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MacBook Air 13" Mid 2011 Teardown

Teardown of the Mid 2011 13" MacBook Air.

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INTRODUCTION

July 21 brought us a bountiful harvest of Apple produce! Today, Apple released updates to the 11" and 13" MacBook Airs, as well as an updated Mac mini.

Although today is an exciting day for consumers, it is a sad day for consumer repair. Apple decided that the "svelte and sexy" MacBook Air would replace the "simple and serviceable" white plastic MacBook (for consumers at least-- the white plastic MacBook is still available for educational use). While this means that your book-bags will be significantly lighter, it will also mean that you won't be upgrading or servicing your computer anytime soon.

Join us today as we take a look inside this game-changing piece of equipment.

🔧 TOOLS:

- P5 Pentalobe Screwdriver Retina MacBook Pro and Air (1)
- Spudger (1)
- T5 Torx Screwdriver (1)
- T8 Torx Screwdriver (1)

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Step 1 — MacBook Air 13" Mid 2011 Teardown

- Here we have Apple's freshest fruit: the updated MacBook Air!

- The drool-worthy specs of the 13" Air include:

    - Core i5 or Core i7 Processors

    - 128 or 256 GB Flash Memory

    - 4 GB DDR3 SDRAM

    - Intel HD 3000 Graphics with 384 MB RAM (shared with system RAM)

    - Thunderbolt Port and SD slot

- The dimensions on this MacBook Air are exactly the same, so if you need to cut some cake, you should be okay.

Step 2

- Luckily, this MacBook Air uses the same pentalobe screws as the previous generation on the lower case.

- In fact, from the outside, there is not very much to differentiate this model from the previous one.

  - Looks like we'll just have to open it up!

- It should be noted that this generation of Airs did not ship with an OS install stick. As of Lion, Macs ship with a Internet Recovery feature in firmware that will re-download and install the OS, even with a corrupt system drive.

Step 3

- Here comes the magic moment....

- And at first glance, everything's pretty much the same as in the previous model.

Step 4
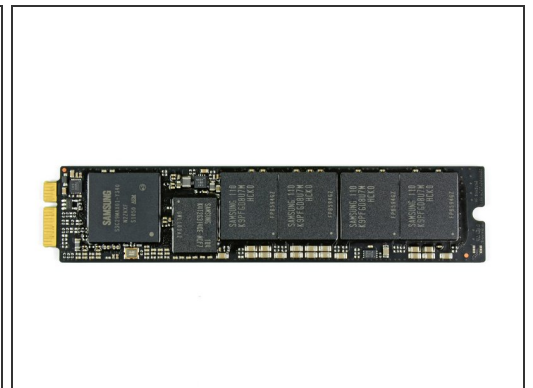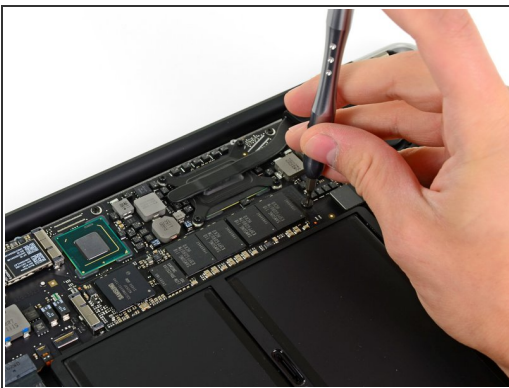
- Just like in the mid-2010 MacBook Air, the SSD is not soldered to the logic board. Thankfully this means you can upgrade the SSD for more storage, but you're still out of luck if you need extra RAM.

- Seeing as how the RAM is not user-serviceable, it might be worth it to buy the nicer model from the get-go (all models except the base 11" come with 4GB).

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Step 5

- The battery is held in place by a few Torx screws.

- Although this battery is rated the same as last year's model, it has a different model number: A1405. Last year's [13" battery](#) was model A1377

- With a battery like this, the 13" MacBook Air will last for up to 7 hours of constant web use, or up to 30 days in standby.

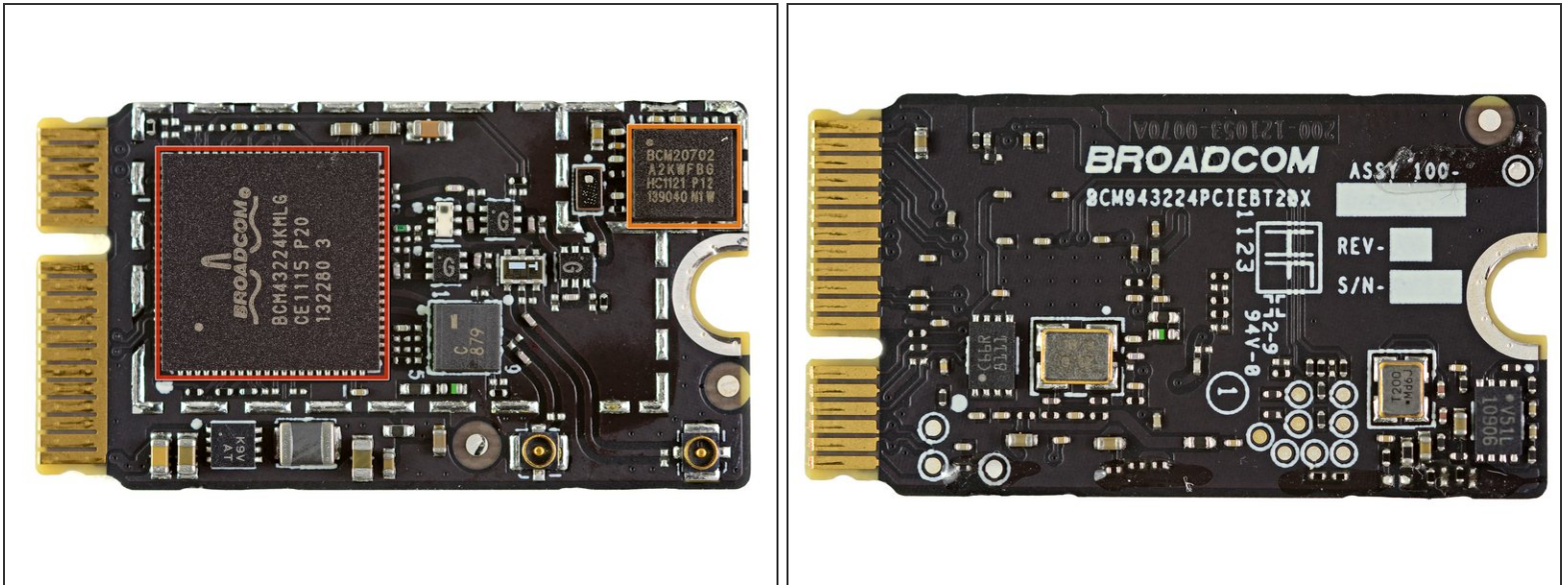- ⓘ We'll have to wait to check for battery compatibility between the two generations.

Step 6
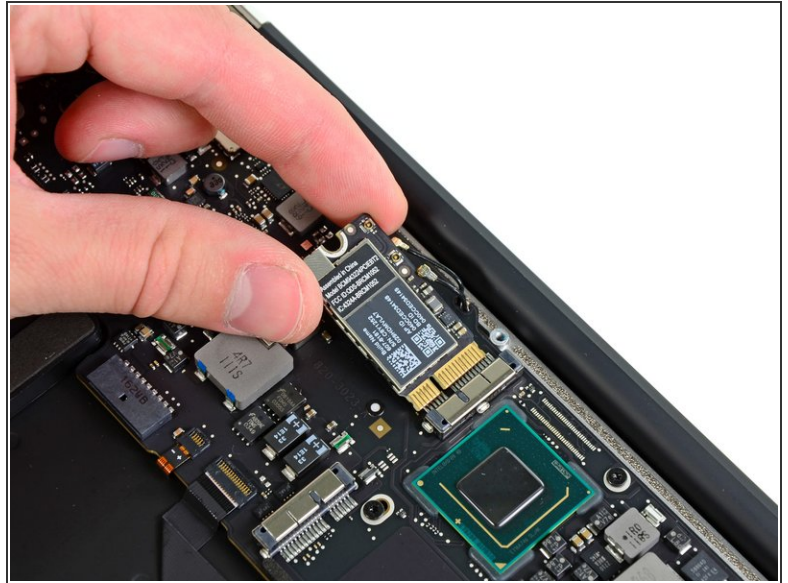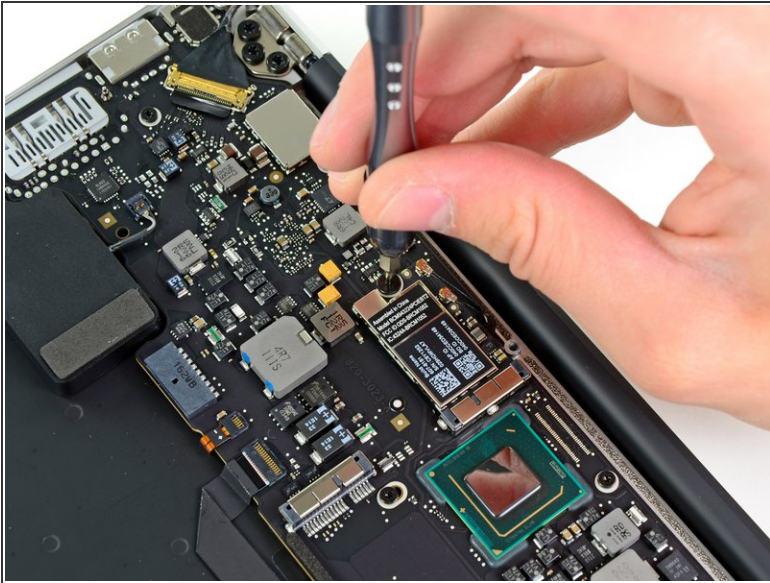
- We've uncovered the Wi-Fi/Bluetooth board in the MacBook Air.

- After disconnecting the antennas and removing a single T5 Torx screw, the board lifts out easily.

Step 7

- The main chips on the mini-PCIe wireless card include:

  - Broadcom BCM4322 Intensi-fi® Single-Chip 802.11n Wi-Fi Transceiver

  - Broadcom BCM20702 Single-Chip Bluetooth 4.0 Processor with Bluetooth Low Energy (BLE) support

    - ⓘ BLE chips hold many advantages over classic Bluetooth including 128 bit AES security, 6 ms latency (classic Bluetooth is 100 ms), and less power consumption.

- It's interesting that there's a spot for stamping the revision and serial number, but that Apple chose not to stamp a unique number on it.

Step 8
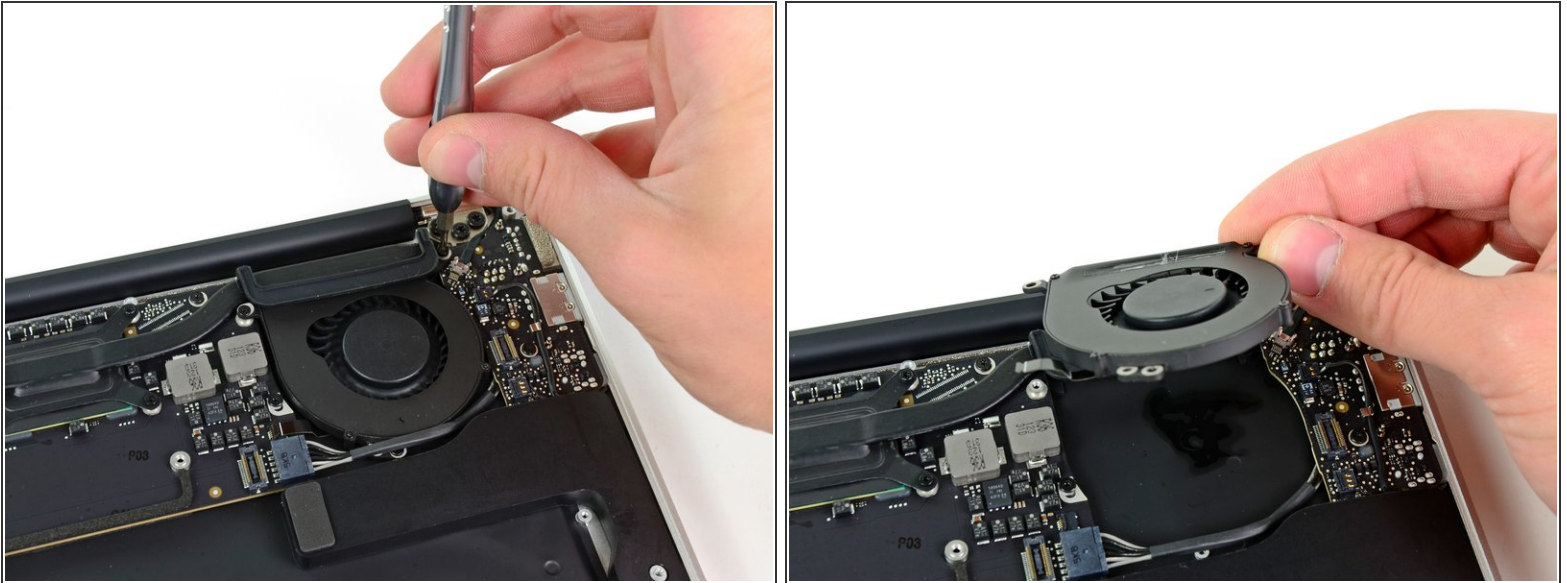
- Removing the fan. Very exciting!

- (i) Judging by the nice oil slick beneath the fan shaft, Apple was concerned about fan lubrication.

- Other than a larger plate to accommodate the bigger die of the Core i5 processor, the heat sink looks nearly identical to the one used on the Core 2 Duo Airs of last year. We'll do some testing to see if temperatures are any higher in this machine.

Step 9
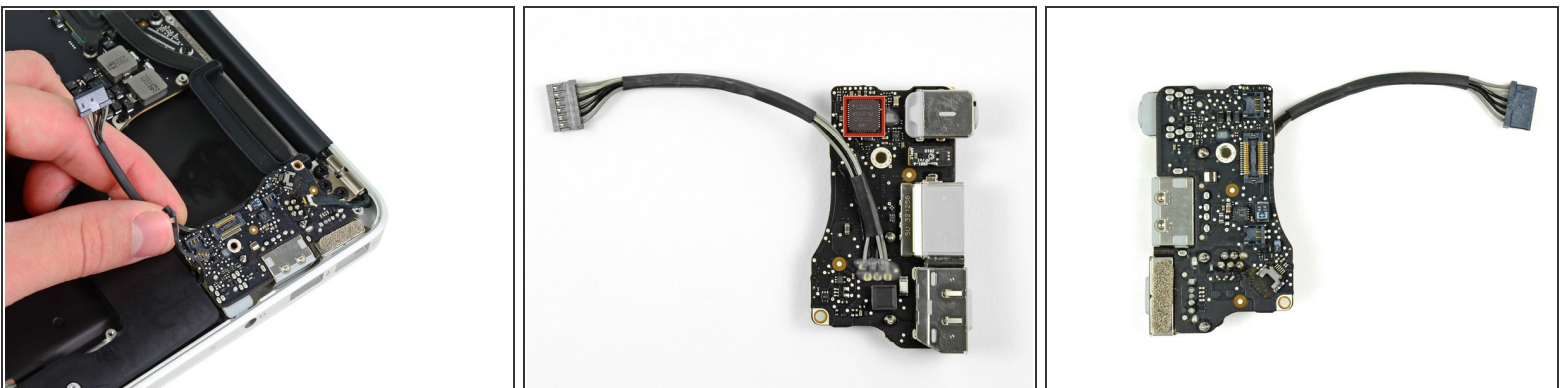
- The I/O board is pretty much unchanged from the previous 13" MacBook Air.

- The Cirrus 4206BCNZ audio controller was also used in last year's Air, as well as most of the Mac lineup in recent history.

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Step 10
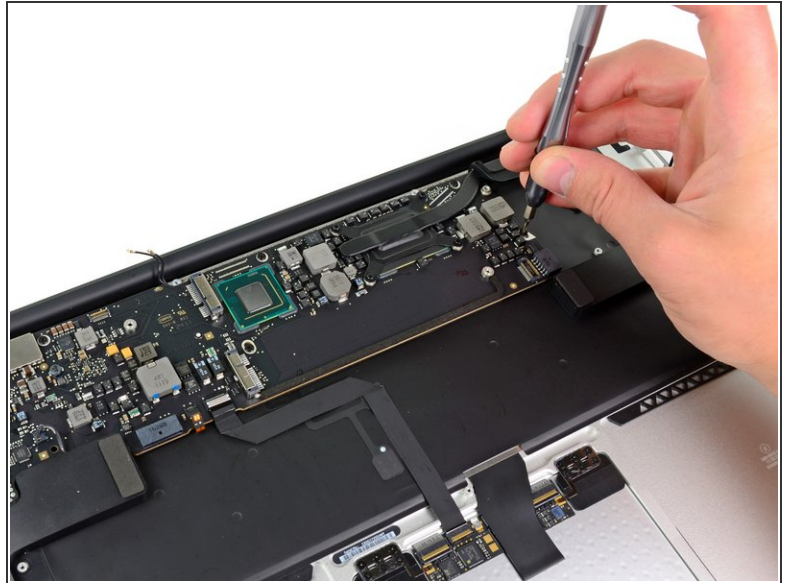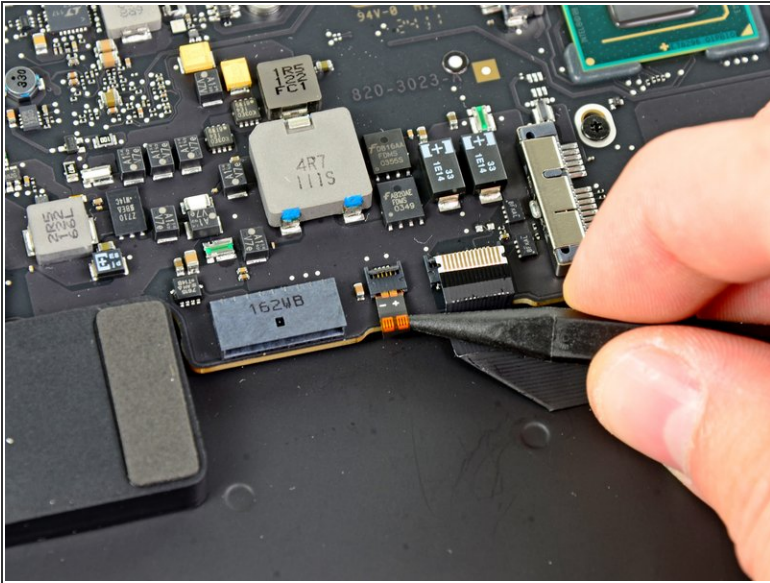
- The cable being disconnected in the first picture is the new keyboard backlight ribbon cable.

  - (i) The backlit keyboard is a returning feature to the Air lineup. It had been removed in the previous-generation model.

- After disconnecting all the cables we could find, we moved on to the T5 Torx screws holding down the logic board.

Step 11
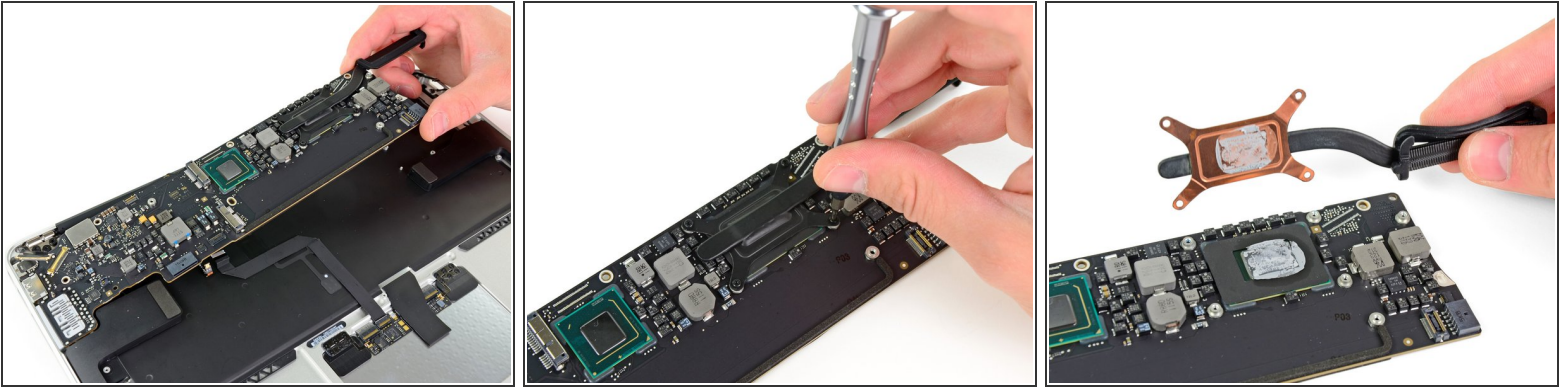
- With that, we can finally remove the logic board from its home.

- To strip down the logic board further, we remove the miniscule heat sink from its cozy position on the Core i5 processor.

- (i) Surprisingly, there isn't too much excess thermal paste between the processor and the heat sink. This is a nice departure from Apple's recent trend of assaulting processors with gobs of thermal paste.
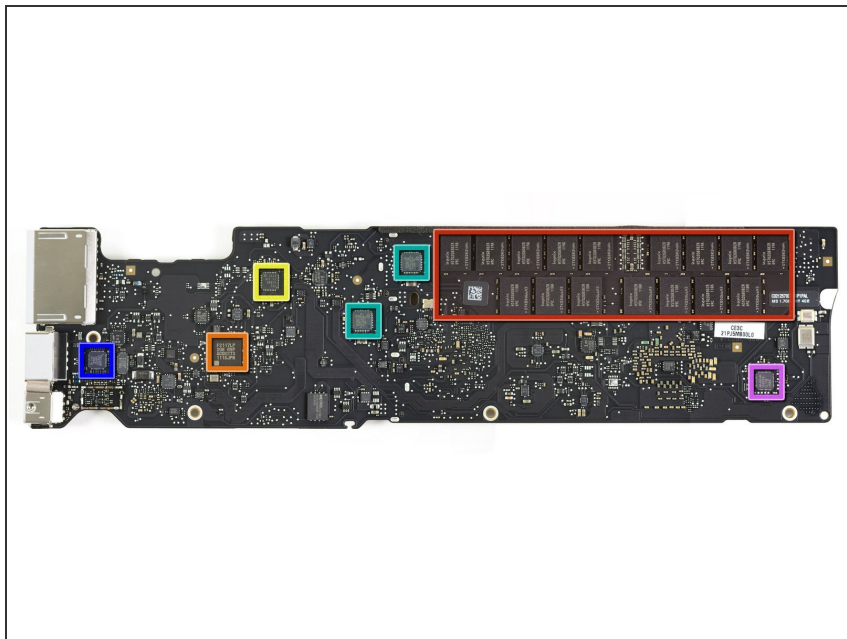
Step 12
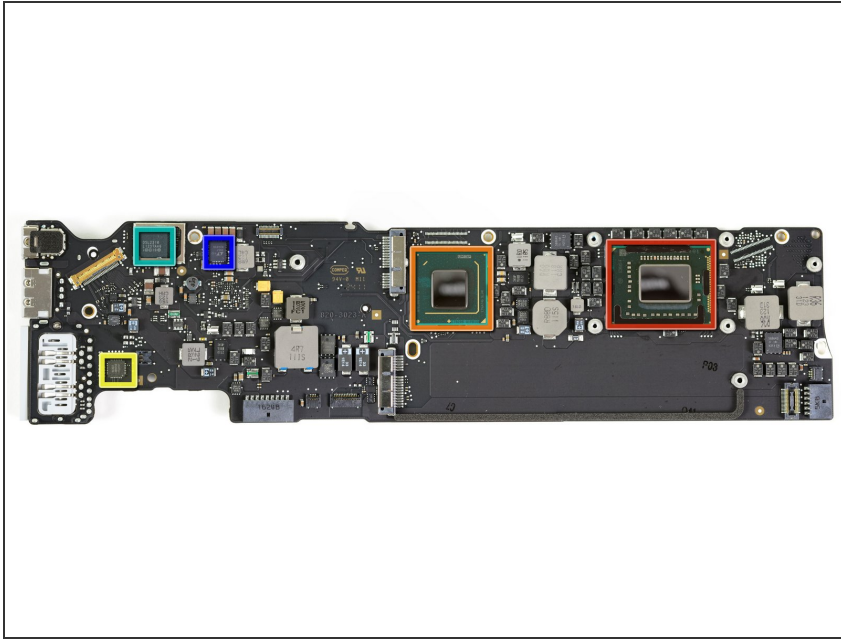
- Major Players on the top side of the logic board include:
  - Intel Core i5 Processor-2557M with integrated Intel HD 3000 graphics
  - Intel E78296 01PB10 / E116A746 SLJ4K Platform Controller Hub. We're guessing this includes an integrated Thunderbolt controller. It's not this part, but it's similar.
  - Genesys Logic 822 SD-slot controller
  - DSL2310 L123TA46 Eagle Ridge SFF Thunderbolt controller
  - Linear Technology 3857
- Shifting to integrated graphics on the processor freed up a lot of room on the board—enough for Apple to add the sizeable Thunderbolt-capable PCH.
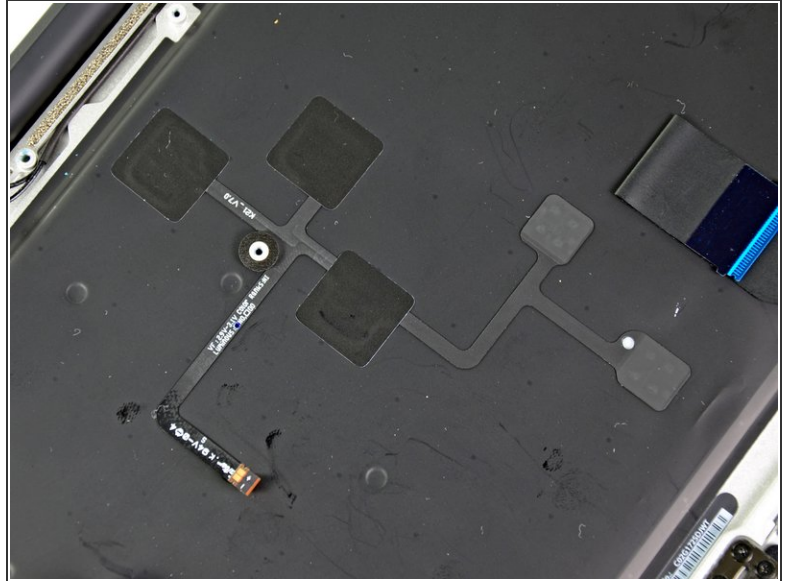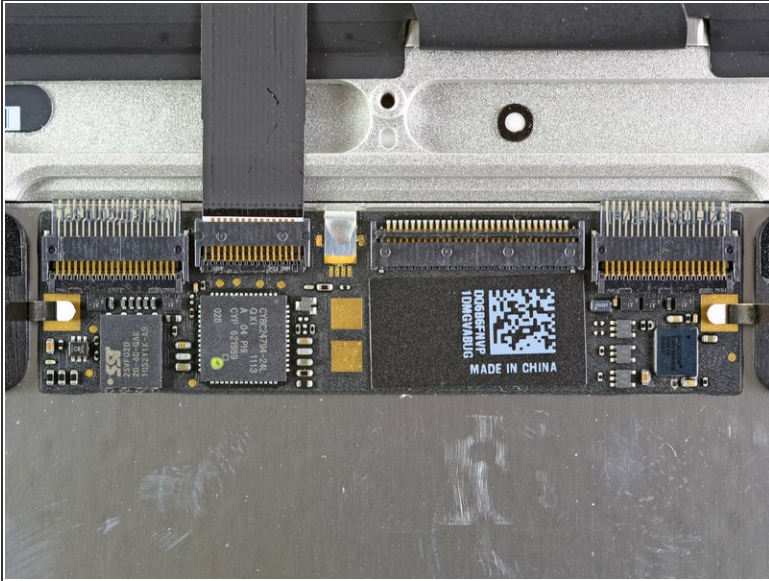- If you're interested in more information on Intel's mobile chipsets, Wikipedia has a lot of interesting information.

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Step 13

- Chips on the back of the logic board board include:
  - Hynix H5TQ2G838ZR 4 GB RAM
  - F2117LP 20H RVP
  - TPS51980
  - SMSC [USB2513B](USB2513B) USB 2.0 Hub Controller
  - Parade PS8301
  - MAXIM 15092G

Step 14

- Next, we turn our attention back to the upper case.

- Here's a big surprise: the circuit board attached to the back of the trackpad is identical to the one on last year's Air.

- A new addition to the upper case is the network of LEDs attached to the keyboard backlight cable. A couple LEDs transmit light through fiber optic channels to evenly illuminate the keys on the keyboard.

Step 15

- The speakers are stuck down to the upper case with some adhesive and can be easily removed.

- Nothing new to see here.

- (i) We've been impressed with the audio quality in Apple's mobile devices lately. High sound quality from such small speaker cones can be attributed to carefully tuning the speaker enclosure to maximize sound output, hence their odd L-shape.
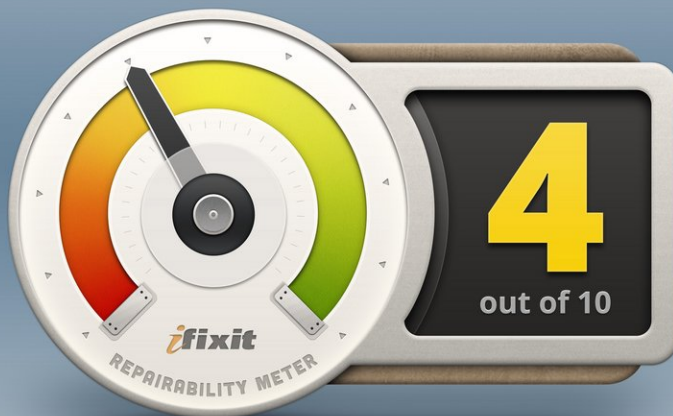
Step 16

- After cranking out a few T8 Torx screws, the display can be removed from the upper case.

- ⓘ This Air is equipped with the same 1440 x 900 LED backlit display as the previous 13" Air.

- The thickness restriction of such a thin display was the deciding factor in equipping the Air with a 640x480 FaceTime camera instead of the 1280x1024 FaceTimeHD model.

Step 17

- MacBook Air 13" Mid 2011 Repairability: **4 out of 10** (10 is easiest to repair).

  - Once you manage to take off the bottom cover, all the parts are pretty easily replaceable.

  - Opening the bottom cover is quite difficult if you don't have the right screwdriver. It's clear that Apple didn't want people to open their machine.

  - All the components -- including RAM and SSD -- are proprietary, meaning that no off-the-shelf parts will work in it without serious rigging.

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