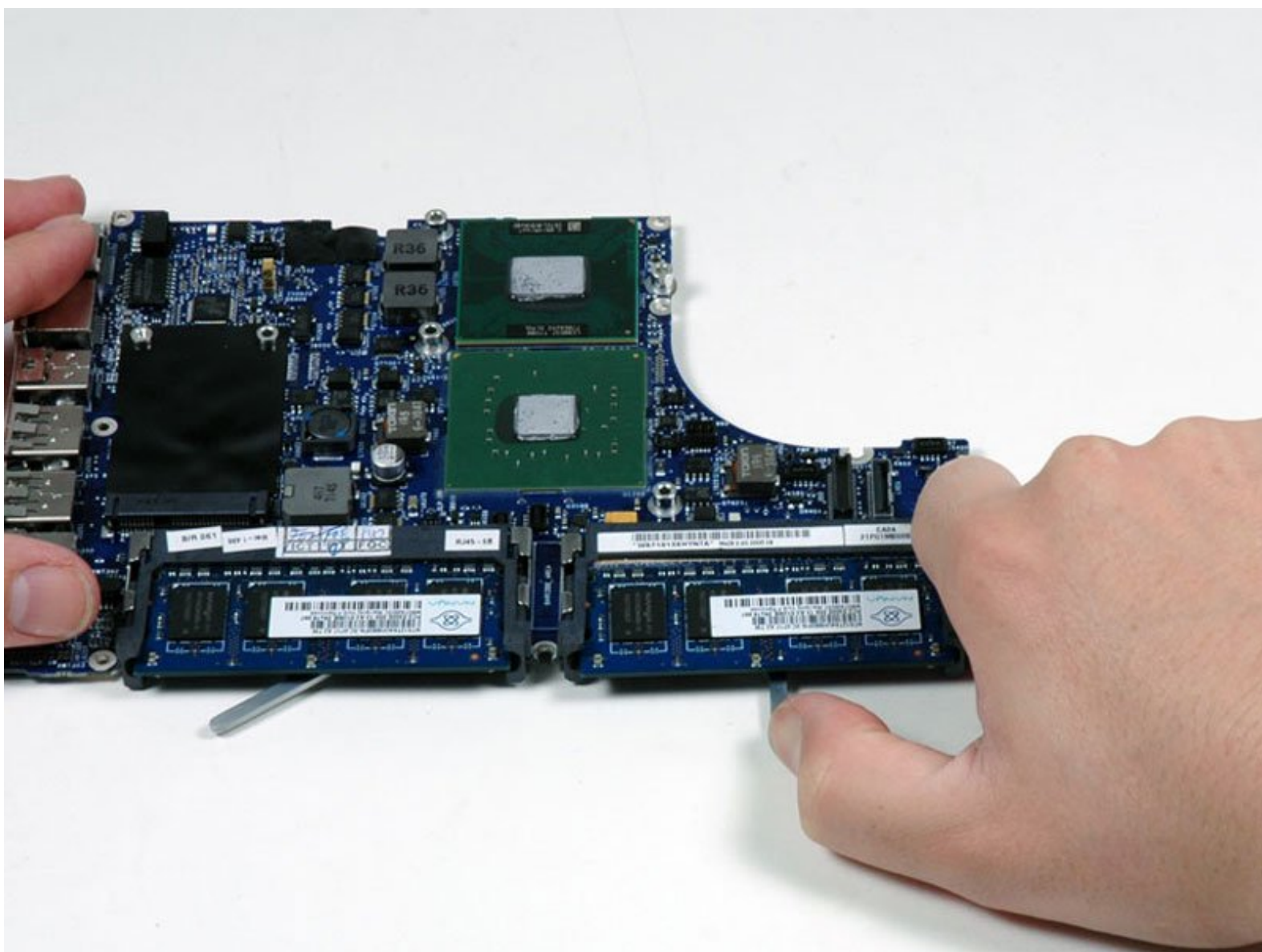




MacBook Core 2 Duo Logic Board Replacement

Written By: iRobot



INTRODUCTION

This motherboard includes all ports on the left side.



TOOLS:

- [Arctic Silver ArctiClean](#) (1)
- [Arctic Silver Thermal Paste](#) (1)
- [Coin](#) (1)
- [Phillips #0 Screwdriver](#) (1)
- [Phillips #000 Screwdriver](#) (1)
- [Phillips #00 Screwdriver](#) (1)
- [Spudger](#) (1)



PARTS:

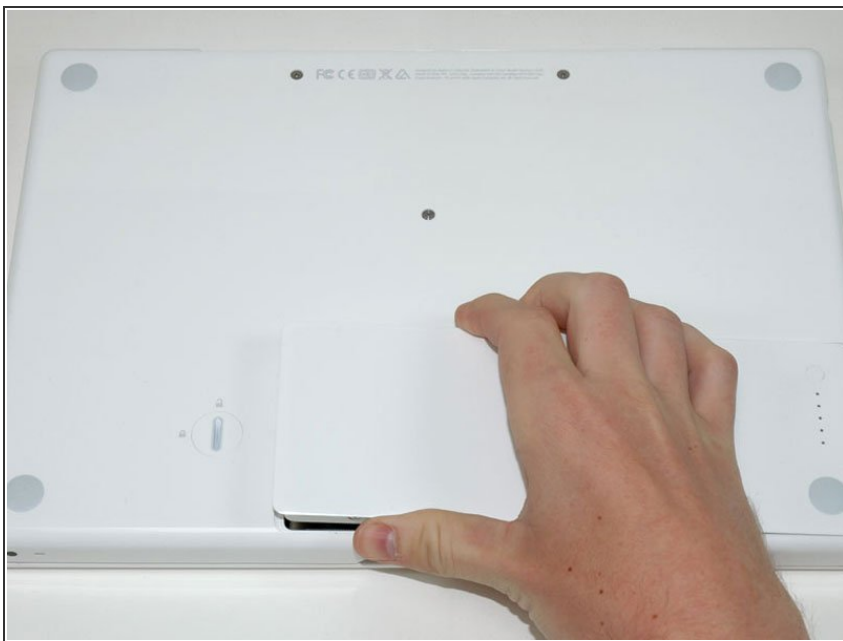
- [MacBook Heat Sink \(Three-wall Connectors\)](#) (1)
- [MacBook Core 2 Duo 2 GHz \(non-Energy Star\) Logic Board](#) (1)
- [MacBook Core 2 Duo 1.83 GHz Logic Board](#) (1)
- [MacBook Core 2 Duo 2 GHz \(Energy Star\) Logic Board](#) (1)
- [MacBook Core 2 Duo 2.16 GHz \(non-Energy Star\) Logic Board](#) (1)
- [MacBook Santa Rosa/Penryn Heat Sink](#) (1)
- [MacBook Core 2 Duo 2.16 GHz \(Energy Star\) Logic Board](#) (1)
- [MacBook Core 2 Duo 2.1 GHz Logic Board](#) (1)
- [MacBook Core 2 Duo 2.2 GHz Logic Board](#) (1)
- [MacBook Core 2 Duo 2.4 GHz Logic Board](#) (1)
- [MacBook \(Mid 2009\) 2.13 GHz Logic Board](#) (1)
- [MacBook \(Early 2009\) 2 GHz Logic Board](#) (1)
- [MacBook 2 GHz Santa Rosa Logic Board](#) (1)

Step 1 — Battery



- Use a coin or spudger to rotate the battery-locking screw 90 degrees clockwise.

Step 2



- Lift the battery out of the computer.

Step 3 — Memory Cover



- Unscrew the three evenly-spaced Phillips screws from along the rear wall of the battery compartment.
- ★ The screws are captive to the metal memory cover so you cannot lose them.

Step 4



- Rotate the L-shaped memory cover so it clears the battery compartment opening and lift it up and out of the computer.

Step 5 — Upper Case



- Remove the following 3 screws:
 - One 11 mm Phillips#00 in the middle of the case. (Head: 5mm dia. x .75mm thick)
 - Two 14.5 mm Phillips #00 (Head: 5mm dia. x .75mm thick)
- ⓘ If the screws stick in the case, you can use a magnetized screwdriver to draw them out.
- ✦ The shorter of the three screws goes in the middle.

Step 6



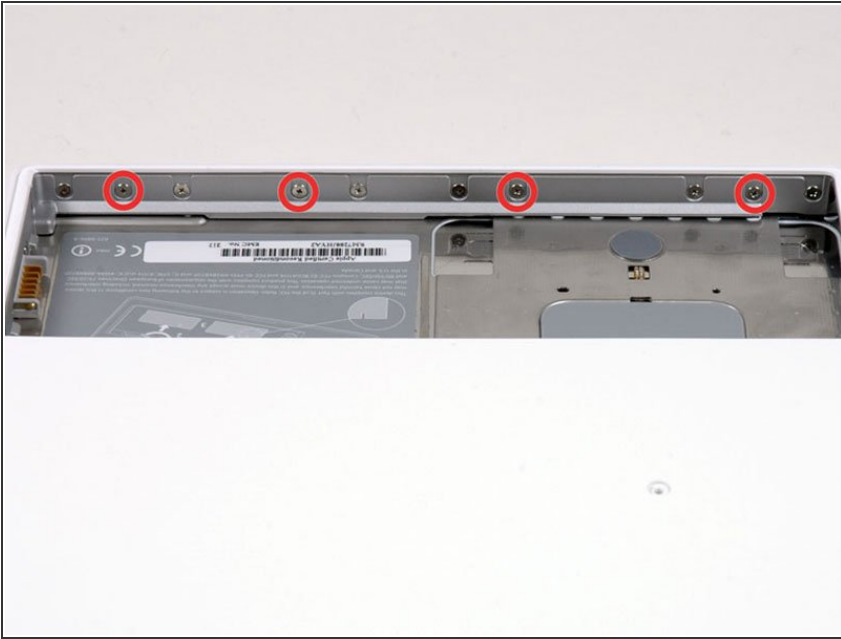
- ⚠ Take extra caution with these screws as they can strip easily!
- Remove the following 3 screws from the rear wall of the battery compartment:
 - One 3 mm Phillips #0. (Head: 2.75 mm. dia.)
 - Two 4 mm Phillips #0 on the either side. (Head: 2.75mm dia.)

Step 7



- Remove the two Phillips screws from either side of the right wall of the battery compartment (not the ones closest to the battery connector).
- Two 6.25 mm Phillips #000.
(Head: 4 mm. dia. x .5mm thick)

Step 8



- Remove the four indicated Phillips screws from the front wall of the battery compartment. When working from the left, remove the 2nd, 4th, 7th and 9th screw.
- Four 3.25 mm Phillips #000.
(Head: 4 mm. dia. x 4mm thick)

Step 9



- Remove the following 4 screws from the back of the computer:
- The longer screws go on the inside, shorter screws on the outside.
- Two 11 mm Phillips #00, with Shank (2.2mm dia. x 2 mm len.)
(Head: 3.2 mm. dia. x .5mm thick)
- Two 7.25 mm Phillips #00, with Shank (2mm dia. x 3.75 mm len.)
(Head: 3.2 mm. dia. x .5mm thick)

Step 10



- Remove the two Phillips screws from the optical drive side of the computer.
 - Two 5.2 mm Phillips #00, with Shank (2.3mm dia. x 3.5 mm len.) (Head: 3.2 mm. dia. x .5mm thick)
- ⓘ It is not necessary to remove the similar screws on the other side of the computer.

Step 11



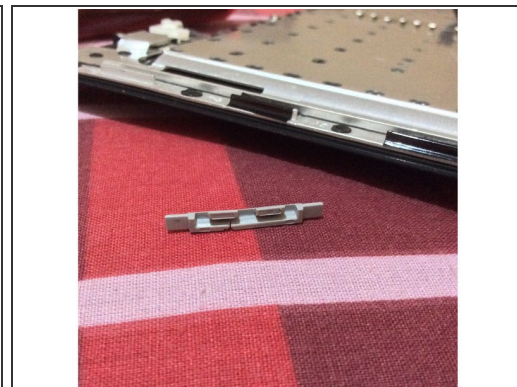
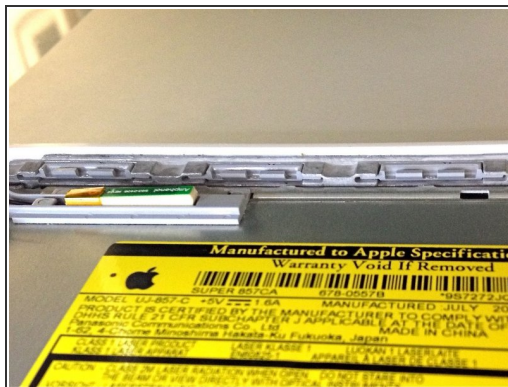
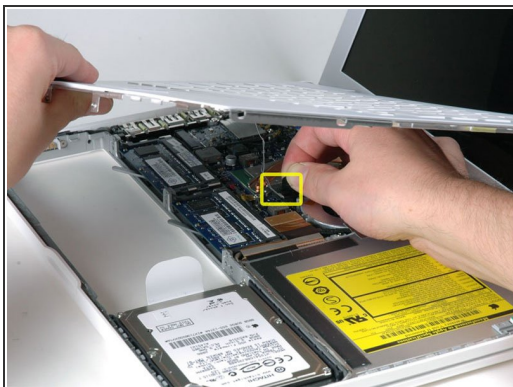
! There's a trackpad and keyboard ribbon connecting the upper case to the logic board, so don't pull the upper case off entirely just yet.

- Starting near the display and working around to the front of the computer, pry up on the upper case. A [plastic opening tool](#) or a medium hard guitar pick may help you to do this.

i The upper case is likely to stick at the connection above the optical drive. If this is the case, first free all other sides, then proceed to pull upward on the upper case from either side of the optical drive opening.

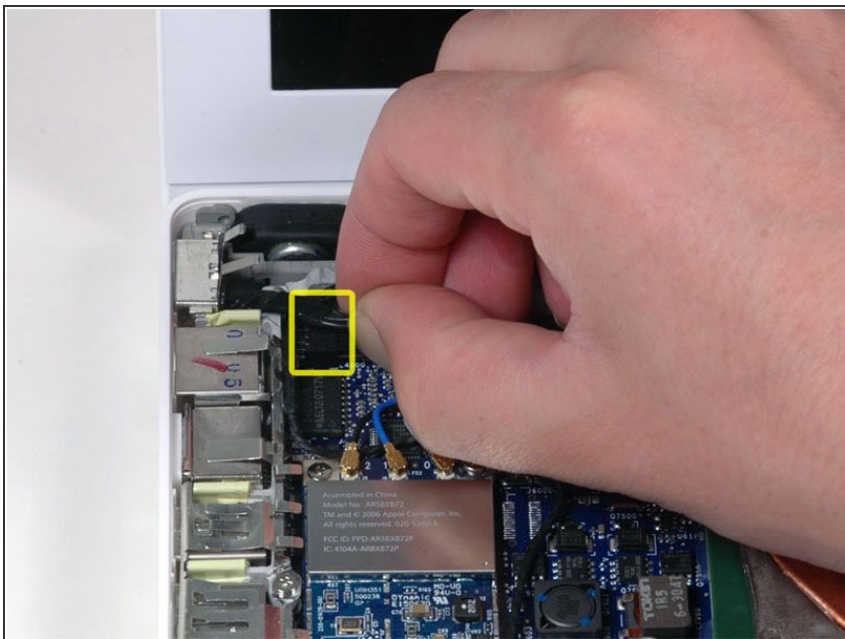
i If you stand the base on end to get a better look you may displace the total of 4 grey plastic clips that hold the keyboard in place. Don't panic. They slide into slots at the top right-most edge near the CD drive.

Step 12



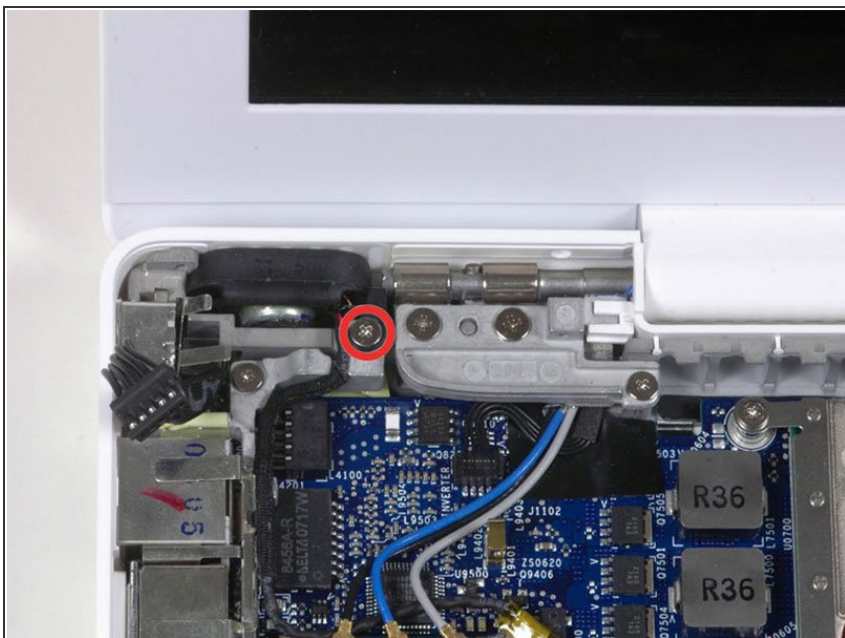
- While holding up the upper case, pull up the black tab of the silver cable away from its connector.
- ⓘ If there is no black tab, you can also use a spudger to gently pry the connector from its housing. This connector is tall, so be sure to pry straight up.
- ⓘ If you happen to break your upper case cable when removing the upper case, we stock the [cable](#) individually and we have a [guide](#) that makes replacing it easy.
- While you have the upper case removed, you may want to take the opportunity to remove dust, hair, etc. It's best to use a can of compressed air, though if you use a brush, make sure that its bristles are made of a material (usually animal hair) that doesn't generate static electricity, which can destroy electronics.
- ⓘ Upon reassembly, there are 4 grey plastic clips on the optical drive side of the keyboard (refer to second picture). They must be installed in their slots for the keyboard to snap in properly.
- ⓘ To make the reassembly process easier, it's better to pull out the clips first by pulling it straight up gently. Be careful not to put too much strength because it will break.

Step 13 — Left I/O Frame



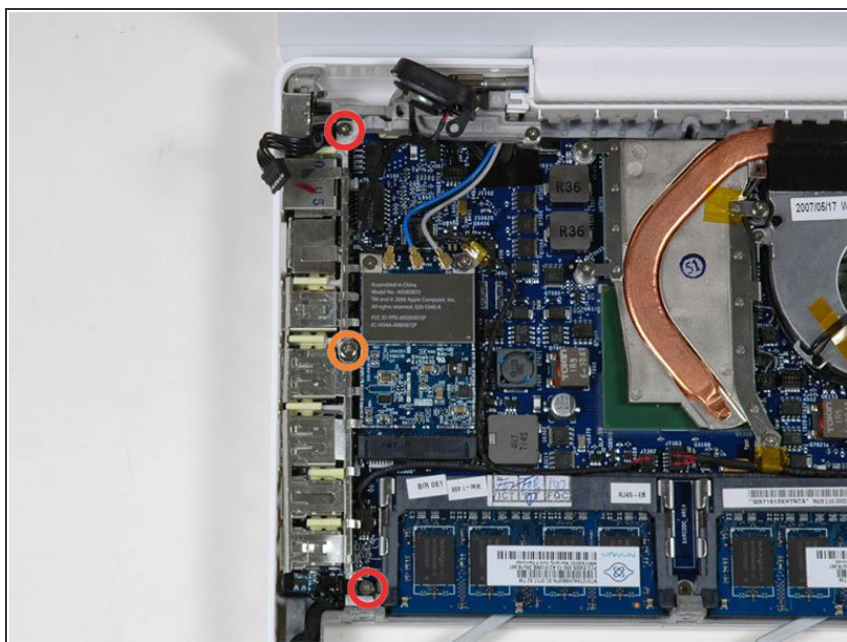
- Disconnect the MagSafe board cable from the logic board by pulling the snap-in connector out (to the right).

Step 14



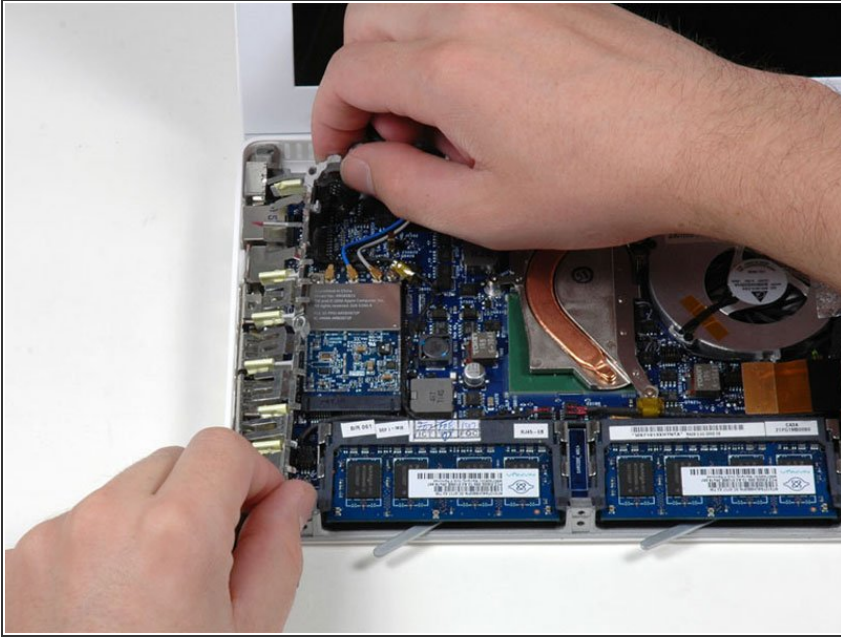
- Remove the single 9 mm Phillips screw securing the left speaker to the lower case.
- Lift the left speaker out of its housing and set it to the side.

Step 15



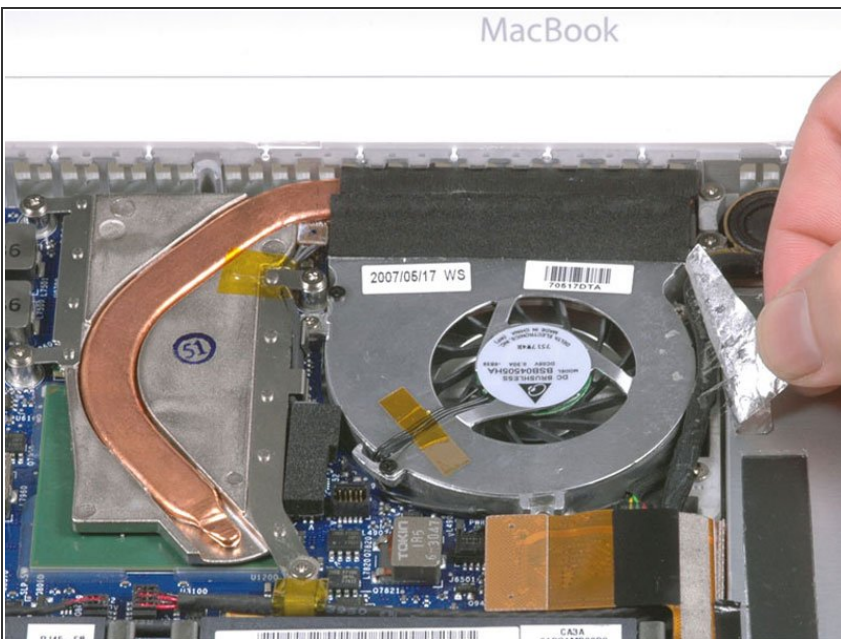
- Remove the following 3 screws:
 - Two 7.5 mm Phillips from either end of the left I/O frame.
 - One 9 mm Phillips from the middle of the left I/O frame.
- ⓘ In some models, all three of these screws may be 7.5 mm.
- Remove the small black plastic spacer at the bottom of the left I/O frame.
- ⓘ Some models such as the Early 2008 may not have a removable spacer at this location.

Step 16



- Lift the left I/O frame up and out of the computer. Pay attention to the thin metal EMI fingers, as they may catch as you remove the left I/O frame.
- ⓘ The speaker wire may be hooked onto the I/O frame. Lift it out of the catch and don't forget to put it back when you are reversing the procedure.
- ⓘ The part of the shield you are removing is attached to other part by little hooks underneath that are hard to see until you have it apart. They're located over the headphone jack and the firewire port.

Step 17 — Logic Board



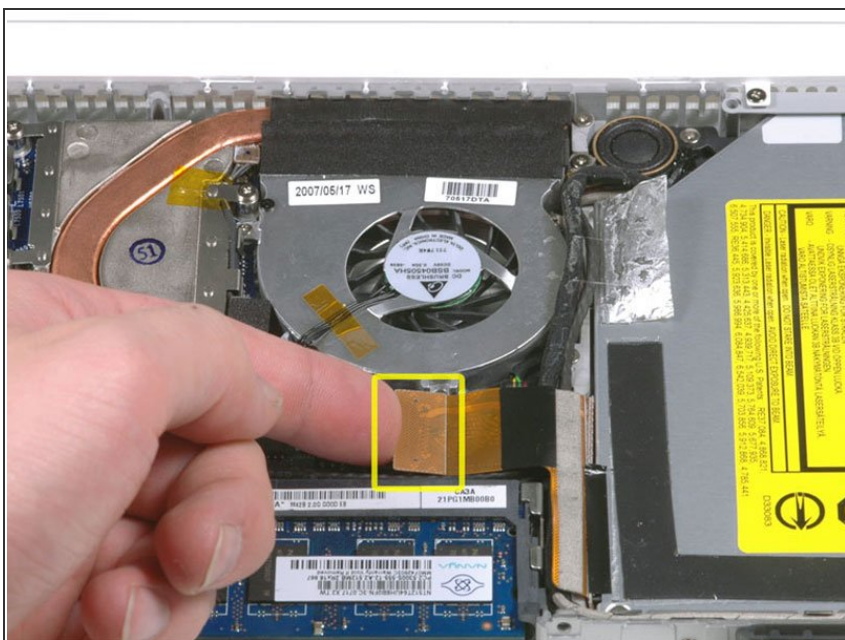
- Peel up the foil tape between the fan and the optical drive.

Step 18



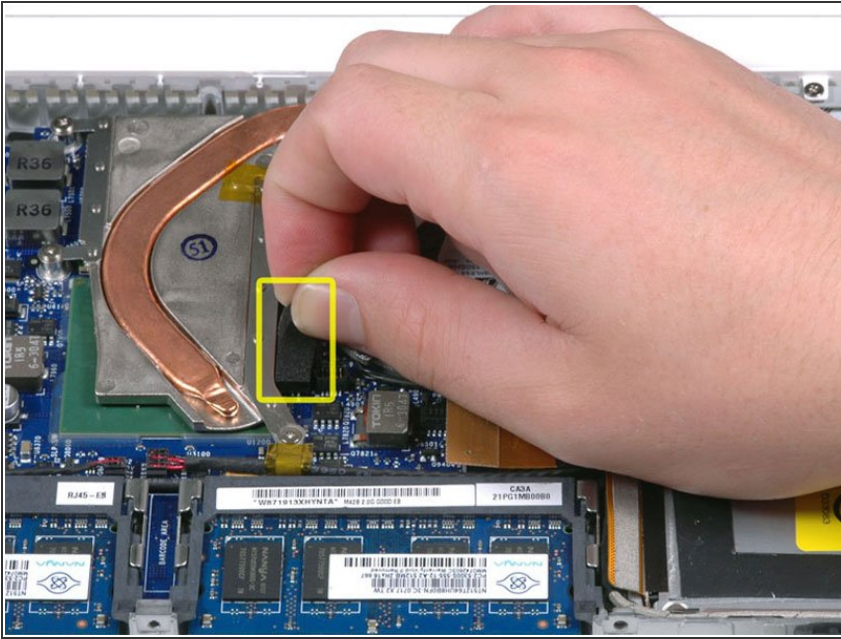
- Use a spudger to move the gray display data and black speaker cables to the right. This will reveal a silver screw securing the fan housing to the lower case.

Step 19



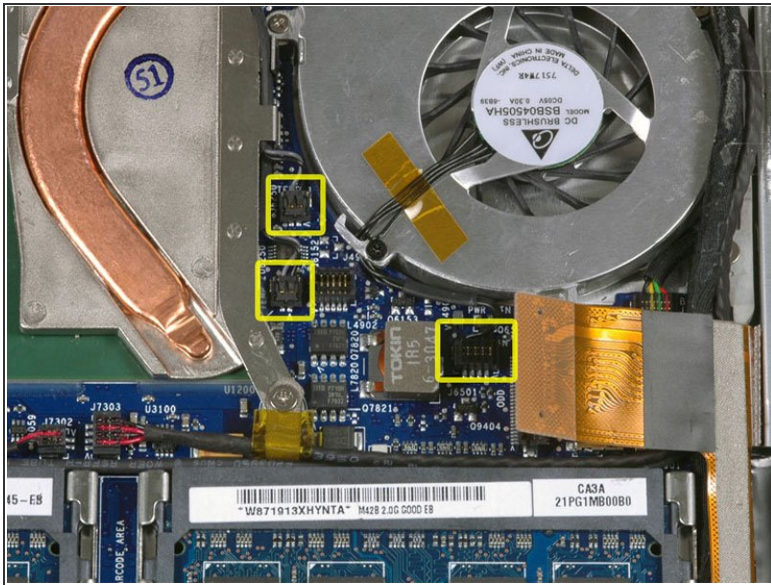
- Disconnect the orange optical drive ribbon cable from the logic board.

Step 20



- Peel up the small black rubber cover from the right side of the heat sink.

Step 21



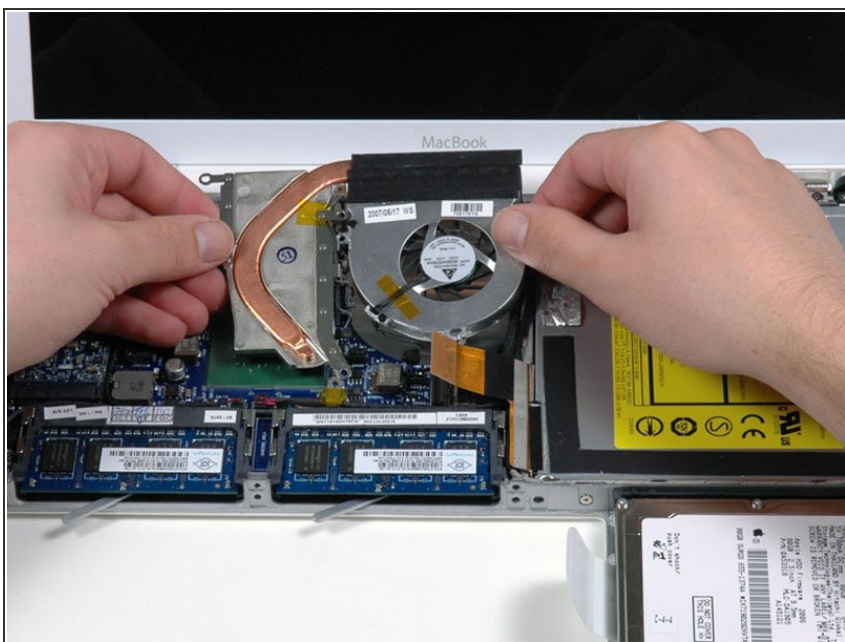
- Disconnect the black fan connector and two temperature sensor connectors from the logic board by pulling/prying them directly up.
- ⓘ Don't try to slide the connector plugs out of their sockets, in the same plane as the logic board, since that may break them.
- ⓘ If you have a MacBook Core 2 Duo Santa Rosa/Penryn/Early 2009, there is only one temperature sensor.
- ☞ The heat sink in early 2009 MacBooks may look slightly different.

Step 22



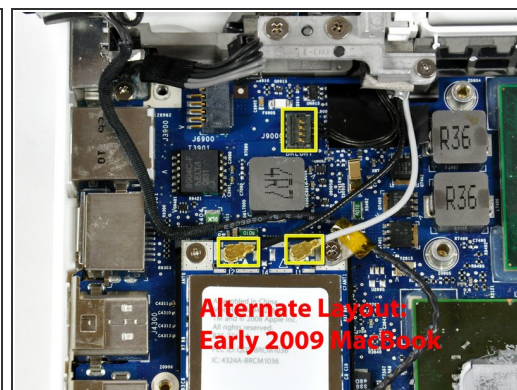
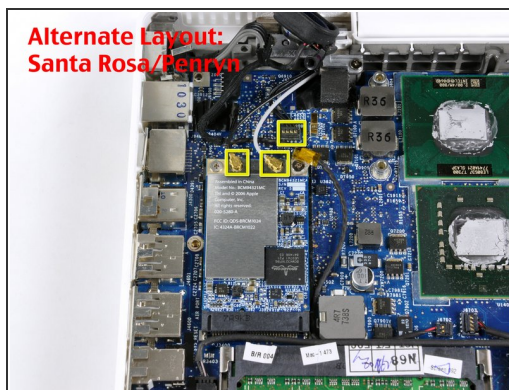
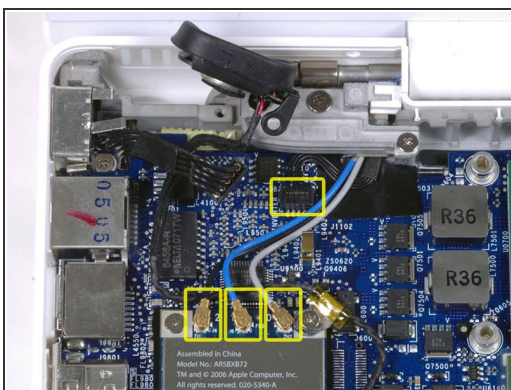
- Remove the following 6 screws:
 - One 3 mm Phillips on the right side of the fan.
 - One 6 mm Phillips on the left side of the fan.
 - Four 9 mm Phillips securing the heat sink to the lower case.

Step 23



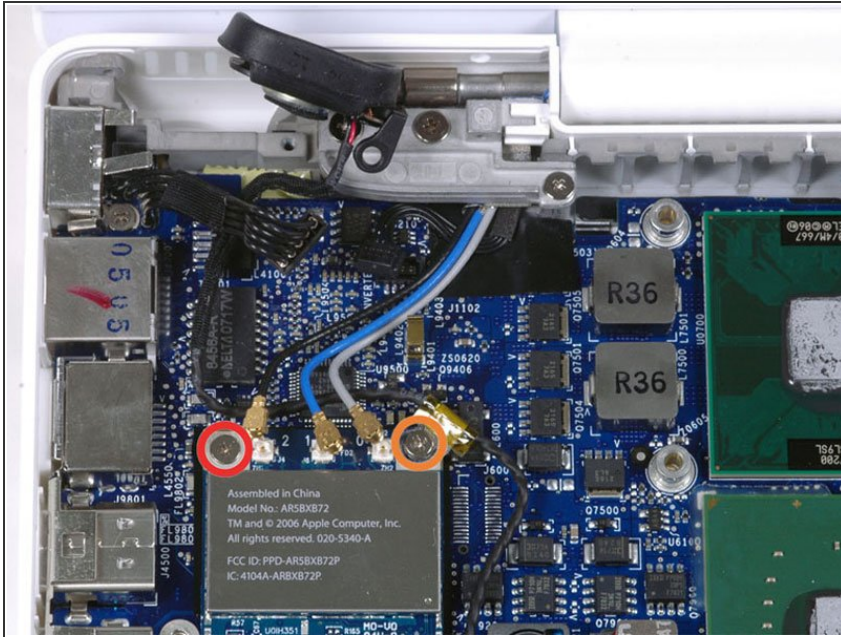
- Hold the heat sink with one hand and the fan with your other hand, and lift the heat sink and fan assembly out of the computer. The fan is attached to the heat sink only with a strip of black felt tape, so be sure to remove both parts as a unit.
- ❗ If you need to mount the heat sink back into the laptop, we have a [thermal paste guide](#) that makes replacing the thermal compound easy.

Step 24



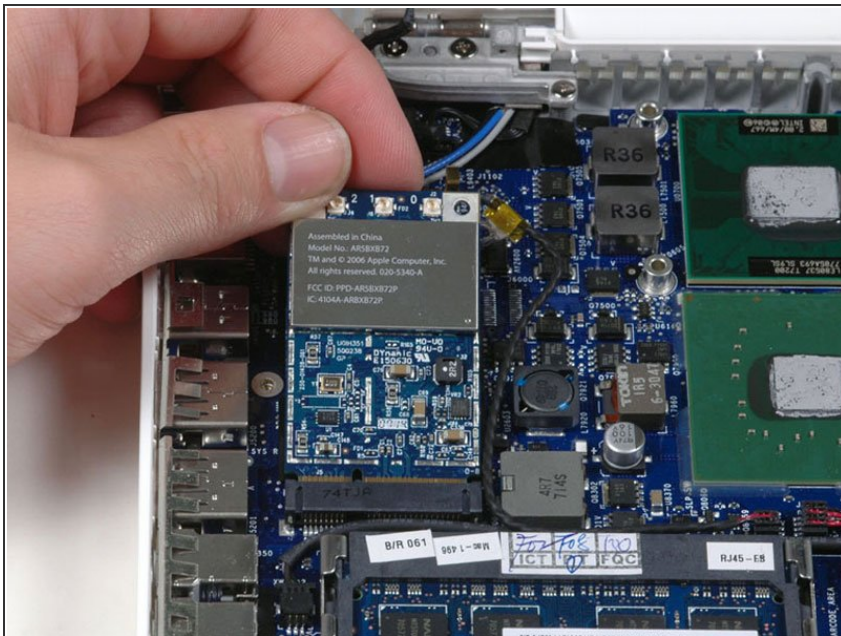
- Disconnect the three antenna cables from the Airport card, and the black inverter cable from the logic board.
- ❗ If you have a MacBook Core 2 Duo Santa Rosa/Penryn/Early 2009, there are only two antenna cables and the black inverter cable's connector is closer to the upper end of the Airport card.

Step 25



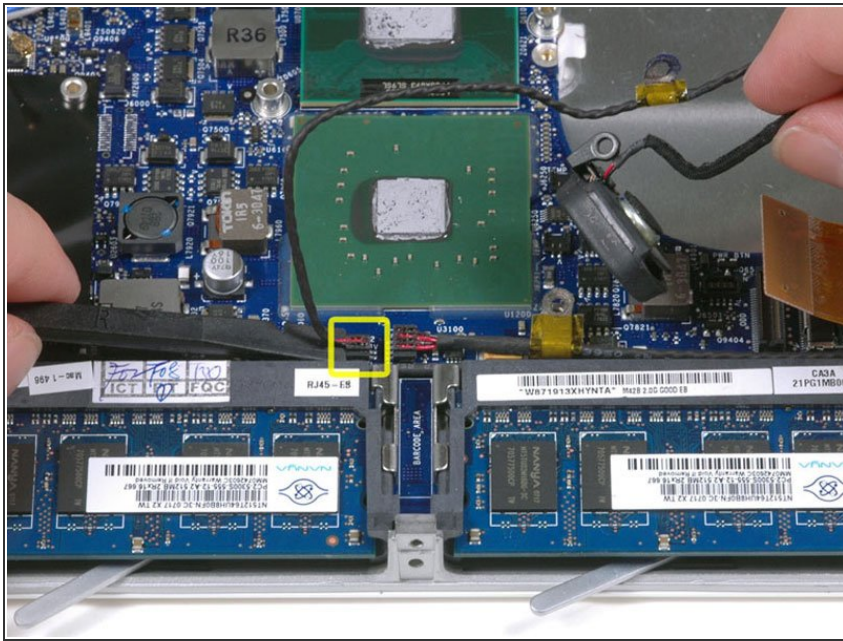
- Remove the following 2 screws from the Airport card:
 - One 3 mm Phillips from the left side.
 - One 8 mm (with a large 2 mm head) Phillips from the right side.

Step 26



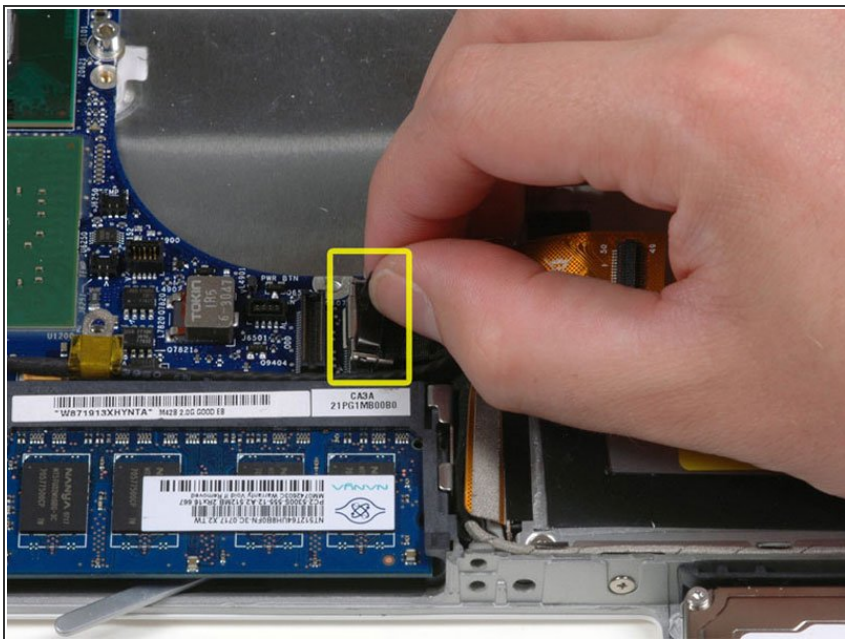
- Grasp the Airport card at its top and slide it toward the screen and out of the computer.

Step 27



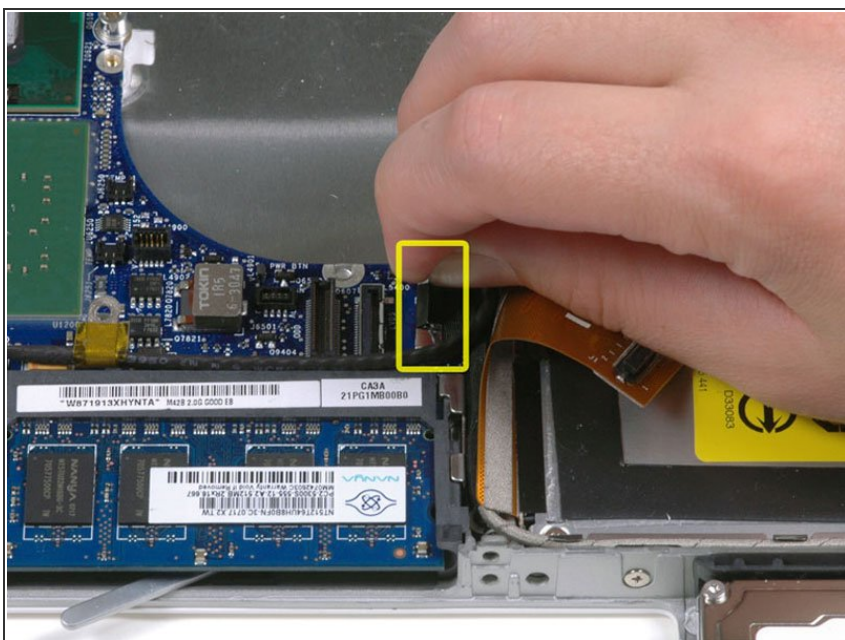
- Use a spudger to disconnect the left speaker connector from the logic board.
- Lift the left speaker out of the computer.

Step 28



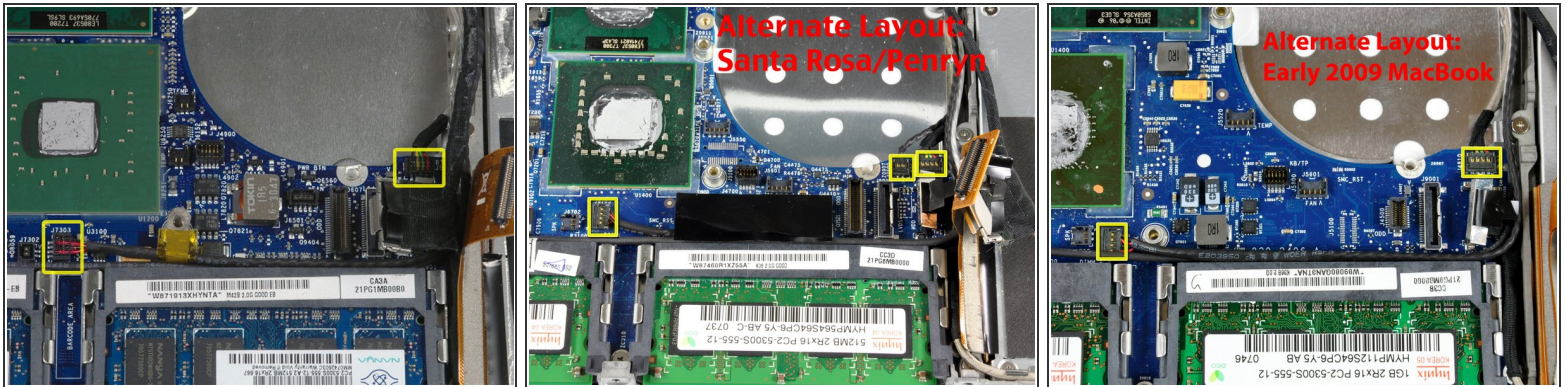
- Disconnect the display data cable by pulling up on the black plastic pull-tab. If there is no pull-tab on the top of the connector, it may be helpful to use a spudger to disconnect this connector.

Step 29



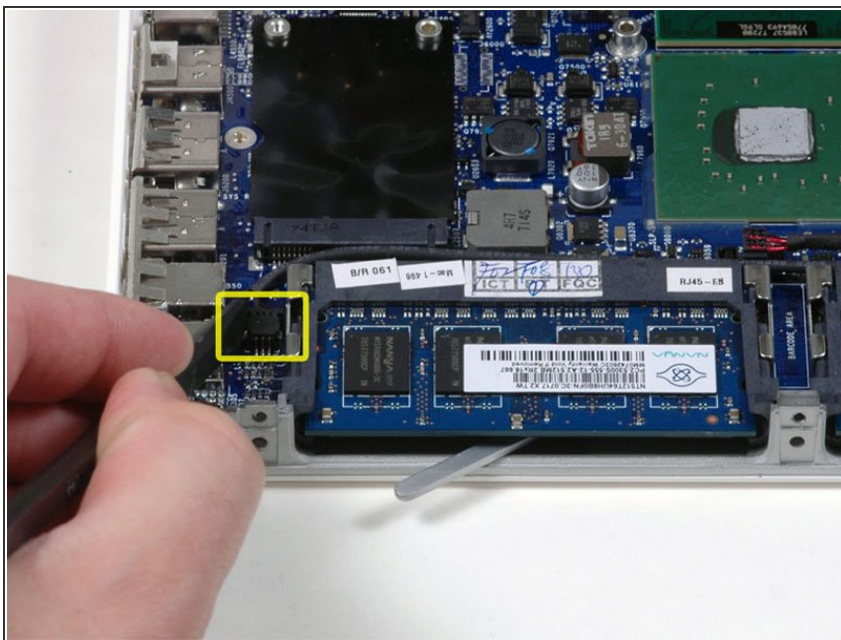
- Disconnect the newly-revealed hard drive cable from the logic board.

Step 30



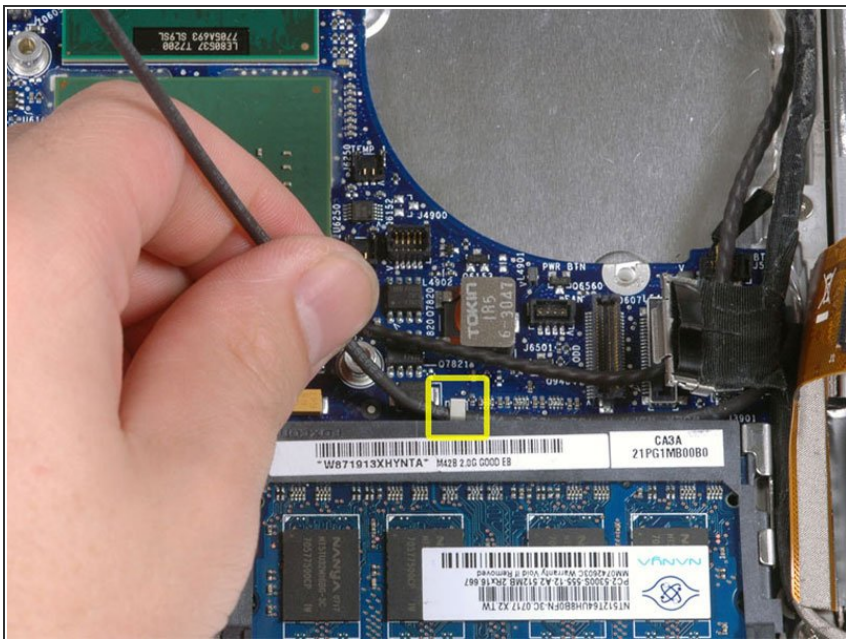
- Use a spudger to disconnect the speaker connector and bluetooth connector from the logic board.
- ❗ If you have a MacBook Core 2 Duo Santa Rosa/Penryn, disconnect the PRAM battery cable.

Step 31



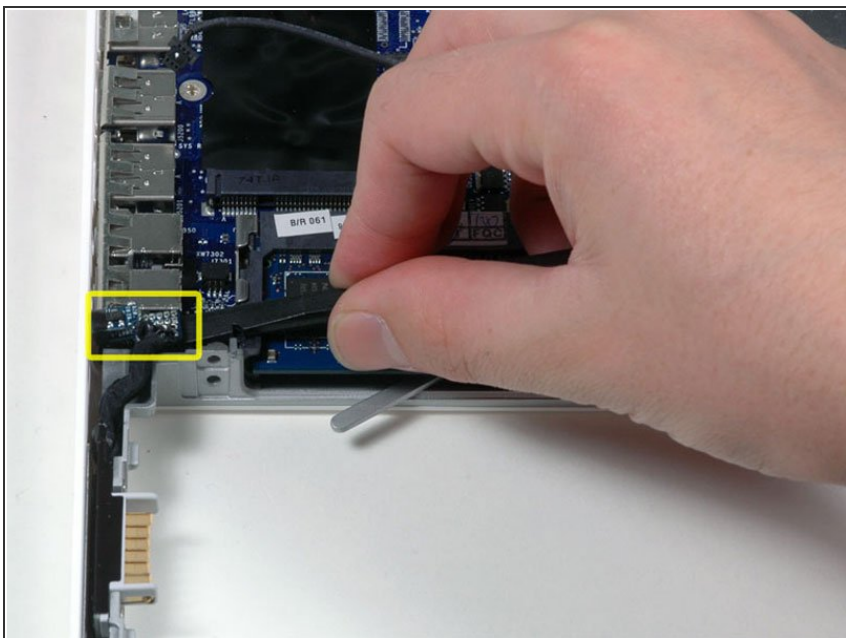
- Use a spudger to carefully disconnect the microphone cable from the logic board. You'll want to work from side to side, and slowly wiggle the connector out of its socket.

Step 32



- Deroute the microphone cable from the silver metal clip just above the right RAM slot.
- ⓘ This metal clip may not be present on some Santa Rosa/Penryn models.

Step 33



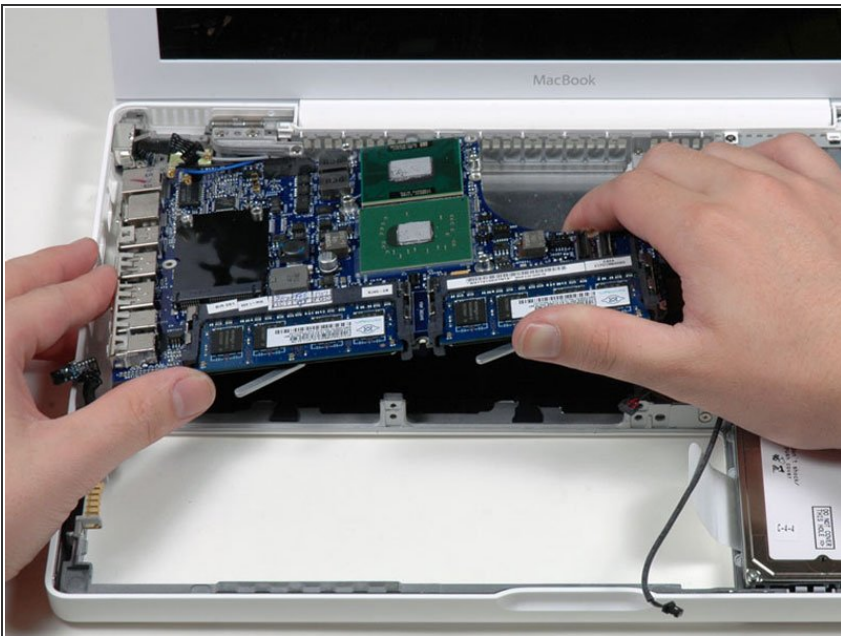
- Use a spudger to carefully pry the battery connector up and disconnect it from the logic board.

Step 34



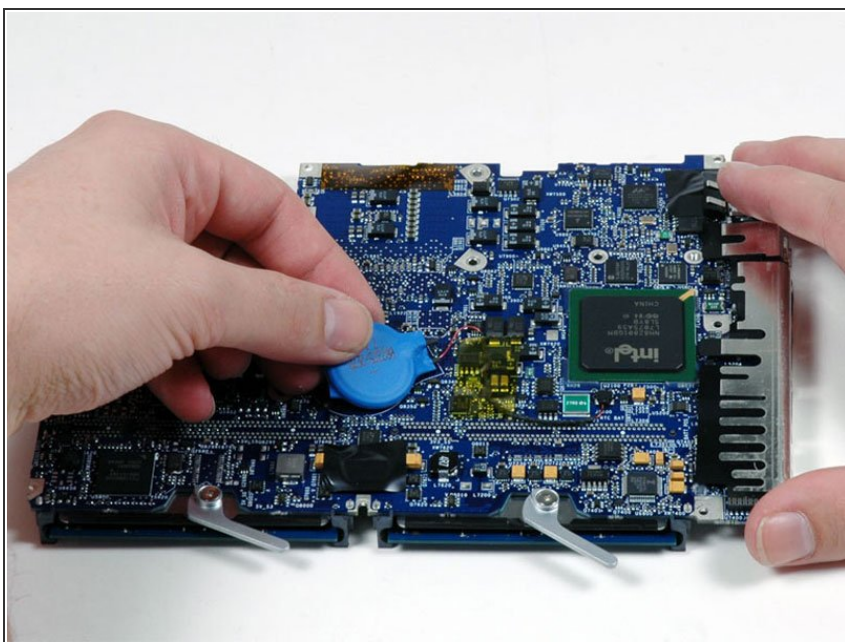
- Remove the three 3 mm Phillips screws securing the logic board to the lower case.

Step 35



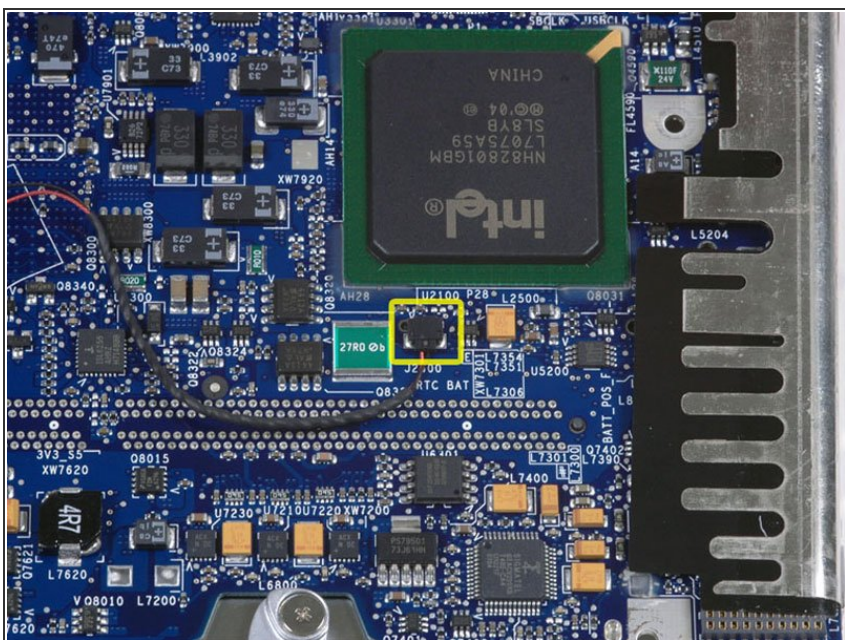
- Lift the logic board up from the right side, and slide it up and out of the computer.
- ⓘ If you removed the shield from the ports, make sure to reinstall the shield before reinstalling the logic board, since the port shield can't be reinstalled once the logic board is installed into the bottom housing.

Step 36 — Logic Board



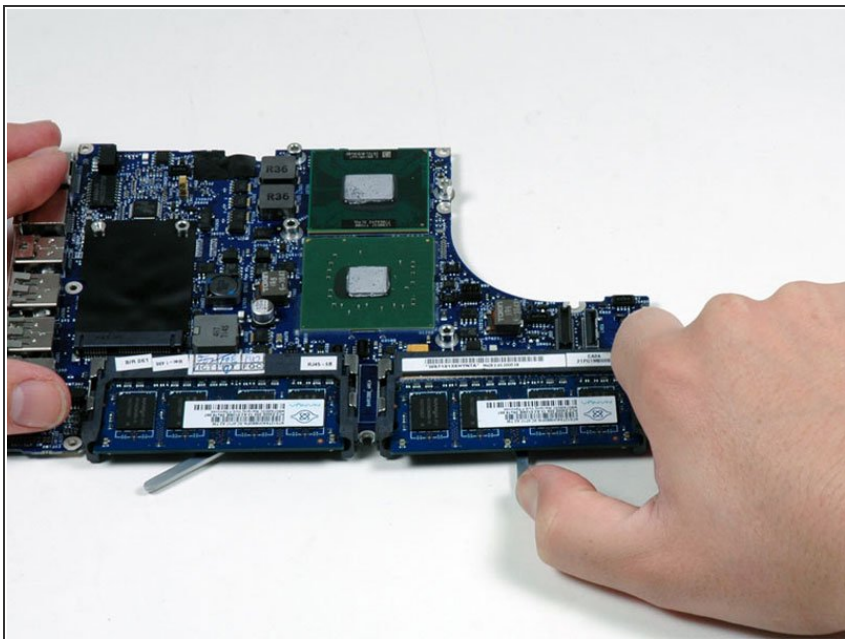
- Turn the logic board over.
- Peel the PRAM battery up from its location on the logic board, removing tape as necessary.
- ❗ If you have a Macbook Core 2 Duo Santa Rosa/Penryn, the PRAM battery is not located on the logic board. Please skip this step.

Step 37



- Disconnect the PRAM battery cable from the logic board and remove the PRAM battery from the computer.
- ❗ If you have a Macbook Core 2 Duo Santa Rosa/Penryn, the PRAM battery is not located on the logic board. Please skip this step.

Step 38



- Pull back on the metal lever and slide the RAM chip out of the logic board.
- Repeat this process for the other RAM chip if there are two RAM chips currently installed in your computer.

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