Samsung Galaxy Note8 Teardown

Teardown of the Samsung Galaxy Note8 performed on September 7, 2017.

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INTRODUCTION

The Note7 came in hot but went out in a show of flames and combustion. Rising out of its ashes is ~~Fawkes~~ the Note8! Samsung has pulled out all the stops on the specs of this phone, and added a few stops where the battery's concerned. Join us—and hopefully not the local fire department—as we open up the Samsung Galaxy Note8!

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TOOLS:

- iOpener (1)
- iFixit Opening Picks (Set of 6) (1)
- Spudger (1)
- Phillips #00 Screwdriver (1)
- Tweezers (1)
- Halberd Spudger (1)

Step 1 — Samsung Galaxy Note8 Teardown

- The Note8 is a *tall* phone. Let's see what occupies all that space:
  - Edge-to-edge, 6.3" Super AMOLED display, 18.5:9 aspect ratio with 2960 × 1440 resolution (521 ppi) and Gorilla Glass 5
  - Qualcomm Snapdragon 835 processor with 6 GB RAM
  - 3300 mAh battery
  - Dual-lens, dual OIS main camera system with one 12 MP wide-angle lens with ƒ/1.7 aperture and one 12 MP telephoto lens with ƒ/2.4 aperture
  - 64/128/256 GB of internal storage with 256 GB available via microSD expansion
  - S Pen slot, USB-C port, and headphone jack
  - IP68 dust and water resistance rating

Step 2

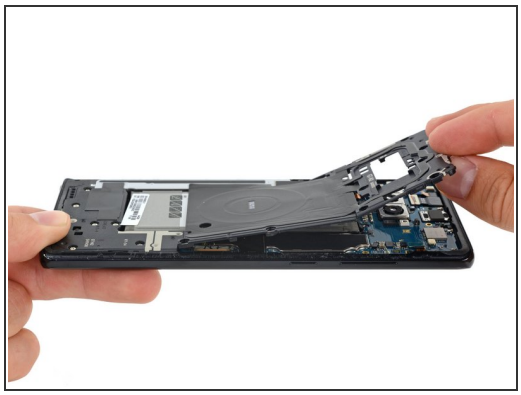
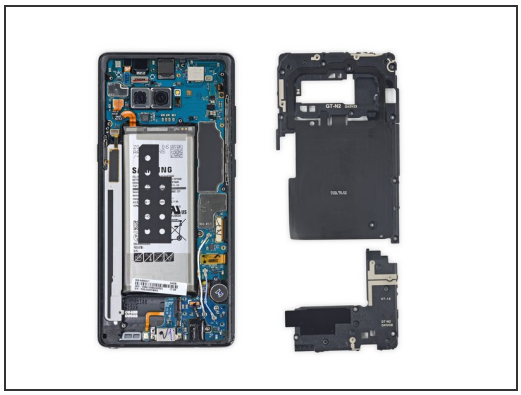


- You can see right through this phone if you squint hard and have the ability to fire high-energy photons.
- The X-ray intel suggests a somewhat familiar layout, but a little physical poking and prodding is definitely in order. Ready the tools!
- But first, a quick exterior comparison of the Note8 and Note7 Fan Edition reveals a bigger display, slimmer bezels, and a fingerprint sensor that has migrated to the back of the phone—where it's now joined by not one, but *two* cameras.

Step 3


- This glue-ridden heat-pry-and-slice opening procedure is certainly not our favorite, but at least by now it's getting familiar. As usual, it all starts with our trusty iOpener.
- Cracking open the phone, we spy a delicate fingerprint sensor cable. This makes carving through all that glue a bit treacherous as the cable might be easy to slice right through if you aren't expecting it.

Step 4

- We are pleased that we get to use a Phillips driver to remove the midframe/NFC antenna/PMA and Qi wireless charging coil combo.
- After removing that maxed-out midframe, we remove the bottom speaker assembly to get our first peek at the internals.

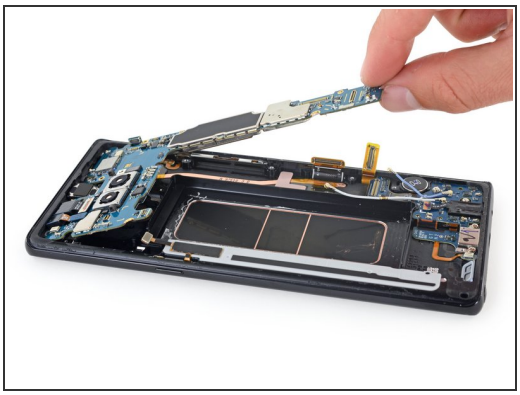
Familiar components, unfamiliar places— the battery is placed nearly dead-center, and the vibrator migrated to the bottom right. Goodbye standard Note/Galaxy S layout.

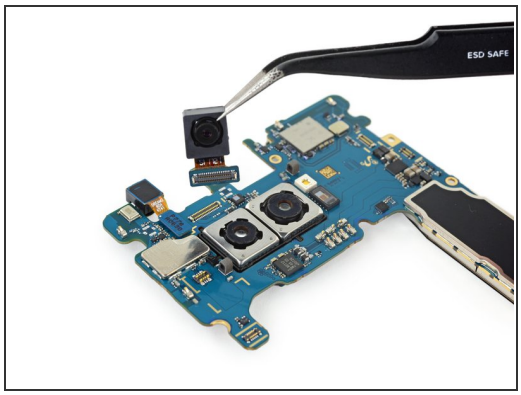
- Is this a subtle response to past battery woes, or just Samsung working to tidy up? Time to take a look at that power plant.

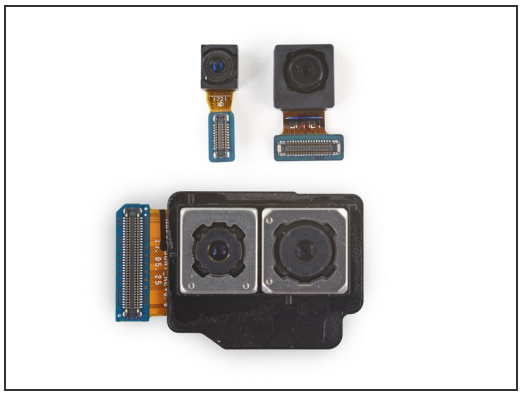
Step 5

- In line with other recent Samsung phones, the battery squats in a little pit of glue-lined sadness, but we quickly set to work digging it free.
  - A little heat can help soften the glue here, but heat and lithium-ion batteries form a combustible mix—so we opt for a different solution.
- This Samsung SDI-made battery plonks down **12.71 Wh** (3300 mAh at 3.85 V) of capacity.
  - That's 6% less than the Note7's 13.48 Wh—but keep in mind that battery burned in more ways than one. The safely revamped battery in the Fan Edition clocked in at only *12.32* Wh, so this actually represents an improvement (assuming of course no fire).

Step 6

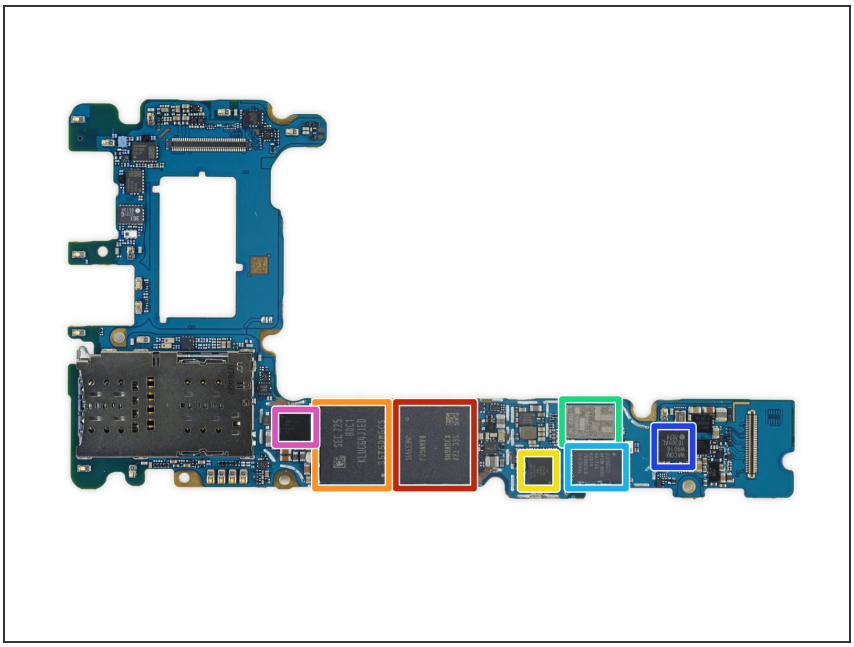






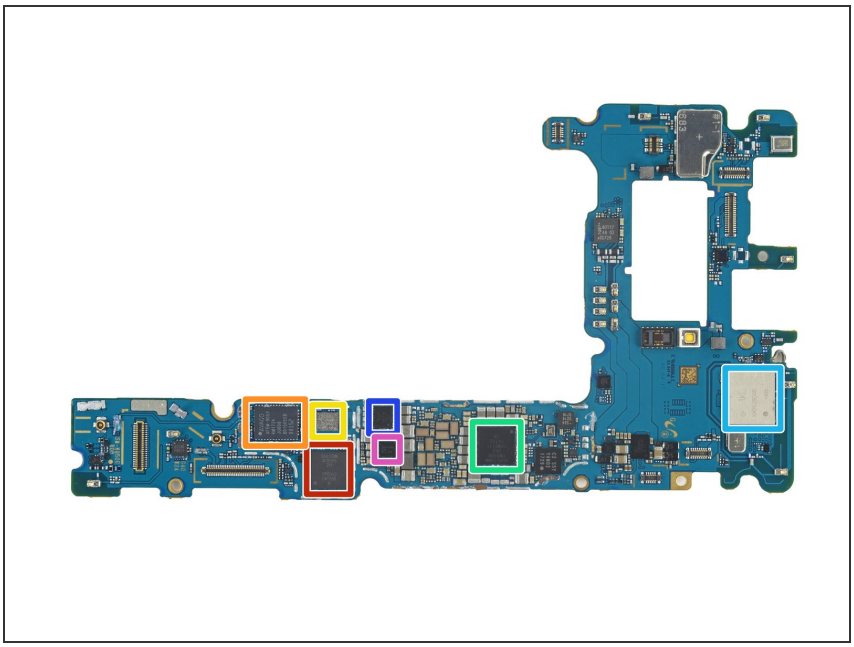
- Next we get our hands on the motherboard, along with the Note8's many cameras.
- If we were impressed with the number of cameras last time, the new Note ups the ante with *four* cameras:
  - Facing the front of the phone we have an iris scanner and an 8 MP, ƒ/1.7 camera.
  - Facing the rear we have Samsung's new dual camera module: one wide-angle and one telephoto camera, both with OIS. This system allows for some pretty cool new features.
  - OIS confirmed. This magic bonus image reveals a squad of dense, dark shapes—those'd be the magnets—surrounding both camera lenses. Neat!

Step 7



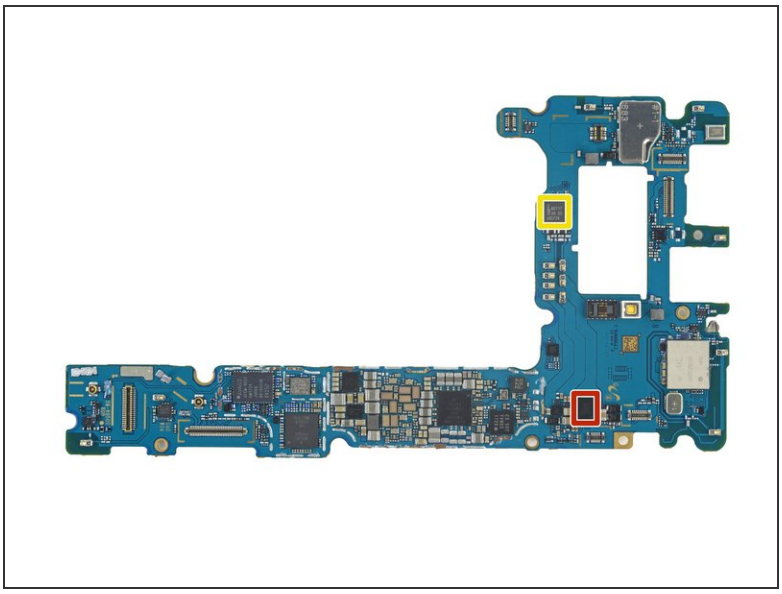
- Let's notate what powers all of this screen:
  - Samsung K3UH6H60AM-NGCJ 6 GB LPDDR4X SDRAM layered over a Qualcomm Snapdragon 835
  - Samsung KLUCG4J1ED-B0C1 64 GB UFS flash storage
  - Qualcomm WCD9341 Aqstic audio codec
  - Skyworks SKY78160-11 power amplifier
  - Avago AFEM-9066 power amplifier
  - Wacom W9018 touch control IC
  - Silicon Mitus SM5720 power management IC

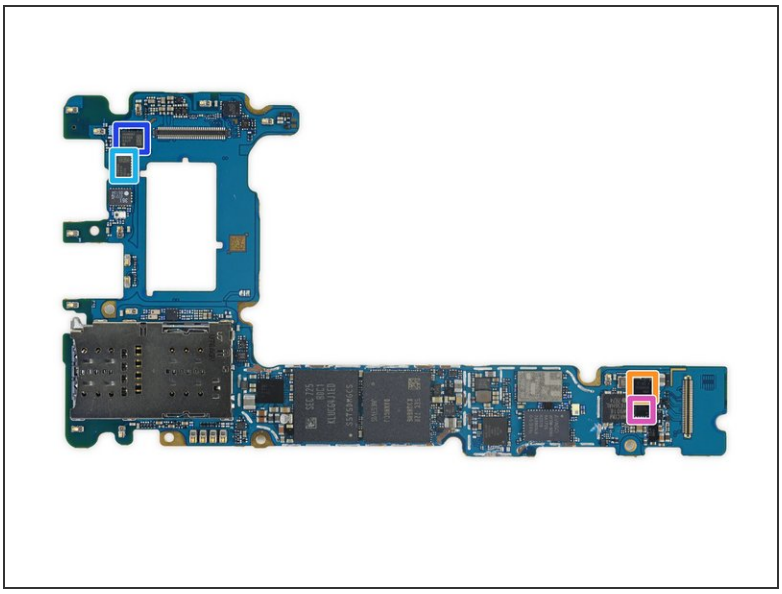
Step 8



- Flipping the board over we find:
  - Qualcomm WTR5975 RF transceiver
  - Avago AFEM-9053 power amplifier
  - Skyworks SKY77365-11 quad-band GSM/GPRS/EDGE power amplification module
  - Qualcomm PM8998 PMIC
  - Murata KM7628048 Wi-Fi module
  - Qualcomm PM8005 power management IC
  - Maxim Integrated MAX77838EWO AMOLED power management IC

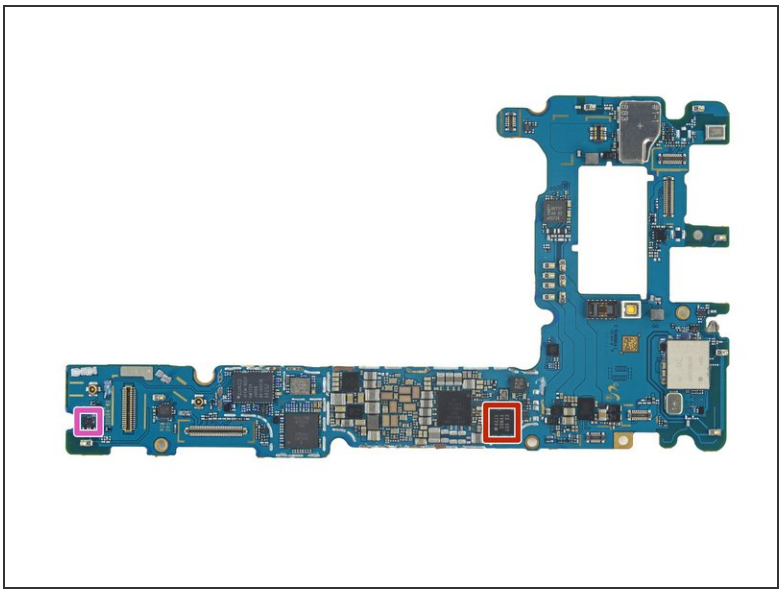
Step 9

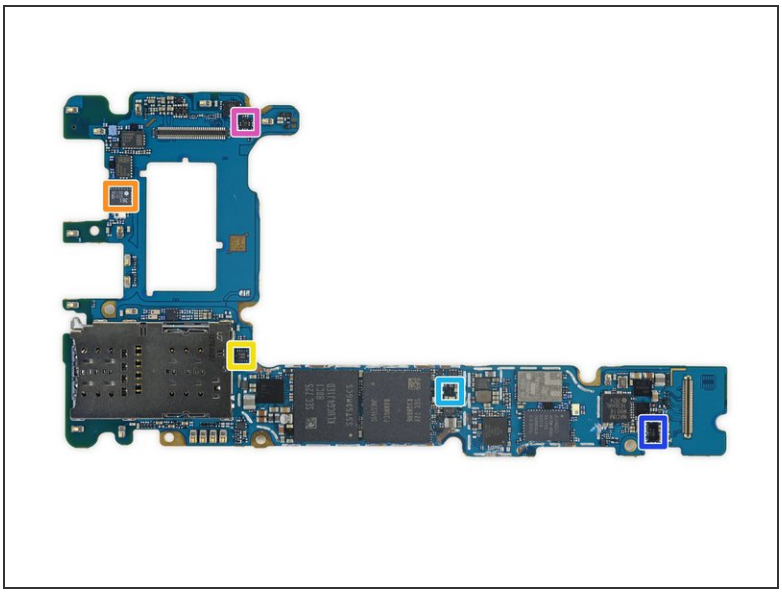




- IC identification, part 2:
  - IDT P9320S wireless charger IC
  - Maxim MAX98506 audio amplifier
  - NXP Semiconductor PN80T NFC controller w/ secure element
  - Qualcomm QET4100 40 MHz envelope tracker
  - Qualcomm ? D5319 mid-band diversity IC
  - Qualcomm ? D5320 high-band diversity IC (likely)
  - Samsung S2M005X02 power management IC (likely)

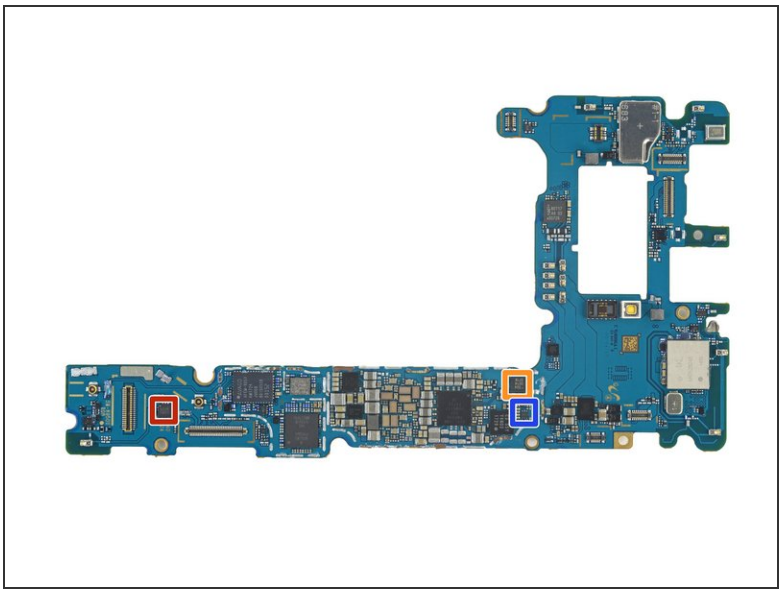
Step 10

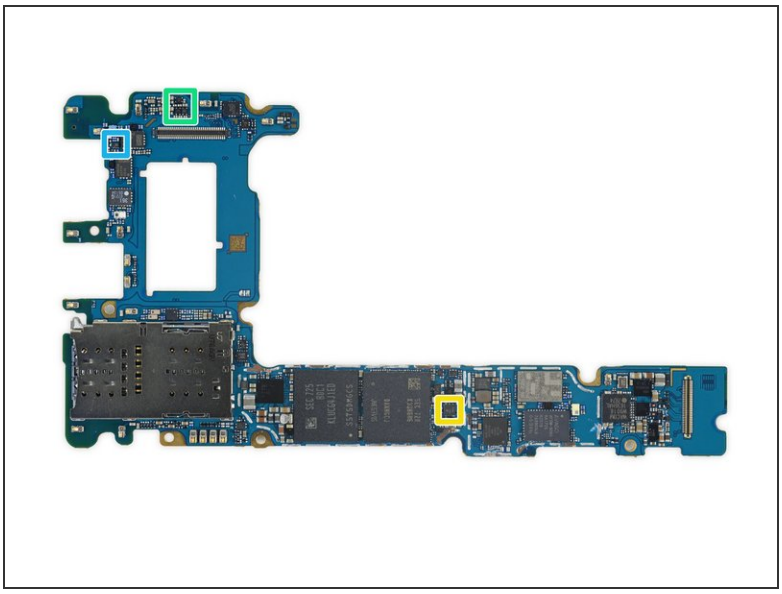




- IC identification, part 3:
  - Samsung S5YY4N02 image processor (likely)
  - Murata 361 low-band diversity
  - ON Semiconductor FXLA0104QFX 4-bit voltage translator
  - NXP Semiconductor NCX2200 comparator
  - ON Semiconductor FAN48618 1 A voltage regulator
  - ON Semiconductor FPF3688UCX load switch
  - Vishay DG2730 2-port, 480 Mbps USB 2.0 DPDT analog switch

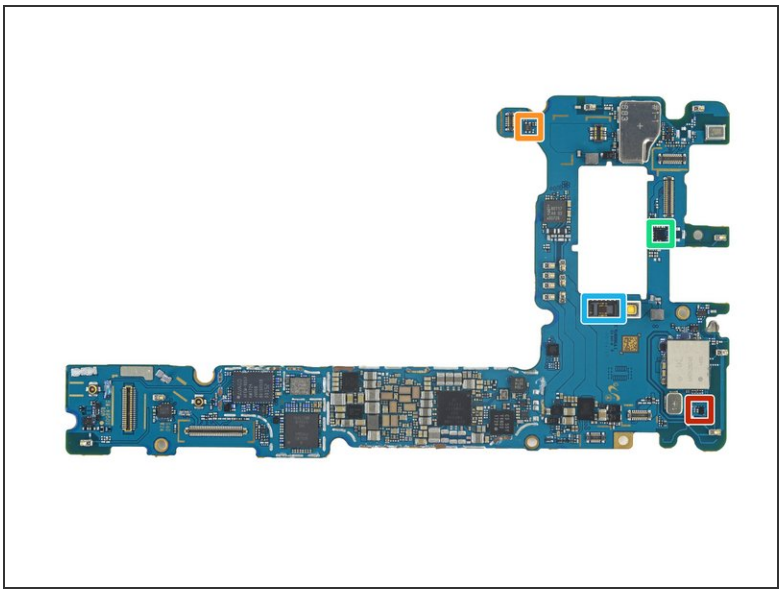
Step 11

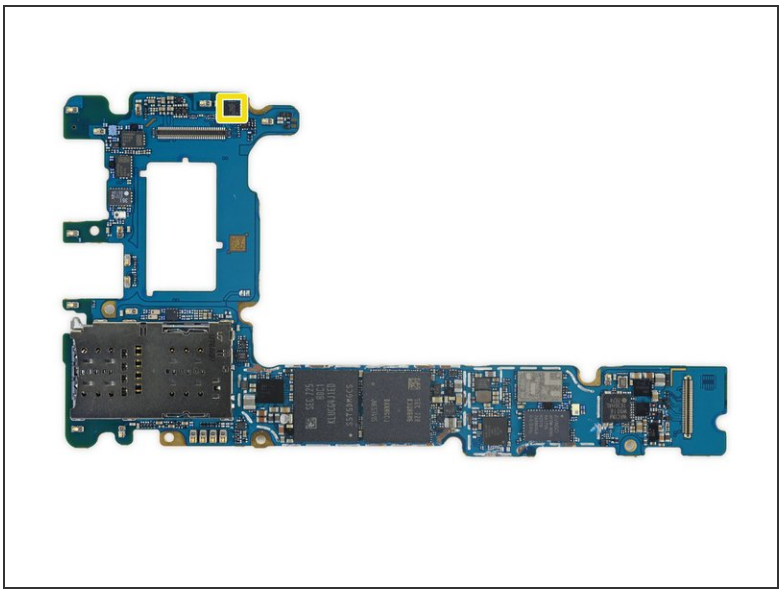




- IC Identification, part 4:
  - RDA Microelectronics RDA6213N FM transceiver (likely)
  - NXP Semiconductor PCAL6524 24-bit I/O expander
  - Richtek RT8010GQW 1 A DC/DC converter
  - Texas Instruments LP5907-Q1, LP5907, and TLV74315P LDO regulators
  - Skyworks SKY65611-11 GPS/GLONASS/Galileo/BeiDou LNA

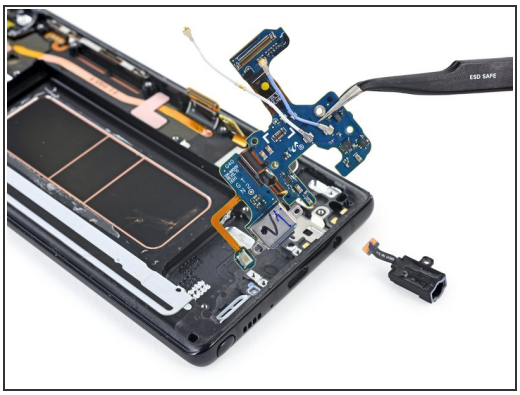
Step 12

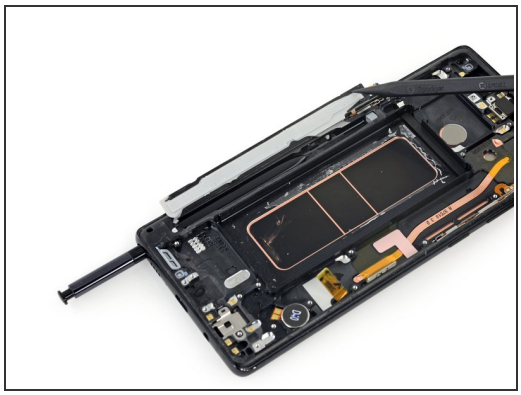




- IC Identification, part 5 (sensors):
  - AKM Semiconductor AK09916C 3-axis electronic compass
  - Ablic (Formerly Seiko Instruments) S-5712CCDL1-I4T1U hall effect sensor
  - STMicroelectronics LSM6DSL 3-Axis accelerometer/gyroscope
  - STMicroelectronics LPS22HB pressure sensor
  - Maxim Integrated MAX86902 heart rate sensor (likely)

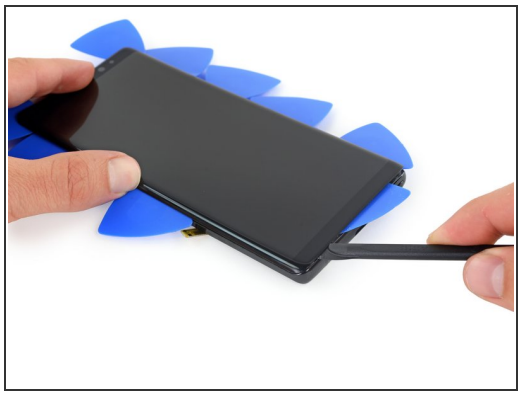
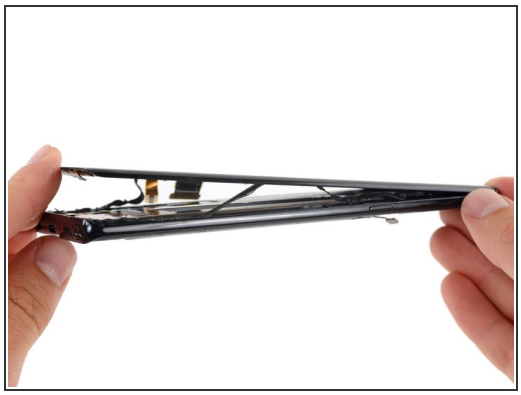
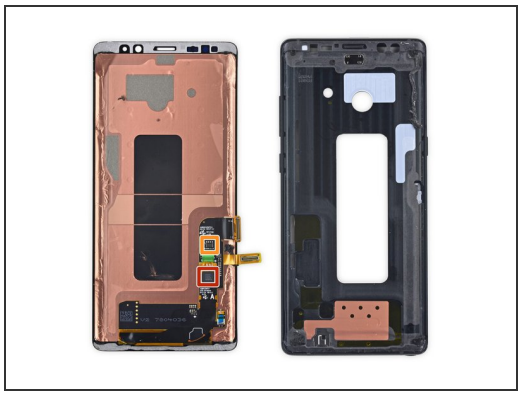
Step 13





- We reserve the right to continue bellyaching about the opening procedure on these phones, but once inside it's not all bad news.
  - The USB-C port, a component that will experience wear, can be removed with the daughterboard.
  - Meanwhile, the 3.5 mm headphone jack is present (huzzah!) and completely modular. We find this *essential* on premium handsets.
  - All that, plus an IP68 water/dust ingress protection rating that bests Apple's efforts. Not too shabby.
- The front-facing sensor (likely AMS TMD4906) assembly is also present on its own little board—another easily replaceable module!
- Next we open up the S Pen compartment … to find the S Pen. Kind of obvious I guess, but we couldn't help ourselves.

Step 14

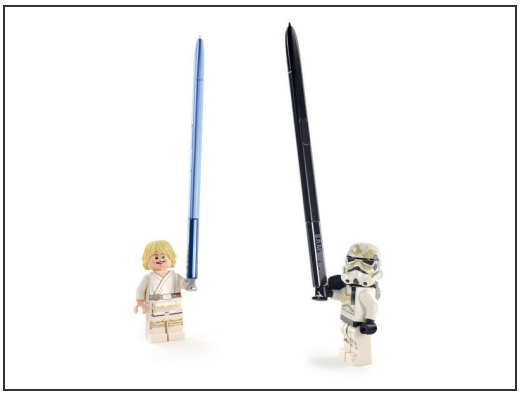




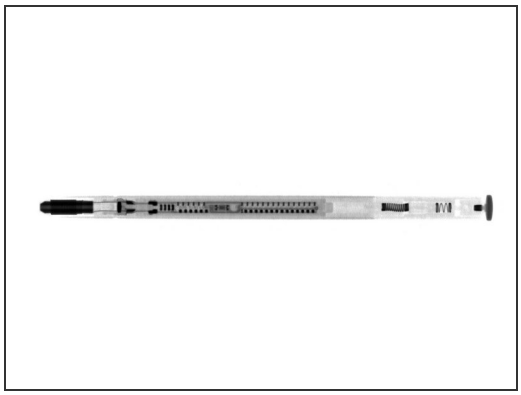
- The Note8's OLED panel has been much ballyhooed, with many superlatives, but we're mostly just interested in how it comes off.
- Answer: bring heat and allllllll your opening picks.

This Samsung-manufactured display bests all previous smartphone displays and represents a significant step forward from what we saw in the S8 series just a few months ago. Small wonder that a certain fruit company wants in on the action.

- Along for the ride: Samsung S6SY661X (likely touch controller)
  - And a Winbond W25Q80EW 8 Mb serial flash memory

Step 15





- With both the Note7 and Note8 styluses on hand, we couldn't help but do our own comparison—Star Wars style.
- After glorious combat we asked our friends at Creative Electron to show us the inner-workings of the S Pen.

Unfortunately, they found no kyber crystals.

Step 16

- We hope you took notes along the way, because this Note is kaput!
- Big thanks to Creative Electron for once again bringing our teardown into a new dimension!
- Feast your eyes on all the bits and stay tuned for a score.

This document was generated on 2022-02-08 04:33:29 AM (MST).

Step 17 — Final Thoughts

- The Samsung Galaxy Note8 earns a **4 out of 10** on our repairability scale (10 is the easiest to repair):
  - Many components, including all of those that experience wear, are modular and can be replaced independently.
  - The only screws in this phone are standard Phillips screws.
  - The battery *can* be replaced, but tough adhesive and a glued-on rear panel make it unnecessarily difficult.
  - All repairs require removing the glass rear panel, which is challenging due to the large amount of adhesive.
  - Replacing the display requires removing the glass rear panel and the display, both of which are fragile and secured with strong adhesive.