



Apple Watch Series 6 Teardown

Teardown of the Apple Watch Series 6 showing unannounced upgrades to battery and Taptic Engine hardware, despite a slightly thinner profile.

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INTRODUCTION

The Apple Watch Series 6 is here to take your breath away—or at least tell you a whole lot about your breathing. We're pushing our VO2 max just thinking about seeing new sensors (and no finicky Force Touch) inside this latest model, so let's get our blood pumping with some very small-space exercise.

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TOOLS:

- [iOpener](#) (1)
 - [Technician's Razor Set](#) (1)
 - [iFixit Opening Picks \(Set of 6\)](#) (1)
 - [64 Bit Driver Kit](#) (1)
 - [Tri-point Y000 Screwdriver](#) (1)
 - [Tweezers](#) (1)
 - [Spudger](#) (1)
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Step 1 — Apple Watch Series 6 Teardown



- Outward comparison of the Series 6 (right) with its one-year-old sibling (left) reveals only subtle differences, but that's what teardowns are for. These details we already know:
 - LTPO OLED Retina display optimized for always-on functionality—this time without Force Touch
 - 64-bit dual-core Apple S6 SiP (System in Package)
 - Updated sensor array measuring heart rate, ECG, and now blood oxygen levels
 - Compass and realtime altimeter
 - Water resistance to a depth of 50 meters
- ① Today's teardown victim is a 44 mm GPS + LTE model, purchased at retail in Germany—but we've also got a 40 mm model that may make a guest appearance, should any interesting comparisons arise.

Step 2



- Underneath the stretchy new watchband, confirmation that this is indeed a new Apple Watch—model number **A2376**—and not merely some blue-hued [lookalike](#).
- The other band slot features ...nothing at all, so our photo editor indulged in a bit of tech fantasy and added a combination lock—as if opening the case could be so easy. Alas, we expect the same ol' opening procedure we perform [every year](#).
- Well, *almost* the same: In a surprise twist, the Series 6 takes after newer ([post-6s](#)) iPhones and opens to the side like a book!
- The procedure is also slightly simplified due to the absence of a Force Touch gasket—a feature now defunct as of watchOS 7.
- ❗ We're happy to see a fragile, damage-prone part retired, but sad to see the final nail in the coffin for Apple's nifty pressure-sensitive display technology. We're torn, but we'll call this a win.

Step 3



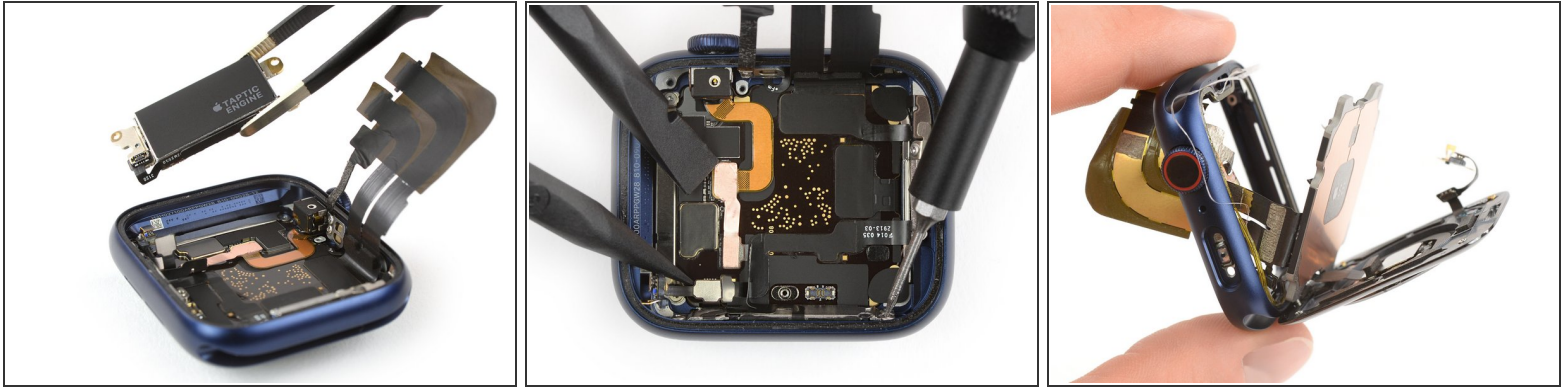
- Safety first! Let's get this battery disconnected. The connector is still hidden underneath the battery, but a quick flip from an [opening pick](#) takes care of that.
- Subtract one tiny tri-point and one teeny bracket and this wee powerhouse is a freed powerhouse.
- The 44 mm Watch cell is rated at 1.17 Wh—a slight increase over the [Series 5](#), but not quite at the level of the [1.3 Wh Galaxy Watch3](#).
- The smaller 40 mm Series 6 retains the [radical metal-pouch design](#) introduced on the [Series 5](#), now with a 1.024 Wh capacity.
- ✦ We're a little surprised the larger model still doesn't get the new battery design this year—we thought Watches might follow the pattern set by the iPhone, where [Max models got the new battery design](#) in its second year.
- ❗ Summing up: that's a 3.5% increase for the 44 mm battery, and an even bigger 8.5% increase for the 40 mm from their Series 5 counterparts.
 - Slowly but surely, [Apple Watches seem to be clawing back capacity](#) after the big drop from Series 3 to [Series 4](#).

Step 4



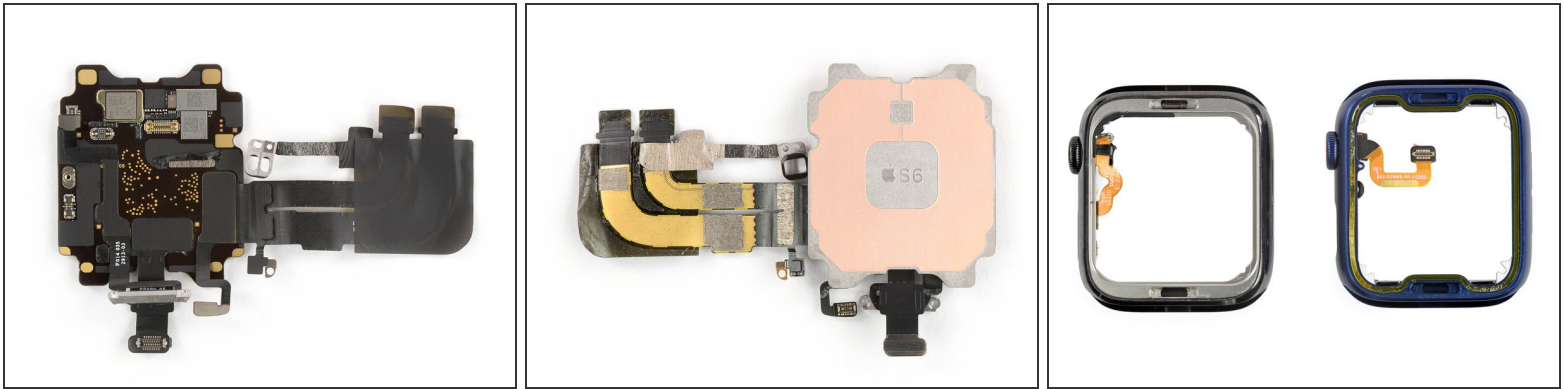
- The Series 6 features a new, brighter display than the Series 5. It's also brighter on the inside!
- This year's model not only eschews that pesky Force Touch gasket, it also has fewer display connectors to wrestle. The NFC cable is now routed through a display-side jumper—and there's only one [grounding cable](#). We love streamlined design, especially when it simplifies repairs!
- Aside from the aforementioned changes, these displays (Series 5 on the left, 6 on the right) look about the same to the naked eye.
 - ❗ That said, we *did* bend a newly-placed spring contact during opening, so maybe wait for our repair guides before you bust these bad boys open.
- **Teardown update:** Here's a closer look at the display, [X-ray style](#). This shows the smaller, 40 mm model's screen, which we stripped apart for our [YouTube audience](#).

Step 5



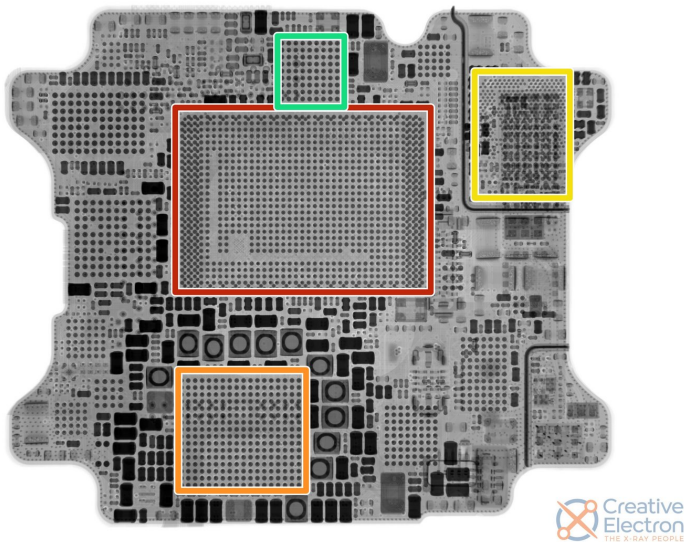
- At first glance, the tri-point-trapped Taptic Engine seems old hat—but it turns out to be bigger than [the one in the 5](#). Maybe the [slimmed-down Series 4 shaker](#) wasn't up to snuff?
- It's also made using 100% recycled rare earth metals and tungsten this time, which is awesome. (But let's not forget, [reuse > recycling](#).)
- **Update:** Since we've got Creative Electron's X-rays on tap, [here's a nifty bonus image of the Taptic Engine's innards](#). Shake and bake!
- ☑ More battery *and* more Taptic Engine—Apple mentioned neither of these in their announcement, but it seems they've quietly pulled out all the stops this year.
- With all the brawn out of the way, it's time to tackle the brains of this operation: the S6 SiP. Even with our trusty tools, this intricate maze of cabling and hidden screws is no picnic.
- But as usual, time + tools + technique prevails! At last this Watch regurgitates its remaining contents.

Step 6



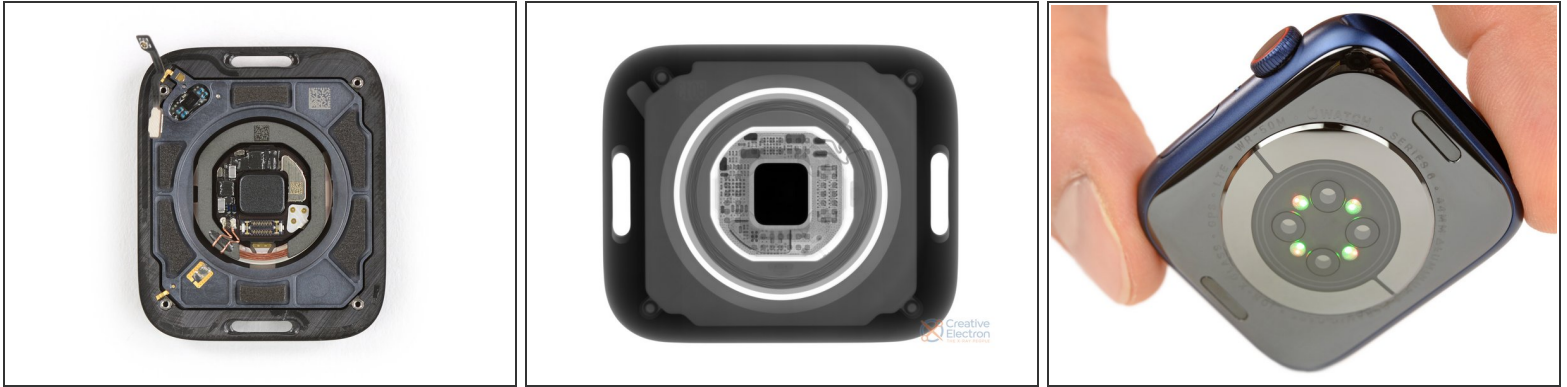
- Like most brains, the grey matter in this Series 6 is pretty inscrutable: it's encased in hardened resin, as per usual, making further exploration extremely difficult.
- ✦ **Update:** Unless you have an X-ray machine, that is! [Here's an inside look at the S6 package](#). If you're wondering what all the tiny shapes are, check out the [original Apple Watch X-ray teardown](#) for an explainer.
- There *are* a few more conventional ICs piggybacked onto the package, and we can at least spot a Skyworks chip marked 239-7. The other chips are more mysterious, and none is an exact match for the U1 chip we found in last year's iPhones.
- ❗ It was probably too much to ask for a labeled U1 package, but there *has* been [more obvious printing in the past](#).
- Sans-brains, we can see the Series 6 frame has a slightly modified footprint with a narrower lip for the adhesive gasket, which is now carefully routed around the band mechanism.
- ✦ The modified case and lack of Force Touch gasket probably accounts for the fact that this year's model is a hair thinner, with overall thickness at 10.4 mm (down from 10.74 mm last year).
- Apple somehow packed more battery *and* more Taptic Engine into a (barely) smaller design. Impressive!

Step 7



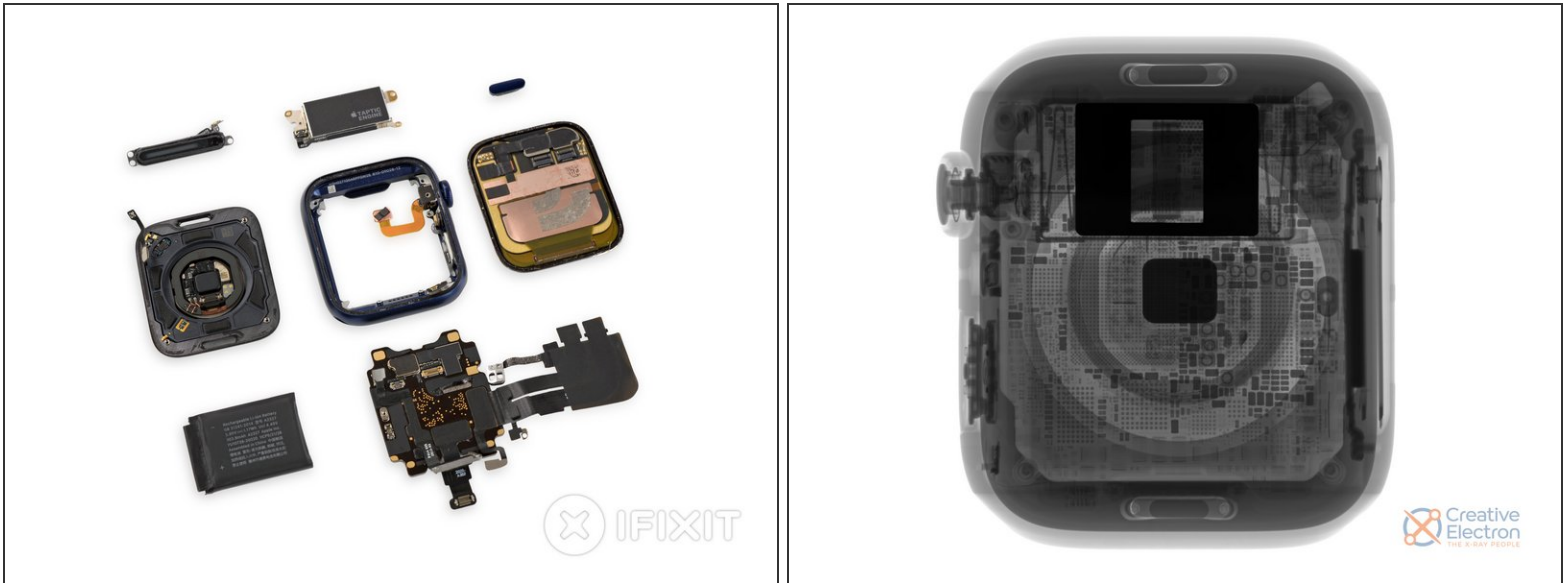
- We interrupt this program to bring you some x-ray speculation:
 - Processor and memory (SDRAM/NAND Flash) Package on Package
 - Power Management IC
 - WiFi / Bluetooth SoC
 - Microcontroller

Step 8



- Fused display up top, fused sensor array below—we won't find anything but broken pieces if we bust this apart, so let's switch on those X-rays from [Creative Electron](#) again for a better look.
- ① The dark rectangle in the center is a dense magnet for centering the charger (and may also help [wick away heat](#) from the S6 package). It's surrounded by the control board for the down-firing LEDs and sensors, and the ropey coils of copper for the inductive charger.
- And here's the (reassembled) pulse oximeter [communicating with aliens](#) lighting up in Christmas-y fashion!
- ① By shining red, green, and infrared light into your skin, then sensing via photodiode how it bounces back, the watch can tell how oxygenated your blood is ([redder means more oxygen](#)).
- Low blood oxygen levels ([hypoxemia](#)) can be an indication of COVID-19 or other serious medical issues.
- The Apple Watch doesn't track body temp like the [Oura Ring 2](#) does. But while both measurements are informative, neither is meant to provide hospital-grade [certainty](#).
- As a reminder, we're not health experts—so read up! Find out more about [how blood oxygen tracking works at CNET](#), or a *lot more* at the [Respiratory Medicine journal](#).

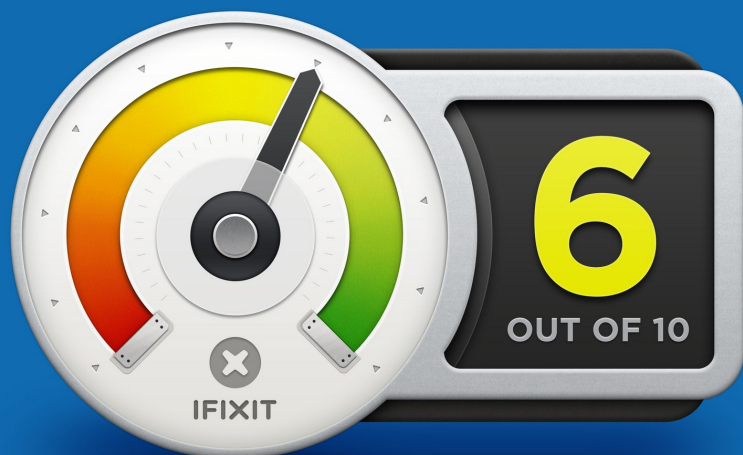
Step 9



- Leaving all the tiny tri-point screws out of the picture for clarity, we feast our eyes on the latest edition of Apple's ~~mobile health diagnostic machine~~ timepiece.
- Repair-wise, we're happy to see the fussy Force Touch gasket gone, and only two fragile cables tethering the display.
- Thicker rubber-like adhesive on the display and back plate also safeguards the watch against unwanted ingress (or in our specific case, *wanted* ingress).
- ⓘ Despite the almost imperceptibly thinner design, Apple packed in brand-new sensors in addition to the larger-capacity battery and beefier Taptic Engine.
 - They just keep polishing this thing to a higher and higher gloss and it's almost sneaky how much of it they don't tell you about, keeping all the focus on the whiz-bang health features.
- ★ Huge thanks to [Creative Electron](#) for partnering up with us once again! They're responsible for all the mind-bending X-rays in this teardown.

Step 10 — Final Thoughts

REPAIRABILITY SCORE:



- The Apple Watch Series 6 earns a **6 out of 10** on our repairability scale (10 is the easiest to repair):
 - Screen replacements are difficult but possible. The screen is the first thing to come off, and detaches via ZIF connectors.
 - Battery replacements are reasonably straightforward, once you're inside.
 - Tiny tri-point screws throughout the watch can be difficult to remove and keep track of.
 - Several component flex cables are mounted directly to the S6 package, requiring skilled microsoldering to replace if they are torn.