



### **Macbook 13-inch Repair Guide**

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#### **TAKE-APART**

Our guides will show you step by step how to take apart your Mac. Each step will be given in great detail and aided with high guality pictures.

#### REPAIR

Our Manuals will also show you what needs to be done for each ailment your Mac may be having.

#### REASSEMBLE

The hardest part about a repair is reassembly. Our guides will assist you in getting those screws back where they came from

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### Your Mac. Our Patient.

At PowerbookMedic.com, we treat each customer and each Mac like a patient. We understand the importance of your Mac in your life, as they are equally important in our own lives. Whether your Mac is healthy or sick, we hope you choose us to be your Macs doctor.

### **Customer Support.**

You aren't a tech. We understand and we're here for you.

Live Support ( Online 9AM - 4PM CST) Phone Support - 1-866-726-3342

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#### **Disclaimer**

Any portion of this manual may not be copied, reproduced, or distributed without the written consent of Powerbookmedic.com. Violaters will be prosecuted.

This manual is presented as a guide in order to help you repair problems with your machine. Working on electrical components can be dangerous if not done properly. We at Powerbookmedic.com take no responsibility for any damage or harm done to yourself or your machine as a result of reading this guide.

Apple manufactures several revisions in each line of their products. This guide will try to cover each of these revisions, but you may find subtle differences between our manual and what you see in your unit. This may require small adjustments to the repair procedure as described in our manual. If you are confused at what you are seeing in comparison to the manual's description and pictures, you may contact us by email or by using our forums and we will try to assist you.

As of the writing of this manual, Apple's warranty policy denotes that opening up your Apple product will void the warranty. If you are still under coverage by Apple for your unit, we would suggest contacting them before performing any repair.

#### **Repair Center**

Powerbookmedic.com offers a repair service if you do not feel confident on performing the repair yourself after reading this manual. The repair service is a flat labor charge plus the cost of the parts needed.

You can view our labor fees on our website by clicking on the repair center link at the top of homepage.

#### **Suggestions?**

Powerbookmedic

If you see any problems with the manual, tips you would like added, or any suggestions to make the manual better, please email us at.. support@powerbookmedic.com

# **TOOLS NEEDED**

#### **Spudger Nylon Tool**

Needed to pry up connector cables and to access hard to reach areas. <u>Click Here to get this tool from our</u> <u>store.</u>

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#### Philips Size #00 Screwdriver

Needed to remove all of the small Philips head screws in the unit. Click Here to get this tool from our store.



#### Torx(r)T8 Screwdriver

Needed to remove hard drive bracket screws only. <u>Click here to get this tool from our</u> store,

#### Other tools...

Unlike other units, the 13-inch Macbook requires few tools, and the three tools above should be all you need to get any job done.

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# **13" MACBOOK REPAIR GUIDE**

### **Introduction:**

General information on the 13" Macbook Models.



# YOUR FIRST LOOK AT YOUR MACBOOK...

With your first look, you may be wondering "How do I get into this thing!". Don't worry, this guide will show you just what you need to know!

The MacBook 13-inch line was released in May of 2006, and serves as a replacement to the popular iBook line of laptops. The Macbook line is primarily geared towards your average consumer and thus has generally lower specs than its big brother, the MacBook Pro.

At the time of writing this manual, the MacBook is available in two colors; white and black. The units feature a 13.3" widecreen LCD and are available as either 1.83 GHz or 2.0 GHz machines. Both the 1.83 and 2.0 GHz models come as either Core Duo or Core 2 Duo processors. The Core 2 Duo processors were released after the Core Duo machines, and have speed advantages over the Core Duo machines. If you have 1.83 GHz machine you can upgrade to a 2.0 machine. However, you can not upgrade from a Core Duo to a Core 2 Duo. The MacBook is available with both combo and superdrives. If you purchased your unit with a combo drive, it is possible to upgrade to a superdrive.

The MacBooks come standard with 512MB of ram which is usually distributed as 2x 256MB chips. The max ram on this unit is 2GB which can be achieved by installing 2x 1GB chips.

The standard hard drive on the MacBooks is 60GB which can be upgraded to 200GB (at the time of writing this manual).

At our online store you'll be able to find virtually every part or upgrade you need for your machine. If you can't find it, email us and we should be able to get it for you.



#### Before Surgery... Use the following page to prep yourself before going into the patient.

# **GETTING STARTED...**



Click for Larger Image



Click for Larger Image

#### **Removing the Battery**

Top image - The technician is using a Spudger tool to unlock the battery.

Bottom Image - The tech is pulling up and removing the battery.

#### **Getting Started...**

Before performing any repair, unplug the unit from the wall, and remove the battery! You do not want to have any current running through the machine while working on it.

Also, do not perform a repair on the carpet as it holds a lot of static electricity that could damage your unit. Perform your repair on a hard level surface such as a computer desk, kitchen table, or ESD work bench.

After unplugging the machine and removing the battery, you'll want to discharge any static electricity in your body. To do this, just touch a piece of metal on your workspace. This will discharge any electricity from your body. If you get up and walk around during the repair make sure to always touch some metal before touching your unit to make

sure you have discharged any static from your body.

### Remove the battery before any repair!

#### **Removing the Battery...**

To remove the battery, simply insert your Spudger into the battery lock and turn he Spudger to the right (to the unlock graphic). Hold the tool in this position, and the battery will pop up slightly. Grab the battery with your other free hand, and pull it up and out of the unit. One the battery is removed, you can remove your Spudger from the lock mechanism.

To replace the battery, line the battery back up in the unit with the right edge corner going in first. Then, hold the battery down and use your Spudger to turn the battery back to the left towards the locked graphic.

# The "L" Bracket

The L-Bracket is responsible for covering the access points to the RAM slots and hard drive bay. It also shields screws that must be removed to remove the top case. Therefore, the L-Bracket will have to be removed for every repair on the Macbook.

# Previous Steps Required...

Battery Removal

Remove the 3 Philips head screws holding down the "L" Bracket. The exact positioning is shown in the picture to the right. The screws should stay attached to the bracket.

2

Lift the bracket up and out of the battery bay as shown in the second picture to the left.

# Memory

### Previous Steps Required...

Battery Removal L-Bracket

After removing the L-Bracket you will see a metal lever. Pull on the lever, as in the picture below to remove the memory currently installed in your machine.

There are two slots, and therefore two levers. If you pull on a lever and RAM does not pop out, then that slot is likely empty. Grasp the memory and pull it out of the slot.

To reinstall the memory, just slide the chip into the slot. If you aren't sure which way it goes, look at the picture in the battery bay



Click for Larger Image



Click for Larger Image



#### Click for Larger Image

#### **L-Bracket and Memory**

Top image - The technician is using a Spudger tool to unlock the battery.

Bottom Image - The tech is pulling up and removing the battery.

Left Hand Image - Release the latch to pop out the memory

### **Hard Drive**

The MacBook uses a Serial ATA (SATA) drive. This is different from Powerbook and iBook drives which have an IDE interface. You can order hard drive replacements from our online store.

### Previous Steps Required... Battery Removal

L-Bracket

On the left hand side of the battery bay, you should notice a white plastic tab. Use your Spudger to pull out the tab so that you can easily grab it with your fingers.

Grasp the plastic tab and pull out. The hard drive is connected to the tab, and it should come out easily.

If you are installing a new drive, you will need to transfer the sled from the old drive to the new one. To do this, remove the 4 Torx T8 screws from each side of the drive.

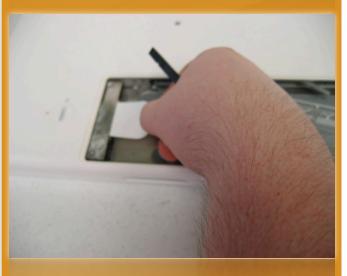
Remove the sled from the old drive, transfer it to the new drive, and reinstall the 4 Torx (r) T8 screws.



Click for Larger Image



Click for Larger Image



#### Click for Larger Image

#### **Hard Drive**

Top image - Locate the Hard Drive Tab.

Bottom Image - Pull the tab to release the hard drive.

Left Hand Image - Remove the two T8 screws on each side of the drive to remove the sled.



Click for Larger Image

#### **Removing the Battery**

*Top image -* Remove 2 5mm Screws from battery bay.

Bottom Image - Remove 3 4mm screws from battery bay.

*Right Hand Image -* Remove the 2nd,4th,7th, and 9th screws from battery bay.

### **Top Case / Track-pad Assembly**

The top case on the Macbook must be removed to access all of the main internal components of the unit. On the Macbook, the keyboard is integrated into the top case, so if something does go wrong with your keyboard or track-pad, you have to replace the top case.

Previous Steps Required... Battery Removal L-Bracket

Note!

This step requires removing a lot of different types of screws. We will distinguish screws by their length or appearance. However, it is always a good idea to track the screws yourself, making notes of where each went!



3

Remove the 2 5mm Philips head screws from inside the battery bay near the battery connector cable. Note that there are 4 screws here, but you are removing the outer two.

Remove the 3 4mm Philips head screws inside the battery bay in the locations shown in the bottom left picture. (These screws are revealed once the L-Bracket is removed.)

On the front wall of the battery bay, you will see a series of screws. You only need to remove the 2nd, 4th, 7th and 9th screws. These are 3mm Philips head screws.

Continued on Next Page ....



Click for Larger Image

### **Top Case Continued...**

Now that we've removed all of the screws from inside the battery bay, we can continue to the case screws.

Δ 6

Remove the 3 Philips head screws in the locations shown in the top picture. The one by itself in the middle is 11mm and the two on the outside edge are 15mm screws. As with al of the external screws, these have a polished head.

Remove the two 2mm Philips head screws from the outside edge of the battery bay as shown in the 2nd picture.

Remove the two 2mm Philips head screws from the other side of the unit. (The side with the optical drive.)

Continue on Next Page....



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#### Click for Larger Image

#### **Top Case Continued...**





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#### Top case continued...

Top image - Remove the last 4 screws holding down the top case.

Bottom Image -Work your way around the top case loosening the edges.

Right Hand Image - Lift the front of the top case up to gain access to the track-pad cable and disconnect it.

### **Top Case Continued...**

Remove the 4 Philips head screws from the back of the unit as shown in the top image. The two on the outside edges are 7mm screws, and the two on the inside are 11mm screws.

You are now ready to remove the top case. Starting from a back corner, gently pry the case up and work your way around the edges of the unit. Do not pull the case up, just loosen the edges.



8

The top case is connected to the logic board by a track-pad cable that must first be disconnected. Do not just try to pull the top case off.

With the edges loose, grab the top case from the front of the unit and lift up to access the track-pad cable. The cable has a black tab on the top of it. Grasp the tab and gently pull up to disconnect the cable.

The top case will now be free to set aside, and you will not have access to the internals of the unit.



There are 4 light gray tabs over the optical drive that may fall out when you remove the top case. These simply slide into place over the optical drive.



Click for Larger Image

### **Optical Drive**

The MacBook shipped with both combo drives and superdrives. If you aren't sure of the difference between the two, a combo drive only burns CDs whereas the Superdrive burns DVDs as well as CDs. Drive replacements are available from our online store.

### **Previous Steps Required...**

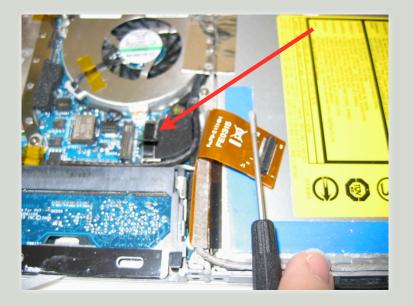
Battery Removal L-Bracket Hard Drive Top Case

Remove the two 3mm Philips head screws shown in the top right picture. These are accessed from the hard drive bay.

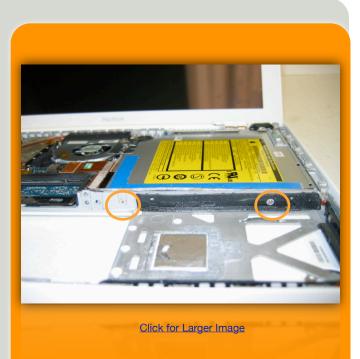
Use your Spudger to disconnect the optical drive cable from the logic board. (To disconnect these cables, get your Spudger tool, and gently pry up. The cable should come up easily, so do not use too much force.

Underneath the optical drive cable is the display cable. Disconnect the display cable by grasping the black tab on the top of the cable and gently pulling up.

Continue on the next page ...



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Click for Larger Image

#### **Optical Drive**

Top image - Remove the two 3mm screws from the side of the optical drive.

Bottom Image - Disconnect the optical drive cable from the logic board.

*Left Hand Image -* Disconnect the display cable from the logic board.

### **Optical Drive Continued...**

4

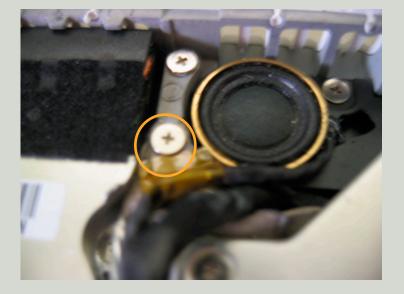
With the display cable disconnected, you will have access to the hard drive cable. Disconnect the cable by grabbing the black tab on the top of the cable and gently pulling up to disconnect.



Remove any foil tape that may be holding the optical drive in place as show in the second picture on the right.

Remove the Philips head screw holding the speaker cable and isight cable in place. This screw is shown in the picture below and is located to the side of the subwoofer.

Continued on next page.



Click for Larger Image





Click for Larger Image

#### **Optical Drive Continued...**

*Top image -* Disconnect the hard drive cable from the logic board.

Bottom Image - Remove any foil tape holding down the optical drive.

Left Hand Image - Remove the Philips head screw holding down the speaker cable and iSight cable.



#### Click for Larger Image

#### **Optical Drive Continued...**

Top image - Hold back the bundle of cable to reveal a Philips head screw. Remove the screw..

Bottom Image - Lift the bluetooth board up and out of the way.

Right Hand Image - Lift the drive up and out of the unit.

### **Optical Drive Continued...**

Hold back the bundle of cables (iSight, speaker, and display cables to reveal a hidden Philips head screw. Remove this screw.

Gently pry up the bluetooth antenna board from the top of the optical drive and away from the optical drive.

Grasp the drive by the optical drive cable, and lift the unit up and out of the unit.

If all you need to do is remove the drive from the unit, you can skip the remaining steps in this section. If you are replacing or upgrading your drive, you will need to continue with the next few steps.

Continued on Next Page....

9

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# **Optical Drive Continued...**

If you are upgrading or replacing your drive, you will need to remove the bracket from your old drive and install it onto your new drive.

10

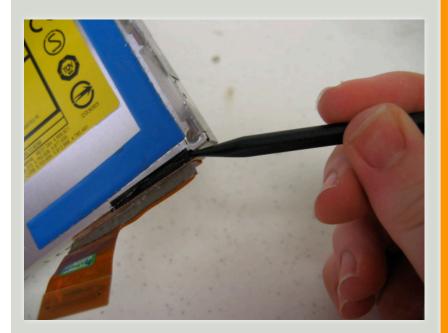
11

12

Remove the two Philips head screws holding down the right side bracket as shown. You can now put this part of the bracket to the side.

The bracket on the left hand side is held on with a mild adhesive. Use your Spudger to separate the bracket from your old drive.

Use your Spudger to disconnect the optical drive cable from the optical drive. There is a piece of black tape holding the cable down that will have to be pried up using the Spudger before the cable will release.



Click for Larger Image



Click for Larger Image



#### Click for Larger Image

#### Optical Drive Bracket...

*Top image -* Remove the two Philips screws nolding on the right bracket.

Bottom Image - Remove the left hand bracket using your Spudger.

*Left Hand Image - Disconnect the optical* drive cable using your Spudger.

## **Airport Extreme Card**

Depending on your model Macbook, the specifications for your airport card may vary. Specifically, the main difference will be whether your card has two antenna cables or three. Our guide shows a card with three antennas, the disassembly is the same for a unit with two as well.

### Previous Steps Required...

Battery Removal L-Bracket Hard Drive Top Case / Track-pad

Locate the airport extreme card on the left hand side of the unit. It will be a card with several cables running to it.

Using your Spudger or needle-nose pliers. Gently disconnect each of the 3 cables from the airport card. From left to right, the colors of the cables are black, blue, and light gray.

The card has two screws holding it in place. Remove the 3mm screw on the left hand side of the card and the 10mm screw from the right hand side. Place your Spudger on underneath the back of the card to pop it up.

The card will now be free. Grasp the card and place it on an antistatic surface.



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#### Click for Larger Image

#### Airport Extreme Card

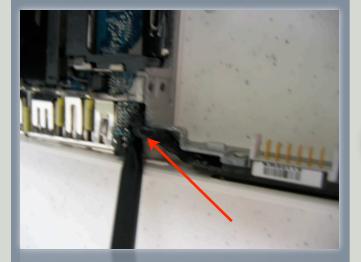
Top image - Disconnect the three antenna cables (2 in some models) from the airport card.

Bottom Image - Lift up the airport card using your Spudger.

Left Hand Image - Grasp the card and remove it from the unit.



Click for Larger Image



Click for Larger Image

#### **Battery Connector Cable**

*Top image -* Remove the 9mm screw and retainer clip from above the connector cable

Bottom Image - Use your Spudger to disconnect the cable from the logic board.

Right Hand Image - Remove the two 5mm Philips head screws from the battery board to release and remove the board.

# **Battery Connector Cable**

The battery connector cable is the part that is responsible for connecting the battery to the logic board.

### Previous Steps Required... Battery Removal L-Bracket Hard Drive Top Case / Track-pad



Locate the battery bay, and then locate a black retainer clip held on by a single Philips head screw. Remove this 9mm screw and the retainer clip.

2

Use your Spudger to get underneath the battery cable connector and gently pry up to undo the logic board connection.



3

If you are removing the logic board, you only need to disconnect the cable from the logic board, you do not need to remove the board from the machine.

Remove the two 5mm Philips head screws from the battery board. Lift the battery board up to remove it from the bottom case.



Click for Larger Image

# **Display Module**

Whether your display is cracked or you have broken hinges, you have to start by first removing the display module from the base of the unit.

#### **Previous Steps Required...**

Battery Removal L-Bracket Hard Drive Top Case / Track-pad Optical Drive Airport Extreme Card ( Disconnect cable only)

Locate the inverter cable, and using your Spudger gently pry it up to release it from its logic board connector..

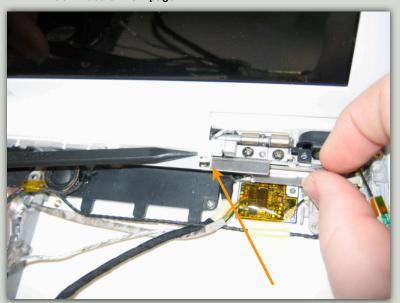
Remove the 3 Philips head screws indicated in the second picture to the right. There is one on the vent assembly, one holding down the black speaker, and one on the bottom holding down the silver metal clasp..

3

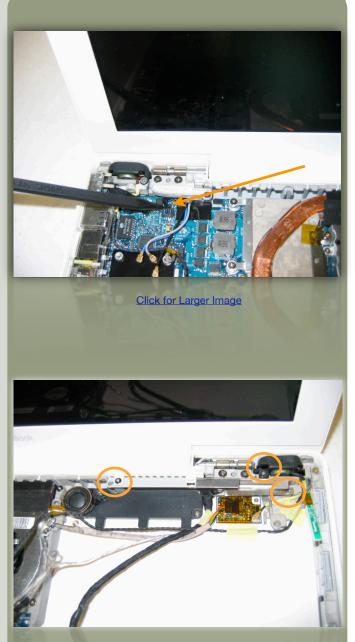
Locate a tab with a hole in it on the vent assembly as shown in the picture below.

Using your Spudger, gently lift up on the tab while simultaneously pulling on the silver clasp to remove the metal clasp.

Continued on next page...



Click for Larger Image



Click for Larger Image

#### **Display Module...**

Top image - Disconnect the inverter cable from the logic board.

Bottom Image - Remove the three Philips head screws as shown in the picture.

Left Hand Image -Lift up the vent tab and slide the metal clasp to remove the clasp.



#### Click for Larger Image

#### **Display Module Continued...**

Bottom Image - Remove the 3mm Philips head screw holding the display cable in

### **Display Module Continued...**

5

Locate the iSight Cable. It is located in front of the battery bay, and the cable has a shiny silvery appearance. The connector on the end is black. Using your Spudger disconnect the cable from the logic board and route the cable toward the right hand hinge.

On the right hand side of the unit, directly behind the bluetooth board is a Philips head screw. This screw holds down the display cable. Remove this 3mm Philips head screw.

Continued on next page...

# **Display Module Continued...**

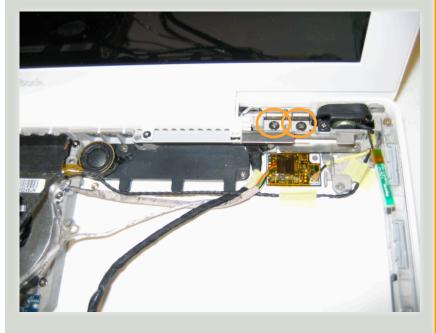
Remove the three Philips head screws from the left hinge. The one on the far left is an 11mm screw, the one to its right is 5mm. The one on the far right is 3mm.

With the screws removed, the hinge retainer will be free. Use your Spudger to lift up the retainer. It will have a colored clutch cover on the end. This cover slides onto the retainer, so if it falls out, just slide it back on before reassembly.

While holding the display with one hand, remove the two screws from the right hinge hinge as shown in the picture below. The outer screw is 11mm, and the inner screw is 5mm. When these screws are removed, the display will be free from the base of the unit.

If the module does not come off easily, follow the cables coming out of the display to make sure they are all free. If they are caught on something route them so that the display can come off. Make a note of how the cables are routed for reassembly.

Note!



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**Click for Larger Image** 

#### **Display Module Continued...**

*Top image -* Remove the three Philips screws on the left hinge.

Bottom Image - Remove the left hinge recainer clip.

*Left Hand Image -* Remove the two screws on the right hand hinge.

# **Display Bezel**

Once the Display Module is free from the base of the unit, you are ready to open up the display.

### Previous Steps Required...

Battery Removal L-Bracket Hard Drive Top Case / Track-pad Optical Drive Airport Extreme Card ( Disconnect cable only) Display Module

Use your Spudger to separate the front bezel from the display module. The bezel is held on by a series of clips on the sides and top, and a series of clips and mild adhesive on the bottom.

After you have initially separated the bezel, you should be able to use your hands to gently pull the bezel completely off the display module.

With the bezel removed, your display should look like the picture below.



Click for Larger Image



Click for Larger Image



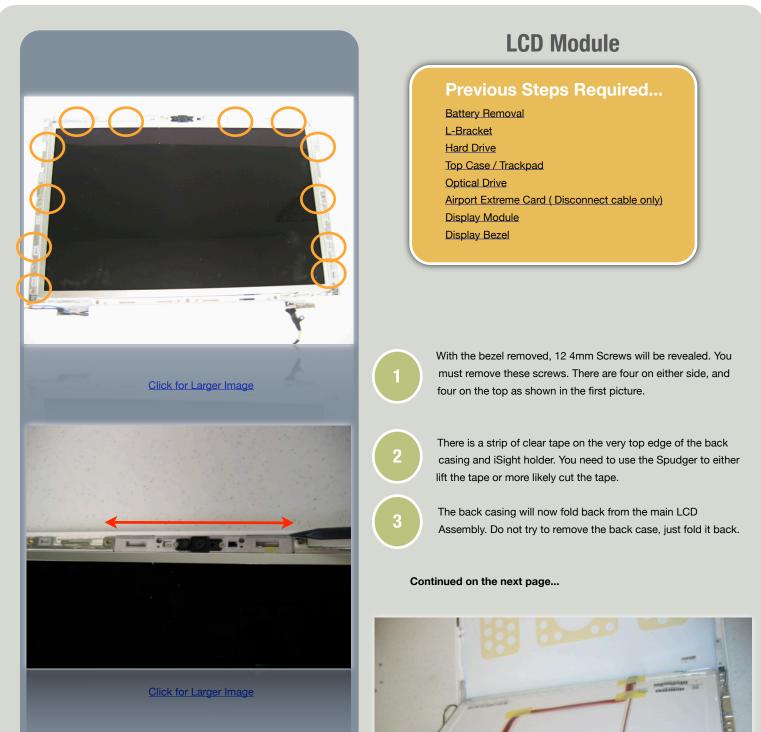
Click for Larger Image

#### **Display Bezel...**

Top image - Begin at a corner, and using the Spudger separate the front bezel from the module

Bottom Image - Use your hands to pull the bezel off the display module.

Left Hand Image - When done, your unit should like like the picture to the left.



#### LCD Module...

Top image - Remove the 12 4mm screws from the front of the panel..

Bottom Image - Remove the clear tape holding the display to the back case.

Right hand Image - Fold the back case back from the main assembly.

Click for Larger Image

# **LCD Module Continued...**

**45** 

Remove or pry up all the yellow tape holding down cables on the back of the LCD.

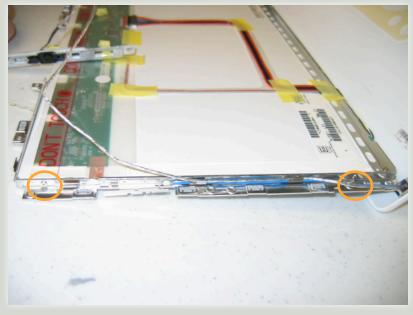
Once the tape is removed, disconnect the display cable and iSight cable from their connectors by gently grasping them and moving them from side to side until they are free from the connector.

6

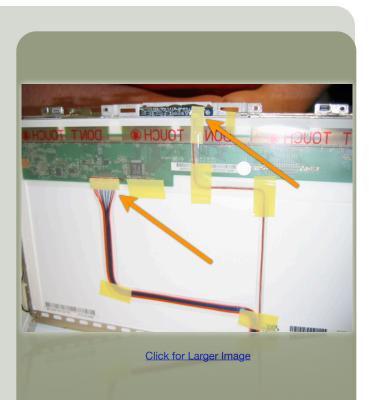
Next, using your fingers, lift up the microphone cable on the very top edge of the LCD to reveal a 3mm screw. Remove this screw and the other 3mm screw on the left hand side as indicated in the picture.

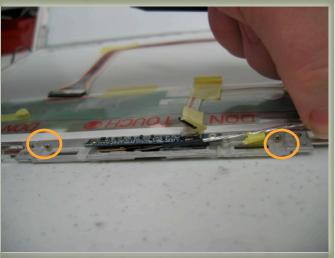
Remove the 2 3mm Philips head screws from the right hand side of the LCD module as shown in the picture below.

Continued on next page...



Click for Larger Image





#### Click for Larger Image

#### LCD Module...

Top image - Remove the yellow tape and disconnect the display cable and iSight cable.

Bottom Image - Hold the microphone cable up and remove the two Philips head screws from the top of the LCD Module.

Left Hand Image - Remove the 2 3mm screws from the right hand side of the LCD Module.

### **LCD Module Continued...**

Remove the three Philips head screws from the right hand side of the LCD Module. You may need to lift up some of the cables to access and remove the screws.

The brackets with cables will now be loose from the right, left and top of the unit. Move these brackets to their respective sides and as out of the way as possible. They will still be connected to the bottom of the display, so they are not completely free.

Flip the LCD Module over so that it is facing you. Next, remove the three 5mm Philips head screws on the clutch cover.

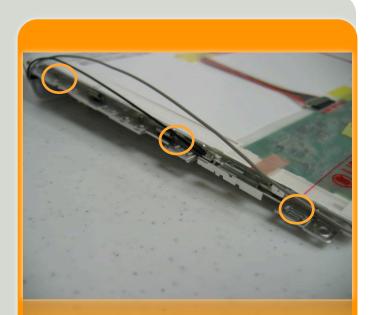
You can now pull the clutch cover away from the LCD module. You may need to route cable around the hinges to get it to come off.

#### Continued on the next page...

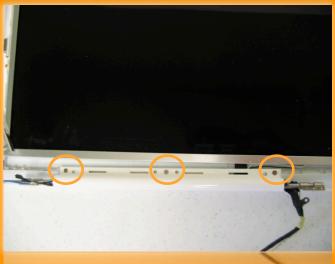
10



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Click for Larger Image



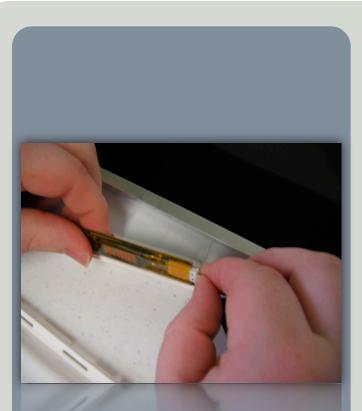
Click for Larger Image

#### LCD Module Continued...

Top image - Remove the three Philips screws right hand LCD bracket.

Bottom Image - Remove the 3 5mm screws from the clutch cover.

Left Hand Image -Pull the clutch cover off of the LCD Base.



Click for Larger Image

#### LCD Module Continued...

Top image - Disconnect the inverter cable from the inverter board to free the LCD.

### LCD Module Continued...

12

With the clutch cover removed, you will have access to the inverter board. On the right hand side of the board is the inverter cable that connects to the LCD. Disconnect this cable by grasping it and gently pulling it free from its connector.

### 13

The LCD will now be free to be removed and replaced.

### **Inverter Board**

### Previous Steps Required...

Battery Removal L-Bracket Hard Drive Top Case / Trackpad Optical Drive Airport Extreme Card ( Disconnect cable only) Display Module Display Bezel LCD (Clutch cover and disconnect inverter cable)

1

To remove the inverter board, simply pull the board up and out of the back case, and disconnect both cables going into the board. The cable on the right hand side is the LCD to display cable, and the cable on the left hand side is the Inverter Board to Logic Board cable.

# **Clutches (Hinges)**

### **Previous Steps Required...**

Battery Removal L-Bracket Hard Drive Top Case / Track-pad Optical Drive Airport Extreme Card ( Disconnect cable only) Display Module Display Bezel LCD



Use your Spudger to pry up the thin covering over the clutch assembly as shown in the top right picture. It is only held on by a light adhesive.



On the bottom of the right hand clutch is a single Philips screw holding down the display cable. Remove this screw.

Remove the 3 3mm screws from each clutch to remove the clutches. They should easily lift out from the back case.



Click for Larger Image



Click for Larger Image



Click for Larger Image

#### **Clutches / Hinges ...**

*Top image -* Remove the thin clutch cover using your Spudger.

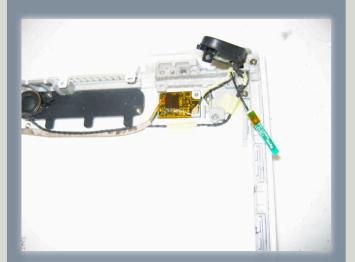
Bottom Image - On the right clutch, remove the Philips head screw holding the display cable in place.

Left Hand Image - Remove the three Philips head screws from each clutch to remove the clutch.

# **Bluetooth Assembly**



Click for Larger Image



Click for Larger Image

#### **Bluetooth Assembly...**

Top image - Disconnect the bluetooth cable from the logic board.

Bottom Image -This image shows the three bluetooth components. To remove the board simply pry up from underneath using your Spudger. The Bluetooth assembly is comprised of three components. There is the cable that runs from the logic board to the bluetooth board, the bluetooth board, and the bluetooth antenna.

#### **Previous Steps Required...**

Battery Removal L-Bracket Hard Drive Top Case / Track-pad Optical Drive

Begin by disconnecting the inverter cable from the logic board. Use your Spudger to get underneath the cable and gently pry up. It should come up easily.

The bluetooth board is held onto the bottom case by a mild adhesive. To remove, simply put your Spudger under the board and pry up. It should come up easily.

When the board is free, you'll be able to disconnect both the antenna and the logic board cable from the bluetooth board. You may need to pull back the speaker cable slightly to free up the antenna cable.

### **Right Speaker & Subwoofer**

On the right hand side of the unit in the optical drive bay, you will locate the right speaker and subwoofer. The subwoofer is the larger black "speaker" in the middle of the unit. The subwoofer is responsible for low bass sounds, whereas your right speaker outputs mostly treble.

### **Previous Steps Required...**

Battery Removal L-Bracket Hard Drive Top Case / Track-pad Optical Drive Bluetooth (Disconnect cables to access speaker)

Disconnect the right speaker / subwoofer cable from the logic board by using your Spudger to gently pry up the connector from the logic board.

The cable will be held in place by a 9mm Philips head screw at the location marked in the top right image.

Remove the two Philips head screws holding down the subwoofer as shown in the picture to the bottom right.

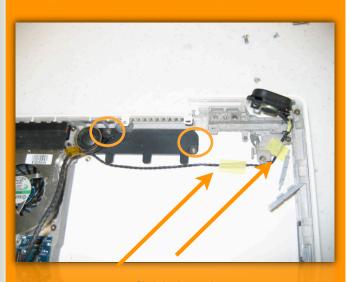
Remove any yellow tape that may be holding how the right speaker cable.

You can now lift the subwoofer and speaker assembly out of the unit.

5



Click for Larger Image



Click for Larger Image

#### Right Speaker & Subwoofer...

*Top image* - Disconnect the subwoofer and right speaker cable from the logic board. Remove the 9mm Philips head screw holding down the cable.

Bottom Image - Remove the two Philips head screws holding down the subwoofer assembly, remove any tape on the right speaker cable.

### **Left Speaker Assembly**

### **Previous Steps Required...**

Battery Removal L-Bracket Hard Drive Top Case / Track-pad

1

3

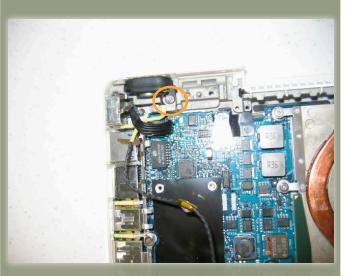
Use your Spudger to disconnect the left speaker assembly connector from the logic board as shown in the image in the top right.

Remove the 6mm Philips head screw holding down the speaker.

You can remove the speaker from the unit. Note that you will need to lift the speaker up and pull away from you so that you can route the speaker cable underneath the DC-IN Cable



Click for Larger Image



Click for Larger Image

#### Left Speaker Assembly ...

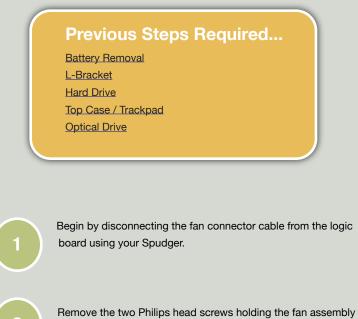
*Top image - Disconnect the left hand* speaker cable from the logic board.

Bottom Image - Remove the 6mm Philips nead screw from the speaker assembly.

# **Fan Assembly**



If you are experiencing a loud whirring sound or experiencing frequent overheating, odd are that this is the component that needs replacing.



Click for Larger Image

#### Fan Assembly...

Top image - Remove the two Philips head screws from the fan and disconnect the fan connector from the logic board.

Bottom Image - Lift the fan up and out of the unit.

in place at the locations shown in the top left hand image. The screw on the left is 6mm, and the screw on the right is 3mm.

The fan is now only held in place by the black dust shield which has a mild adhesive backing. You can simply pull up on the fan to remove it from the unit.

2

### **Heat Sink**

The heat sink is the element in the Macbook (and all laptops) that dissipates heat away from the processor. The heat sink has temperature sensors to let your unit know if it is running too hot.

### Previous Steps Required... Battery Removal L-Bracket Hard Drive Top Case / Trackpad

Right Speaker (Cable and screw holding down cable) Fan Assembly

1

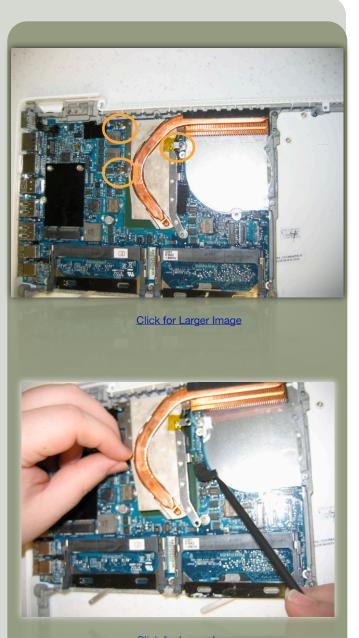
3

Remove the 3 9mm Philips head screws from the heat sink in the locations shown in the image in the top right.

Locate a black foam block to the right of the heat sink. Using your Spudger, lift up and remove this block. It is held on with a mild adhesive.

Underneath the black foam are two temperature sensor connectors. Use your Spudger to disconnect these from the logic board by gently prying them up. To reinstall, just line up and snap down into place.

Lift the heat sink up and out of the unit.



#### Click for Larger Image

#### Heat Sink ...

Top image - Remove the 3 9mm screws holding the heat sink in place..

Bottom Image - Remove the foam block covering the temperature sensor connectors, and disconnect the cables.

### **Logic Board**

To remove the logic board, you will need to disassemble to majority of the unit. On some steps, you only need to disconnect cables from the logic board and do not need to follow the entire disassembly procedure. For example, for the display module, you only need to disconnect the cables referenced in that step from the logic board. You do not have to disassemble the whole display to remove the logic board.

### Previous Steps Required...

Battery Removal L-Bracket Hard Drive Top Case / Trackpad Optical Drive Airport Extreme Card Battery connector cable (Cable to logic board) Battery (Disconnect cables from logic board) Bluetooth (Disconnect cables to Logic Board) Bluetooth (Disconnect cable to logic board) Left Speaker Fan Assembly Heat Sink

Remove the two screws indicated in the top right image to remove the logic board bracket. The screw closet to the MagSafe board is 7mm the screw in the middle of the image is 10mm

Lift the bracket up and to the right to maneuver it underneath the MagSafe cable. You must route it underneath the cable.

Continued on Next Page...



#### Logic Board...

Top image - Remove the two screws holding down the logic board bracket.

Bottom Image - Lift the logic board pracket up and to the right and route it inder the MagSafe cable.



# Logic Board Continued...



Remove the 4 3mm Philips head screws in the locations shown in the top left image.

Lift the logic board up and out as shown in the bottom left image and place it on a static free surface.

# **MagSafe Board**

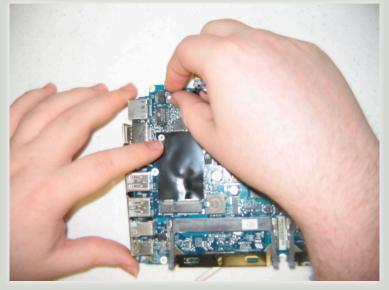
The MagSafe board is the board that your adapter plugs into.

### Previous Steps Required...

Logic Board

1)

Grasp the MagSafe board and gently pull as shown to remove it from the logic board connector.



Click for Larger Image



Click for Larger Image

#### Logic Board Continued...

Top image - Remove the three 3mm Philips head screws from the logic board.

Bottom Image - Lift the board up and out of the unit.

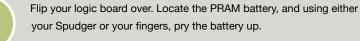
Left Hand Image - Disconnect the Magsafe board.

### **PRAM Battery**

The PRAM battery is responsible for keeping the date and time settings on your Macbook.

### Previous Steps Required...

Logic Board



Remove any kapton (orange) tape, holding down the battery cable.

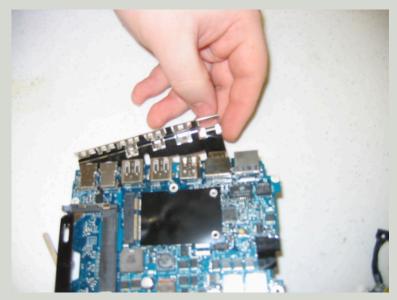
Disconnect the PRAM battery from the logic board by gently pulling the connector cable out of its logic board connector.

# **EMI Shield**

1

3

Covering the ports on the logic board is an EMI Shield. To remove, simply pull it off of your board.



Click for Larger Image



Click for Larger Image



#### Click for Larger Image

#### PRAM Battery ...

Top image - Locate the Pram battery and pry up with your fingers or Spudger.

Bottom Image - Disconnect PRAM cable from logic board.

*Left Hand Image -* Remove EMI shield by pulling it off the board.