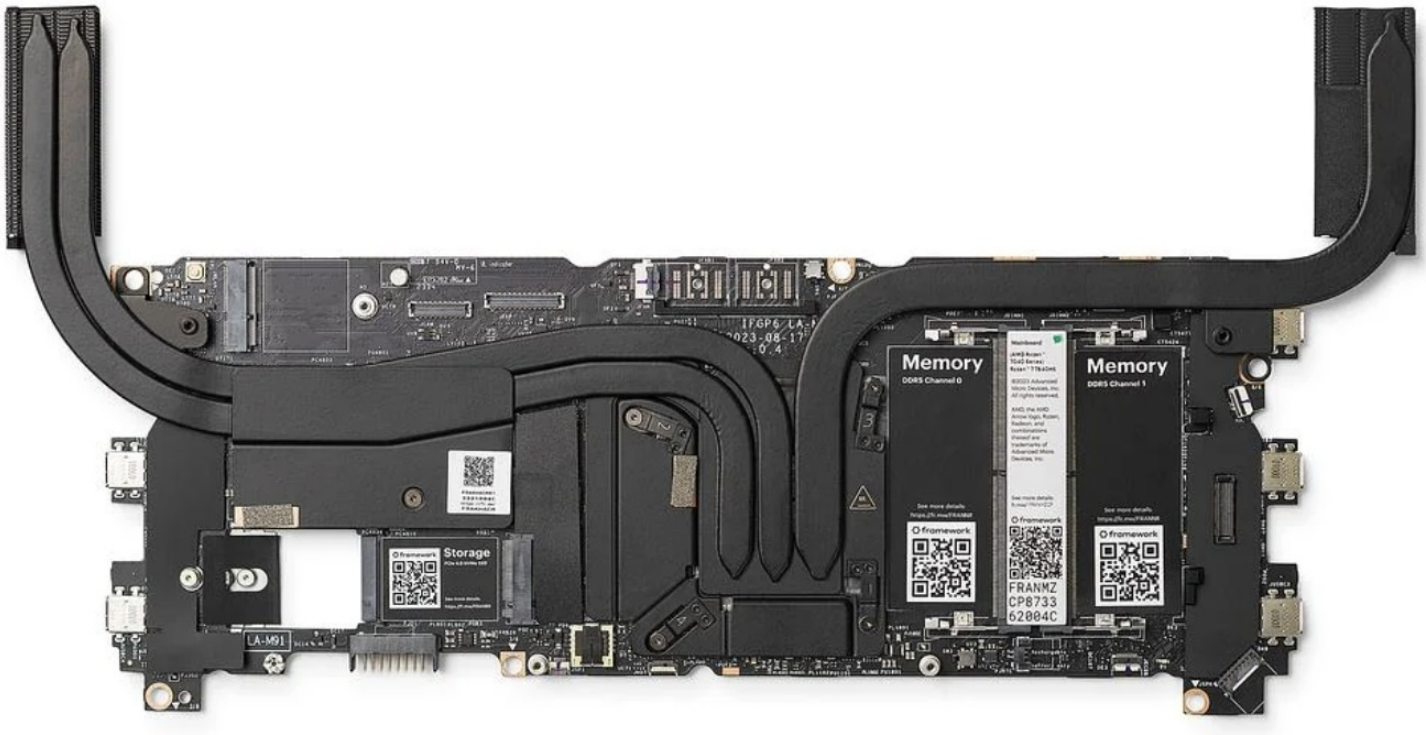
Mainboard

Written By: Levi



INTRODUCTION

Use this guide to replace or upgrade the Mainboard in your Framework Laptop 16.

The Mainboard (aka motherboard) is responsible for the primary functions for your laptop. If you want to upgrade your processor, you'll need to replace the Mainboard.

Replacement Mainboards come with a pre-installed heatsink but *don't* come with pre-installed storage, memory, or Wi-Fi modules. This guide will show how to transfer them to your new Mainboard.

If you're running Windows:

- Make sure you back up your data.
- If you're running a Pro version of Windows, follow these directions to suspend BitLocker.
- If you're running a Home version of Windows and have enabled Windows Device Encryption, you'll want to disable it. To disable it, press **Win + I** to open **Settings** and select **Privacy & Security**. Then, click on **Device Encryption** on the right panel and toggle the setting to **Off**.
- Find your product key or link your Windows license to a Microsoft account to make sure you can re-activate Windows after the change.

Some photos in this guide may contain slight visual discrepancies, but they won't affect the procedure.

TOOLS:

- Framework Screwdriver (1)

Step 1 — Before you begin



ⓘ If you are upgrading from AMD Ryzen™ 7040 Series to AMD Ryzen™ AI 300 Series, you'll need to first update your Input Module firmware following the instructions here.

- Unplug all cables and fully shut down your laptop.

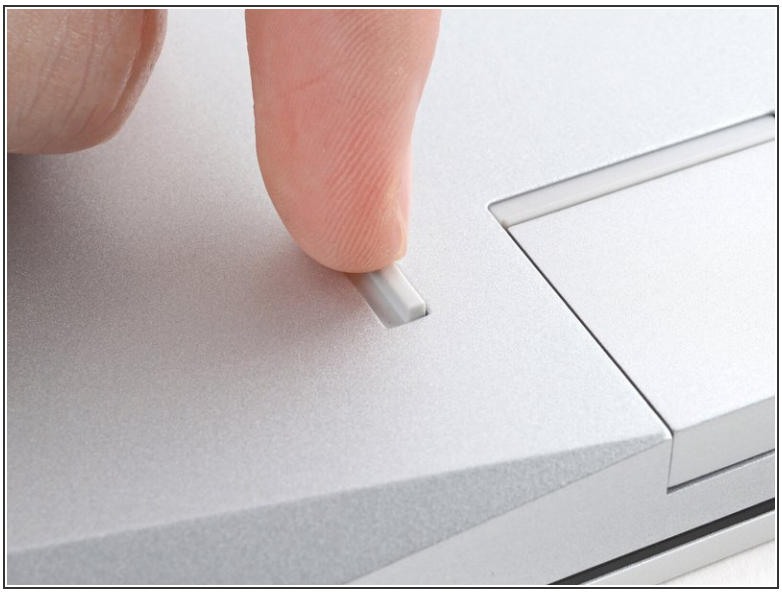
Step 2 — Reposition the laptop

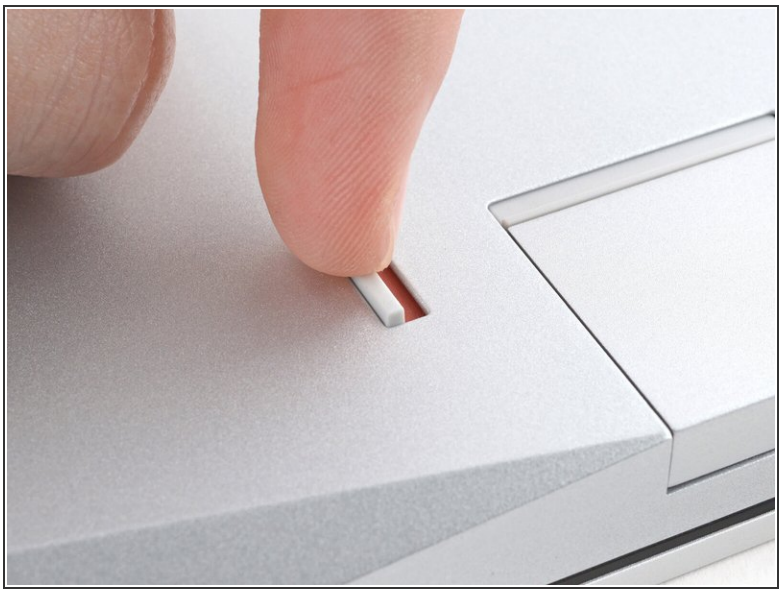




- Close the laptop and flip it over.

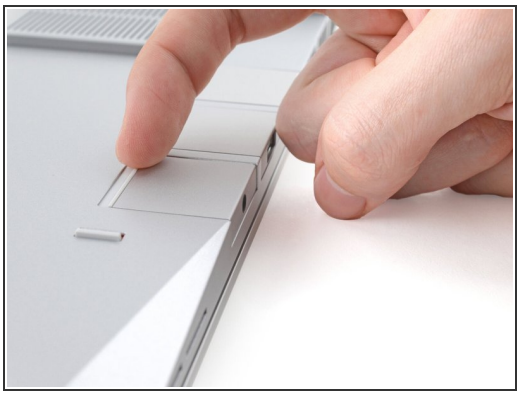
Step 3 — Remove the Expansion Cards

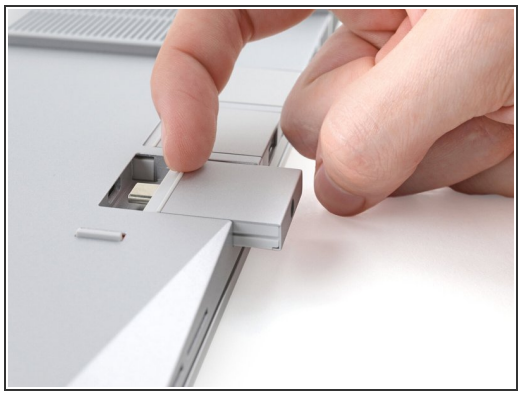




- Use your finger to flip the Expansion Card latches into the **unlocked** position.
  - ⓘ The latch displays a red bar when it's unlocked.

Step 4







- Grip the lip of the Expansion Card with your fingers.
- Pull the Expansion Card out of its slot and remove it.
  - ⓘ This might take some initial force. If you're having trouble, make sure the locking tab is properly unlocked.
- Repeat for all remaining Expansion Cards.

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Step 5 — Unlock the Input Modules





- Flip your laptop over and open it.
- Use your fingernail to pull out the two Input Module latches and unlock them.
  - ⓘ The latch will show red if it's unlocked.

Step 6 — Remove the Touchpad Spacers





- Use your fingers to slide the Touchpad Spacer toward the bottom edge of the laptop and unclip it.
  - ⓘ If you're having trouble, check if the corresponding Input Module latch is properly unlocked.
- Lift the Touchpad Spacer off the laptop and remove it.

Step 7





- Repeat the same procedure for the other touchpad spacer.

Step 8 — Remove the Touchpad Module





- Use your fingers to slide the Touchpad Module toward the bottom edge of the laptop and disconnect it.
  - ⓘ If you're having trouble, check if the Input Module latches are properly unlocked.
- Lift the Touchpad Module and remove it.

Step 9 — Remove the keyboard





ⓘ The keyboard is held in place with strong magnets. Apply gradually increasing force to avoid having the keyboard violently eject.

- Grip the two pull tabs along the bottom of the keyboard and lift until its magnets release.
- Remove the keyboard.

Step 10 — Remove the Input Modules

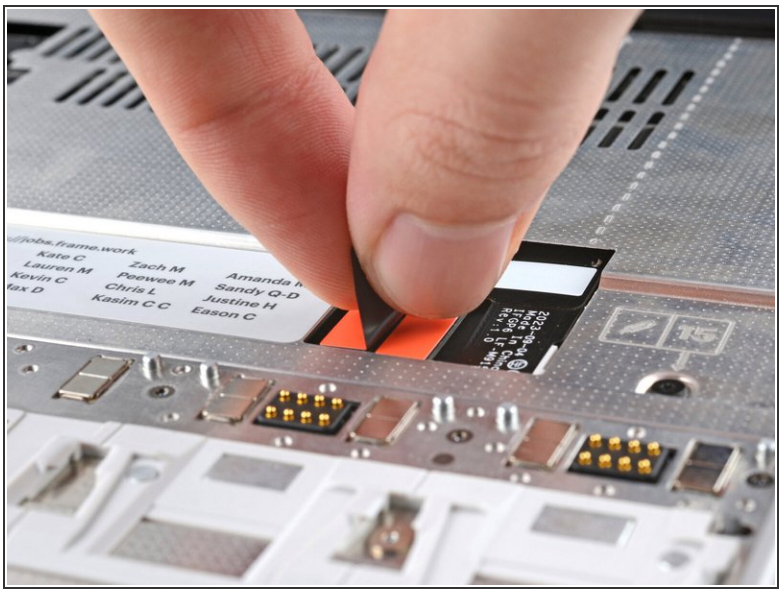


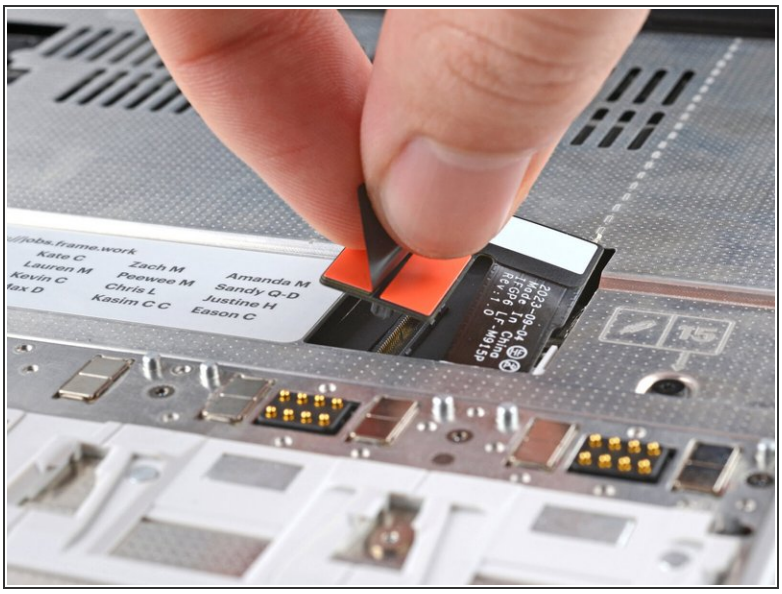


ⓘ Your Input Module(s) might be different, but the procedure to remove them is the same.

- Grip the pull tab at the bottom of the Input Module and lift until its magnets release.
- Remove the Input Module.
- Repeat for any remaining Input Modules.

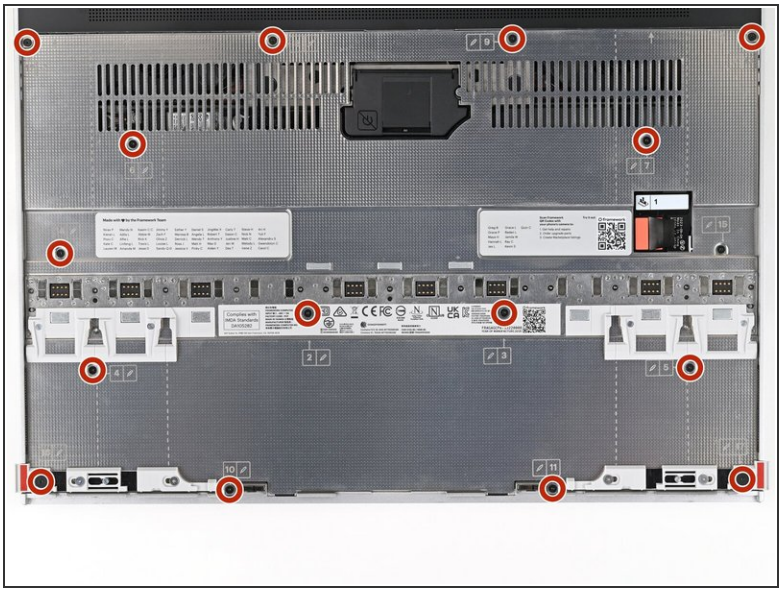
Step 11 — Disconnect the Mid Plate cable

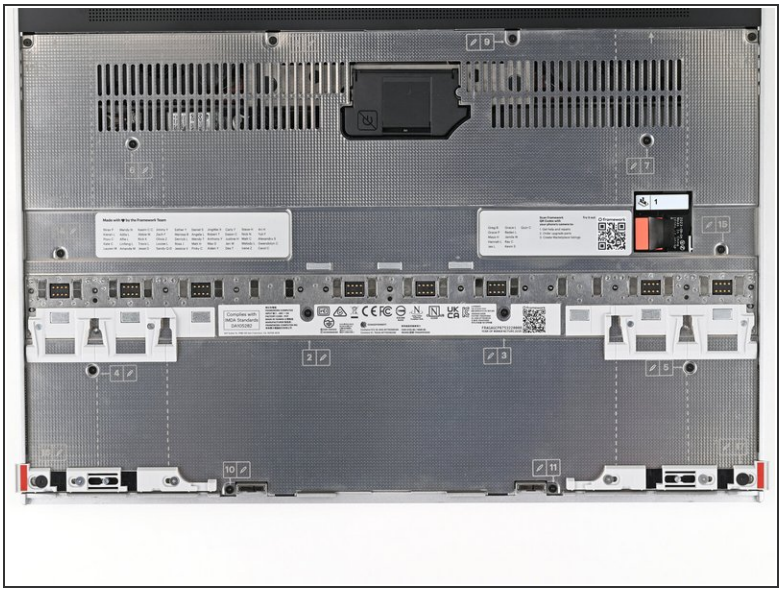




- Grip the black pull tab on the Mid Plate cable press connector and lift up to disconnect it.

Step 12 — Loosen the Mid Plate screws

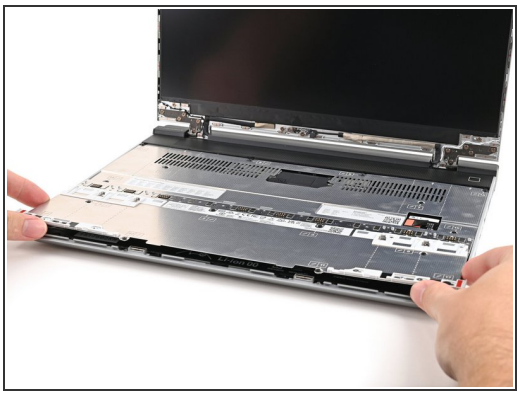




ⓘ The Mid Plate screws are ordered from 2–17 (number 1 is the press connector). You don't have to follow the order, but you can use it to help keep track of the screws you've loosened.

- Use your Framework Screwdriver to loosen the 16 captive T5 Torx screws securing the Mid Plate.

Step 13 — Remove the Mid Plate





- Use your fingers to lift the Mid Plate off the laptop and remove it.

Step 14 — Loosen the battery screws

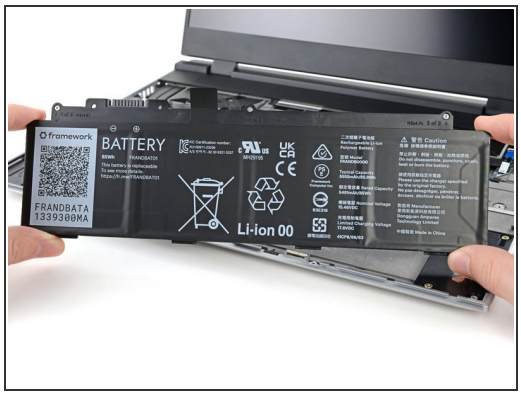




- Use your Framework Screwdriver to loosen the three captive T5 Torx screws securing the battery.

Step 15 — Remove the battery





- Grip the black pull tab at the top of the battery and lift to disconnect the battery connector.
- Remove the battery.

Step 16 — Remove the primary SSD screw





- Use your Framework Screwdriver to remove the 2 mm-long T5 Torx screw securing the SSD.
  - ⓘ The SSD might pop up at a shallow angle when you remove the screw.

Step 17 — Remove the primary SSD





- Grip the end of the SSD with the screw hole and slide it out of its socket.
- Remove the SSD.

Step 18 — Remove the secondary SSD screw

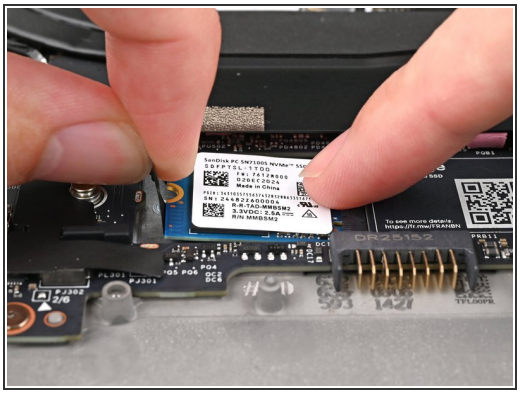




ⓘ If you have a secondary SSD installed, follow the next two steps.

- Use your Framework Screwdriver to remove the 2 mm-long T5 Torx screw securing the secondary SSD.

Step 19 — Remove the secondary SSD

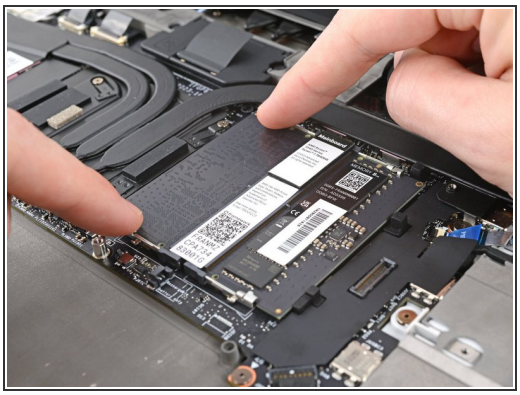
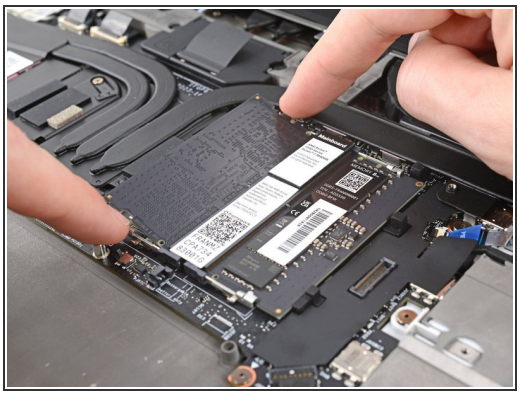
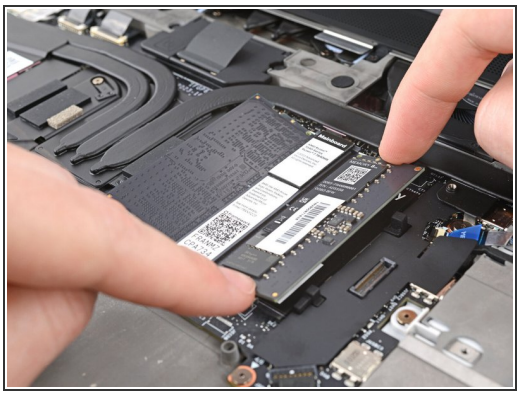




- While pulling up on the black tab underneath the SSD, use your finger to slide the SSD out of its socket.

⚠ Avoid touching the gold contacts. Only press on the top label or the edges of the SSD.

Step 20 — Remove the memory

- Push the two metal arms on each side of the RAM stick outward until they disengage and the stick pops up at a shallow angle.
- Repeat for the other RAM stick.

Step 21





- Slide the RAM stick out of its socket and remove it.
- Repeat for the other RAM stick.

Step 22 — Loosen the Wi-Fi module screw




- Use your Framework Screwdriver to loosen the captive T5 Torx screw securing Wi-Fi module.
  - ⓘ The module might pop up at a shallow angle when you loosen the screw.

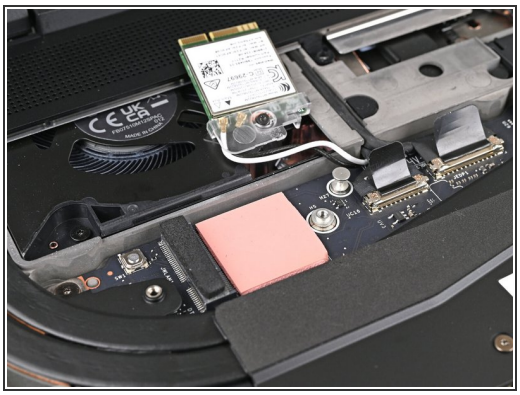
Step 23 — Disconnect the Wi-Fi Module




- Grip the end of the Wi-Fi module with the screw hole and slide it out of its socket.
  - ⚠ Don't pull the module too far from its socket, as it's still connected by two cables.

Step 24 — Reposition the Wi-Fi module





- Rotate the Wi-Fi module towards the top of the laptop to keep it out of the way of the Mainboard.
  - ⓘ If the antenna cables disconnect, follow these steps to reconnect them.

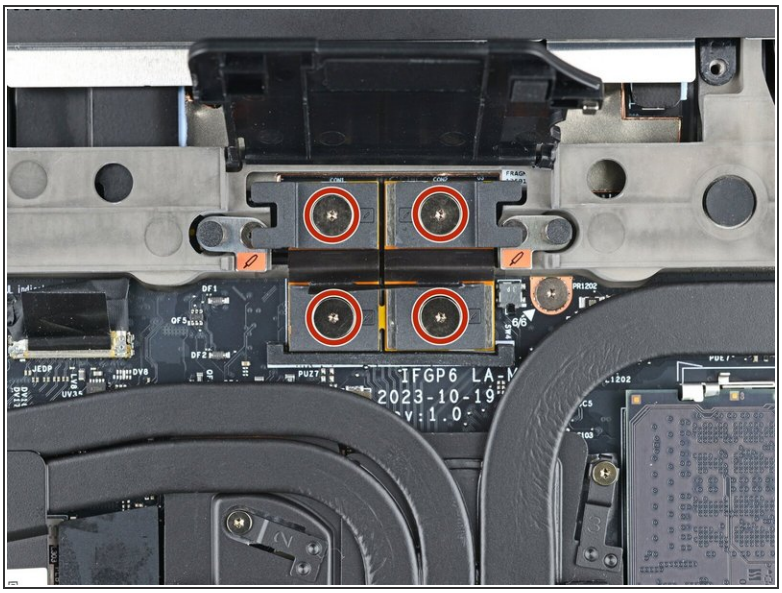
Step 25 — Lift the interposer door

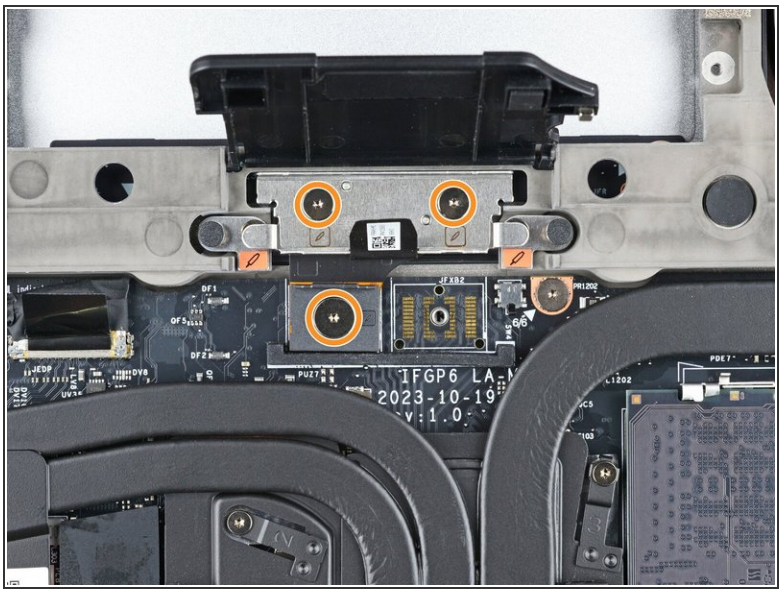




- Lift the interposer door by its black pull tab and let it rest upright.

Step 26 — Loosen the interposer screws





ⓘ If you have the Graphics Module installed, your interposer will have four screws. If you have the Expansion Bay Shell installed, you'll have three screws instead.

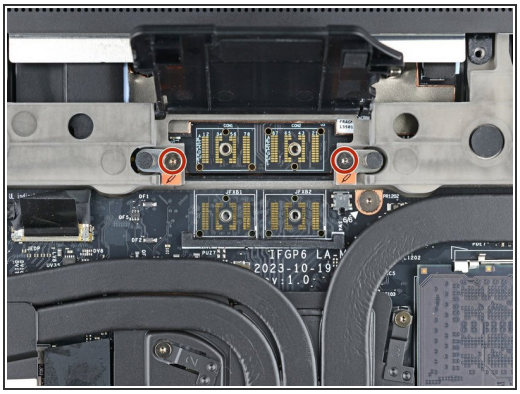
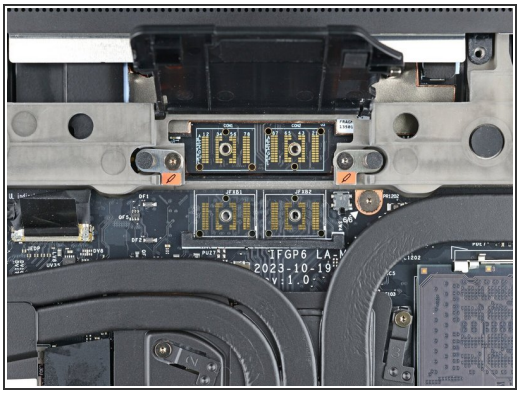
- If you have the Graphics Module, use your Framework Screwdriver to loosen the four captive T5 Torx screws securing the interposer.
- If you have the Expansion Bay Shell, use your Framework Screwdriver to loosen the three captive T5 Torx screws securing the interposer.

Step 27 — Remove the interposer




- Lift the interposer by its pull tab and remove it.

Step 28 — Loosen the Expansion Bay Module screws


- Use your Framework Screwdriver to loosen the two captive T5 Torx screws securing the module in the Expansion Bay.
- Close the interposer door before continuing.

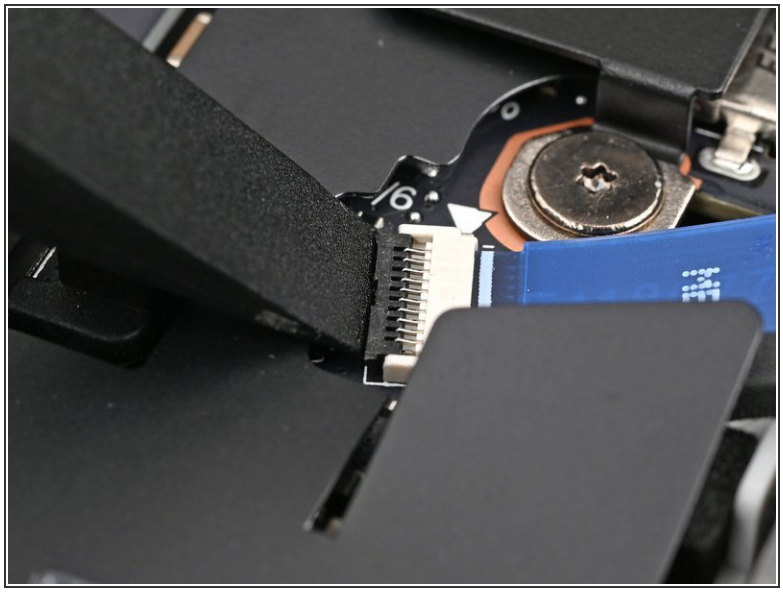
Step 29 — Remove the Expansion Bay Module





- Close your laptop and flip it over.
- Slide the Expansion Bay Module out of the laptop and remove it.
  - ⓘ The module should slide out easily. If you feel any resistance, check if the screws holding it in place are fully loosened.
- Reopen your laptop and flip it over.

Step 30 — Disconnect the fingerprint sensor




- Use the flat end of a spudger, or a clean fingernail, to lift up the locking tab on the fingerprint sensor ZIF connector next to the memory.

Step 31




- Use tweezers, or your fingers, to grip the blue pull tab and slide the fingerprint sensor cable straight out of its socket.

Step 32





ⓘ The fingerprint sensor cable is lightly adhered to the laptop's frame.

- Use your fingers to peel the fingerprint sensor cable away from the frame and separate the adhesive.

Step 33 — Remove the ventilation plate

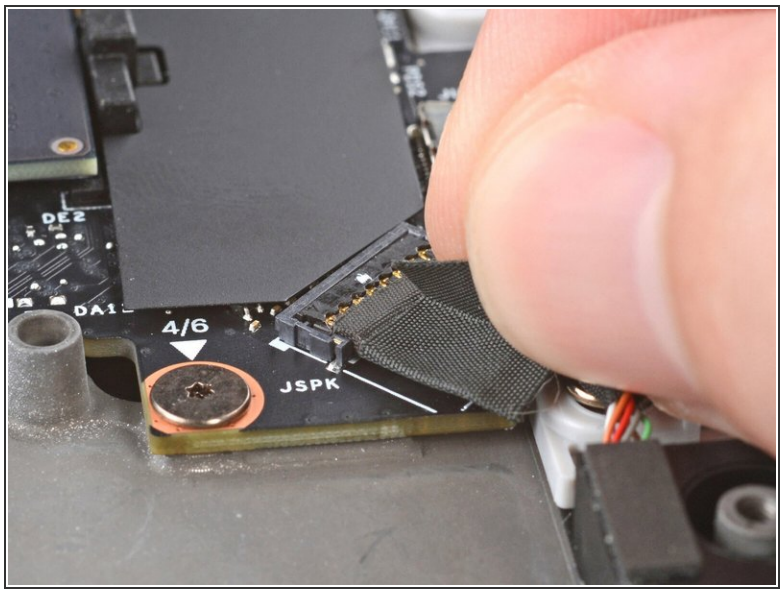


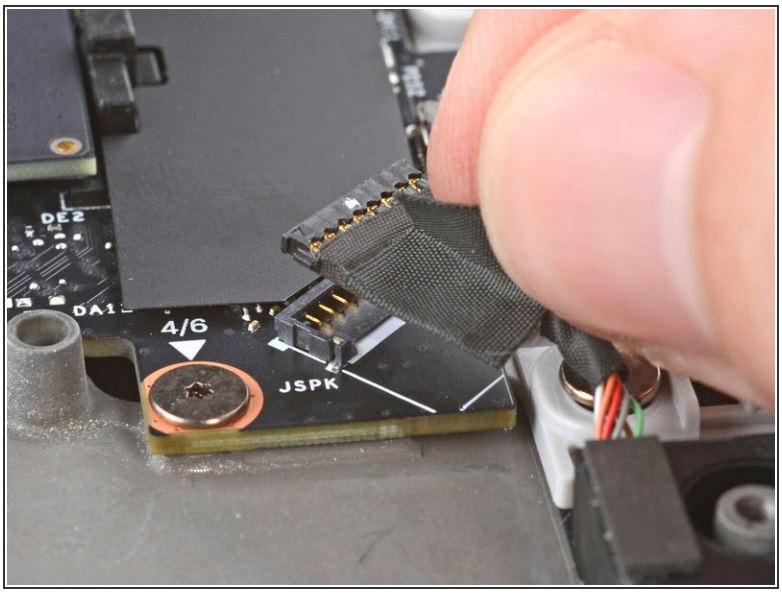


ⓘ The ventilation plate is held in place with magnets.

- Lift the bottom of the ventilation plate and pull it away from the laptop until the magnets release.
- Remove the ventilation plate.

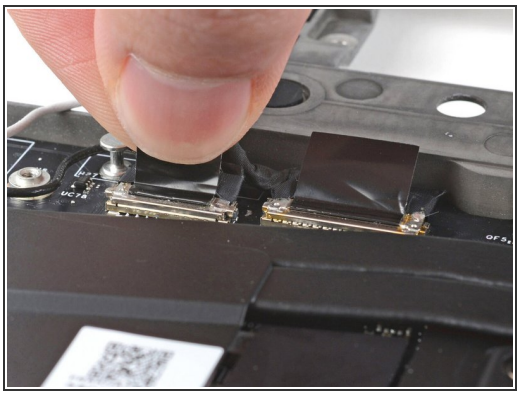
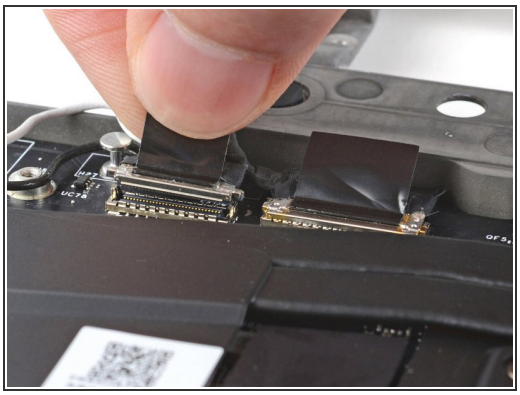
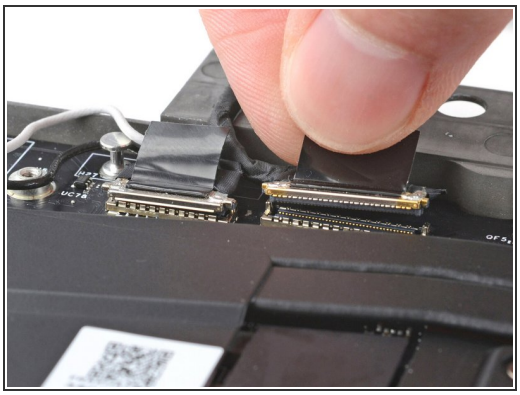
Step 34 — Disconnect the speaker





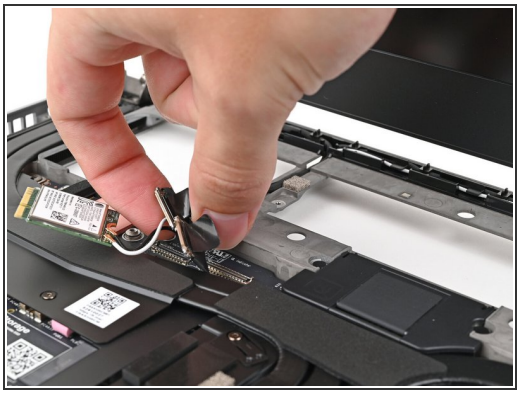
- Lift the speaker cable connector by its black pull tab and disconnect it.

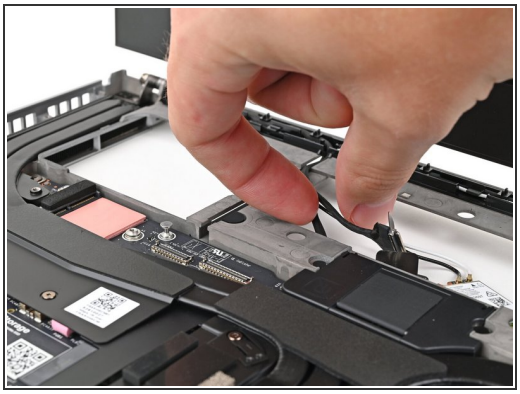
Step 35 — Disconnect the display

- Grip the webcam cable connector to the right of the Wi-Fi module slot by its pull tab and lift up to disconnect it.
- Repeat for the display cable connector next to it.

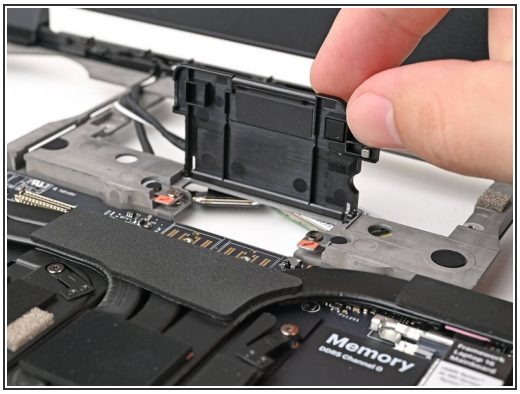
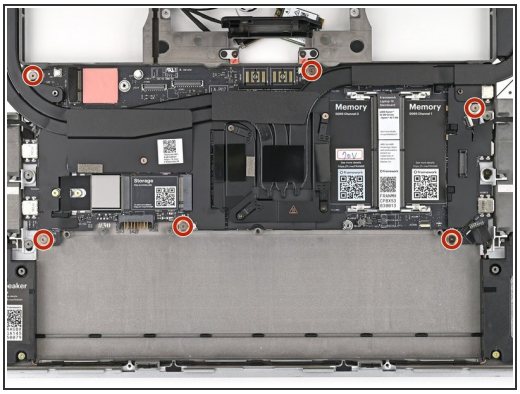
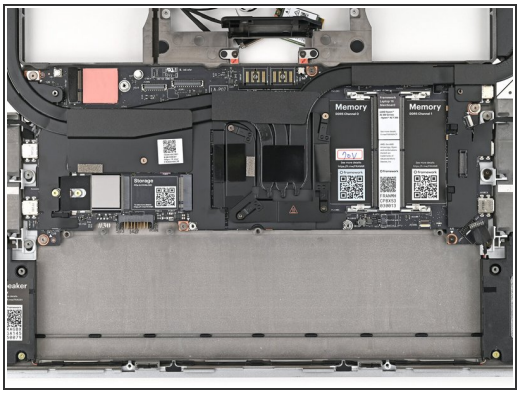
Step 36 — Reroute the cables





- Lift the display, webcam, and Wi-Fi module cables out of their slot in the frame enough to give room for the Mainboard to lift straight up.
  - ⓘ Optionally, you can tuck the cables underneath the frame.

Step 37 — Remove the Mainboard screws

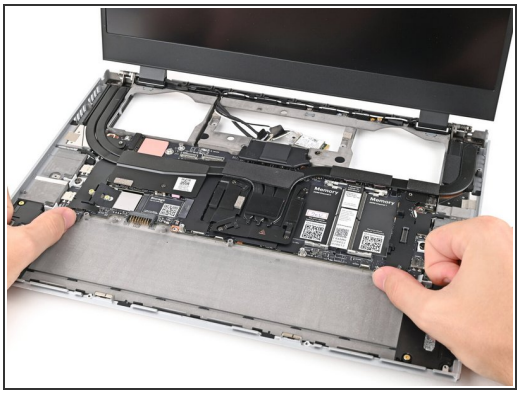
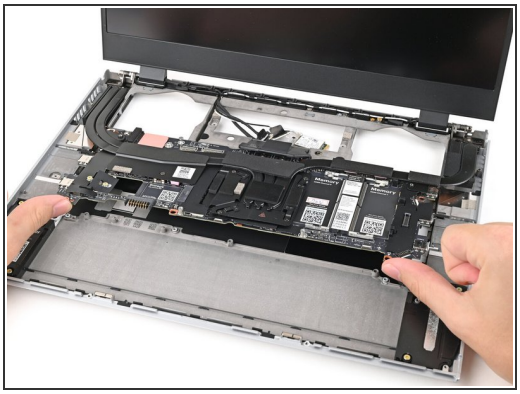
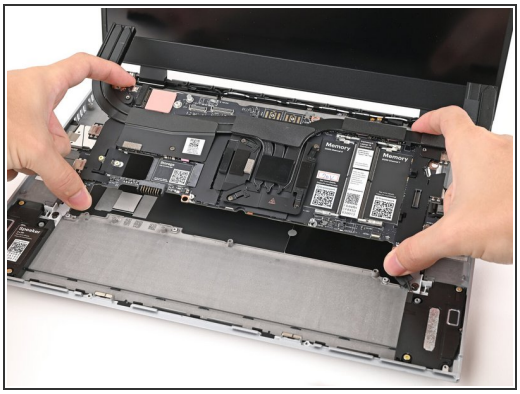




- Lift up the interposer door to reveal the screw underneath.

ⓘ The Mainboard screws are ordered from 1–6. You don't have to follow the order, but you can use it to help keep track of the screws you've removed.

- Use your Framework Screwdriver to remove the six 2 mm-long T5 Torx screws securing the Mainboard.

Step 38 — Remove the Mainboard

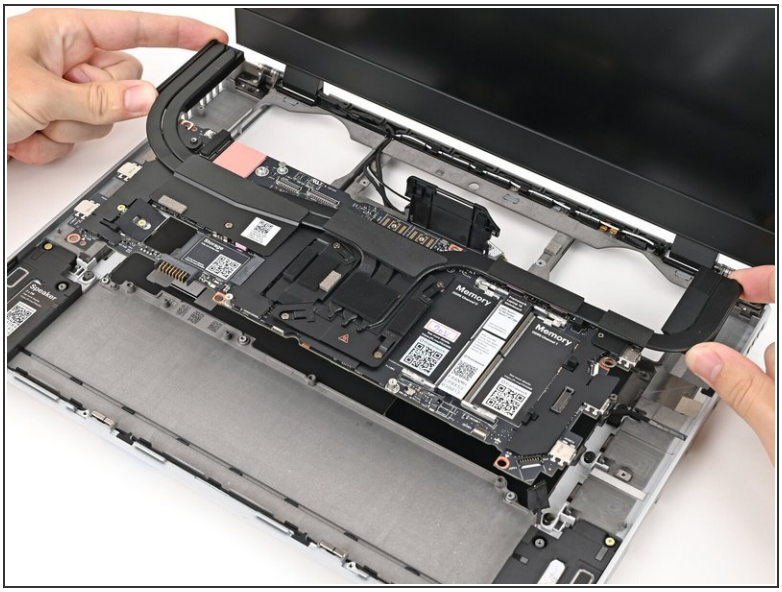
- Use your fingers to lift the bottom edge of the Mainboard enough to grip its edges.
- Lift the Mainboard off its alignment pegs and remove it.

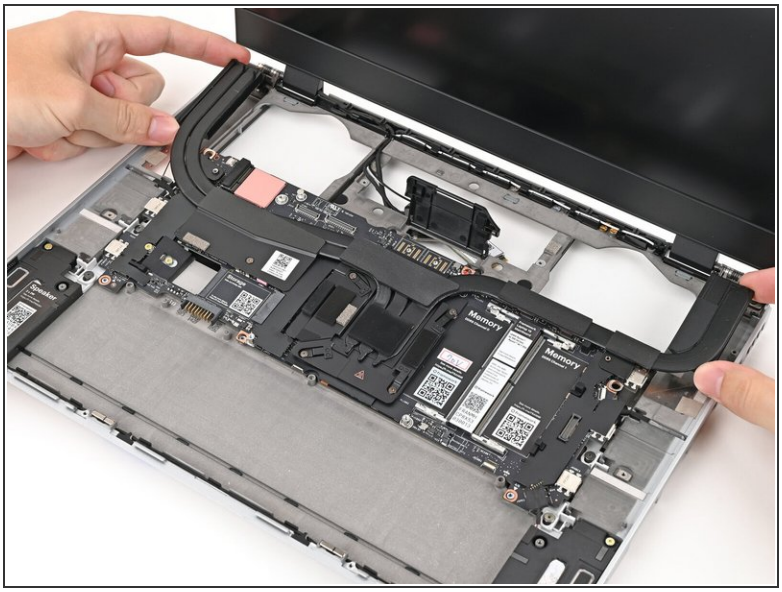
Step 39 — Disassembly complete



- Congratulations on completing disassembly! **The remaining steps will show how to reassemble your Framework Laptop.**

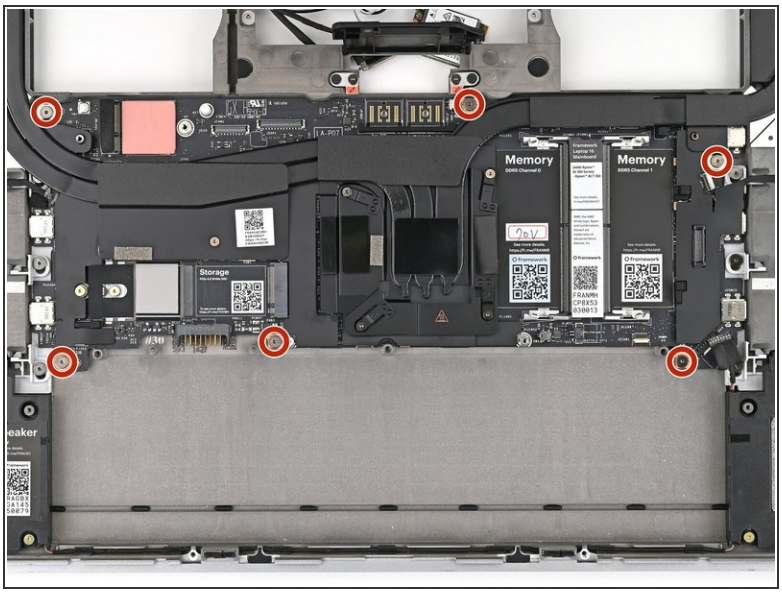
Step 40 — Place the Mainboard

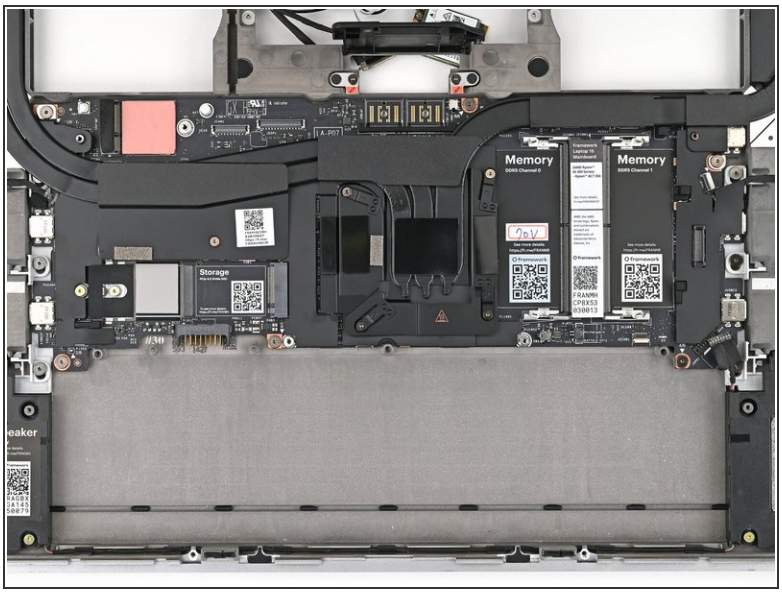




- Grab the Mainboard by the curving pipes of its heatsink.
- Place the Mainboard into the laptop and onto its alignment pegs.
  - ⓘ Make sure all of the cables are above the Mainboard before continuing.

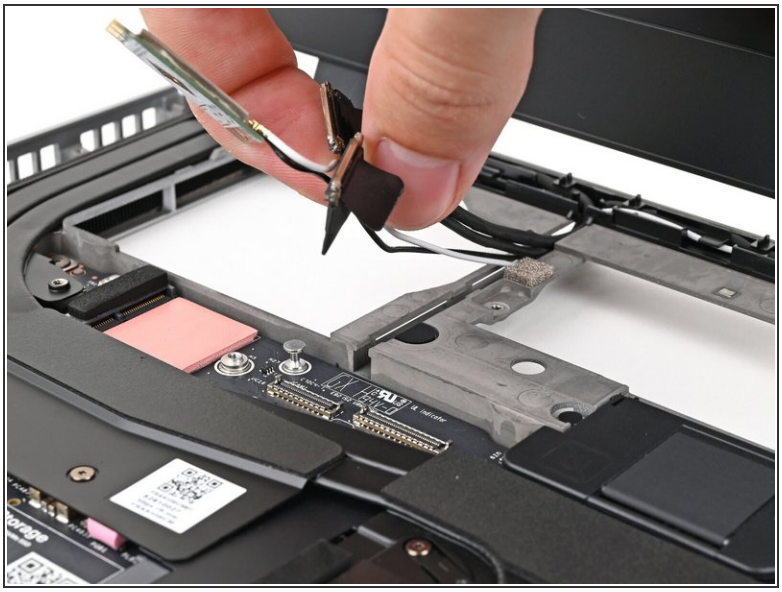
Step 41 — Install the Mainboard screws





- Use your Framework Screwdriver to install the six 2 mm-long T5 Torx screws securing the Mainboard.

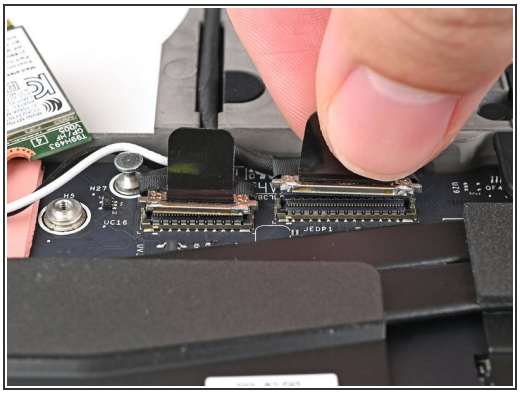
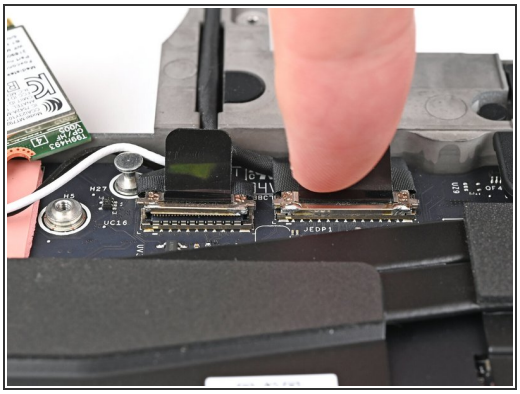
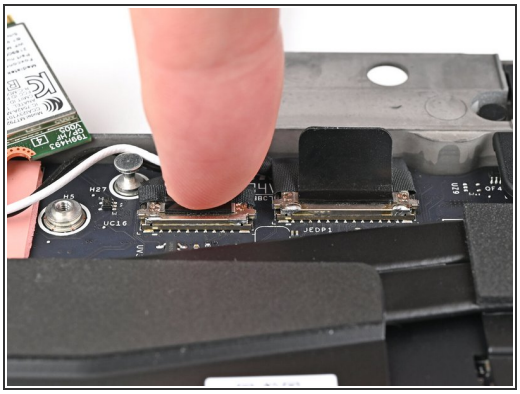
Step 42 — Reroute the cables





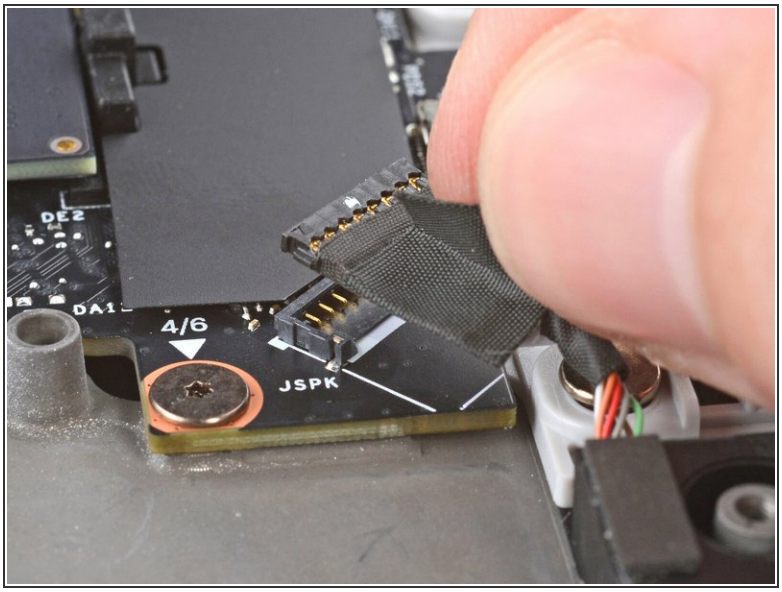
- Route the display, webcam, and Wi-Fi module cables into their slots in the frame.

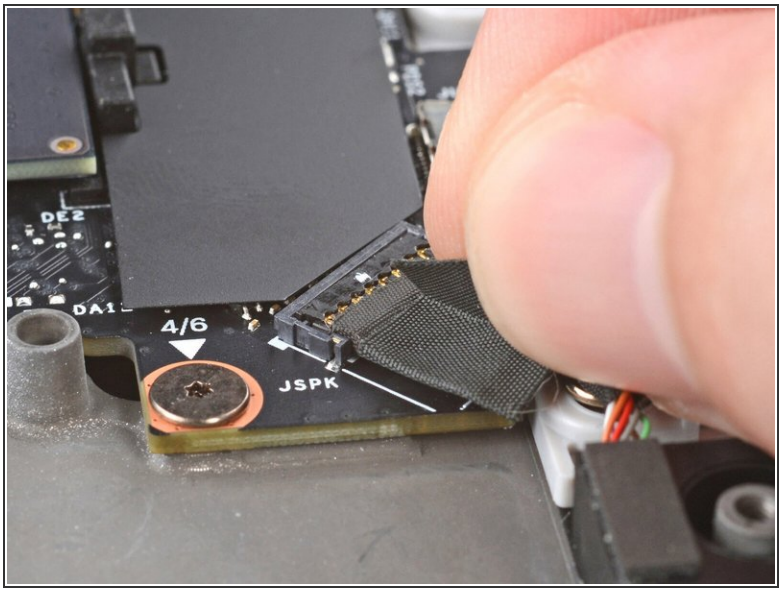
Step 43 — Connect the display

- Press the two display connectors straight down into their sockets to connect them.

Step 44 — Connect the speaker





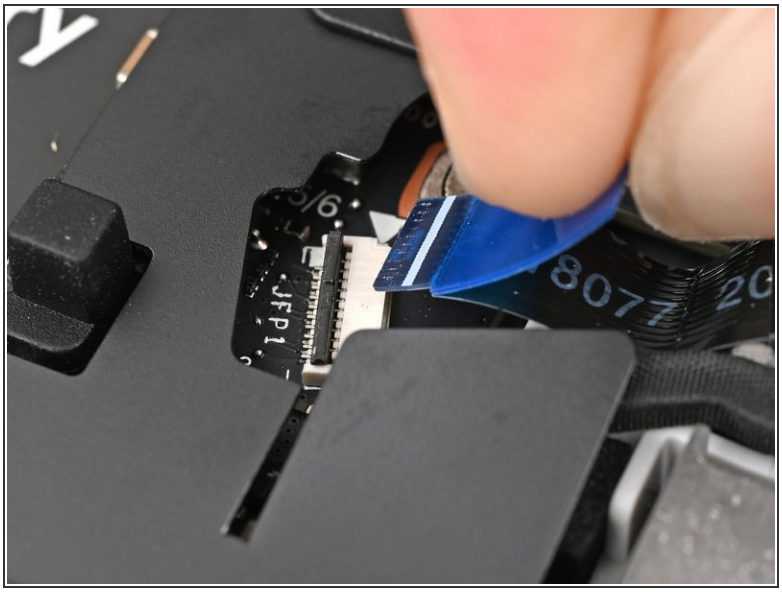
- Press the speaker cable connector straight down into its socket to connect it.

Step 45 — Place the ventilation plate




- Lay the ventilation plate along the top edge of the laptop and let its magnets pull into place.

Step 46 — Connect the fingerprint sensor




- Use tweezers, or your fingers, to grip the blue pull tab and slide the fingerprint sensor cable straight into its socket.

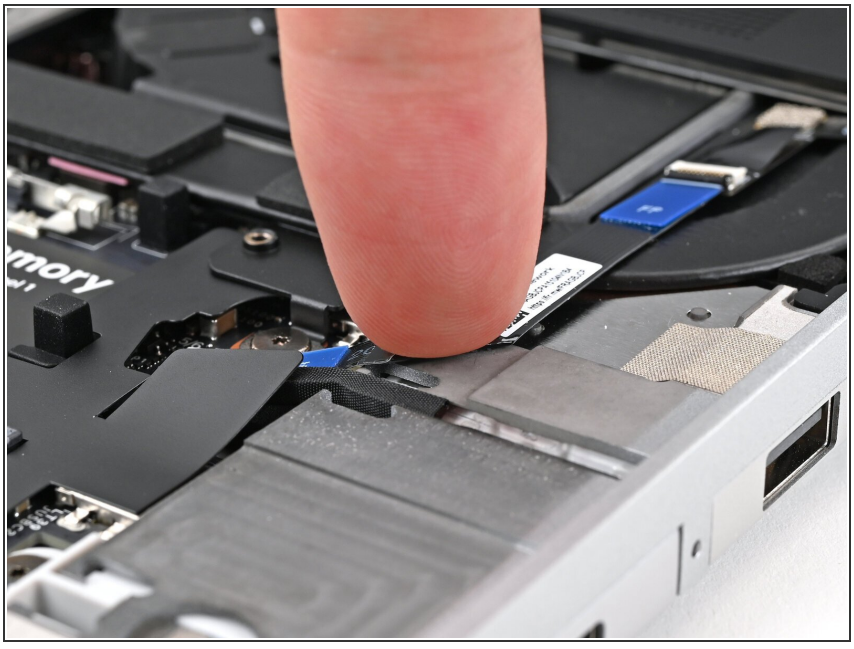
Step 47





- Use the flat end of a spudger, or a clean fingernail, to press down the locking tab on the fingerprint sensor ZIF connector.

Step 48



- Press the fingerprint sensor cable to the frame to re-adhere it.

Step 49 — Insert the Expansion Bay Module





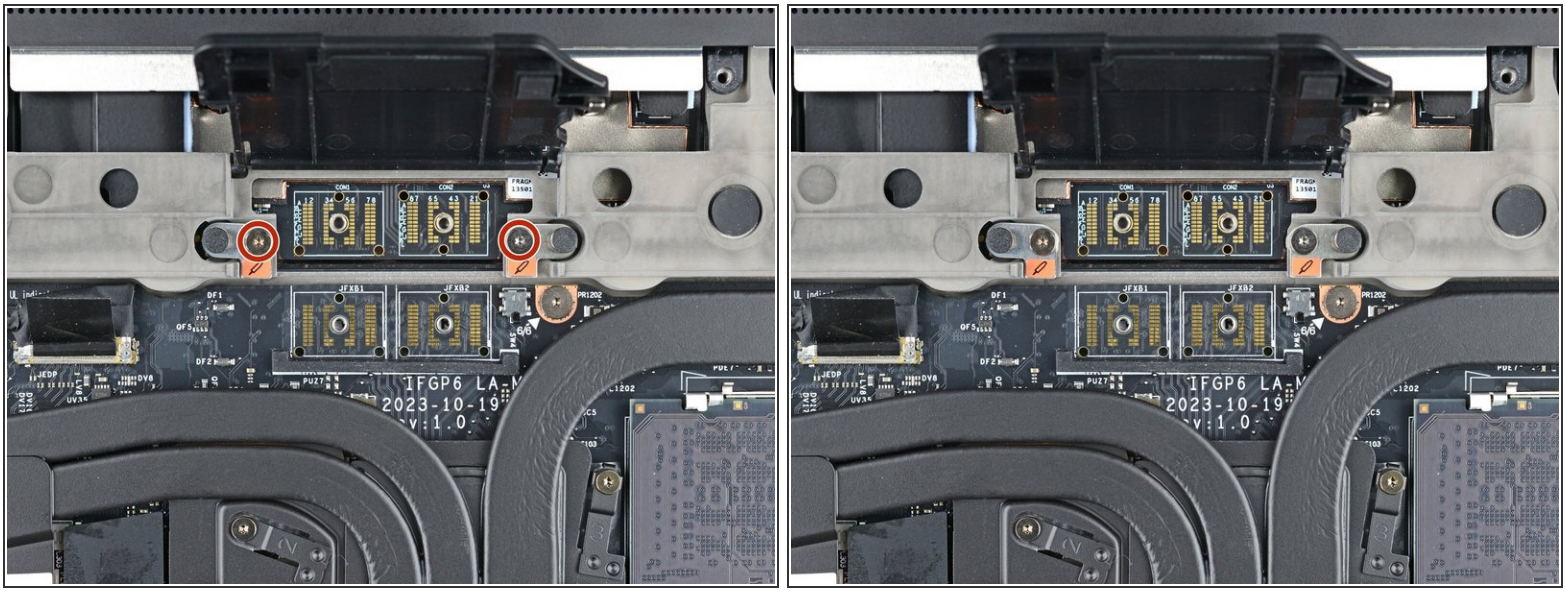
- Close your laptop and flip it over.
- Align the Expansion Bay Module with its slot in the laptop.
  - Check that the module sits evenly with the rail on the outside edges of the slot .
  - Check that the two center rails are threaded between the fans.

Step 50



- While keeping the module level with the laptop, slide it into its slot.
  - ⓘ The module should slide in easily. If you feel any resistance, pull the module out and realign it.
  - ⓘ You should hear an audible "click" when the module's clips snap into place.
- Reopen your laptop and flip it over.

Step 51 — Tighten the Expansion Bay Module screws



- Use your Framework Screwdriver to tighten the two captive T5 Torx screws securing the Expansion Bay Module.

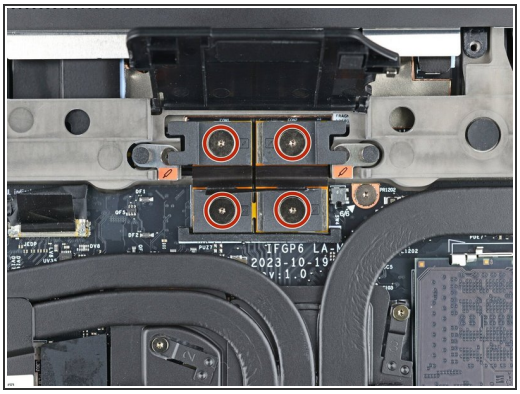
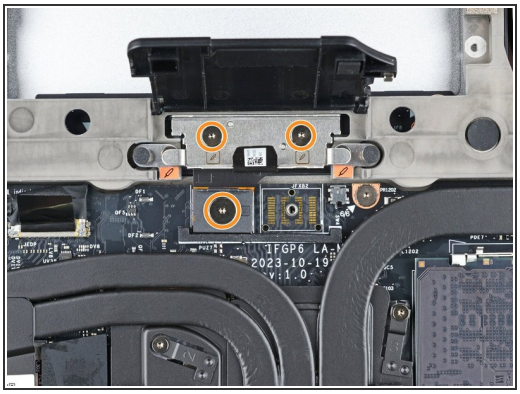
Step 52 — Place the interposer





- Place the interposer over its spot between the Mainboard and the module.
  - ⓘ Depending on if you're installing a Graphics Module or the Expansion Bay Shell, the interposer should be oriented so either rubber grommets or metal tabs cover the Expansion Bay screws.

Step 53 — Tighten the interposer screws


ⓘ If you have the Graphics Module installed, your interposer will have four screws. If you have the Expansion Bay Shell installed, you'll have three screws instead.

- If you have the Graphics Module, use your Framework Screwdriver to tighten the four captive T5 Torx screws securing the interposer.
- If you have the Expansion Bay Shell, use your Framework Screwdriver to tighten the three captive T5 Torx screws securing the interposer.
- Close the interposer door.

Step 54 — Reposition the Wi-Fi module





- Rotate the Wi-Fi Module back into place, making sure the antenna cables wrap around their silver peg on the Mainboard and tuck underneath the heat sink.

Step 55 — Install the Wi-Fi module





⚠ Hold the Wi-Fi module by its edges. Don't touch the gold contacts with your fingers. If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

- Align the Wi-Fi module's gold contacts and notch with the socket on the Mainboard.
- Insert the Wi-Fi module into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.

ⓘ The Wi-Fi module fits into the socket in one orientation. If it doesn't fit, try flipping the module.

Step 56 — Align Wi-Fi module cover




- Slide the clear Wi-Fi module cover on the module and align its screw with the screw hole cutout.

Step 57 — Tighten the Wi-Fi module screw




- Use your Framework Screwdriver to tighten the captive T5 Torx screw securing Wi-Fi module.

Step 58 — Install the memory



⚠ **Hold the memory module by its edges. Don't touch the gold contacts with your fingers.** If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

- Orient the module with its label facing down and align the gold contacts with the left socket labeled **DDR5 Channel 0**.
- Insert the contact edge into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.
- Press the edges of the memory module down until the side clips lock it in place.

Step 59



- If you're using two memory modules, orient the other module so its label is facing upward and repeat the previous step for the other socket labeled **DDR5 Channel 1**.

Step 60 — Install the secondary SSD





⚠ **Hold the SSD by its edges. Don't touch the gold contacts with your fingers.** If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

- Align the SSD's gold contacts with its socket.
- Insert the SSD **partially** into the socket at a shallow angle. You should still be able to see most of the gold contacts.
- Press the SSD flat to the Mainboard.

Step 61





- While keeping the SSD flat to the Mainboard, push it into its socket until its golden contacts are completely covered.

Step 62 — Secure the secondary SSD





- Use your Framework Screwdriver to install the 2 mm-long T5 Torx screw securing the SSD.

Step 63 — Install the primary SSD

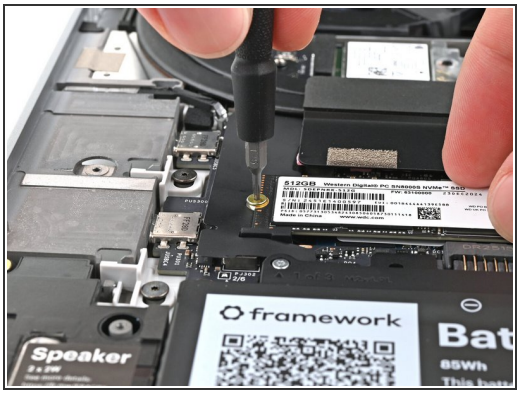




⚠ Hold the SSD by its edges. Don't touch the gold contacts with your fingers. If you do, wipe the contacts with a clean, lint-free cloth to remove any finger oils.

- Insert the SSD into the socket at a shallow angle. The gold contacts should mostly be covered by the socket.
  - ⓘ The SSD fits into the socket in one orientation. If it doesn't feel like it fits, try flipping the module.

Step 64 — Tighten the primary SSD screw

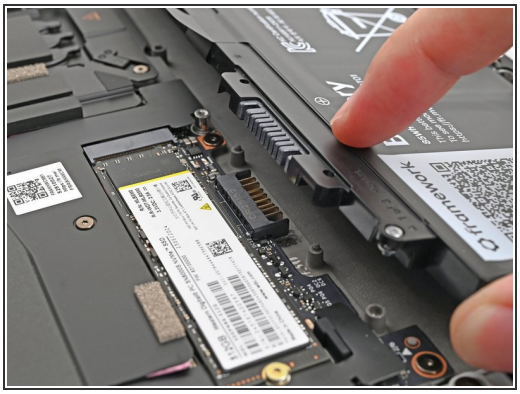
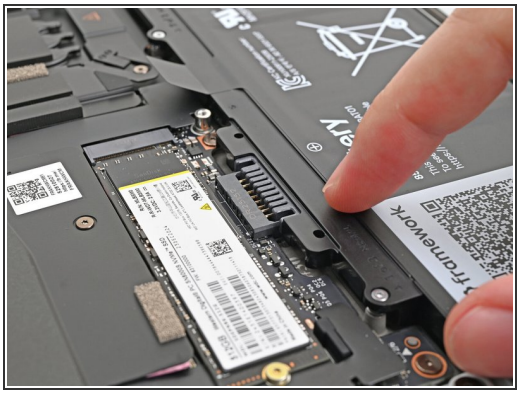
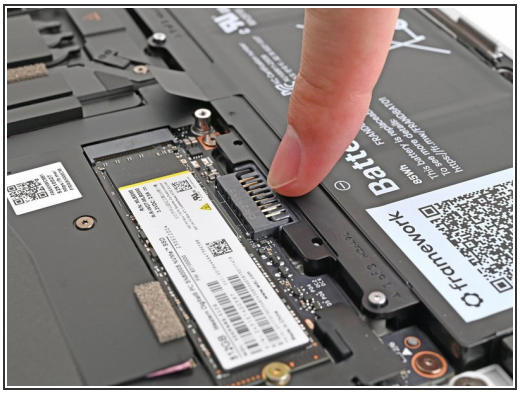






- While holding the SSD flat to the Mainboard, use your Framework Screwdriver to install the 2 mm-long T5 Torx screw securing the SSD.

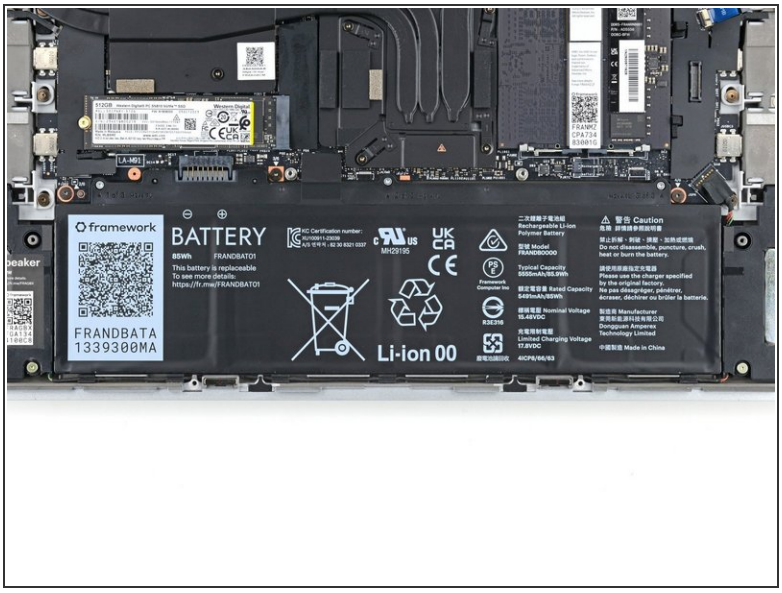
Step 65 — Install the battery

- Align the battery connector over its socket and lay the battery into its well.
- Lightly press the battery down to connect it.

Step 66 — Tighten the battery screws





- Use your Framework Screwdriver to tighten the three captive T5 Torx screws securing the battery.

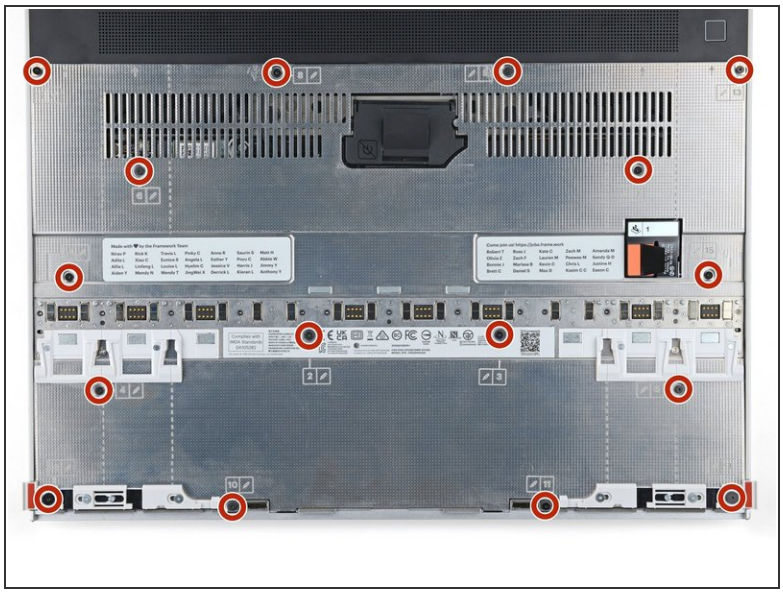
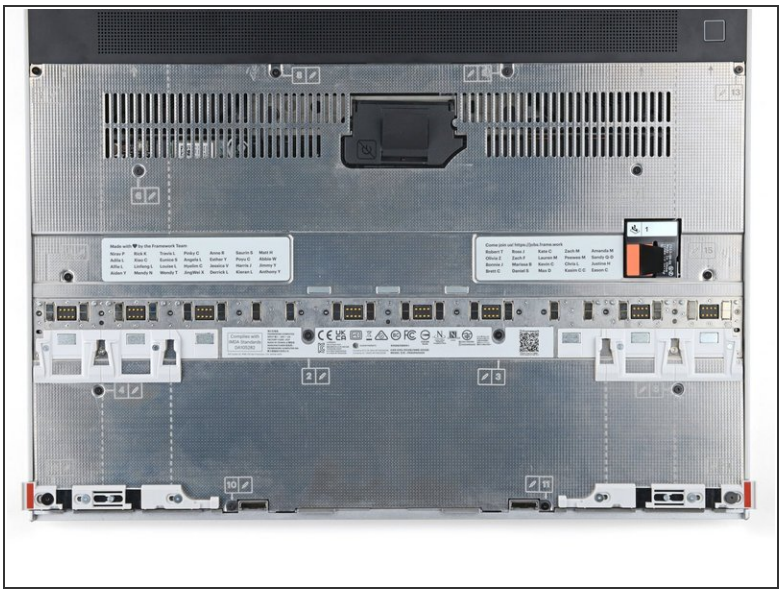
Step 67 — Place the Mid Plate





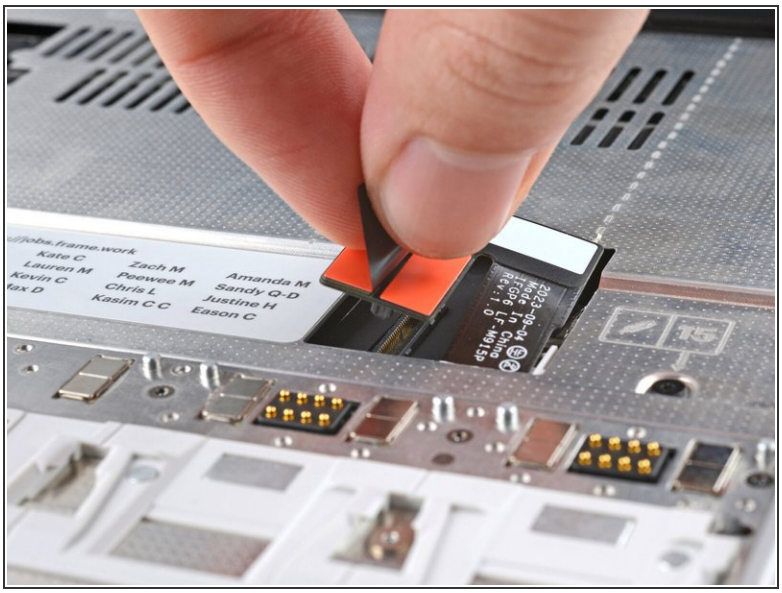
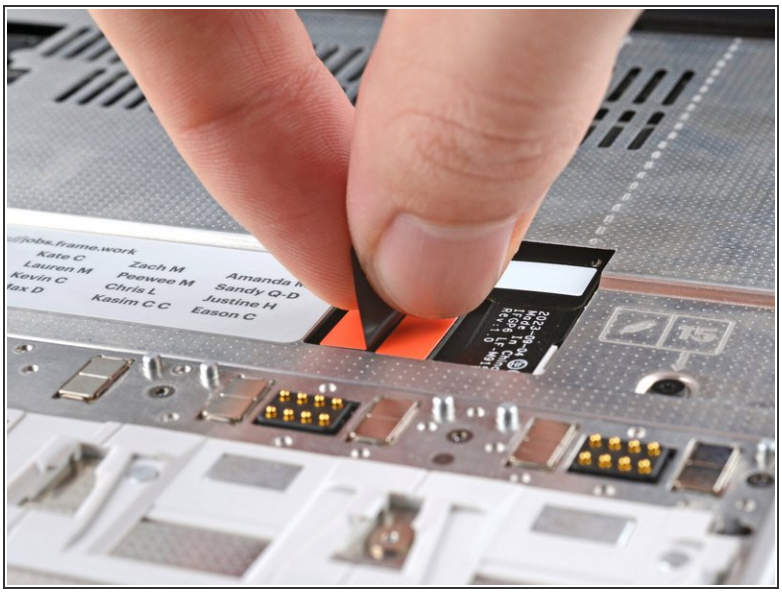
- Place the Mid Plate on the laptop, making sure it sits evenly on its alignment pegs.

Step 68 — Tighten the Mid Plate screws

- Use your Framework Screwdriver to tighten the 16 captive T5 Torx screws **in order** (starting with 2) to secure the Mid Plate evenly.

Step 69 — Connect the Mid Plate cable

- Align the Mid Plate cable press connector over its socket and press down to connect it.

Step 70 — Install the Input Modules





ⓘ Your Input Module(s) might be different, but the procedure to remove them is the same.

- Align the top edge of the Input Module with the top edge of the laptop.
- Lay the Input Module on the laptop and let the magnets pull the keyboard into place
  - ⓘ Make sure the Input Module is seated properly on its alignment pegs and sits flush with the edges of the laptop.
- Repeat for any remaining Input Modules.

Step 71 — Install the keyboard





- Align the top edge of the keyboard with the top edge of the laptop.
- Lay the keyboard on the laptop and let the magnets pull the keyboard into place
  - Make sure the keyboard is seated properly on its alignment pegs and sits flush with the edges of the laptop.

Step 72 — Install the Touchpad Module




- Place the Touchpad Module flat on its cutout so its clips are properly aligned.
- Press the Touchpad Module down and slide it into place so it lines up evenly with the bottom edge of the laptop.

Step 73 — Install the Touchpad Spacers





- Place the Touchpad Spacer over its spot on the laptop with the bottom edge overhanging slightly.
- Slide the Touchpad Spacer towards the top of the laptop to secure it.
- Repeat the same procedure for the other Touchpad Spacer.

Step 74 — Lock the Input Modules





- Push the Input Module latches back into place to lock them.

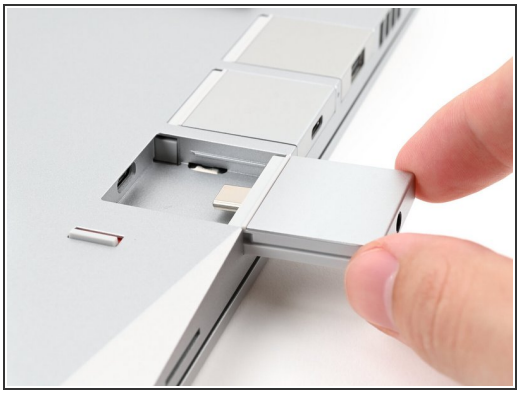
Step 75 — Reposition the laptop





- Close the laptop and flip it over.

Step 76 — Install an Expansion Card







- Slide an Expansion Card into an Expansion Card slot.
  - ⓘ You don't need to unlock the latch to install the Expansion Cards—only when you want to remove them.
  - ⓘ The Expansion Cards should click into place, and the front edge should be flush with the laptop.
- Repeat for all remaining Expansion Cards.

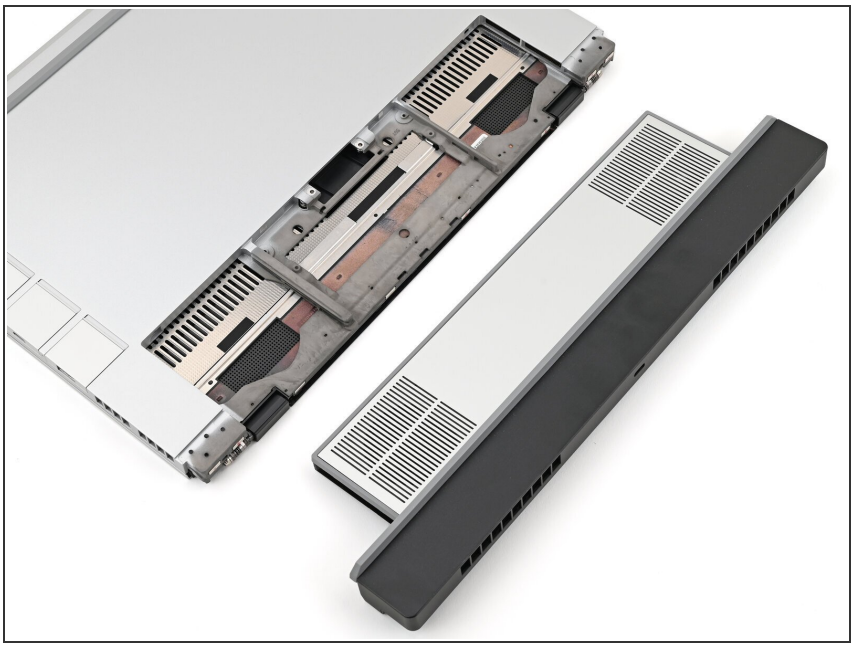
Step 77 — Lock the row of Expansion Cards





- Use your finger to flip both latches and lock the row of Expansion Cards above them.

Step 78 — Install the Driver Bundle



- If you've just upgraded to a new generation of Mainboard or Graphics Module, you'll need to install the latest Driver Bundle for your generation, which you can download here.
- There may also be newer firmware available for your Mainboard. You can download the latest here.

You finished fixing your Framework Laptop!

Take your e-waste to an R2 or e-Stewards certified recycler.

If you need help, contact Framework support.