



Google Pixel 3a Teardown

Teardown of the Google Pixel 3a, performed May 2019.

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INTRODUCTION

The Pixel 3a breaks all the rules—a polycarbonate back panel, no wireless charging, visible bezels, a headphone jack, and a top-notch camera in a budget phone. Is there a method to Google's madness? A teardown might be the only way to find out!

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TOOLS:

- [iSclack](#) (1)
 - [iFixit Opening Picks set of 6](#) (1)
 - [Pro Tech Toolkit](#) (1)
 - [Spudger](#) (1)
 - [T3 Torx Screwdriver](#) (1)
 - [Tweezers](#) (1)
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Step 1 — Google Pixel 3a Teardown



- This phone's raw specs aren't meant to impress, but there's quite a lot here for the price:
 - 5.6" OLED display with FHD+ 2220 × 1080 resolution (441 ppi) and Dragontrail Glass
 - Octa-core, 64-bit Qualcomm Snapdragon 670 processor (2.0 GHz + 1.7 GHz) with 4 GB LPDDR4x RAM
 - 12.2 MP, $f/1.8$, OIS main camera with dual-pixel phase detection autofocus; 8 MP selfie camera
 - 64 GB built-in storage
 - USB-C and a mysterious 3.5 mm "headphone jack"
 - Android 9.0 Pie
- ⓘ This budget-oriented Pixel is also defined by the specs it *lacks*: no wireless charging, and no ingress protection rating. It's [2016](#) all over again!

Step 2



- If you're in a hurry, here's a teardown TL;DR in X-ray form—courtesy of [Creative Electron](#).
- Those of us without X-ray powers can only see this pristine, polycarbonate exterior.
 - ⓘ The polycarbonate build should be more durable than a [glass back](#), although it's likely no match for the rigidity of the [metal construction](#) of yore.
- One thing has persevered through the Pixel's changing materials—the [partial matte finish](#) on the back.
- Meanwhile, this Pixel's party piece—a rear camera like the one in the rest of the Pixel 3 line—promises some serious firepower for a budget phone.
- Turning to the front of the phone, we note how this notch-less 3a has bezels similar to the standard Pixel 3, but has just one front-facing camera.

Step 3



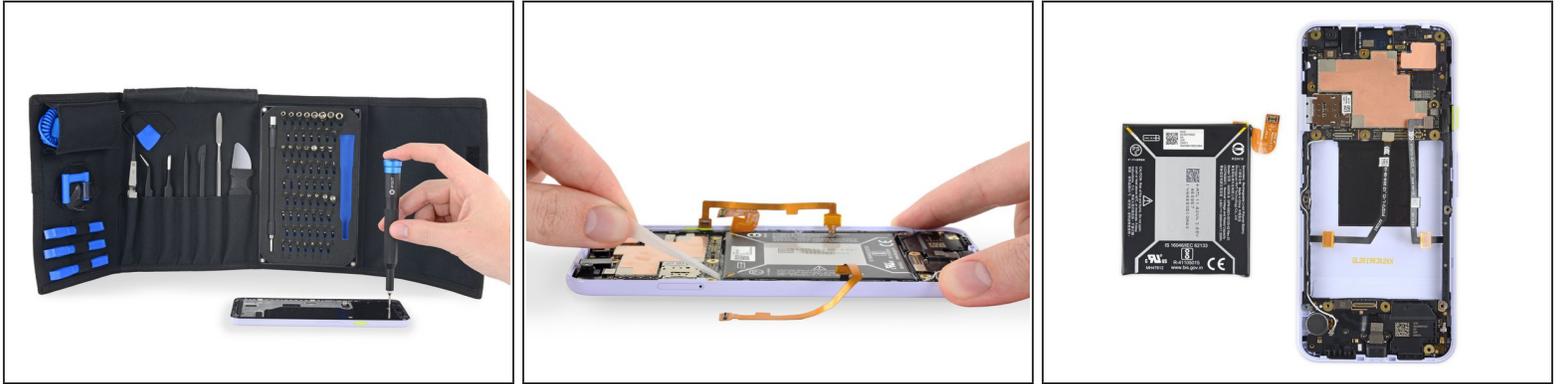
- The 3a looks very much like its older brother, the Pixel 3, but with fewer seams. Ours also came in a rather distinctive color, which Google dubs "Purple-ish," but which we dub "[Thanos Edition](#)."
 - That seamless enclosure points to a screen-first entry on this phone—we're hoping this will mean easier screen replacements than what we saw on the [Pixel 3](#).
-  Dread it, run from it, but screen repairs arrive all the same.
- Google also managed to fit a headphone jack in here—which weirdly feels like a luxury feature on this budget phone.
 - From the back, it's hard to tell the 3 and 3a apart. Supposedly that brittle glass cover makes for a more premium handset, but we can't see the difference from here.
 - The [iPhone XR](#) and [Galaxy S10e](#) would also like to take your budget smartphone dollars—but at \$700+, they're not trying *that* hard. The Pixel 3a packs a slower processor and plastic construction, among other changes, to bring the price down a ton.

Step 4



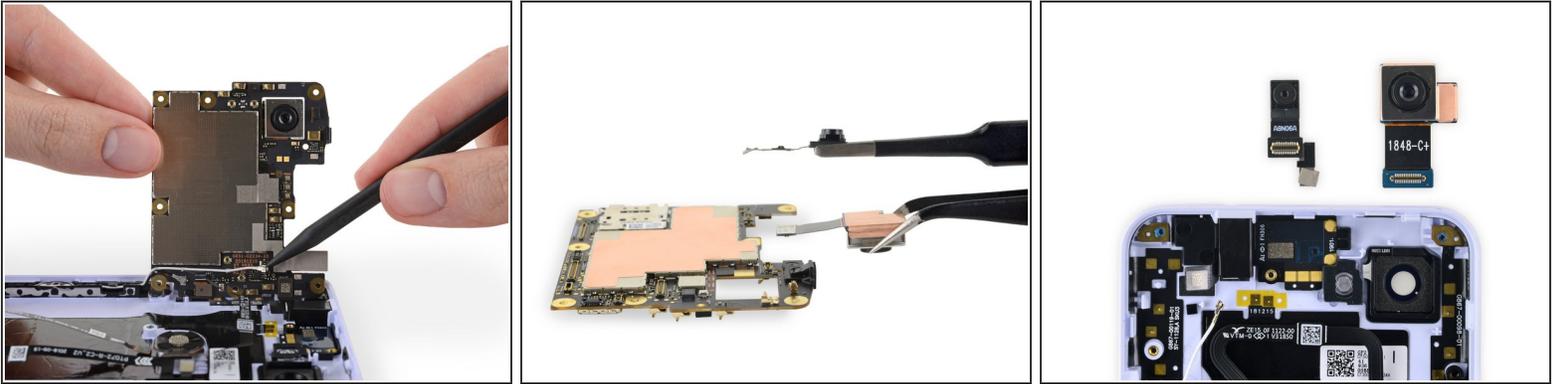
- *What, no iOpener?* Although it would help, this phone was easy enough to open without heat—a rarity these days.
 - A spongy, easily-separated adhesive secures the display—which is good for repairs. But it's probably a trade-off that also leaves this phone less than waterproof, so beware.
- The usual tiny side bezels leave this expensive OLED panel vulnerable to our opening pick. Expecting this, we safely slice alongside the display and free it from the phone.
- Just like [old times](#), the display is connected to the motherboard by a single ribbon cable.
- Rumors pointed to a "gOLED" display made by LG, but this is unmistakably a Samsung panel.
- ⓘ **Spoiler alert:** we're also tearing down a 3a XL, and [that's got a Samsung panel, too](#).
 - Also along for the ride is a Synaptics [S3706](#) touchscreen controller.
 - GigaDevice GD25LH40C 4 Mb Serial Flash Memory

Step 5



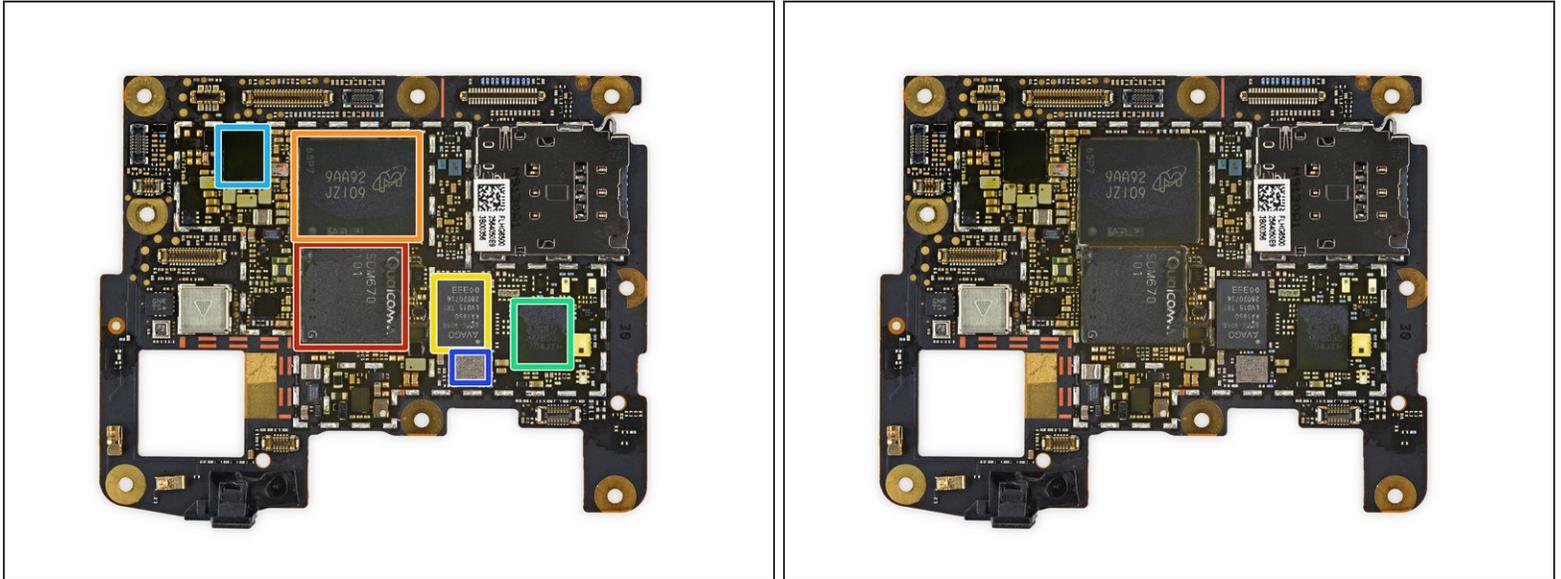
- We came overprepared with our [Pro Tech Toolkit](#) and its 64 driver bits—we only need one to twirl away these Torx screws and remove the midframe, along with its embedded earpiece speaker.
- On our way to the battery, we fold aside a couple of golden flex cables for the Active Edge sensors. In Pixels past, these cables were routed *under* the battery, out of sight and easy to destroy with wayward prying. It's nice to see them out of harm's way here.
- Onward to battery extraction, where two adhesive strips stand in the way. We locate the pull tabs and they cooperate without much fuss. Success! The battery is out.
- This battery beats out the [Pixel 3's 11.2 Wh battery](#) with its own 11.55 Wh (3.85 V, 3000 mAh) powerhouse. That falls neatly between the [iPhone XR](#) and Samsung [Galaxy S10e](#), at 11.16 Wh and 11.94 Wh, respectively.

Step 6



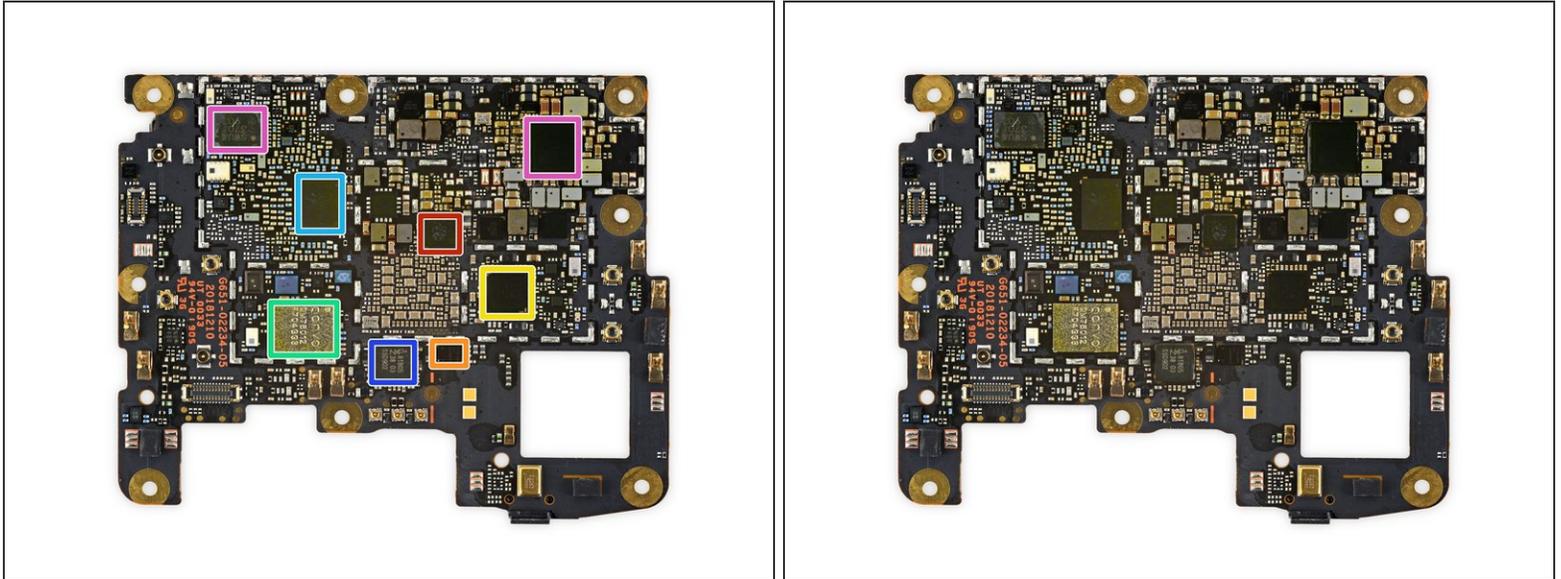
- Next to come out is the motherboard, with some wiry antenna barnacles attached to its underside.
- ⓘ Our teardown engineers often develop tweezerhands as a result of their work environment.
 - Some find it alarming, but what better type of hands to pull out a couple tiny cameras?
 - The 3a inherits the well-reviewed 12.2 MP rear camera from the Pixel 3. Instead of having two 8 MP selfie cameras, the 3a only has one, averaging the $f/1.8$ and $f/2.2$ apertures to a middling $f/2.0$.

Step 7



- Let's peep at these pixels to figure out what the chips are.
 - Qualcomm [SDM670](#) Snapdragon 670 octa-core processor + Adreno 615 GPU
 - Micron [MT29VZZZAD8DQKSL-046](#) W.9K8 64 GB flash storage + 4 GB LPDDR4X DRAM
 - Avago [AFEM-9046](#), probably a front-end module
 - Qorvo [QM78035](#), probably a voltage controlled oscillator
 - Qualcomm [PM670A](#) PMIC
 - Skyworks [SKY77365-11](#) Quad-Band GSM / GPRS / EDGE Power Amplifier Module
- ① And this time around we *don't* get a peep at Google's [Pixel Visual Core](#), which we saw in our [last couple Pixel teardowns](#).

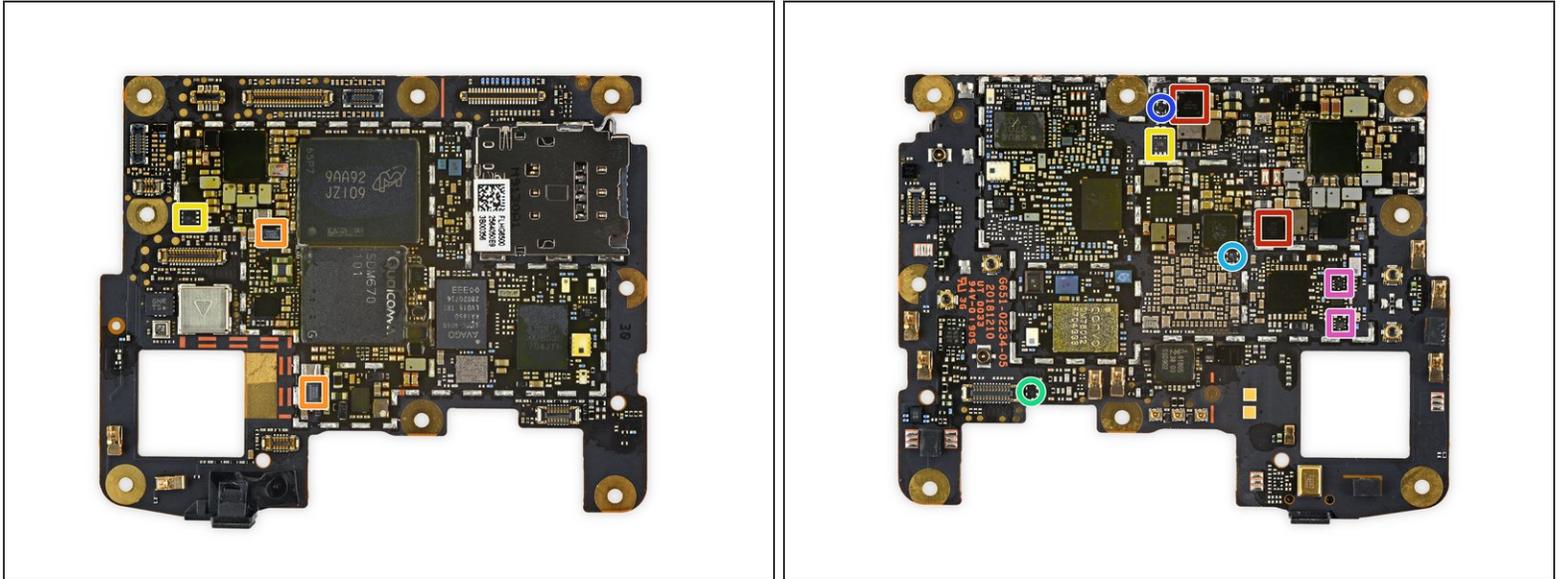
Step 8



- Back side:

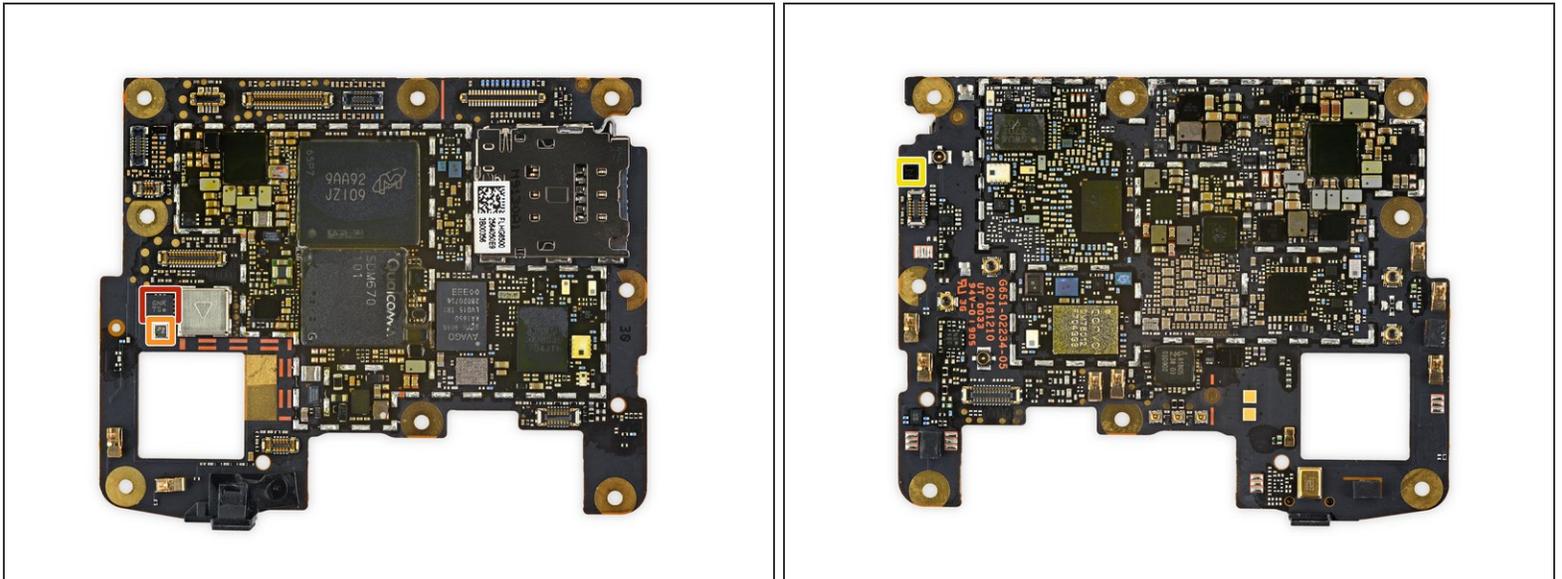
- Google [H1C2M](#) Titan M [security chip](#)
- STMicroelectronics [ST33J2M0](#) ARM SecureCore microcontroller
- Qualcomm WCN3990 wireless combo SoC
- Qorvo [QM78012](#) RF fusion module
- Qualcomm SDR660 RF transceiver
- NXP PN81B, probably an NFC controller w/ Secure Element
- Murata SWUA 370 90 and Qualcomm PM670 PMIC

Step 9



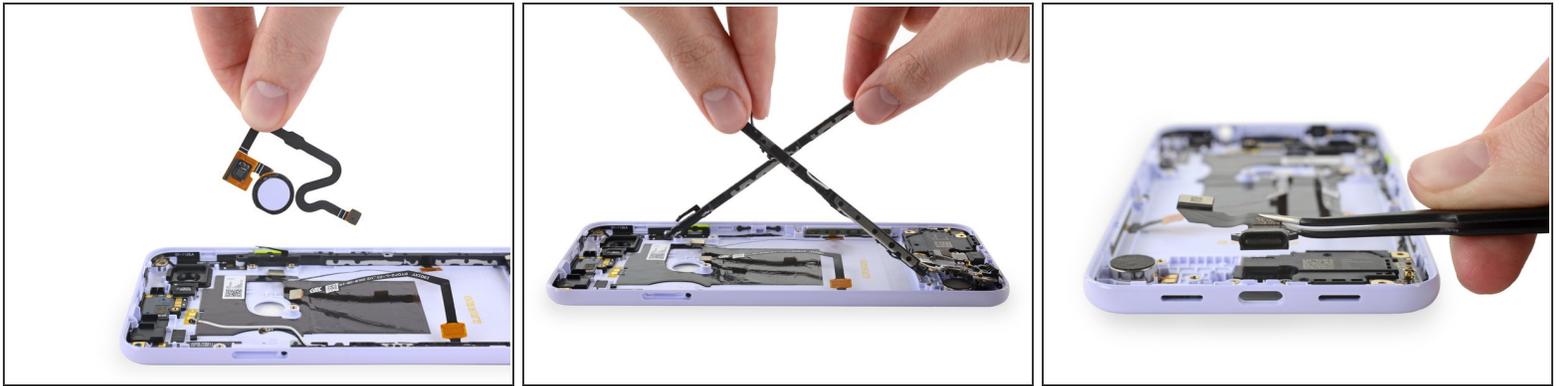
- Bonus chips!
 - Cirrus Logic CS35L36-CWZR audio amplifier
 - Qualcomm PM3003A power management
 - Texas Instruments [TLV7113318DDSE](#) 200 mA LDO regulator
 - Texas Instruments [TLV70728PDQN](#) 200 mA LDO regulator
 - Texas Instruments [TLV70718PDQN](#) 200 mA LDO regulator
 - Texas Instruments [TLV73318PDQN](#) 300 mA LDO regulator
 - Skyworks [SKY13351-378LF](#) GaAs SPDT switch

Step 10



- And the sensors:
 - Bosch Sensortec [BMI160](#) 3-axis accelerometer/gyroscope
 - Bosch Sensortec [BMP388](#) pressure sensor
 - AKM Semiconductor [AK09915C](#) 3-axis electronic compass

Step 11



- After the motherboard, there isn't much left in the barrel. That's not a bad thing, especially when each part comes out easily and in one piece.
- First we fish out the fingerprint sensor, complete with its wavy tail flex cable.
- Next, these plastic rails—serving dual purposes as both cabling routers and brackets which press the [squeeze sensors](#) in place.
- Down at the bottom edge, we find a *modular* USB-C port! This is a welcome design for this high-wear component, especially since the 3a does not offer wireless charging.
 - The headphone jack also makes a [cool modular comeback](#).
- Down south we also spot the vibration motor—a small, round LRA (*Linear Resonant Actuator*) as found in just about every smartphone not made by Apple or Google. No fancy [precision haptic motor](#) for this Pixel.

Step 12



- After running the gauntlet of this teardown, we lay out our seemingly infinite number of ~~stones~~ parts.
 - While taking this phone apart was far from a "snap," we did enjoy some of the throwbacks to a prior, more-repairable era.
 - How does this phone fare in the repair endgame? Check the score below to find out!
- ⓘ If you're looking for a more *cinematic* offering in this series, check out our [Pixel 3a XL video teardown](#).
- ⓘ If you'd like to marvel at the innards, [we've made some wallpapers](#) for you!

Step 13 — Final Thoughts

REPAIRABILITY SCORE:



- The Pixel 3a earns a **6 out of 10** on our repairability scale (10 is the easiest to repair):
 - Most components are modular and can be easily replaced once the display assembly is removed.
 - Repair-friendly stretch-release adhesive secures the battery.
 - The only screws are standard T3 Torx fasteners.
 - The display comes off first, but is thin and poorly supported. Foam adhesive makes the opening process relatively easy.
 - The myriad long, thin ribbon cables connecting the internal componentry can be obnoxious to work around, and are easy to accidentally tear.