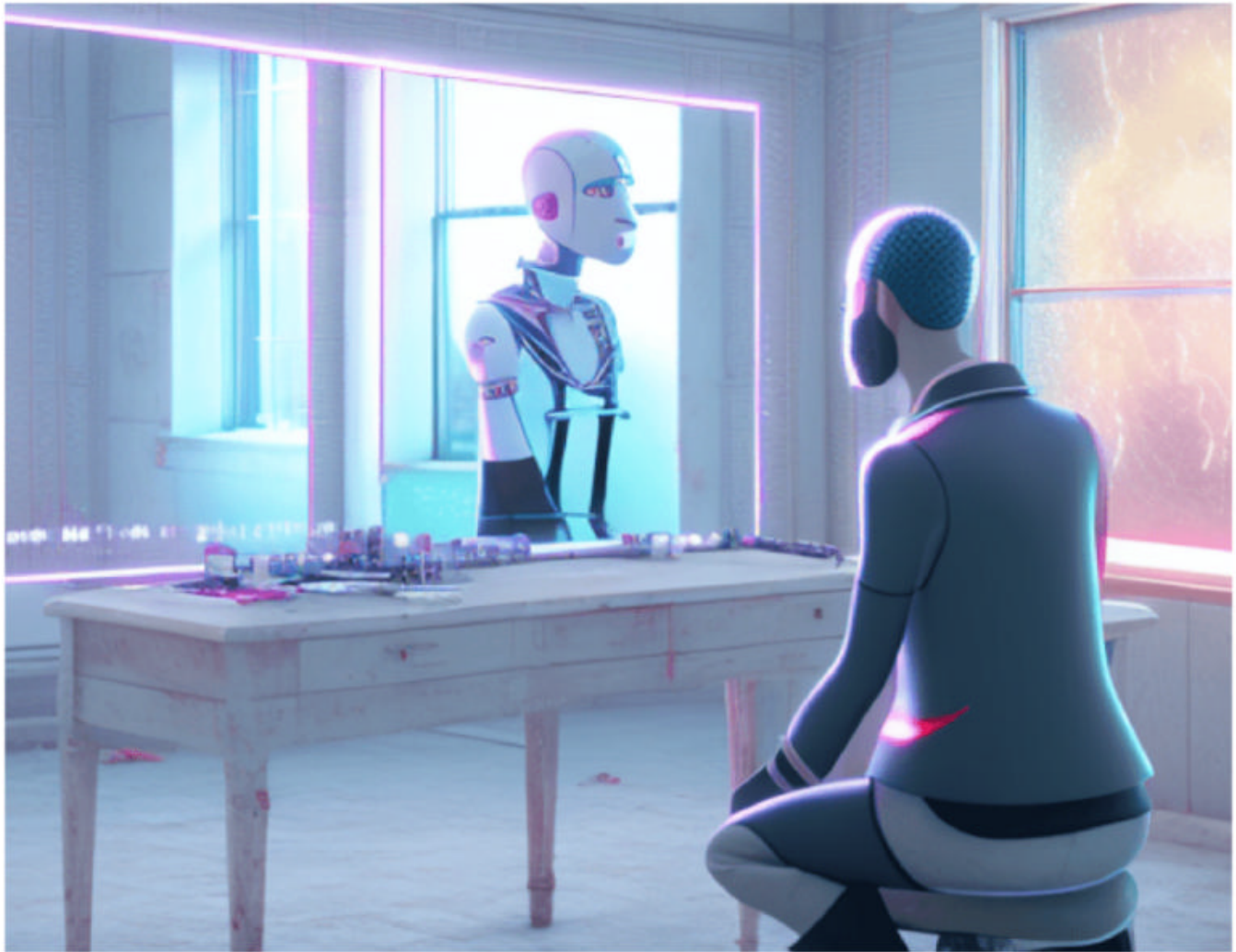
For Intel, however, it gives the company something to crow about over the competition. Humans oddly care a lot about the big round numbers—it's even said that 6GHz is more eye catching than, say, 6.2GHz to the average person. In other words, it's really all psychological, but also a point of pride to both companies who

have been engaged in a slug fest for years over desktop processor performance.

The Core i9-13900KS will likely go toe-to-toe with AMD's new Ryzen 9 7950X3D chip ([fave.co/3weWvLE](https://fave.co/3weWvLE)), which was announced at CES. AMD has yet to announce a price and availability date, giving Intel a clear runway for its Core i9-13900KS when it goes on sale. 🔌



**The 24-core Core i9-13900KS is essentially a special-edition version of the Core i9-13900K.**



# AI Tom Hanks didn't offer me a job, but it sure sounded like he did

AI audio has improved—and this isn't even the latest model. **BY MARK HACHMAN**

**T**om Hanks didn't just call me to pitch me a part, but it sure sounded like he did.

Ever since PCWorld began covering the rise of various artificial intelligence applications like AI art ([fave.co/3YnSzFq](https://fave.co/3YnSzFq)), I've been poking around in the

code repositories in GitHub and links within Reddit, where people will post tweaks to their own AI models for various approaches.

Some of these models actually end up on commercial sites, which either roll their own algorithms or adapt others that have published as open source. A great example of



an existing AI audio site is Uberduck.ai ([fave.co/3WksFQF](https://fave.co/3WksFQF)), which offers literally hundreds of preprogrammed models. Enter the text in the text field and you can have a virtual Elon Musk, Bill Gates, Peggy Hill, Daffy Duck, Alex Trebek, Beavis, The Joker, or even Siri read out your pre-programmed lines. We uploaded a fake Bill Clinton praising PCWorld last year and the model already sounds pretty good ([fave.co/3aShWv8](https://fave.co/3aShWv8)).

Training an AI to reproduce speech involves uploading clear voice samples. The AI learns how the speaker combines sounds with the goal of learning those relationships, perfecting them, and imitating the results. If you're familiar with the excellent 1992 thriller *Sneakers* (with an all-star cast of Robert Redford, Sidney Poitier, and Ben Kingsley, among others), then you know about the scene in which the characters need to crack a biometric voice password by recording a voice sample of the target's voice. This is almost exactly the same thing.

Normally, assembling a good voice model can take quite a bit of training, with lengthy samples to indicate how a particular person speaks. In the past few days, however, something new has emerged: Microsoft Vall-E, a research paper (with live examples, [fave.co/3ku0vFF](https://fave.co/3ku0vFF)) of a synthesized voice that requires just a few seconds of source audio to generate a fully programmable voice.

Naturally, AI researchers and other AI groupies wanted to know if the Vall-E model

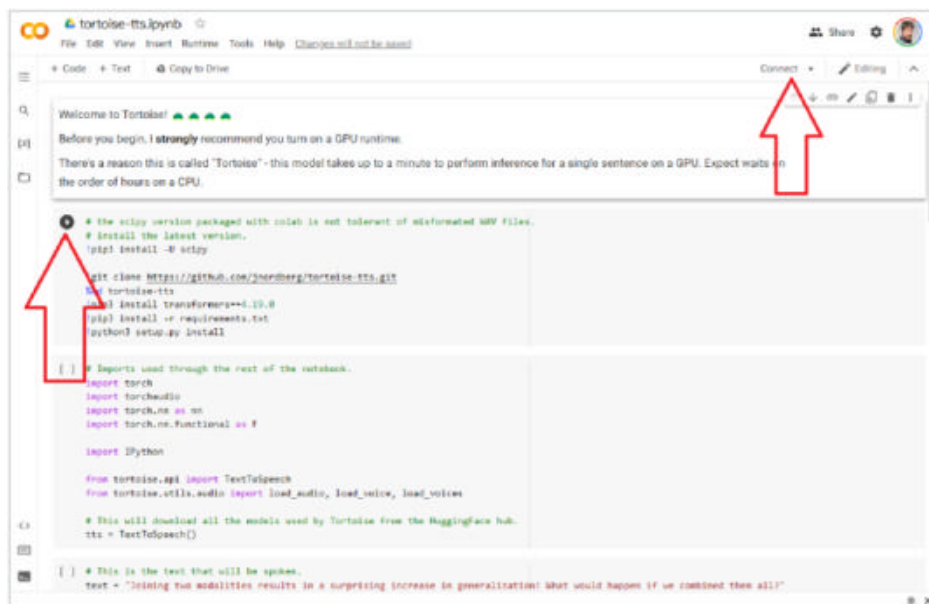
had been released to the public yet. The answer is no, though you can play with another model if you wish, called Tortoise. (The author notes that it's called Tortoise because it's slow, which it is, but it works.)

## TRAIN YOUR OWN AI VOICE WITH TORTOISE

What makes Tortoise interesting is that you can train the model on whatever voice you choose simply by uploading a few audio clips. The Tortoise GitHub page ([fave.co/3CXdTsb](https://fave.co/3CXdTsb)) notes that you should have a few clips of about a dozen seconds or so. You'll need to save them as a WAV file with a specific quality.

How does it all work? Through a public utility that you might not be aware of: Google Colab ([fave.co/3XEFTsm](https://fave.co/3XEFTsm)). Essentially, Colab is a cloud service Google provides that allows access to a Python server. The code that you (or someone else) writes can be stored as a notebook, which can be shared with users who have a generic Google account. The Tortoise shared resource is here ([fave.co/402EGNN](https://fave.co/402EGNN)).

The interface looks intimidating, but it's not that bad. You'll need to be logged in as a Google user and then you'll need to click Connect in the upper-right corner. A word of warning: While this Colab doesn't download anything to your Google Drive, other Colabs might. (The audio files this generates, though, are stored in the browser but can be



**The Tortoise Colab.** Click the Connect button to get started, then click the small “play” icon next to each block of code in turn.

downloaded to your PC.) Be aware that you’re running code that someone else has written. You may receive error messages either because of bad inputs or because Google has a hiccup on the back end such as not having an available GPU. It’s all a bit experimental.

Each block of code has a small “play” icon that appears if you hover your mouse over it. You’ll need to click “play” on each block of code to run it, waiting for each block to execute before you run the next.

While we’re not going to step through detailed instructions on all of the features, just be aware that the red text, such as the suggested text that you want the model to speak, is user modifiable. About seven blocks down, you’ll have the option of training the model. You’ll need to name the

model, then upload the audio files. When that completes, select the new audio model in the fourth block, run the code, then configure the text in the third block. Run that code block.

If everything goes as planned, you’ll have a small audio output of your sample voice. Does it work? Well, I did a quick-and-dirty voice model of my colleague

Gordon Mah Ung, whose work appears on our The Full Nerd podcast ([fave.co/3v6fp8i](https://fave.co/3v6fp8i)) as well as various videos. I uploaded a several-minute sample rather than the short snippets, just to see if it would work.

The result? Well, it *sounds* lifelike, but not like Gordon at all ([fave.co/3HjlmDq](https://fave.co/3HjlmDq)). He’s certainly safe from digital impersonation for now. (This is not an endorsement of any fast-food chain, either.)

But an existing model that the Tortoise author trained on actor Tom Hanks sounded pretty good ([fave.co/3wi3p2P](https://fave.co/3wi3p2P)). This is not Tom Hanks speaking here! Tom also did not offer me a job, but it was enough to fool at least one of my friends.

The conclusion? It’s a little scary: The age of believing what we hear (and soon see) is ending. Or it already has. 🔌



# Ice-cold PC market sees worst sales ever in fourth quarter

The 28.1 percent drop was the worst ever, Gartner said. **BY MARK HACHMAN**



**T**he PC market collapsed during the fourth quarter of 2022, analysts said, with an unprecedented drop in sales due to inflation and other factors.

IDC reported that PC unit sales fell by 28.1 percent to 67.2 million units, while Gartner said that sales fell by 28.5 percent to 65.3 million units. (IDC is owned by International

Data Group [IDG], which owns PCWorld.) According to Gartner, the drop is the largest since the firm began its PC coverage in the mid-1990s.

Analysts blamed a perfect storm of pandemic-related issues. "The anticipation of a global recession, increased inflation, and higher interest rates have had a major impact on PC demand," said Mikako Kitagawa, the

TOP 5 COMPANIES, WORLDWIDE TRADITIONAL PC SHIPMENTS, MARKET SHARE, AND YEAR-OVER-YEAR GROWTH, 2022

	LENOVO	HP	DELL	APPLE	ASUS	OTHERS	TOTAL
2022 Shipments (million units)	68	55.3	49.8	28.6	20.6	70.1	292.3
2022 Market Share	23.3%	18.9%	17%	9.8%	7%	24%	100%
2021 Shipments (million units)	81.8	74	59.3	27.9	21.8	85.2	350.1
2021 Market Share	23.4%	21.1%	16.9%	8%	6.2%	24.3%	100%
2022/2021 Growth	-16.9%	-25.3%	-16.1%	2.5%	-5.7%	-17.8%	-16.5%

IDC said that PC sales fell fairly universally across 2022.

director analyst at Gartner. “Since many consumers already have relatively new PCs that were purchased during the pandemic, a lack of affordability is superseding any motivation to buy, causing consumer PC demand to drop to its lowest level in years.”

Still, IDC noted that 2022 shipments were well above pre-pandemic levels at 292.3

million units for the full year. Consumers bought up PCs at record rates in 2020 and 2021, but declined to upgrade those relatively new PCs.

“Consecutive quarters of declines clearly paint a gloomy picture of the PC market, but this is really all about perception,” said Ryan Reith, group vice president with IDC’s Worldwide

Mobility and Consumer Device Trackers, in a statement. “2021 was near historic levels for PC shipments, so any comparison is going to be distorted. There’s no question when we look back at this time that the rise and fall of the PC market will be one for the record books, but plenty of opportunity still lies ahead. We firmly believe the market has the potential to recover in 2024 and we also see pockets of opportunity throughout the remainder of 2023.”

Both firms named Lenovo, HP, and Dell as the top three worldwide PC



Although Lenovo is still one of the top three worldwide PC vendors, it still suffered a huge drop in sales.



vendors for the fourth quarter, though all suffered drops in the number of PCs sold by almost 30 percent. Lenovo ended the year with a 23 percent market share, followed by HP (19.6 percent) and Dell (16.1 percent), according to IDC. Apple (7.5 percent) and Asus (4.8 percent) rounded out the top five, IDC said, though Gartner agreed with the rankings as well. Gartner believes that the decline in shipments will persist during 2023.

The U.S. PC market recorded its sixth straight quarter of declining shipments. HP, Dell, Apple, Lenovo, and Asus ended the year as the top five PC vendors. “Even as vendors offered deep PC discounts during the holiday season in an



Dell remains one of the top five PC vendors.

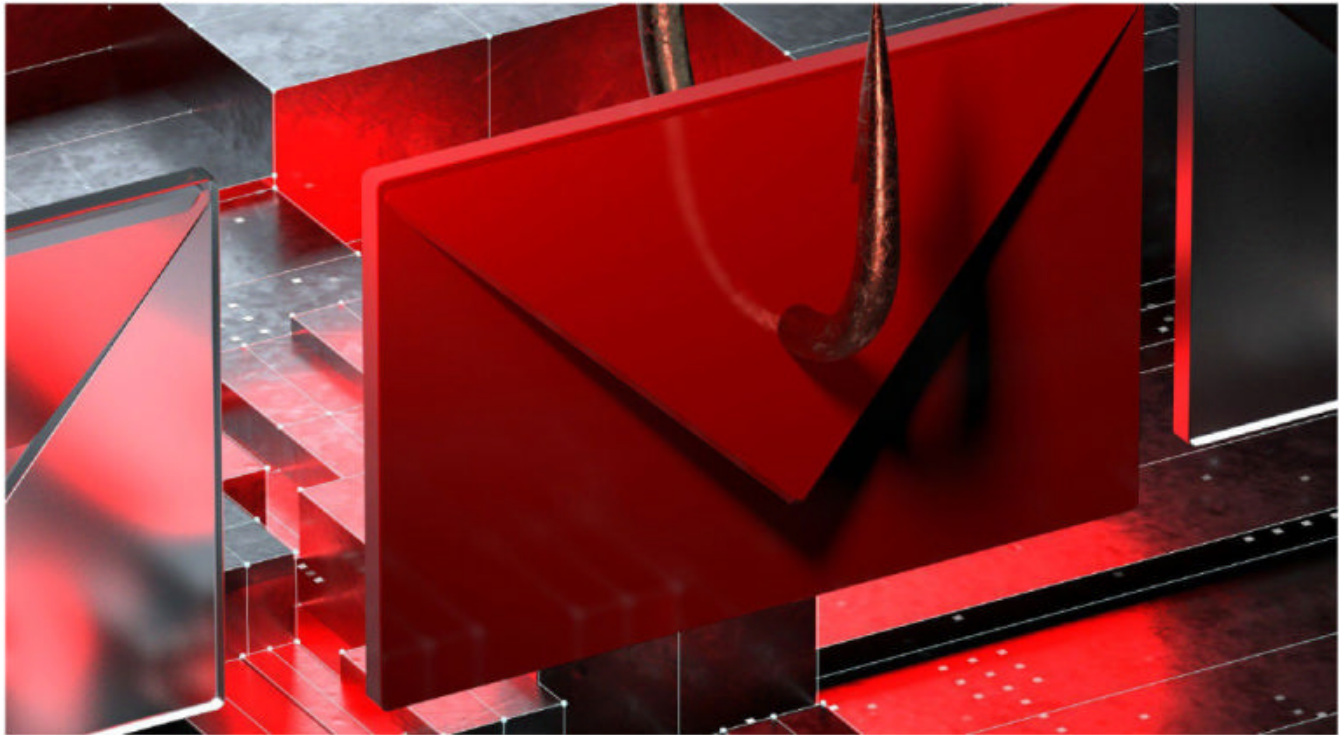
attempt to lower inventory, consumers were not swayed to spare their money,” Kitagawa said. 🔌

### PRELIMINARY U.S. PC VENDOR UNIT SHIPMENT ESTIMATES FOR 4Q22

	LENOVO	HP	DELL	APPLE	ASUS	ACER	OTHERS	TOTAL
4Q 2022 Shipments (thousand units)	2,387	4,582	4,005	2,936	954	729	1,511	17,104
4Q 2022 Market Share	14%	26.8%	23.4%	17.2%	5.6%	4.3%	8.8%	100%
4Q 2021 Shipments (thousand units)	3,147	5,380	5,925	3,030	906	1,125	2,001	21,513
4Q 2021 Market Share	14.6%	25%	27.5%	14.1%	4.2%	5.2%	9.3%	100%
4Q 2022/4Q 2021 Growth	-24.2%	-14.8%	-32.4%	-3.1%	5.3%	-35.1%	-24.5%	-20.5%

Gartner’s estimates for the fourth quarter of 2022, and the U.S. PC market.

**Notes:** Data includes desktop and laptop PCs that are equipped with Windows, macOS, and ChromeOS. All data is estimated based on a preliminary study. Final estimates will be subject to change. The statistics are based on shipments selling into channels. Numbers may not add up to totals due to rounding.



# Watch out for phishing attacks after the latest credit breach

Have your name, address, birthday, and Social Security number been leaked onto the web before? You should probably be on alert. **BY ALAINA YEE**

**E**xperian, one of the biggest consumer credit reporting bureaus, likely put your full credit history into the hands of identity thieves last year. On Monday, news broke of a major flaw in the company's website, which allowed anyone with your name, address, birthdate, and Social Security number to bypass a security check and get to your report.

First discovered by security researcher Jenya Kushnir, the exploit had an unknown duration and was only patched in late

December 2022—seemingly after Brian Krebs of Krebs on Security, having been notified by Kushnir about the issue, brought it to Experian's attention. (You can read the full details in Krebs' post about the matter, [fave.co/3GOkcPG](https://fave.co/3GOkcPG).)

Given how many data breaches have leaked all the information needed by identity thieves (including the massive 2017 Equifax hack, [fave.co/3XMLyww](https://fave.co/3XMLyww)), you can now assume your private financial info is out on the web. Accordingly, you'll want to be on guard

against even more clever phishing scams in the future—the kind meant to disarm you with info you might assume only a legitimate source would have.

The good news is that your existing protective measures against phishing still apply here—you can look over our guide to the important basics ([fave.co/3D5iGYG](https://fave.co/3D5iGYG)) if you need a refresher. But in the wake of this Experian leak, you should pay extra attention in a few specific situations:

**Receiving calls or messages from so-called Experian representatives.** You could receive a phone call, text message, or email from someone who says they represent Experian, claiming you must respond to a matter or verify personal information. It's likely a scam. Don't click on any links and don't respond directly—follow up by reaching out to Experian via the company's official contact methods, [fave.co/3CYpKpF](https://fave.co/3CYpKpF).

**Getting alerts about your credit accounts.** Legitimate messages about your credit card, car loan, mortgage, or other debt often include information like the first or last few digits of your account. That information isn't private anymore. If you receive any warnings about your accounts, treat them with caution and don't click any links. Call or message your lender through the phone number or portal available on its website.

### Getting alerts about your bank

**accounts.** The credit bureaus don't track checking and savings accounts, but many people use just one or two institutions for all their financial needs. An unexpected phone call, text message, or email could be a ploy to suss out information on your savings. Don't immediately trust anyone asking about these kinds of accounts, no matter how legitimate they sound.

In the end, avoiding phishing attacks still boils down to the same defense: Have guards in place, like a trusted password manager and antivirus software on your PC to help with basic URL screening. Then, when unexpected communication arrives, always take a little time to think over the call or message. Nowadays, self-protection is the only line of defense between you and a massive headache—or worse. 🔌



**If you receive an unsolicited text message from someone claiming to be from Experian, it's likely a scam.**





# The year of the OLED monitor has finally arrived

Drop-dead-gorgeous OLED monitors are going mainstream, finally. **BY MATTHEW S. SMITH**

**T**he annual Consumer Electronics Show has teased PC enthusiasts and gamers craving OLED monitors for years now, but has never left them satisfied. This was true even at last year's show. Yes, the Alienware AW3423DW is excellent ([fave.co/3bTPB8b](https://fave.co/3bTPB8b)), but I hoped its release would be the beginning of an OLED tidal wave. That never happened.

CES 2023 might be different. LG came to the show with a flashy 45-inch ultrawide and a more practical 27-inch 1440p, both of which are

available for preorder right now. Samsung has fired back with the Odyssey OLED G9 ([fave.co/3HoY9AU](https://fave.co/3HoY9AU)), a flashy 49-inch super-ultrawide due for release in early 2023. They're impressive monitors, and the OLED panels in them will go mainstream in displays from Asus, Acer, Alienware, Dought, and MSI, among others.

## OLED COMPETITION IS COMING

The unending dawn of OLED for PC monitors was due, at least in part, to a lack of options.

OLED panels are produced by only a few companies, most notably LG and Samsung, and a mere handful of panel options were available to monitor manufacturers. The low production volume of OLED panels suitable for monitors kept prices high.

But at CES 2023, that changed. We have ourselves a race.

LG and Samsung leaned into OLED for the PC market in 2020. You've likely noticed the results if you've bought a PC laptop ([fave.co/3qL4oHf](https://fave.co/3qL4oHf)) in the past two years. Laptops with OLED displays ([fave.co/3qL4oHf](https://fave.co/3qL4oHf)) are much, much more common than they used to be, and OLED is now available in laptops below \$1,000 ([fave.co/3D9Xr86](https://fave.co/3D9Xr86)).

The war between LG and Samsung will also improve the affordability of PC monitors. Both have their own OLED panel technology: LG offers a WRGB OLED panel, while Samsung offers QD-OLED. And both have incredible influence in the world of display technology and are familiar with working with a wide range of different partners.

Surprisingly, LG won the battle at CES 2023. Samsung's QD-OLED, which is found in the Alienware AW3423DW and (of

course) the new Samsung Odyssey OLED G9, looks spectacular. However, LG's new 27-inch 1440p 240Hz OLED panel is a superb fit for mainstream PC gamers, and LG is ramping up production to support multiple third-party monitor makers ([fave.co/3D674Vf](https://fave.co/3D674Vf)). It's likely this panel will dominate until Samsung can respond with a QD-OLED option of similar size.

CES 2023 was also a reminder that OLED technology faces broader competition. Several new Mini-LED monitors and laptop displays ([fave.co/3rDPT6T](https://fave.co/3rDPT6T)) arrived from multiple manufacturers including Acer, Asus, Razer, and Lenovo. Samsung, meanwhile, continues to invest in Micro-LED, a panel technology constructed from tiny LEDs, and showed its latest generation of NEO QLED 8K televisions at CES 2023.



**LG's Ultragear 27 OLED monitor.**

Affordable Micro-LED televisions are years away, and monitors will be even more challenging due to their smaller size. Still, Mini-LED and Micro-LED represent a long-term threat to OLED. Both can deliver much higher levels of brightness and can do so without suffering the risk of burn-in. The evolution of alternative panel technologies gives LG and Samsung incentive to improve OLED's performance and cut costs.

## SUBPIXELS REMAIN AN ISSUE

OLED has many perks, but it's not perfect. Most OLED panels found in computer monitors and laptops use a subpixel layout that differs from the RGB layout common to LCD displays. This can cause issues like color bleed or fringing around details and an overly pixelated look for small fonts.



**Acer's curvaceous Predator X45 OLED looks absolutely outstanding in person.**

Let's set one thing straight: PC enthusiasts hoping LG and Samsung have a cheap RGB-OLED panel up their sleeves should check their expectations. David Park, senior product marketing manager at LG, says the company's use of an alternative layout (in LG's case, WRGB) is purposeful.

"It's the brightness. For the screen sizes that are 55, 65, and larger, we can add control architectures...we can use different picture algorithms to really push that brightness," says Park, explaining that its current OLED panel technology for small displays is meant to maximize brightness for the display size. "On the screen sizes that are 45, 27, we can't use the same technology, that brightness doesn't shine through. So there's an advantage to using WRGB, where you get that white subpixel."

Samsung did not provide comment

when asked if it might change the subpixel layout of future QD-OLED panels available for PC monitors. This likely means the answer is no—for the foreseeable future, at least.

Still, eagle-eyed PC enthusiasts have options. JOLED, a small company





**Asus' ROG Swift OLED PG27AQDM was unveiled at CES 2023.**

based in Tokyo, produces the excellent OLED panel found in the Asus ProArt Display OLED PA32DC ([fave.co/3Ws4fVF](https://fave.co/3Ws4fVF)), which I reviewed last year, and the upcoming Asus ProArt Display OLED PA32DCM, a premium 4K OLED monitor revealed at CES 2023. JOLED's panels have excellent clarity, but the panels are produced in low volumes, which makes them expensive. They also don't offer the high refresh rate of LG and Samsung panels.

## **FINALLY, MAINSTREAM AVAILABILITY IS REAL**

OLED's image quality, pixel response times, and low input latency make it an ideal technology for PC gaming and, for many

people, general day-to-day-use. Yet high pricing and extremely limited availability have kept OLED monitors out of most homes.

But 2023 is the year in which that will finally change. Acer, Asus, Alienware, Corsair, and Dought are among the monitor makers with plans to release new OLED monitors. Some monitors based on new OLED panels, such as Corsair's Xeneon Flex

([fave.co/3kpXndG](https://fave.co/3kpXndG)), are already available and others are currently up for pre-order.

And this is just the start. "[LG has] plans to introduce different screen sizes, different form factors," says Park. "Throughout 2023, you'll hear more announcements from LG on different OLED monitors we're going to bring to the market."

Make no mistake: These monitors command a premium price, and it's likely to be some years before OLED comes close to the rock-bottom pricing of modern IPS LCD monitors. Still, many PC enthusiasts will happily pay a few hundred more to gain OLED's advantages—and in 2023, after years of waiting, that will finally be possible. 🔌

# Intel and AMD are building AI into PCs. It doesn't matter yet—but it will

CES 2023 showed us the future of AI in PCs, but 2024 and beyond is where we'll reach it.

**BY MARK HACHMAN**



**T**he rise of consumer-focused artificial intelligence applications (like AI art, [fave.co/3YnSzFq](https://fave.co/3YnSzFq), and ChatGPT, [fave.co/3wnujwM](https://fave.co/3wnujwM)) was the most dynamic trend of 2022. But don't get too excited quite yet—buying new laptops from AMD and Intel with AI functions built in aren't worth opening your wallet. Given the breakneck pace of AI development, though, they may very well be come *next year's* CES.

Here's what's going on. Deep within the confusing mishmash ([fave.co/3XMVZ3I](https://fave.co/3XMVZ3I)) of

processor architectures that make up AMD's latest mobile Ryzen chips ([fave.co/3WnH8ev](https://fave.co/3WnH8ev)) lies XDNA, the new AI hardware architecture that AMD is launching within the Ryzen Mobile 7040 Series as "Ryzen AI." (Think of XDNA as the AI version of RDNA, the foundation of AMD's Radeon graphics cores.) Intel has similar plans, though right now it's using a discrete Movidius AI card ([fave.co/3Ws0jUx](https://fave.co/3Ws0jUx)) as a placeholder until its Meteor Lake chips integrate a "real" AI core ([fave.co/3XwKbST](https://fave.co/3XwKbST)). Qualcomm has offered AI

technology as part of its Arm-based Snapdragon chips for years, which power most smartphones but are a niche player in Windows PCs.

Right now, there is only one reason to buy an AI-powered PC: Windows Studio Effects, the collection of webcam technologies built into the Snapdragon-wielding Microsoft Surface Pro 9 5G ([fave.co/3ghcbtC](https://fave.co/3ghcbtC)).

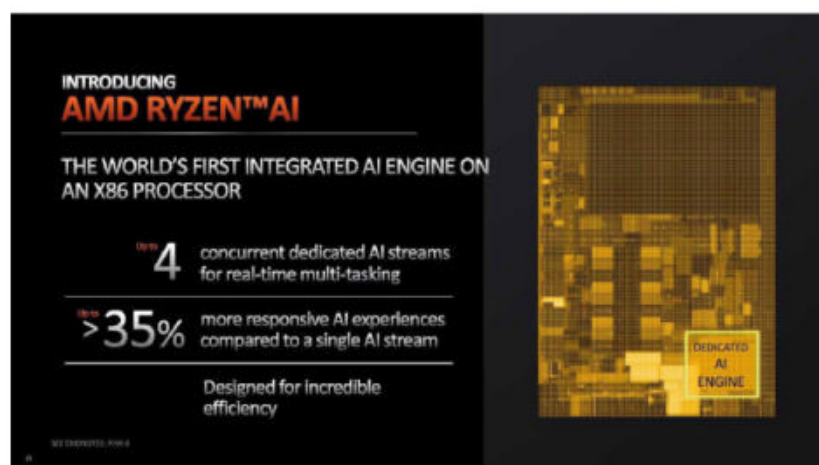
Windows chief Panos Panay joined AMD CEO Lisa Su onstage to talk up Studio Effects during XDNA's introduction. The technology includes a number of different features—an integrated background blur, noise filtering to cut out background sounds, Eye Contact, and automatic framing. All use AI in some ways; Eye Contact, for example, uses the webcam to notice where your eyes are looking and then applies AI to make them look as if you're constantly making eye contact with the camera.

That's interesting, though not ground-breaking. Still, Microsoft has smartly used AI to improve productivity on your local device in ways that make you look more alert and productive. Without it, you simply have to put more effort in: Pay attention, make sure you're centered on camera, and conduct meetings from a quiet location.

But AI is still feeling itself out on a number of different fronts. First, there's the hardware.

Remember that PC sound accelerators started out within the CPU, migrated out into a standalone chip or card (RIP, SoundBlaster) and then back into the CPU again. GPUs traced a similar path, but they've become so valuable that they'll remain discrete components seemingly forever. With AI, no one's quite sure: AI art applications like Stable Diffusion ([fave.co/3kzk7rZ](https://fave.co/3kzk7rZ)) were designed for PC GPUs, but they require a substantial amount of video RAM to even function. It's far easier for users to ask services like Midjourney ([fave.co/3QWOeFQ](https://fave.co/3QWOeFQ)) or Microsoft's stunning Designer app ([fave.co/3HkIEJ5](https://fave.co/3HkIEJ5)) to compute those AI functions in the cloud, even if you have to "pay" via a subscription or advertising.

There's also the very reasonable question of what AI apps and services we'll see in the years to come. AI art exploded during the last six months to not only include art but AI-powered chatbots like ChatGPT ([fave.co/3wnujwM](https://fave.co/3wnujwM)) that some think may replace





or supplement search engines like Bing ([fave.co/3H7ij10](https://fave.co/3H7ij10)). Companies quietly toiled away on AI server hardware and learning models throughout the past years, and the fruits of those labors are being reaped now. Training massive AI engines can literally take months, but models like ChatGPT can generate text right now that could receive passing grades in high school. What will the next generation hold? We all remember what the early days of the PC were like, with Pentium chips pushing the PC into the mainstream. It very much feels like that time now, even if we can't know for sure what that future will look like.

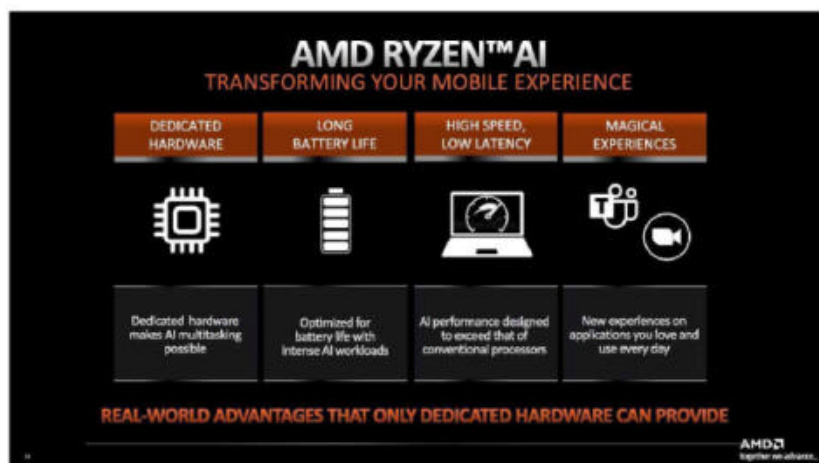
It's probably fair to say, then, that 2022 was the year AI began emerging into the public consciousness. This year, 2023, feels like the year it all begins shaking out: what services will be viable, what we'll use, what society will ask for in the future. It seems very likely that software forks of Stable Diffusion and other AI frameworks will be recoded for Ryzen AI and the Movidius hardware, and

we'll have a better understanding of how XDNA compares to RDNA in terms of what it can accomplish.

That's an exciting future, though it's still the future. AMD told PCWorld that its XDNA architecture was designed around an FPGA (Field Programmable Gate Array) it obtained from its Xilinx acquisition, a technology which allows quick reconfiguration of the hardware. FPGAs make sense when a technology isn't totally understood, and changes and adjustments need to be made.

Subsequent chip revisions in 2024 and 2025 will likely integrate AI into our computing lives: top-to-bottom integration, more dedicated logic. Who knows? We may use AI to "train" digital models of ourselves, so those models can start to serve as AI proxies—scheduling dentist appointments, say, with knowledge of our calendar and our contacts. We could create a video avatar of ourselves as a sort of visual voice mail, if we still use voice mail.

On the other hand, people have been betting big on the metaverse. The future that a company *wants* isn't always what it ends up being. We doubt you'll rush out to buy new AI-powered PC processors. For now, we'd recommend you wait. But we're also fairly confident that AI will be a part of your PC's future, whenever that future ends up arriving. 🔌



>> How a silver lining forms

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

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

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

>> Come together at [lovehasnolabels.com](http://lovehasnolabels.com)



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## The best cheap cell phone plans: Slash your monthly bill

Alternative providers offer a wider range of plans and at better prices. **BY ALAINA YEE**

**A**T&T, Verizon, and T-Mobile may seem like your only cell phone plan options, but they're not. And sticking with the familiar could be costing you hundreds per year.

Alternative providers use the same networks as the big companies, offering almost identical service but with lower prices, still no contracts, and often more perks. With a

mobile virtual network operator (MVNO), an unlimited plan can be had for as little as \$30 per month for a single line, and \$25 per line for group plans. And that includes 5G coverage.

Light cell phone users can enjoy big savings, too. Where you live doesn't matter either—AT&T, Verizon, and T-Mobile MVNOs all exist. The only real catch is that deciding on the right alternative carrier takes a little

more consideration (see below), but we've taken those into account when choosing our top picks.

In fact, not only do our selections cost little, but you can expect straightforward

management of your account, accessible customer service, and little hassle if you chose to leave. A couple even toss in great perks, like free subscriptions to cloud storage or streaming services (or both).

## BEST CHEAP CELL PHONE PLANS WITH UNLIMITED DATA: **CRICKET**

**Carrier:** AT&T

**Cost:** \$60/mo from [fave.co/3kyFh9u](https://fave.co/3kyFh9u)

**Taxes included:** Yes

**BYOD:** Yes

**Data throttling:** None

**Hotspot allowed:** Yes (15GB)

**International roaming:** Mexico and Canada included

The advertised price is what you'll pay with this AT&T subsidiary.

Taxes and fees are included in the cost of its premium Unlimited + 15 GB Mobile Hotspot plan ([fave.co/3GXBQRj](https://fave.co/3GXBQRj)), which offers truly unlimited talk, text, and data. Coverage includes international roaming in Mexico and

Canada, and within the U.S. you also get international texting to 37 countries.

A slew of perks comes with this plan: 15GB of hotspot data, HBO Max (with ads), and 150GB of cloud storage. It also gets the same prioritization as post-paid AT&T subscribers, meaning your calls, texts, and data won't suffer extra delays in congested areas.

Managing an account is pretty easily done via website or app, and customer service is

easy to reach. It works out well despite the lack of a slick interface or fast service.

**Need multiple lines?** Cricket Wireless

offers hefty group discounts, particularly for four or five lines. Currently, you'll pay just \$160 a month for five lines for this plan, or \$32 per month per line.



## BEST T-MOBILE CHEAP PLAN WITH UNLIMITED DATA: **METRO BY T-MOBILE**

**Carrier:** T-Mobile

**Cost:** \$40/mo from [fave.co/3J961I2](https://fave.co/3J961I2)

**Taxes included:** Yes

**BYOD:** Yes

**Data throttling:** Possible after 35GB usage

**Hotspot allowed:** No

**International roaming:** Mexico and Canada for an additional fee

A fun perk included with T-Mobile subsidiary MetroPCS's plans is T-Mobile Tuesdays ([fave.co/3XR3qq2](https://fave.co/3XR3qq2)), which provides freebies and deals on food, gas, and more. But the real benefit to MetroPCS is its all-inclusive pricing, which means taxes and fees are included in the advertised cost.

This basic \$40 unlimited plan ([fave.co/3Hmpu6l](https://fave.co/3Hmpu6l)) offers up to 35GB of 5G or LTE data unthrottled; afterward you may see slowdowns whenever the network's congested. Note that this basic plan lacks hotspot use and the extras available to more expensive unlimited plans, like a Google One membership (100GB), a 1-year subscription to Vix+, and unlimited texting to over 210 locales.

T-Mobile does put MetroPCS subscribers

at lower priority for call, text, and data requests, so if your area is congested, you may notice slower responses than on a post-paid plan before using 35GB of data.

**Need multiple lines?** Like Cricket Wireless, MetroPCS's group discounts are sizable for four or five lines. For this plan, it's \$125 a month for five lines, or \$25 per month per line.

**Want to save even more cash?**

Rival T-Mobile MVNO Tello ([fave.co/3R2VzDU](https://fave.co/3R2VzDU)) offers a \$30 unlimited plan

with hotspot included, as well as free calling to over 60 countries. But its data throttling starts earlier, at 25GB, and will bump you down to a painful 64Kbps. It also doesn't bundle taxes and fees into its prices, so if you live in an area with high regulatory charges, the cost skirts closer to \$40 per month.



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## BEST VERIZON CHEAP PLAN WITH UNLIMITED DATA: US MOBILE

**Carrier:** Verizon

**Cost:** \$45/mo from [fave.co/3R2Wqo6](https://fave.co/3R2Wqo6)

**Taxes included:** No

**BYOD:** Yes

**Data throttling:** Possible after 100GB usage

**Hotspot allowed:** Yes (50GB)

**International roaming:** Yes (100-plus countries, possible additional fee)

US Mobile's incredibly slick interface makes switching to its Unlimited Premium ([fave.co/3XNXCxx](https://fave.co/3XNXCxx)) plan an absolute breeze. In fact, managing your account is so easy through the app and website, they're part of what sells this service.



But the meat of this top-tier plan is still the star of the show. You get unlimited talk and text, along with 100GB of 5G data and 50GB of hotspot data before you're subject to speed throttling.

You also get free international LTE roaming in select countries ([fave.co/3QVHsjC](https://fave.co/3QVHsjC)), with data allotments as generous as 10GB. (This varies by country; some still require an additional fee.)

The main drawback of US Mobile is that despite its premium data plans having the same prioritization as post-paid Verizon plans, you'll only experience that benefit on a 5G device. LTE-only phones get hit with deprioritization, and in our

experience, it can cause your data to crawl—especially if the network is congested or you've got poor reception. You also have to pay taxes and fees separately, which can hit hard in areas with high regulatory charges.

#### **Need multiple lines?** US Mobile's

group discounts steadily drop the cost the more lines you have, with the maximum of four lines costing \$120 a month or \$30 a month. But the company further sweetens the pot—

plans with three lines can choose a free subscription to a streaming service (such as Spotify, Disney Plus, HBO Max, or Xbox Live Gold), while plans with four lines can choose two.



## BEST CHEAP CELL PHONE PLANS: MINT MOBILE

**Carrier:** T-Mobile

**Cost:** \$15/mo from [fave.co/3H02M2S](https://fave.co/3H02M2S) and up (3-, 6-, or 12-mo plan)

**Data:** 4GB

**Taxes included:** No

**BYOD:** Yes

**Hotspot allowed:** Yes

**International**

**roaming:** Yes, separate pay-as-you-go rates

This Ryan Reynolds-backed MVNO may be best known for its green fox mascot, but it's more than a gimmick. Mint Mobile's ([fave.co/3Xx7z2J](https://fave.co/3Xx7z2J))

[co/3J7JQSp](https://fave.co/3J7JQSp)) ultra-affordable 4GB plan includes unlimited talk and text, free use of your data for mobile hotspot, and free calling to Mexico and Canada.

The catch? You have to buy the plans in

increments of three, six, and 12 months. An annual plan is required to get costs down to \$15 per month, or \$180

upfront. A 7-day trial ([fave.co/3Xx7z2J](https://fave.co/3Xx7z2J)) allows you to try the service before you commit, but it can still be a gamble if you're not 100 percent sure about coverage in your area.



The good news is that Mint Mobile often runs promotions, in which the three-month plans cost as little as the annual rate—or less, if you catch a buy three, get three free promotion. Taxes and fees tend to be lower, since you pay once on the whole plan rather than per month.

**Need more data?** Mint Mobile also offers 10GB, 15GB, and unlimited plans.

Unlimited plans are capped at 5GB for mobile hotspot, 480p resolution for streaming, and speed throttling after 35GB of data use.

**Hate online subscriptions?** You can purchase extensions for Mint Mobile plans at Best Buy ([fave.co/3kwTC6m](https://fave.co/3kwTC6m)) and Target ([fave.co/3ZOM92N](https://fave.co/3ZOM92N)).

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## BEST AT&T CHEAP PLAN: H2O WIRELESS

**Carrier:** AT&T

**Cost:** \$12.50/mo (annual plan) from [fave.co/3J4evA9](https://fave.co/3J4evA9)

**Data:** 3GB

**Taxes included:** No

**BYOD:** Yes

**Hotspot allowed:** No

**International**

**roaming:** Yes, at additional pay-as-you-go rates

H2O Wireless ([fave.co/3J4evA9](https://fave.co/3J4evA9))

offers many plans, but best among them are its 12-month options, with the 3GB plan particularly standing out at \$12.50 month or \$150 total. You get unlimited talk and text, 3GB of high-speed

data, and unlimited throttled data (128Kbps). If you need more data, you can instead bump up to the 10GB 12-month plan (\$25/mo or \$300 total).



The big risk with H2O Wireless is that no trial is available—the best way to try out the service is to first sign up for a monthly plan (such as the \$20 per month 2GB plan or \$30 per month 6GB plan), see how well you like it, and then switch plans.

**Never use data?** Don't ever use data, including for group texts, audio text messages, or picture messages? Check out H2O wireless's \$5 per month unlimited talk and text annual plan (\$60 total).

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## PREPAID: VERIZON WIRELESS

**Carrier:** Verizon

**Cost:** \$35/mo (after auto-pay discount) from [fave.co/3XR5ONw](https://fave.co/3XR5ONw)

**Data:** 15GB

**Taxes included:** No

**BYOD:** Yes

**Hotspot allowed:** Yes

**International roaming:** Yes, for an additional fee

If you don't use a lot of data, the options for cheap Verizon plans are limited. Generally your options are the choice of iffy customer service or paying nearly as much as for a cheap unlimited plan.

But if you really hate the idea of a \$45 a month unlimited plan, then Verizon's own basic prepaid plan ([fave.co/3Xx82Ss](https://fave.co/3Xx82Ss)) is your best bet—provided you sign up for auto-pay, which knocks \$10 off the monthly cost (\$45) immediately. Otherwise, you're on the hook at the going rate for three months until loyalty discounts start kicking in.

This plan includes unlimited talk and text, 15GB of high-speed data, mobile hotspot use, unlimited 2G data, and unlimited international texting from the US to 200-plus

countries. You also get unlimited calling and texting to Mexico, Canada, Puerto Rico, and the U.S. Virgin Islands.

If you travel, you have access to unlimited calls, text, and data while in Mexico, Canada, Puerto Rico, and the U.S.

Virgin Islands (data capped at 3G speed after 2GB per day use); other areas require the purchase of a TravelPass ([fave.co/3Xwlo1w](https://fave.co/3Xwlo1w)).



[co/3Xwlo1w](https://fave.co/3Xwlo1w)).

**Heads-up:** Verizon deprioritizes most of its prepaid plans, so you may face slower speeds and responsiveness from the network, especially in congested areas or places with poor reception. Only unlimited plans with premium data (such as Verizon's Unlimited Plus prepaid plan or US Mobile's plans with premium data) get treated the same as Big Red's post-paid plans.

## BEST CHEAP CELL PHONE PLAN FOR INTERNATIONAL ROAMING: **GOOGLE FI**

Google Fi ([fave.co/3iTuFBM](https://fave.co/3iTuFBM)) started as a rival to MVNOs like Republic Wireless: It charged a baseline \$20 fee for unlimited talk and text, and then \$10 per gigabyte of data. You saved big on your cell phone bill by leaning hard on Wi-Fi for all of your data needs.

But the best part of Fi was its inclusion of free international roaming in over a hundred countries with its plan. You could land in the U.K. and then hop between Denmark, Italy, and Germany without paying an extra dime—just your usual base fee plus data charges. All the hassle of obtaining a local SIM card was gone as well; you simply turned on your phone at your destination and went on your merry way.



This feature is still going strong, with even more countries and territories supported (200 plus). Google has further sweetened its plan offerings, too. Data charges on its original metered plan are now capped—you won't pay more than the cost of 6GB—and there's also a \$65 a month unlimited plan with this kind of international roaming.

While at home in the U.S., you can make free calls to other countries (Canada and Mexico at minimum, or more with the Unlimited Plus plan). You'll also get

treated with the same priority as T-Mobile's post-paid customers for network connectivity, so slowdowns shouldn't be an issue outside of typical congestion.

### **The one small(ish)**

**catch:** Your phone must be compatible with Google Fi, which relies on multiple cellular networks (T-Mobile and U.S. Cellular) to provide talk, text, and data connectivity.

These days, many phones work, but models built for this kind of switching (such as Pixel or newer Samsung phones) are your best bet.



## **BEST CHEAP CELL PHONE PLAN FOR IRREGULAR DATA USE: TRACFONE WIRELESS**

**Carrier:** Verizon

**Cost:** \$60 from [fave.co/3WAGASst](https://fave.co/3WAGASst)

**Taxes included:** No

**BYOD:** Yes

**Hotspot allowed:**

No

**International**

**roaming:** No

If you want plans, Tracfone has them—plans upon plans. This is fortunate if a regular monthly plan is more than you need, but a pay-as-you-go plan not enough—one special Tracfone plan lets you buy a set pool of talk, text, and data to use over the

span of a year.

This offering, available only through eBay, costs \$60 for 1,200 minutes, 1,200 texts, and 3GB data plan ([fave.co/3Xtji2v](https://fave.co/3Xtji2v)) and lasts for 365 days. This means you can stretch out that use however you see fit—a

perfect fit if some months you need more and others less. This plan also allows your choice of carriers.

For extra savings:

Keep an eye out for discounts on this plan—in previous years, it's been possible to get it for \$30 or less. You can most easily do this by creating a deal alert on Slickdeals.net ([fave.co/3H3Nqds](https://fave.co/3H3Nqds)).



## BEST CHEAP PAY-AS-YOU-GO CELL PHONE PLAN: PAGE PLUS CELLULAR

**Carrier:** Verizon

**Cost:** \$10 and up from [fave.co/3ROu5P8](https://fave.co/3ROu5P8)

**Expiration:** 120 days

**Taxes included:** No

**BYOD:** Yes

**Hotspot allowed:** No

**International roaming:** No

Yes, you can still find pay-as-you-go plans, where you pay a fixed amount for each minute, text, or megabyte of data you use. Page Plus Cellular ([fave.co/3ROu5P8](https://fave.co/3ROu5P8)) is

among the best, as it allows you to pay as little as \$10 to keep your line topped off—and the credit lasts 120 days. You can even roll over the credit if you add more money to your account within that four-month window.

These days, the company requires an LTE-compatible phone, so your rates will



follow the 4G Plan details: \$0.06 per minute, \$0.29 per minute while domestically roaming, \$0.05 per text, \$0.20 per international text, \$0.05 plus data costs for picture messages, and \$0.05 per megabyte. Calls to directory assistance (411) cost \$1.25 plus the standard rate per minute.

**Want to go longer between top-offs?**

The \$80 pay-as-you-go plan lasts one year.

**Seeking cheaper rates?** Tello, [fave.co/3XSIxvl](https://fave.co/3XSIxvl) (T-Mobile) has some of the best pay-as-you-go rates available, charging just \$0.01 per minute, \$0.01 per text, and \$0.02 per megabyte.

The catch: The minimum buy-in is \$20, and credits expire in 90 days.

**Can't use Verizon or T-Mobile?** H2O

Wireless, [fave.co/3J9bizk](https://fave.co/3J9bizk) (an AT&T-based network) also has pay-as-you-go rates, though it's twice as expensive for data. Credits also expire faster (90 days).

## OTHER CARRIERS WE CONSIDERED

**Boost Mobile** (T-Mobile, [fave.co/3H1XR1c](https://fave.co/3H1XR1c)):

This popular MVNO often runs tempting promotions for its plans, but customer service complaints are numerous with this service. In particular, reports of difficulties getting Boost to release a phone number when switching to

a new provider are uncomfortably high.

**Red Pocket Mobile** (AT&T, T-Mobile, Verizon, [fave.co/3ZY1xdh](https://fave.co/3ZY1xdh)): Red Pocket offers a wide range of extremely affordable plans (from \$5 to 17 a month annually, or \$20 to \$50 monthly), free international calls to over 80 countries, and support for all three major networks. The catch is customer service, which

is easily reached but can be ploddingly slow to resolve issues. If you can bear that experience, consider the even-cheaper eBay-exclusive annual plans, available via the company's storefront ([fave.co/3R0JOIV](https://fave.co/3R0JOIV)).

**Straight Talk** (Verizon, [fave.co/3XNq8PP](https://fave.co/3XNq8PP)): A part of the Tracfone family of MVNOs, Straight Talk offers several affordable plans, including one for \$35 a month that offers unlimited talk, text, and 2G data, plus 10GB of high-speed data. However, the ownership transition (Verizon bought Tracfone in late 2021) seems to have triggered more than the usual customer service issues ([fave.co/3iVUVv8](https://fave.co/3iVUVv8)).

**Tello** (T-Mobile, [fave.co/3jcYvfj](https://fave.co/3jcYvfj)): This MVNO supports both custom plans and pay-as-you-go usage. The build-your-own plans allow hotspot use, and minutes include free calling to 60-plus countries. However, Tello's monthly plans often work out to be as expensive as those of rivals with more minutes and data, due to taxes and regulatory charges not being baked in. For most people, you can find better value elsewhere.

**Ting** (T-Mobile, [fave.co/3WxhvlN](https://fave.co/3WxhvlN)): A polished interface and straightforward pricing makes Ting attractive and a viable option. The company also makes it easy to switch to and *from* the service—for the latter, it provides port-out information in the web interface and releases numbers extremely fast. The only reason it didn't make our list? Its competitors' plans offer more value.



**Tello lets you build your own plans.**

**Visible** (Verizon, [fave.co/3kzTdQF](https://fave.co/3kzTdQF)): Another Verizon alternative, Visible offers straightforward pricing—all taxes and fees are included in the price—and plans that all but mirror those of rival US Mobile. What keeps it out of contention is network slowness. Online commenters hypothesize its back-end technical setup causes higher ping times, but regardless, data speeds can abruptly drop to a miserable crawl while you're out and about.

**Xfinity Mobile** (Verizon, [fave.co/3H03cGr](https://fave.co/3H03cGr)): Available only to Xfinity internet subscribers, these plans offer the convenience of one-shop billing. Prices also start at \$30 a month for unlimited plans if you have at least two lines, though taxes aren't



included. Xfinity Mobile users also get the same priority on the network as post-paid Verizon subscribers. The big sticking point is

Xfinity's poor reputation for customer service. Comcast may have changed its name, but it hasn't changed its stripes.

## FAQ

### 1. Is a cheap cell phone plan right for me?

Plans from alternative carriers aren't exact duplicates of those offered by traditional carriers and come with a couple of important caveats. But the advantages are typically huge and outweigh the disadvantages.

### Advantages of MVNOs

**Cheaper:** MVNOs can save you as much as 50 percent or more per month, partially due to the many options available (so you can pick a plan better suited to your needs) and partially because of lower prices, period.

**Prepaid usage:** A traditional plan through AT&T, T-Mobile, or Verizon is post-paid—you're billed after your usage each month. In contrast, MVNO plans are all prepaid; you're billed upfront and then use what you paid for. There are no surprises on each bill. If you run out of minutes, texts, or data during the month, you simply buy more.

**No credit check required:** Since MVNOs only offer prepaid plans, they don't require credit checks—no need to cough up

confidential personal information or worry about your credit score. If you have money, you can get service.

### Disadvantages of MNVOs

**Lower network priority:** Network priority is all about who gets first access to cell towers for calls, texts, and data. Post-paid customers (those on traditional plans from the three big carriers) are at the front of the line—and depending on the network, they can even be split among themselves to determine priority. The carrier's own prepaid plans, subsidiaries, and MVNOs come after, and where an MVNO falls on the list depends on the carrier's tiering system and the MVNO.



**MVNOs could save you more than 50 percent per month.**

In practical terms, that means MVNO users may experience slight slowdowns or delays in moderately crowded areas. It depends on the network, your MVNO, and sometimes which plan you have.

So if having first-in-line access is important, you may need to stick with a traditional plan. Still, that kind of plan won't help when towers are slammed with requests—like during huge sporting games, work conferences, or major disasters. You'll be closer to the front of the line, but there just won't be enough signal to go around for everyone.

**Limited domestic roaming:** Even when network priority isn't an issue, your MVNO's roaming agreements—for example, your ability to get signal from T-Mobile or Verizon towers when on an AT&T network plan—might limit your coverage. And not all MVNOs are equal in what they negotiate for your area. When possible, it helps to do a trial before committing. You can see what reception is like for the places you frequent and the areas you often travel through.

**Limited (or no) international roaming:** Most MVNOs offer limited international roaming. Some offer none at all. That said, most travelers opt for local SIM



**Most MVNOs offer limited international roaming.**

cards for better coverage and rates, or stick with Google Fi as the best of both worlds.

**Lower stream quality:** Prefer to stream in 1080p or higher? Be aware that many unlimited plans on MVNOs cap resolution to 480p (SD).

## 2. What should I look for in a cheap cell phone plan?

Some companies look great on paper, thanks to cheap, generous plans and slick mobile apps. But don't discount the other parts that contribute to your experience. Self-service is a big factor with MVNOs, and you want that experience to be as stress-free as possible.

**Easy, hassle-free number porting:** Ideally, transferring a number to an MVNO or transferring a number away from an MVNO should be quick and painless. Watch out in particular for companies that make you work

to get the info you need for porting out (that is, account number and account PIN) or that don't release the number quickly (or, heaven forbid, both). You don't want to be stuck on an MVNO with bad cell service and awful customer service.

**Straightforward website:** A website that puts self-service tools into your hands is best. We like Google Fi's site in particular—the important information is very accessible and dramatically reduces the time needed for account maintenance or transfer. The less you need to talk to customer service, the better.

**Accessible customer support:**

Sometimes things just go sideways with an account. Maybe you're not receiving texts, or you can't find your info to port out a line. Make sure you're comfortable with the platforms customer support is most on (live chat, phone, Reddit, Twitter, and so on), and

you know what to expect from them. (You can usually read up on the experience on Reddit.)

**Taxes and fees included:** Not all MVNO plans include taxes and fees, and these can be killer on low-cost plans for people living in high-tax areas. Maybe you're only billed \$10 per month for the plan, but you could pay as much as 60 percent more (\$16) after factoring in regulatory fees and taxes. If you can't find a provider you like that includes taxes and fees, see if you can at least pay in bigger installments (6-month or 12-month plans). You'll typically pay less.

### 3. What about prepaid plans from AT&T, Verizon, and T-Mobile?

Currently, the prepaid plans available directly from the big three don't generally have the same price advantages or perks as with a subsidiary (like Cricket Wireless for AT&T) or

an independent MVNO. They still are treated like MVNOs, especially for prioritization, though on Verizon you can pay for the top-tier plan to get "premium" data—not as deprioritized.

Largely, these are good options if you'd like more control over knowing your final bill while sticking with a company you know. 🔌



**Prepaid plans don't have the same price advantages.**



# Acer Swift Edge: An extremely light and thin OLED laptop

Light as a feather. **BY MATT ELLIOTT**



**S**creen size and travel weight are likely at or near the top of every laptop buyer's list of priorities, where you want the most of the former and the least of the latter. The Acer Swift Edge lets you have your display and travel weight, too, supplying a roomy and modern 16-inch 16:10 wrapped in a thin magnesium alloy chassis that's a mere ½ inch thick and roughly 2.5 pounds. We've not seen a laptop with a larger screen that weighs

less—although I'd happily accept an extra ounce or two of carrying weight to get a more rigid lid for the display.

The 16-inch display—an OLED panel with a crisp 4K resolution—is outstanding and worth protecting. The image quality is stellar, offering brilliant color and outstanding contrast with inky blacks and bright whites. An octa-core AMD Ryzen 7 6800U CPU and integrated Radeon graphics power the action, a duo that offers some multimedia editing

ability but is better suited for general home entertainment and office pursuits. If you want the biggest OLED display in the thinnest, lightest design, the Acer Swift Edge is it.

## SPECIFICATIONS AND FEATURES

Our Acer Swift Edge test system costs \$1,499.99 from Acer and features the following specs.

**CPU:** AMD Ryzen 7 6800U

**Memory:** 16GB

**Graphics:** AMD Radeon 680M  
(integrated)

**Storage:** 1TB PCIe NVMe M.2 SSD

**Display:** 16-inch 16:10 4K (3840×2400)

**Webcam:** 1080p

**Connectivity:** 2×USB 3.2 Gen 2 Type-C,

2×USB 3.2 Gen 1 Type-A, HDMI 2.1, combo audio jack

**Networking:** Wi-Fi 6E, Bluetooth 5.2

**Biometrics:** Fingerprint reader

**Battery capacity:** 55 watt-hours

**Dimensions:** 14.0×9.5×0.55 inches

**Measured weight:** 2.59 pounds

**Price:** \$1,499.99

## DESIGN AND KEYBOARD

With its matte-black surfaces and understated aesthetic, the Acer Swift Edge gives off ThinkPad vibes. It looks like an extra-thin X1 Carbon. The lid is plain black and the keyboard and keyboard deck on the inside are also black with a simple Acer logo on the top edge of the lid and another centered on the bottom bezel below the display. A small,

subtle Swift logo sits below the keyboard on the right side of the wrist rest. The Swift Edge looks like a corporate workhorse laptop, but one that's incredibly thin.

The laptop is a hair thicker than ½ inch and weighs a bit more than 2.5 pounds. That's just not a weight we have even seen for a 16-inch laptop—not even close. At 3.86 pounds, the Acer Swift 3 is more than a pound heavier. Even the impressively thin and smaller 14-inch



**With its matte-black surfaces and understated aesthetic, the Acer Swift Edge gives off ThinkPad vibes.**

Lenovo Slim 9i weighs more at an even 3.0 pounds. The Swift Edge is able to achieve such a thin design and light weight because it's made not from aluminum like most laptops but from a magnesium alloy that Acer states is 20% lighter and twice as strong as aluminum.

Even with the reported double strength, the Swift Edge's magnesium alloy chassis doesn't have the most rugged and rigid feel. There is some flex on the keyboard deck, and the lid lets the display flex to an almost worrisome degree. I wouldn't mind a thicker aluminum lid for added protection, even if it meant the Swift Edge would be a bit thicker and a few ounces heavier. Even with a more substantial lid, the Swift Edge would likely still weigh less than 3 pounds and remain eminently portable.

The ThinkPad vibes begin to dissipate after you start typing on the Swift Edge. The keys are flat and offer very shallow travel—not surprising given the thinness of the machine. They feel more like those on Apple's derided butterfly keyboard. If you are a fast touch typist, you'll probably enjoy the fast feedback, but others may bemoan the lack of a more traditional feel with deeper travel and a snappier response. The keyboard offers two-level backlighting, which you can conveniently control from the F11 key. The



**If you are a fast touch typist, you'll enjoy the keys' fast feedback.**

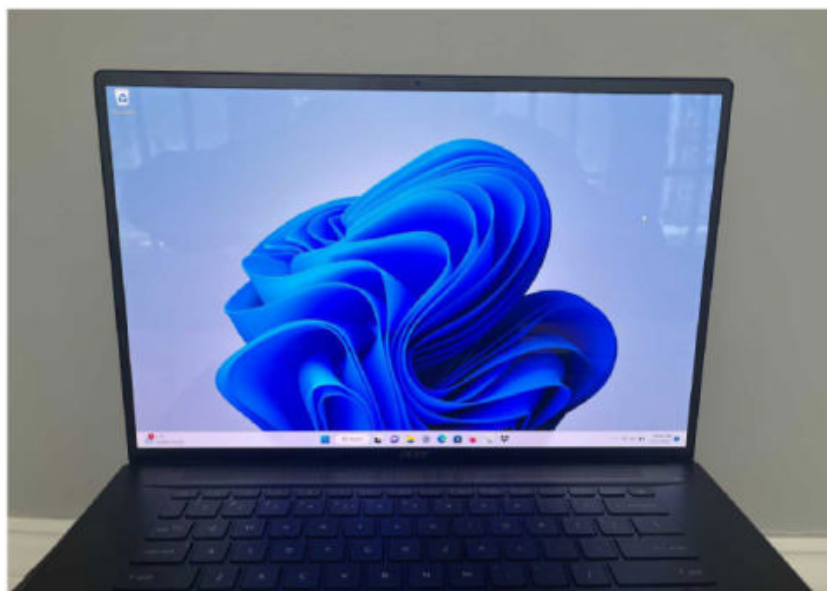
power button sits in the upper-right corner of the keyboard and doubles as a fingerprint reader for easy, secure logins.

The touchpad is roomy and responsive, with a comfortable click response that offers just the right amount of travel. The matte finish allows for smooth glide, and it accurately recorded my pinches and swipes and other mouse gestures.

## DISPLAY AND PORTS

Other than the extreme thinness and incredible lightness of the chassis, the display is the star of the Swift Edge show. It's a roomy 16-inch OLED panel with a 16:10 aspect ratio and a fine 4K (3840×2400-pixel) resolution. The display is outstanding in every way: bright and crisp with incredible contrast and vivid, accurate color. The 4K resolution produces a





**The 16-inch OLED panel is the star of the show.**

spectacularly sharp picture with crisp text and edges. I measured the max brightness at an impressive 630 nits—this is a laptop capable of being used outside in direct sunlight. The OLED panel produces absolute black levels and bright whites. There is just no beating the contrast ratio of an OLED display.

With a tall 16:10 aspect ratio, the 16-inch display feels huge. It offers plenty of space to juggle multiple windows and a big screen for watching shows and movies. Taller than the traditional 16:9 widescreen laptop display, the Swift

Edge's display requires less scrolling through long documents and webpages.

The webcam located above the display is a modern 1080p camera that produces a crisp and well-balanced picture with accurate color and skin tones. I have no complaints about the webcam's performance, but I will register a grievance about the lack of a physical shutter or electronic kill switch so you can protect your privacy when the

camera is not in use.

Don't let the dotted grill above the keyboard fool you: That wide stripe of dots is venting for the laptop's cooling system and not a speaker grill. The Swift Edge features two downward-firing speakers that produce average laptop audio. It suffices for YouTube videos but



**The Acer Swift Edge's connectivity options.**

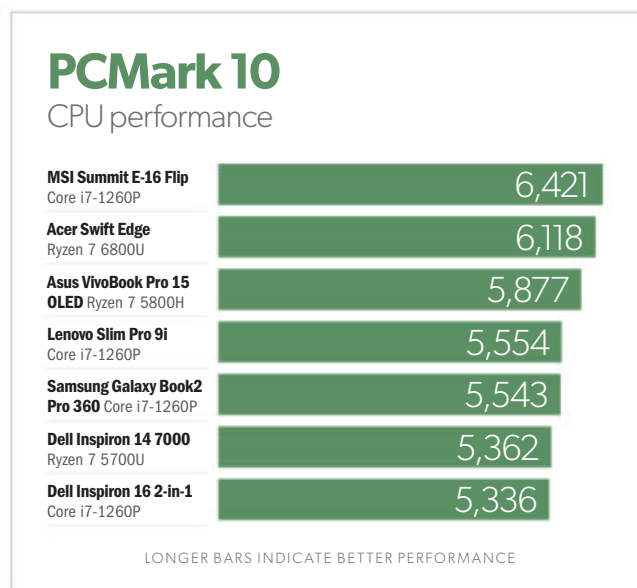
lacks the bass needed for music playback and for effects and explosions in movies.

The Swift Edge features a pair of USB-C ports and a pair of USB-A ports, so you won't need to carry around an adapter. The USB-A ports are split across the left and right edges, but the USB-C ports are both located on the left edge, which means you'll have to loop the power cord around to that side if you are seated with an outlet to your right. The USB-C ports do not support Thunderbolt 4 because of the AMD chipset. They are USB 3.2 Gen 2 ports with up to 10 Gbps transfer speeds compared with 40 Gbps for Thunderbolt 4. The Swift Edge also has an HDMI 2.1 port, an appreciated inclusion that is often omitted on thin-and-light laptops. It does lack an Ethernet port, which means you'll need a dongle if you want to connect to a wired network.

## PERFORMANCE

The Swift Edge features the Ryzen 7 6800U, a CPU with eight cores and 16 processing threads. It's an efficient CPU with a TDP between 15 and 28 watts. The other core specs are a sufficient 16GB of RAM, integrated AMD Radeon 680M graphics, and a spacious 1TB SSD. We compared its performance to models featuring Intel Core i7 processors from Intel's current 12th generation as well as a laptop with a Ryzen 7 chip from AMD's previous Ryzen 5000 series.

In general, the Swift Edge felt peppy when navigating Windows and multitasking



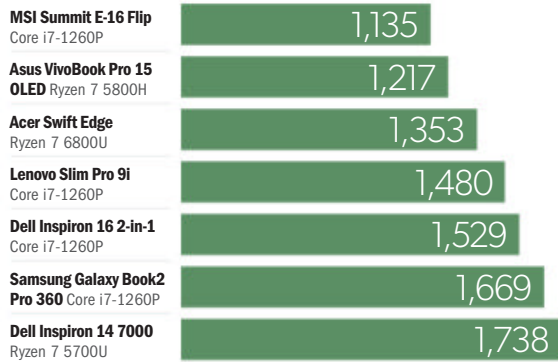
with a handful of open apps, including Chrome with dozens of open tabs. While the overall performance felt fast, the cooling fans were often employed during multimedia editing and 3D graphics tasks, a result of the ultra-thin chassis.

Our first benchmark is PCMark 10, which measures performance on everyday computing work including office productivity tasks, web browsing, and video chats. The Swift Edge got off to a hot start in labs testing, surpassing the 6,000 threshold and finishing second to the high-powered MSI Summit E-16 Flip, which has the added advantage of dedicated RTX graphics.

Our HandBrake benchmark tests how a laptop is able to handle crushing CPU loads over a lengthy period—in this case, transcoding a 30GB MKV file to a format suitable for Android tablets using HandBrake, the free video encoding utility. The Swift Edge

## Handbrake 0.9.9 Encode

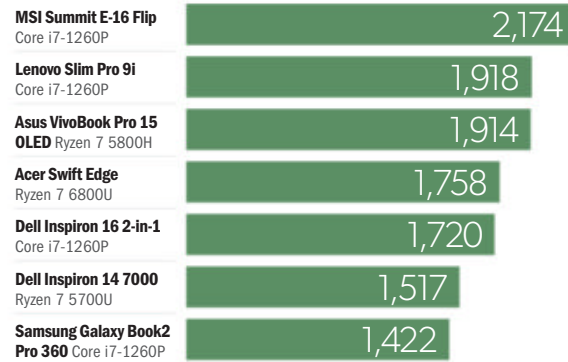
Seconds



SHORTER BARS INDICATE BETTER PERFORMANCE

## Cinebench R15

All threads



LONGER BARS INDICATE BETTER PERFORMANCE

slipped to third on HandBrake behind the two laptops with RTX graphics but was first among the systems with integrated graphics.

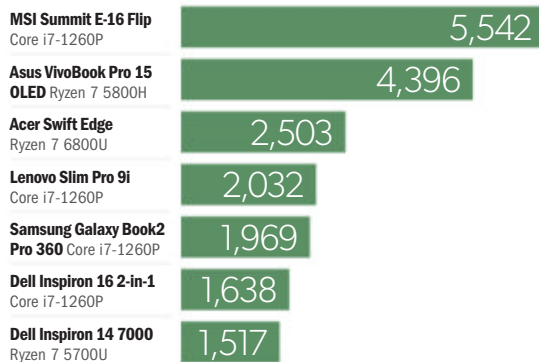
Next up is Cinebench, another CPU-intensive test but one that renders a complex 2D scene over a short period of time. The Swift Edge posted a positive result on Cinebench, but the Lenovo Slim Pro 9i took

top honors among the laptops with integrated graphics.

Not surprisingly, the two RTX-based laptops finished first and second on our 3DMark benchmark, but the Swift Edge with its integrated Radeon 680M GPU has a clear advantage over the Intel Iris Xe machines as well as the Dell Inspiron 14 7000 with its previous-gen Radeon graphics.

## 3DMark Time Spy 1.2

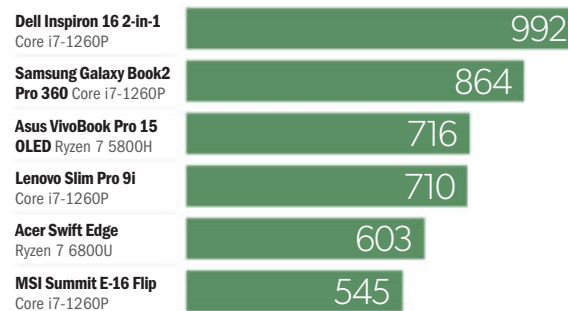
GPU performance



LONGER BARS INDICATE BETTER PERFORMANCE

## Battery life

Minutes



LONGER BARS INDICATE BETTER PERFORMANCE



To test a laptop's battery life, we loop a 4K video using Windows 11's Movies & TV app, with the laptop set to Airplane mode and earbuds plugged in. We set the screen brightness at a relatively bright 250 nits to 260 nits, which is a good brightness for watching a movie in an office with the lights on.


We had hoped that with its efficient Ryzen 7 6000 U-series chip, the Swift Edge would run longer. A runtime of 10 hours will get you through most workdays, but the competing laptops here are able to run for hours longer. The Swift Edge's high-resolution 4K OLED display is the likely culprit for the merely average runtime. Powering all of those pixels is the greatest drain on battery resources. A lower-resolution display would allow it to run longer, and we've also seen that OLED panels have a slight adverse effect on battery life.

## BOTTOM LINE

Go ahead, find another 16-inch 16:10 laptop that's thinner than 0.55 inches and lighter than 2.59 pounds. We have yet to encounter such a machine. The Acer Swift Edge makes for an easy commuting companion with a screen that's large enough to work and multitask on all day. And better still, the display is a 4K OLED panel that delivers a gorgeous image. We'd argue for a slightly



**The Swift Edge is a great commuting companion.**

thicker and heavier chassis if it meant the lid behind the display was a bit more substantial and the keyboard deck allowed for keys with deeper travel and snappier feedback. As currently constructed, however, the Acer Swift Edge offers an unmatched combination of screen size and portability. 

### Acer Swift Edge



#### PROS

- Impossibly thin and light.
- Roomy and modern 16-inch OLED display.
- Strong application performance.

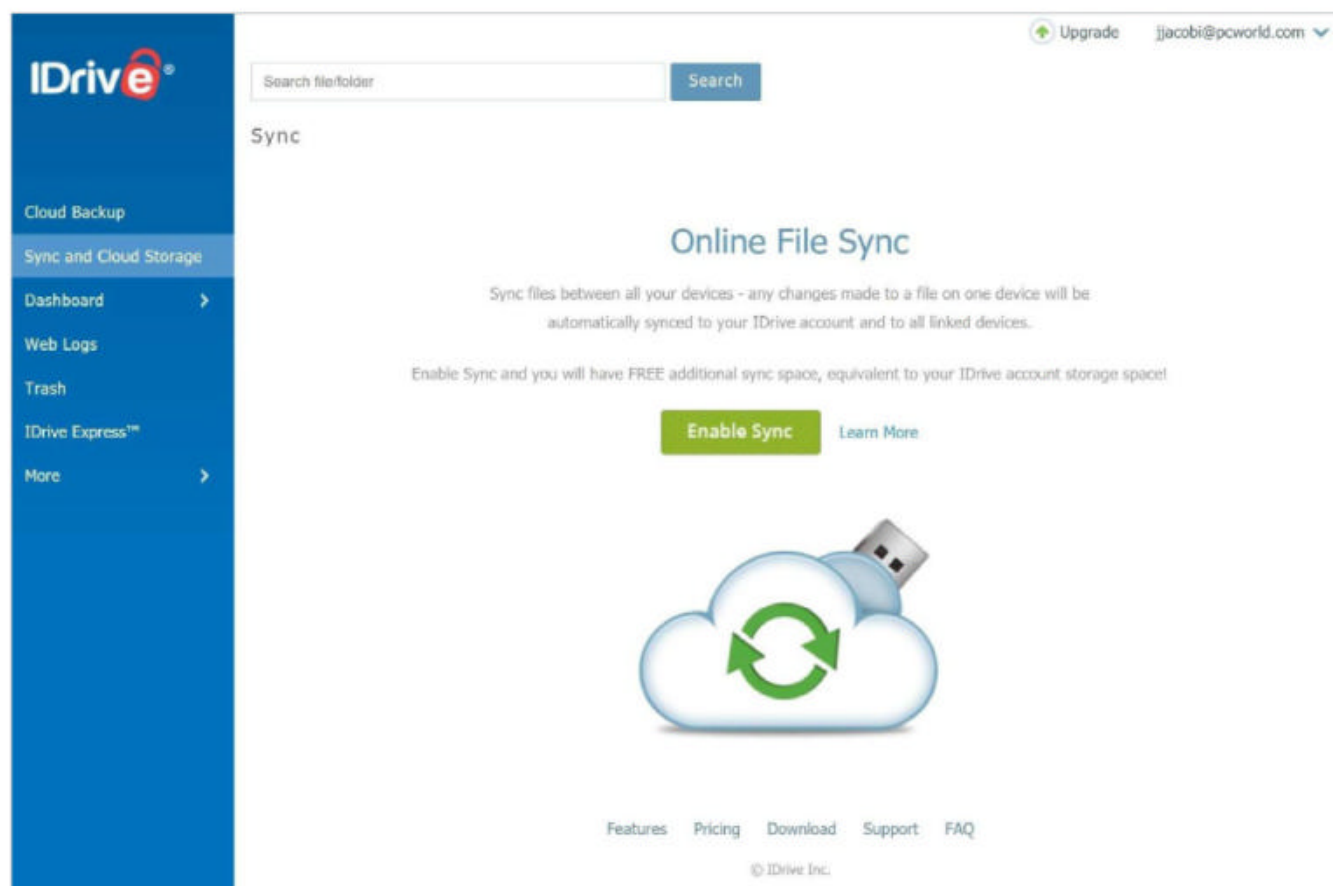
#### CONS

- Display lid flexes a bit too much.
- Keyboard a bit Butterfly-ish.
- No Thunderbolt 4.

#### BOTTOM LINE

The Acer Swift Edge delivers a spacious 16-inch OLED display inside an enclosure that's hardly more than 2.5 pounds and half an inch thick.

**\$1,499**



# iDrive: Excellent online backup, sharing, and more

Backup, storage, sharing, physical transfer—if it has something to do with backup, iDrive supports it. **BY JON L. JACOBI**



As of our latest look, iDrive remains the most comprehensive online backup and sharing service we've tested. It's not the cheapest, but it's still affordable, it comes with backup clients for nearly every PC and device, and it is more than competent at local backup. The company also provides additional storage for

syncing all your devices and PCs, allows sharing of files with anyone, and has the ability to back up to a local drive. See how well it compares to the competition in our big online backup roundup ([fave.co/3FWaMk6](https://fave.co/3FWaMk6)).

## PLANS AND PRICING

Believe it or not, iDrive still offers a free storage plan, which has increased from 5GB

to 10GB since our last look at the service. As far as we're aware, it's the only free repository not associated with a mega corporation (Microsoft, Apple, Google, and so forth) still in existence.

iDrive has three Personal plans that cover one user with unlimited computers and devices: a 5TB plan for \$59.62 the first year (or \$119.25 for two years), and \$79.50

each year after; a 10TB plan for \$74.62 the first year (or \$149.25 for two years) and \$99.50 each year after; and a 20TB plan that's \$149.62 for the first year (\$299.25 for two years) and \$199.50 after that.

If you enable the separate sync service, you get an equal amount of storage just for that task—no extra charge.

There's a new Team plan that scales from five users and computers for \$99.50 per year to 500 users and computers for \$19,999.50, all offering 1TB of storage per user. Those were also discounted at the same rate as the Personal plans at the time of this writing.

Don't get completely caught up in the price-per-gigabyte game: The size of your essential data is probably a lot smaller than

Basic	iDrive <sup>®</sup> Personal	iDrive <sup>®</sup> Team	iDrive <sup>®</sup> Business
Free	<del>\$99.50/year</del> <b>\$59.62</b> first year One user, One computer 5 TB Storage	<del>\$99.50/year</del> <b>\$74.62</b> first year Five Computers, Five Users 5 TB Storage	<del>\$99.50/year</del> <b>\$74.62</b> first year Unlimited users, multiple computers and servers / Exchange / SQL / NAS devices 250 GB Storage
10 GB	5 TB	5 computers, 5 users (5 TB)	250 GB
No credit card required	1 Computer <del>\$99.50/year</del> <b>\$59.62 first year</b> <del>\$99.50</del> <b>\$119.25 for 2 years</b>	<del>\$99.50/year</del> <b>\$74.62 first year</b> <del>\$99.50</del> <b>\$149.25 for 2 years</b>	<del>\$99.50/year</del> <b>\$74.62 first year</b> <del>\$99.50</del> <b>\$149.25 for 2 years</b>

**iDrive plans as of December 2022.**

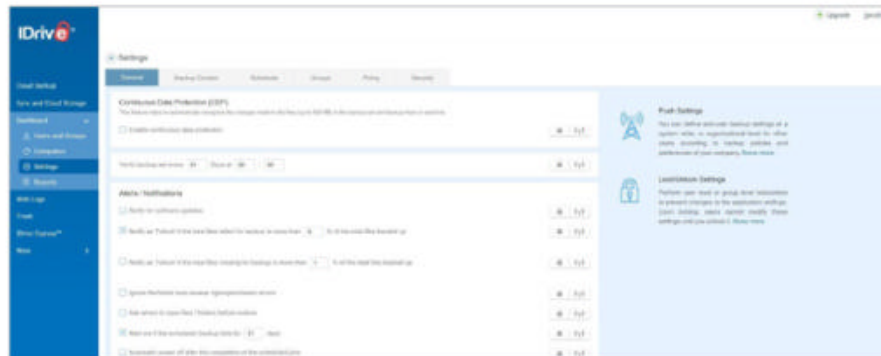
the amount iDrive is offering, unless you're into HDR and 4K.

## FEATURES

Like its competitor Carbonite Safe ([fave.co/3Hvq4Nv](https://fave.co/3Hvq4Nv)), iDrive uses continuous data protection (CDP) rather than backing up on a set schedule. If you have a rapidly changing data set, it's nice to have files backed up as they change, not just periodically. iDrive also supports nearly every type of PC and device: Windows, OS X, Android, iOS, and various NAS boxes. Also nice are the snapshots, which make it easy to restore your PC to a particular point in time.

iDrive now features two local clients. The normal one allows access to all the options,





**iDrive's online dashboard shows all the settings that the client offers, including enabling and disabling continuous data protection (near real-time backup of changed files).**

and is nearly identical to iDrive's online dashboard. The other, iDrive Basic, is for those who just want to push a button and back up everything (assuming your plan has the space).


iDrive will also handily duplicate your online backup to local storage. That allows you to painlessly maintain the Rule of Three: your original data, a copy, and a copy of the copy. Also, it's much faster to restore from a hard drive than from any online service.

iDrive also features iDrive Express, a two-way physical shipment service. Say you're walled off from the internet or just in a very low-bandwidth location. Use iDrive's local backup function to back up your data to a storage device provided by the company, then ship it to them. It will get uploaded to your online account and then updated by your local client thereafter. Or if you need to restore from a backup in hurry, iDrive will ship your data to you on an appropriate device—all within a week's time.

Personal customers get 3TB of data delivered to or from for free—the first time. Team and Business users get three free deliveries. Subsequently, there's a \$60 charge per use.

## BOTTOM LINE

iDrive offers the most comprehensive set of

backup and backup-related features of any online service we've tested, plus one of the simplest clients we've seen for those who just want to back up with a minimum of fuss. That all the advanced features are available at the basic service level makes iDrive less expensive than it might seem at first glance. It's good stuff from a now venerable company in the online backup field. 

### iDrive



#### PROS

- Online and local backup in the same job.
- Supports multiple PCs and devices on the same account.

#### CONS

- One of the pricier services, beyond the free version, though justifiably so.

#### BOTTOM LINE

iDrive has you covered six ways to Sunday when it comes to backup. Online, local, sync, snapshots, shipping hard drives to you for quicker recovery—you name it, the company does it. It's not the cheapest service, but it's easily the most comprehensive.

**\$79**

# Nvidia GeForce RTX 4070 Ti: Hobbled and wildly overpriced

With prices like these, who needs scalpers? **BY BRAD CHACOS**



**T**his review will be short and sweet. Nvidia's new \$799 GeForce RTX 4070 Ti is a technically hobbled, drastically overpriced graphics card that costs \$100 more than the higher-tier RTX 3080 did last generation. In exchange for that 14 percent higher price tag, you usually get 14 percent higher performance at 4K resolution and around 20 percent at 1440p.

Depending on how you look at it, the GeForce RTX 4070 Ti offers stagnant-at-best value at similar prices to last generation, or a painfully steep markup over last gen's already overpriced RTX 3070 Ti. It's a beastly card that can topple the previous RTX 3090 Ti flagship in many games, especially at 1440p resolution or when DLSS 3 swings into action, but at this chest-clutching price, we simply can't

recommend it. In fact, we recommend avoiding it outright unless there are mammoth price reductions.

## SPECS, FEATURES, AND DESIGN

The specs for the GeForce RTX 4070 Ti shouldn't surprise anyone, since it's the "unlaunched" \$899 RTX 4080 12GB ([fave.co/3kCzglS](https://fave.co/3kCzglS)) with a new name. Gamers (and us, [fave.co/3wwBv2Z](https://fave.co/3wwBv2Z)) called shenanigans on Nvidia initially giving this scaled-down GPU the same 4080 branding as the much more powerful 16GB RTX 4080, and shortly before AMD revealed its Radeon RX 7900-series graphics cards ([fave.co/3kFEZ0q](https://fave.co/3kFEZ0q))—which would've made this GPU look silly at the same \$899 price as the 7900 XT—Nvidia canceled its original launch plans. It's back with a lower price tag that's

still unreasonably, uncomfortably high for what's being offered. Here's a recap of the RTX 4070 Ti's core specs:

**Graphics Processing Clusters:** 5

**Texture Processing Clusters:** 30

**Streaming Multiprocessors:** 60

**CUDA Cores:** 7680

**Tensor Cores:** 240 (4th Gen)

**RT Cores:** 60 (3rd Gen)

**Texture Units:** 240

**ROPs:** 80

**Boost Clock:** 2610 MHz

**Memory Clock:** 10500 MHz

**Memory Data Rate:** 21 Gbps

**L2 Cache Size:** 49152 KB

**Total Video Memory:** 12GB GDDR6X

**Memory Interface:** 192-bit

**Total Memory Bandwidth:** 504 GB/sec

**Texture Rate:** 626 Gigatexels/sec

**Connectors:** 3×DisplayPort, 1×HDMI

### Max Display

**Resolution:** 4K at 240Hz or 8K at 60Hz with DSC

### Power

**Connectors:** 2× PCIe 8-pin cables OR 300w or greater PCIe Gen 5 cable (adapter included in box)

### Minimum Power

**Supply:** 700 Watts

**Power:** 12W Idle, 20W AV1 Video



**The GeForce RTX 4070 Ti is a beastly card that can topple the previous RTX 3090 Ti flagship in many games.**



Playback, 226W Average  
Gaming Power (AGP), 285 W  
Total Graphics Power (TGP)

### **Maximum GPU**

**Temperature:** 90° C

### **PCI Express Interface:**

Gen 4

Yes, the 4070 Ti's core count and memory capacity are drastically reduced versus the 4080's—Nvidia made the right call (eventually) with its name change. But now that the name won't sow confusion among would-be buyers, the more concerning tweak revolves around the 4070 Ti's memory bus.

Wider bus lanes let you move data more effectively. Think of it like rush hour; a four-lane highway can keep traffic moving much faster than a single-lane dirt road. Bus width is an important factor for overall memory bandwidth, especially at higher resolutions where textures and ray tracing can gobble up memory *fast*.

The GeForce RTX 4070 Ti packs a pipsqueak 192-bit memory bus. By contrast, the RTX 3080 ([fave.co/38NTnOi](https://fave.co/38NTnOi))—which, again, was a higher-tier card that cost \$100 less than the 4070 Ti—wielded a 320-bit bus, which is typical for a high-end GPU. Even the already pandemic-overpriced \$600 RTX 3070 Ti ([fave.co/3j3S9UL](https://fave.co/3j3S9UL)) had a 256-bit bus. You had to go all the way down to the \$330 RTX



**The Asus Tuf RTX 4070 Ti features an attractive backplate with plenty of airflow.**

3060 ([fave.co/3IUcqKX](https://fave.co/3IUcqKX)) to find an Nvidia GPU with a 192-bit bus in the last generation.

The new 4070 Ti offers 504GB/s of total memory bandwidth; the 3080 hit 760GB/s and the 3070 Ti offered 608GB/s, while the 3060 and its far slower GDDR6 non-X memory hit an appropriate 360GB/s.

It matters. Compared to the RTX 3080, the 4070 Ti's uplift in 4K gaming is measurably slower than its 1440p uplift. You can still play 4K games with everything cranked and still hit 60 frames per second without issue most of the time, but intentionally hobbling the 4K performance of a *freaking \$799 graphics card* leaves a sour taste in the mouth. The 4070 Ti is tangibly slower than all other new-gen GPUs and the RTX 3080 in *Counter-Strike: Global Offensive* at 4K and 1440p resolutions, and I wouldn't be surprised if the neutered



**Asus includes a handy dual-BIOS switch on the Tuf.**

bus width factors into that. It would be more acceptable if this GPU cost hundreds of dollars less.

Fortunately, the RTX 4070 Ti is much more efficient than the 3080 was, rated for 285 watts of total graphics power compared to the 3080's 320W. It's faster, too. Nvidia's new Ada Lovelace GPU architecture ([fave.co/3O1pryL](https://fave.co/3O1pryL)) impresses there.

The custom Asus Tuf 4070 Ti we're reviewing today—Nvidia isn't launching a Founders Edition version of this GPU—still uses the new 16-pin 12VHPWR connector, however, with an adapter included in the box. (Make sure you plug it in snugly; [fave.co/3DamkAq](https://fave.co/3DamkAq).) It's also a huge 3.25-slot graphics card despite the lower power draw. Asus otherwise did a fine job with Tuf, which features a striking industrial design, a

dual-BIOS switch (we test at default), and not one but two HDMI 2.0b connectors to go along with three DisplayPorts. Finding dual HDMI ports on a GPU is rare these days, and Asus only charges a \$50 premium for this version of the Tuf—though, *again*, the RTX 4070 Ti is wildly overpriced to begin with.

Nvidia maintains its lead in terms of offering well-rounded features and capabilities that AMD simply can't match. The Radeon RX 7900 duo is tangibly faster than the 4070 Ti in terms of raw rasterization (read: traditional gaming) performance, but Nvidia's GPU holds a massive ray-tracing performance advantage, bolstered by AI-powered DLSS and DLSS Frame Generation technologies. They're fiercely impressive. Generally speaking, Nvidia also thwomps AMD in CUDA support for machine learning tasks (duh) and overall content creation prowess, and has other life-enhancing features like Nvidia Broadcast, Reflex, and Shadowplay. If you do more with your GPU than simply play games, or if you consider peak ray-tracing performance a priority, target an Nvidia GPU.

Let's get to the games.

## OUR TEST SYSTEM

We test graphics cards on an AMD Ryzen 5900X PC used exclusively for benchmarking GPUs. We now test with PCIe Resizable BAR (also known as Smart Access Memory on Ryzen systems) active, as most modern gaming PCs released in the last four years support the performance-boosting feature, either natively or via a motherboard firmware update. Nvidia also recommends turning on the optional “Hardware-accelerated GPU scheduling” option in Windows to let the RTX 40 series stretch its legs to the fullest, so we’ve made that tweak as well. Most of the hardware was provided by the manufacturers, but we purchased the storage ourselves.

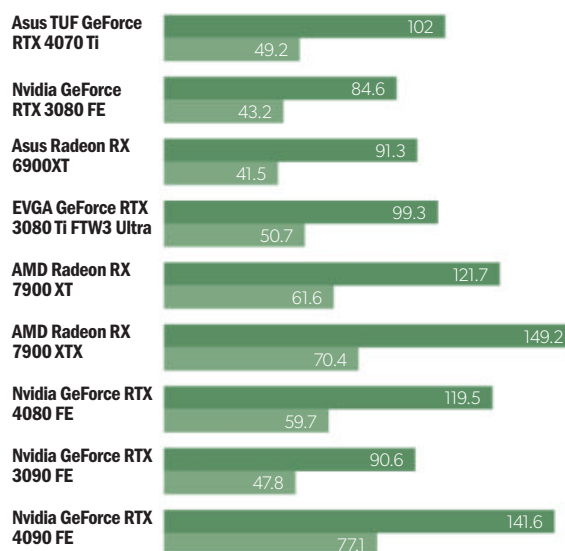
- AMD Ryzen 5900X, stock settings
- AMD Wraith Max cooler
- MSI Godlike X570 motherboard
- 32GB G.Skill Trident Z Neo DDR4 3800 memory, XMP active
- Corsair HX1500i, [fave.co/3Wv1p1L](https://fave.co/3Wv1p1L), power supply (and optional \$20 12VHPWR 600 cable, [fave.co/3EMlrz](https://fave.co/3EMlrz), for Nvidia GPUs)
- 1TB SK Hynix Gold S31 SSD ([fave.co/3IRPhZM](https://fave.co/3IRPhZM)) ×2

We’re comparing Nvidia’s \$799 GeForce RTX 4070 Ti against all the modern GPUs released by both Nvidia and AMD thus far, as well as last generation’s RTX 3080, 3080 Ti, and 3090 and Radeon RX 6900 XT. Time constraints prevented us from benchmarking the \$600 GeForce RX 3070 Ti, the 4070 Ti’s ostensible predecessor, but given this new

## Cyberpunk 2077 (DX12)

Frames per second

1440p 4K

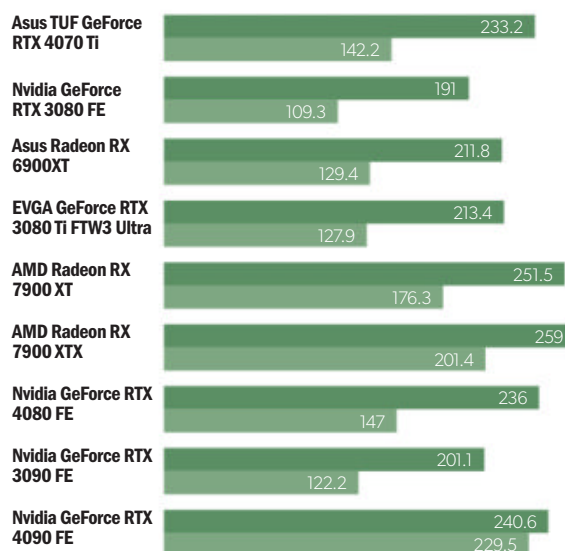


LONGER BARS INDICATE BETTER PERFORMANCE

## Hitman 3 (DX12)

Frames per second

1440p 4K



LONGER BARS INDICATE BETTER PERFORMANCE



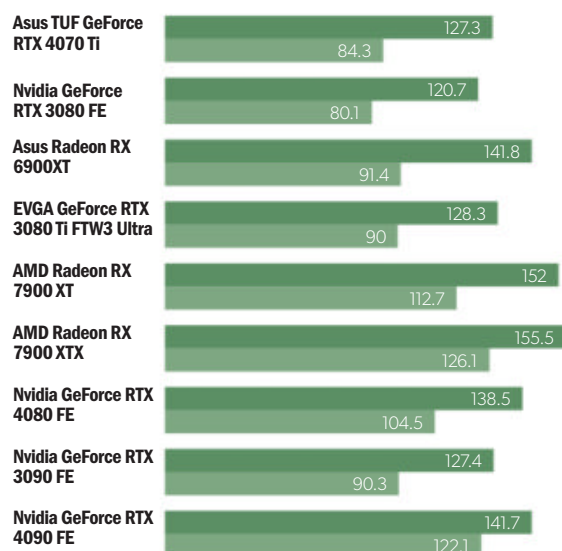
card's jacked-up price point, the RTX 3080 is a more honest comparison anyway.

In addition to turning on PCIe Resizable BAR by default, we've also moved to a new set of games in our testing suite for this new generation. We test a variety of games spanning various engines, genres, vendor sponsorships (Nvidia, AMD, and Intel), and graphics APIs (DirectX 9, 11, DX12, and Vulkan) to try to represent a full range of performance potential. Each game is tested using its in-game benchmark, sanity checked by Nvidia's FrameView tool ([fave.co/3XRc4F5](https://www.nvidia.com/en-us/drivers/frameview/)), at the highest possible graphics presets unless otherwise noted, with VSync, frame rate caps, real-time ray-tracing or DLSS effects, and

## Total War: Troy (DX11)

Frames per second

1440p 4K

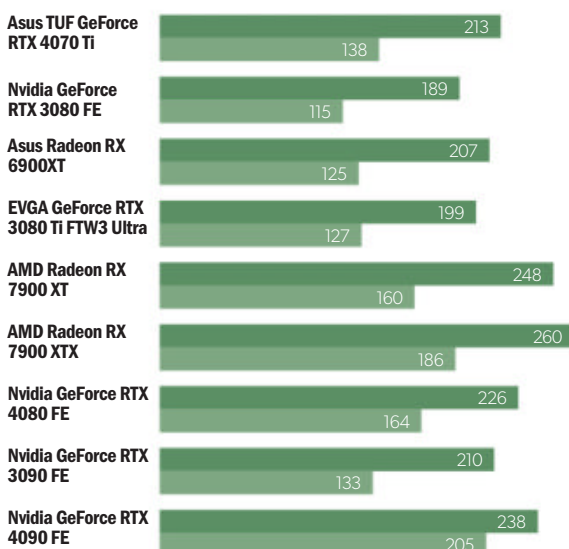


LONGER BARS INDICATE BETTER PERFORMANCE

## F1 22 (DX12)

Frames per second

1440p 4K

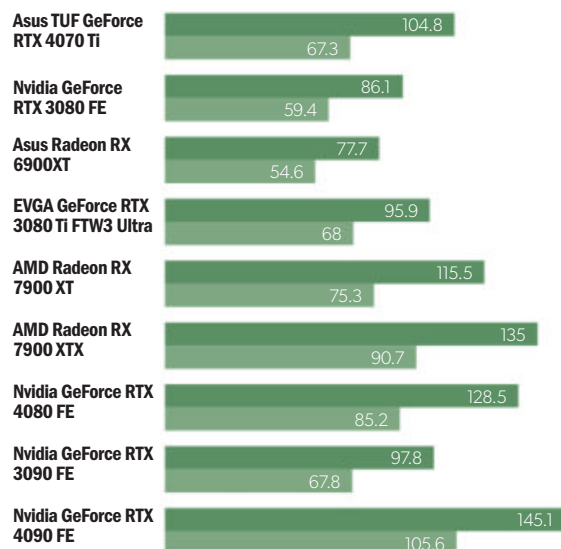


LONGER BARS INDICATE BETTER PERFORMANCE

## Red Dead Redemption 2 (Vulkan)

Frames per second

1440p 4K



LONGER BARS INDICATE BETTER PERFORMANCE

FreeSync/G-Sync disabled, along with any other vendor-specific technologies like FidelityFX tools or Nvidia Reflex. We've also enabled temporal anti-aliasing (TAA) to push these cards to their limits.

We run each benchmark at least three

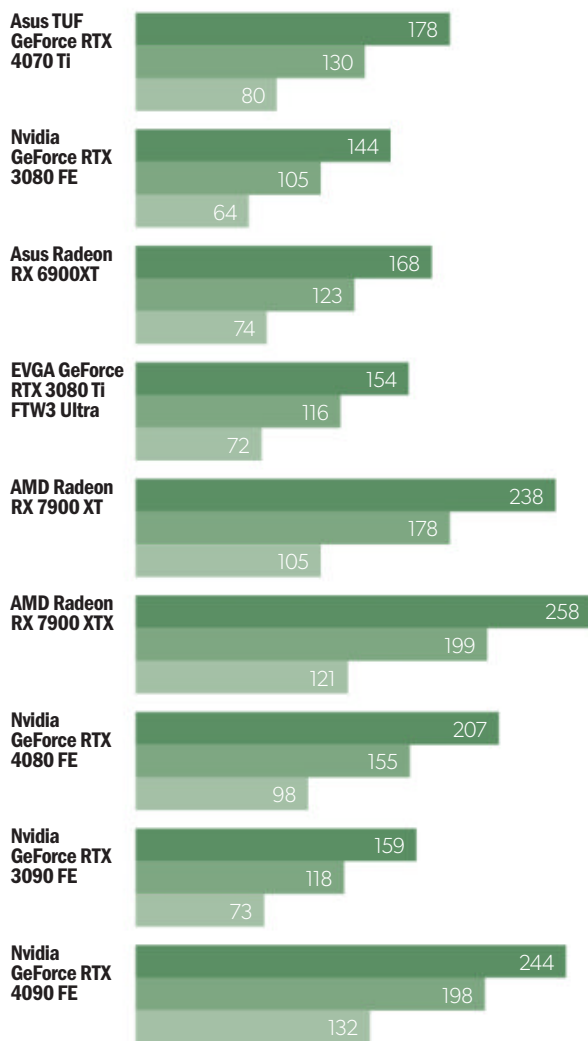
times and list the average result for each test. Outside of esports, we've limited our benchmarks to 4K and 1440p resolutions, as those are the natural fits for these juggernaut GPUs (despite the 4070 Ti's paltry bus width).

We're going to show these benchmarks

## Call of Duty: Modern Warfare 2 (DX12)

Frames per second

1080p 1440p 4K

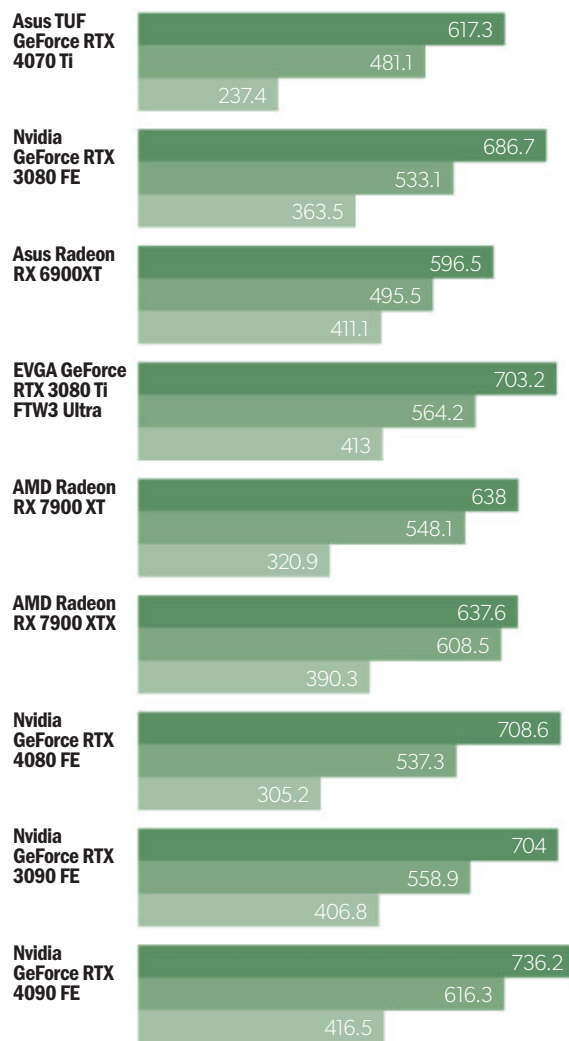


LONGER BARS INDICATE BETTER PERFORMANCE

## Counter-Strike: Global Offensive (DX9)

Frames per second

1080p 1440p

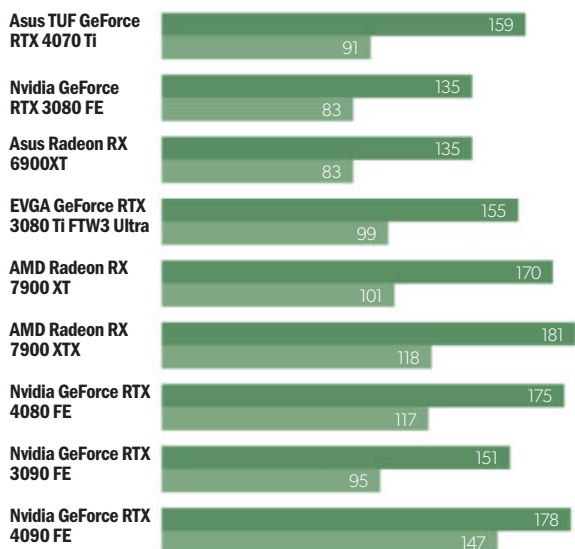


LONGER BARS INDICATE BETTER PERFORMANCE

## Horizon Zero Dawn (DX12)

Frames per second

1440p 4K

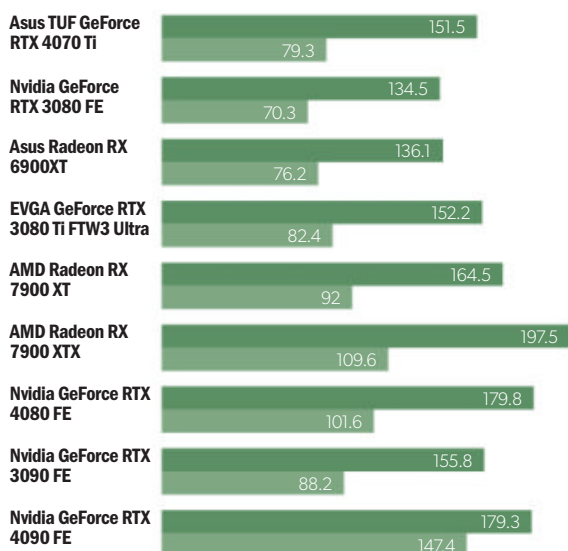


LONGER BARS INDICATE BETTER PERFORMANCE

## Gears Tactics (DX12)

Frames per second

1440p 4K



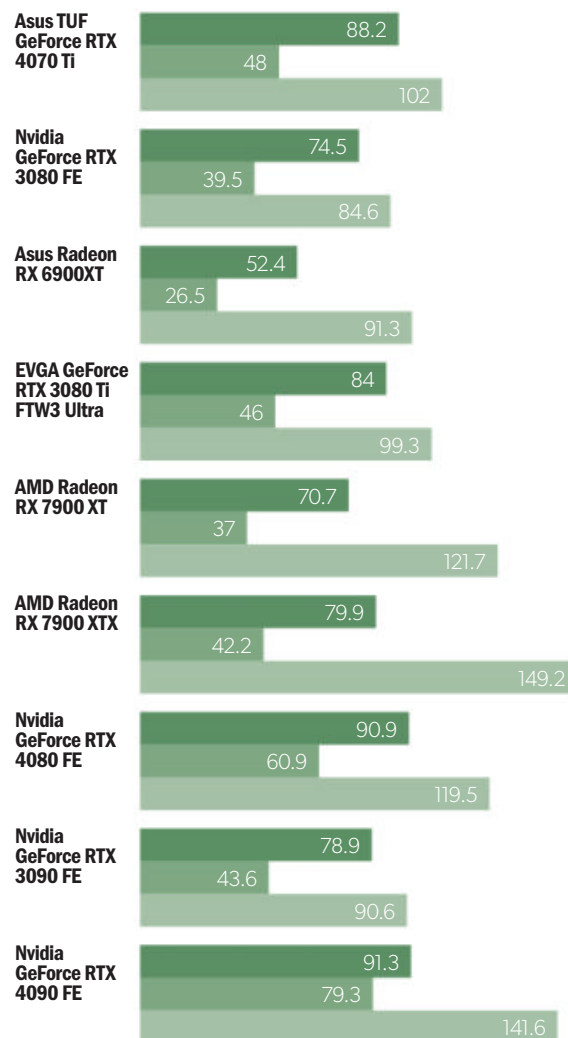
LONGER BARS INDICATE BETTER PERFORMANCE

without individual game commentary. In general, pay attention to how much faster the 4070 Ti is compared to the \$100 cheaper 3080, and how the 4070 Ti gains more speed on the 3080 at 1440p than 4K. Also note how the similarly overpriced \$899 Radeon RX 7900

## Cyberpunk 2077 (DX12); ray tracing at 1440p

Frames per second

RT Ultra/DLSS Balanced On RT Ultra On/DLSS Off Native



LONGER BARS INDICATE BETTER PERFORMANCE



XT outperforms the \$799 4070 Ti by a significant amount across the board. We didn't have time to fully benchmark the 4070 Ti's ray tracing prowess, but included a chart showing *Cyberpunk 2077* running with RT enabled (with DLSS and FSR both on, and off) to confirm that, yep, Nvidia's GPU architecture continues to blow AMD's ray-tracing performance out of the water. It isn't even close.

## POWER AND THERMALS

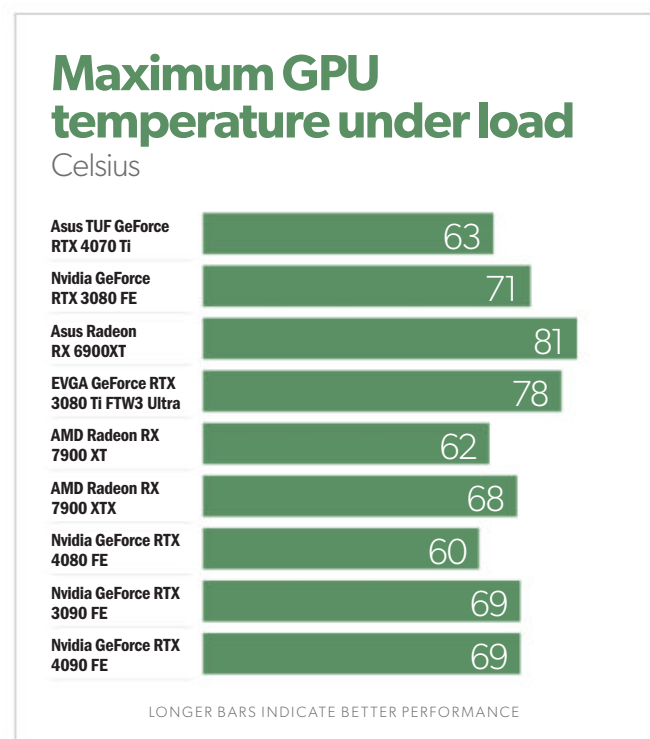
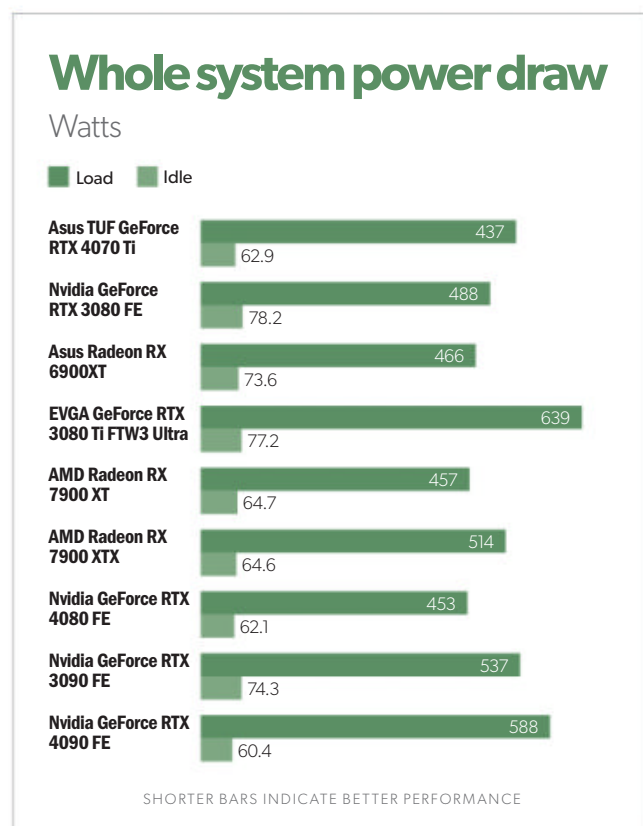
We test power draw by looping the *F1 22* benchmark at 4K for about 20 minutes after we've benchmarked everything else (to warm up the GPU) and noting the highest reading on our Watts Up Pro meter, which

measures the power consumption of our entire test system. The initial part of the race, where all competing cars are onscreen simultaneously, tends to be the most demanding portion.

This isn't a worst-case test; this is a GPU-bound game running at a GPU-bound resolution to gauge performance when the graphics card is sweating hard. If you're playing a game that also hammers the CPU, you could see higher overall system power draws. Consider yourself warned.

Despite being faster than the RTX 3080, the 4070 Ti consumes far less power both when idle and under load. Even if Nvidia isn't moving the needle in terms of value with the 4070 Ti, its efficiency is no doubt improving.

We test thermals by leaving GPU-Z open



during the *F1 22* power draw test, noting the highest maximum temperature at the end.

The custom Asus Tuf cooling design delivers absolutely frigid temperatures under full load. Overclockers could have a field day with this particular model. You hear some fan noise to achieve those impressive temperatures, but it isn't overly loud or annoying. I have no complaints about the Asus Tuf's overall thermal design.

## BOTTOM LINE

Please don't buy the GeForce RTX 4070 Ti. It's a beast of a card that shows what Nvidia's stellar hardware and software engineers are capable of—but not at this eye-watering price.

In a vacuum, the \$799 GeForce RTX 4070

Ti's rasterization performance underwhelms compared to the \$899 Radeon RX 7900 XT except in ray-tracing performance, but Nvidia's abundant software and feature offerings—Studio drivers, DLSS and Frame Generation, Broadcast, Reflex, CUDA, et cetera—can make that gap easier to swallow if you use your GPU for more than just gaming. In reality, the RTX 4070 Ti—like the RTX 4080 and Radeon 7900 XT before it—carry price tags that make their value stagnant at best and borderline insulting at worst.

At \$799, the GeForce RTX 4070 Ti costs \$100 more than last generation's stunning RTX 3080—and it's a lower-tier GPU. It's \$200 more than the already-overpriced RTX 3070 Ti was. In exchange for that 14 percent price hike over the 3080, you usually get a

stagnant 14 percent more performance than the 3080 at 4K, or roughly 20 percent faster speeds at 1440p. Nvidia cut the 4070 Ti's memory bus back to RTX 3060 levels, which slows it down at 4K. That's



**The GeForce RTX 4070 Ti is a beast of a card.**

flat-out unacceptable in a \$799 graphics card.

Gamers are in a bad place. Nvidia and AMD's flagships, the GeForce RTX 4090 ([fave.co/3O1pryL](https://fave.co/3O1pryL)) and Radeon RX 7900 XTX ([fave.co/3kFEZ0q](https://fave.co/3kFEZ0q)), offer stunning performance

gains over their predecessors for similar prices. But everything under those carries downright painful MSRPs compared to prior generations. Nvidia and AMD must still think we're in the midst of a pandemic with roaring cryptocurrency value. We're not. Miners were the ones buying graphics cards for painful, outrageous prices, not gamers. These graphics card costs are ludicrous.

Nvidia's RTX 4080 costs \$500 more than the 3080 did. Gross. Rather than seizing the moment, AMD priced its feature-lacking Radeon RX 7900 XT at \$899, when spec-wise it probably should've been called the Radeon RX 7800 XT and priced a couple hundred dollars lower. But AMD's thirst for 7900 XT profit margins also allowed Nvidia to reintroduce the "unlaunched" disastrous RTX



**The RTX 4070 Ti costs \$100 more than last generation's stunning RTX 3080.**

4080 12GB with a new name and a price tag just \$100 less than before. It's still extremely unappealing. You shouldn't have to pay \$800 dollars for what's being actively marketed ([fave.co/3WCGn1c](https://fave.co/3WCGn1c)) as a 1440p graphics card in 2023, especially with its 4K performance hobbled by the subpar memory bus.

Bah. It's like WOPR said in *WarGames*: "A strange game. The only winning move is not to play."

Part of the reason why Nvidia and AMD are keeping prices so high is to move their stockpiled last-gen GPUs now that cryptocurrency has crashed, at carefully managed high prices. Nvidia in particular keeps trying to show the RTX 40 series as expensive options on top of the 30 series lineup rather than the generational



replacement it truly is—a worryingly anti-consumer business decision. Buy a used graphics card instead ([fave.co/3JfXumj](https://fave.co/3JfXumj)) if you aren't going all-in on a 4090 or a 7900 XTX. You can find similarly performing GPUs like the Radeon RX 6800 XT and 6900 XT or the RX 3080 for hundreds of dollars less than Nvidia and AMD are charging for these wildly overpriced new offerings. We have tips to help you avoid buying a used lemon ([fave.co/3JfXumj](https://fave.co/3JfXumj)).

And I'm saying that despite being a guy who typically recommends that you avoid used graphics cards ([fave.co/3XRbuXR](https://fave.co/3XRbuXR)).

Because paying \$800 for a hobbled, drastically overpriced 1440p-focused graphics card in 2023 ain't it. The launch of this new generation largely mirrors the RTX 20 series launch, where stagnant gen-on-gen value led to terrible sales and the introduction of an RTX 20 Super series shortly after to help kickstart matters...though that launch coincided with the release of AMD's excellent, sanely priced Radeon RX 5000-series. This generation, AMD seems content to ride the coattails of Nvidia's excessive pricing. Flagship GPUs shouldn't offer the best price-per-dollar value, and the rest of your stack shouldn't deliver performance that scales almost linearly with the pricing of last-gen models.

Discrete graphics cards sales just hit a 20-year low ([fave.co/3HsxhzZ](https://fave.co/3HsxhzZ)). Unless something drastic changes, like a modern

introduction of Super series equivalents, releases like the GeForce RTX 4070 Ti and 4080 will likely only exacerbate the pain.

So it's not just a pass, but a hard pass. If you must buy a next-gen GPU around this price point, the Radeon RX 7900 XT is also atrociously priced but it's noticeably faster and comes with 20GB of memory, 8GB more than the 4070 Ti. If you need Nvidia features and must buy a 4070 Ti, I highly recommend the Asus Tuf model.

But we're in the midst of a strange game. Please don't buy either. Not at these prices. 🔌

## Nvidia GeForce RTX 4070 Ti



### PROS

- Ultra-fast 1440p gaming, solid 4K gaming.
- Excellent ray-tracing performance tops AMD's best GPUs.
- Superb Nvidia software features like DLSS 3, Broadcast, Reflex, CUDA, Shadowplay, and more.
- DLSS 3 Frame Gen makes even demanding games buttery smooth.

### CONS

- Painfully overpriced by hundreds of dollars.
- Stagnant performance per dollar versus 3080, huge price increase versus 3070 Ti.
- Nerfed memory bus width unacceptably impacts 4K gaming on an \$800 GPU.

### BOTTOM LINE

Nvidia's GeForce RTX 4070 Ti is a ferociously capable graphics card for 1440p gaming, but Nvidia cut down the memory system in a way that reduces 4K performance and overpriced the GPU by hundreds of dollars. It offers stagnant value at best and atrocious value at worst depending on how you look at it. We can't recommend the 4070 Ti unless Nvidia slashes the cost significantly.

**\$799**



# Monoprice DT-3BT: Affordable PC speakers play nice with all devices

These speakers favor ease of use over audio tuning. **BY ALAINA YEE**

**M**onoprice may not be a household name, but for decades it has quietly sold tech gear that rivals brand-name goods in quality—in a fashion. Rather than undercutting more expensive brands by pumping up a few key features and dramatically paring back others, items with Monoprice's label go for a solid but no-frills approach.

The Monoprice DT-3BT ([fave.co/3HpXHSS](https://fave.co/3HpXHSS)) firmly upholds that philosophy. At

\$100, these 50W desktop speakers offer an understated appearance and clear audio, and blend in well with a typical computer desk setup. They also focus more on function, rather than control over audio tuning. You get Bluetooth 5.0 support in addition to TRS and RCA jacks, allowing you to use them with a wide array of devices.

Each speaker measures 5.5×8.0×5.9 inches (140×204×50mm) and weighs 3.5 pounds (1.6kg). No wood tones here; the

all-black coloring is meant to blend into the background. Inside are 3-inch woofer drivers and 0.75-inch tweeter drivers. All the action lives on the primary speaker—on the front, you'll find a comfortably sized volume knob, along with separate 3.5mm jacks for auxiliary input (for, say, a compatible smartphone or tablet) and headphone output, plus two status lights for power and Bluetooth status. On the back are RCA and ¼-inch TRS inputs, outputs to connect to the secondary speaker, and buttons for power and Bluetooth pairing.


For setup, you simply connect the primary speaker and your PC using the color-coded RCA-to-3.5mm cable, and then link the primary and secondary speakers using the color-coded speaker interconnect cable. You'll also need to plug the primary speaker into a polarized 2-prong outlet for power.

Compared to rivals, the DT-3BT puts more emphasis on higher- and lower-end frequencies—right in line with Monoprice's other audio products. Some ears will find this sound profile has a pleasing focus on clarity and crispness, while others may think it's a touch hollow. Either way, you can hear elements in layered music distinctly, where with warmer speakers they sometimes get overshadowed or lost.

And you can listen to those songs at extremely high volume (though with some distortion), if you so choose. These speakers can easily fill a smaller living room. I usually

kept the knob at well below the quarter mark (figuratively speaking) for daytime listening, and cut it even further during later hours. And since you can play from different devices simultaneously, there's no real effort needed to switch between them. You just start playback from the desired piece of gear.

## BOTTOM LINE

As speakers go, \$100 may not seem like much—audiophiles can easily blow thousands on gear without blinking. But if you're on a budget, that amount can feel like a splurge. The Monoprice DT-3BT's feature set makes it feel worthy of its price tag. The speakers have straightforward setup and controls, immediately work out of the box with multiple audio sources, and boast clear audio. Those who are into the DT-3BT's sound profile should be well pleased with them. 

### Monoprice DT-3BT



#### PROS

- Clean audio.
- TRS, RCA, and Bluetooth connectivity.
- Capable of very loud volume.

#### CONS

- Audio will sound a little hollow to some ears.
- Audio distortion at higher volumes.

#### BOTTOM LINE

Monoprice delivers a solid set of speakers in the DT-3BT. Its sound profile won't be to everyone's taste, but many folks will find it a hassle-free option for upgrading your desk's audio output—and an easy way to listen to your devices.

**\$100**

# The best ultrawide monitors: Let's get large

These immersive monitors are perfect for productivity and gaming. **BY MATTHEW S. SMITH**



**D**o you want a huge amount of usable display space, but also want to stick with a single monitor? If so, an ultrawide monitor is the ticket. These have a wider display panel that's far more impressive, and

immersive, than your average widescreen. We've tested a bunch of ultrawide monitors in order to name the best picks in various categories. You can learn more about our evaluation process and what to look for in an ultrawide monitor in our recommendations.



## BEST ULTRAWIDE MONITOR: **ALIENWARE AW3423DWF**



The Alienware AW3423DWF is a legendary monitor. It packs the incredible contrast and realism of OLED in a 34-inch widescreen panel, yet it's priced at just \$1,099. That's not inexpensive, but it's better value than other OLED monitors available right now.

Image quality is where it stands out. It delivers a vivid, immersive, rich experience with deep black levels and bright highlights, which are enhanced by the display's glossy finish. Movies and games seem nearly three-dimensional—as if you're looking through a window, not staring at a monitor.

What's the catch? The monitor is not bright, especially in SDR, so it's a bad choice for a brightly lit room. We also noticed the OLED panel has trouble rendering small fonts smoothly. These are minor

issues, though, and they shouldn't trouble most users.

This monitor targets gamers, so it offers an enhanced refresh rate of up to 165Hz and supports AMD FreeSync Premium Pro for smooth frame pacing in games. However, its excellent image quality will be impressive in everyday uses as well.

It has good connectivity, with two DisplayPort inputs and one HDMI, as well as a USB-A hub with four ports. There's even a healthy range of calibration options that helps demanding owners dial in the image to their personal specifications.



## BEST BUDGET ULTRAWIDE FOR GAMERS: **LG ULTRAGEAR 34GN850**

The LG Ultragear 34GN850-B, released in 2020, was once the king of ultrawide gaming.

It was dethroned by Alienware's AW3423DWF—and as a result LG has slashed the price. Originally \$999.99, this monitor is now available for \$699.99 (and sometimes less).

That's great news. Although surpassed by the Alienware, LG's Ultragear 34GN850-B is an attractive monitor with excellent color performance, good image clarity, and a bright, vivid picture. It has an enhanced refresh rate of up to 144Hz (with a 160Hz overclocked mode) and supports both AMD FreeSync and Nvidia G-Sync for smooth gameplay.

Its weakness? Contrast. The IPS panel scores lower in contrast than other monitors on this list, including the Asus ProArt PA348CV, which also has an IPS panel. The image can look hazy in darker scenes.

Connectivity is respectable with two HDMI ports, one DisplayPort, and two-port USB-A hub for connecting wired peripherals. The monitor also retains many of the features that would be expected of a high-end



**RATING**



**PRICE:**

\$699 from  
[fave.co/3wuA9WJ](https://fave.co/3wuA9WJ)

**FULL REVIEW:**

[fave.co/40aGCno](https://fave.co/40aGCno)

monitor, including a sturdy ergonomic stand and an attractive design.

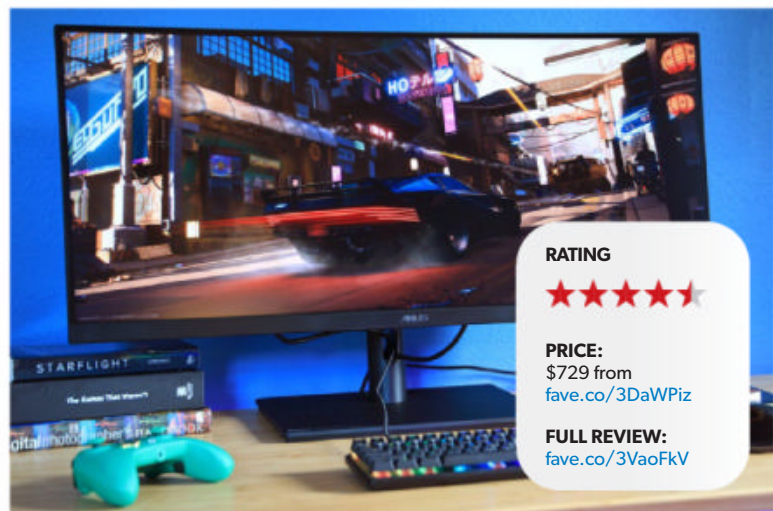
## BEST ULTRAWIDE MONITOR FOR PROFESSIONALS: **ASUS PROART PA348CGV**



The Asus ProArt PA348CV surpassed our expectations. Priced at just \$729.99, it's toward the low end of pricing for a professional ultrawide display—yet its performance is near the top of the pack.

This monitor has a wide color gamut, excellent color accuracy, and a virtual buffet of image-quality

calibration features that let users precisely tune the image. It's also a bright and vivid



**RATING**



**PRICE:**

\$729 from  
[fave.co/3DaWPiz](https://fave.co/3DaWPiz)

**FULL REVIEW:**

[fave.co/3VaoFkV](https://fave.co/3VaoFkV)

monitor, making it easy to use in nearly any office. Admittedly, it doesn't set any records in image quality tests—but it ties with or comes close to alternatives that are hundreds of dollars more expensive.

Asus throws in a useful USB-C port that supports DisplayPort Alternate Mode and delivers 90 watts of USB Power Delivery. It also drives a USB-A hub with four downstream

ports. Additional video connectivity includes two HDMI and one DisplayPort for a total of four input options.

Surprisingly, Asus throws in an enhanced refresh rate up to 120Hz. It's not sold as a gaming monitor, but it can handle gaming well enough. That's good news if you need one home office monitor for both work and play.

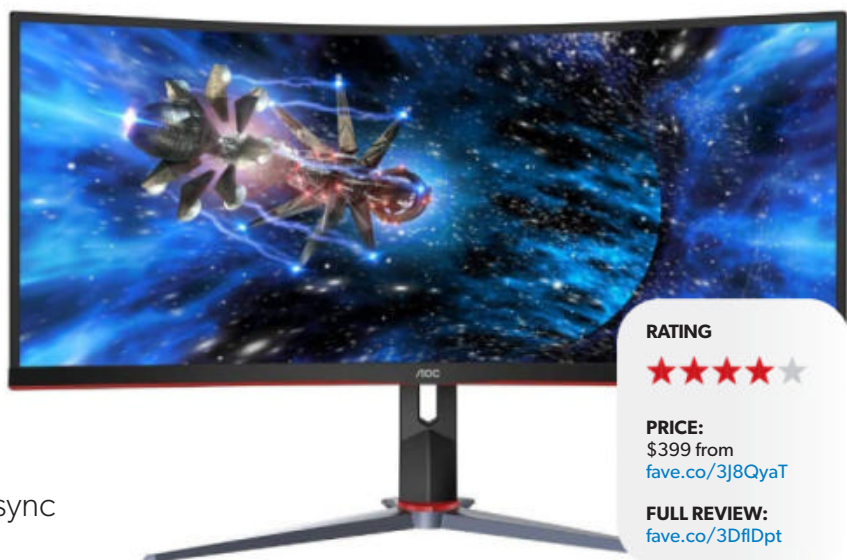
## BEST BUDGET ULTRAWIDE: AOC CU34G2X

This monitor has a 34-inch ultrawide VA panel that, by most measures, performs surprisingly close to more expensive alternatives. It provides a good contrast ratio and delivers vivid color performance. It also has the same 3440×1440 resolution as the other monitors on this list, so it looks just as sharp. In truth, less demanding shoppers may find it difficult to notice any difference between this monitor and more expensive options like the Asus ProArt PA348CV.

The AOC CU34G2X is marketed as a gaming monitor and has an enhanced refresh rate of up to 144Hz. It doesn't officially support AMD FreeSync or Nvidia G-Sync, however, so gamers may have mixed results when trying to use these adaptive sync standards.

Though it punches above its price in image quality, the AOC CU34G2X's design looks cheap. It leans a bit too hard on an aggressive red-and-black gaming theme. That will annoy shoppers who prefer a calmer, less obtrusive look.

Connectivity is great, though, with two HDMI and two DisplayPort inputs plus a four-port USB-A hub. The monitor also has a height-adjustable stand, a must-have perk that isn't guaranteed on budget ultrawide monitors.





## WHAT TO LOOK FOR IN AN ULTRAWIDE MONITOR

Ultrawide monitors are a favorite of PC enthusiasts, but remain a niche within the larger monitor market. This leaves shoppers with fewer options. Most ultrawide monitors have a 34-inch panel with a resolution of 3440×1440 and similar connectivity. Still, these monitors can differ in several key areas. Here's what to look for.

### Panel type is a big deal

Ultrawide monitors offer less choice in some regards, but that script is flipped when it comes to panel type. Ultrawide monitors come in a variety of panel types: IPS, VA, and OLED.

IPS panels are common in midrange and premium ultrawide monitors. This panel type delivers great color performance, high maximum brightness, superb sharpness, and good motion performance. It's weak in contrast, however, which can disappoint when viewing TV shows or movies.

VA panels are typically a budget option, though some are found in premium ultrawide monitors. They have better contrast than IPS panels and deliver similar color performance and brightness—however, budget VA panels tend to be merely okay in these areas. Most VA panels fall short in motion performance and may look blurry when playing fast-paced games.



**Alienware's AW3423DWF delivers a vivid, rich, immersive experience.**

OLED is king of the hill. It leads in color, contrast, and motion performance. Sharpness is often slightly reduced compared to IPS and VA, but most people will find it a minor downgrade. OLED also is the best choice for HDR. In general, OLED is better than IPS and IPS is better than VA. However, some people might prefer VA over IPS because it has a better contrast ratio and looks darker in dark content.

### A height-adjustable stand is a must-have

All the monitors on this list provide an ergonomic stand that adjusts for height, tilt, and swivel. This is a must-have feature, but one that isn't found on the least expensive ultrawide monitors.

As tempting as it may be to save money on a budget model without a height-adjustable stand, you would regret it.



Ultrawide monitors are bulky and tend to require a larger, heavier stand, which in turn makes them more difficult to place on an elevated platform. The old college trick of sticking a monitor on a shoebox won't work.

### **Look for USB-C, but don't expect it**

USB-C compatibility is an excellent feature, and USB-C hub monitors ([fave.co/3xzdm48](https://fave.co/3xzdm48)) can clear away tons of clutter on your desk. Unfortunately, many ultrawide monitors don't support USB-C yet, or have limitations that detract from the USB-C port's usefulness.

Asus's ProArt PA348CV, our favorite ultrawide for professionals, is one exception. It has a USB-C port with up to 90 watts of Power Delivery, and the port drives a USB-A hub with four downstream ports.

Dell, HP, and BenQ also offer ultrawide monitors with USB-C. Most of these lack an enhanced refresh rate, however, and they're typically more expensive than the Asus.

### **Pricing is important—and can swing wildly**

Monitor pricing is always important, but it's key for ultrawide monitors. Although very expensive at MSRP, ultrawide monitors routinely see huge price cuts during seasonal sales. They also receive major semi-permanent price cuts later in their life.

The LG Ultragear 34GN850-B is an example of this. Originally sold for \$999.99, it's now routinely available for \$699.99, and

went as low as \$599.99 during Amazon's Black Friday sale. That's a 40 percent reduction in price! Waiting for a deal can save you hundreds.


### **Don't buy an ultrawide for console gaming**

A quick word of warning: You should not buy an ultrawide monitor if you plan to connect a game console frequently.

Game consoles don't support ultrawide aspect ratios, so you'll see black bars on either side of the image. That's unattractive and wastes the monitor's potential. It's best to stick with a widescreen monitor if console gaming is a priority.

## **HOW WE TEST MONITORS**

PC World's team of staff and freelance reviewers conduct in-depth testing to compare monitors across a wide range of categories and price points. We test dozens of monitors each year to find the best pick for every category and price point.

Our testing uses a SpyderXElite color calibration tool. It delivers objective, unbiased measurements for a wide range of metrics including brightness, contrast, color gamut, color accuracy, color temperature, and gamma. Results are recorded and logged for future comparison. This allows our experts to easily compare many monitors at once and eliminates subjective bias from the results. 



# DDPai Mini5: An elegant take on the dash cam

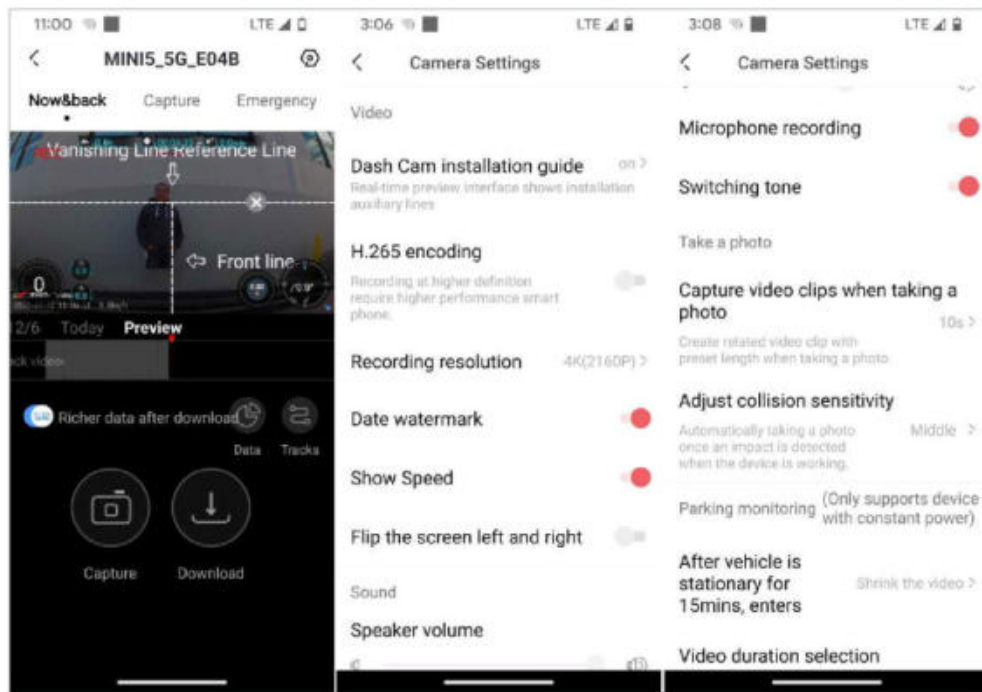
This classy dash cam is easy to set up, has its own internal memory, and is just generally a grade above your garden-variety dash cam. **BY JON JACOBI**



The \$160 DDPai Mini5 ([fave.co/402bczl](https://fave.co/402bczl)) is one of the more elegant front dash cams I've experienced. It's of the displayless (and largely buttonless) variety, but with the phone connectivity, most users will barely miss the display or the buttons. It also opts for internal memory and computer connectivity over TF cards.

## DESIGN

The Mini5 is a flattened cylinder approximately 4.15 inches long, 1.45 inches deep, and a hair less than an inch thick. The 140-degree field-of-view, 4K UHD camera is by far the most prominent feature on the main body. The only other notable physical features are an emergency save button on the left and a Type-C port on



**The DDPai app is your gateway to the Mini5's copious settings.**

the right, plus an activity light on the back (green means the camera is active).

The mount is a self-adhesive (semi-permanent) cage that the camera itself slides into. You attach the Type-A to Type-C USB power cable (an aux adapter is included) after the camera is in place and it helps keep the camera from slipping out—not that that's a likely scenario: The fit is very snug. The Mini5 and mount both have a substantial feel. Many dash cams feel cheap; this one doesn't.

As mentioned, the Mini5 features integrated eMMC memory—64GB of it, to be exact. That's a fair amount; however, the math might be considered a tad concerning. With the video captures taking approximately 234MB per minute at 3840×2160 (222MB for a full-res file and 12MB for a smaller file used for

display and so on), you'll write the full capacity of the card in less than 5 hours.

DDPai describes the eMMC as having 3,000 write cycles, so you'll likely get around 15,000 hours out of the Mini5. That's quite a lot for most users, even ride givers. But there are also ways to cut down drastically on the disk space

used: employing h.265 (100MB per minute at 4K UHD) rather than the default h.264 if your devices support it, and knocking down the resolution to 1600p (50-60MBpm using h.265) or 1080p (25MBpm using h.265).

Good optics and processing can make up for a lot of the missing detail from 4K UHD, but try the three resolutions and see which you like best. Normally, I step up to 4K UHD only when the scenery warrants it. That said, I'm unlikely to ever approach 15,000 hours of dash cam use, so I might just set it to max and forget it.

The Mini5's Spartan design is because all settings are tweaked using the DDPai app. The app features an installation guide and alignment grid on the home page's live view. You connect via Wi-Fi (or a faster 5GHz when

possible), so there's only your phone service internet while using the app. Various parameters include g-sensor tweaking, how to handle GPS info, volume, audio capture, and so forth—all the normal goodies.

There's of course a parking mode, but it requires that the camera have constant power. This means a hardwiring kit or OBDII power cable. Note that it is possible to run your battery down with such a setup, though most cameras will ditch the parking mode if an under-voltage state occurs.

The app also will display a map of your travels, but only after you download videos to your phone. The aforementioned smaller files are used for preview directly from the camera. On a rather random note, I will say that hearing "Hello Ding Ding Pai" every time the camera powers up makes me smile.

So does the two-year warranty, which is twice the length of most. Note that some cheaper dash cams are only warrantied for 90 days. I can't vouch for DDPai's customer service, but the company's PR were dogged in their communications with me.

## PERFORMANCE

Though I found the Mini5's daylight video a tad overexposed, the effect was minimal and can be dialed back in the settings. Some of the indistinct mottling you see below is my windshield and due to inclement conditions the night before. Most cameras filter this out. However, all in all, day captures are colorful



**Though the surrounding areas are a bit overexposed, the focal point is not. This is a very good, detailed capture. The smudges are on my windshield and not artifacts from the camera.**



**This night capture from the Mini5 is excellent. It shows a lot more detail when you brighten it up in post.**





**I'm not sure what caused this headlight flare as it was the only real instance. Most headlights didn't result in this blowout.**

and reveal plenty of detail. That integrated GPS allows you to pinpoint locations and track your travels.

Night video was generally quite good, though I did notice one instance of flare blowout that you can see in the second capture. This must've been a freak angle and even cars driving closely by didn't cause this phenomenon.


Above is the artifact I told you about. As noted, this was the exception and generally flare is not an issue. Note that you can still see good detail in the surrounding areas. And yes, 0km/h means I was parked. There's a setting to change this to MPH for the U.S. market. I didn't notice it immediately as dash cams sold here are normally set to MPH.

I should note that the Mini5 ran very cool. The unit employs a super capacitor, which allows the camera to run long enough to save

any current video, but not capture post-incident action should the car power fail.

## BOTTOM LINE

Other than the integrated memory wearing out in the far future (like Apple's planned obsolescence with SSDs), there's nothing about the Mini5 not to like. It's lush, it's

exceptionally easy to set up and use, and the captures are very good. If you desire the premium experience provided by the DDPai Mini5, go for it. 

### DDPai Mini5

★★★★★

#### PROS

- Attractive.
- Good day and night captures.
- 64GB integrated eMMC memory.
- Super-easy setup with GPS.
- Phone connectivity.

#### CONS

- No onboard display.
- Memory isn't replaceable (15,000 hour lifespan) or upgradable.

#### BOTTOM LINE

We like the elegance of the DDPai Mini5 and its good day and night captures. It's phone centric or dependent, so if that's your thing, you'll like it. Note that the memory is hardwired internally (64GB), but should still last you around 15,000 hours according to DDPai.


**\$160**

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# 18 WORK- FROM- HOME TECH PRODUCTS THAT WILL LEVEL UP YOUR OFFICE



BECOME MORE  
PRODUCTIVE AND TURN  
YOUR HOME OFFICE  
INTO A WORKSTATION  
POWERHOUSE WITH  
THESE ITEMS.

**BY SAM SINGLETON**



OFFICE



**M**aking the switch from the office to working from home has become the new normal, but some users might feel like their setup is not as well appointed or productive as at the office. It's time to change that. With the proper equipment and gear, you can turn your boring old home setup into a workstation powerhouse—ensuring you'll never need to return to the office.

At PCWorld, we've had to adjust to remote work just like the rest of the world. Our staff has spent countless hours testing and reviewing hardware, which means we've been lucky enough to find the best gear and

accessories available. Below you'll find our favorite work-from-home essentials.

## LOOK SHARP DURING ZOOM MEETINGS: **LOGITECH C920E BUSINESS WEBCAM**

**Price:** \$70 from [fave.co/3kDFx73](https://fave.co/3kDFx73)

Working from home means you'll have video meetings. Lots of them. And those low-quality webcams that ship with most laptops won't show your brightest side. So opt for a new webcam with high-quality resolution such as the Logitech C920e Business Webcam ([fave.co/3Jlou42](https://fave.co/3Jlou42)). It captures 1080p HD resolutions and a 78-degree field of view, and



**The Logitech C920e is a high-quality webcam that captures 1080p resolutions.**



**The SD5500T lets you expand a laptop's capabilities.**

comes with great perks such as autofocus and light correction.

## CREATE A FULL-ON WORKSTATION: **KENSINGTON SD5500T THUNDERBOLT 3 DOCKING STATION**

**Price:** \$290 from [fave.co/3WDL3Uv](https://fave.co/3WDL3Uv)

Your ultraportable laptop may be perfect for commuting to and from the office, but when you're working from home, you want a dedicated workstation with the ability to connect all of your peripherals. A Thunderbolt dock will help you expand your laptop's capabilities and allow you to connect to a larger monitor and a full-size keyboard. You'll increase your productivity and your body will thank you for the ergonomic upgrade. We've tested a ton of Thunderbolt docks, and the Kensington SD5500T ([fave.co/3HT3st1](https://fave.co/3HT3st1)) is our favorite. It

gives you the reliable Thunderbolt 3 standard, a pair of DisplayPort ports, and 60W of laptop charging power, all for a relatively affordable price.

## OR OPT FOR A LESS EXPENSIVE USB-C HUB: **YEOLIBO 9-IN-1 USB-C HUB (RU9A)**

**Price:** \$25 from [fave.co/3kDG8pj](https://fave.co/3kDG8pj)

If you don't want to drop the cash on a Thunderbolt dock, you should at least

consider getting a USB-C hub. Modern laptops tend to lack all of the ports you need to connect peripherals. That's where a USB-C hub comes in. They are cheap and they allow you to significantly expand your port options. We recommend the YEOLIBO 9-in-1 USB-C Hub as it gives you a variety of USB-A as well as USB-C ports and microSD and SD card slots, all for around \$25.



**YEOLIBO's 9-in-1 USB-C Hub significantly expands your port options.**



**Simplehuman's Cleanstation kills 99 percent of your phone's surface germs.**

## CLEAN UP YOUR ACT: SIMPLEHUMAN CLEANSTATION PHONE SANITIZER

**Price:** \$200 from [fave.co/3HyrLvB](https://fave.co/3HyrLvB)

Your phone is dirty. That's because your hands are dirty, your keyboard is dirty, and the poop bag you handled on your 10 a.m. dog walk is dirty. All our WFH germs get on our phone cases, so that's why our editor keeps the Simplehuman Cleanstation on his home office desk. Just drop your phone into this gadget and 30 high-intensity UV-C LED lights will kill 99.9 percent of the phone's surface germs in less than 30 seconds.

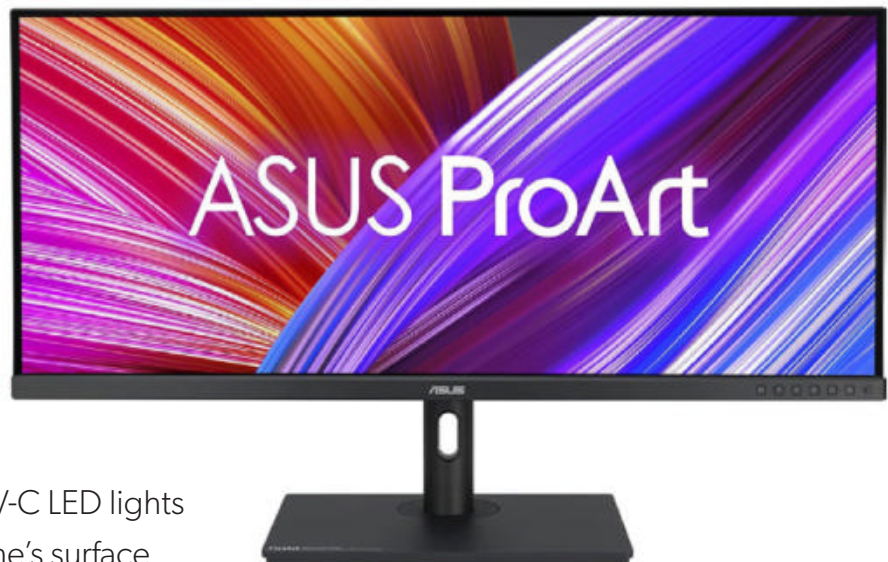
## DON'T SKIMP ON YOUR SCREEN: ASUS PROART PA348CGV

**Price:** \$730 from [fave.co/3kNABwr](https://fave.co/3kNABwr)

Working from home is all about productivity, and one of the best pieces of hardware to boost productivity is a great monitor. The Asus ProArt PA348CGV ([fave.co/3kNABwr](https://fave.co/3kNABwr)) is an ultrawide monitor with plenty of horizontal screen space so you can view all of your apps and documents spread out at the same time. It sports excellent image quality, a wide color gamut, and good

connectivity options.

There are a ton of great monitors ([fave.co/3Jg6rfw](https://fave.co/3Jg6rfw)) available, but the Asus ProArt PA348CGV has an excellent mix of features for anyone who has basic needs but wants a premium experience.



**The ProArt PA348CGV has a great mix of features.**





Logitech's \$67 Lift mouse can be purchased for left or right hands.

## CONSIDER ERGONOMICS: LOGITECH LIFT & KEYCHRON Q8 KEYBOARD

**Price:** \$67 from [fave.co/3kzFEk4](https://fave.co/3kzFEk4)

**Price:** \$205 from [fave.co/3DhHGfr](https://fave.co/3DhHGfr)

If you're working from home all day, you *need* to be comfortable and a standard mouse and keyboard just won't cut it. Focusing on ergonomics, the Logitech Lift mouse ([fave.co/3kzFEk4](https://fave.co/3kzFEk4))

and Keychron Q8 ([fave.co/3WA5v8N](https://fave.co/3WA5v8N)) keyboard were built to help keep your hands and wrists in a more comfortable and less injury-prone position.

The Lift mouse can be purchased for either left or right hands and comes in a variety of colors. It's also wireless, which helps you minimize desktop clutter. The Keychron Q8 keyboard is a bit pricey, but gives you the satisfying feel and dependability of a mechanical keyboard, while the curved design allows your wrists to rest in a more natural and comfortable position while typing.



The Keychron Q8's curved design allows your wrists to rest in a more natural and comfortable position while typing.

## GO WIRELESS: LOGITECH MK540 ADVANCED WIRELESS KEYBOARD AND MOUSE COMBO

**Price:** \$50 from [fave.co/3wtsbNA](https://fave.co/3wtsbNA)

If you don't want to spend big on a mouse and keyboard, you can find a





**Logitech's keyboard and mouse combo is an affordable option if you want decent performance without breaking the bank.**

more affordable alternative in the Logitech MK540 Advanced Wireless Keyboard and Mouse combo. Coming in at an affordable \$50, the keyboard is surprisingly snappy and

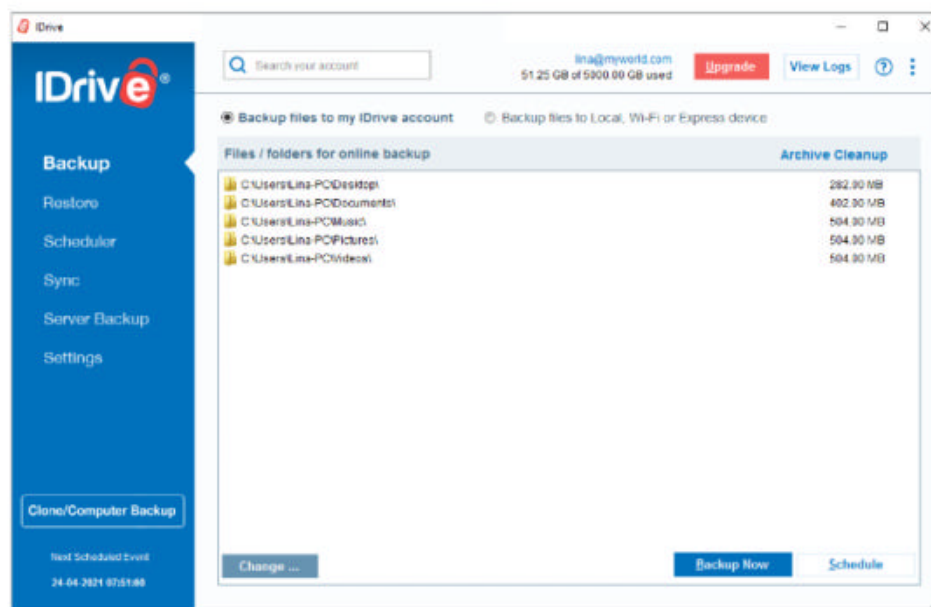
has a pleasant tactile experience without too much noise. The mouse provides smooth and reliable use and has a few programmable gestures you can set for your convenience. Both are wireless, so you can do away with all of those annoying cables cluttering your desktop.

## BACKUP SOFTWARE IS A MUST: **iDRIVE ONLINE CLOUD BACKUP**

**Price:** \$75 from [fave.co/3QEr2vq](https://fave.co/3QEr2vq)

Many people neglect to consider backup when working from home, but if your IT department isn't covering you and your data, it's something that needs to be addressed. Luckily there are relatively inexpensive services such as iDrive Online Cloud Backup that make it simple to do. iDrive is versatile and comprehensive and allows you to set up

and use the backup software without any fuss. It's a one-stop shop to help keep your valuable data safe and secure.

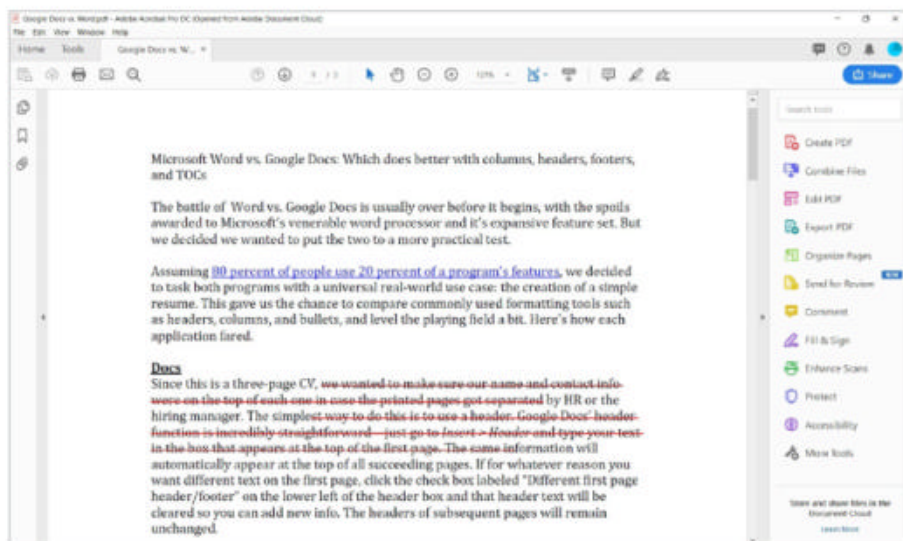


**iDrive is a comprehensive and versatile backup service.**

## SO IS A ROBUST PDF EDITOR: **ADOBE ACROBAT PRO DC**

**Price:** \$180 from [fave.co/3Ra9QP5](https://fave.co/3Ra9QP5)

PDFs are a staple of any



**Adobe Acrobat Pro DC is the best PDF editor out there.**

modern digital workplace, but they aren't always the easiest to edit. There are a ton of great PDF editors ([fave.co/3V8Y9bO](https://fave.co/3V8Y9bO)) out there, but Adobe Acrobat Pro DC has been, and continues to be, the reigning champ.

## EASE EYESTRAIN: **BENQ SCREENBAR**

**Price:** \$109 from [fave.co/3jd3lUh](https://fave.co/3jd3lUh)

To save space on your desk and reduce eyestrain, there is no better option than a



**BenQ's Screenbar will help prevent eyestrain without taking up valuable desk space.**

There is no other software that combines the same features for creating, editing, reviewing, and securing your PDF documents. Plus, the subscription-based format means that you'll always have access to the latest version and won't need to continually buy new software every year.

screenbar. When BenQ debuted its ScreenBar ([fave.co/3kzG5Le](https://fave.co/3kzG5Le)), it had us wondering why no one had thought of this before—it's an extremely practical solution to a very modern problem. It'll save you desk space and keep you from going cross-eyed from squinting through the reflections on your monitor all day. Admittedly, it's a bit pricey, but your eyes will thank you in the long run.



**If you don't fancy a screenbar, IKEA's Forså will keep your desk looking chic and well lit.**

## THE DESK LAMP OPTION: **IKEA FORSÅ**

**Price:** \$35 from [fave.co/3XKwksn](https://fave.co/3XKwksn)

If you don't want to shell out the money for a screenbar or it just isn't your style, then the tried-and-true desk lamp can be a great alternative. At just \$35, the IKEA Forså provides form and function to help keep your desk looking chic and well lit. It comes with excellent adjustability, a cool old-school chrome design, and a straightforward on/off switch to keep things dead simple.

## KEEP UPRIGHT: **JARVIS BAMBOO STANDING DESK**

**Price:** \$549 from [fave.co/3HyITCv](https://fave.co/3HyITCv)

When working from home you have a tendency to stay seated for long periods of

time even more so than when working in an office. And no matter how comfy that fancy ergonomic office chair is, sitting in it all day isn't ideal. The best way to keep your body happy while working at a desk is to switch to an electric height-adjustable standing desk.

The Jarvis Bamboo Standing desk not only looks nice with its clean bamboo top, but it's practical too. It comes with an impressive height adjustment range,

solid stability (even when maxed out), a great warranty, and decent customization options—it ticks all the boxes for things you want in the perfect standing desk.



**The Jarvis Bamboo Standing desk comes with an impressive height adjustment range.**





**Lutron's smart dimmer lets you control the lighting system in your home office via voice controls.**

## SET THE MOOD: LUTRON DIVA SMART DIMMER

**Price:** \$70 from [fave.co/3j8Qddu](https://fave.co/3j8Qddu)

A smart light switch isn't an obvious necessity, until you have one. Being able to control the lighting system in your home office via voice controls, motion detection, or your smartphone is a simple luxury that can pay dividends—both in your mood and in your energy bill.

The Lutron Diva Smart Dimmer is built to work with the Lutron Caséta ecosystem, but it also provides broad compatibility with different smart products and systems such as Amazon Alexa, Google Assistant, and many others. It also has a minimalist design that doesn't draw attention to itself.

## STAY WARM: VORNADO VH200 HEATER

**Price:** \$93 from [fave.co/3wtjX8a](https://fave.co/3wtjX8a)

In those cold months of winter you need a way to stay warm and comfortable while you work at home. A space heater such as the Vornado VH200 Heater is a great way to keep your energy bill down while still warming a specific area. The Vornado is small enough so it won't take up too much room in your office, but powerful enough to heat an entire room by itself. It's also extremely quiet, meaning you can focus on your work without being distracted by an overly noisy fan.



**The VH200 Heater can help keep your energy bill down while still warming a specific area.**



## SAY NO TO CABLES: ANKER POWERWAVE 7.5 STAND

**Price:** \$55 from [fave.co/3H8ENOT](https://fave.co/3H8ENOT)

A clean desktop can help you stay productive and focused while working at home. One of the best ways to reduce your cord clutter is to switch to a wireless phone charger. It's also one of the most convenient and hassle-free ways to charge your mobile devices.

Right now there's no better wireless charger than the Anker PowerWave 7.5 Stand. It's the fastest Android charger we've ever tested, it has a clean, minimalist look, and the upright stand makes checking notifications a breeze.



**The Anker PowerWave 7.5 Stand is the fastest Android charger we've ever tested.**

## GET SOME COMPUTER SPEAKERS: CREATIVE PEBBLE

**Price:** \$40 from [fave.co/3HAeYcg](https://fave.co/3HAeYcg)

A full, booming 7.1 surround sound speaker setup might be great for watching movies and playing games, but for work you don't need anything nearly as fancy. If you're working at home, you just want something that will produce clear audio during meetings or while you're listening to some background lo-fi beats to help stay focused. Save yourself some money and go with the Creative

Pebble speakers ([fave.co/3L39Egv](https://fave.co/3L39Egv)), which for only \$40 produce deep and rich audio you would expect from something two or three times the price. Plus they don't take up



**The Creative Pebble speakers produce deep and rich audio.**



**Lenovo's ThinkPad X1 Carbon Gen 9 offers great performance.**

much space and look really good on a desktop.

## DO-IT-ALL PRODUCTIVITY: LENOVO THINKPAD X1 CARBON GEN 9

**Price:** \$1,335 from [fave.co/3RabcjF](https://fave.co/3RabcjF)

You need a laptop while working at home and none is more suited to the task than the Lenovo ThinkPad X1 Carbon Gen 9 ([fave.co/3jdbtE](https://fave.co/3jdbtE)). It sports great performance thanks to its Core i7, integrated Iris Xe graphics, and 16GB of RAM. It will not only handle any word processing and spreadsheet work you throw at it, but it can also handle web browsing while you're on your lunch break. It has a spacious 16:10 aspect-ratio screen, which is ideal for viewing documents, and a comfortable keyboard for marathon typing or coding sessions.

## BACK TO BASICS: CHROMEBOOK SPIN 713 CP713-3W-5102

**Price:** \$800 from [fave.co/3j4gucY](https://fave.co/3j4gucY)

[fave.co/3j4gucY](https://fave.co/3j4gucY)

If you want something a little more portable (or affordable) than a full-fledged productivity machine like the Lenovo ThinkPad, then look no further than the Chromebook Spin 713 ([fave.co/3Fzr1nM](https://fave.co/3Fzr1nM)). It has fast performance and a versatile 2-in-1 form factor. Meaning you can

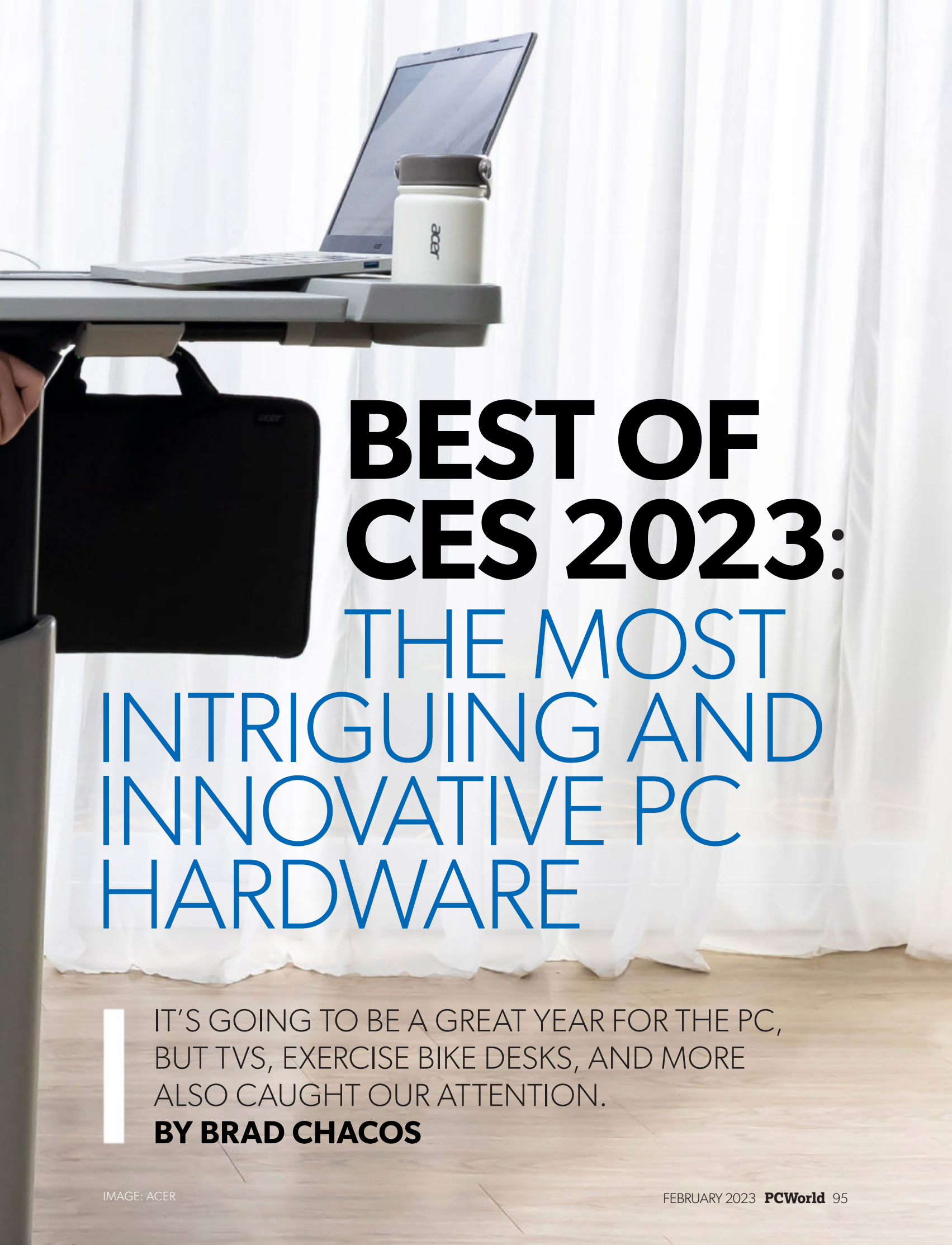
either use it as a regular laptop or flip the screen around and use it like a tablet. At just under 3 pounds, it's also portable enough to take to the coffee shop when you need a change of scenery. So long as you don't need Windows while working, the Spin 713 is a great everyday option. 🔌



**The Chromebook Spin offers fast performance and a 2-in-1 form factor.**







# BEST OF CES 2023: THE MOST INTRIGUING AND INNOVATIVE PC HARDWARE

IT'S GOING TO BE A GREAT YEAR FOR THE PC, BUT TVS, EXERCISE BIKE DESKS, AND MORE ALSO CAUGHT OUR ATTENTION.

**BY BRAD CHACOS**



**W**e're finally getting back to normal. Most major PC players returned to the Las Vegas desert for CES 2023

after sticking to the safety of remote events last year—and they brought some very enticing shiny new tech along with them.

Big names like AMD, Intel, and Nvidia all made splashy announcements, and PC manufacturers revealed a barrage of large and in-charge laptops ([fave.co/3kpfHUh](https://fave.co/3kpfHUh)) that are taking advantage of the unprecedented power. Computer monitors witnessed revolution like never before ([fave.co/3D674Vf](https://fave.co/3D674Vf)). Heck, we even saw a PC case that *breathes*.

Yep, CES is back.

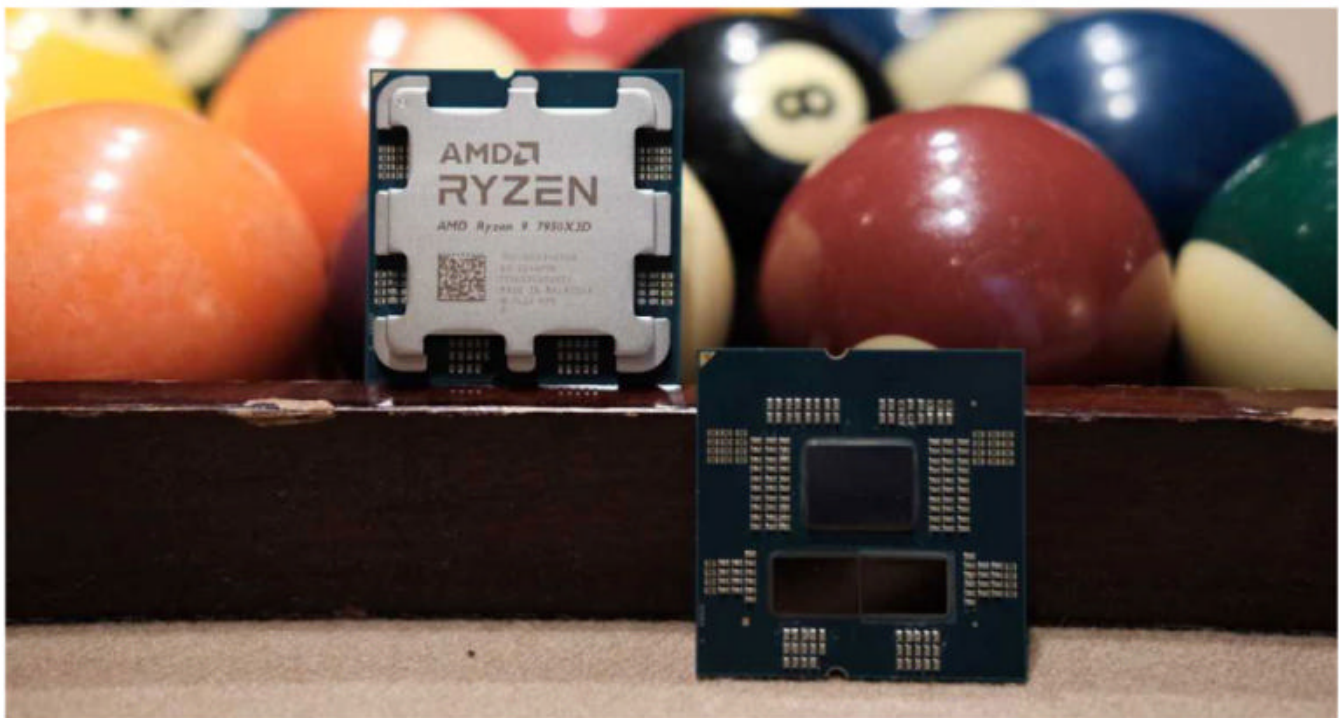
No time to sift through all our CES coverage? No problem! Read on for our Best

of CES 2023 picks—the most intriguing and innovative products that impressed PCWorld's staff at the show.

## AMD RYZEN 9 7950X3D

The hotly anticipated Ryzen 9 7950X3D ([fave.co/3weWvLE](https://fave.co/3weWvLE)) packs 16 cores and a surprising, potentially very smart design: The special sauce V-Cache is only on one of the chip's two 8-core chiplets. That lets games that like the 7950X3D's performance-boosting 128MB of L3 cache run on one die, while games that aren't fond of cache can run on the standard chiplet at higher 5.7GHz frequencies.

This design, AMD says, essentially gives consumers a “best of both worlds” CPU that no longer forces gamers to pick between the



**AMD's Ryzen 9 7950X3D looks set to be the 2023's performance CPU to beat.**



**The eKinekt BD 3 Bike Desk's companion app tracks information like calories burned and distance traveled.**

higher clocks of a non-X3D part or the fat V-Cache of an X3D part. Simply put, the Ryzen 9 7950X3D looks to be the performance CPU to beat in 2023.  
—Gordon Mah Ung

## ACER EKINEKT BD 3 BIKE DESK

Acer's new eKinekt BD 3 Bike Desk ([fave.co/3Hyikfw](https://fave.co/3Hyikfw)) turns the kinetic energy of your pedaling into electric energy for charging up your devices. As a remote employee who likes to stay active during the day, I was immediately drawn to this product. The

companion app tracks information like travel distance, calories burned, and so on. You can even charge multiple devices at once, as the desk features two USB Type-A and one USB Type-C. The desk is also eco-friendly thanks to the PCP plastic in its casing. If you have a desk job, this is a great way to exercise while working.—Ashley Biancuzzo

## ASUS VIVOBOOK PRO 16X 3D OLED

The combination of a 3,200×2,000 OLED screen at 120Hz and with glasses-free 3D technology is something that we're already salivating for: The combination of visual quality (infinite contrast! 100% DCI-P3 color gamut coverage!) and a high-refresh rate really is the Holy Grail of content creation and *gaming*. Pair that with Nvidia's next-gen RTX 40-series GPU, a 13th-gen Intel Core chip, and up to 2



**Asus' VivoBook Pro 16X 3D OLED offers glasses-free 3D technology.**



terabytes of storage, and the Asus VivoBook Pro 16X 3D OLED ([fave.co/3ksPpAz](https://fave.co/3ksPpAz)) should be one of the most incredible laptops to ship this year.—*Mark Hachman*

## ACER PREDATOR X45 OLED GAMING MONITOR

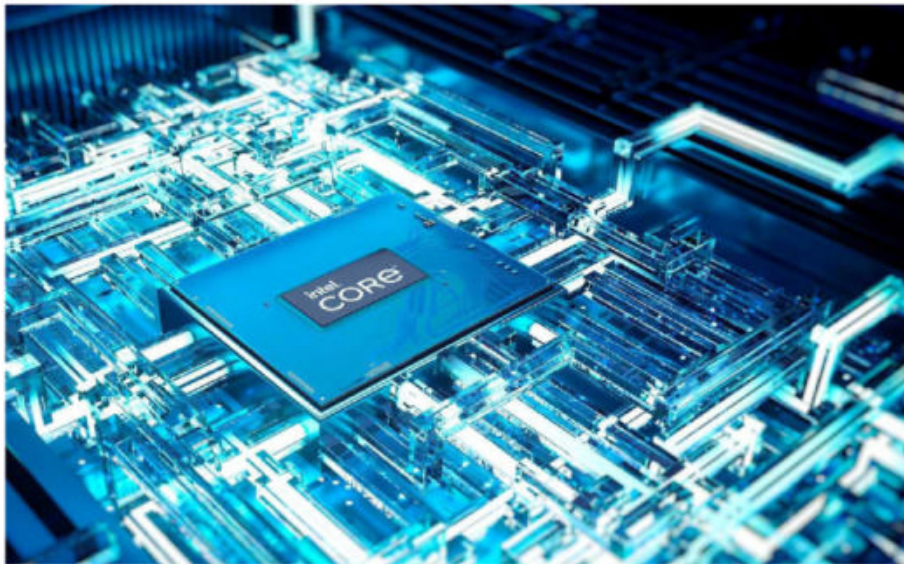
An arms race of high-end gaming OLED monitors emerged at CES. While Samsung's new OLED G9 ([fave.co/3HoY9AU](https://fave.co/3HoY9AU)) takes the crown for the biggest, I think Acer's curvy Predator X45 ([fave.co/3kjdkvU](https://fave.co/3kjdkvU)) is the one that might just earn a spot on my desk. Its more practical 1440p resolution means it won't break a GPU in half just to render *Fortnite*, and 45 inches isn't so gigantic that nothing else can fit in your setup.

Plus, just look at the thing. The dramatic 800R that tries to tickle your ears, the bezel



**Acer's curvy Predator X45 is absolutely gorgeous.**

that almost disappears into the frame. It's freakin' gorgeous, and it even includes a KVM switch for handling multiple machines. And at \$1,700, it's actually surprisingly OK in terms of value.—*Michael Crider*

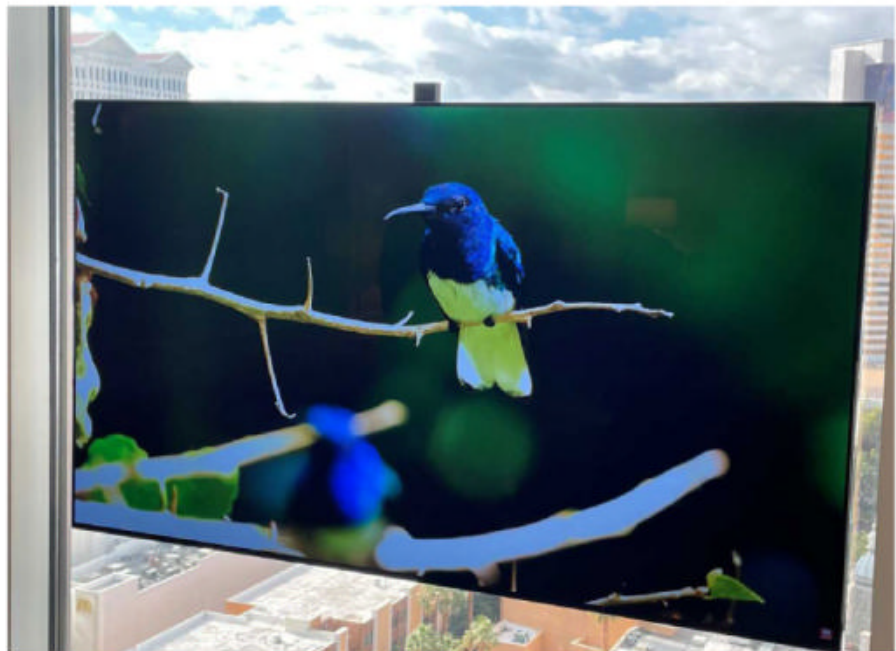


**The 13th Gen Intel Core Hx-55W Mobile Chip is blisteringly fast.**

## INTEL CORE i9-13980HX

Just stop, Intel. You had us at "24 cores in a laptop CPU." But we admit that we just can't say no to a CPU that cranks out performance 40 percent faster than the already

stupidly fast 12th-gen HX-CPUs. And let's not even mention the 164 percent advantage the Core i9-13980HX ([fave.co/3Ws0jUx](https://fave.co/3Ws0jUx)) has over an Apple M1 Max in Cinebench R23. We're pretty hot and bothered by this much performance in a laptop CPU. Did we mention it hits a blistering 5.6GHz?  
—Gordon Mah Ung



## DISPLACE TV

TVs are always a big draw at CES. And often it's the

biggest ones that grab the most attention. But I was particularly wowed by this 55-incher, which might be standard size but is brimming with innovations. For starters, the Displace TV ([fave.co/4068usx](https://fave.co/4068usx)) is completely wireless, using rechargeable batteries for power and wireless signals for A/V feeds. It also forgoes mounting hardware in favor of an advanced suction solution.

And lest you feel like this 55-inch 4K OLED panel is too confining, the Displace TV is modular, meaning it has retractable joiners on its edges so you can scale up to 8K by joining four panels. You can send multiple feeds from its remote-based station to each screen separately or spread a single stream across all panels. That's a lot of technological leaps and

**During our Displace TV demo, the company's CEO hung this 55-inch 4K OLED TV on the hotel window with vacuum power supplied by the TV itself.**

bounds in one product, should it actually make it to market.—Katherine Stevenson

## CYBERPOWER KINETIC 360V

Is it cheating to pick the same product as last year? Not possible when the item is this cool. Of the PC cases I've seen over my career, few have had the CyberPower Kinetic 360V's wildly futuristic, absolutely mesmerizing take on high airflow ([fave.co/3XH8Tjy](https://fave.co/3XH8Tjy)). It *breathes*. At first glance, its geometric design and distinctive copper and white coloring seem merely stylish—then the mechanical wizardry fires up. Watching those small, angular panels on the front automatically open and close to keep your system cool



feels like the stuff of sci-fi movies. And CyberPower assures us that we can finally get one of our own this year. Spring 2023 can't come soon enough.—*Alaina Yee*

## NVIDIA RTX VIDEO SUPER RESOLUTION

You know DLSS, the amazing AI-powered game upscaling technology that supercharges performance on Nvidia's RTX graphics cards? Now GeForce is bringing those dedicated tensor cores to bear on crappy web videos. Nvidia RTX Video Super Resolution ([fave.co/3j9icty](https://fave.co/3j9icty)), which will work on the RTX 30 and 40 series at launch and the RTX 20 series at a later date, can intelligently clean and upscale 1080p video to 4K in Chrome and Edge. The proof will be in the pudding, but 4K videos remain relatively rare on YouTube, so I'm thrilled by the prospect of

having a DLSS-like feature make those HD vids look even better on my pixel-packed screen.—*Brad Chacos*

## GIGABYTE AERO 16

The Gigabyte Aero line is one of my favorites for video-editing laptops (I'm actually using one to edit video at the show!) and the updated Aero 16 fixed one of my major problems with previous models. Instead of relying on a USB-C dongle for connectivity in Apple-like fashion, the company brought back a USB Type A port (one is better than none) and a full-size HDMI port, and moved the barrel charger to the back. It also added a built-in SD card reader, which is certainly welcome, but unfortunately it's only microSD. Maybe next year it'll go full size.

Of course, the new Gigabyte Aero 16 has been updated with the latest Intel CPUs (up

to a Core i7- 13800H) and Nvidia GeForce GPUs up to a RTX 4070. That combination should deliver a *huuuuuuge* increase in editing performance. Sign me up! —*Adam Patrick Murray*



The new Aero 16 has been updated with the latest Intel CPUs.

## ACER EKINEKT BD 3 BIKE DESK, AGAIN

The most notable PC-related announcement at CES, as far as I'm concerned, was for a new generation of OLED monitors



**Acer's eKinect BD 3 lets you sit and work for hours while getting in some light cardio.**

([fave.co/3D674Vf](https://fave.co/3D674Vf)). But that's less a single product than a trackable trend. If there's one thing that made me go "I'm so gonna buy THAT," it's Acer's new eKinect workstation exercise bike ([fave.co/3Hyikfw](https://fave.co/3Hyikfw)).

The idea of combining a light elliptical workout machine with a computer desk is nothing new, but the eKinect BD 3 is making a lot of smart choices. Forget about the device-charging gimmick, though it would be kind of satisfying to say I charged up my laptop with my puny human legs. No, look at that solid base, the comfy seat: This thing was meant to let you sit and work for hours while getting in some light cardio.

Ready to step it up a notch? "Sport mode" subtly adjusts the

geometry of the desk, allowing you to bear down on the pedals while still catching up on some streaming action. It's a well-thought-out gadget, and at \$1K it's surprisingly decent in terms of price, too.—*Michael Crider*

## HYPERX'S PERSONALIZED KEYCAPS

These 3D-printed custom upgrades from HyperX ([fave.co/3DdmbMr](https://fave.co/3DdmbMr)), HP's gaming

peripherals team, make me squeal with delight because they're just so freaking adorable. The limited-edition Cozy Cat keycap, which will be available this month, is wonderfully cute and maybe a little necessary. These add-ons may not offer much in terms of function, but they're fun, especially if you're



**The limited-edition Cozy Cat keycap is wonderfully cute.**

looking to dress up your keyboard or gaming headset. Sometimes you have to go back to the basics and learn to appreciate the little things in life.—*Ashley Biancuzzo*

## ASUS ROG AND ALIENWARE 500HZ MONITORS

After first being teased at Computex ([fave.co/3ogGnp1](https://fave.co/3ogGnp1)) only to never appear in 2022, face-melting 500Hz monitors are actually a thing at CES 2023 ([fave.co/4035Aox](https://fave.co/4035Aox)). As a self-confessed sweaty try-hard in competitive games, I am extremely here for it.

The Asus ROG Swift Pro PG248QP ([fave.co/3JemkDd](https://fave.co/3JemkDd)) and aptly named Alienware 500Hz Gaming Monitor (AW2524H, [fave.co/3Rc6yek](https://fave.co/3Rc6yek)) both measure 24.5 inches and rock 1080p resolutions—perfect for esports—as well as Nvidia’s fantastic G-Sync and Reflex technologies for even more smoothness. But that 500Hz refresh rate is the real draw.

Frames win games in esports, and fast monitors help games handle even more responsively. Some misguided people think you can’t feel the responsiveness provided by ultra-fast displays, but as the happy owner of a 360Hz Asus ROG monitor I can report that even mousing around the desktop feels smoother the faster your screen goes.

All the new OLED and mini-LED monitors look damned enticing, sure, but *these* are the displays I can’t wait to get my hands on in 2023.—*Brad Chacos*

## NVIDIA GEFORCE RTX 40-SERIES LAPTOP GPUS

Just how damned impressive are Nvidia’s new GeForce 40-series Laptop GPUs ([fave.co/3XLPFJe](https://fave.co/3XLPFJe))? An RTX 4080 Laptop GPU locked at 50 watts in a smaller, lighter, and quieter Razer Blade 16 outperforms the previous GeForce RTX 3080 Ti Laptop GPU in

a larger, heavier, and louder Razer Blade 17. Wow. In fact, Nvidia’s new RTX 40-series of GPUs appears to be so efficient that we’re seeing



**Alienware’s 500MHz Gaming Monitor is perfect for esports.**





**Nvidia's GeForce RTX 40-series Laptop GPUs look seriously impressive.**

rubber brush design prevents tangling from pet hair; it's able to lift either dry or wet cleaning element to avoid cross-contact with the wrong the surface; and a drying feature has been added to the self-cleaning process to avoid mold growth. I'm sold! —

*Katherine Stevenson*

thinner, lighter and now much faster laptops than ever before to go with all the fire-breathing RTX 4090-powered behemoths ([fave.co/3kpfHUH](https://fave.co/3kpfHUH)).—*Gordon Mah Ung*

## ROBOROCK S8 PRO ULTRA

I've been slow to jump on the robot vacuum bandwagon after a bad first impression from an early-generation model.

Admittedly, that was a loooong time ago. And nothing drives that point home more than seeing the Roborock S8 Pro Ultra ([fave.co/3H7JZTj](https://fave.co/3H7JZTj)). This beast does everything! It vacuums, it mops, it empties its dustbin, it wets its own mop, it cleans itself. *And* it refines those duties in important ways: Suction power is boosted to 6,000Pa (compared to Roborock's previously high 5,100Pa); a new

## LENOVO THINKPAD TWIST

I've been burned before by its style of swivel hinge. I already have an e-ink reader. I'm not even convinced I wouldn't damage one of the screens. (And I generally am gentle with my gear.) But boy, do I want Lenovo's ThinkBook Twist ([fave.co/3kEdVyF](https://fave.co/3kEdVyF)). Its top panel sports a 13.3-inch 1440p OLED touch panel on one



**The S8 Pro Ultra does everything—it vacuums, it mops, it empties its dustbin, it wets its own mop, it cleans itself.**




**The latest ThinkBook combines a new color e-ink display and an old-school form factor for something unique.**

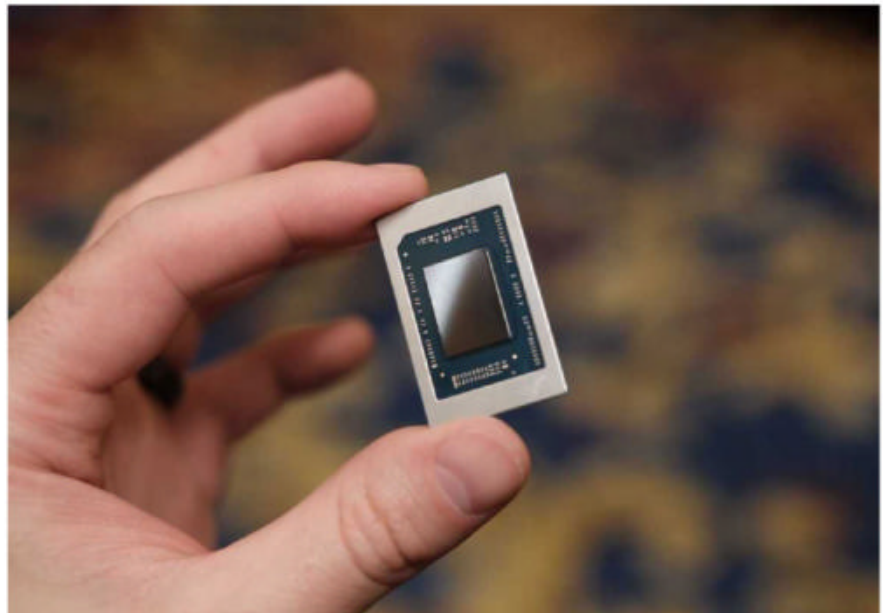
side and a 12-inch *color* e-ink display on the other—perfect for working on the go. That OLED display will provide sharp, high-res output for image editing and watching videos, while the e-ink display will go easy on battery life when I’m writing articles, reading books, and taking notes with the included stylus. With less eyestrain. In *color*. I can’t wait for a hands-on experience in June.—Alaina Yee

## AMD RYZEN 7040 LAPTOP CHIPS WITH XDNA AI

The rise of AI art and ChatGPT points to a future where

AI-powered experiences will become a commonplace thing. AMD’s Ryzen 7040 Mobile series ([fave.co/3WnH8ev](https://fave.co/3WnH8ev)) is the first time we’ve seen AI built directly into an X86 processor. Ryzen AI, as the company calls it, offers four concurrent AI streams at once, thanks to a programmable core sourced from its 2020 acquisition of Xilinx. We

expect that the XDNA architecture underlying Ryzen AI will be as pervasive as its RDNA GPUs in a few years. This is just the beginning.—Mark Hachman 



**AMD’s Ryzen 7040 Mobile series is the first time we’ve seen AI built directly into an X86 processor.**

# GET DOWN

WITH YOUR BLOOD PRESSURE

1

## GET IT



2

## SLIP IT



3

## CUFF IT



4

## CHECK IT



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## 10 Windows 11 tips and tricks we use to customize our PCs

We use these Windows 11 tips, and we think you should too. **BY MARK HACHMAN**

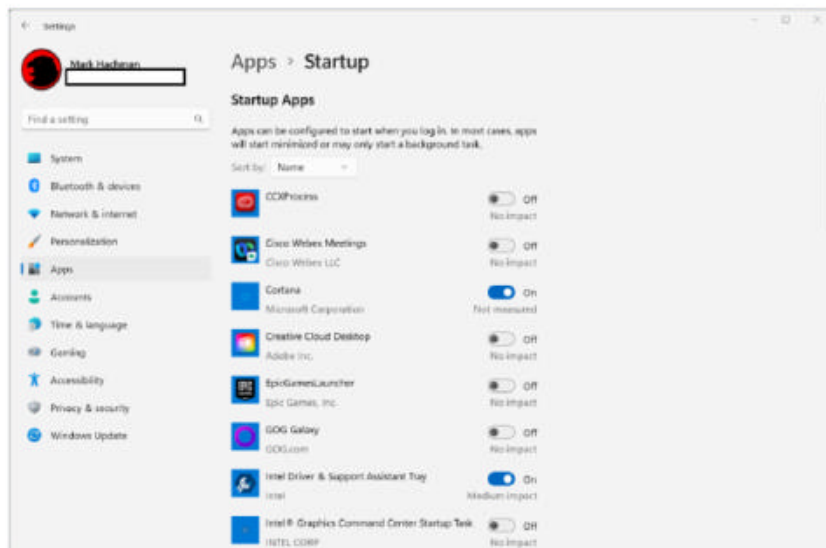
**T**he best Windows 11 tips are the ones you use—to make you more efficient and productive, and to customize your PC so it's exactly how you want it to be.

But to integrate a tip, you have to actually try it out. So that's what we'd like you to do: Give each of these tips a quick whirl, see if they work for you, and if they do, great! We

want to share what helps us and hope that it helps you as well. The list below includes tips for both older features and newer ones. Either way, enjoy!

### 1. OPTIMIZE YOUR STARTUP APPS

Everyone hits the gym to start off the year. So why not use the time to trim some of the



**You'd be surprised how many apps your PC may be loading at startup. Choose carefully to minimize performance impact.**

holiday bloat from your PC? There are potentially dozens of apps that can quietly load during your PC's startup, adding to the time it takes your PC to boot *and* gobbling up memory when it's completed.

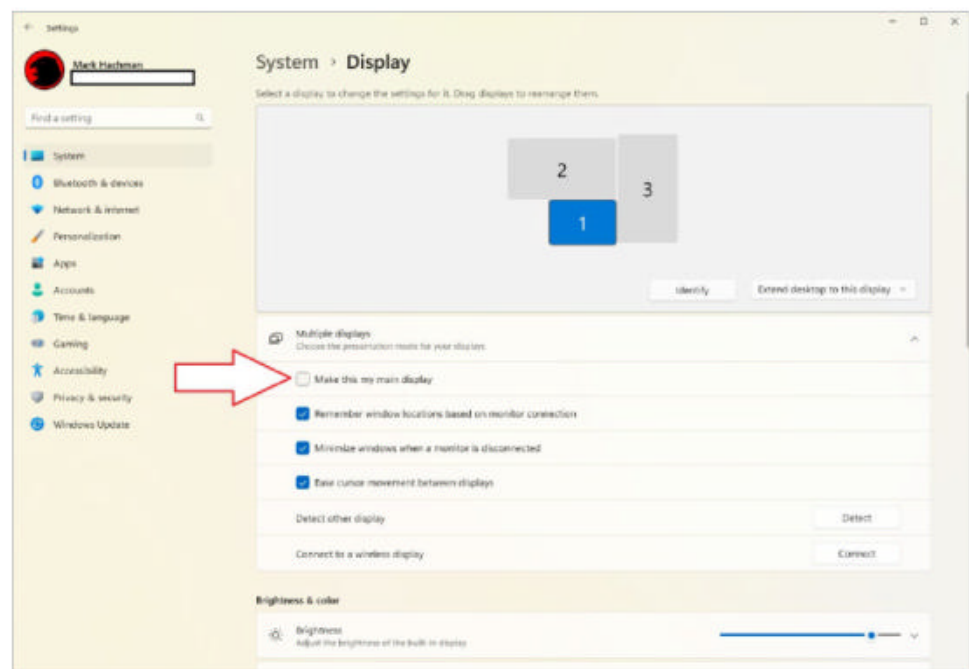
Take a look at your startup apps inside the Windows 11 Settings menu (Settings > Apps > Startup) and start considering flipping off apps that you won't immediately need, especially those that are marked "high impact." All this will do is force you to load them when you want to use them, which honestly isn't so bad.

Just don't turn off a background antivirus process or anything associated with Windows (Edge is fine). If you have any utilities associated with your PC maker (Dell, HP, and so on), it might be best to leave those alone.

## 2. SET UP YOUR PC FOR MULTIPLE DISPLAYS

Hopefully you use more than one display ([fave.co/3Je76hD](https://fave.co/3Je76hD)) with your desktop and/or

laptop, and you can buy great monitors on sale right now ([fave.co/3j1iDpZ](https://fave.co/3j1iDpZ)). They're hugely productive, and if you're worried about desk space, you can go vertical instead ([fave.co/3Dda1n5](https://fave.co/3Dda1n5)).



**Arranging your displays is a key part of working with multiple displays.**



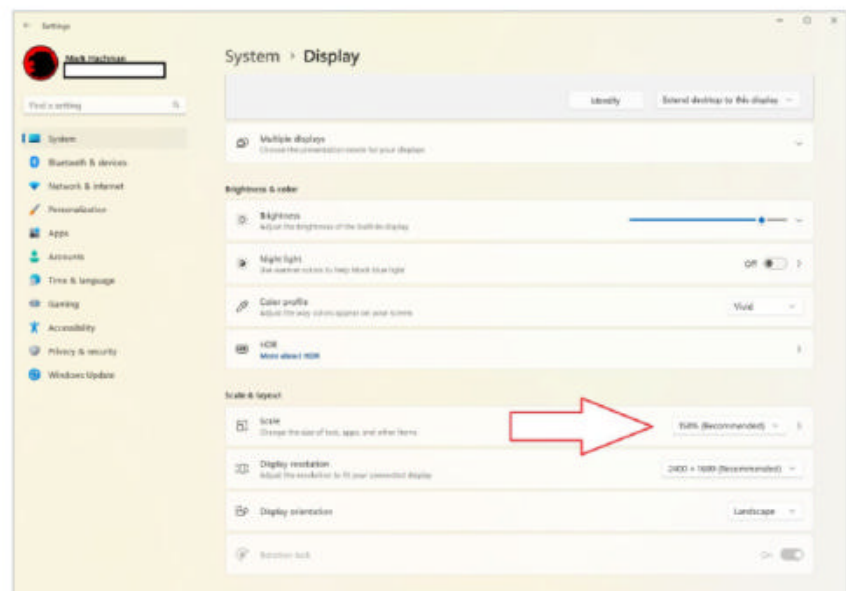
With Windows 11, you'll want to do two things: Arrange your displays within Windows, and make sure you have your "primary" display picked out.

At Settings > System > Display you can arrange your monitors so that your cursor naturally and seamlessly moves from one display to the other. Drag the displays next to one another in whatever arrangement you'd like: if you use one display to the right of another, arrange them side by side in Windows so you can mouse from one to the other. Also pick out which display should be the primary one, where you can click on the volume icon and Notifications.

If you have a laptop, ensure the option to preserve the display layout is checked ("Remember window locations based on monitor connection"), especially if you own a Thunderbolt dock ([fave.co/3vtA0BE](https://fave.co/3vtA0BE)). That way everything will remain organized the same way whether you undock your laptop or not.

### 3. UNDERSTAND HOW TO ADJUST THE SIZE OF TEXT AND ICONS

We're all getting older—and even if your vision is excellent, we're all still squinting at screens more than we should. In Settings > System > Display, you can adjust the Scale of



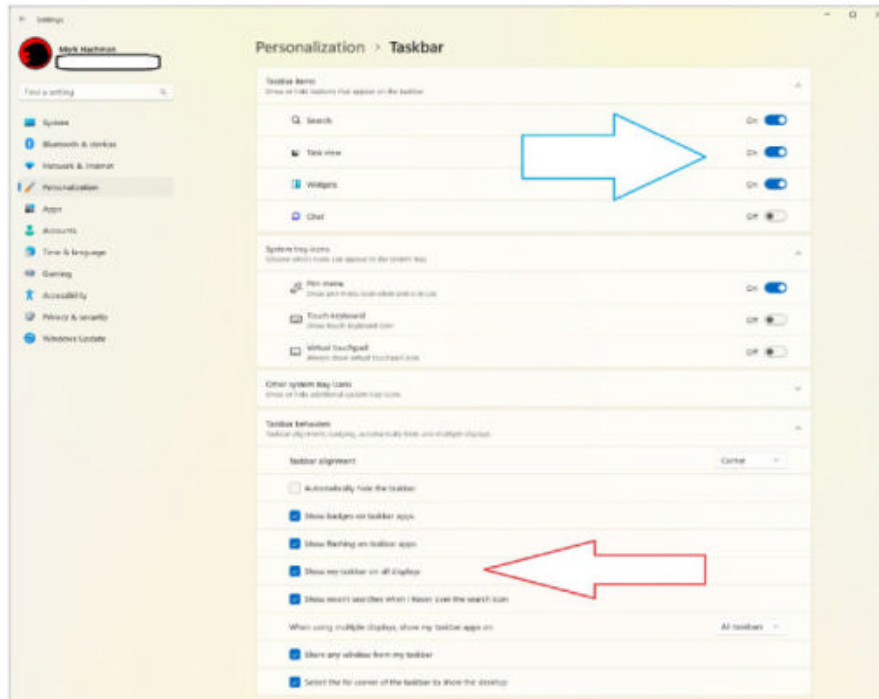
**You can find the control to scale Windows here (red arrow). Experiment to find the right setting.**

each display. Making the value larger will increase the size of every element within Windows: icons, text, window sizes, and so forth. But Settings > Accessibility > Text size will simply scale the text size up and down for what you're reading right now.

Why choose one over the other? Because you may instinctively know which icon corresponds to which, whether you wear glasses or not. But adjusting the text size may allow you to avoid paying for bifocals while still using Windows effectively.

### 4. GET THE WINDOWS 11 TASKBAR THE WAY YOU WANT IT

Windows 11's taskbar still stinks—though the excellent \$4.99 Start11 utility fixes things ([fave.co/3A2JzKj](https://fave.co/3A2JzKj)) by allowing you to widen



Of all the options here, extending your Taskbar to all of your displays (red arrow) and hiding unnecessary icons (blue arrow) are probably the most important.

and move it. But if you don't want to pay, make sure you're getting the most out of Windows 11 itself. In Settings > Personalization > Taskbar you can ensure that the taskbar, including the badges that indicate available mail, is shown or hidden on all of your displays.

You can also choose to hide various Taskbar icons by toggling off apps you'll never use. (Bye-bye, Chat.)

## 5. SKIP THE START MENU ENTIRELY

Honestly, the best way to use your Start menu is not to use it; just press the Windows key and type the name of the app (**Win**, then

"word" to open Microsoft Word, for example). It's simply faster than pawing for your mouse and clicking through various submenus to find what you want.

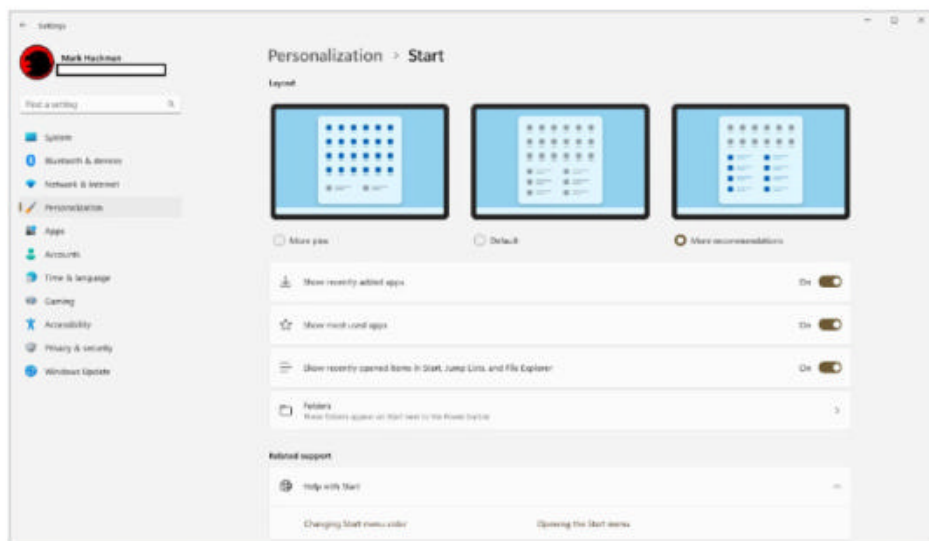
If you want an even faster method, simply type **Win** plus the number of the icon on the taskbar to launch that program—so opening the first taskbar program would be **Win + 1**, the second would be **Win + 2**, and so on. Beware, though, as Microsoft appears to have switched up how it counts the icons. On my PC, the

"first" icon is File Explorer, not the Start, Search or virtual desktops icon to its left.

## 6. OPTIMIZE THE WINDOWS 11 START MENU

How we use the Start menu isn't necessarily how you'll use the Start menu. The Start menu isn't that great for searching for apps, but it's surprisingly good for picking up where you left off on a specific document.

To configure the Start menu the way you want, go to Settings > Personalization > Start. Choose the layout you prefer: "more pins" shows more apps, while "more recommendations" shows more recent documents. If you'd like to turn off recent



**Configure the Start menu as you wish.**

documents, toggle them off in “Show recently opened items in Start...” below. (Microsoft does an awful job of naming these.) You’ll see your changes reflected in the Start layout the next time you open it.

There’s more that you can do here, such as adding to the icons that are displayed next to the power button (Personalization > Start > Folders), but they’re not as efficient as using File Explorer.

## 7. FILE EXPLORER’S NEW TABS ARE THE BEST WAY TO COPY FILES

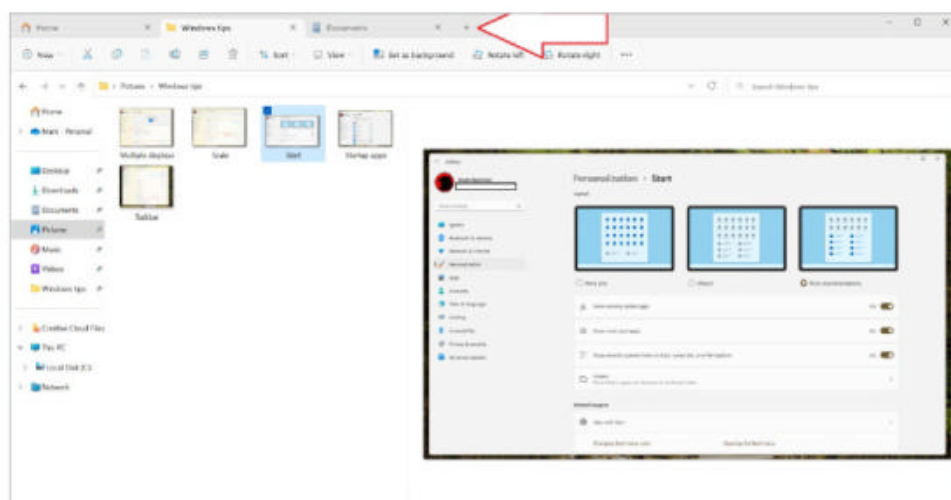
It’s no fun to use a single File Explorer window to highlight a file, cut or copy it, then navigate

open another tab, and then transfer files back and forth at your leisure.

## 8. USE FILE EXPLORER’S PREVIEW PANE

Sometimes file names aren’t really enough to find the file you’re looking for. For that, there are two solutions: File Explorer’s built-in search

through an entire file tree of drives, files, and folders to find the target location. If you’ve installed the Windows 11 2022 Update followed by its supplementary October Update, File Explorer is now new and improved with a browserlike tab option. Just open the File Explorer window, click the plus-sign (+) button to



**Clicking the plus-sign (+) button (next to the red arrow) adds another File Explorer tab. To the right you can see the File Explorer preview pane in action.**



is one. The other is the preview pane, which “opens” the file for you to view. This works for text files, images, PDFs—a surprising number of file types, actually. Just make sure the Preview pane is enabled (click on View at the top, then Show, and then Preview pane) and make sure the pane is large enough so you can comfortably view the document in question.

## 9. TURN ON GAME MODE


Windows 11 Game Mode prevents Windows from updating while you’re playing a game and shuts off background processes to give your PC all the horsepower it can muster. Seems obvious, right? Go to Settings > Gaming > Game Mode to flip it on. It will

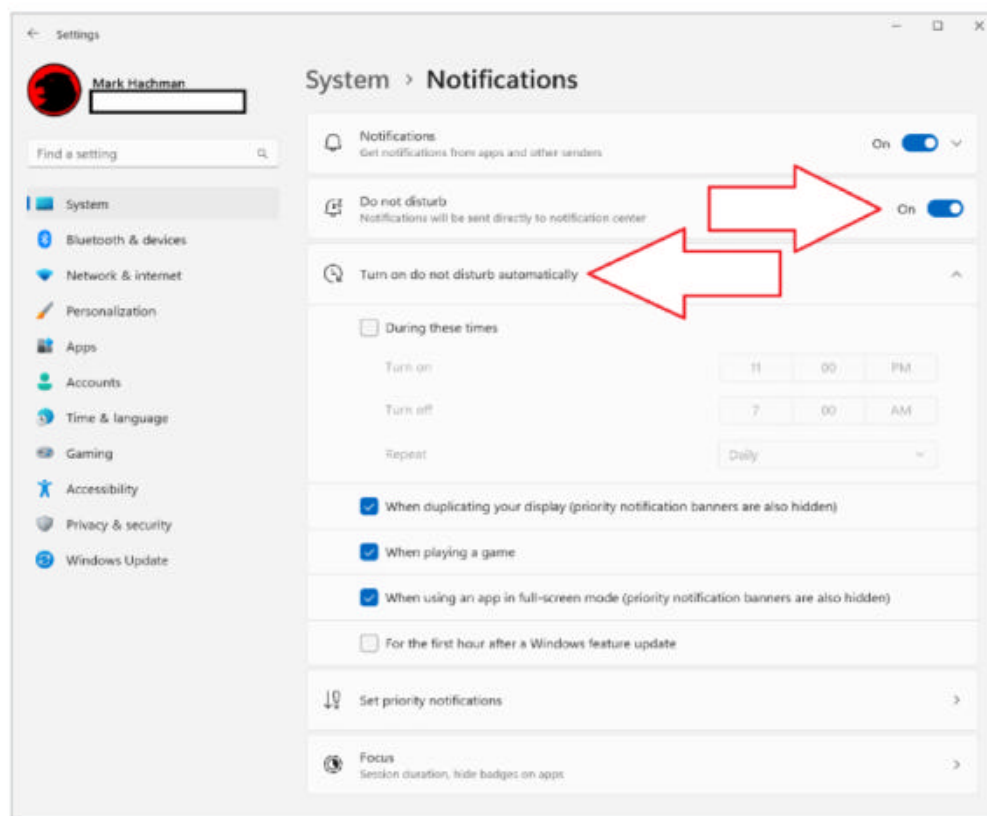
trigger when you’re playing a game, but it won’t do anything otherwise. Note that it may cause YouTube videos playing in a browser on a second monitor to stutter a bit, however.

## 10. CARVE OUT SPACE FOR YOU WITH DO NOT DISTURB

Windows’ Focus Mode turns off notifications and can schedule a playlist of Spotify songs to help you burn through a task without external distractions. But if you have multiple monitors open to view email, and if an app icon posts a taskbar badge to alert you...do you really need notifications? In Settings > System > Notifications you can simply turn “Do not disturb” on, which allows notifications to

accumulate in the Notifications portion of the Action Center, but you won’t actually be bothered by them.

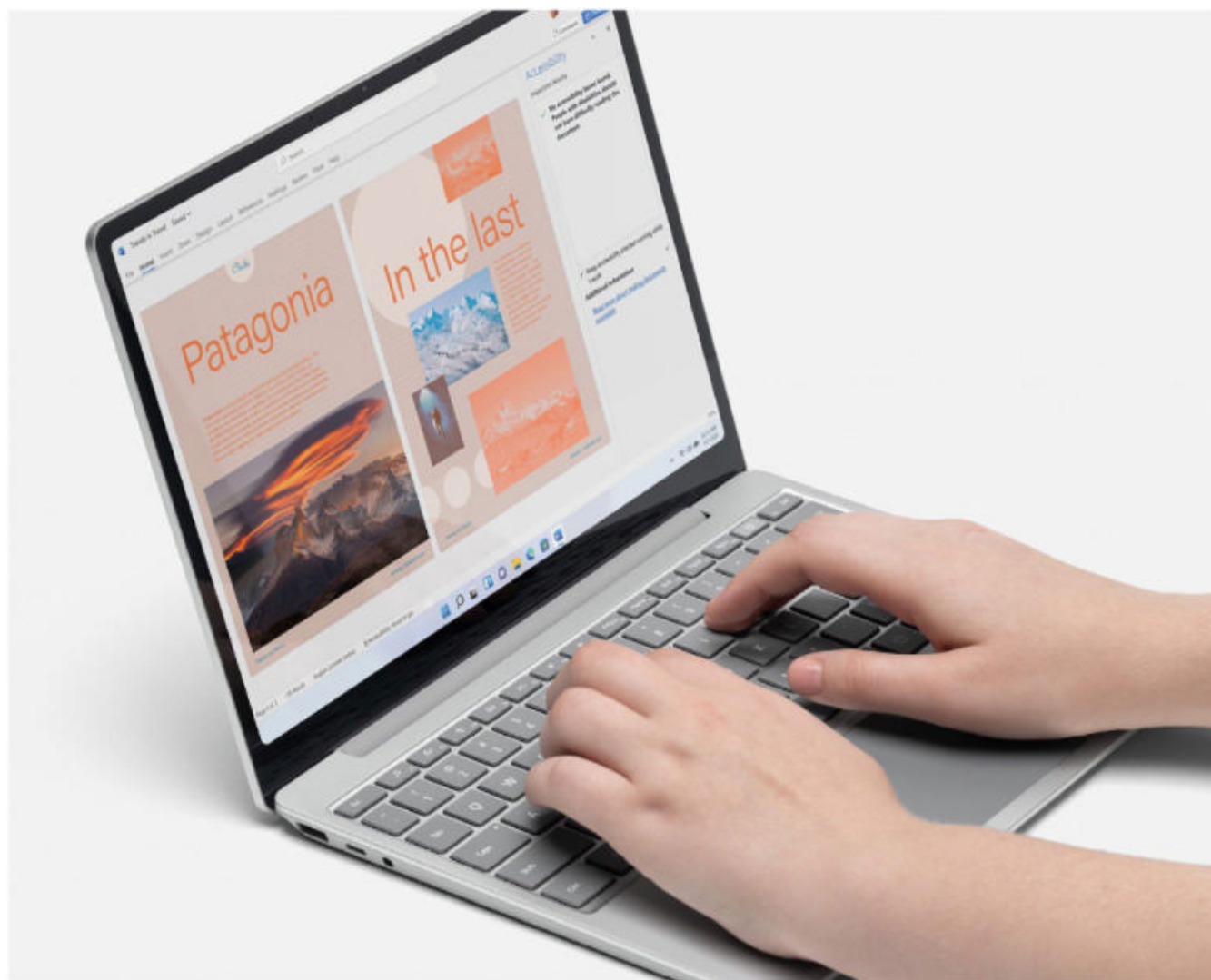
You can also schedule notifications to be turned off at certain hours with the related control labeled “Turn on do not disturb automatically.” Your personal time should be your own... especially after hours during a vacation. 



**Notifications can be handy, but not always. Control them!**

# How to insert and adjust images in Microsoft Word

It's easy-peasy. **BY ALEX HUEBNER**



**T**o create a simple handout that only needs a few visuals or maybe a basic flyer, Microsoft Word can be your go-to. However, putting an image into Microsoft Word exactly as you have it in your head can be difficult if you

don't know exactly how. Getting the images in can be handled in a few ways depending on how you want it to look with your text. Once it's in place, you can even change the size and angle of the image. Read on to learn more.

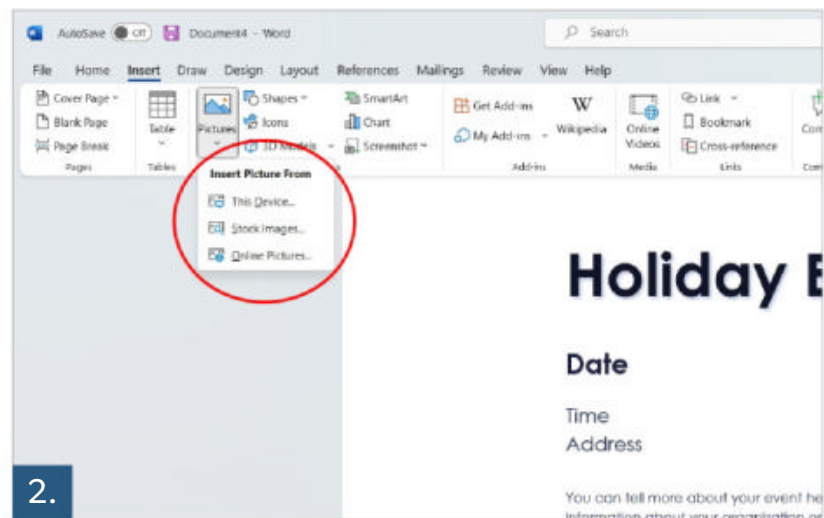
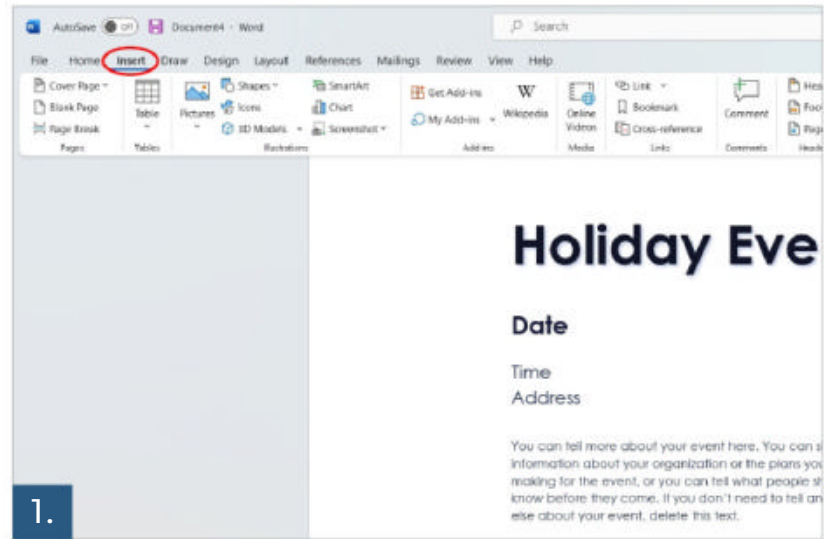
# INSERTING AN IMAGE INTO MICROSOFT WORD

Place your cursor where you'd like your image to go and left click. Then go to the Insert tab (1) at the top of Microsoft Word.

In the Insert tab, there's an Illustrations section where you select Pictures. This brings a dropdown of options for you to choose from.

If you don't already have an image in mind, you can use the Insert Picture From choices of Stock Images or Online Pictures (2). Once you click, a search box will pop up. Stock Images pulls from a library of photos available through Microsoft while Online Pictures pulls from a Bing search. Simply type some keywords for the image you'd like and choose the one you like best.

To insert a photo of your own from your device, click This Device instead and File Explorer will pop up. Choose your photo and it will appear where you clicked your cursor within the document. By default, your image will be placed in line with the text. This means the image will act just like text, pushing the rest of the words after

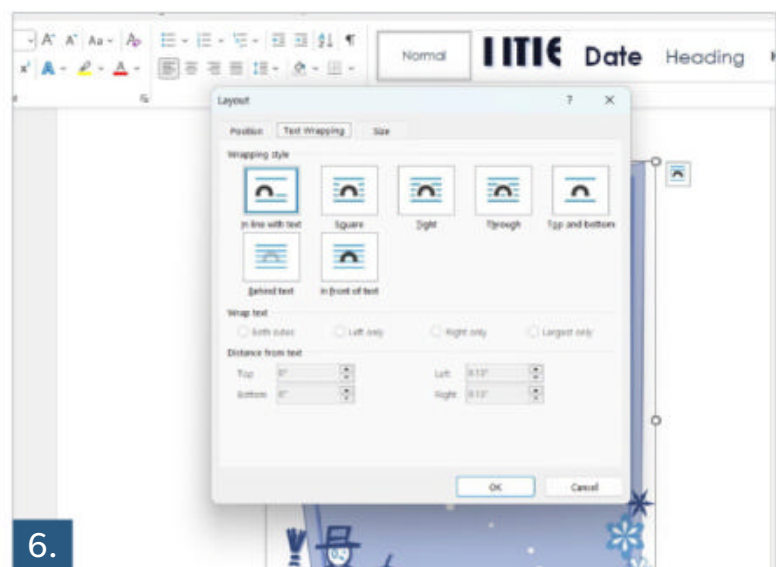
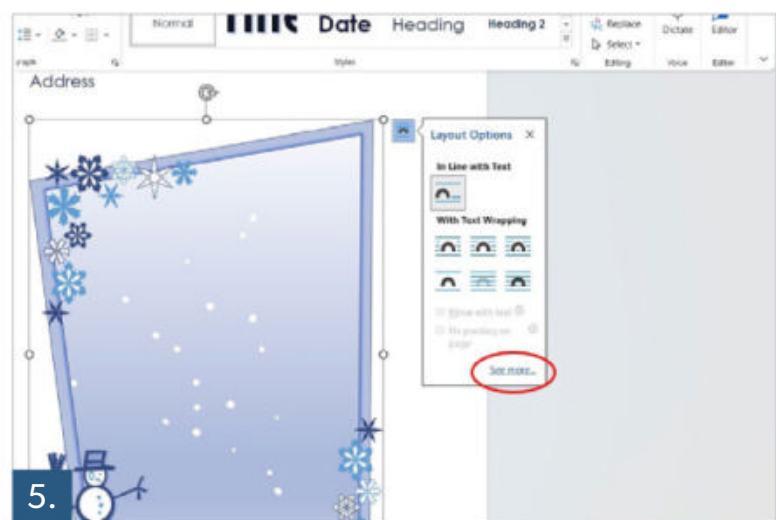
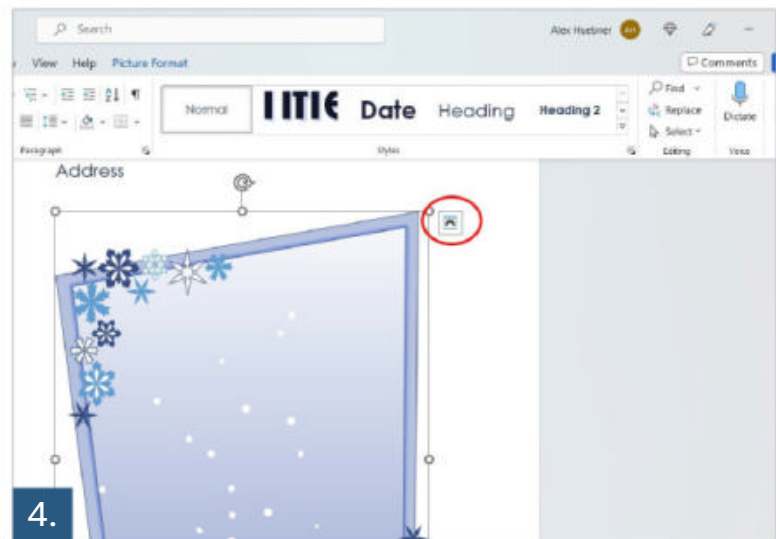




the cursor next to and below it (3). To change this, left-click the image and a Layout Options box will appear to the right of it (4).

Hover over each icon to see the name of each layout and choose the one that matches your goal. If you'd like to see all the ways you can change the layout, select "See more" at the bottom of the menu (5). A Layout box will pop up with options for position, text wrapping, and size (6).

Text wrapping will determine how the image appears within the text. Square will make your image form a square with the text around it. Tight means the very edges of your photo will have text as close as possible. This is most effective with PNG images or photos without traditional borders. Through will be similar to Tight but will also fill in gaps in the middle of your image. Top and bottom makes your image have its own line, meaning text will not be beside the image at all and will have space before and after its placement. Behind text makes your image serve as more of a background. In front of text will place the image over any words you have in the document without moving them, so that it obstructs them.




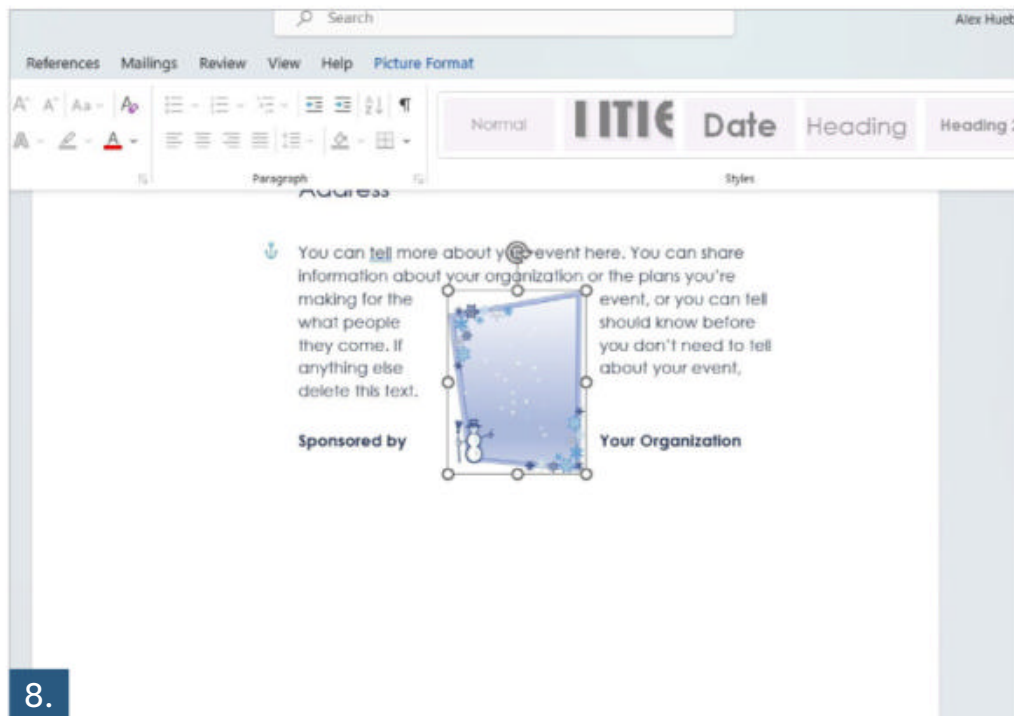
## ADJUSTING AN IMAGE IN MICROSOFT WORD

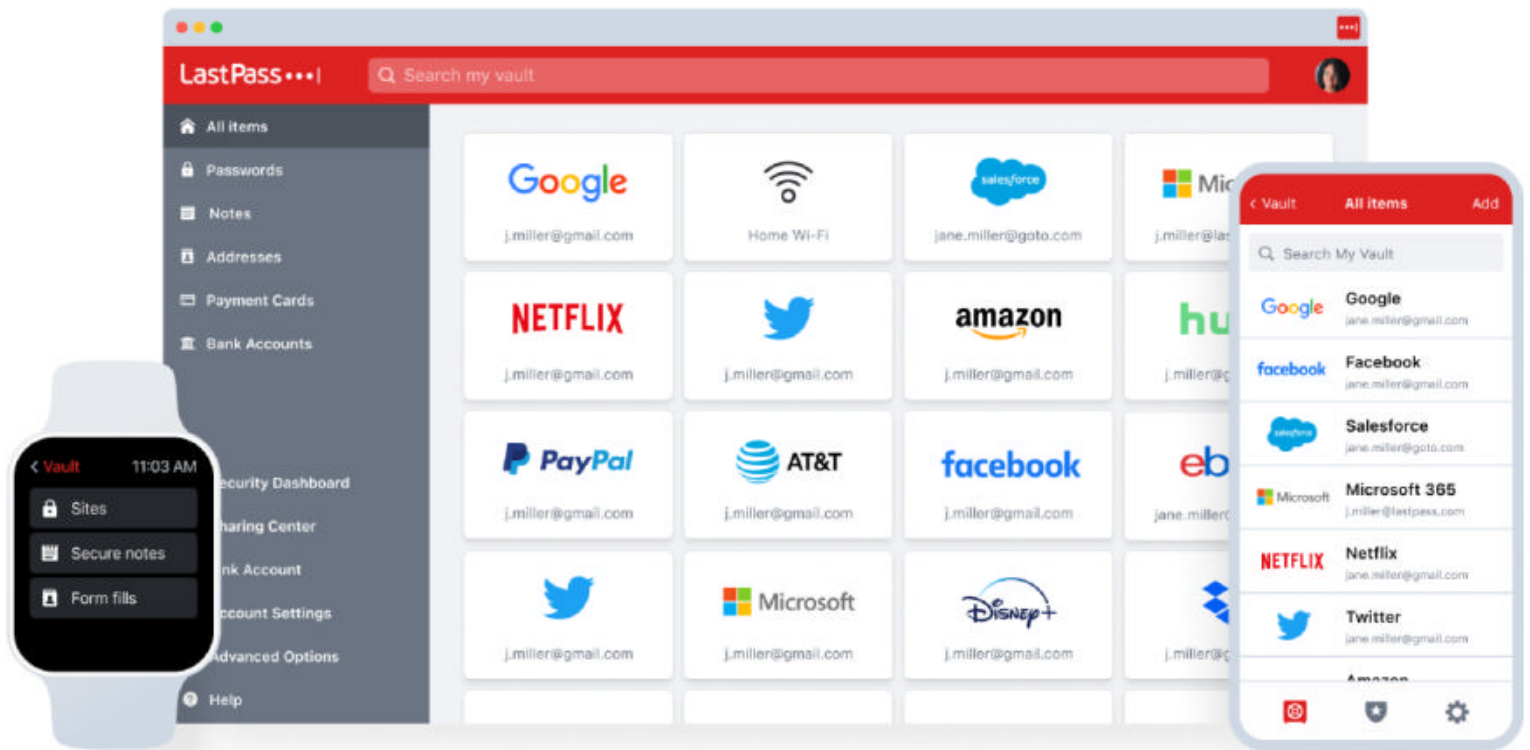
You aren't stuck with the image size as it is inserted. When you click an image in a Word document, a box with circles along the line

appears (7). The circles at the top and bottom will make the image vertically taller or shorter. The ones on the left and right will bring it in horizontally, making it thinner or wider. In the corners, you can keep the

image ratio the same and pull the image thinner or wider and taller or shorter at the same time. Just left-click the circle that will adjust the image the way you'd like and hold the mouse button down while you drag in the desired direction.

Once it's the size you'd like, if you want to move it you will need to left click the image. While your cursor is a white arrow with four black arrows in all directions underneath, left-click and hold while dragging it to the new location on the document (8). 





# LastPass hacked: How to export and protect your passwords

You can leave LastPass and move elsewhere in just minutes. **BY ALAINA YEE**

**L**astPass is no stranger to data breaches. It's suffered several high-profile leaks, with the most recent (and alarming) incident happening just last year. When news first broke in August, the developer assured everyone that customers were unaffected. But in a complete reversal, the company's December updates were grim ([fave.co/3XDTctq](https://fave.co/3XDTctq))—customer data had been taken after all.

If you're feeling like you want to leave the service, you can hardly be blamed. In this latest breach, not only was personally identifying information like billing addresses, telephone numbers, and IP addresses stolen, but vault data as well. Most damning: Some of that vault data was unencrypted.

The good news is that exporting your data is quick and relatively straightforward. You get



URL	username	password	help	extra	name	grouping	fav
http://www.bestbuy.com	user	gD1G8tPv			Best Buy		0
https://accounts.google.com/ServiceLogin	user	2sk1v1g02			Google		0
http://www.office.com	user	pSp*0KX3ku			Microsoft 365		0

**Your exported data from LastPass will be saved to an unencrypted file. (A sample CSV document is pictured here).**

the entire vault in a single file that you can then use to upload to a new password manager ([fave.co/3lRkfRz](https://fave.co/3lRkfRz)).

Here's how to export your passwords from LastPass—and how to do it securely. Plus, learn what you should do afterward to ensure the safety of all your online accounts.

## HOW TO EXPORT YOUR LASTPASS PASSWORDS

Getting your passwords out of LastPass is actually very easy. More complicated is ensuring the exported file remains secure. LastPass exports in either CSV and XML file formats, and those file types aren't encrypted.

You don't want your passwords downloaded as plain text—even if you delete the file, it can still be recoverable on an

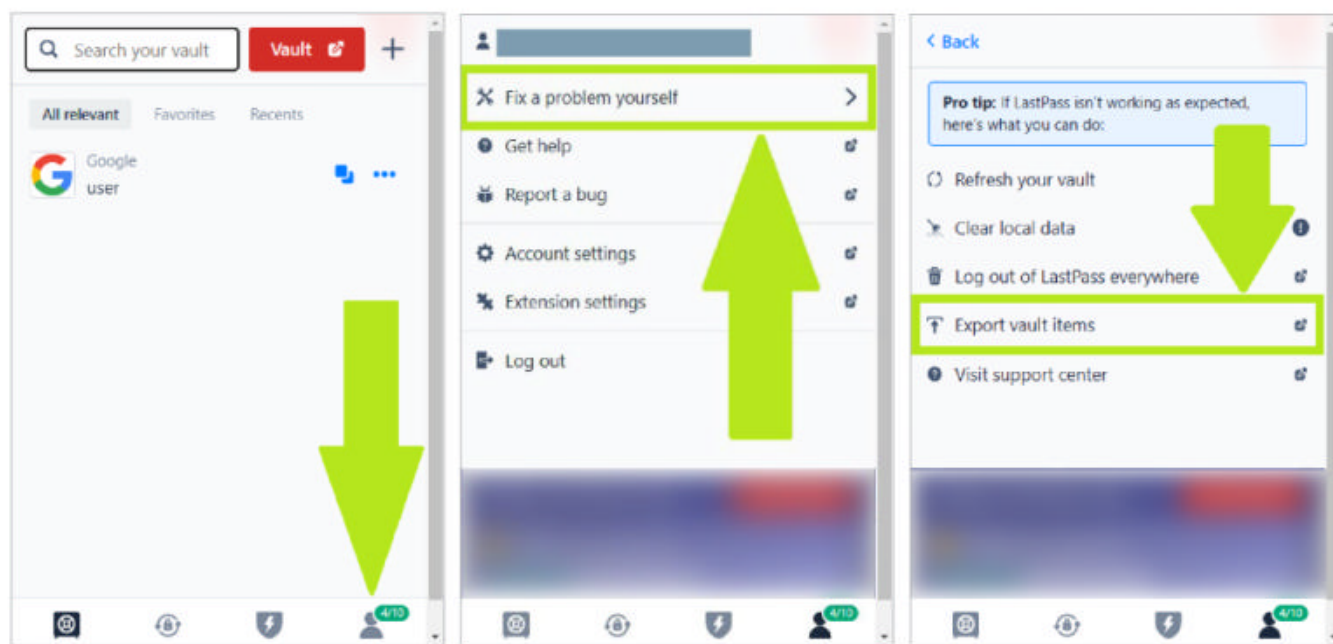
unencrypted drive. And many people haven't encrypted their PC drives.

The less complex method is to download the file to a drive fully encrypted by Windows ([fave.co/3wN3lZj](https://fave.co/3wN3lZj)), then permanently delete it as soon as you're done importing your info elsewhere. (Leaving

it in the Recycling Bin means the file is available and unencrypted whenever you're logged into your computer.) This isn't a bulletproof method, as you can recover the data while logged into your PC, but it's a middle ground.

If you can tolerate a little more effort, I recommend creating an encrypted folder using VeraCrypt ([fave.co/3Jb95Dh](https://fave.co/3Jb95Dh)), then downloading exported vault data to that location. It acts like a safe for the file. Your data only becomes available when the container is unlocked. When you're done, just delete the whole set while locked; if the container's password is never shared, the valuable info inside should remain secure.

Once you have your security precautions set, follow these steps to get your data out of



Step 1.

Step 2.

Step 3.

LastPass, via either the web interface or the browser extension.

**Note:** If you're using a free account that's tied to mobile devices only, you should be able to export via the web. If not, a workaround is to start a paid trial, so that you temporarily get multidevice access.

## How to export from LastPass via the browser extension

**Step 1:** Access your account settings.

- Open the browser extension, then click on the account icon.

**Step 2:** Dig into the "Fix a problem" menu options.

- Choose Fix a problem yourself.

**Step 3:** Export your vault items.

- Click on Export vault items. Your file will immediately begin downloading.

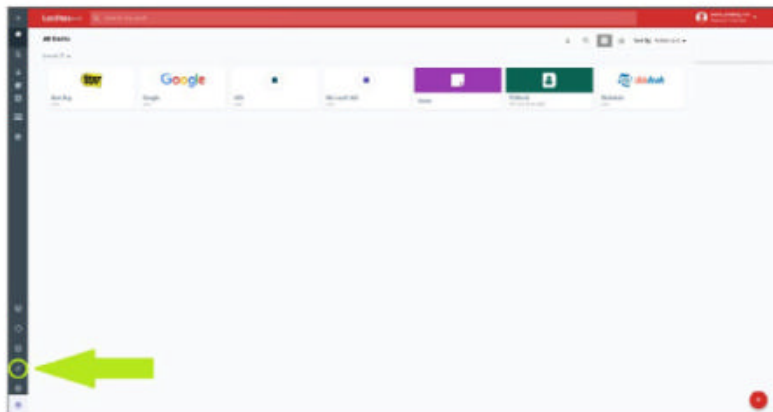
**Reminder:** The downloaded file will be in an *unencrypted* format. Anyone with access to the file can see all of your passwords. For a secure way to download the file, see the notes at the start of this section.

You can now import your file into a new password manager (either another cloud-based service or software installed to your computer). The process should be straightforward, but if you run into any issues, you can look up your new service's help pages for instructions.

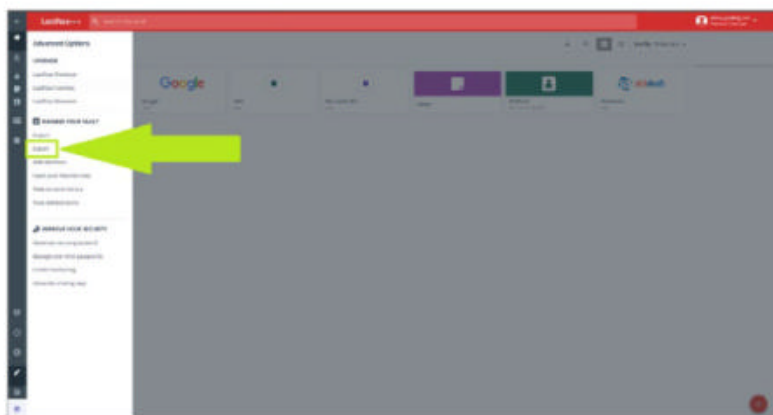
## How to export from LastPass via the web interface

**Step 1:** Access the Advanced Options.

- In the left nav bar, click on the icon for Advanced Options. It should be the second from the bottom.



Step 1.



Step 2.

**Step 2:** Choose Export.

- Under Manage Your Vault, choose Export. A green banner will pop up at the top

of the page, instructing you to check your email.

**Step 3:** Verify the export request.

- Log into the email address associated with your account. Open the email from LastPass and click the Continue export link within. A browser tab should open, saying the export is ready.

**Step 4:** Enter your login info to begin download.

- Go back to Advanced Options > Export. To begin the download, enter your user name and password.

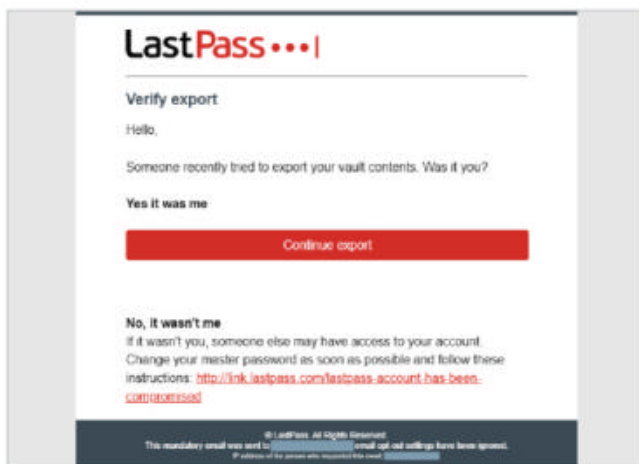
**Reminder:** The downloaded file will be in an *unencrypted* format.

Anyone with access to the file can see all of your passwords. For a

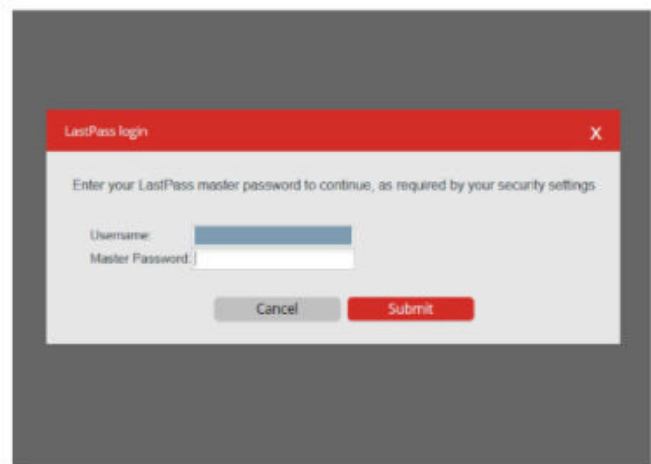
secure way to download the file, see

the notes at the start of this section.

You can now import this file into a new password manager (be it another



Step 3.



Step 4.

cloud-based service or a piece of software installed to your computer). It should be a straightforward process, but if you run into difficulties, your new service should have help pages with instructions.

## YOU'RE NOT DONE YET, UNFORTUNATELY

Usually, leaving a password manager for another one is simple. You export your passwords from the old service, import the info into your new service, and then go back to your life.

Ditching LastPass because of its breach makes matters more complicated. Because hackers have your vault data, your master password is the only thing standing between them and access to your accounts. To ensure your security, you're best off changing the passwords in your vault.

Hopefully you had a strong random master password, which will make brute-force entry into the vault very difficult. But there's no way around this one if you want to be sure you're safe. You can't change your LastPass master password and be done—the vault data captured is linked to the master password you had at the time of the hack. Updating it now won't help.

With hundreds of passwords a part of our daily lives, this task is no quick feat. Our recommendation? Work in graduated steps:


1. Move to the new password manager.
2. Immediately change all of the

passwords for critical services—banks and other financial institutions, tax preparation, government programs, and so on, anything that could be ruinous if someone got hold of those accounts.

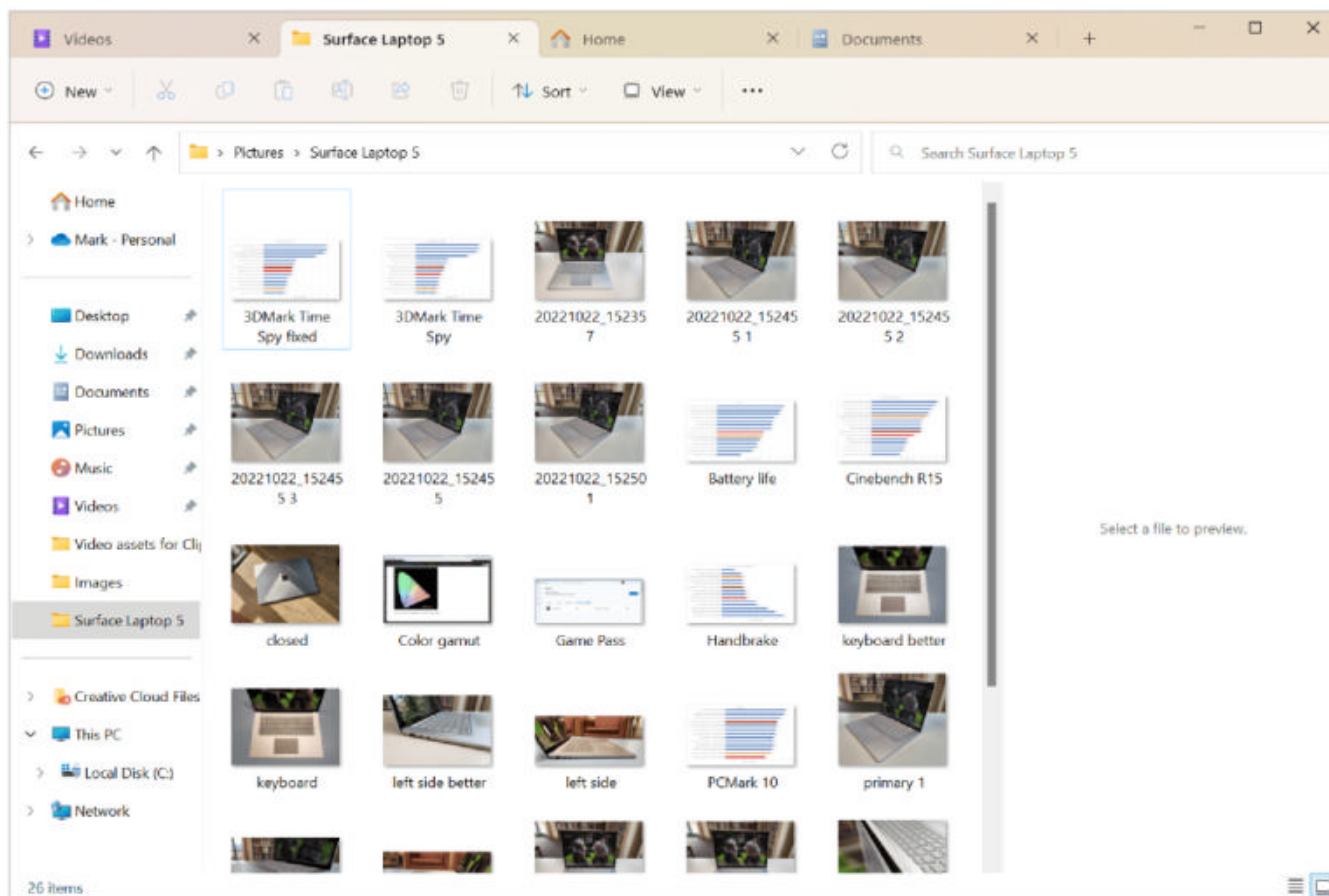
3. Work your way through the remainder of your passwords, starting with those that have more sensitive info stored (such as physical addresses, birth dates, credit card numbers). Now's a good time to also wipe that info from websites; keep it in your password manager instead.

You want to do this *after* you leave LastPass, especially if you're concerned about remaining security vulnerabilities the company has yet to detect. This breach is not LastPass's first—and given the company's history, likely not its last, either.

(Whether LastPass is that much better at transparency, has that much more difficulty maintaining security, or is just a bigger target in general is a question to be answered another time.)

Whatever you do, don't abandon password managers all together. Security online is imperfect, and so the solutions for it are also imperfect—but some systems are much more flawed than others. Reusing passwords, using weaker passwords, writing them down in a notebook—these won't keep you safe. You can find a good password manager ([fave.co/3IRkfRz](https://fave.co/3IRkfRz)) and a system of use ([fave.co/3aXBOgj](https://fave.co/3aXBOgj)) that works for you. 





# File Explorer tabs are finally in Windows! Here's how to use them to simplify your life

It's a simple upgrade, but you won't want to go back. **BY MARK HACHMAN**

**B**y now, your PC should have received the small October update to the larger Windows 11 2022 Update, [fave.co/3Mu22p3](https://fave.co/3Mu22p3) (if you're using Windows 11). It holds a long-asked-for, much appreciated new feature: tabbed browsing in File Explorer. You don't need to keep separate windows open to have

multiple folders open anymore! Is it necessary? No. Are heated car seats necessary? No. But once you start using File Explorer tabs, you'll be loath to give them up.

They're dead simple. Tabs within File Explorer are just like tabs within a browser; a compact way of navigating back and forth without needing to open a separate window.

But in File Explorer, you're probably used to opening a folder, using copy or cut to move files from one folder to another, then navigating through the file hierarchy to actually find that folder. That's a pain. Stop doing that!

That's the whole point of using the tabbed File Explorer: Open up a folder or drive in one tab, and the target folder or drive in another. Then you can go back and forth and simply make sure that you're copying the right files to the right folders. And, of course, you can open other tabs in File Explorer as you see fit at the same time. It's as simple as that.

## HOW TO GET STARTED WITH FILE EXPLORER TABS

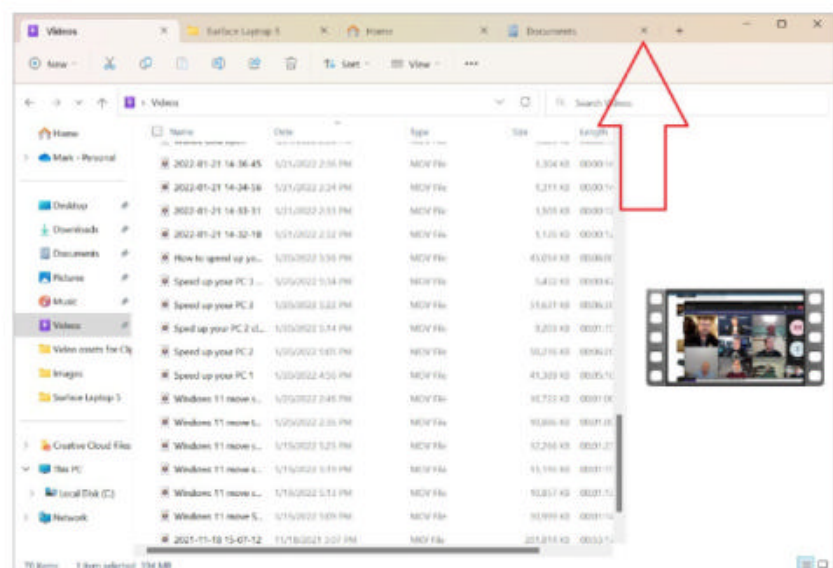
File Explorer tabs are already part of the File Explorer UI, provided that you're running an up-to-date copy of Windows. (You can check Windows Update in the Windows 11 Settings menu to be sure.)

To open a new tab, simply navigate to the top of the File Explorer window and click the small plus-sign (+) button next to the tab. Voilà! A new tab opens. There doesn't seem to be any limit to the number of tabs, so you can open as many as you wish. To close the tab, you can click the small X in the upper-right corner of the tab.

Tabs can of course be dragged around within the File

Explorer interface to help you navigate around. Unlike in a browser, however, you can't drag them out of the current window to create another separate File Explorer window. You also can't drag a folder up to the navigation bar to create a new tab, at least not yet. (If you *want* Microsoft to add these new features, remember to add your request to the Feedback Hub [[fave.co/3Htmvcl](https://fave.co/3Htmvcl)] on Windows 10 or Windows 11.)

Remember, tabs within File Explorer were *not* part of the Windows 11 2022 Update, [fave.co/3Mu22p3](https://fave.co/3Mu22p3) (22H2)—they were added as part of a later separate update. It's all part of the new "Moments" strategy that Microsoft has implemented to add new features at unexpected times. So if you haven't seen them before, that's fine. But it's worth starting to use them now that you're aware! 🔌



**Close tabs by clicking the X, as per the normal way of navigating around Windows.**

# Tech Spotlight

A video showcase  
of the latest trends



## Practical Buying Advice For PC Parts In 2023

➡ Gordon ran into YouTube's @OzTalksHW ([youtube.com/@OzTalksHW](https://youtube.com/@OzTalksHW)) at CES 2023 and asked him for advice on the best way to buy PC parts in 2023.