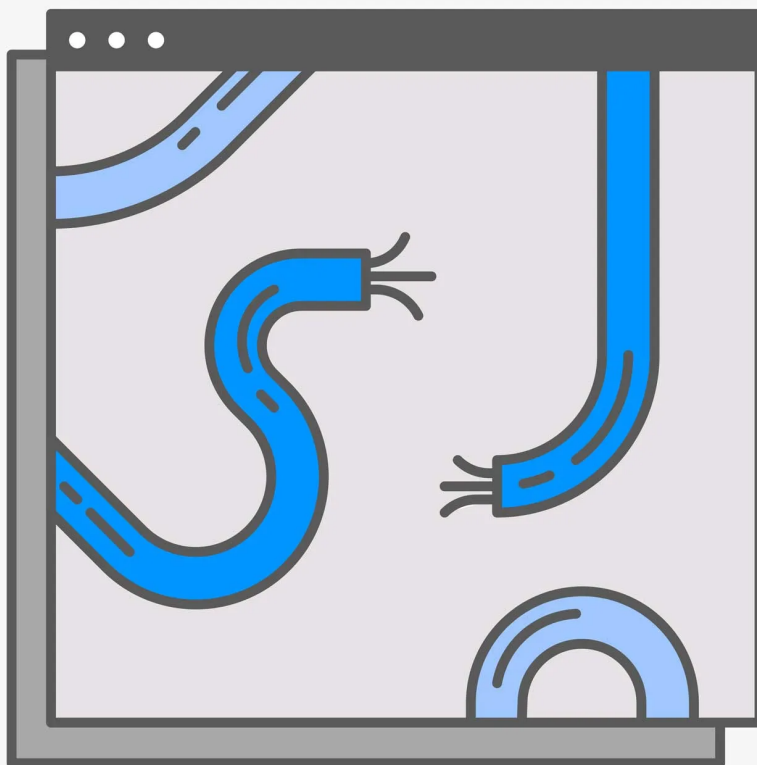# How to Rip the Mics Out of Your MacBook and iPhone

Once the mics are removed and your phone is reassembled, you can plug in a mic-enabled headset or earbuds whenever you need to use your phone again. (Remember to disconnect them after your conversation.) AARON FERNANDEZ

ANY SELF-RESPECTING PARANOIAC long ago taped over the webcam on their laptop—and for good measure, the cameras on their smartphone too. But for those truly concerned that their computers have been hacked and turned into spy tools, the microphones on those devices represent just as much of a security threat as the cameras. They would allow a hacked gadget to bug an entire room.

THE WIRED DIGITAL SECURITY GUIDE

SPY
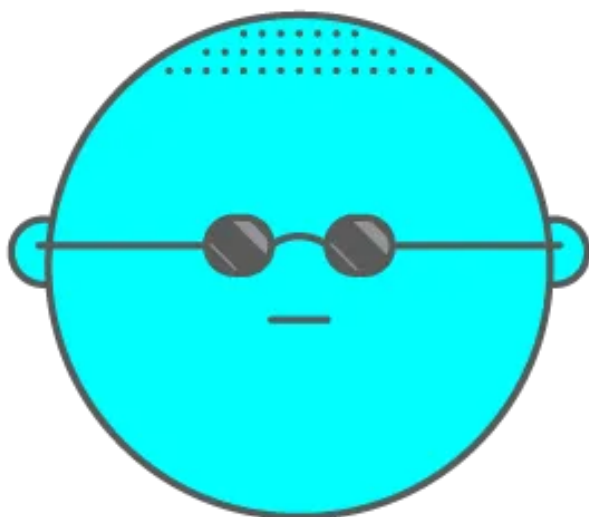
The good news for the targets of highly sophisticated cyberspies? There's a practical fix for that audio espionage problem. The bad news: It requires some surgery.

No software setting can turn off a microphone such that a skilled hacker who controls your device can't turn it back on. Instead, you can simply remove them, and then plug in an external microphone only when you truly need it.

"There's no reason why these devices need those sensors to function," says Kyle Wiens, the founder of device research and repair company iFixit. "And taking them apart to break the microphone isn't any harder than fixing it."

In fact, physically disconnecting a MacBook's microphone is a simple, five-minute job that anyone can do with little more than a couple of cheap tools, Wiens says. Disabling an iPhone's mics presents a greater challenge, but it's not impossible. A skilled iPhone repair technician can do it in less than 30 minutes for less than $100, or you can even do it yourself if you're brave enough to dig into the guts of your phone.

Given the uniformity and popularity of Apple products—and the broadly recognized superiority of the iPhone's security compared to Android's—WIRED asked hardware specialists for advice specifically about how to deafen the mics in MacBooks and iPhones. Here's what we found.

The Mic Jack Stub Trick

Before cracking open any computer, it's worth considering a simpler solution: Insert a small stub device into your headphone and microphone jack that tricks the computer into thinking that a mic is already plugged in. In his book, _The Art of Invisibility_, famed hacker Kevin Mitnick describes how to create a "dummy mic plug" by cutting off the plug from an old pair of mic-enabled headphones. Insert that into the jack and "your computer will think there's a microphone there when there isn't," Mitnick writes. Be careful, he notes, not to let the two wires coming out of the end of your stub touch; you could short-circuit your microphone port and damage your computer.

But not every Apple device even has a microphone jack these days. And Richard George, a former technical director at the NSA who helped design President Obama's secure BlackBerry,

says that mic plug trick might not be enough regardless. He says that a rogue application potentially could circumvent the fake mic and turn the real microphone on anyway. George notes that verifying that attack would require software testing he hasn't done, but he warns that the mic stub mostly offers a false sense of security.

"If you're talking easiest target then that would work—any difficulties, they move on to the next guy," George says. "But if you're actually targeted, no, it won't protect you."

The Mac Microphonectomy

For your laptop, a more surefire approach is to physically disconnect your microphone altogether, says iFixit's Wiens. Start by using a Pentalobe screwdriver to take out all the screws on the bottom of your Macbook's case, then open that bottom panel. Locate the small flat black cable pictured to the right. You can use a spudger, a pointed tool designed to allow for delicate electronics fiddling, to flip open the retaining flap on the cable's socket. (This is also described in step 31 of iFixit's guide to replacing the microphone.) Then use the spudger to gently coax the cable out.
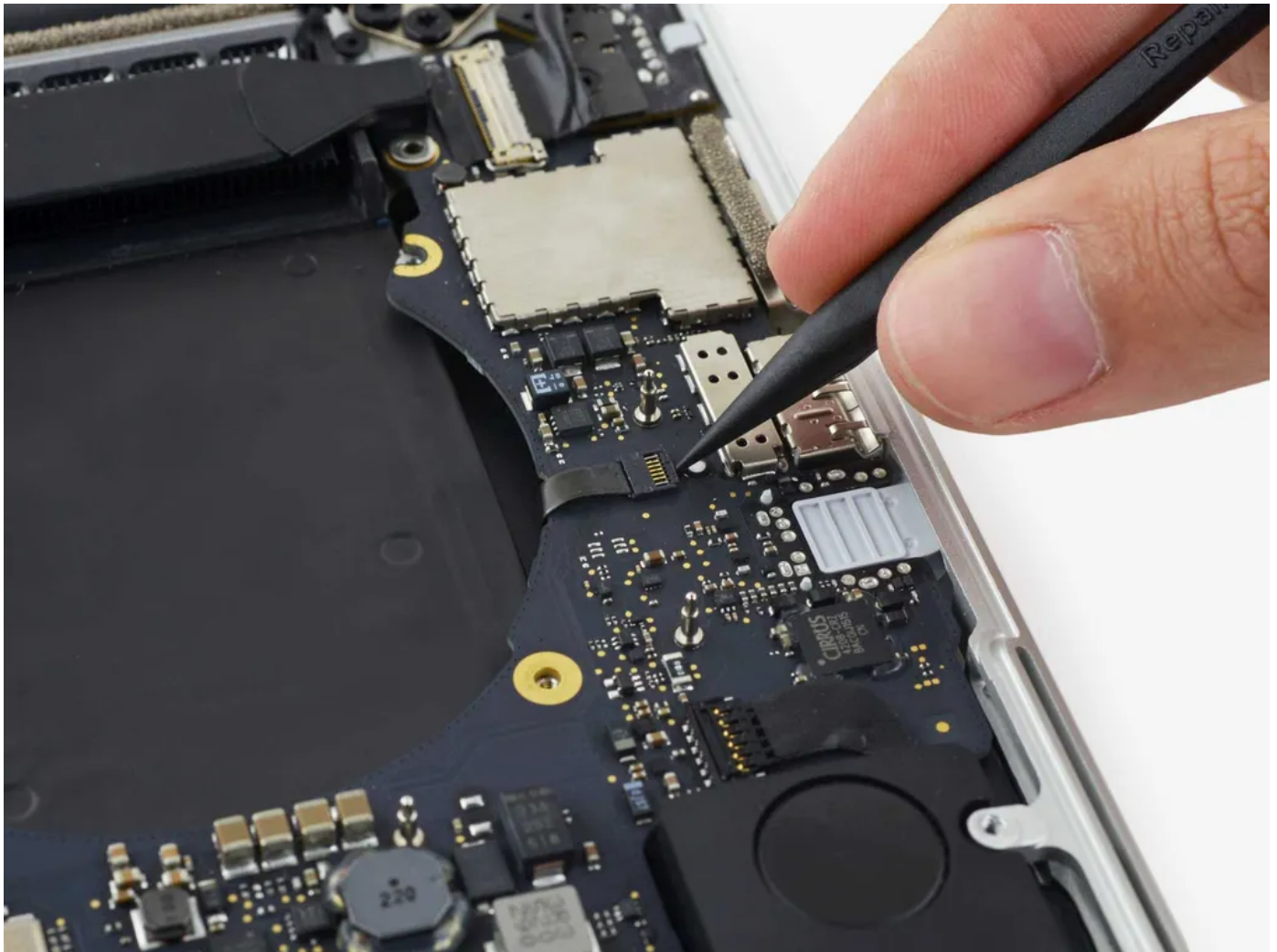
Use a specialized tool called a spudger to flip open the cable socket's retaining flap. IFIXIT

The best part about this audio vasectomy for your Macbook is that it's easily undone, Wiens says. Just plug that cable back in and the microphone will work again.

"It's a relatively reversible procedure," Wiens says. "Like maybe if we get a new president and you decide you trust the government again."

The iPhone Triple-Snip

Disabling the microphones in your iPhone, on the other hand, is a more permanent—and much more technically tricky—maneuver, as described to WIRED by Sunny Lin, the owner of New York-based Simple Mac and iPhone Repair. For modern iPhones, it involves opening the phone with a suction cup, a wedge, and a heating pad, and then carefully cutting microphones off of three individual components in the phone's internals.

Those three components are known as the front camera and sensor cable, the lightning connector assembly, and the power and volume control cable. All three are strips of thin, flexible cabling to which components like cameras, ports and sensors are connected—as well as the phone's four microphones. iFixit offers detailed instructions on how to find and remove those parts, which you can also follow to cut off their microphones instead. (And yes, all of this definitely voids your warranty.)

You'll find one of the iPhone's four microphones jutting out from the power and volume control component. IFIXIT

One iPhone mic extends from the top right of the power and volume control component, and two dangle from either side of the lightning port. The tiny cable strips connecting them can easily be sliced away with an X-Acto-knife, Lin says. The fourth microphone is found on the front-facing camera component, and while it's not connected by a thin strip of cable like the

other three, a steady hand can still carve it off. "It's not very hard if you know what you're looking for and how to do it," Lin says.
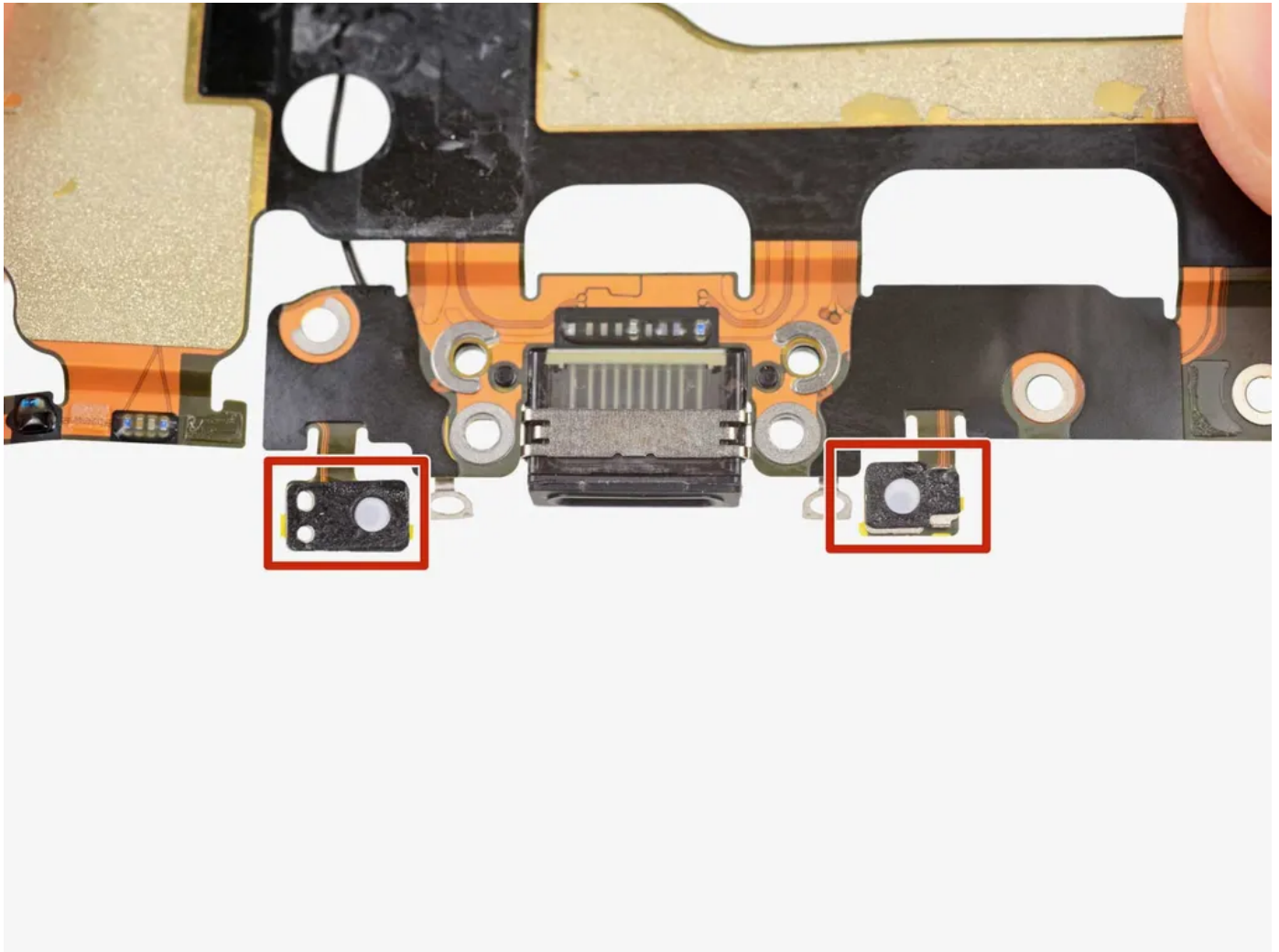

Two more microphones abut the iPhone's lightning port. IFIXIT

If all of that does in fact sound *very* hard—and for average mortal technology consumers, it likely will be—Lin notes his company and many others can also just do it for you, a process that takes him about 20 minutes and for which he charges $75. In fact, he's replaced those parts countless times, and twice even performed the rarer task of removing the mics on behalf of privacy-focused customers. "People like that don't like to talk very much," Lin says. "We just did it and didn't ask why."

The last of the four mics sits on the iPhone's front-facing camera component. IFIXIT

Once those mics are removed and your phone is reassembled, you can plug in a mic-enabled headset or earbuds whenever you need to actually use your phone again. Remember to disconnect them after your conversation: Researchers have shown that even headphones without a mic can be converted into a listening device by clever malware. Oh, and probably chuck your Amazon Echo while you're at it.
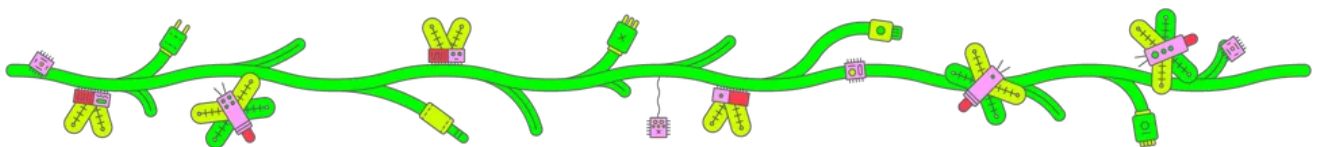
The Wired Guide to Digital Security

- **More Tips for Superspies**: After you, remove the mic from your devices, sweep for bugs and (worst case scenario) dive down the paranoia rabbithole.

- **Activist? Journalist? Politician? Consider Yourself a Target, Too**: Encrypt everything, sign up for Google Advanced Protection, take a tour of Tor, and deploy physical measures to increase your digital security.

- **Advice for Regular Users (the Hackers Are Still Circling)**: Master passwords, lock down your smartphone, keep yourself secure from phishers, know how to deal with getting doxed, and, if you have kids, keep them safe online.

Andy Greenberg is a senior writer for WIRED, covering security, privacy, and information freedom. He's the author of the book *Sandworm: A New Era of Cyberwar and the Hunt for the Kremlin's Most Dangerous Hackers*. The book and excerpts from it published in WIRED won a Gerald Loeb Award for... Read more

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