iPad Air 2 Teardown

What's lighter than Air? An Air 2. Join us as...

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INTRODUCTION

What's lighter than Air? An Air 2. Join us as we disassemble the new, shaved-down iPad Air 2, and see whether Apple's thinnest device is still its least-repairable.

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[video: https://www.youtube.com/watch?v=JlLf6sei6YQ&feature=youtu.be]

TOOLS:

iOpener (1)
iFixit Opening Picks (Set of 6) (1)
Tweezers (1)
Spudger (1)
Plastic Cards (1)

Step 1 — iPad Air 2 Teardown

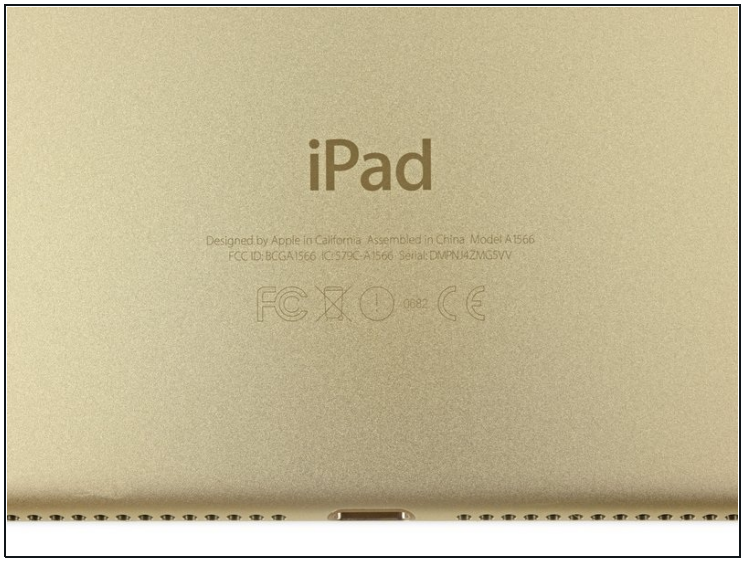


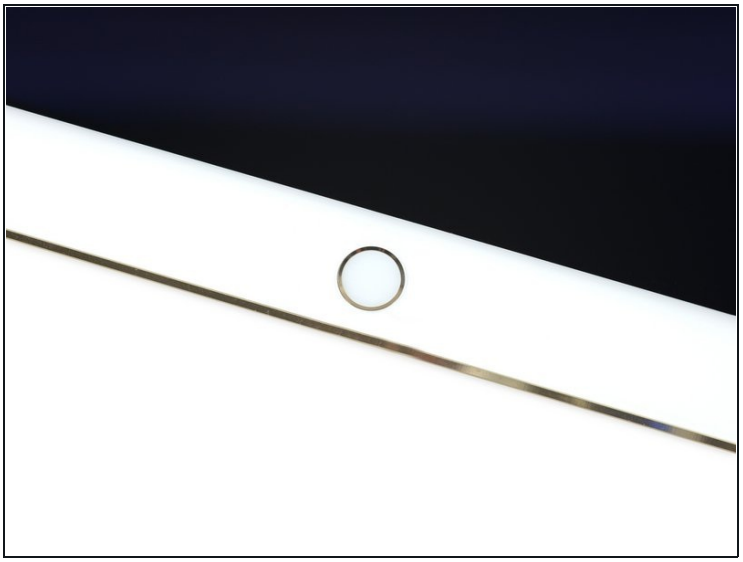




- Just add air? That would be too easy. Apple has packaged all kinds of revised hardware into its thinnest tablet yet:
  - Fully laminated, 9.7" IPS Multi-Touch LCD with a 2,048 x 1,536 resolution at 264 ppi and antireflective coating
  - A8X 64-bit CPU (rumored to be a triple-core, 1.5 GHz SoC) paired with 2 GB RAM and M8 motion coprocessor
  - 8-megapixel rear iSight camera capable of recording 1080p/30fps or 720p/120fps video + 1.2-megapixel 720p front-facing camera
  - Touch ID fingerprint sensor + barometer + dual microphones + 3-axis gyro + accelerometer + ambient light sensor
  - 802.11ac dual-antenna MIMO Wi-Fi + Bluetooth 4.0
  - 16, 64, or 128 GB on-board storage

Step 2





- The iPad Air 2 marks the beginning of a new model number pattern, A15XX. In this case, the iPad Air 2 Wi-Fi bears the model number A1566.

- In addition to a new model number, the iPad Air 2 introduces Touch ID into the iPad family.

- If you're new to the game, Touch ID allows you to use your fingerprint to unlock your iPad. You can also use it to authorize purchases from the iTunes Store, App Store, and iBooks Store.

  The Touch ID sensor is capable of registering your fingerprint from any angle—which means no matter what the orientation, your device reads your fingerprint and knows who you are.

Step 3





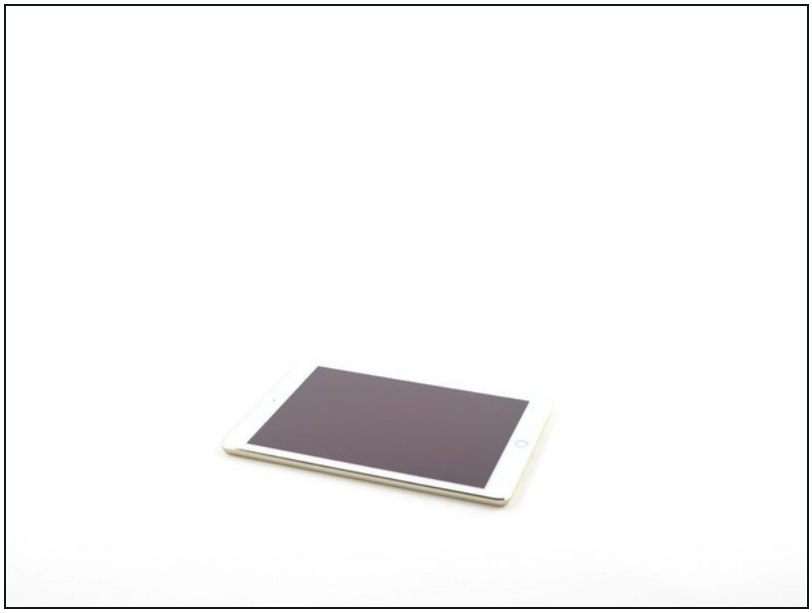
- Pencil-thin is so last year. This gold brick is now *slightly thinner* than a pencil.

- In all seriousness, the 6.1 mm profile is impressive. Not only is the iPad Air 2 thinner than the original iPad Air, it's even thinner than the latest iPhones—and lacks the latter's controversial camera bump.

  Close inspection also reveals that the dual mic inched its way closer to the iSight camera, apparently chasing the hold switch clean off the device.

- Not only is this iPad Air 2 thinner, but it is lighter too. How much lighter? About 12 pennies worth.

Step 4



- Hey, Goose! (Yes, Maverick?) I feel the need...the need for heat!
- We had high hopes for finding some exterior screws on the Air 2—after all, the iPhone 6 Plus proved Apple can do tablet-sized gadgets, without the glue.

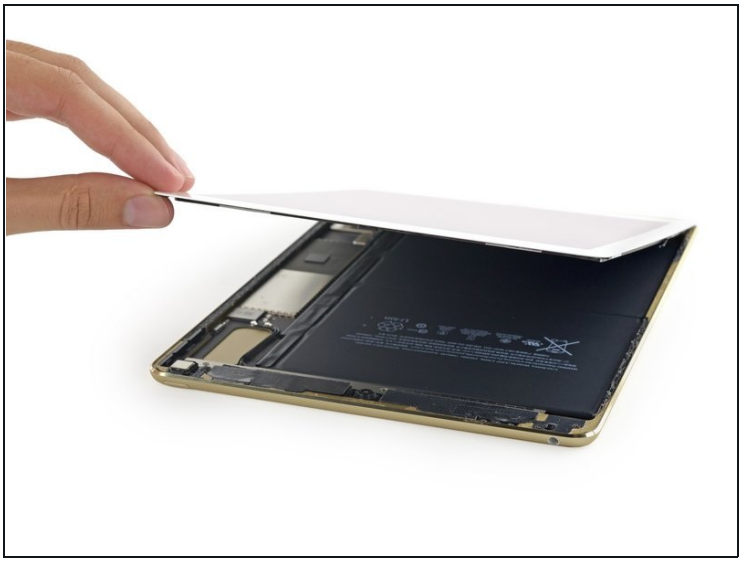
⚠ Alas, it's not to be—the sleek chassis is utterly devoid of screws.

- We are forced to pile on—iOpeners, that is.

ⓘ We promise to post a blow-by-blow description of this thoroughly technical opening procedure at a later date.

Step 5





Coming up next: classic iPad reruns—careful prying and tons of heat.

- The newly-bonded front panel is more rigid than in previous iPad models, and therefore feels a bit sturdier to pry against—however, flexing the glass still disturbs the LCD, even when you aren't inserting the pick very deeply.

⚠ That being the case, the glued-down display remains the iPad's only access point, so there's still a risk of damaging it even when performing ordinary repairs.

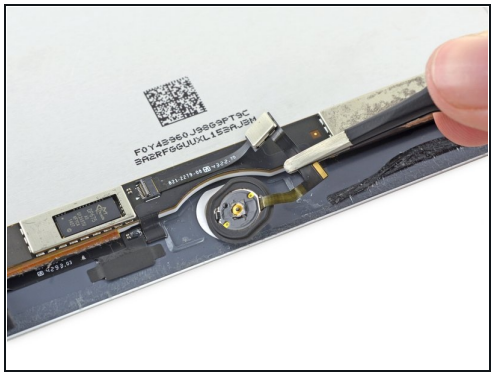
Step 6

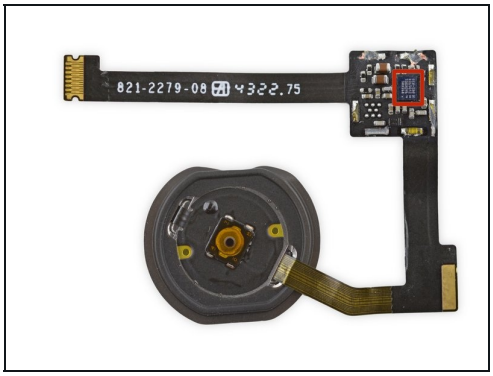


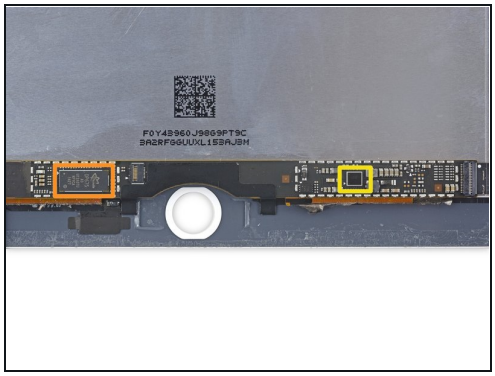


- Upon successfully opening the iPad Air 2, we immediately note that all the display cables now reside near the lower edge.
- This is a welcome change from the previous iPad Air, whose digitizer and LCD cables effectively booby-trapped two edges of the display.
- In case you were wondering how much room you have to wedge your opening pick in between the front panel assembly and rear case, it's not much. There's little margin for error in this Air 2's margins.

Step 7



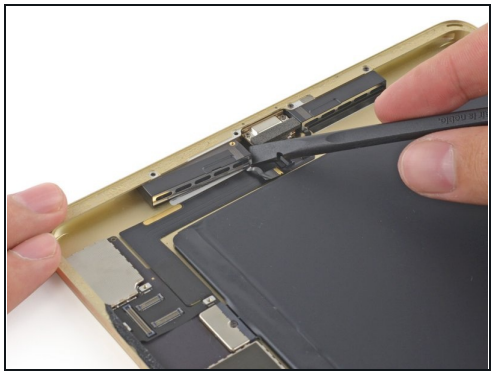


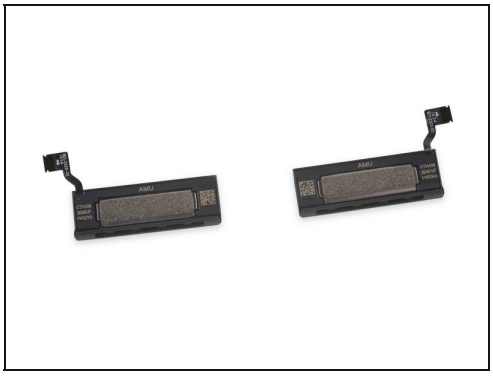


The design of the Air 2's Touch ID sensor cable closely resembles that of the new generation of iPhones.

- With the home button removed, we discover a single IC on the home button assembly:
  - NXP Semiconductors 8416A1 Touch ID Sensor
- Further inspection reveals even more ICs on the front panel assembly:
  - Parade Technologies DP675 LCD Driver
  - Texas Instruments TPS65143A LCD Bias Solution For LCD Panels

Step 8

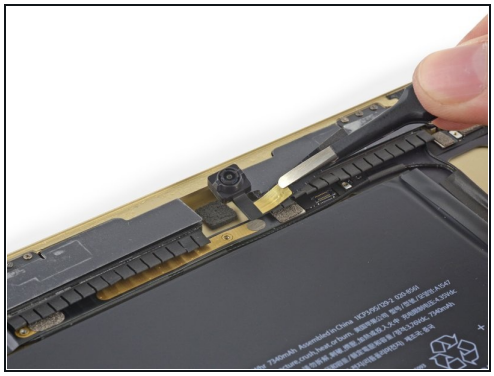


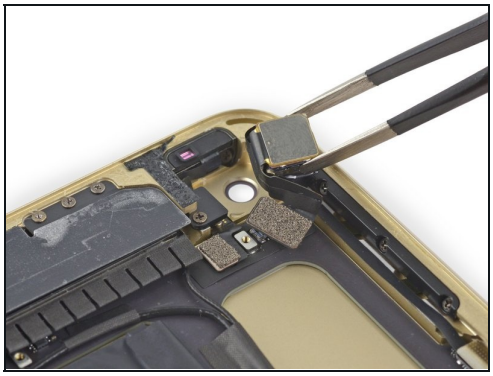




- Next we set our spudgers to the fancy, and tiny, new speaker units.
- Unfortunately, they are not speaking to us, and their markings don't have many secrets to divulge...
- Not waiting around for the awkward silence, we press on to glory.

Step 9



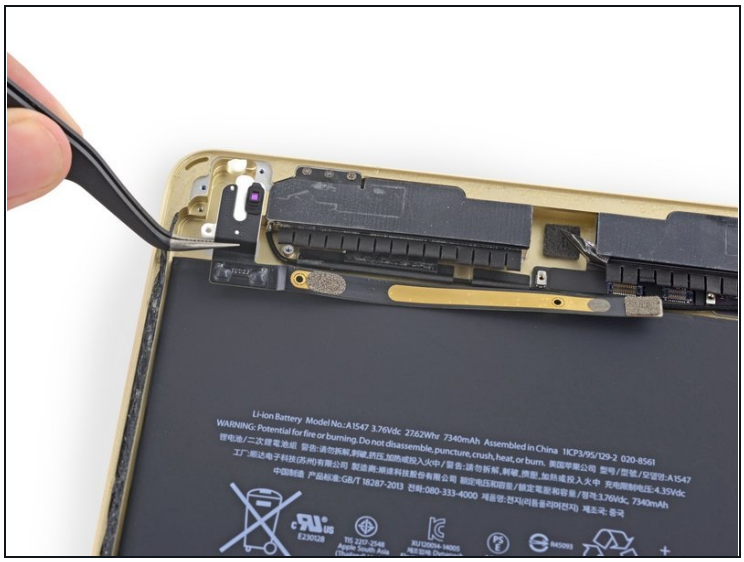




- Our next step is to remove the FaceTime HD camera and microphone-encircled 8 MP iSight camera.

- When compared to the larger, bump-inducing iSight camera from the iPhone 6 Plus, we can see they aren't quite the same—but it's indeed a leap in quality over the iSight camera found in the first-gen iPad Air.

Step 10

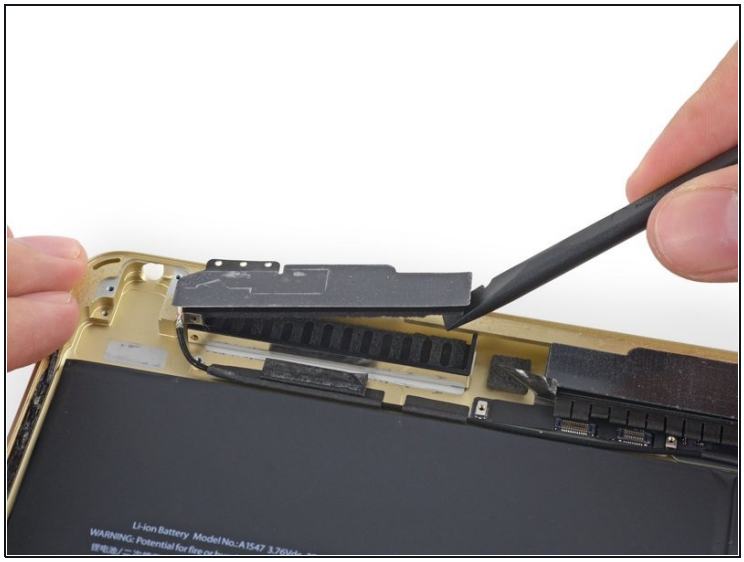


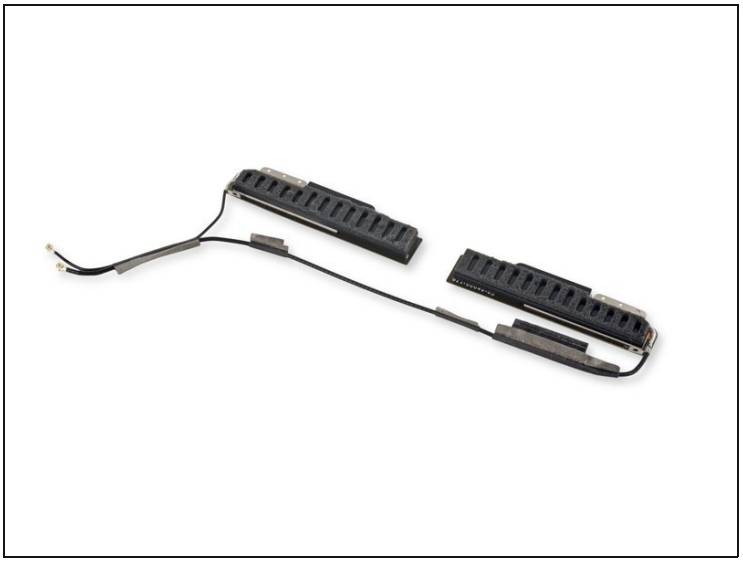


- The location and design of the headphone jack remains mostly identical. We say mostly due to one small change...

  - It seems the FaceTime HD camera ambient light sensor has been split into two sensors—one now residing on the headphone jack.

Step 11



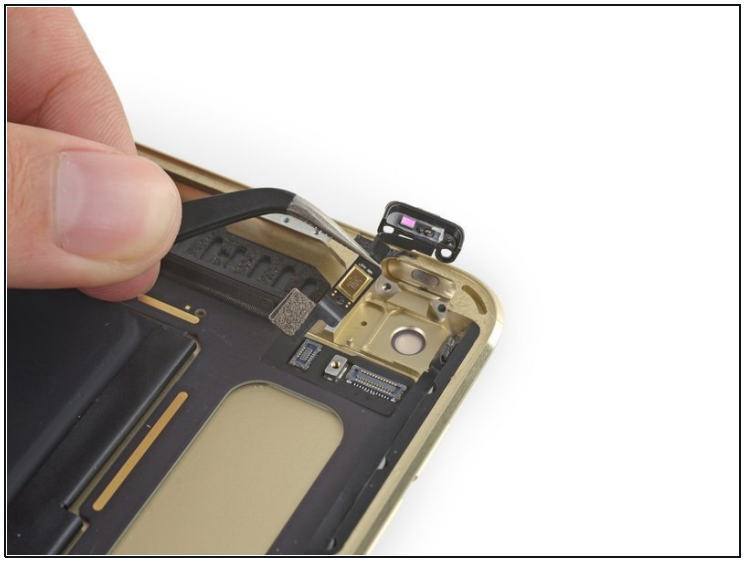


- Our Wi-Fi model's antennas now grace the top of the iPad, where previously they were ensconced along the lower edge.

  We're curious to see where the Air 2 LTE models will hide their cellular antennas.

- With the swoop of a spudger, the antennas are roused from their foamy beds.

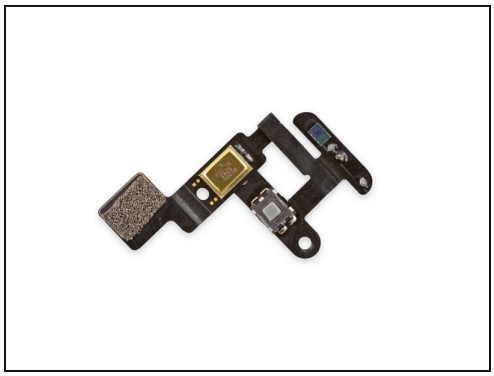
Step 12





- In a bevy of twos, we pull the first of two microphones, the second ambient light sensor, and the (single) power switch from the iPad Air 2.
- A second round of twos brings us the other microphone, and two volume switches on a single cable.

Step 13





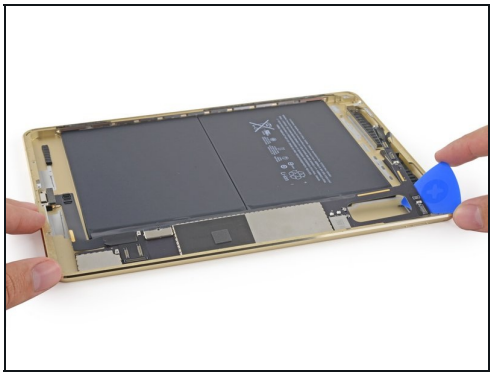
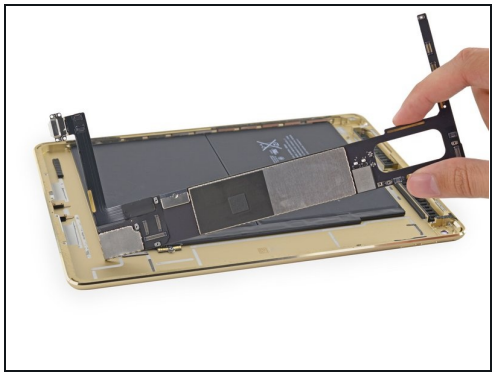


- The following markings were found on the microphones:
  - M1300 5743 M1 334 (found on the power button cable assembly)
  - M1300 5723 M1 334 (found on the volume buttons cable)

On a side note, the power and volume buttons stack nicely.

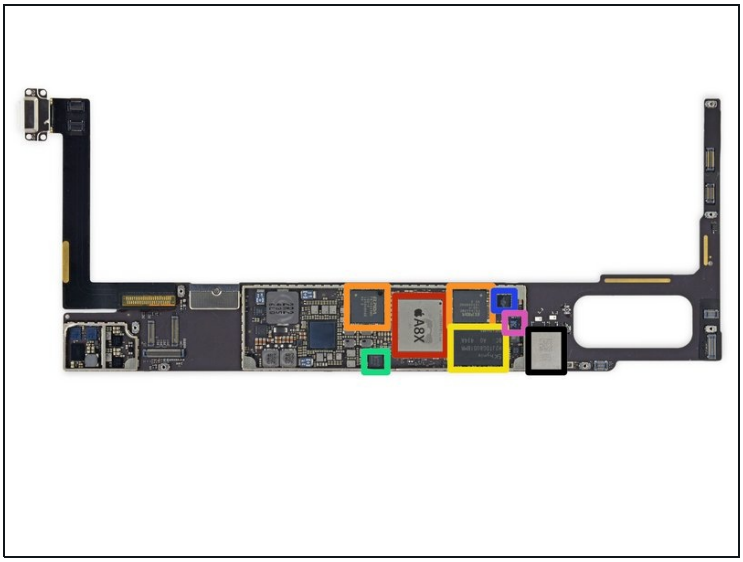
Step 14

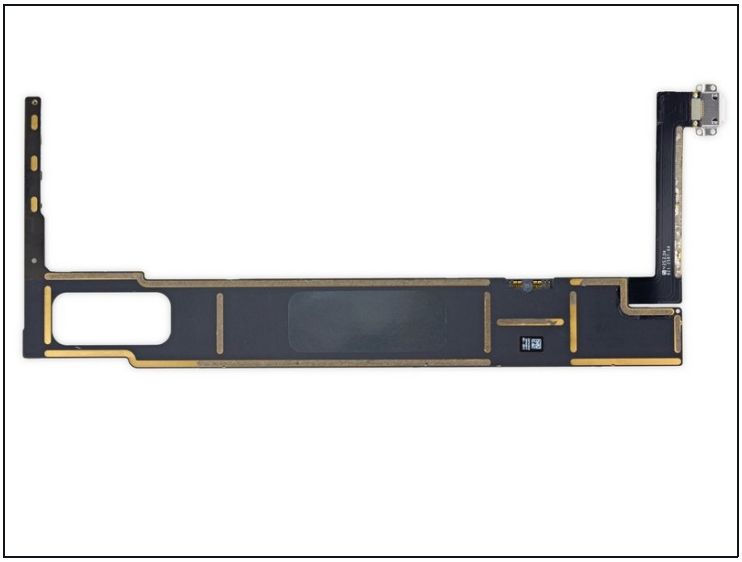


- Unfortunately, the logic board is still glued in—so we call our trusty iOpener out of retirement for one more gig.
- After some careful and tedious prying, we have ourselves a logic board!
- Upon removal, we are saddened to see that the Lightning connector cable remains soldered to the logic board.
  - This makes logic board removal even more of a chore. It also means that replacing the Lightning connector basically requires replacing the entire logic board.

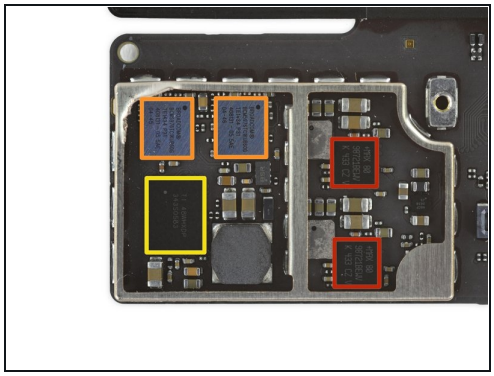
Step 15

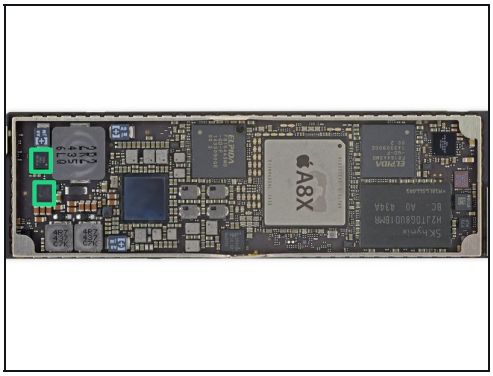


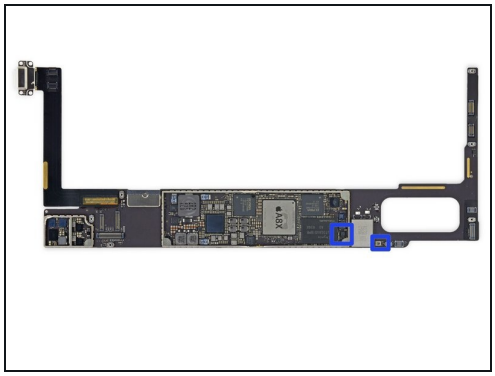


- At last, the main course. An entire plate of chips for us! Yum.
  - Apple APL1012 A8X 64-bit Processor
  - Elpida/Micron Technology F8164A3MD 8 Gb (1 GB) RAM (1 GB x 2 = 2 GB total)
  - SK Hynix H2JTDG8UD1BMR 128 Gb (16 GB) NAND Flash
  - NXP 65V10 NFC Controller (as found in the iPhone 6 and 6 Plus)
  - Apple (Cirrus Logic) 338S1213 Audio Codec
  - NXP Semiconductors LPC18B1UK ARM Cortex-M3 Microcontroller (Apple M8 Motion Coprocessor)
  - Murata 339S02541 Wi-Fi Module

Step 16

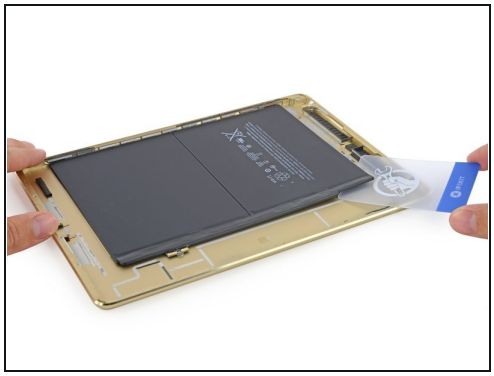


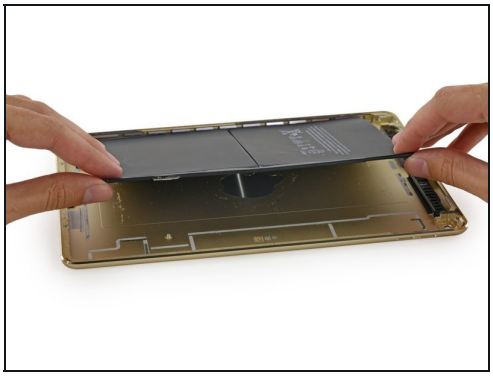




- More chips for those who want seconds:
  - Maxim Integrated MAX98721BEWV Boosted Class Amplifier
  - Broadcom BCM5976 Digitizer Controller
  - Texas Instruments TI48WHXDP 343S0583
  - Fairchild Semiconductor FDMC 6683 and FDMC 6676BZ (two ICs that date all the way back to the iPad 2)
  - Bosch Sensortec Barometer BMP280 Accelerometer BMA280

Step 17



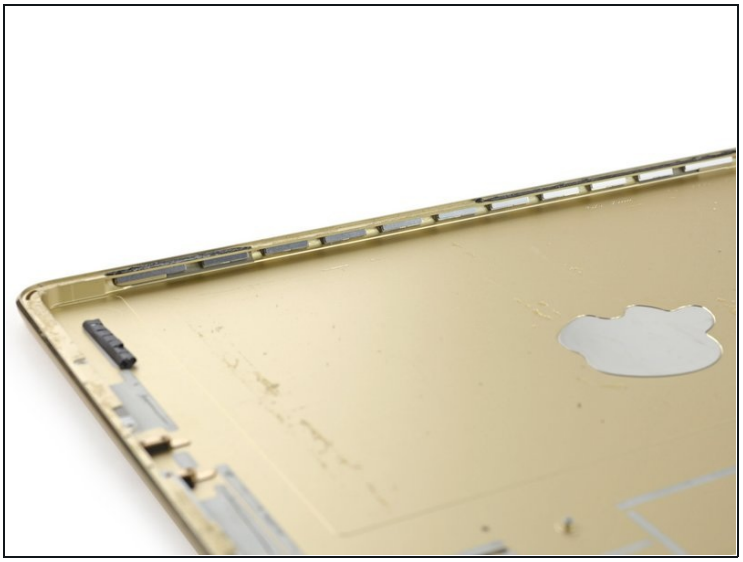




- The battery, now freed from the logic board's grasp, is ready for removal.
- It looks like we're going to need more help to get out of this sticky situation. Cue iOpener.
- It takes more heat and prying to free this dual-cell energy slab from the rear case.
  - It's not the worst, but it would be nice to leave the plastic cards on the sidelines for a battery replacement, for once.
- The 27.62 Wh battery in the iPad Air 2 drops a bit from the previous Air's 32.9 Wh capacity.
  - Apple claims the same 10-hour battery life as the original Air, so more efficient power use seems to be on tap here—though early reviews indicate that real-world battery life is still down a bit from the Air 2's predecessor.

Step 18





- After removing every component from the rear case, all that remains in this lifeless shell are the Smart Cover magnets.

- Good news everyone! Last year's Smart Cover is still compatible with the iPad Air 2.
  - Finally, a small escape from Apple's yearly upgrade cycle!

Step 19





- iPad Air 2 Repairability Score: **2 out of 10** (10 is easiest to repair)
  - The battery is still not soldered to the logic board.
  - The LCD and front panel glass are now fused together. This slightly simplifies the opening procedure.
  - The fused front panel also increases the cost of repairing a cracked screen, and increases risk of damage to the LCD when opening.
  - Just like in previous iPads, the front panel is glued to the rest of the device, greatly increasing the chances of cracking the glass during a repair.
  - Gobs of adhesive hold everything in place making all repairs more difficult.

To reassemble your device, follow these instructions in reverse order.