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)
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!
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.
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 $f/2.2$ aperatures to a middling $f/2.0$. 
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 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

💡 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 81B05 38 03 SSD902, probably an NFC controller
  - Murata SWUA 370 90 and Qualcomm PM670 PMIC
Step 9

- 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 10

- 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 11 — Final Thoughts

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.