iPad Pro 9.7" Teardown

iPad Pro 9.7" teardown on April 4, 2016.

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INTRODUCTION

You probably expected a thinner, lighter, and faster iPad Air 3, but Apple had other ideas. Instead of iterating on October 2014’s iPad Air 2, they went back to the drawing board. Actually they probably don't use a drawing board, they use an iPad Pro—which might be where they got the idea for this. It seems to pack all the features of the first iPad Pro, in a smaller package. Let's see how they did it—it's time to tear down the iPad Pro 9.7”.

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[video: https://www.youtube.com/watch?v=1Qqtn1G6jhl]

TOOLS:

- iOpener (1)
- Suction Handle (1)
- iFixit Opening Picks set of 6 (1)
- iFixit Opening Tools (1)
- Tweezers (1)
- Phillips #00 Screwdriver (1)
- Spudger (1)
Apple may have let all the Air out of the iPad line, but they didn’t skimp on the 9.7” Pro’s specs:

- Fully laminated, 9.7", LED-backlit, Oxide TFT "True Tone" display with 2048 x 1536 resolution (264 ppi)
- 3rd generation 64-bit Apple A9X custom processor, with M9 motion coprocessor
- 12 MP rear iSight camera with 4K video recording at 30 fps, and 5 MP FaceTime camera with 720p video
- Self-balancing, four-speaker audio
- Touch ID sensor, 2 microphones, 2 ambient light sensors, accelerometer, barometer, and 3-axis gyro
- 802.11a/b/g/n/ac MIMO Wi-Fi + Bluetooth 4.2
- 32, 128, or 256 GB of on-board storage
Before sinking our teeth picks into this thing, we check out our favorite website to get a look at the True Tone display.

Of course, what sleek, new mobile offering out of Cupertino would be complete without the infamous camera bump?

This 1.1-millimeter mesa was absent from the 12.9" model, but probably necessary in this iteration due to the slightly shallower rear case and spec'd up 12 MP, 4K rear camera.

And, for the second time this week, the Rose Gold rear case shows off a new model number: A1673, and the usual regulatory markings.

No surprise, once it reaches its 5th birthday, Apple doesn't want you pitching your iPad into the nearest trash can—they'd prefer you give it back.
Step 3

- The whole iPad family is here! Left to right: Mini 3, Air 2, and iPad Pro 12.9".
- Truly, in its entire history, there has never been a more Rose Gold iPad than this.
- In all seriousness, it's refreshing to see a redesign that seems to focus on features rather than a nigh-pointless reduction in thickness, in a device that's already thinner than a pencil.

Step 4

- Our ingenious friends at Creative Electron sent us a sneak peek at the Pro 9.7's internals, X-ray style.
- We immediately note that where the larger iPad Pro's interior volume was dominated by four huge speaker enclosures, this little guy uses a more conventional setup: the battery hogs most of the space, with the logic board on the side and the speakers squeezed in at the margins.
- What's that weird strip of PCB running through the middle, though?
- Time for a closer look. Let's open it up!
Step 5

- As we heat up the iOpeners, we place bets in the office pool: Where will the display cables be this time?

- Time to pick softly and hope we don't snag anything.

  * One day, perhaps, Apple will put its massive engineering prowess to work on the problem of how to make a tablet that opens for servicing—*without* the nail-biting 30-minute process of heating, blind prying, and suctioning it currently demands. But it is not this day.

- Having successfully carved the front panel free from its gluey frame, we get our first peek inside...
Survey says: Display cable's in the bottom right corner! That's a new configuration.

We'd like to take a brief moment to mention that disassembly instructions are hugely important for successful repairs. We believe every user has the right to know how to safely work on their device.

The display, backed with some cushioning foam, also contains a ton of chips!

- Parade Technologies DP815 (likely an iteration of the DP695 timing controller found in the 12.9" Pro)
- NXP Semiconductors 8416A1 (NVT8416) secure microcontroller (for Touch ID)
- Renesas ISL98667A display power management
Step 7

- After popping a few screws, we remove a big slab of EMI shield covering the logic board. We saw this same kind of shielding in the larger iPad Pro, but it didn't exist in the iPad Air line.

- Our fingers are itching for chips, but for now we restrain ourselves and settle for isolating the battery. One precisely-placed pick separates the battery contacts from the logic board.

- Next to come off is another shield covering the battery board, nestled between the two large battery cells.

- There's some action in there, and bizarrely, a screw that seems to be holding the smart keyboard connector to the battery board.
Step 8

- With shields and tape deftly dispatched, we turn our attention to the heavy hitters. First up: upper speakers!

- They're really fiercely glued in, and screwed in, but it's nothing a plastic opening tool can't deal with.

- Once we pop the speakers out for a closer look, we're rewarded for our hard work: they connect to the logic board with spring contacts!
Step 9

- Out pops the perpetrator of that unsightly camera bump.
- And yup, that dimple goes all the way down, through the case down to the sapphire crystal lens cover.

- Recently, there have been a number of consolidated hardware features in Apple's mobile lineup and this camera is no exception.
- It's the same 12 MP, 4K shooter featured in the 6s—a substantial upgrade over the 8 MP 1080p camera we dug up in our last Pro teardown.

ℹ️ We assume this will lead to nothing good.
On our way to the logic board, we encounter some strange new antenna interconnect boards.

A dab of glue fastens each connector in place, but they come free with a little gentle prying.

The boards themselves serve no obvious purpose; we can only speculate that their flat tops provide a little extra support for the display.

* Now that you'll be resting your palms on the glass while drawing with your Pencil, maybe a little reinforcement is called for.

Anyway, time to get a look at that logic board!
Step 11

- Chip chip hooray!
  - Apple APL1021 A9X 64-bit applications processor
  - Samsung K3RG1G10BM-KGCH 2 GB (16 Gb) LPDDR4 SDRAM memory
  - SK Hynix H23QEG8VG1ACR-BC 32 GB (256 Gb) NAND flash memory
  - 2 × Broadcom BCM15900B0 (as seen in the iPad Pro 12.9") touchscreen controller
  - Apple 339S00109 Wi-Fi module
  - NXP 66V10 (PN66V) NFC controller and 1610A3 charging IC (as seen in iPhone SE/6s/6s Plus) (CBTL1610A3, possibly a display port multiplexer)
  - InvenSense EMS-A 6-axis gyroscope and accelerometer combo (also found in iPhone SE)
Step 12

- But wait, there's even more chips!
  - Maxim Integrated [MAX98721BEWV](https://www.maximintegrated.com/en/products/audio/boosted-class-amplifiers/98721.html) boosted class amplifier
  - Apple 343S00051-A1 (likely an iteration of the 343S00052-A1 found in the iPad Pro 12.9"") power management
  - Apple 343S00089-A1 power management
  - STMicroelectronics [STM32L052T8](https://www.st.com/en/microcontrollers-mcu/stm32l052t8.html) 32-Bit ARM Cortex-M0+ microcontroller
  - Cirrus Logic CS42L83A audio codec
  - Analog Devices [ADAU7002](https://www.analog.com/en/adau7002.html) audio converter
Unfortunately for repair-minded folks like ourselves, the battery contains none of those nifty adhesive pull tabs found in the larger iPad Pro (and in every iPhone since the 5s). So, removing it is a sticky affair.

Maybe next time Apple? Pretty please?

What the battery does contain is a rating of 3.82 V, 27.91 Wh, and 7,306 mAh, amounting to a 10-hour battery life claim.

As expected, that's quite a bit less than the 38.8 Wh capacity of the larger iPad Pro—but fractionally better than the iPad Air 2's 27.62 Wh. Still, all three models have roughly the same estimated battery life.

We're about to leave the case at that, but we try another poke at the Smart connector, hoping for an easier extraction than last time. No such luck.

Texas Instruments SN27545 Battery Fuel Gauge
Step 14

iPad Pro Repairability Score: 2 out of 10 (10 is easiest to repair)

- While not soldered in place, the battery is very solidly adhered—no more pull tabs like we saw in the larger iPad Pro 12.9"

- The Smart Connector port is virtually impossible to replace—but incorporates no moving parts and is unlikely to fail.

- The LCD and front panel glass are fused together. This slightly simplifies the opening procedure.

- The fused front panel increases the cost of screen repair, and the risk of damaging the LCD when opening.

- Gobs of adhesive hold everything in place making all repairs more difficult.