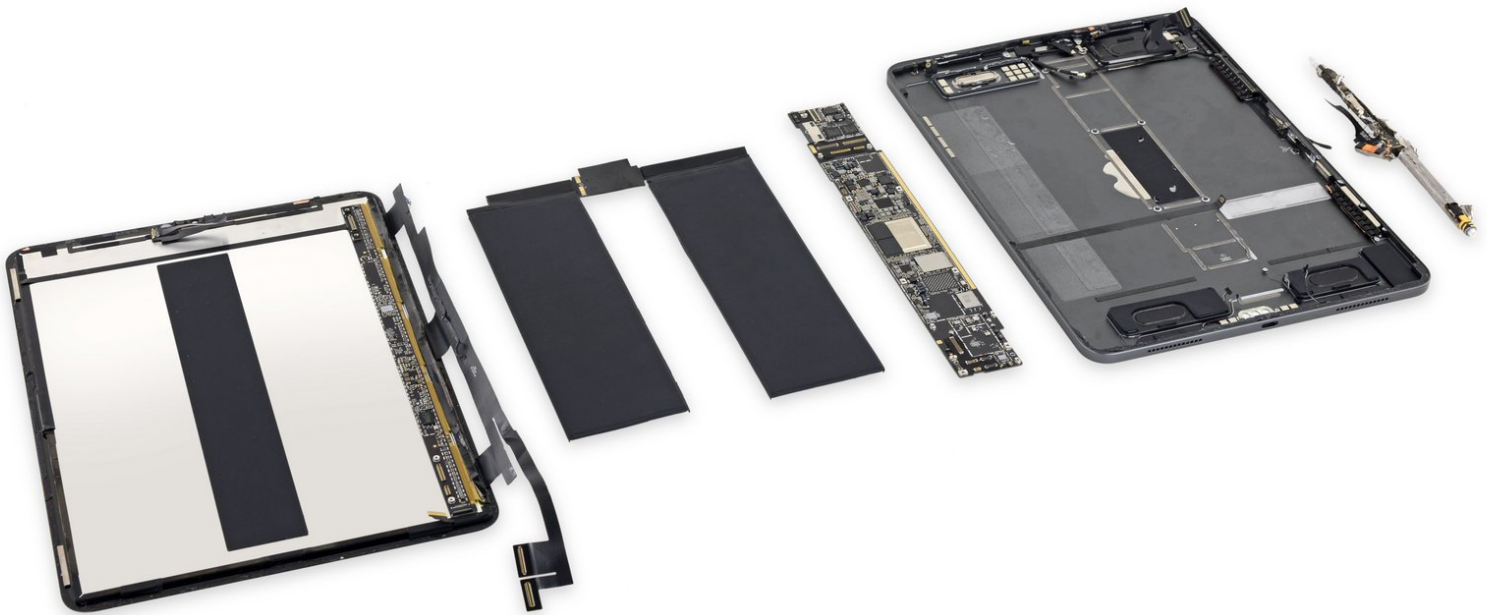# iPad Pro 11" Teardown

Teardown of the iPad Pro 11", performed on November 9, 2018.

Written By: Arthur Shi

INTRODUCTION

The new iPad Pro 11" sports narrower bezels, curvy LCD corners, and cutting edge silicon. This is apparently *the iPad* Apple dreamed about building from the very beginning, but what *we* dream about is a device that is easy to repair. Will this iPad fulfill both dreams, or will ours be left in the pipe? There's only one way to tell—with a teardown!

Catch our Tweets, or drift through our Facebook and Instagram pages to keep up with the latest Teardown news!
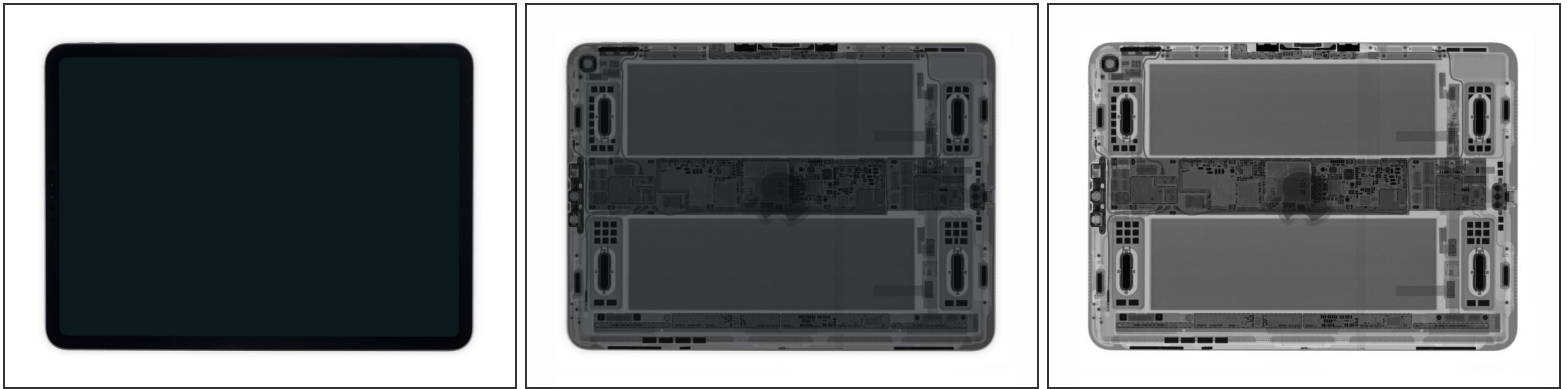
🔧 TOOLS:

- iOpener (1)
- Suction Handle (1)
- Phillips #00 Screwdriver (1)
- T3 Torx Screwdriver (1)
- iFixit Opening Picks set of 6 (1)
- Tweezers (1)
- Rotary Tool (1)
- Spudger (1)

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Step 1 — iPad Pro 11" Teardown

- Let's take a look at what sets this Pro iPad apart from its amateur peers:
  - Fully laminated, 11", LED-backlit, Oxide TFT Liquid Retina display with 2388 × 1668 resolution (264 ppi), featuring ProMotion Technology
  - Octa-core Apple A12X Bionic custom processor, with M12 motion coprocessor and integrated 7-core GPU
  - 12 MP rear camera with 4K video recording at 60 fps, and 7 MP TrueDepth camera with 1080p video
  - Self-balancing, four-speaker audio
  - Face ID, five microphones, ambient light sensor, accelerometer, barometer, and 3-axis gyro
  - 802.11a/b/g/n/ac dual band MIMO Wi-Fi + Bluetooth 5.0
  - 64 GB, 256 GB, 512 GB, or 1 TB of on-board storage

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Step 2

- With each passing year, Apple seemingly gets closer to realizing its dream of selling a blank slab of glass with its logo on the back.

- It's a good thing we've got X-rays on tap from Creative Electron, or this would just look like a black rectangle.

- As always, the darkest areas in the X-ray image represent dense materials that absorb more X-rays—usually magnets, such as those used in speakers and for clip-on accessories.

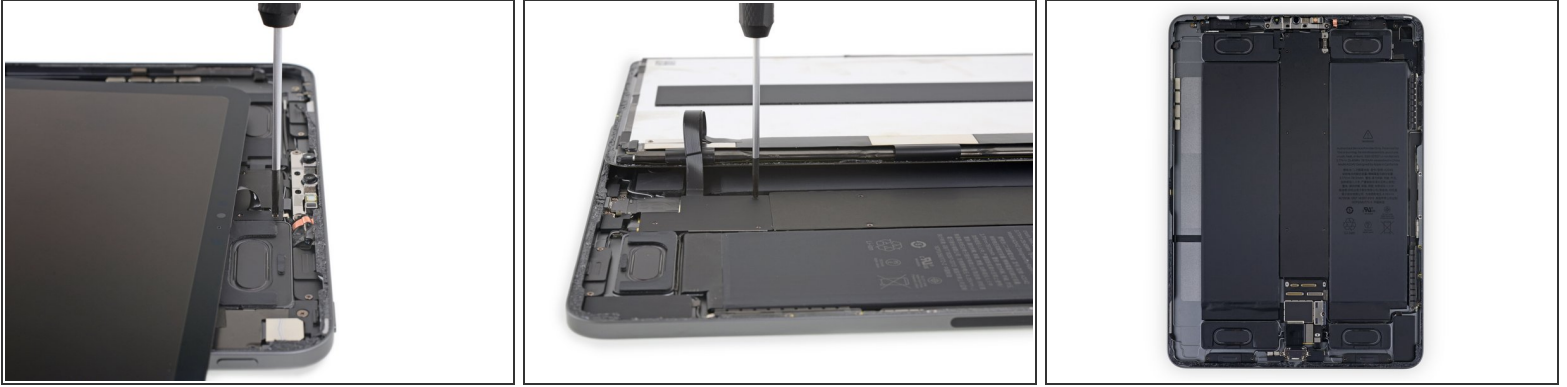- We're seeing *considerably* more of those than usual here.

Step 3

- Visual inspection time. Above the newly repositioned Smart Connector, we have a new model number: A1980.

- Compared with its 10.5" predecessor, it looks about the same, and the lost .2 mm are hard to spot due to the squared-off edges.

  - Not that we mind at all—it actually reminds us of some of the iPad's more repairable competitors.

  - (i) Could Apple's tablet line be getting a bit more repairable this time? In light of recent teardowns, we're keeping our fingers crossed.

- Final notes before we dive in: no headphone jack ☹, USB-C port (non-Thunderbolt) in place of Lightning, and a long dark oval to charge the new Pencil.
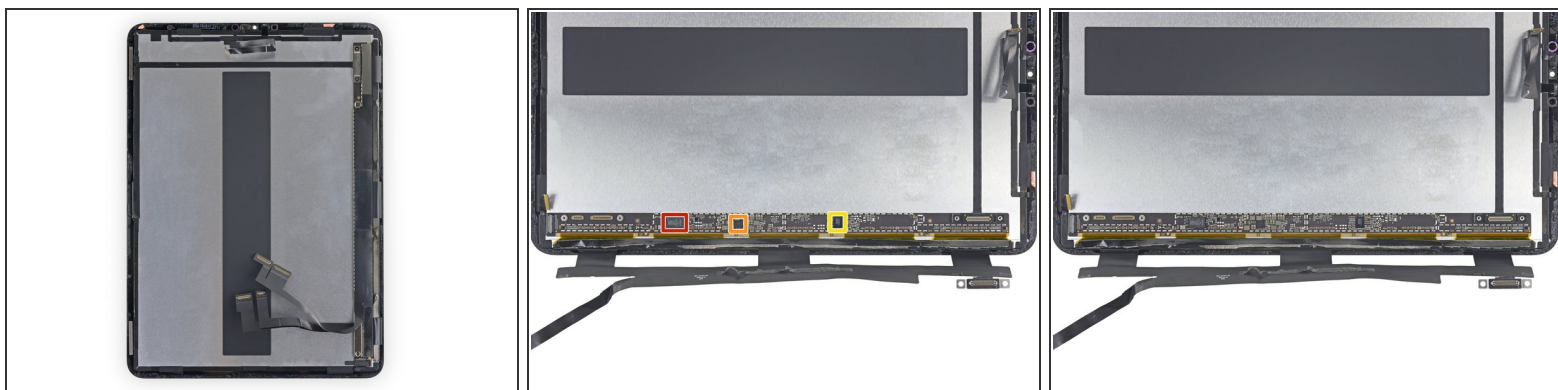
Step 4

- We loved the experience of cutting through all the glue to open our first iPad, and it has never gotten old.
  - ⓘ This statement is brought to you by the Coalition of Sarcastic Tinkerers and National Opposite Day.

- It helps to be practiced at this, but these extra-thin bezels make it even a bit more harrowing than usual. Heat, carve, hold your breath, and hope nothing breaks.

- ⓘ It turns out the case is a little thicker around the Pencil charging area—we started prying there and quickly regretted it.

- On the plus side, the display's ribbon cables are a safe distance from the bezels—but they're also spread out in a way that makes display removal really awkward.

Step 5

- Those cables aren't safe *quite* yet, as we're forced to lay the display at a weird angle and hopefully not damage anything while we disconnect them.

- We put our [Phillips driver](#) to work releasing both cable connectors.

- Now we see what those X-rays were trying to show us! One thing that immediately stands out is the iPad's quartet of speakers.

  - (i) Four woofers and four tweeters, for a total of *eight* speakers, make for a Netflix powerhouse—because even professionals need a break sometimes.

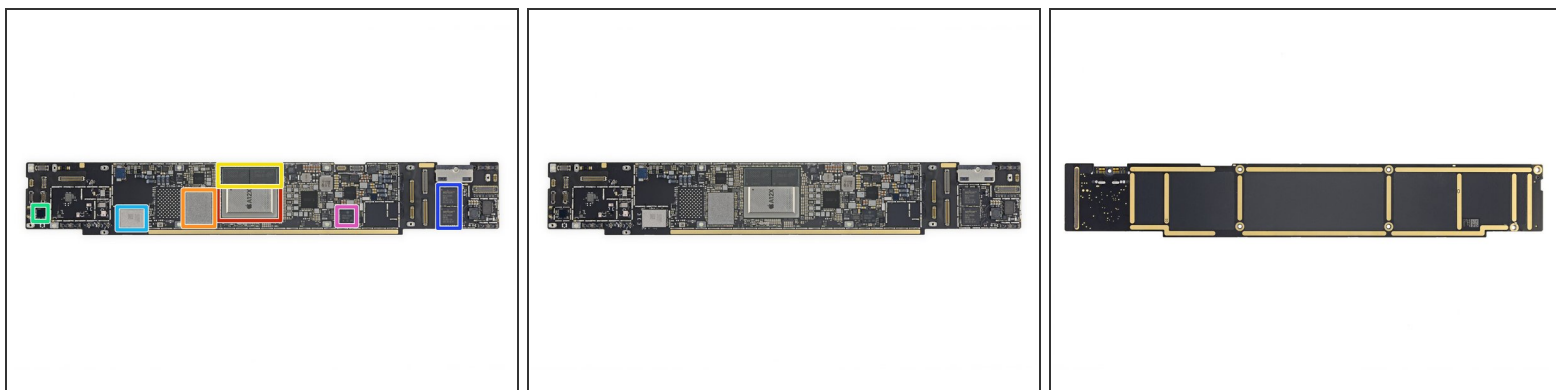This document was generated on 2019-09-16 06:54:57 PM (MST).

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Step 6

- Here's the new Liquid Retina display—scaled up from when we first saw it, and packing the same awesome 120 Hz refresh rate we saw on the last iPad Pro.

- The fancy new display brings some chips along with it too:

  - Parade Technologies DP825 timing controller (the same one we saw on the iPad Pro 10.5")

  - Texas Instruments TPS65158 (maybe a variation of the TPS65168 LCD Bias IC)

  - Intersil 24883A D826AB

Step 7

- Anxious for our first glimpse of that A12X~~box~~ chip, we peel away the logic board cover next.

- Yuck—as always, the board is secured with adhesive, and it's made even fussier by the speakers, which block almost all prying access.

- But we're impatient, and soon victorious. The logic board triumphantly emerges from the canyon betwixt the battery cells.

   (i) *That Netflix prowess comes at a price.*

Step 8

- After all that, we're rewarded with some silicon:

  - Apple APL1083 [A12X Bionic SoC](#)

  - Toshiba TSB3247M61710TWNA1 flash storage (64 GB total)

  - 2x Micron 8MBT9 D9WHG RAM (4 GB total)

  - NXP 100VB27 NFC controller

  - Apple / USI 339S00551 Wi-Fi / Bluetooth module

  - 2x Broadcom BCM15900B0KWFBG touch screen controller

  - Texas Instruments CD3215C00 power controller
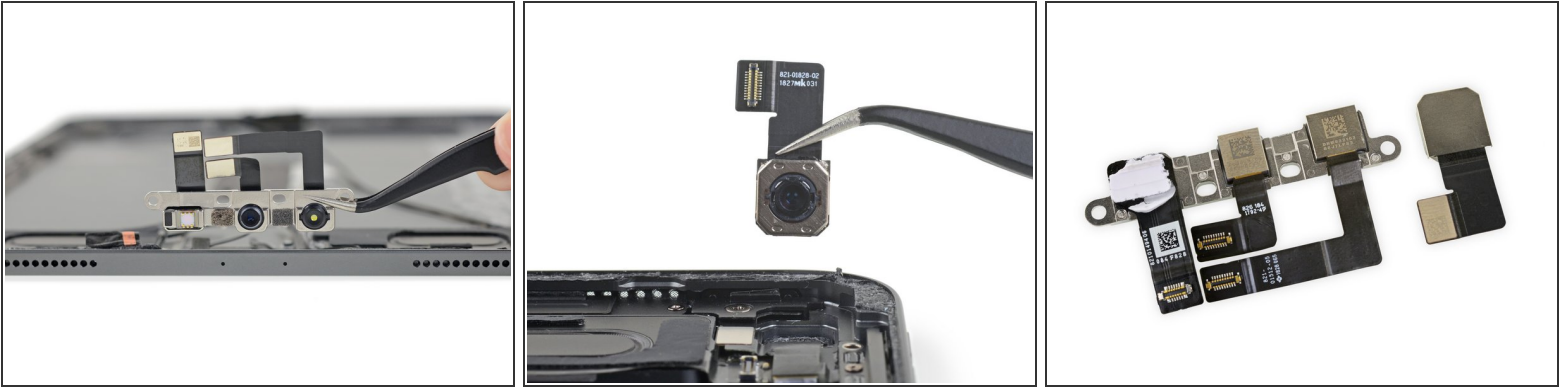
Step 9

- These chips can't be contained to just one step, so here are some more:
  - STMicroelectronics STB601A0 PMIC

  - 343S00252-A0 1834PHHE

  - 343S00257-A0 1834PHGI

  - 343S00248-A0 1835NHGY

  - 343S00235 88A49H8 D TI

  - P13DPXT2 05A12LBE 1832GC

Step 10

- Battery time! We were *not* fans of [last year's iPads](#), which skipped out on the stretch-release battery tabs.

- This year, pull tabs are back in style—six U-shaped strips this time! Each strip has *two* tabs, giving fixers a second chance should one of them break. Neat!

  - (i) Maybe we pegged this iPad all wrong. It was painful to open, but these adhesive strips pull out [buttery smooth](#)—

- But the smooth stops there. A huge patch of supergoop runs all the way down the left side. *Sigh.* Time to break out the pry tools.

  - We were left speechless. Why would Apple do this? We could only hypothesize that the adhesive is there for "[rigidity reinforcement](#)".

- This iPad's powered by a 7812 mAh battery running at 3.77 V, for 29.45 Wh—a slight downgrade from the 30.8 Wh pack in the [10.5" iPad Pro](#), and a lot smaller than the most recent [Microsoft Surface Pro's](#) 45 Wh battery.
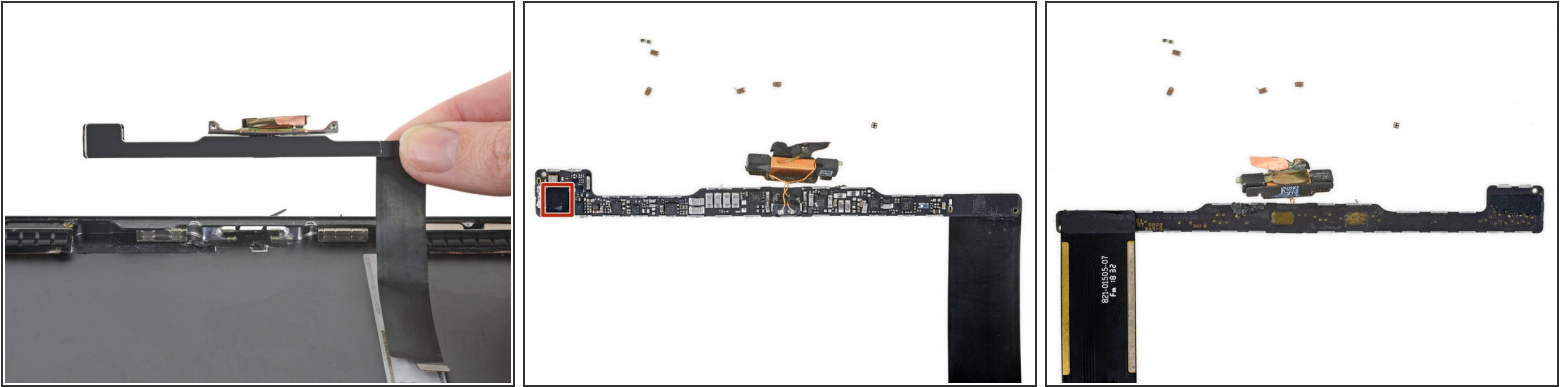
Step 11

- Next up, making its debut in the iPad: Face ID.

- More specifically, this is the same basic hardware we've seen since [iPhone X](#)—IR dot projector, selfie camera, and IR camera—but in a slightly modified form factor.

- While we're at it, we fish out the rear camera—which Apple says brings the same performance as the camera from the previous iPads, while being re-engineered for more thinness.

  - [With the loss of OIS, and still a huge camera bump](#), this design seems shot through with compromise.
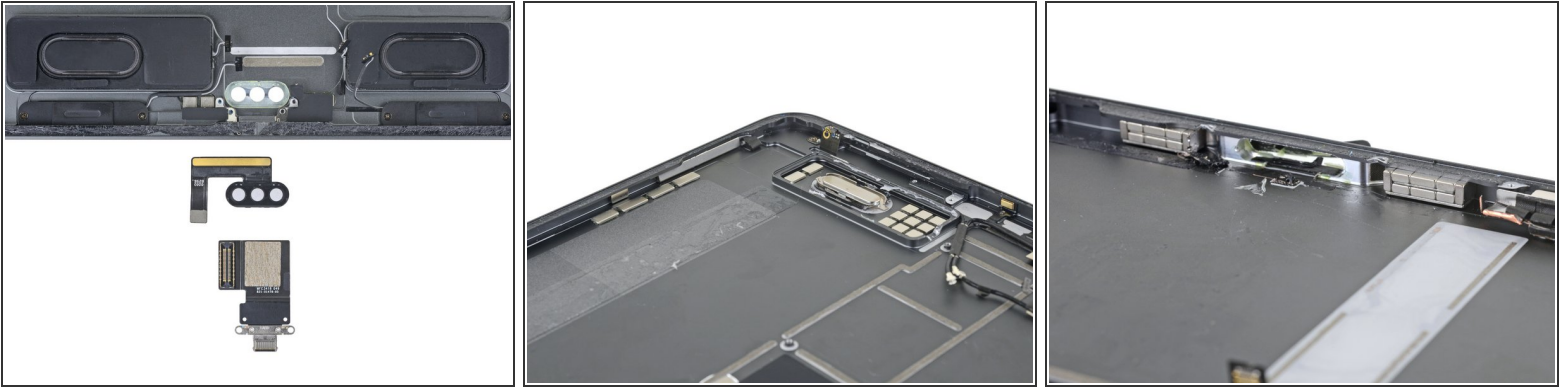

Step 12

- Let's remove those speakers, shall we?

- That's easier said than tear-done. The housings are carved right into the aluminum case, and were clearly never meant to be removed. Digging them out takes a ton of heat and willpower.

  - The tweeters come out without a fight but the woofer drivers are pretty much toast—hope they're made of never-fail-ium!

- Hiding within the speaker chamber; more magnets! If we had a nickel for every magnet in here, we could melt them all down and make a giant novelty nickel.

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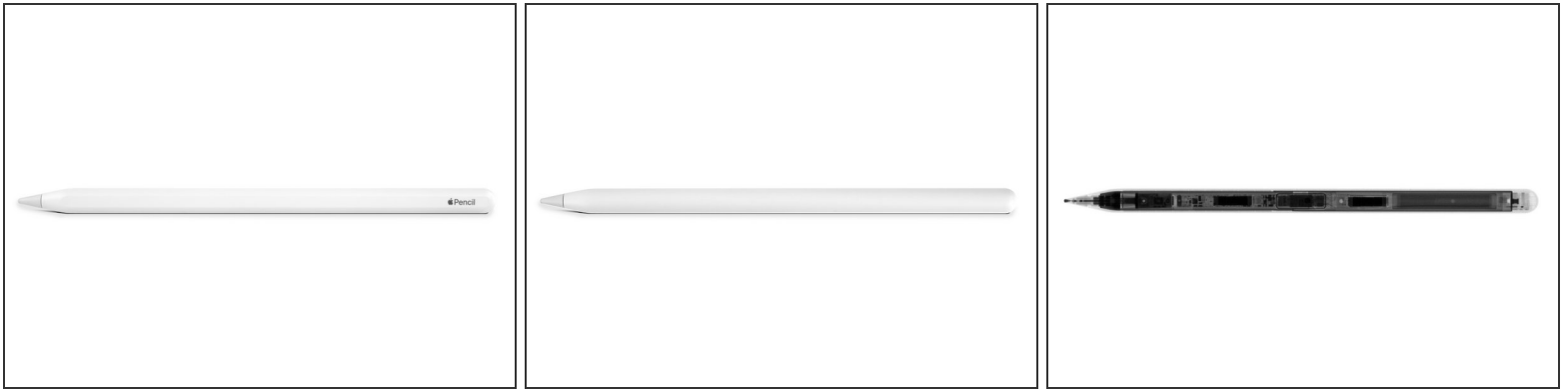
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Step 13

- Next to come out is the Pencil charging board, with its copper charging coils attached.
  - While it's technically out, it's not without casualty...

- Tiny capacitors and other board bits go flying in protest as we remove the shields. Are we sorry? No we're not.

- What's this we see, hiding in the corner? It's an STMicroelectronics [STM32L476JGY6](#) ARM Cortex MCU.
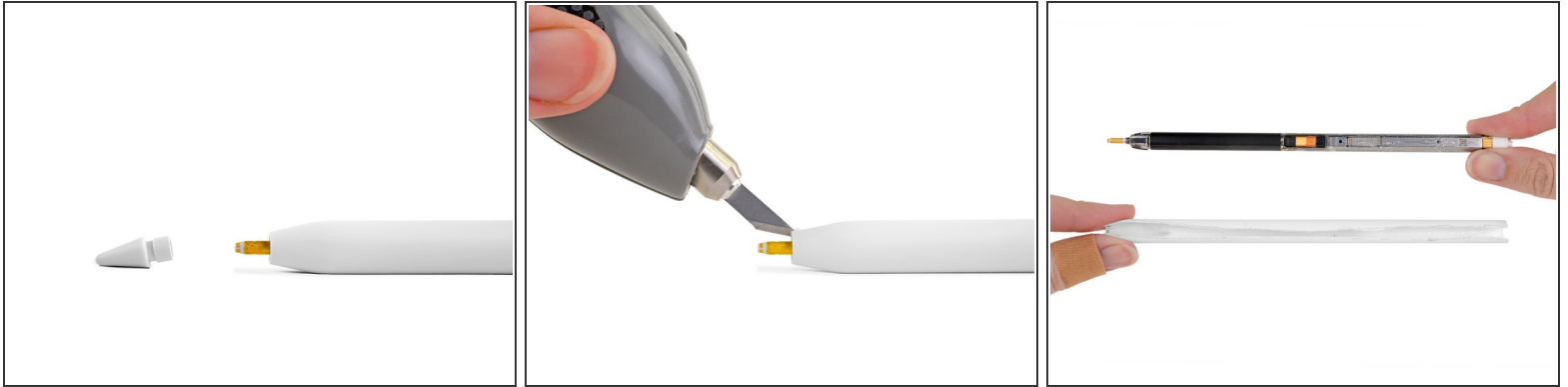
Step 14

- Last to come out is the USB-C port—which unlike previous iPads, is fully modular.

  - (i) *Technically* previous iPads didn't have USB-C at all—but they had Lightning ports for the same purpose, and *those* were soldered to the logic board.

- This is a high-wear component, so the ability to replace it independently of the main board is a nice repair win.

- It might not be a win for people who are heavily invested in Lightning, but our message to those people is: At least USB-C offers faster throughput in a standardized, non-proprietary form factor.

- About the only things left in the chassis are a whole **ton** of ~~nickels~~ magnets.
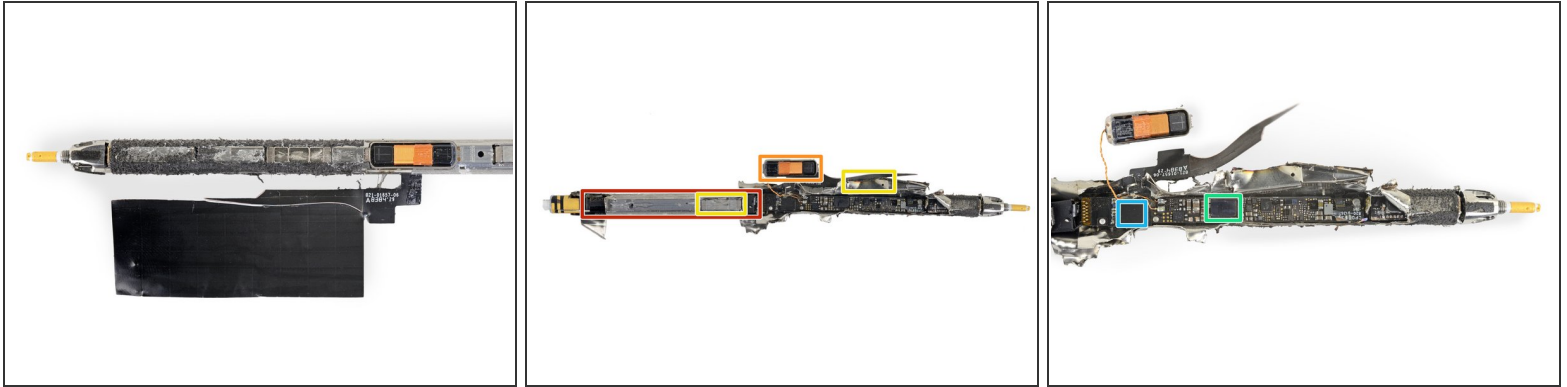
Step 15

- **Bonus round**: we also picked up the new Apple Pencil.

- We can already tell, based on the number of visible entry points (read: zero), that this isn't going to be pretty. ([Again.](#))

- Let's start with an X-ray before things get messy.

Step 16

- Okay so technically there is *one* entry point, but we all know nothing's getting in through that tip.

  - ⓘ The tip is actually the one thing that is compatible with the previous model—if you bought a new iPad this year and want a Pencil, get ready to spend some more money.

- With the tip removed, we go straight for the big guns. Bring out the ultrasonic blade!

- When the dust settles, a metal rod emerges from the Apple-white plastic shell.

- Looking around, we spot the new wireless charging getup, some magnets, a black sheath, and a wounded teardown engineer. ☹

  - ⓘ Only one engineer was harmed in the making of this teardown.

Step 17

- A large black ribbon cable unfurls from around the Pencil body, revealing what looks like a capacitative grid!

  - ⓘ This is likely used to register tap inputs, but this grid ought to help the Pencil know where—not just when—you tap. Could more complex gestures be on the way?

- Unfortunately, it's back to destruction from here—the Pencil's many welded steel layers put up quite a fight, and we're only able to reveal a few components.

  - Battery (even we don't want to tempt that little explosive)

  - Wireless charging coil

  - Alignment magnets

  - Broadcom 59358A0 touch controller

  - Custom Apple 343S00250 IC

Step 18

- This iPad Pro is no mo'—we've broken it down to its constituent parts!

- It's hard to tell if this is a good Apple, or a bad one. There's a modular USB-C port and stretch-release battery adhesive, but it's still mostly glued together and a strip of tough conventional adhesive also secures the battery.

- It looks like Apple is trying to change, but the voice on the other shoulder was a little louder than the repairability angel this time around. That said, with all of Apple's late 2018 products showing some improvement, we're hoping the repairability angel is gaining influence.

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Step 19 — Final Thoughts

REPAIRABILITY SCORE:

3 OUT OF 10

- The iPad Pro 11" earns a **3 out of 10** on our repairability scale (10 is the easiest to repair):
  - The USB-C port is modular and can be independently replaced.
  - The lack of a physical home button eliminates a common failure point and may simplify repairs.
  - The battery is secured with both easier-to-remove stretch-release tabs *and* conventional, non-removable adhesive.
  - The LCD and front panel glass are fused together—simplifying the opening procedure, but increasing the cost of repair.
  - Gobs of adhesive hold most everything in place, making all repairs more difficult.