OnePlus 2 Teardown

OnePlus 2 Teardown on August 13, 2015.

Written By: Andrew W.

INTRODUCTION

What would you do for a OnePlus 2? We're a little shy, so we asked OnePlus if we could skip the dance party and flashmob contests, and they happily sent us a unit to rip apart. Kudos for their bravery.

Self-styled as the "2016 flagship killer," the OnePlus 2 steps into the Android phone market with circus-clown-sized shoes to fill. After the OnePlus 1's lackluster repairability score last year, we're hopeful that the new model brings some refinements and improvements for repair-minded folk like ourselves.

Follow along as we disassemble OnePlus' latest offering and see if they'll "never settle" for a 5/10 in repairability again.

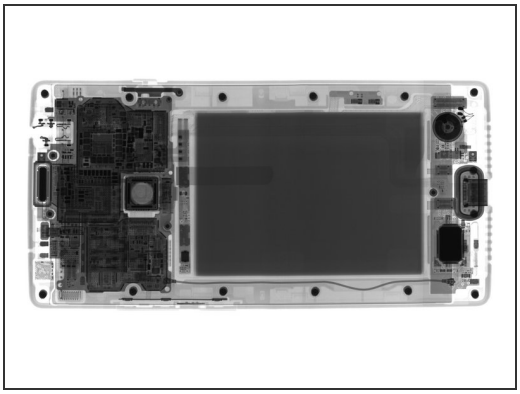
Here are OnePlus 2 different ways to keep up with the latest teardown news: follow us on Facebook Instagram, or Twitter!

[video: https://www.youtube.com/watch?v=pusyMbsQgq0]

TOOLS:

- iOpener (1)
- Tweezers (1)
- Spudger (1)
- iFixit Opening Picks set of 6 (1)
- Phillips #000 Screwdriver (1)

Step 1 — OnePlus 2 Teardown



- The OnePlus 2 will need a bit of brawn to beat the big boys. Let's check its specs:
  - 5.5-inch IPS display (1920x1080, 401 PPI)
  - 13 MP main camera, 5 MP selfie cam; up to 4K video; 720p slow-mo at 120fps
  - 64-bit Qualcomm Snapdragon 810 processor with 1.8 GHz Octa-core CPU and Adreno 430 GPU
  - 3 or 4 GB LPDDR4 RAM
  - 16 or 64 GB eMMC v5.0 storage capacity
  - 802.11a/n/ac Wi-Fi, Bluetooth 4.1, GPS/GLONASS, Digital Compass—and USB-C connectivity (a pretty snazzy cherry to top off these features)

Can't wait to see inside? Neither could we! Fortunately, we have friends with X-ray vision.

Step 2



- Meet the new "alert slider." OnePlus has developed a "volume" control for your notifications, throttling to various levels of priority with a single switch.
- On the back of the phone, we find the highly touted six-element, 13 MP, f/2.0 rear-facing camera, flash, and laser autofocus blaster.
- Is that a USB-C port we USB-see?
  - One of the first mass-market smartphones with a USB-C port, the OnePlus 2 gets the benefit of a reversible connector—though it seemingly lacks the faster charging and data transfer abilities we'd hope for.

Step 3



- Like another recent flagship Android phone, the OnePlus 2 lacks external screws.
- Thankfully, OnePlus has also foregone the use of adhesive for the rear cover, instead opting for plastic clips.
- We got our hopes up, but prying the case up revealed a solid midframe, no battery in sight.

ⓘ The easily-removable rear case means increased repairability—though we suspect the ease of replacement has more to do with OnePlus' StyleSwap covers.

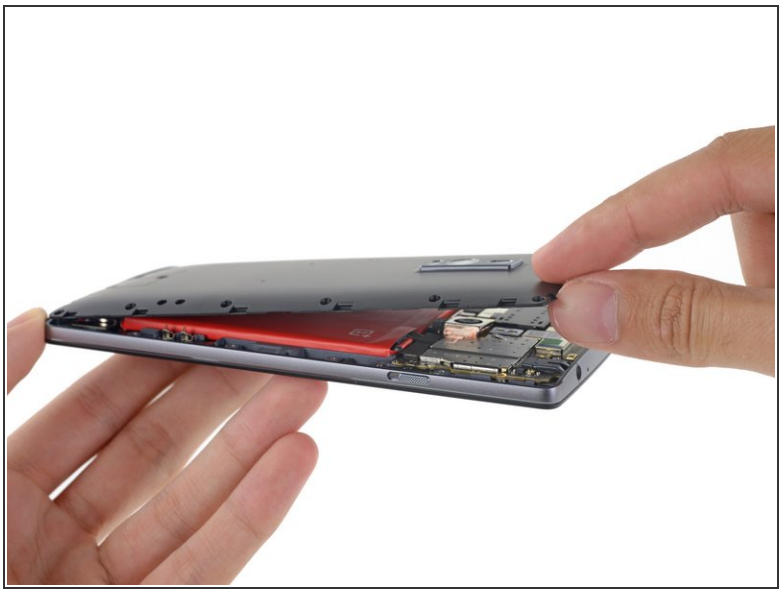
- And at least we have access to the dual-slotted Nano SIM tray, no SIM eject tool needed.

Step 4



- With the rear cover removed, we set to work on a vast legion of screws. It's miles better than glue, but there are just so many... Fortunately, our Pro Tech Screwdriver Set is on hand to face down this gaggle of Phillips fasteners.
- The OnePlus 2 hits back as we find even more screws hidden away beneath rubber covers.
- We also find a single screw wearing a tamper-evident seal—one that we're pretty sure OnePlus expected would be broken...

Step 5

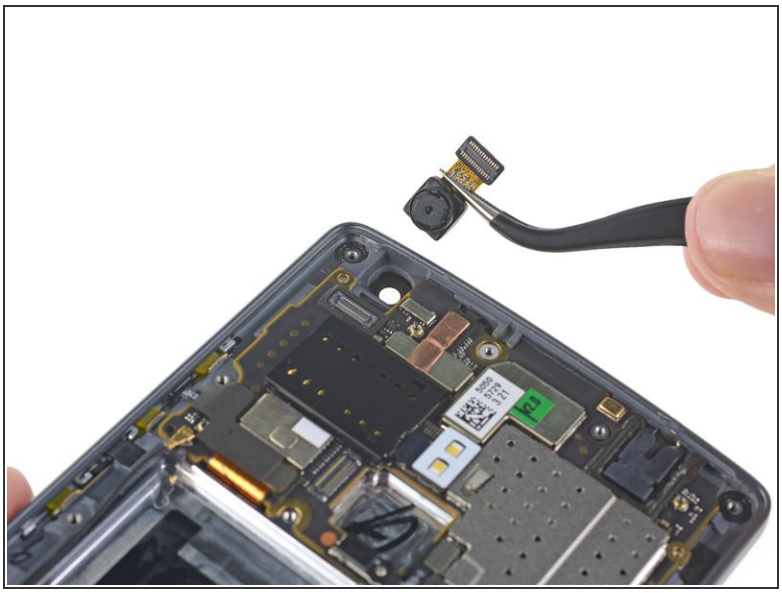


- Turns out that well-secured midframe is a thin plastic cover—now (minus 18 screws) easily removed.
- A peek inside reveals the signature red battery and a bit of the motherboard.
- There's not much left in the midframe cover—just a loudspeaker, and cover lenses for the camera and LED flash. We'll move on to greener and more tempting pastures...

Step 6

- "Battery is not removable," you say. Sounds like a challenge to us.
- The *not-removable* battery makes a pretty red target for our grabby teardown hands.
  - Although this battery is tucked under that midframe cover, it's actually much easier to extract than the lithium polymer cell in the OnePlus One.
- At 3.8 V and 3,300 mAh, this battery also provides a slight improvement from the One's 3,100 mAh lithium polymer cell.
  - That puts the 2 a rank above the 2,915 mAh iPhone 6 plus and 2,550 mAh Galaxy S6, and even edges out the 3,220 mAh cell in the monolithic Nexus 6.

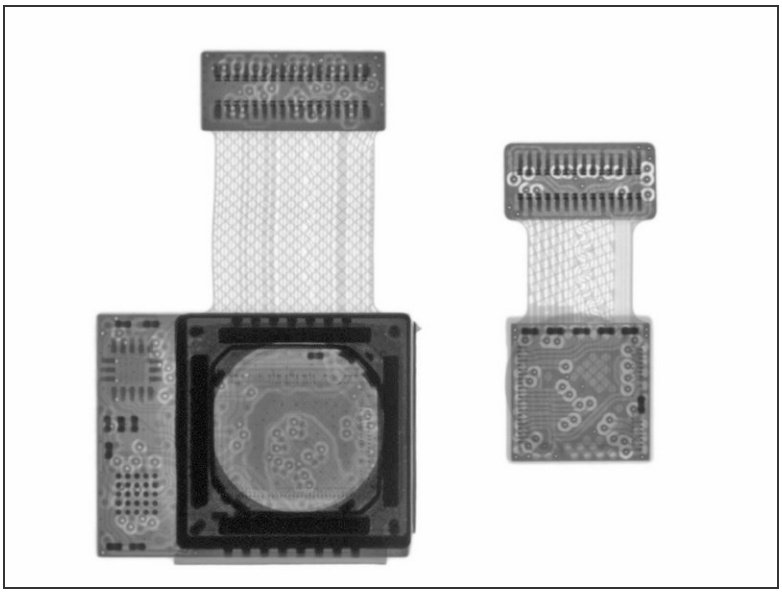
Step 7



- Smartphones today are without a doubt the go-to photography tool (camera!) of choice. That makes the shooters in these smart devices a cardinal comparator. Here's what OnePlus brings against the competition:
  - 13 MP, *f*/2.0 rear-facing camera with Optical Image Stabilization and Dual-LED flash.
  - 5 MP front-facing selfie camera.

To make the most of this killer hardware, OnePlus is rolling out a software update to offer 4K video and 10-bit RAW image recording.

Step 8

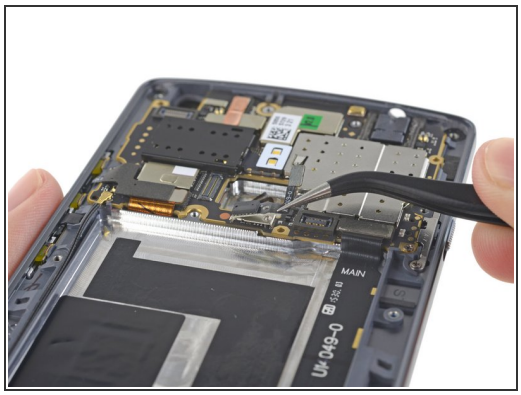


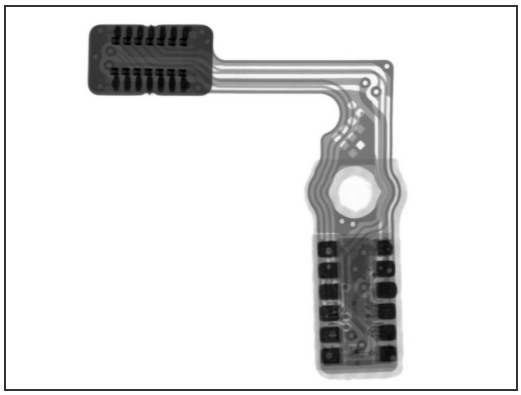
- According to our research, the main camera sports an Omnivision OV13860 PureCel-S image sensor while the selfie camera uses a 5 MP OmniVision OV5648.
- That rear-facing camera features 1.3 µm light-collecting pixels—the biggest ever in a 13 MP smartphone camera.

  But not bigger than the iPhone 6's 1.5 µm pixels in its 8 MP camera. Make of that what you will.
- Taking a closer look with our X-ray vision, we can clearly make out the electromechanical actuators that move the lens, providing that optical image stabilization.

  They're the horizontal and vertical bars surrounding the lens.

Step 9





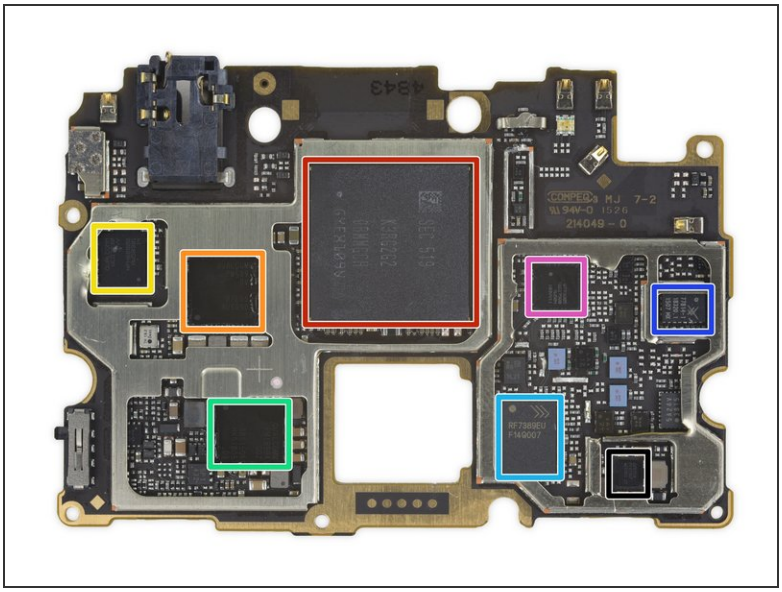
- One last component makes up the OnePlus 2's fancy photographer: The infrared laser rangefinder.
- This component is made up of two parts: an IR LED and matched receiver.
  - The IR LED probably projects a cone of IR light on the subject, which bounces to the receiver. This lets the camera estimate the distance to the subject, and snap the focus to match.

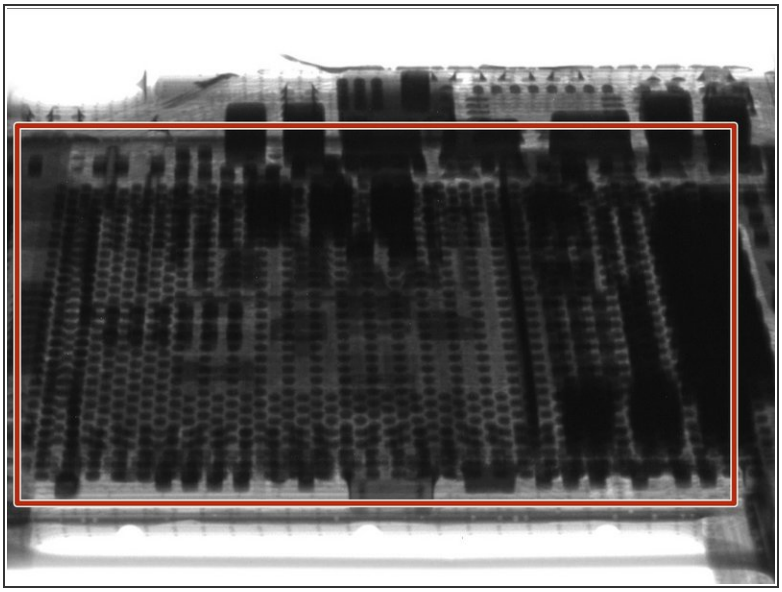
ⓘ We also shot it full of X-rays, because we can.

Step 10

- Our always-trusty spudger shows up to detach the handful of cables still keeping the motherboard in place.
- A few of the many midframe screws served to secure the motherboard—but having dispatched those previously, we're faced with just one more.
  - Screw removed, alert slider *up*, and—with a bit of prying—the motherboard is out.

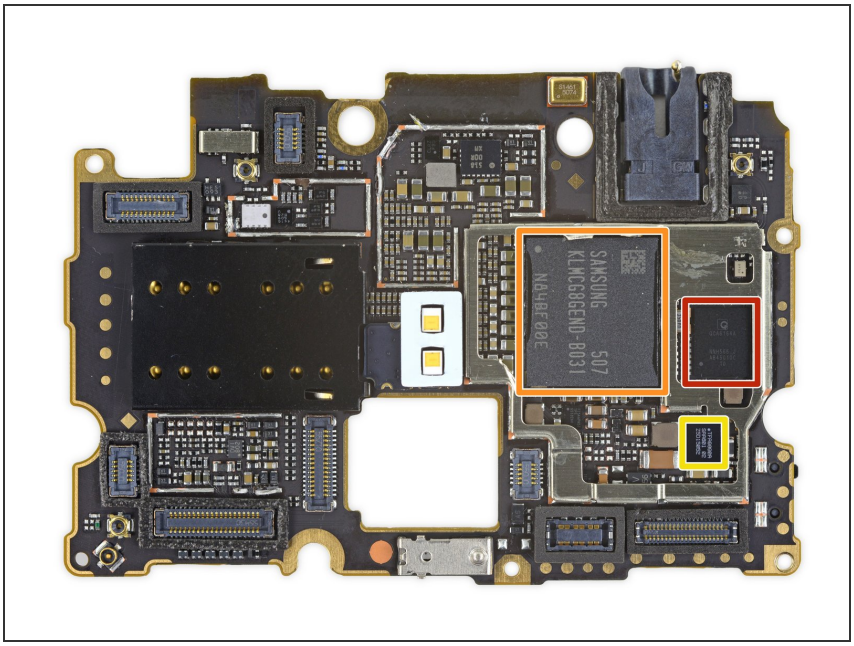
Step 11





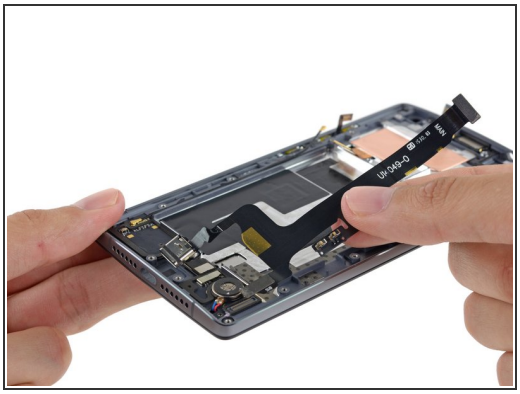
- Samsung K3RG2G2 LPDDR4 dual-channel RAM, with the Qualcomm Snapdragon 810 layered beneath
- Qualcomm PM899
- Qualcomm WCD9330 audio codec
- Qualcomm PMI8994 Power Management IC
- RF Micro Devices RF7389EU multi-band power amplifier
- Skyworks 77814-11 power amplifier module for LTE
- Qualcomm WTR3905 RF transceiver for dual SIM support
- Qualcomm QFE1100 envelope tracking IC

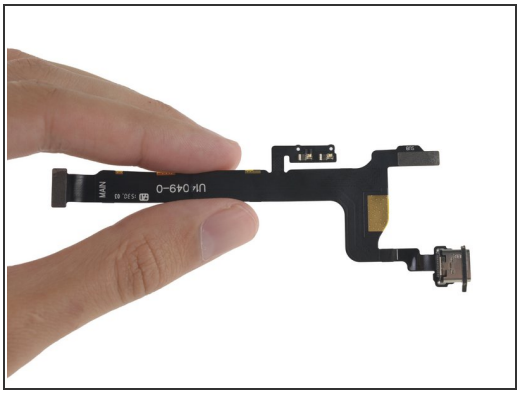
Step 12

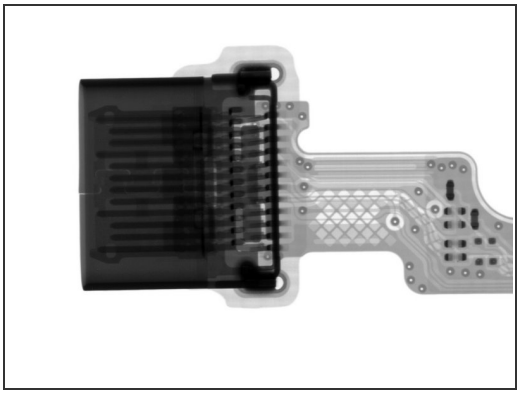


- And on the reverse...
  - Qualcomm QCA6174 802.11ac Wi-Fi 2x2 MIMO combo SoC
  - Samsung KLMCG8GEND-B031 eMMC 64 GB NAND flash memory
  - NXP TFA9890 audio amplifier

Step 13



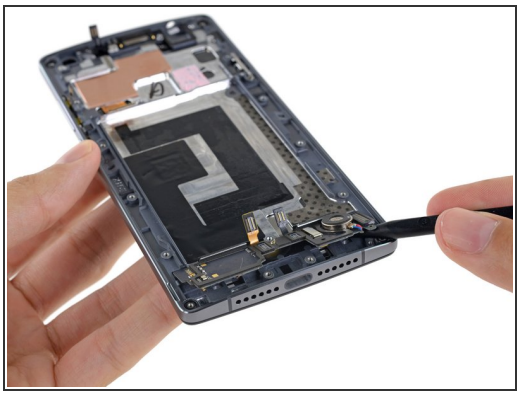


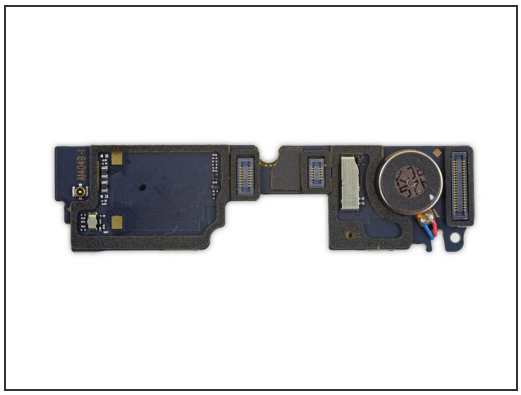


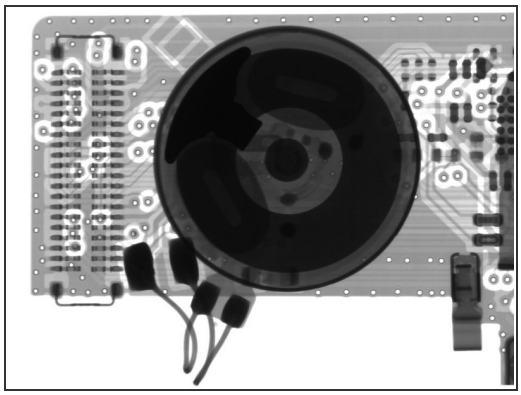
- The USB-C port cable is pretty barebones—just a couple of (mysterious) spring contacts, which is good news for repair.
  - It's a little more fiddly than last year's One, but certainly not the Apple standard charging port mess.
- USB-C is a pretty new addition to the smartphone world, so naturally we took a peek inside.

USB-C's design is compact and reversible, much like Apple's Lightning connector—but cooler. It's a more open standard, and has more features. Let's hope these ports stick around, and can put up with charging cable abuse.

Step 14







- Under the charging port cable, we strike daughterboard. Eureka!
- The little foam foundation is the speaker box for that loudspeaker we spied in the midframe.
- The daughterboard also houses a familiar classic: a coin-style vibration motor. Unfortunately, you'll need a soldering iron to replace it.
- On the backside we find yet more spring contacts, a microphone, and the soft button LEDs. Like the motherboard, this daughter is a busy board.

Step 15


- It was bound to happen sooner or later—out comes the iOpener to beat down the adhesive that secures the display to the midframe of the device.
- After a quick spot of heat under the iOpener, the display of the OnePlus 2 is easily freed using a couple opening picks.
- We finally get a good look at the backside of the 5.5-inch display assembly next to the now-empty shell of the midframe.

Step 16

- On the rear of the display we find the Synaptics S3320A touch controller that governs the touchscreen.
- We also get a look at what turns out to be a soft home button which sits awkwardly below the very delicate side button cables. This is sure to make replacing the home button more of a hassle than it should be.
- Keeping pace with Apple and Samsung, the OnePlus 2 features a fingerprint sensor. The FPC1150 touch fingerprint sensor by Fingerprint Cards AB can recognize up to five fingerprints and will read them in any orientation.

Step 17

- OnePlus 2 Repairability Score: **7 out of 10** (10 is easiest to repair).
  - A single (non-proprietary) screw head decreases cost of tools for repairs.
  - Many components are modular and can be replaced independently.
  - USB-C port is on a relatively simple flex cable, not an assembly—it should be an inexpensive replacement.
  - Despite the warning, the battery is fairly easily removed—but still requires disassembly.
  - The LCD and digitizer glass are fused together and must be replaced as a single part; heat is required to remove it from the midframe.

Today's eye-watering X-ray images brought to you courtesy of our great friends at Creative Electron—thanks guys!

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