Service Source

iMac (Early 2006 20-inch)

iMac (Early 2006 20-inch)

Contents

Take Apart

Troubleshooting

Views

What's New

Manual Updates

April 2007
- The **optical drive removal procedure** has been updated. Using a screwdriver to release the optical drive tabs is causing damage to the logic board. The updated procedure shows how to remove the optical drive using a needlenose pliers.
- Additional information on handling slot-load optical drives can be referenced in **Kbase article 305282.**

23 January 2007
- The **SMC reset** procedure was corrected in the Troubleshooting chapter.

15 January 2007
- The "**No Power**" symptom in Troubleshooting has been updated. If your computer won't turn on, try removing and reinstalling the SO-DIMMs.

13 November 2006
- The DC/DC power supply was incorporated into the "**No Power**" troubleshooting steps

October 2006
- 31 October 2006: Troubleshooting has been updated with a new symptom, "**Fans running at full speed after computer turns on**." Note: The customer may have entered a diagnostic mode that causes the fans to run at full speed. This symptom is very easy to resolve at the customer level.
- Photos of the EMI tape (922-44786 and 922-5026), used to repair torn and damaged EMI shielding, have been added to the **EMI Shielding** section in the General Information chapter.

July 2006
- Troubleshooting symptom charts updated : Video Distortion After Waking From Sleep: Shimmering, vertical lines, Horizontal lines
- Logic Board/Take Apart
    - Added IR board to the "Preliminary Steps" list
    - In step 5, a note was added to mention the transfer of the metal brackets (clips) to the new logic board if you replace the logic board

April 2006
- The iMac (Early 2006) 20-inch manual has been updated to show only one antenna cable attached to the AirPort card.

March 2006

- A **Screw Chart** was added.
- **Access tool modification** instructions have been added to General Information.
- Troubleshooting symptom added: **No audio from internal speakers (may hear faint putt-putt or motor-boating noise)**.
- Troubleshooting symptom added: **No Video, No Boot Chime, White LED ON (Symptom 1)**

February 2006

- Take Apart chapter: the power supply, memory, AirPort antenna , and Bluetooth antenna topics have been revised with new photographs.
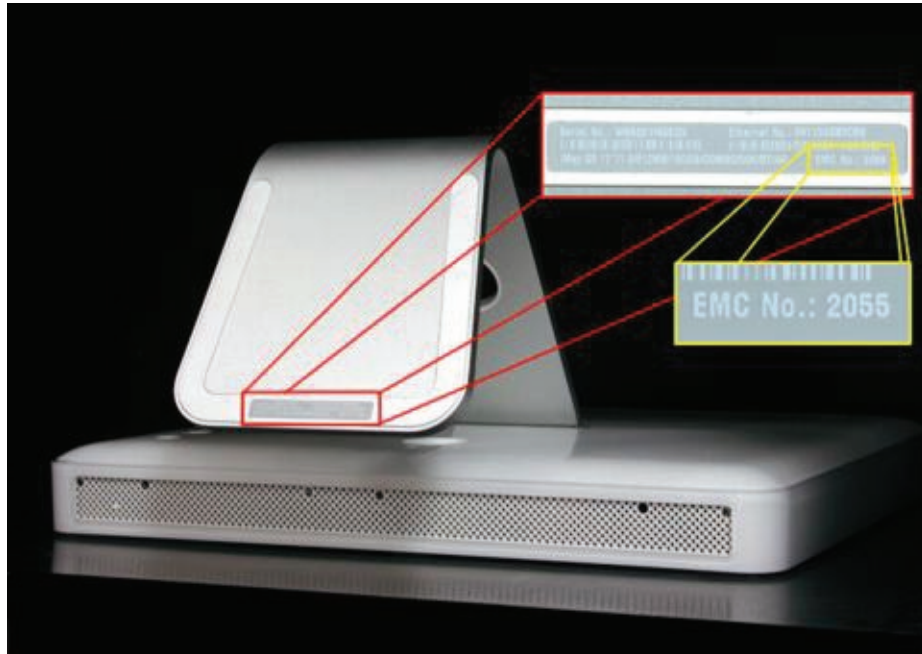-

Service Source

Take Apart

iMac (Early 2006 20-inch)

General Information

Product View

How to identify your iMac

On the bottom of your iMac stand, you'll find a label with the serial number printed on it:

This label also provides other information, including the computer configuration and an "EMC" number (EMC No.). The EMC number is unique for different iMac models; just make note of the EMC number on the bottom of your computer and refer to the step #1 below to identify your model.

1. The EMC number for the Intel Core Duo model is 2105 for the 20-inch and 2104 for the 17-inch.

2. From the Apple menu, choose About This Mac. The Processor listing will show the speed of the processor followed by the processor type. It will show PowerPC G5 for the iMac G5, iMac G5 (Ambient Light Sensor), and iMac G5 (iSight). For iMac (Early 2006) computers, the listing will show Intel Core Duo.

3. The iMac (Early 2006) has several features that distinguish it from the iMac G5:
    *   A 1.83 GHz Intel Core Duo processor with a 17-inch screen, or a 2.0 GHz Intel Core Duo processor with a 20-inch screen.
    *   Comes with an ATI Radeon X1600 video card using PCI Express.
    *   Comes with a mini-DV video out port.

What's Different on this iMac?

Logic board
- Intel Core Processor 1.83 and 2.0 GHz
- No troubleshooting LEDs
- Battery is located on the top side of the logic board

AirPort Extreme and Bluetooth
- Separate antennas
- Separate parts: AirPort Extreme and Bluetooth boards

Memory
- SO-DIMM DDR2 667 MHz, memory slot
- Memory ejector levers are visibly different from the iMac G5 (iSight) models and should be used as shown in the Take Apart section.

Ports
- Mini-DVI video out port (for mirroring or extending the desktop)

Displays
- LVDS (Low Voltage Differential Signaling) displays

Power Management
- SMC replaces SMU (See SMC Overview and SMC Reset Procedure)

Diagnostics
- Apple Hardware Test and Apple Service Diagnostic have new interfaces and procedures (See Diagnostics)

Troubleshooting
- New procedures for troubleshooting no power (See Symptom Charts)
- New procedures for troubleshooting no video (See Symptom Charts)
- Updated procedures for Target Disk Mode (See Using Target Disk Mode)
- Updated procedures for formatting hard drives (See Drive Formatting for Intel-based Macs.)

Tools Required

The following tools are required to service the computer. **Note** that a special access card (part 922-7172) is required to open the front bezel.

- ESD-safe workstation and mat
- Soft, clean towel or cloth (to protect the display and removed parts from scratches)
- Access card to open the rear cover (part 922-7172)
- Black stick (or other nonconductive nylon or plastic flat-blade tool)
- Phillips #1 screwdriver
- Phillips #2 screwdriver
- Torx T8 screwdriver (magnetized)
- Torx T6 screwdriver (magnetized)
- Torx T10 screwdriver (magnetized)
- Flat-blade screwdriver

Orientation

For most repairs, the unit should be placed screen-side up, with the bottom facing toward you. Most photos in this manual reflect that orientation. The SO-DIMM slot is located beneath the front bezel and is more easily accessed with the unit laying-down on a soft, clean cloth.

Serial Number Location

iMac (Early 2006) serial number is located on the bottom of the computer stand.

Safety

Warning: When the iMac (Early 2006) is under power, be aware that the power supply contains high voltages that pose a potential hazard to your personal safety. Never work on or near the power supply with the unit powered on, and as a further precaution always make sure the unit is unplugged when working on it with the front bezel removed.

WARNING: HIGH VOLTAGE
Text or photographs marked by this symbol indicate that a potential hazard to your personal safety exists from a high voltage source.

The AC/DC power supply board is a high voltage source with the unit under power, and remains powered up whenever the system is plugged in, whether or not the system is turned on. Use extreme caution when troubleshooting the system with the front bezel removed.

- Disconnect power to the system before performing maintenance.
- Don't work alone. In the even of an electrical shock it is important to have another individual present who can provide assistance.
- Keep one hand in your pocket when working on any iMac (Early 2006) that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.
- Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.
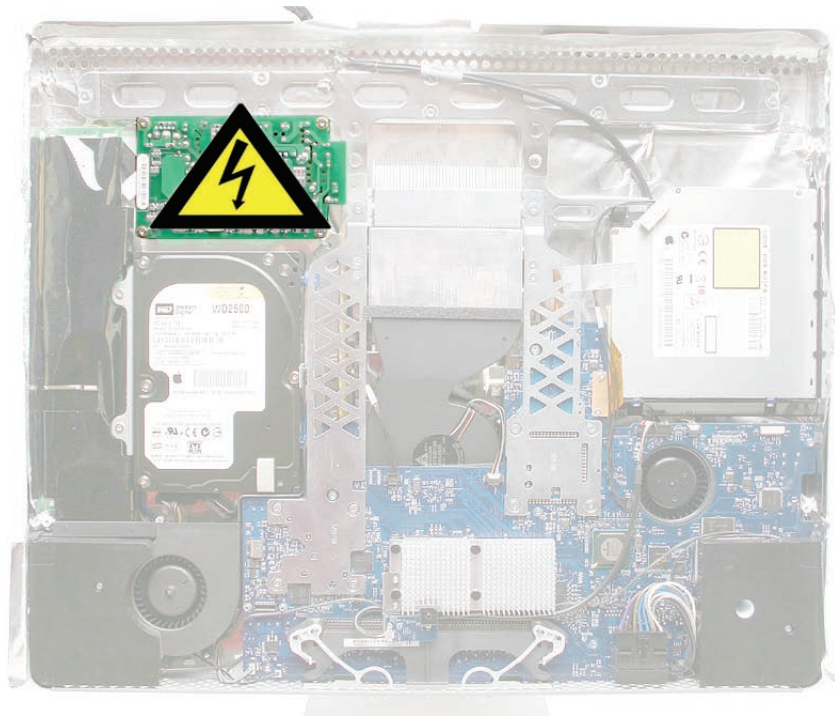
Opening the Computer

Apple authorized, desktop certified technicians only should ever remove the front bezel on the iMac (Early 2006). When the front bezel is removed, be sure to always ground yourself and follow ESD-safe repair practices

Removing the front bezel requires using a special access card (part 922-7172) to release latches located inside the upper corners of the front bezel. Slightly bending the upper quarter of the access tool card will help engage the latch more securely.

As you are inserting the card to disengage the latch you should squeeze the top of the bezel, that will help take pressure off of the latch and enable it to open easier. Note: If the bezel won't open, try cutting the card lengthwise into 3/4 inch or 1.5 cm strips. Insert the card on a 45º angle, aimed toward the outer corner, and try again.

Once the card has been released it is safe to open the bezel. See the Front Bezel Take Apart procedure for more information.

Access Tool Modification

If you wish to modify the access card tool, order kit 076-1213. The kit contains an access card and a piece of EMI gasket that can be cut and added to the top of the card. The additional thickness on the card will improve the chances of making contact with each bezel latch.
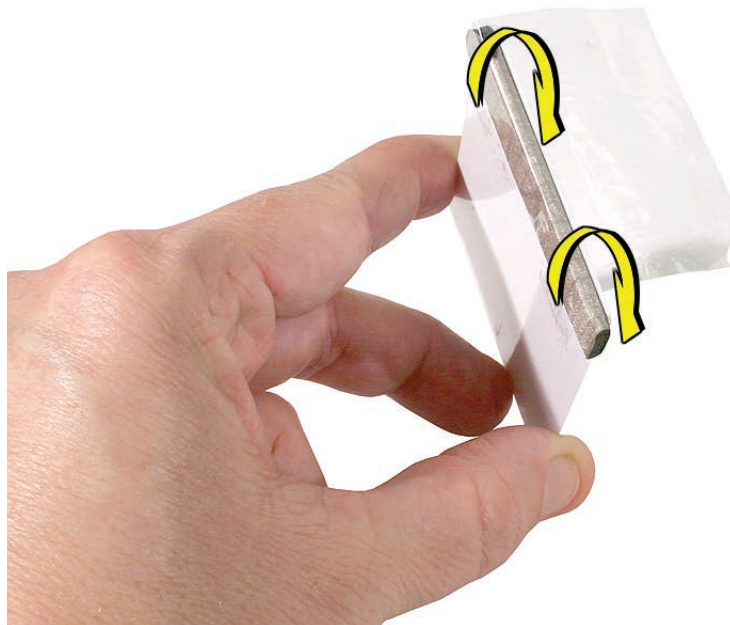
1. Remove the tape on the gasket to expose the sticky side of the gasket. Attach the sticky side of the EMI gasket to the top of the access card.

2. Cut the EMI gasket to the edge of the access card.

3. Using packing tape, or something equivalent, fold the tape over the EMI gasket to attach the gasket to the card.

4. Bend the card at a slight angle at the top to make sure the card makes contact with each latch.

5. Refer to **Removing the Front Bezel** for the complete procedure.

EMI Shielding

The iMac enclosure is wrapped in EMI shielding that is easily torn and damaged. To maintain a properly shielded unit, you must repair all accidental tears and cracks to the shielding by covering them with EMI tape. Order EMI tape, part number 922-4786 (a long, thin strip) or 922-5026 (short, wide strips).

Pay particular attention to the EMI shielding inside the rear housing, shown below. The EMI shield is easily damaged when replacing modules.

Lower EMI Shield

EMI tape covers the top and sides of the display panel, and the lower EMI shield covers the logic board along the bottom of the unit. The EMI tape and lower EMI shield are easily damaged when removed, and removal is necessary in order to access most components within the unit.

Should the EMI tape that seals the display, or the EMI shield covering the bottom of the enclosure (see photo below) accidentally tear, use the EMI tape (922-4786 or 922-5026) to repair and completely seal the unit.

When properly repaired, all edges shown below will be wrapped by EMI tape, and the tape securely adhered to all edges. Use a "black stick" to flatten the EMI tape tightly and rub out air pockets and wrinkles.
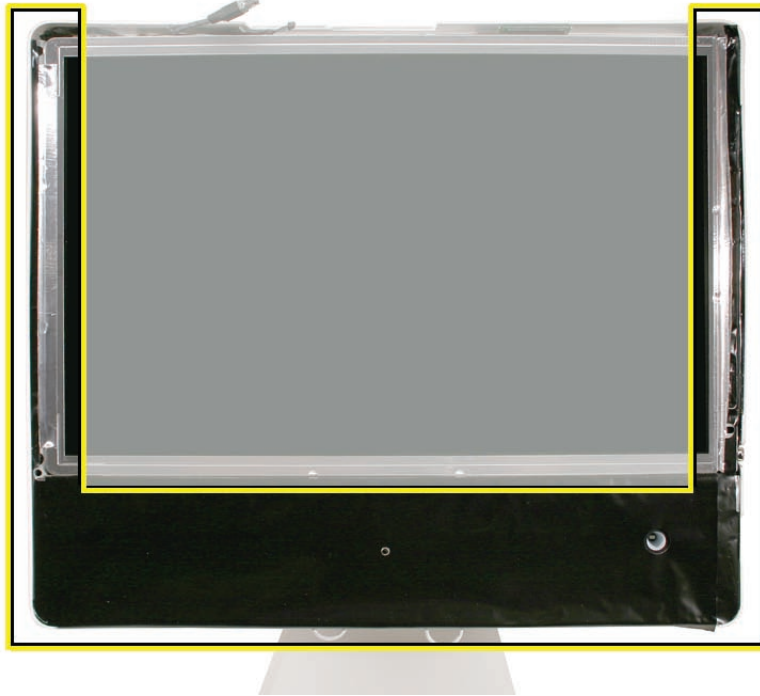
Access Door

Tools

- Phillips #2 screwdriver
- ESD-safe workstation and mat
- Soft , clean towel or cloth

Preliminary Steps

Before you begin, lay the computer down so the panel is face down and the bottom is facing you.

Part Location

Removing the Access Door

1. Raise the stand and use a Phillips #2 screwdriver, to loosen the two captive access door screws.
   Warning: The ambient light sensor is located to the left. Don't mistake the ambient light sensor for a screw. Sticking a screw driver or other sharp object in the ambient light sensor could damage the computer.

2. Remove the access door.

Replacing the Access Door

1. Position the access door on the rear housing over the memory compartment.

2. Lift the stand out of the way.

3. Use a Phillips #2 screwdriver to tighten the captive screws.

Memory

Tools

- Phillips #2 screwdriver
- ESD mat, soft , clean towel or cloth

Preliminary Steps

Before you begin, lay the computer down so the panel is face down with the bottom is facing you; and remove the **access door**.

Part Location

Removing the Memory

1. After removing the access door, touch the metal frame around the memory compartment to discharge any static electricity from your body.
   Important: Always discharge static before you touch any parts such as the memory board. To avoid generating static electricity, do not walk around the room until you have finished replacing the memory.

2. Pull the two levers in the memory compartment toward you. If a memory module is installed in the slot, pulling the levers will dislodge it. **Note:** The levers are used to remove memory not to install memory. Always install memory my hand.
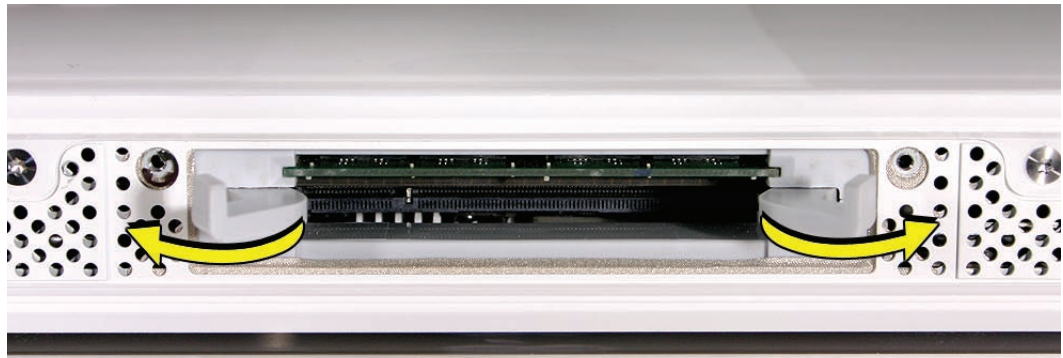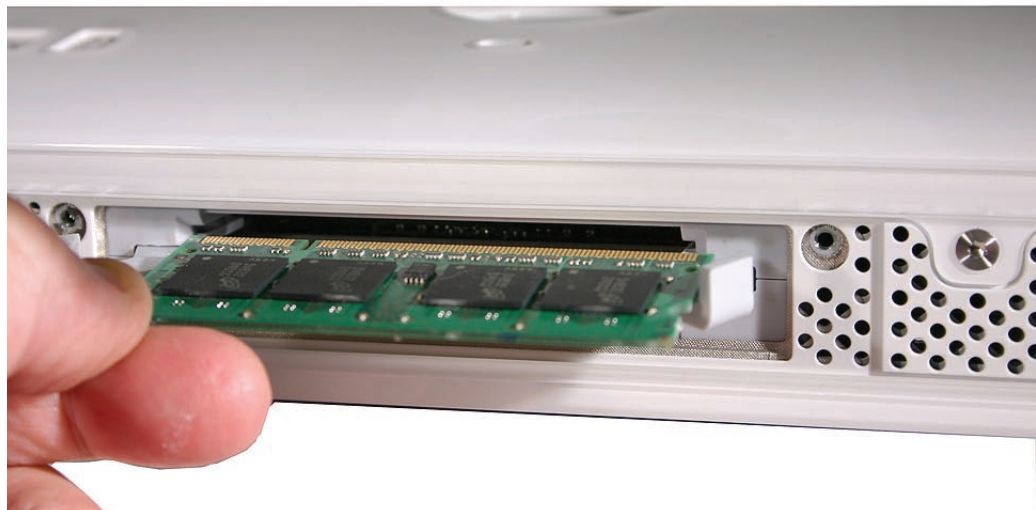

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3. Set the memory module aside.

Replacing the Memory

1. Make sure the DIMM levers are all the way open.

2. With the computer face down, orient the DIMM with the notch on the left.

3. With your fingers, press the DIMM fully into the slot until you hear a click. After inserting the memory, fold the DIMM levers closed. There will be a slight resistance and you will hear a click when they fold into the closed position.
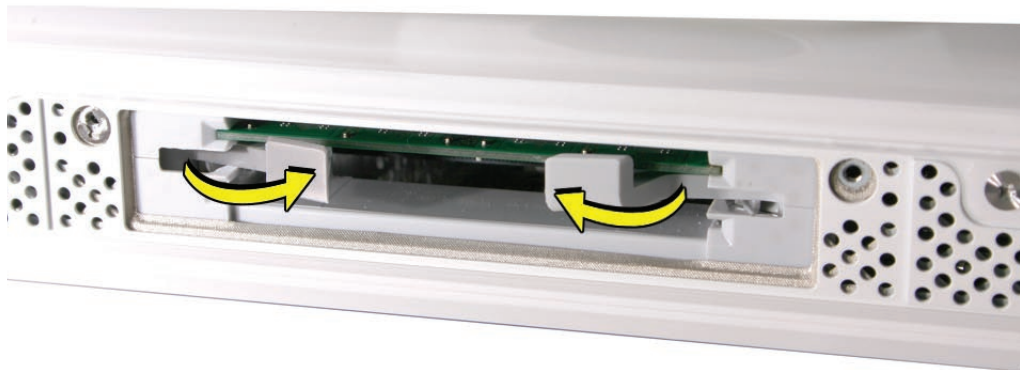
4. Replace the access door on the memory compartment.

5. Use a Phillips #2 screwdriver to tighten the captive screws on the access door.

Front Bezel

Tools

This procedure requires the following tools:
- Torx T8 screwdriver
- Access card tool 922-7172

Preliminary Steps

Before you begin, remove the **access door.**

Part Location

Removing the Front Bezel

1. Position unit on rear cover with the stand facing you.

2. Tilt up the front bezel and remove four screws along the bottom.
   Warning: The ambient light sensor is located in the second hole from the right. Don't mistake the ambient light sensor for a screw. Sticking a screwdriver or other sharp object in the ambient light sensor could damage the computer.

3. Locate the access card. Bending the upper quarter of the access tool card will help engage the latch. **Note**: Refer to **Access Tool Modification** in the General Information chapter if the bezel is difficult to open.

4. This picture shows how the access tool works. Pushing the tool up the vent on the rear cover releases the latches on the inside of the front bezel. Refer to the next step for the procedure.
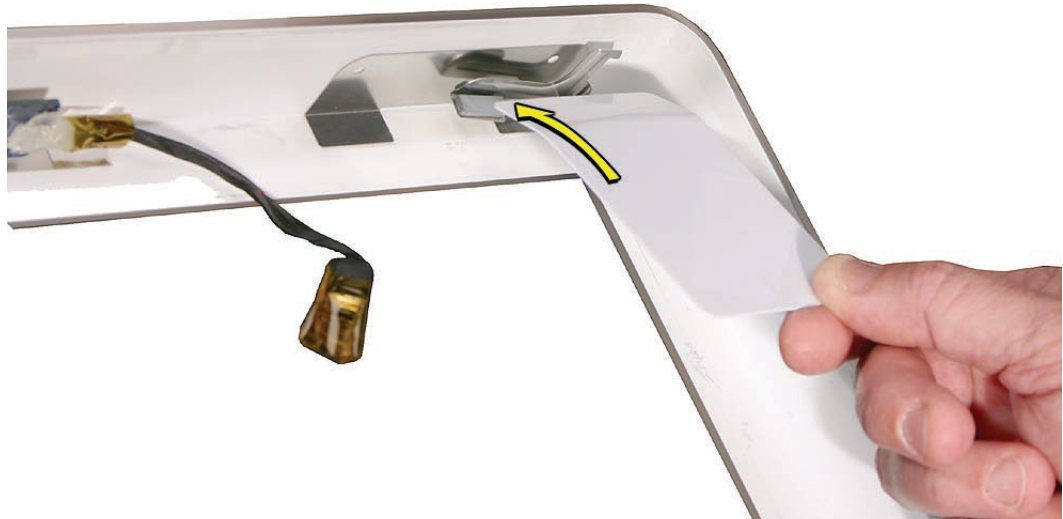
5. Start on the left side (looking from the back of the unit). As you insert the card to disengage the latch, squeeze the top of the bezel, that will help take pressure off of the latch and enable it to open easier. As the bezel releases, pull the bezel away from the rear housing. Note: If the bezel won't open, try cutting the card lengthwise into 3/4 inch or 1.5 cm strips. Insert the card on a 45º angle, aimed toward the outer corner, and try again.

6. Repeat step 5 to release the locking latch in the right corner. Again, pull the bezel away as the card releases the latch.
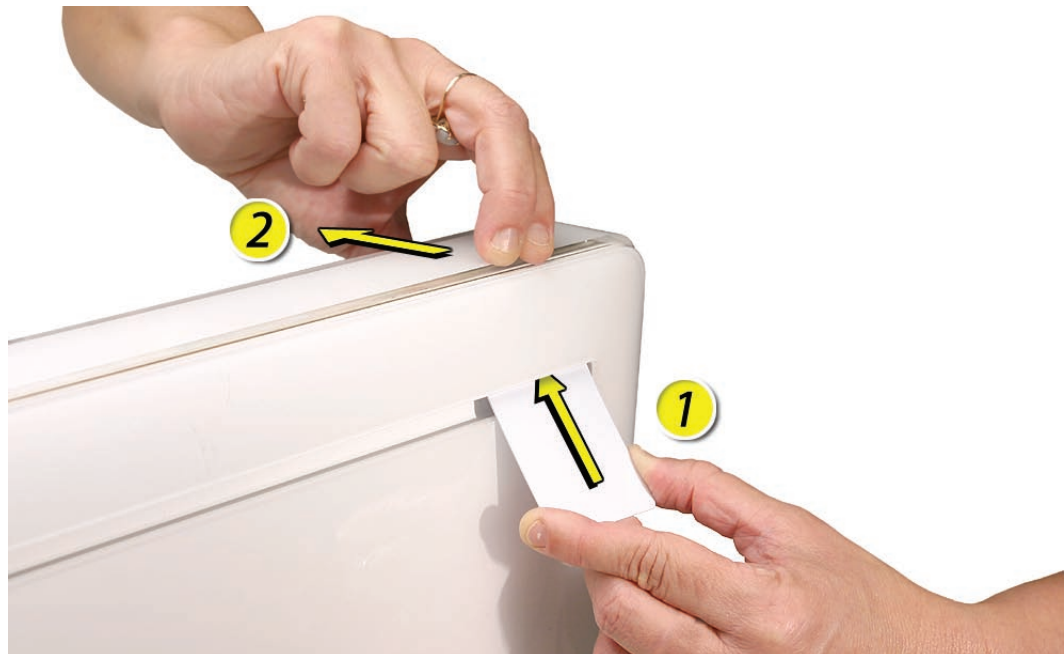

7. If the bezel won't release, pull the bottom of the bezel out a bit and insert the access card again.

8. Repeat step 7 for the left side.

9. Once the access card has been removed, it is safe to open the bezel. Position the unit on an ESD mat, with the bottom facing toward you. Lift up the top of the bezel and pull it up and slightly toward you. **Caution:** Make sure the memory eject levers are not protruding from the access door when you lift the bezel up.
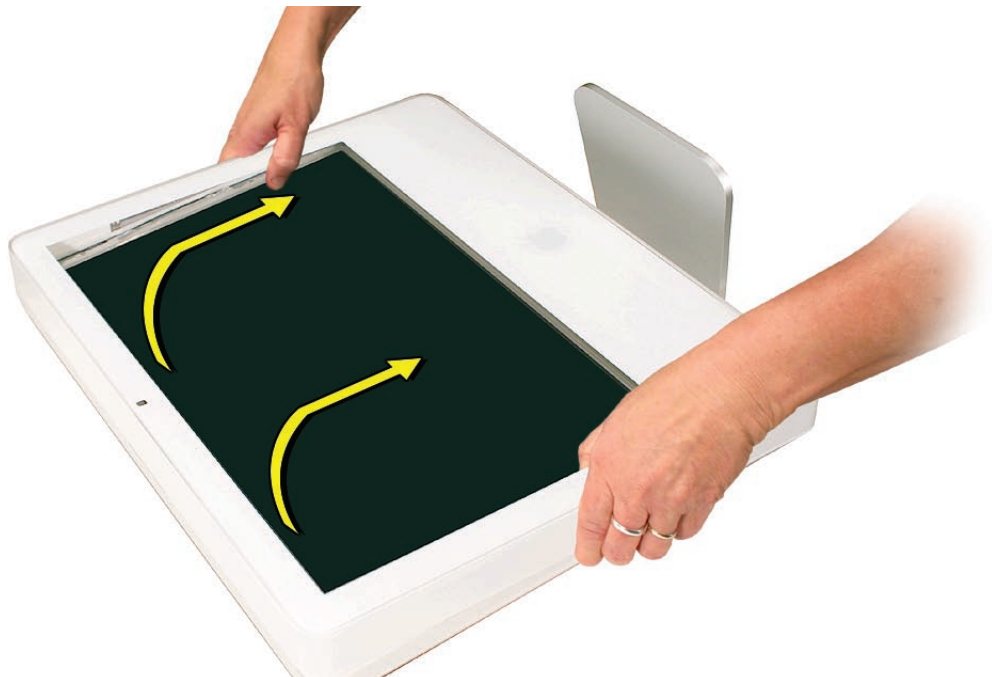
10. Swing the bezel up so you can disconnect two cables on the camera board at the top of the bezel.
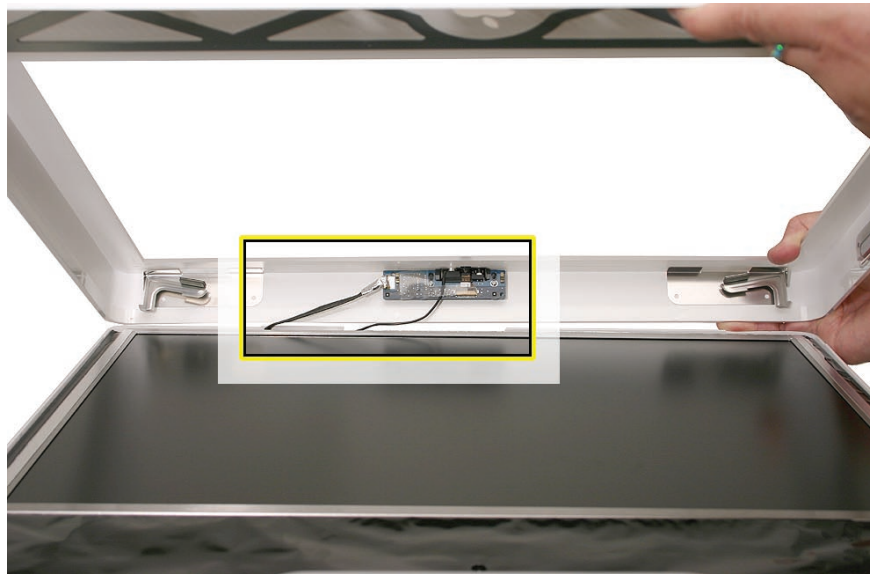

11. Remove the any kapton tape and disconnect the camera and microphone cables from the camera board.
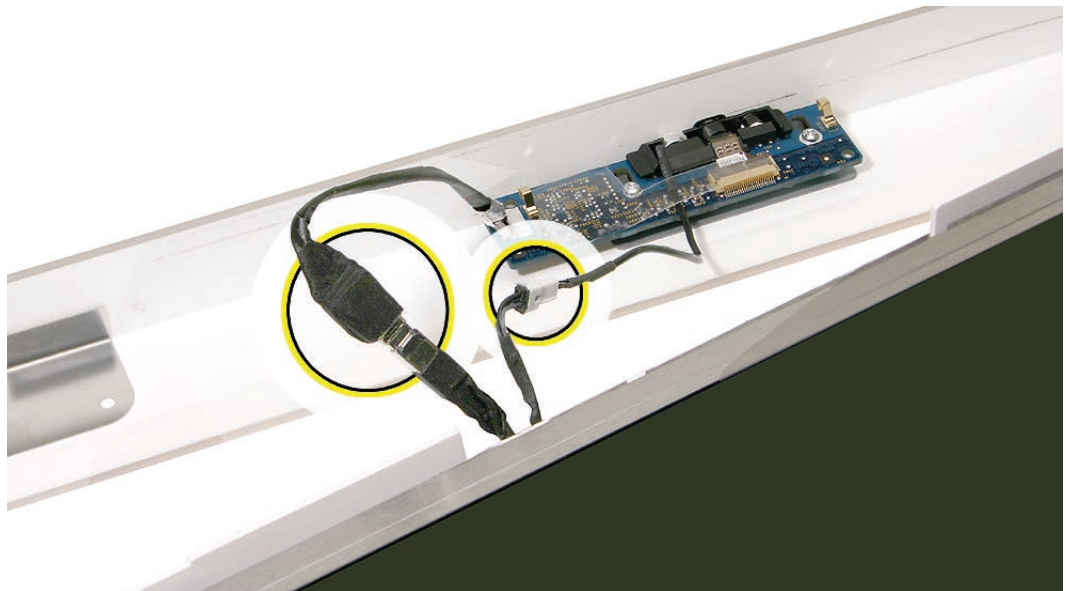

12. Lift the front bezel off the computer. If replacing a damaged front bezel, also remove the camera board. **Note** the microphone is part of the front bezel assembly.

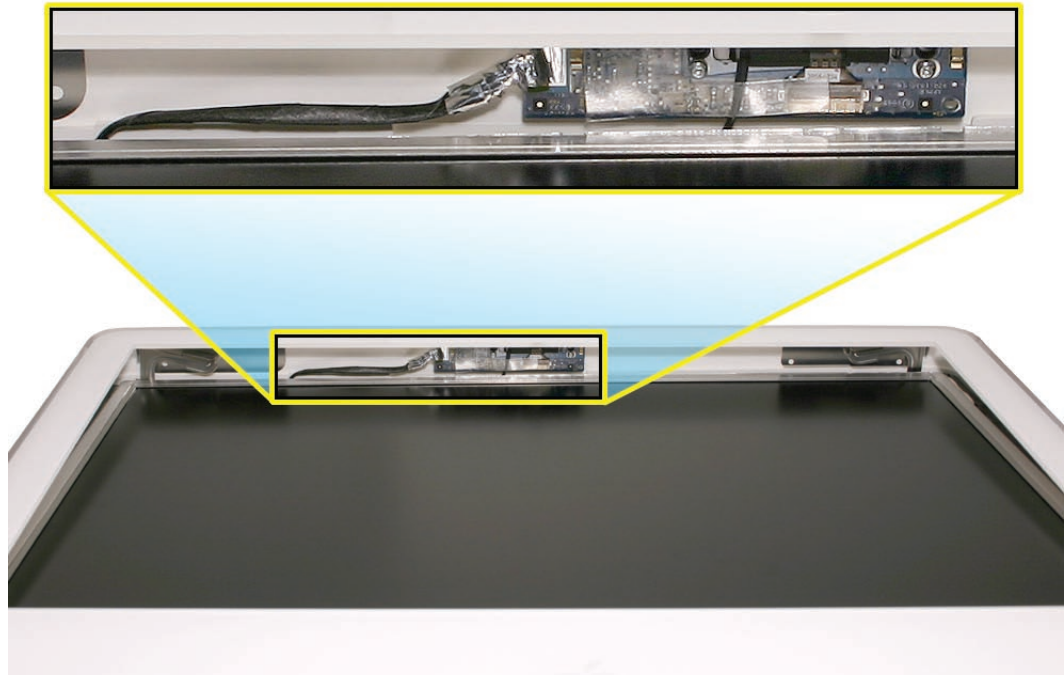## Replacing the Front Bezel

1. Make sure the black EMI shielding along the top of the LCD panel is not in the way of the locking mechanisms when you lower the front bezel onto the computer. Use a black stick to press (re-stick) the EMI shielding along the top of the panel.
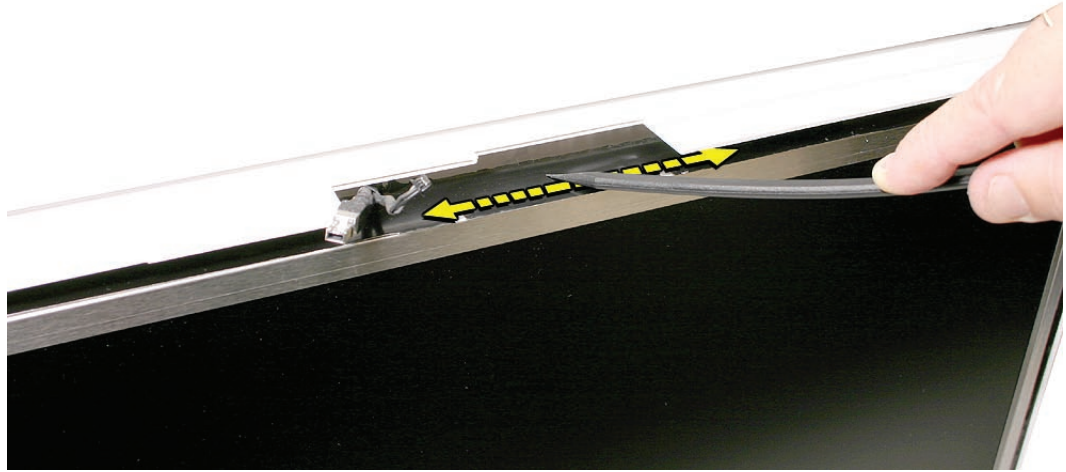
2. Connect the camera and microphone cables (on the camera board) to the cables sticking out of the top of the computer.
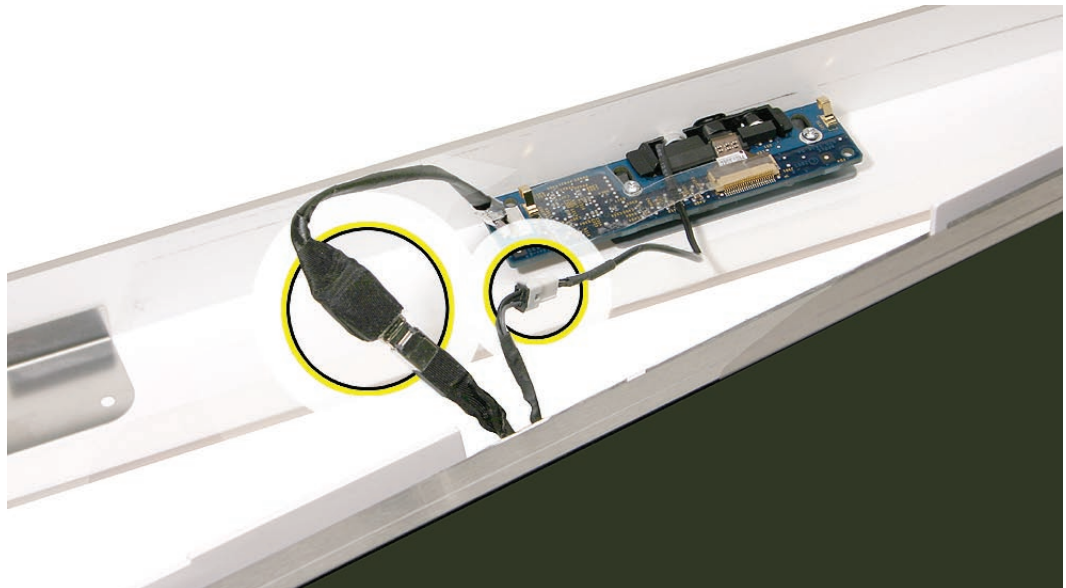
3. Tuck the cables neatly into the channel on the rear housing.

4. Press the memory ejector levers into the closed position.

5. Continue to lower the font bezel down and press the top corners of the front bezel to connect the latches. **Note**: Check that the latches are connected by lifting the front bezel at each corner.

6. Replace the four bezel mounting screws along the bottom of the computer.

7. Replace the access door; tighten the two captive screws.

Camera Board

Tools
- Torx T6 screwdriver
- ESD mat, soft , clean towel or cloth

Preliminary Steps

Before you begin, remove the **access door** and **front bezel.**

Part Location

Removing the Camera Board

1. The camera board and cables are visible as you lift the front bezel off the computer.
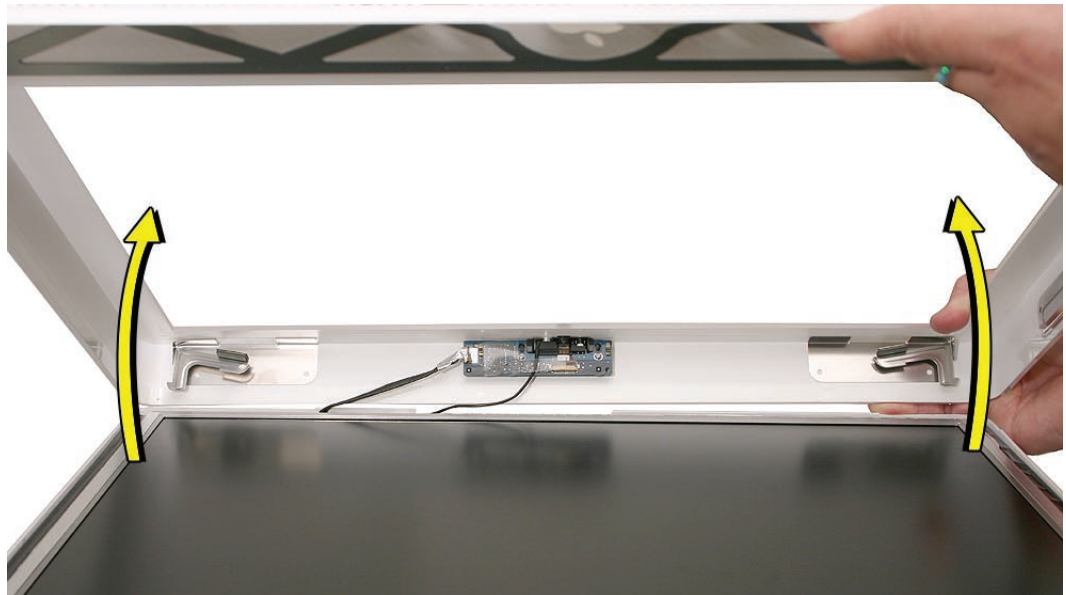
2. Disconnect the camera and microphone cables.
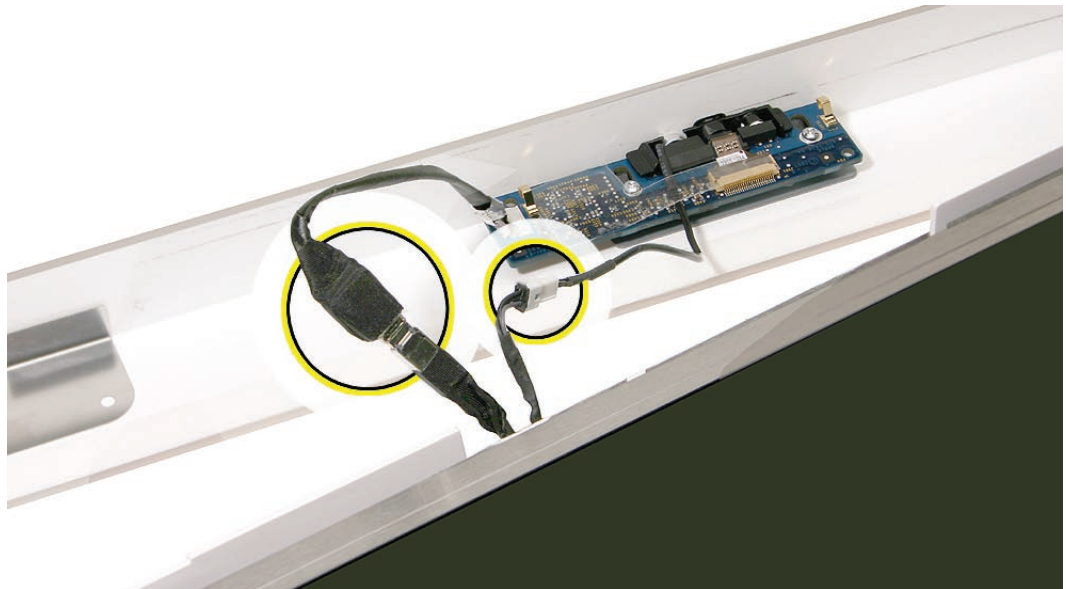
3. Remove the two T6 screws on the camera board.
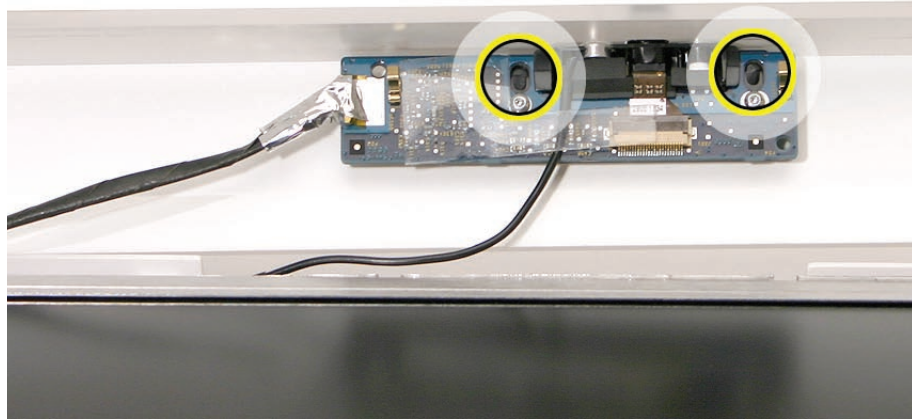
4. Peel back the clear mylar material to free the microphone cable from the camera board.
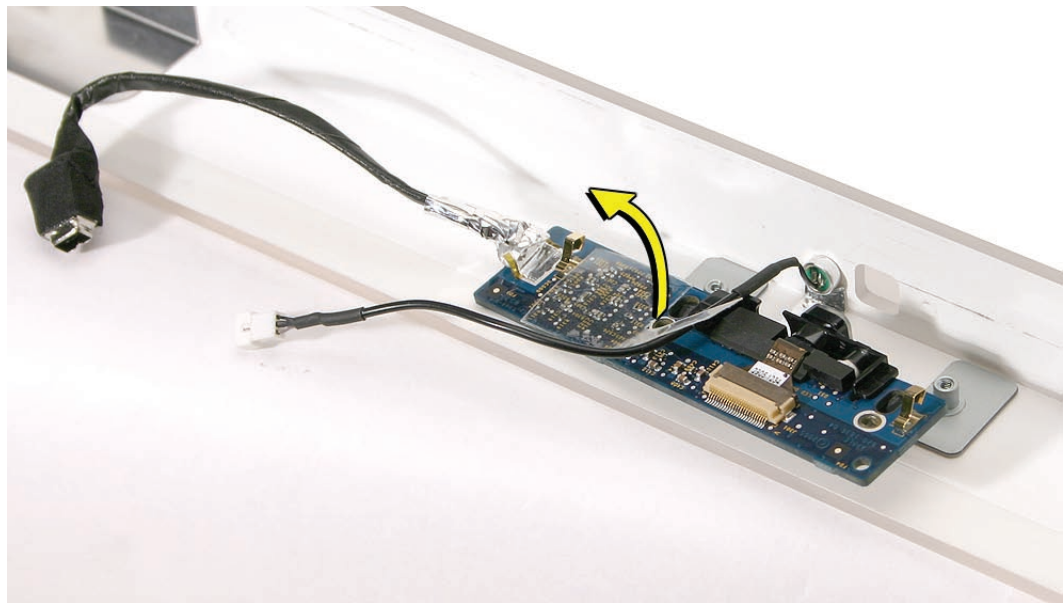
5. Remove the camera board from the front bezel.
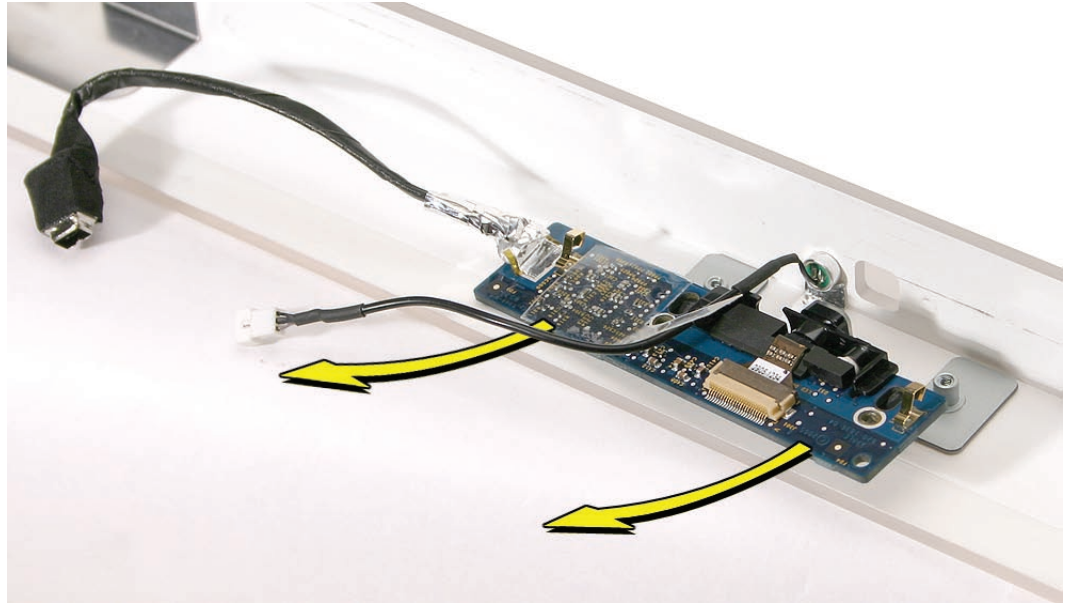
Replacing the Camera Board

1. Replace the camera board on the front bezel. Carefully align and insert the camera lens until it is snug in the bezel aperture

2. Replace the two screws on the camera board. Route the microphone cable under the clear mylar.
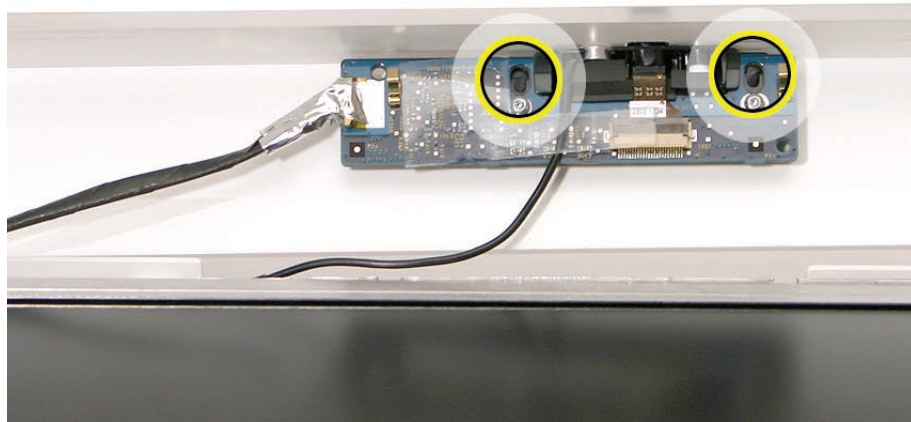
3. Connect the camera and microphone cables.
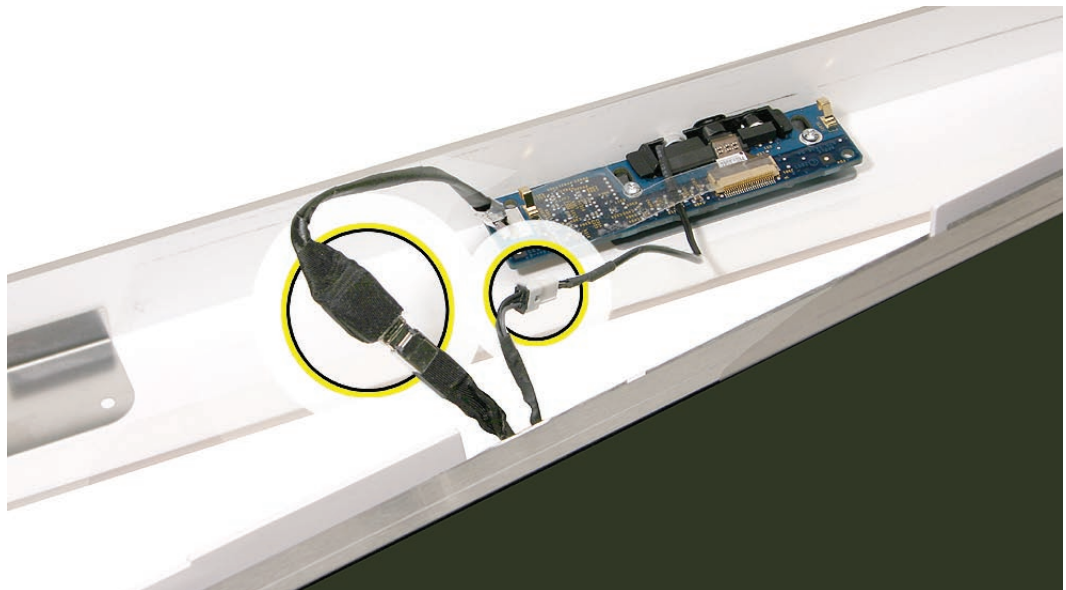
4. Tuck the camera board cables neatly into the channel on the rear housing.
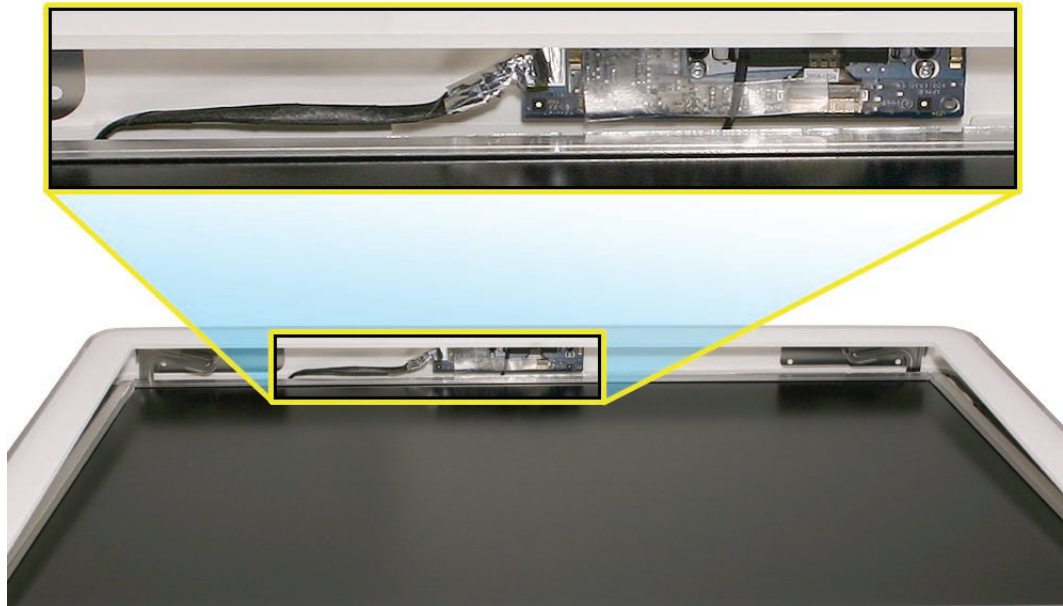
5. Position the memory ejector levers into the closed position.

6. Continue to lower the font bezel down over the pull rings (in the memory compartment) and then lower the top corners of the front bezel so they connect with the magnetic latches. **Note**: check that the latches are connected by lifting the front bezel at each corner.

7. Replace the bezel screws along the bottom of the computer.

8. Replace the access door; tighten the two captive screws

Lower EMI Shield

Tools

The only tool required for this procedure is a black stick (or other nonconductive nylon or plastic flat-blade tool).

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**

Part Location

Removing the Lower EMI Shield

1. Carefully peel the lower EMI shield off the bottom edge of the rear housing. Use a black stick to help peel back the shield.
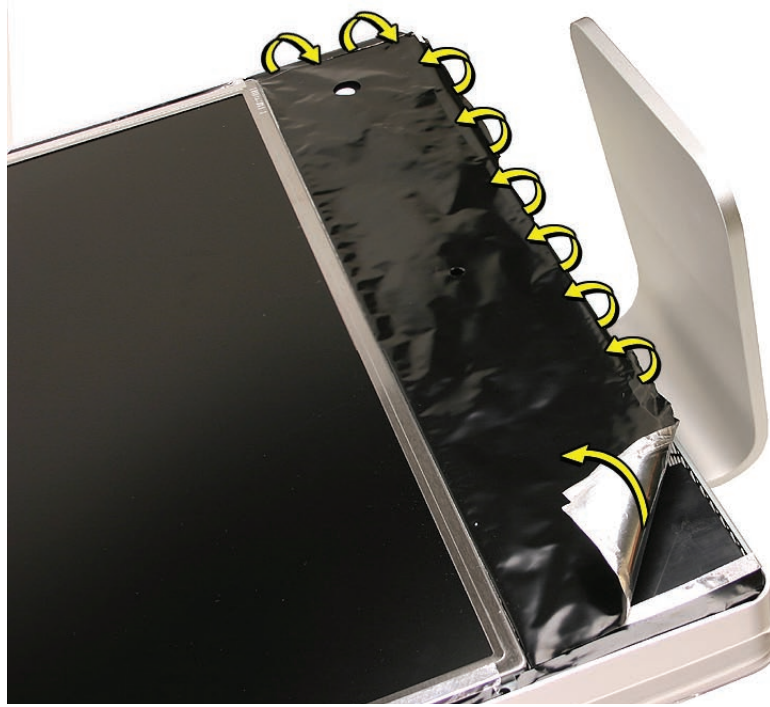
2. Gently lift the EMI shield to rest of the way to expose the other modules.

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Replacing the Lower EMI Shield

1. Position the lower EMI shield over the bottom of the unit so that the holes (for the IR board and the LED) in the shield are properly aligned.

2. Press the sticky, edge of the EMI shield onto the bottom side of the display panel. The crease in the EMI shield should align with the edge of the panel.

3. Fold down the EMI shield and press it firmly over the bottom edge of the rear housing. Use a black stick to rub out any air bubbles and ensure that the EMI shield adheres firmly and without wrinkles along all edges.

4. Make sure the memory eject levers are in the closed position as shown above.

5. Replace the front bezel.

6. Replace the access door.

IR Board

Tools

The only tool required for this procedure is a Torx T6 screwdriver.

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**

Part Location
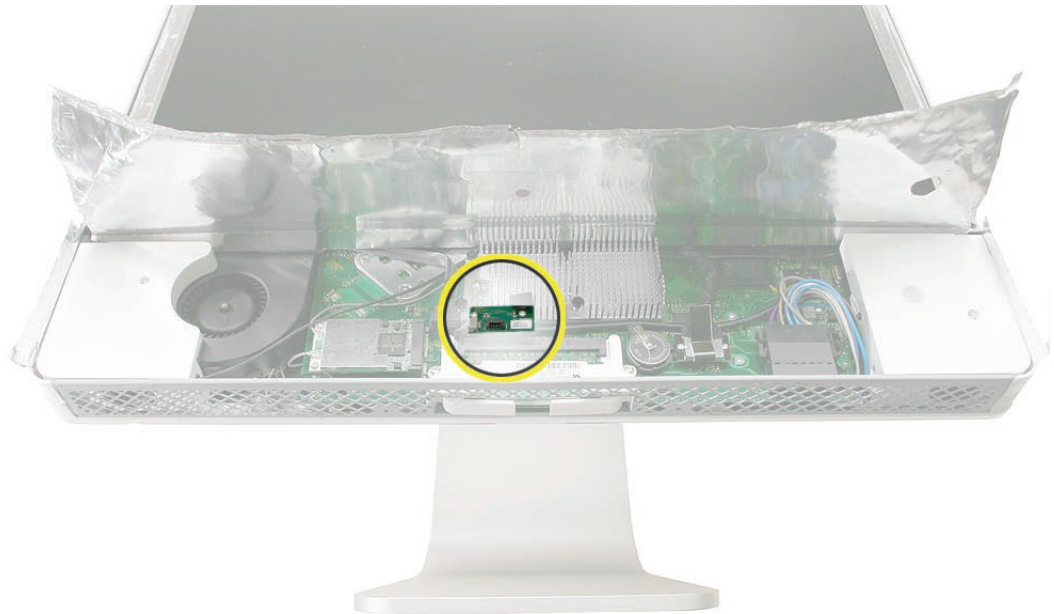
Removing the IR Board

1. Disconnect the IR cable and the two T6 screws on the IR board. Lift the IR board from its mounting bracket.
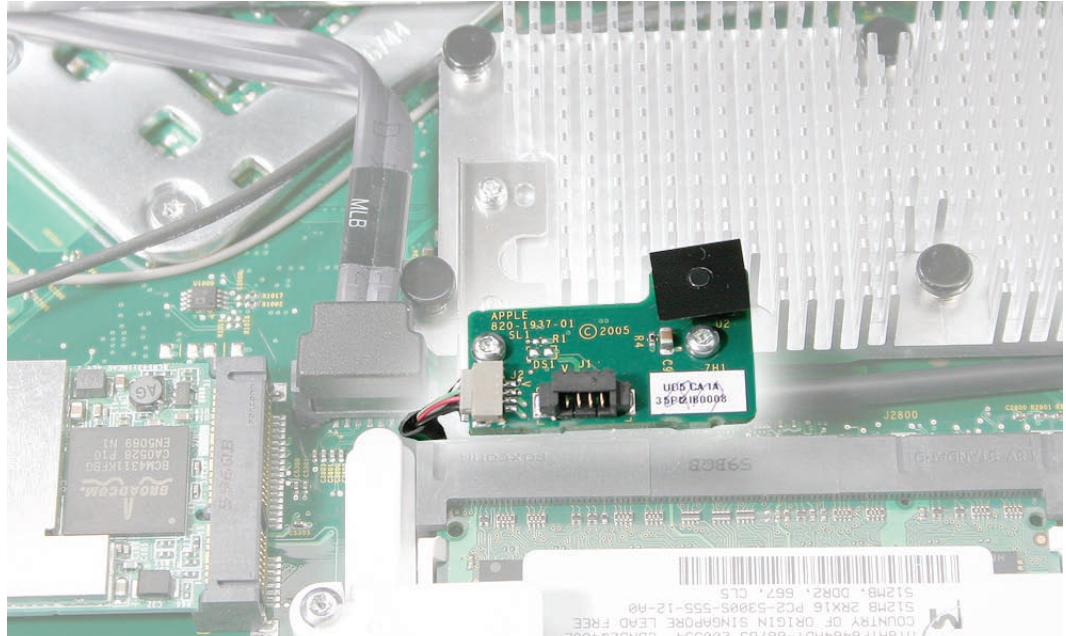
2. Using a Torx T6 screwdriver, remove the two IR board mounting screws. Remove the IR board mounting bracket from the logic board.
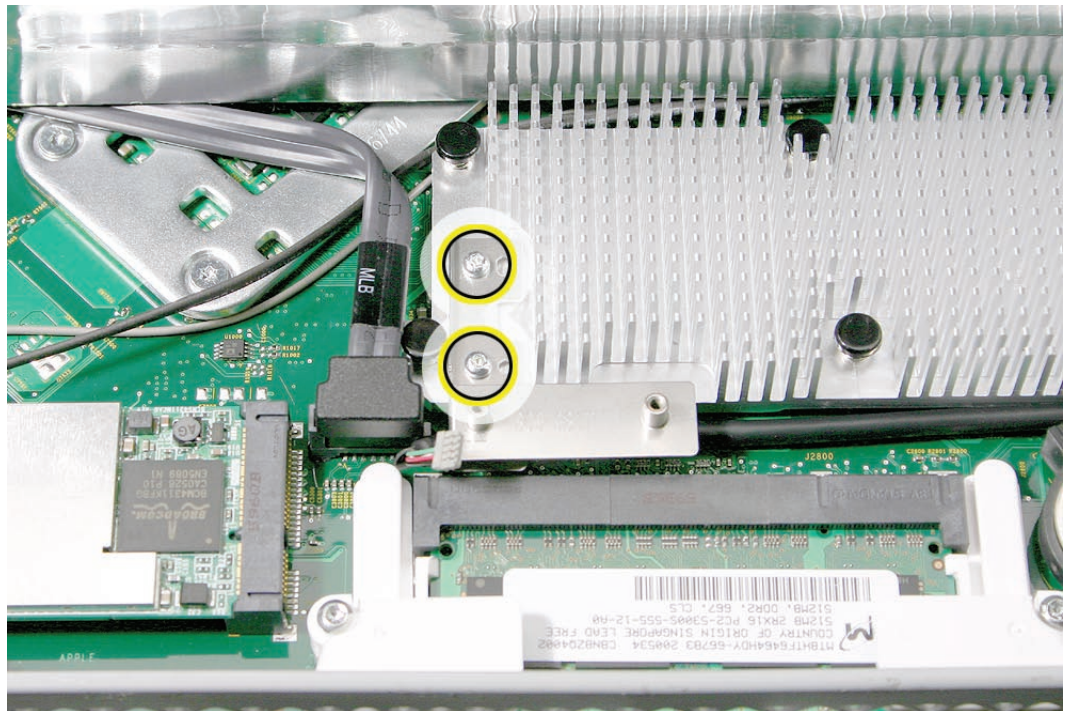
3. **Note**: If you are replacing the IR cable, you must remove the optical drive and disconnect the cable from the logic board.
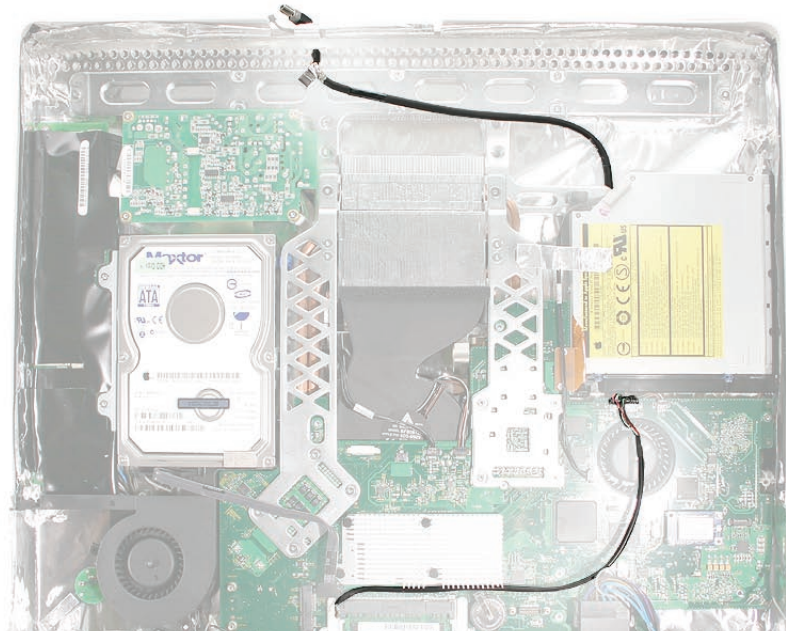
Replacing the IR Board

1. If removed, route the IR cable as shown below and make sure the cable is connected to the logic board near the optical drive and to the IR board near the memory.
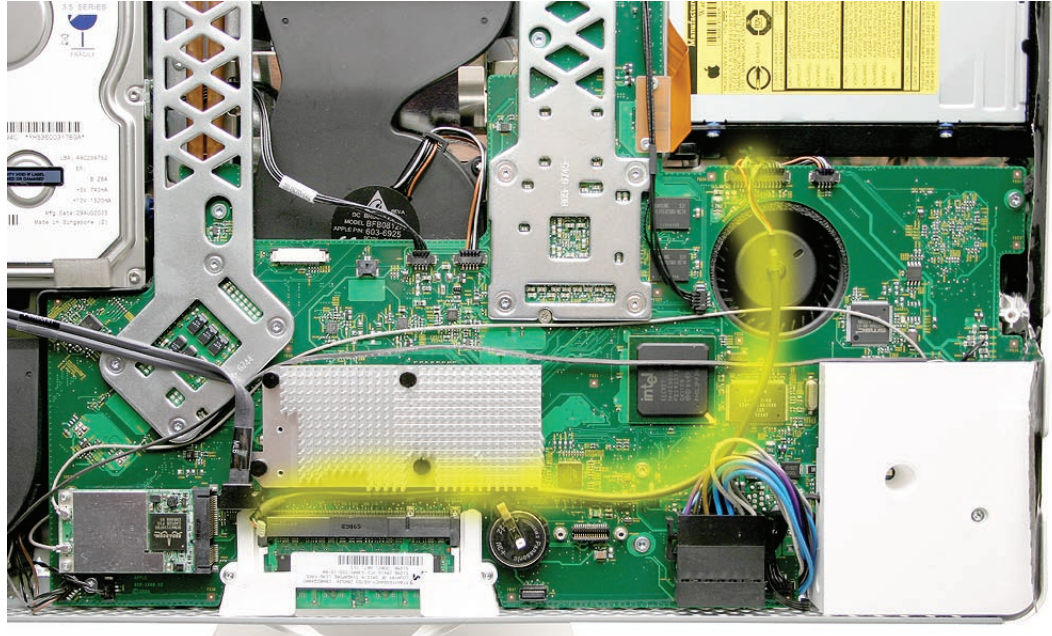
2. Install the IR board mounting bracket, IR board, and screws.

3. Replace the lower EMI shield.

4. Position the memory eject levers into the closed position.

5. Replace the front bezel.

6. Replace the access door.

LCD Display Panel

Tools

- Torx T6 screwdriver.
- Torx T10 screwdriver
- Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**

Part Location

Removing the Display Panel

1. Peel the bottom of the EMI shield off the frame.
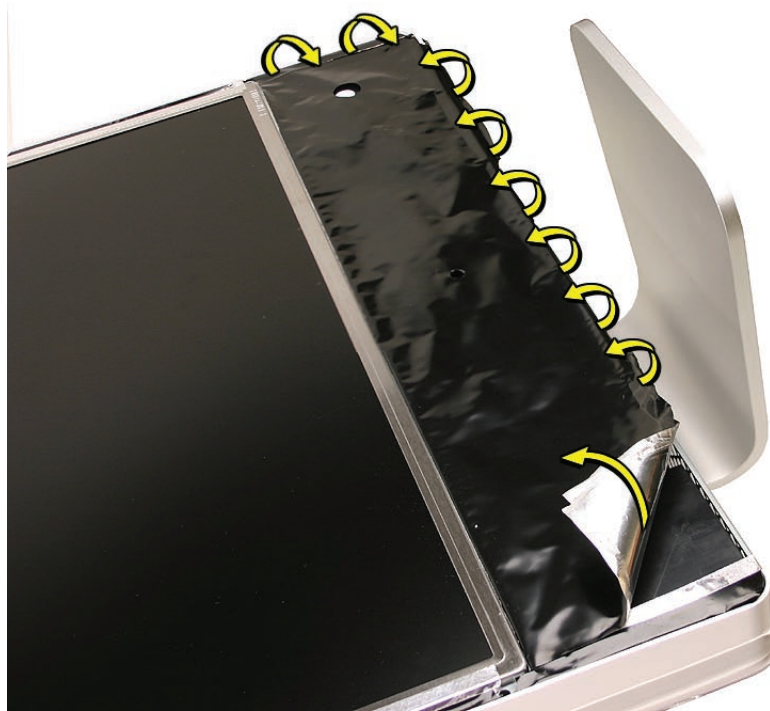
2. Peel the EMI shield up all the way.

3. Using the access tool, a black stick, or your fingers, peel the black EMI tape off the right and left sides of the panel.
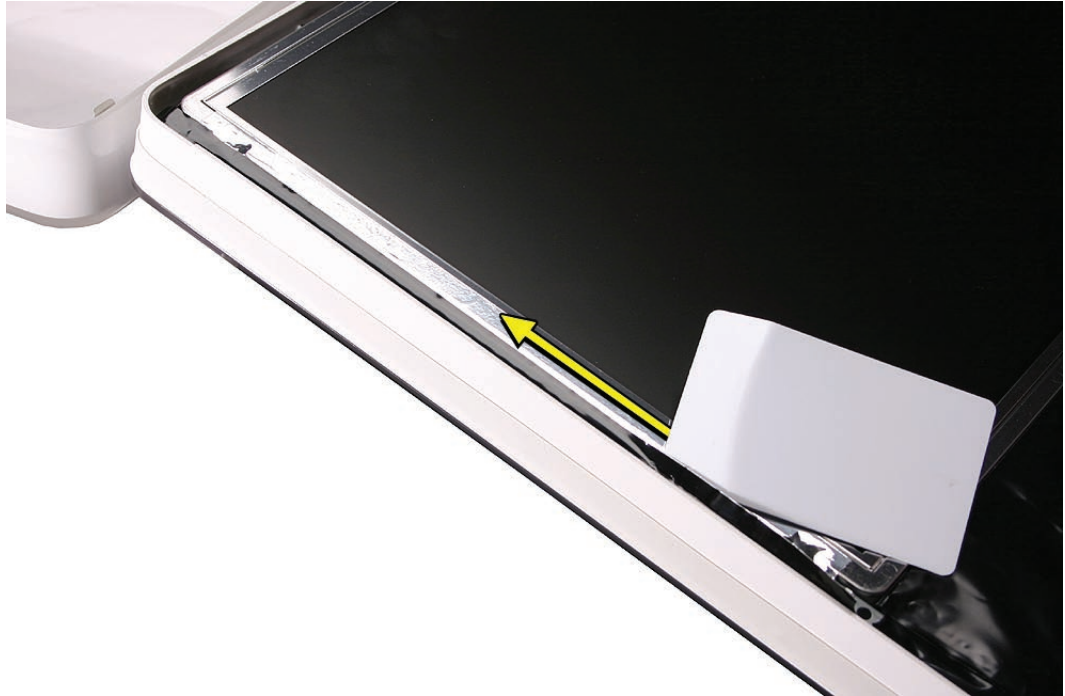
4. Using the access tool or black stick, peel back the black EMI tape stuck along the entire length of the top panel.
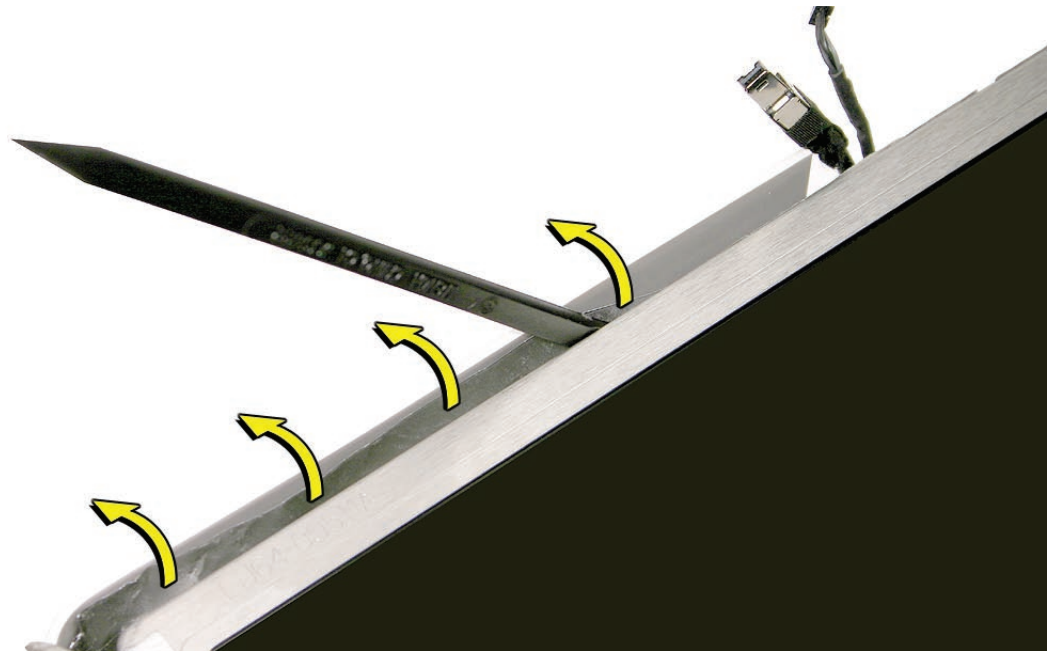
5. Using a Torx T6 screwdriver, remove the two LVDS connector screws. Pull the black tab on the connector to disconnect the LVDS cable from the logic board.
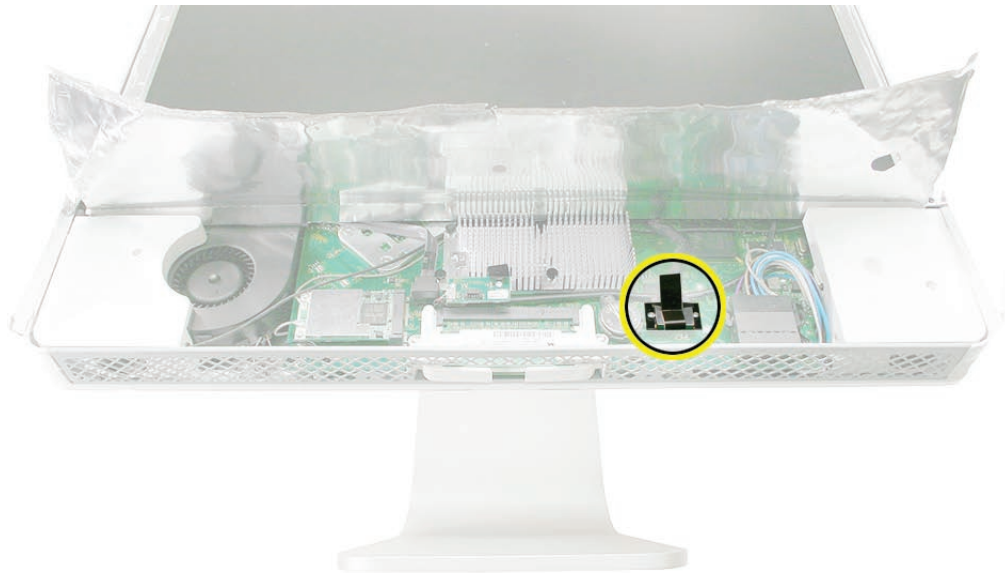
6. Using a Torx T10 screwdriver, remove the four panel mounting screws.
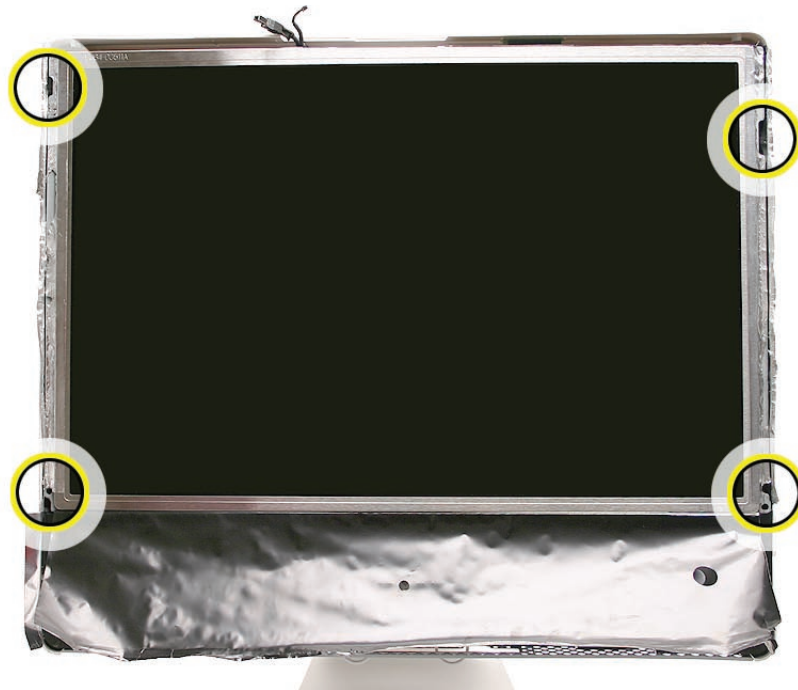
7. Lift the panel up just enough to see the inverter cables on the left side (Note: this shows the iMac G5 computer, but the procedure is the same).

8. Disconnect the two panel-to-inverter cables on the bottom left side of the display.
Replacement Note: The cable connectors are marked with dots to indicate "right-side-up".
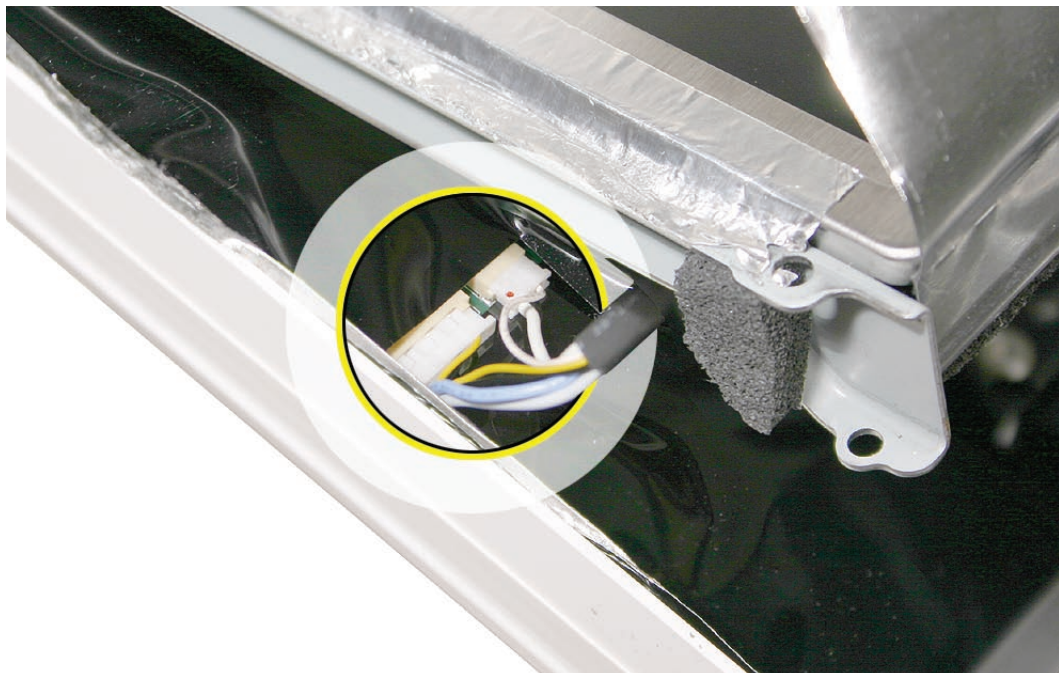
9. Raise the panel up the rest of the way to locate the two inverter cables on the top left side of the display. **Replacement Note**: The cable connectors are marked with dots to indicate "right-side up".
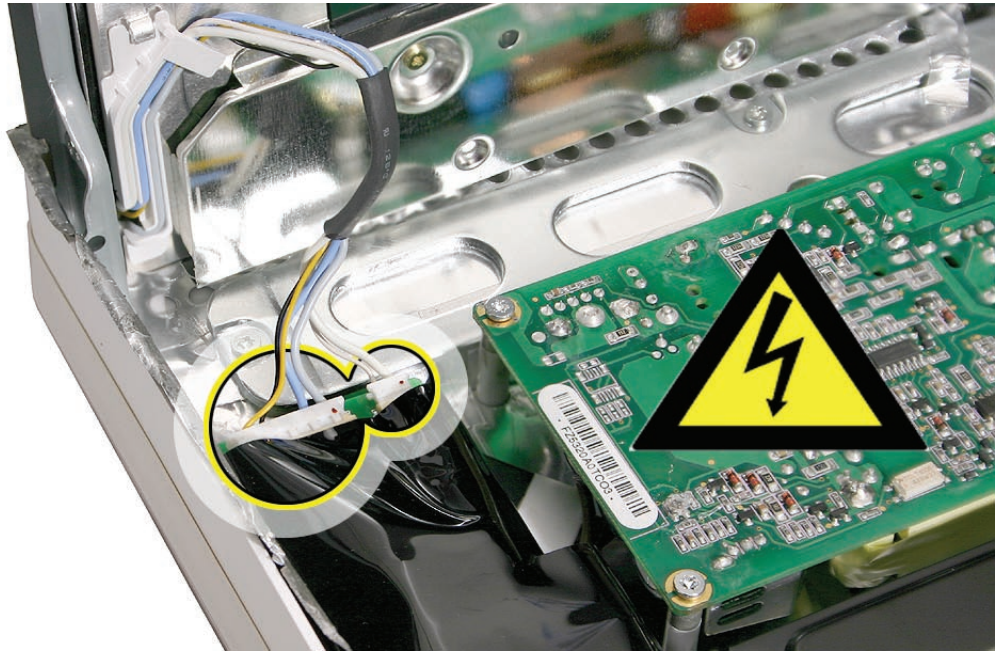
10. Lift the panel off the computer.
    Note: If replacing the display panel, remove the lower EMI shield (if still attached), the display panel mounting brackets, and the LVDS cable from the back of the display panel before returning the module to Apple.

Replacing the Display Panel

1. Replace the LVDS cable on the rear of the display panel.

2. If removed, replace the metal panel mounting brackets to each side of the display.

3. Connect the four inverter-to-display cable connectors. Remember the connectors are keyed; dot-side-up.

4. Replace the display panel with four mounting screws.

5. Connect the LVDS cable connector to the logic board and secure it with two screws.

6. Fold the EMI tape firmly over the left, top, and right edges of the display panel. Use your fingers or the black stick to adhere the tape firmly and rub out wrinkles. **Note:** If the tape was ripped or damaged, replace the damaged EMI tape with new EMI tape

7. Replace the lower EMI shield. Press the EMI shield along the bottom and sides of the computer frame.
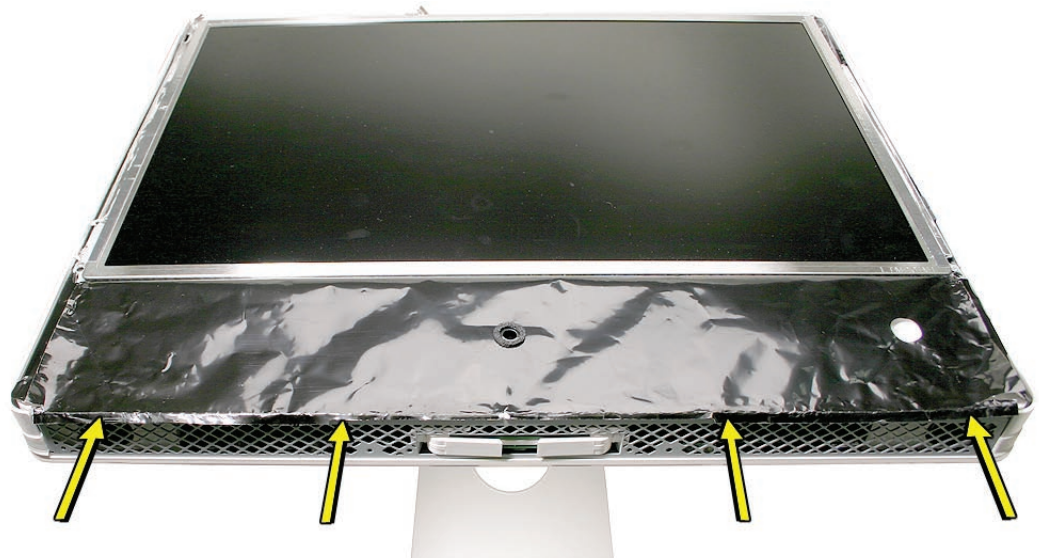
8. Replace the front bezel.

9. Replace the access door.

Speakers

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Display Panel**

Part Location
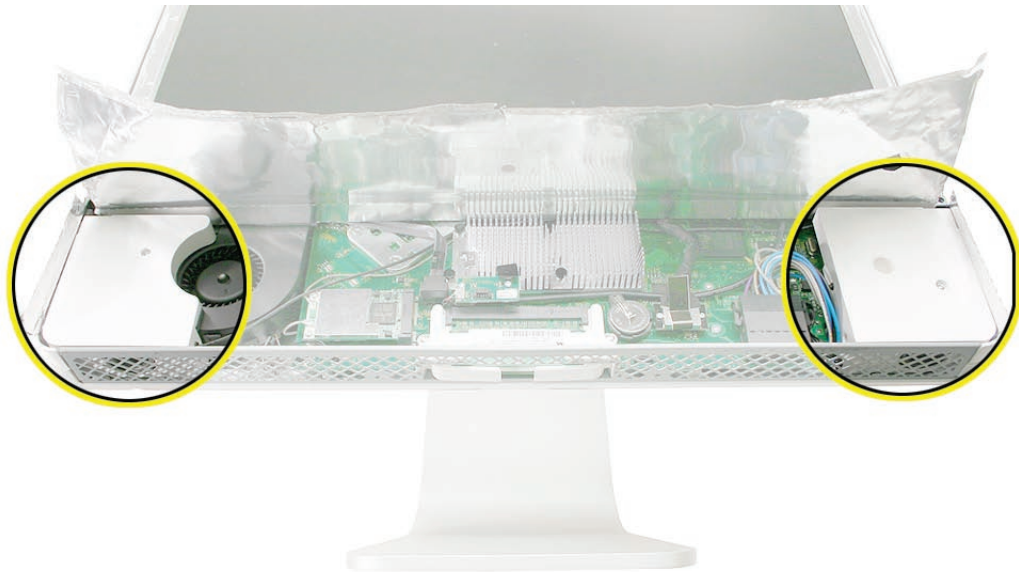
Removing the Speakers

1. Using a T10 torx screwdriver, remove the screws from the left and right speakers.
   Replacement Note: The longer of the two speaker mounting screws is used to secure the left speaker; the shorter screw secures the right speaker.
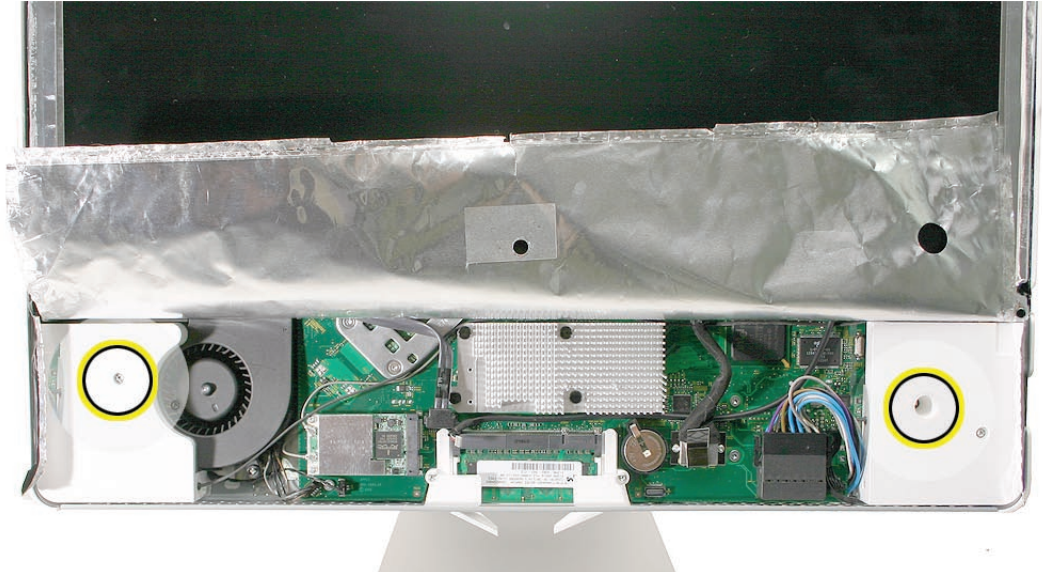
2. Note the speaker cable routing before removing the speakers. The speaker wire runs around the AirPort Extreme card and above the heatsink.
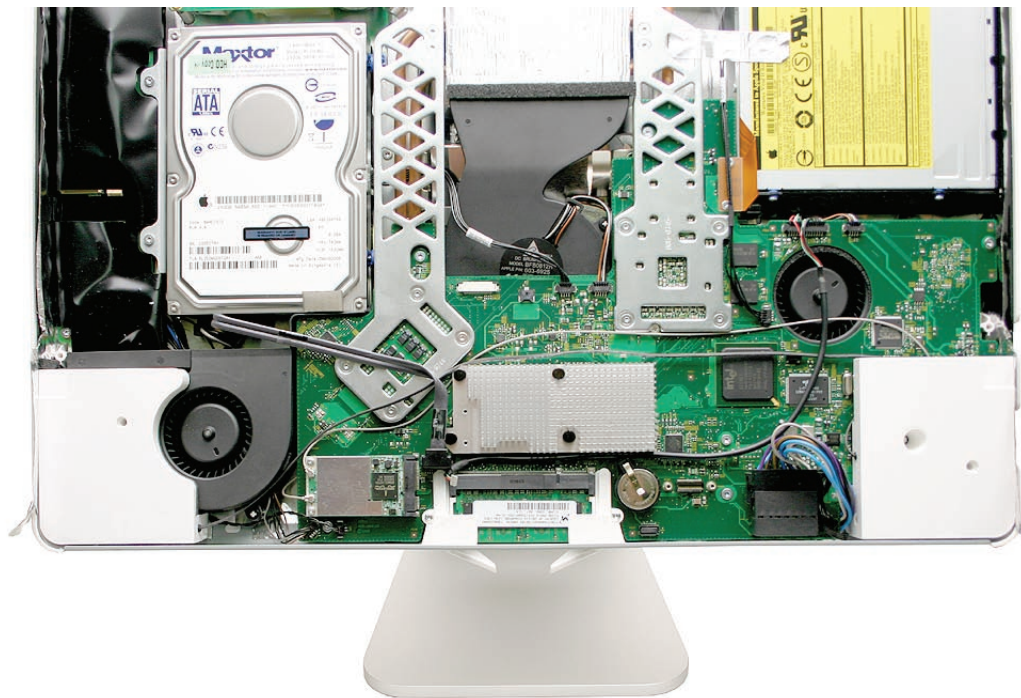
3. Lift the speakers up and out of the computer. See the next photo for disconnecting the speaker.
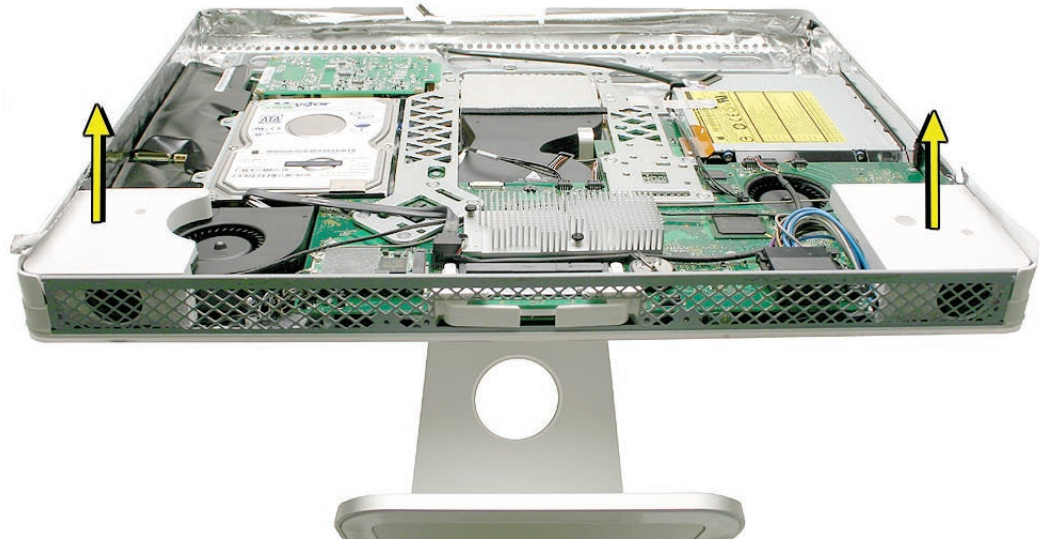
4. Under the right speaker, disconnect the speaker cable from the logic board.
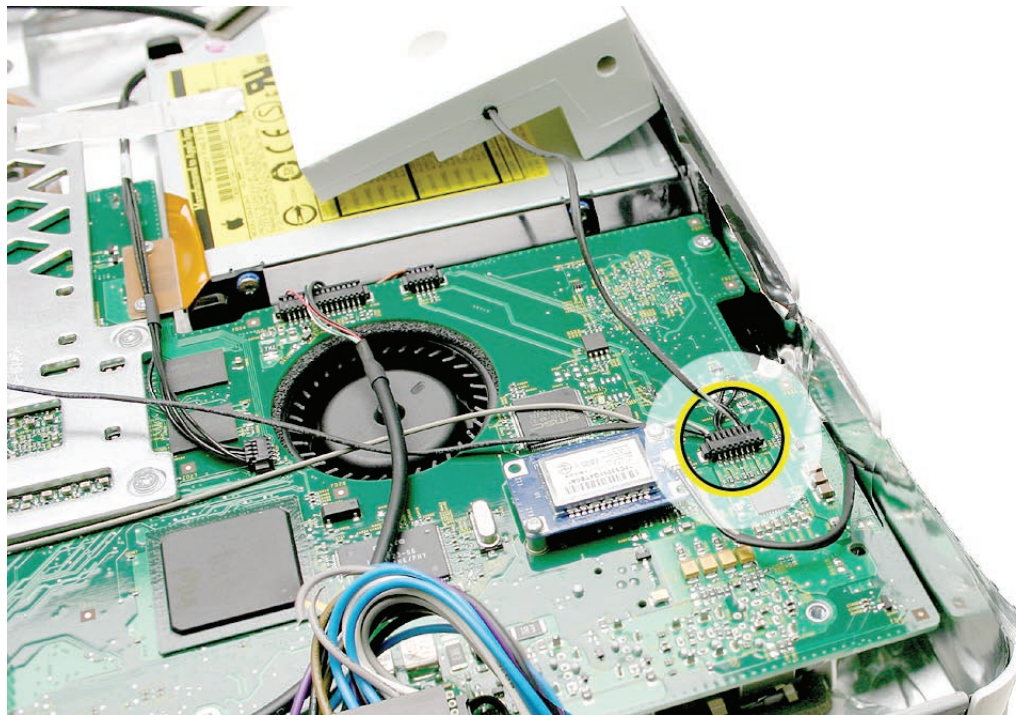
Replacing the Speakers

1. Connect the speaker cable to the logic board.

2. Install the speakers and route the speaker wire above the heatsink and around the AirPort Extreme card.

3. Secure the right speaker with the smaller of the two mounting screws.

4. Secure the left speaker with the longer of the two mounting screws.

5. Replace the display panel.

6. Replace the lower EMI shield.

7. Replace the front bezel.

8. Replace the access door.

AirPort Extreme Card

Tools

- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**

Part Location
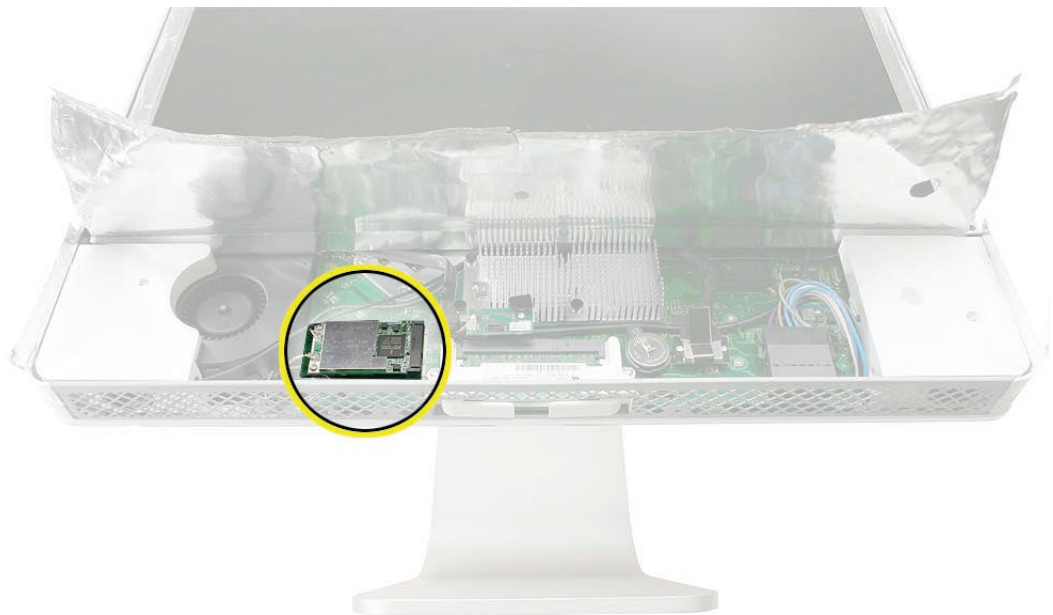
Removing the AirPort Extreme Card

1. Using a T6 torx screwdriver, remove the two screws and disconnect the gray antenna from the AirPort Extreme card.

2. The board pops up when the screws are removed. Pull the AirPort Extreme card out of the slot in the direction of the arrow.

Replacing the AirPort Extreme Card

1. Align the AirPort Extreme card with the slot on the logic board. Insert the board into the slot.
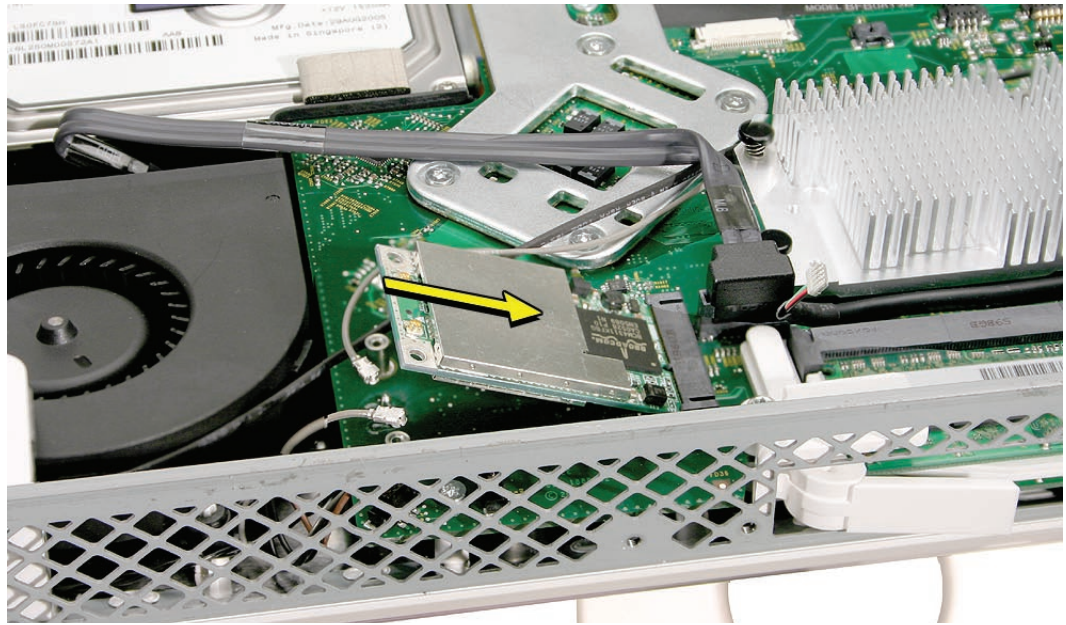
2. Replace the two AirPort Extreme card screws.

3. Connect the antenna cable to the lower connector on the AirPort Extreme card.

4. Replace the lower EMI shield.

5. Replace the front bezel.

6. Replace the access door.

Bluetooth Card

Tools
- Torx T6 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Speakers**

Part Location
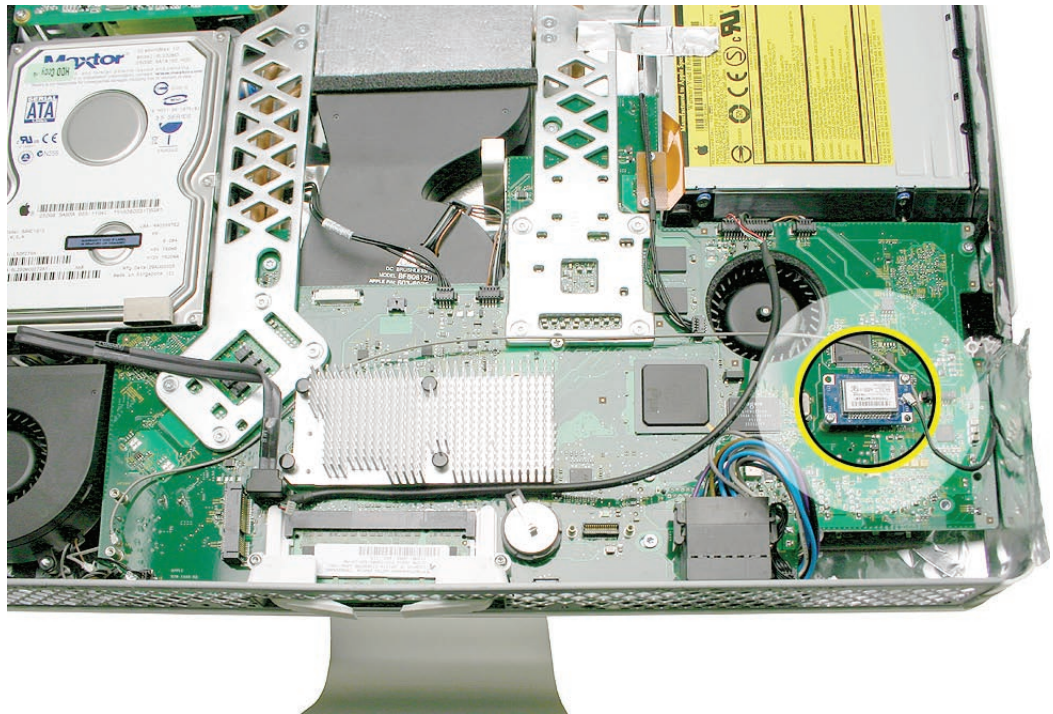
Removing the Bluetooth Card

1. Using a T6 torx screwdriver, remove the two T6 screws on the Bluetooth card and disconnect the antenna from the card.
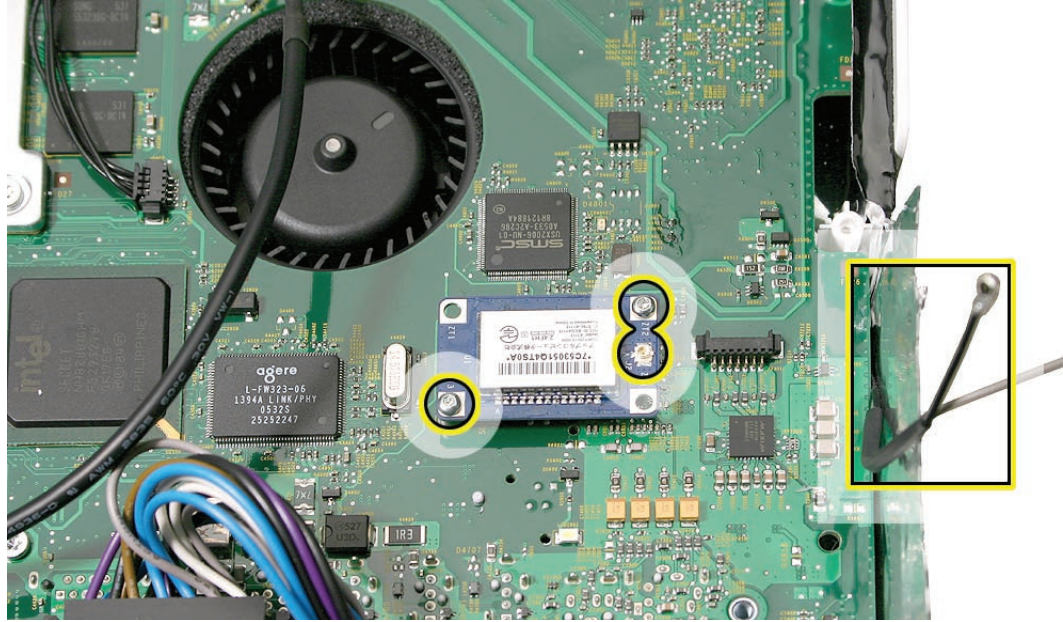
2. Lift the card off the logic board.

Replacing the Bluetooth Card

1. Press the Bluetooth card onto the logic board connector. **Note**: Make sure the card and antenna are securely connected before installing the speakers.

2. Connect the Bluetooth antenna to the Bluetooth card.

3. Replace the two T6 Bluetooth card screws.

4. Replace the speakers and speaker screws.

5. Replace the lower EMI shield.

6. Replace the front bezel.

7. Replace the access door.

Optical Drive

## Tools

- Torx T10 screwdriver
- Torx T6 screwdriver
- Flat-blade screwdriver

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Display Panel**

Part Location
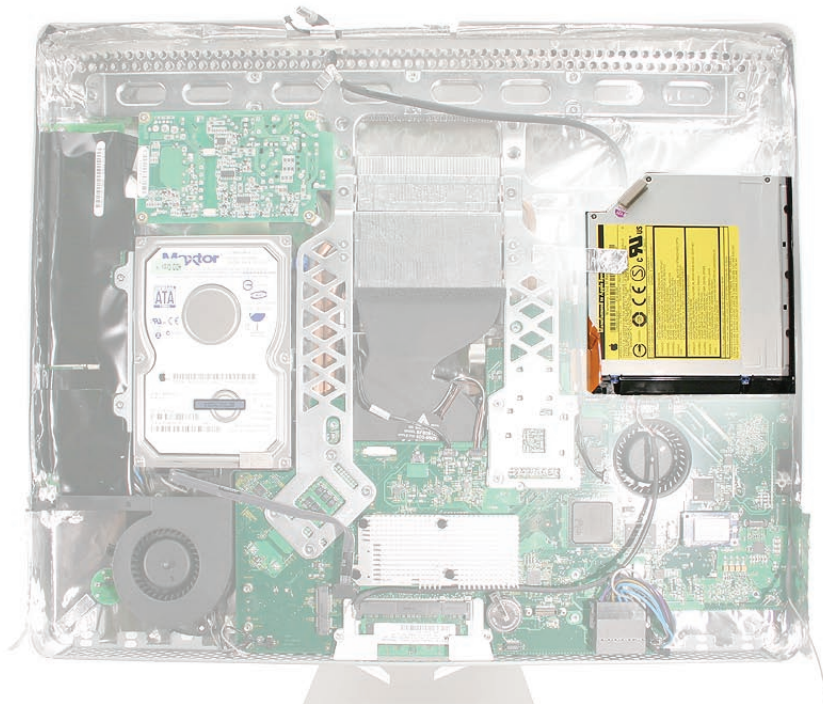
Removing the Optical Drive

1. Looking at the circles below, starting with the top circle, do the following:
   Peel back the silver EMI tape going from the chassis frame to the optical drive, remove the two T6 screws on the optical drive flex cable, disconnect the flexible cable and the optical drive sensor cable from the logic board.
   Caution: Never press down on or grasp the body of the optical drive. Pressing or squeezing the body of the optical drive could damage the mechanism.
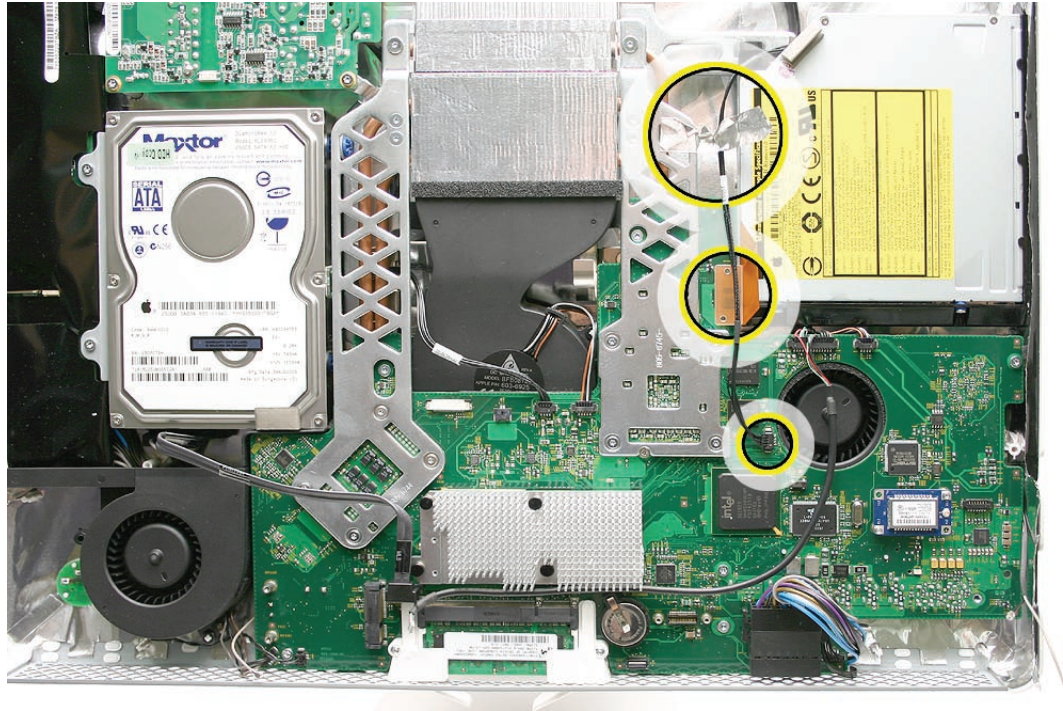
2. Locate the black tabs at each side of the plastic optical drive mounting bracket. Starting at the release tab that is furthest from the logic board, grasp the tab with needlenose pliers, and flex the tab toward the optical drive flexible cable. (**Note**: This graphic shows a different iMac model, but the removal procedure is the same.) Use one finger underneath the edge of the optical drive to gently lift up that corner of the drive.
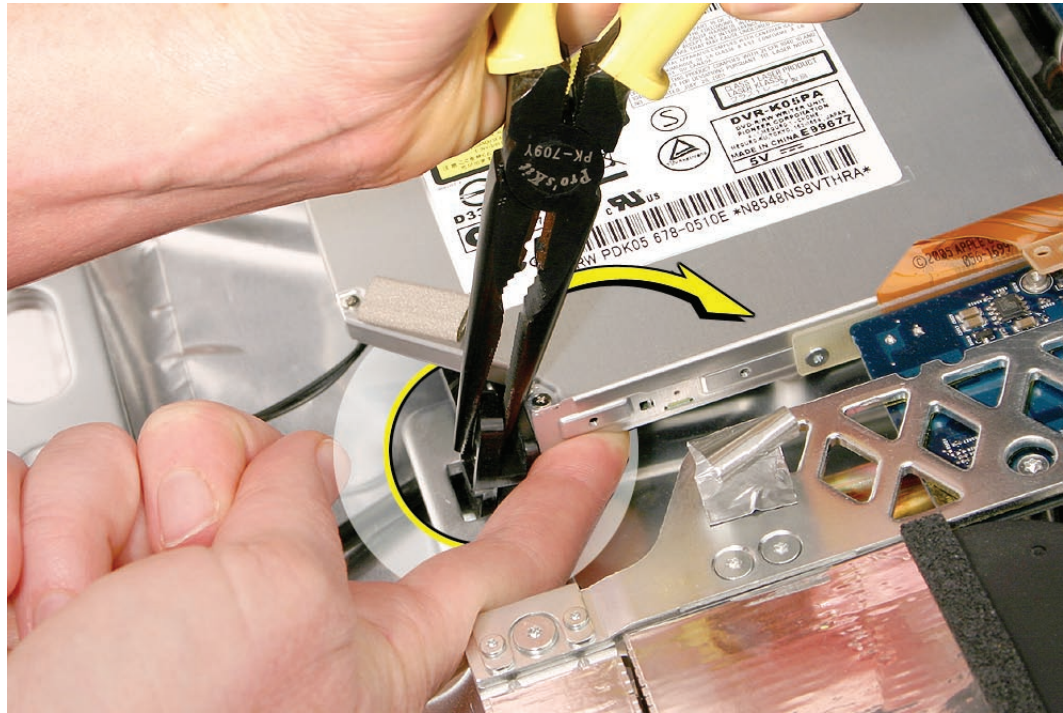
Caution: Never press down on or grasp the body (silver) of the optical drive when removing or installing it. Depressing the body of the optical drive could damage the mechanism. Grasp the optical drive by its mounting bracket only.

3. **Warning**: iMac main logic boards returned with physical damage such as scratches, fractures, or broken or missing components caused by improper servicing may be classified as customer abuse. When using a tool to release the latches, be careful not to apply pressure to the logic board or it may be damaged.

While avoiding the logic board, grasp the tab with needlenose pliers, and flex the tab toward the optical drive. Use one finger underneath the rear edge of the optical drive to gently tilt up the end of the drive and remove the optical drive out of the housing. **Note**: This graphic may show a different iMac model, but the removal procedure is the same.
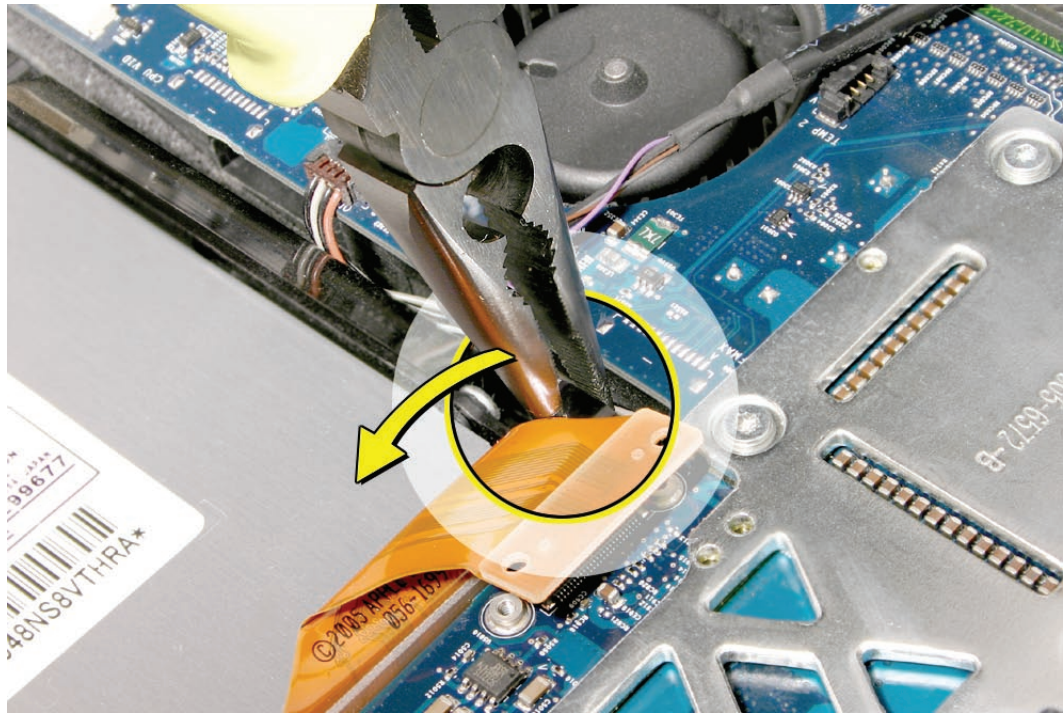
4. This photo shows the optical drive out of the computer so you can visualize how the clips move. Pressing down (#1) releases the clips (#2) outward from the metal chassis.
    Caution: Never press down on or grasp the body of the optical drive when removing or installing it. Pressing or squeezing the body of the optical drive could damage the mechanism.
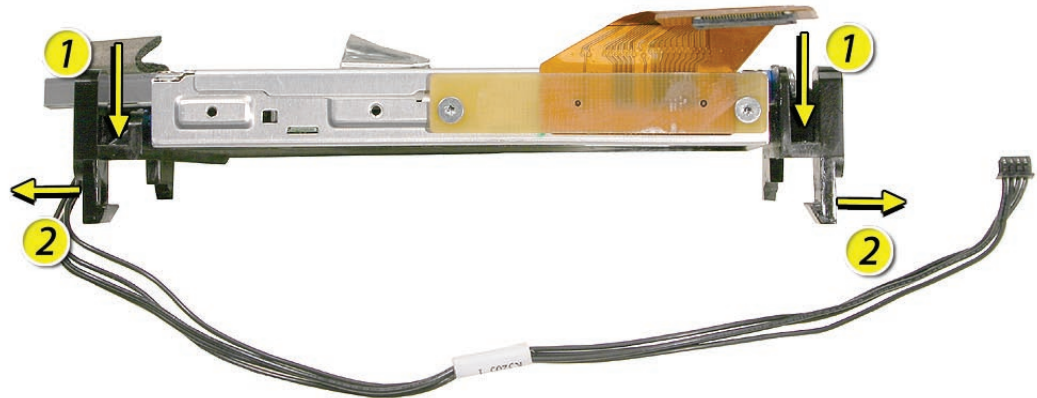
5. If replacing the optical drive, use a T6 torx screwdriver to remove two flex cable screws attaching to the optical drive. **Note**: Disconnect the flex cable and transfer it to the replacement drive. Go on to the next step.
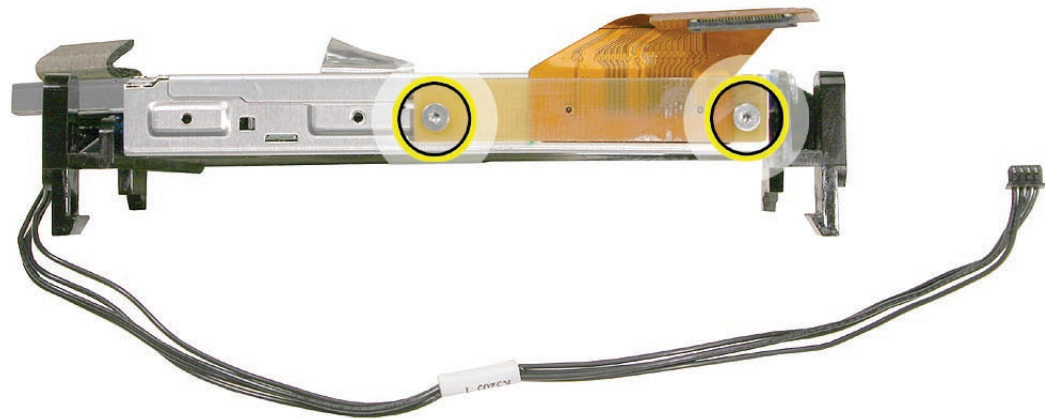
6. If replacing the optical drive, disconnect the sensor cable from the optical sensor located on the underside of the optical drive. Transfer the sensor cable to the replacement drive.
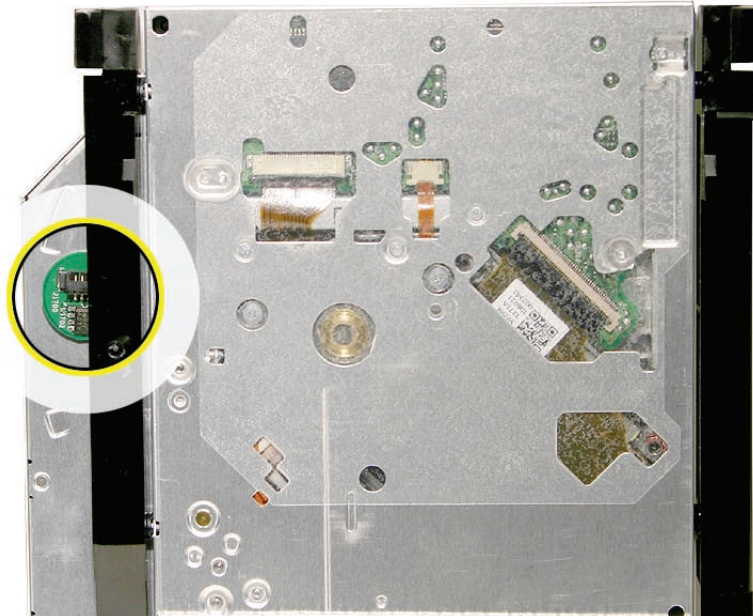
Replacing the Optical Drive

1. Install the flex cable to the optical drive with two T6 screws.
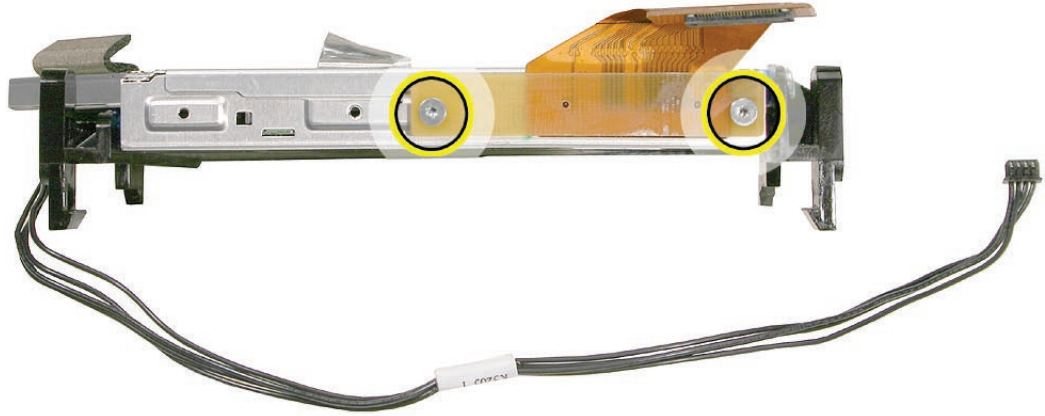
2. Insert the optical drive bezel into the rear housing, lining up the bezel with the slot opening (#1) . Be sure to align the two guide holes in the front bezel with guide posts at each end of the drive access hole.
   Push down on the mounting brackets (#2) to lock the optical drive securely into place on the chassis.
   Caution: Never press down on or grasp the body of the optical drive when installing it. Pressing or squeezing the body of the optical drive could damage the mechanism.
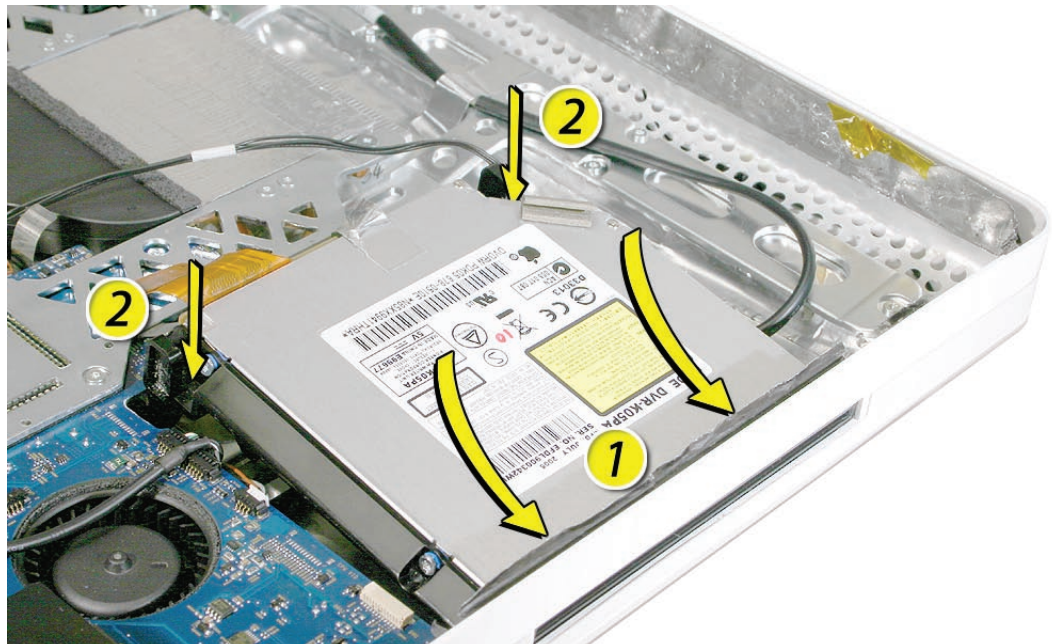
3. Connect the optical sensor cable to the logic board, attach the flex cable and secure it with the T6 screws, and reattach the silver EMI tape.
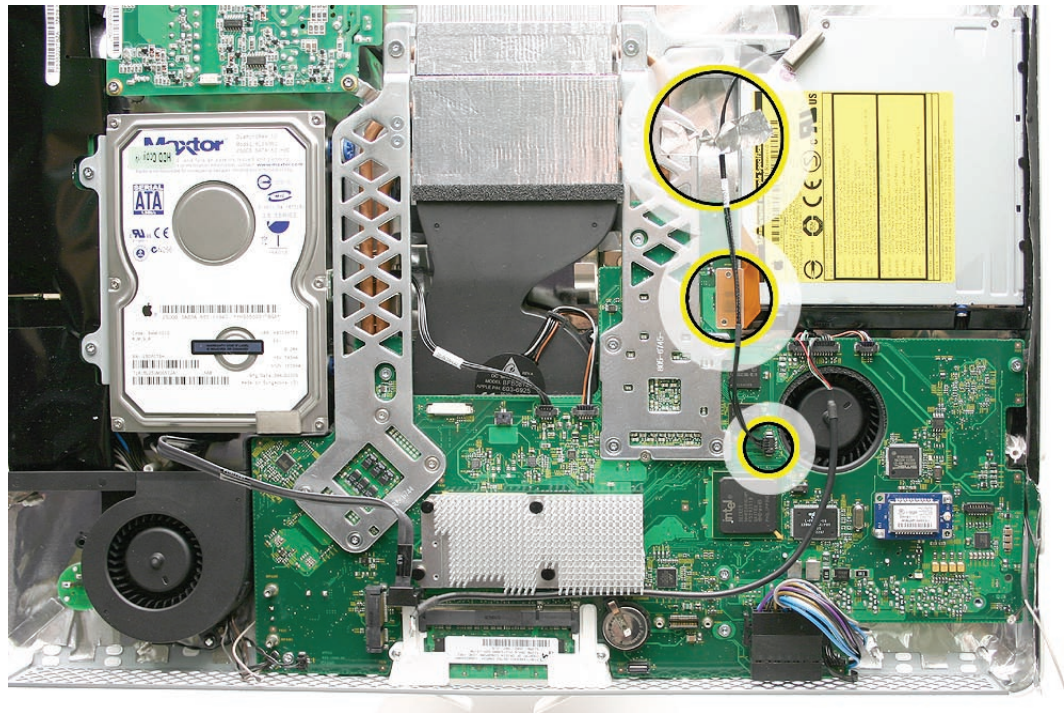
4. Replace the display panel.

5. Replace the lower EMI shield.

6. Replace the front bezel.

7. Replace the access door.

Hard Drive

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Display Panel**

Part Location
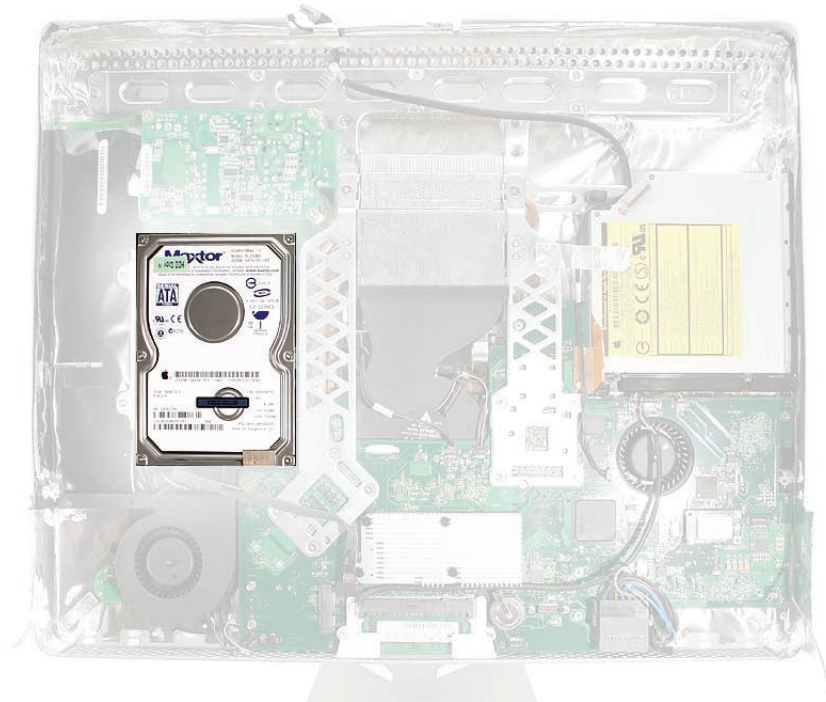
Removing the Hard Drive

1. Remove the two T10 screws attaching the hard drive to the DC/DC inverter board
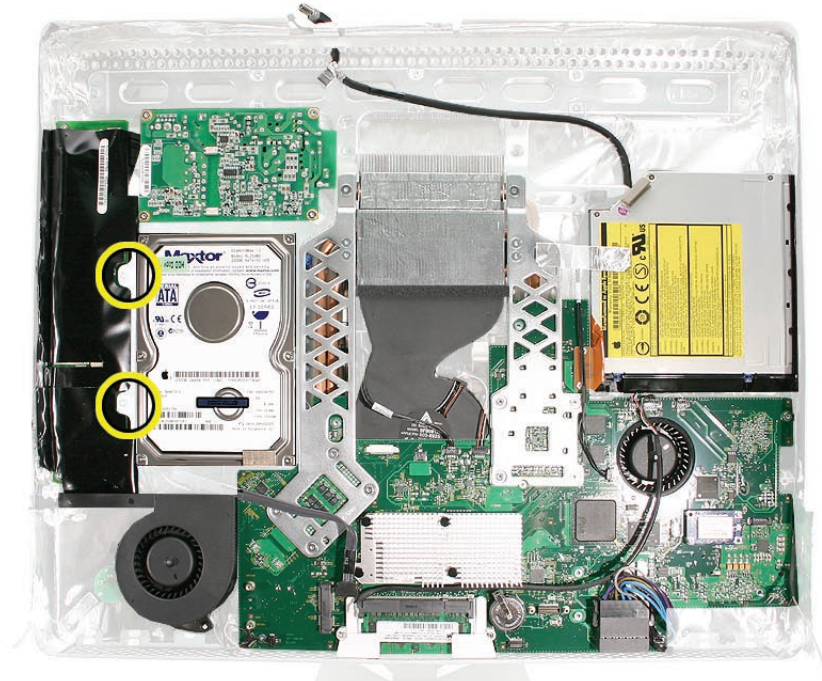
2. Disconnect the hard drive sensor cable from the connector on the logic board. **Note** the location of the sensor on the side of the hard drive and the routing of the cable.
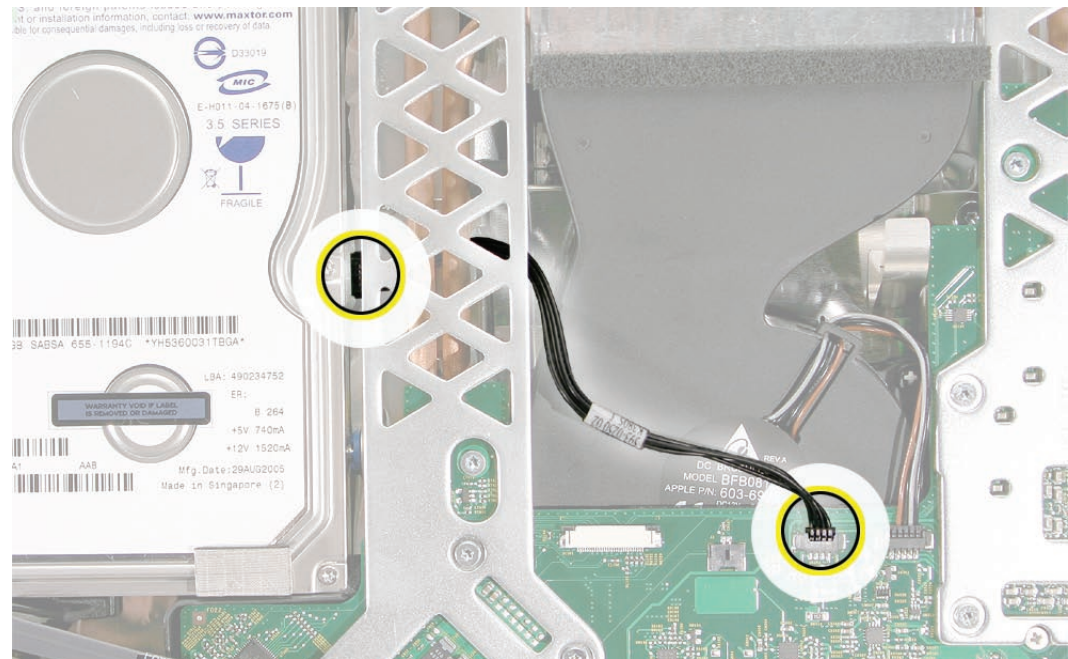
3.	The hard drive sensor is different from the optical drive sensor. The hard drive sensor can be identified by resistor R1700. **Replacement Note**: Make sure to transfer the sensor to the replacement hard drive. Use the double-stick tape enclosed with the replacement hard drive to attach the sensor.
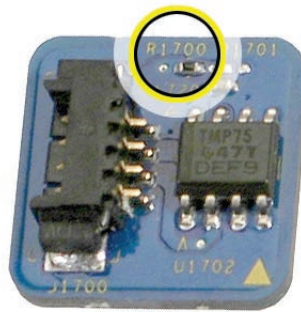
4.	Holding the drive by the metal bracket, pull the hard drive toward the inverter and then up to release the hard drive mounting pins from the grommets on the chassis.
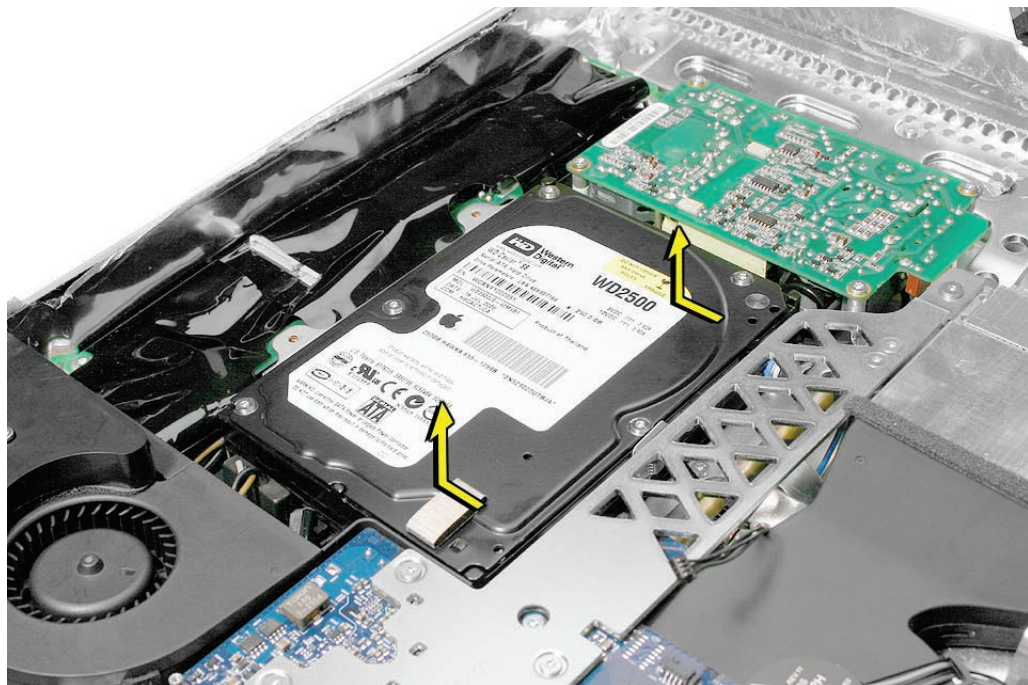
5. Disconnect the hard drive power and data cables.
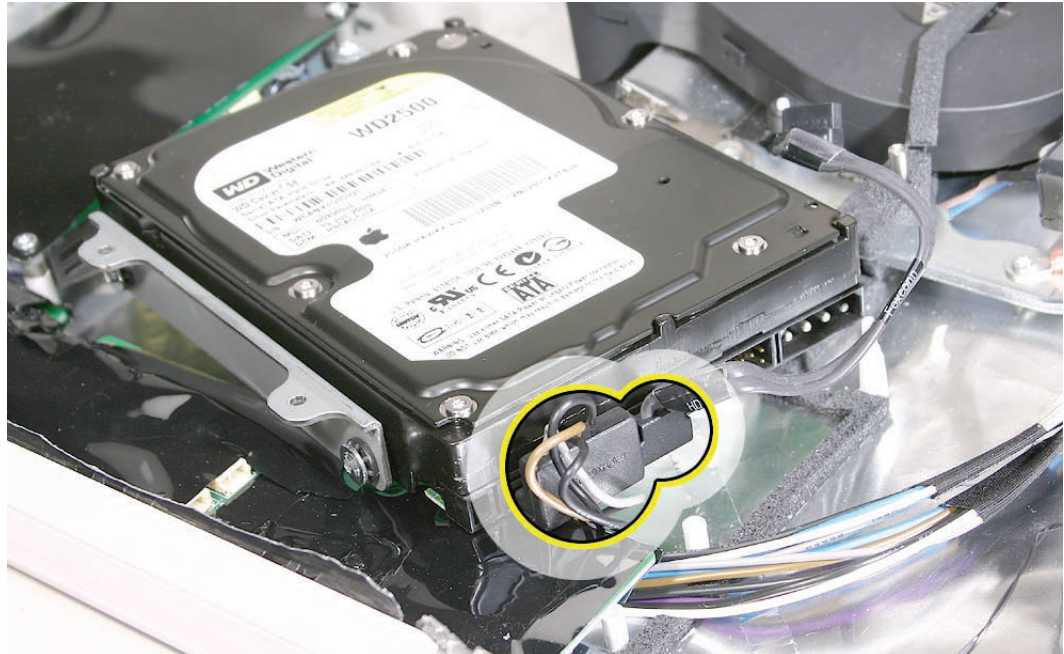
6. If you are replacing the hard drive, remove the temperature sensor, mounting bracket, and mounting pins (circled) before returning the drive to Apple. Transfer these parts to the replacement drive.

Replacing the Hard Drive

1. Attach the hard drive sensor and sensor cable to the side of the hard drive.

2. Attach the mounting bracket and pins if they were removed. Connect the hard drive data and power cables.
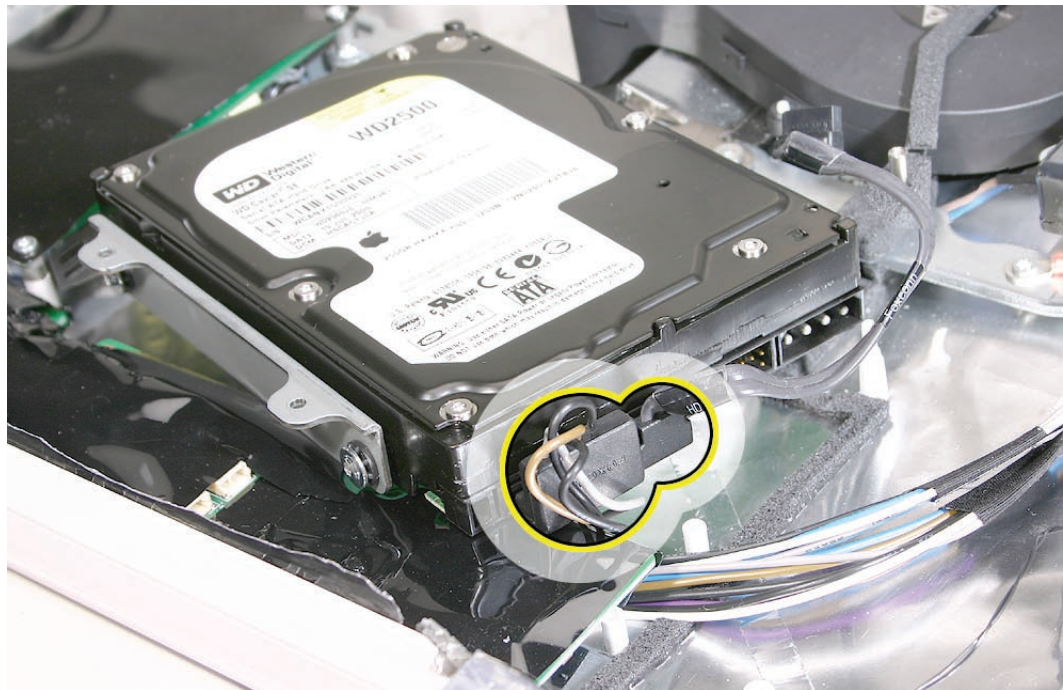
3. Route the hard drive sensor cable under the metal chassis. Connect the sensor cable to the logic board.
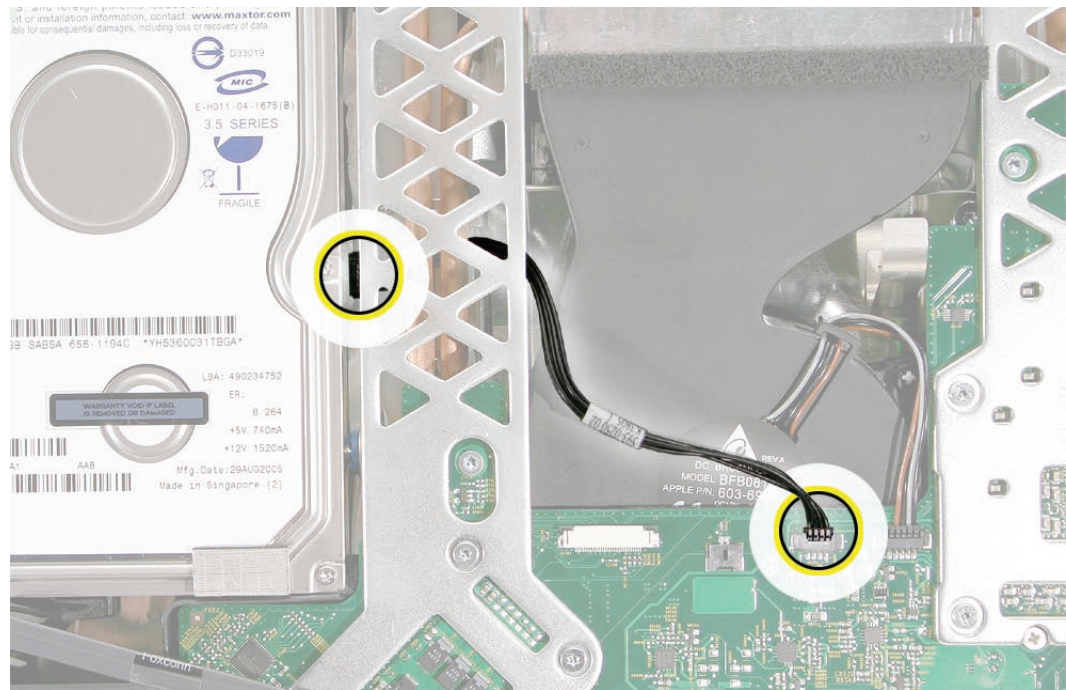
4. Insert the hard drive pins into the grommets. Lower the drive into the rear housing.
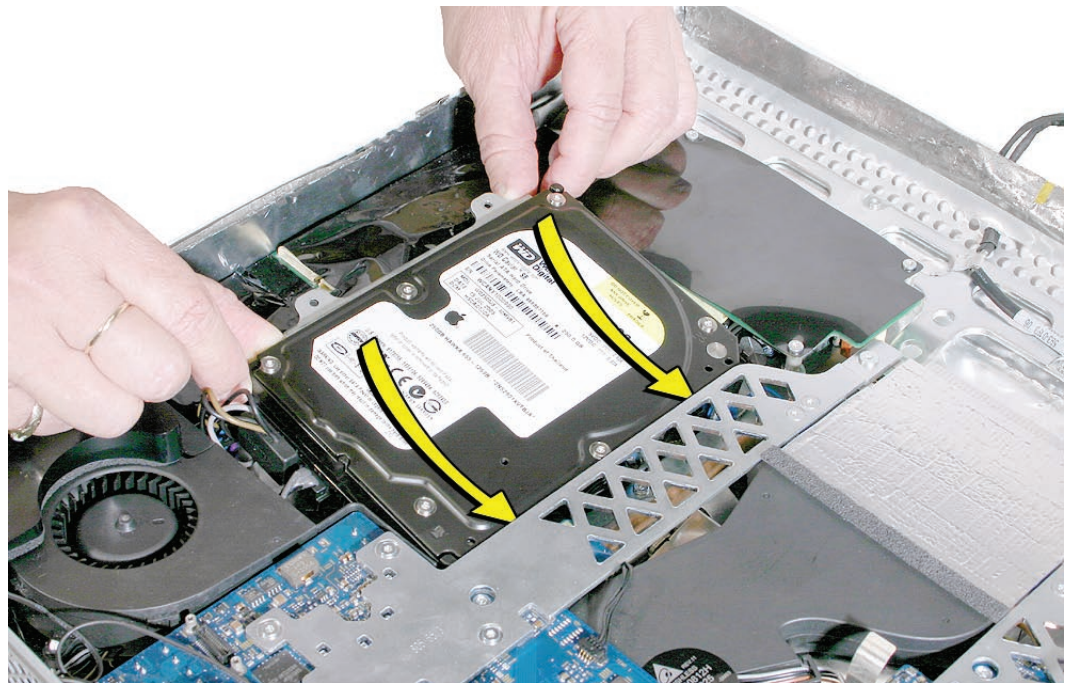
5. Secure the two T10 screws on the hard drive mounting bracket to the DC/DC/inverter board.
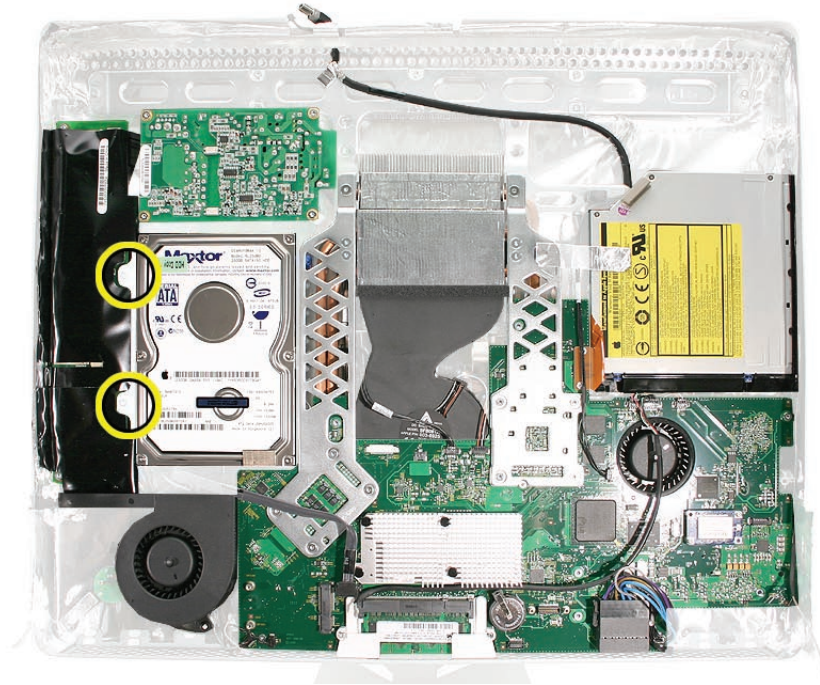
6. Replace the display panel.

7. Replace the lower EMI shield.

8. Replace the front bezel.

9. Replace the access door.

Power Supply, AC/DC

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Display panel**
- **Hard drive**
- **Logic board**

Part Location

Removing the AC/DC Power Supply

WARNING: The AC/DC power supply PCB remains powered up whenever the system is plugged in, whether or not the system has been turned on. Use extreme caution when troubleshooting the system with the front bezel removed.

- **Don't work alone. In the event of an electrical shock it is important to have another individual present who can provide assistance.**
- **Keep one hand in your pocket when working on any iMac (Early 2006) system that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.**
- **Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.**

1. Using a torx screwdriver, remove four screws from the AC-DC board. The top left screw also connects a ground cable to the chassis; leave it attached to the chassis. **Replacement Note:** Install the machine screw (to bottom right corner) first when installing the power supply.
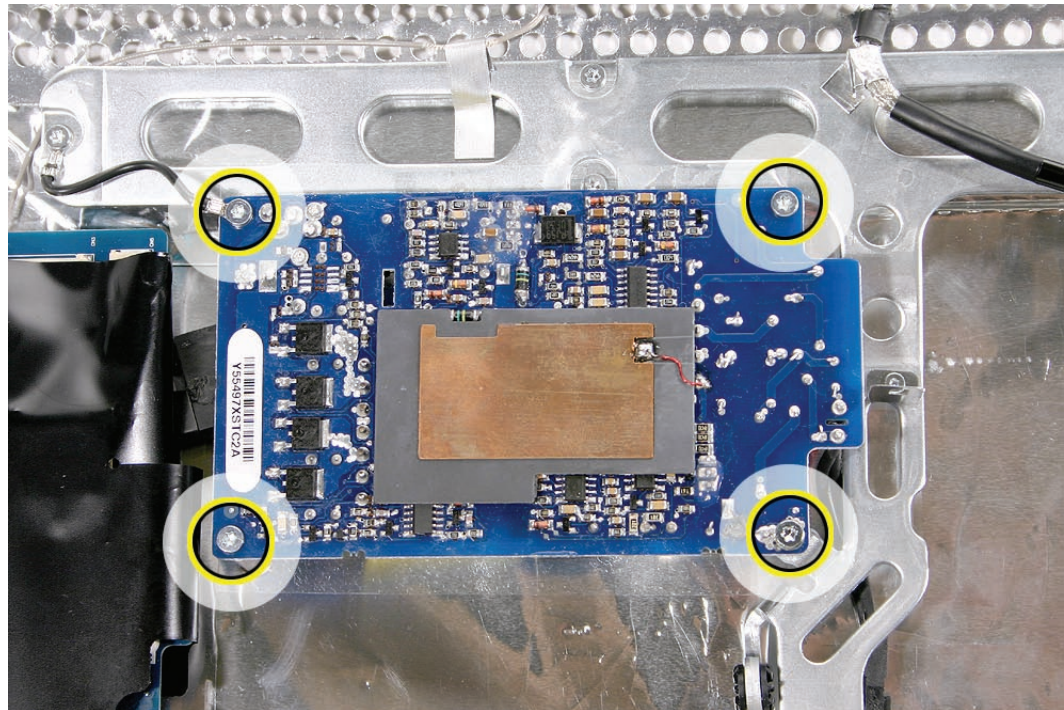
2. Lift the power supply up and locate the cable tucked under the inverter. Disconnect the cable.
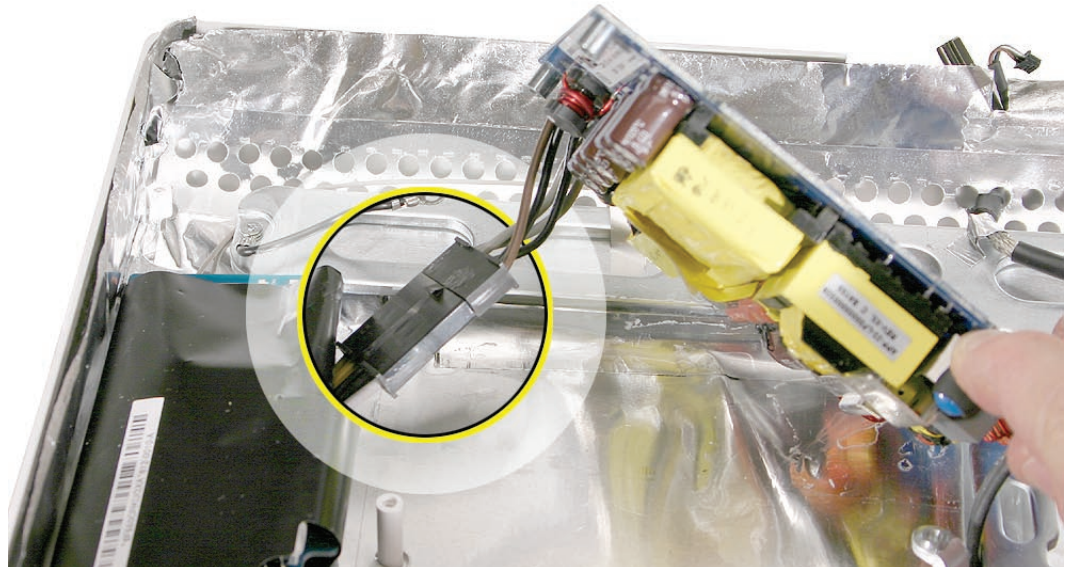
3. Locate the cable that connects the AC-DC power supply to the AC line filter. The cable is tucked under the metal chassis. With your fingers or a black stick, pry the cable free from the chassis and disconnect it. Lift the power supply out of the chassis.
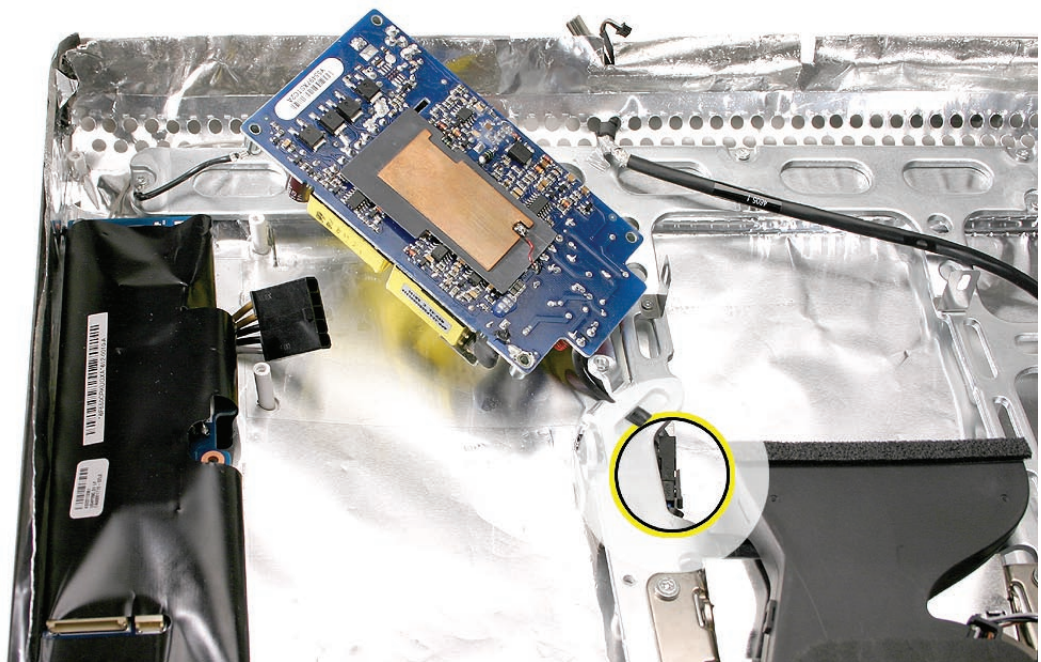
Replacing the AC/DC Power Supply

WARNING: The AC/DC power supply PCB remains powered up whenever the system is plugged in, whether or not the system has been turned on. Use extreme caution when troubleshooting the system with the front bezel removed.

- **Don't work alone. In the event of an electrical shock it is important to have another individual present who can provide assistance.**
- **Keep one hand in your pocket when working on any iMac (Early 2006) system that is plugged in. This will help ensure that your body does not provide a path to ground in the event that you accidentally make contact with the line voltage.**
- **Don't wear jewelry, watches, necklaces, or other metallic articles that could present a risk if they accidentally make contact with the power supply circuitry.**

1. Route the AC filter cable under the chassis. The cable routes as shown below.
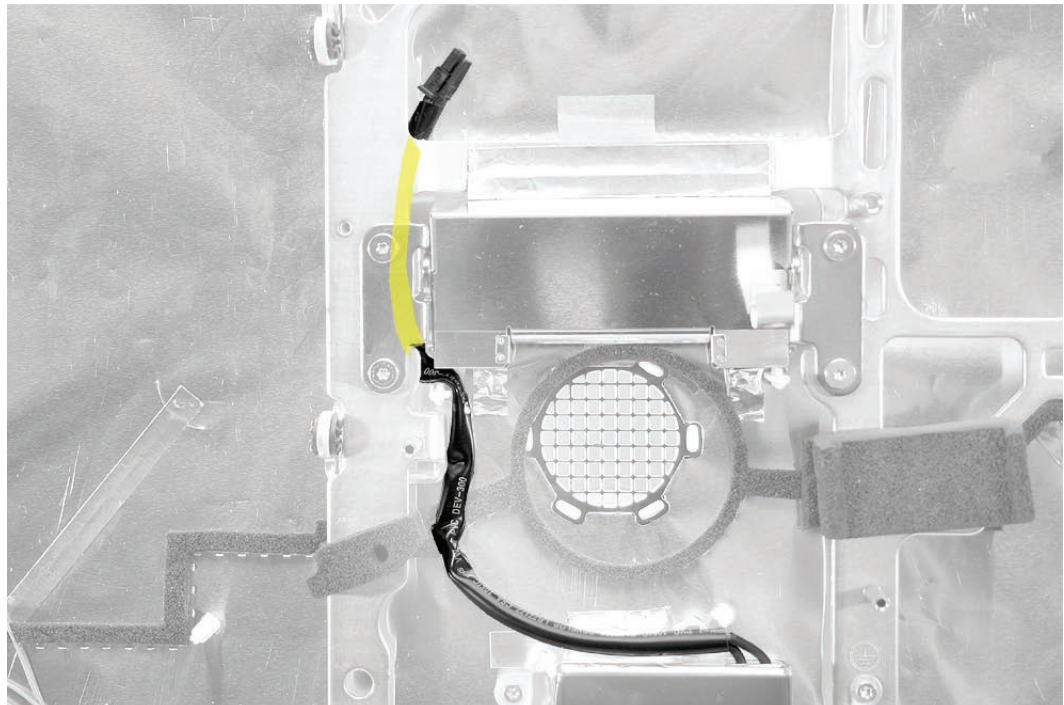
2. Reconnect the power supply to AC line filter cable. Tuck the cable under the metal chassis.
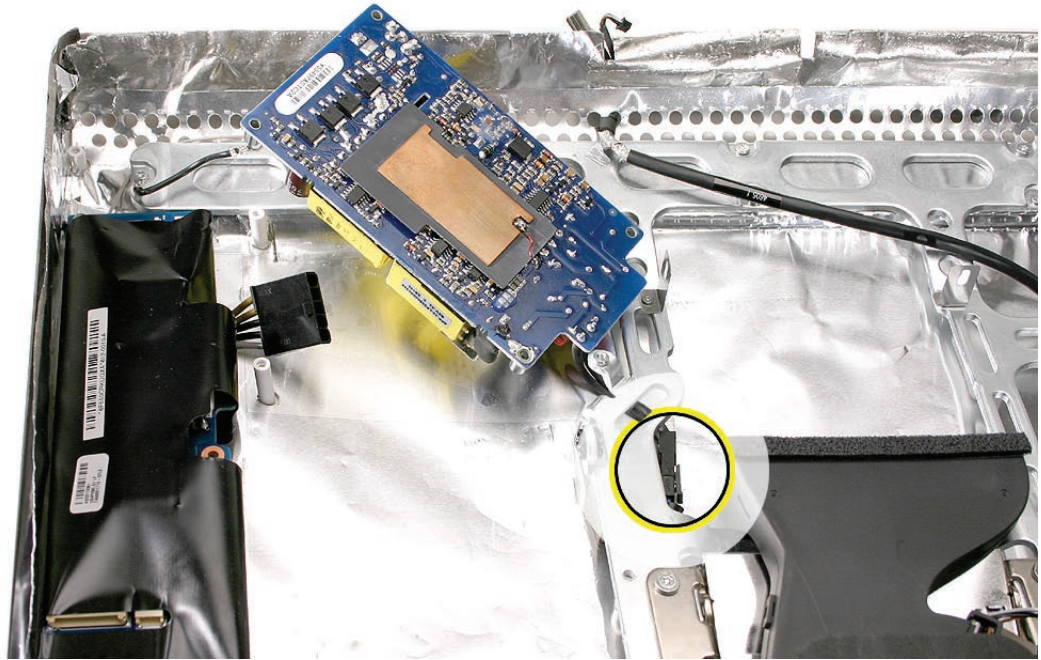
3. Connect the AC-DC power supply cable to the inverter. Tuck the cable under the inverter board.
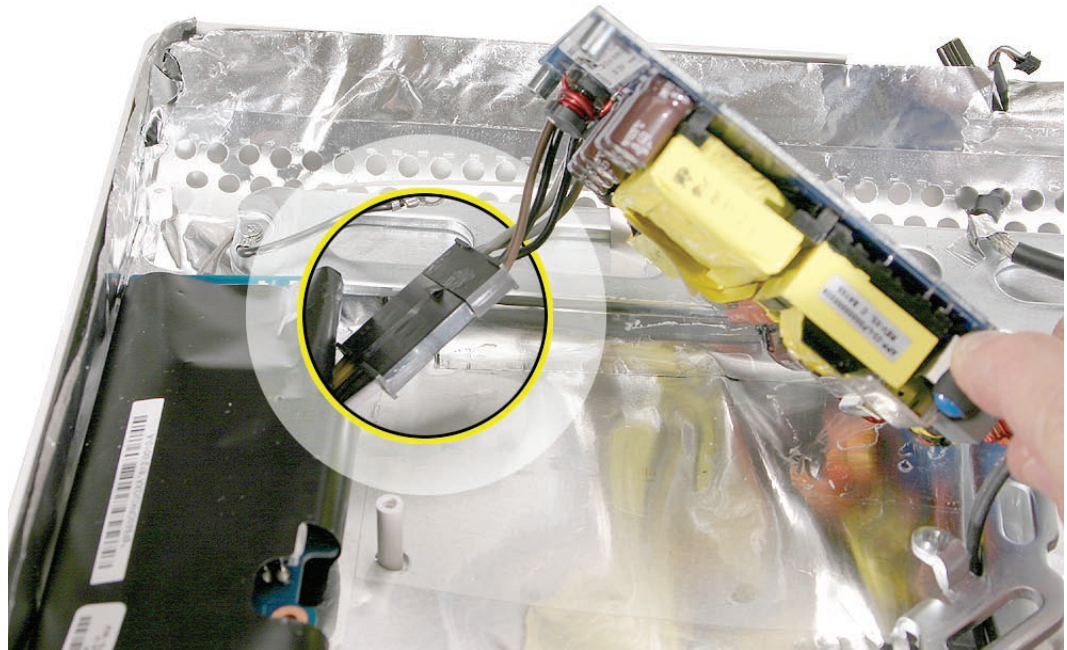
4. Replace the power supply screws. Install the machine screw (bottom right corner) first when installing the power supply.
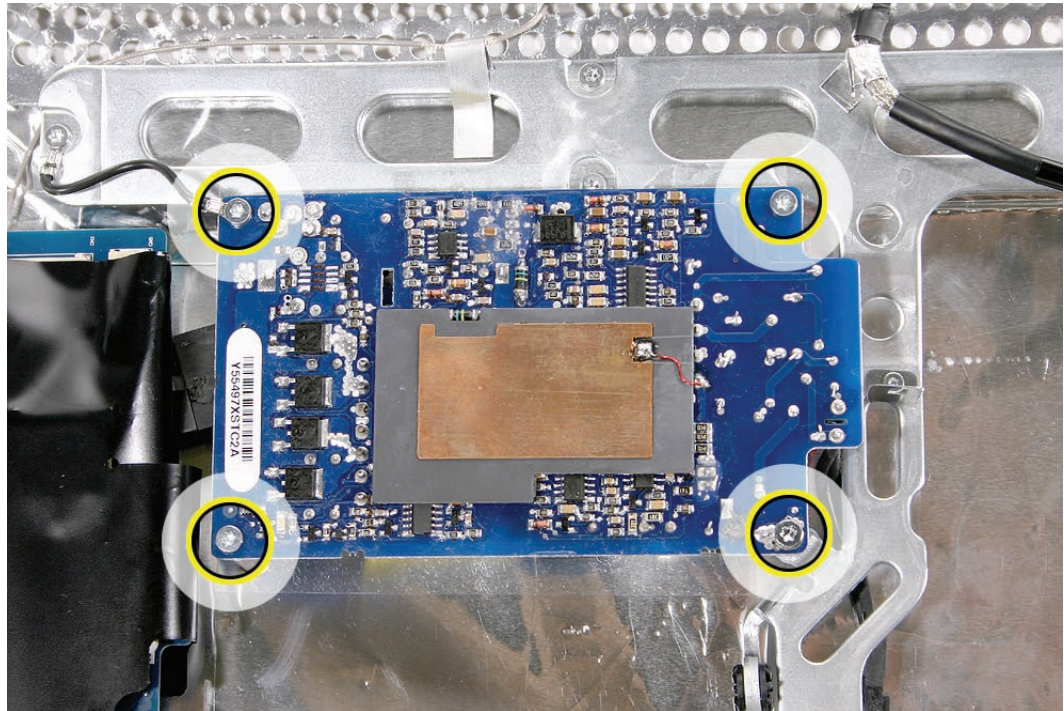
5. Replace the hard drive.

6. Replace the logic board.

7. Replace the display panel.

8. Replace the lower EMI shield.

9. Replace the front bezel.

10. Replace the access door.

11. Replace the display panel.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the access door.

Logic Board

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Display Panel**
- **IR Board**
- **Speakers**

Part Location
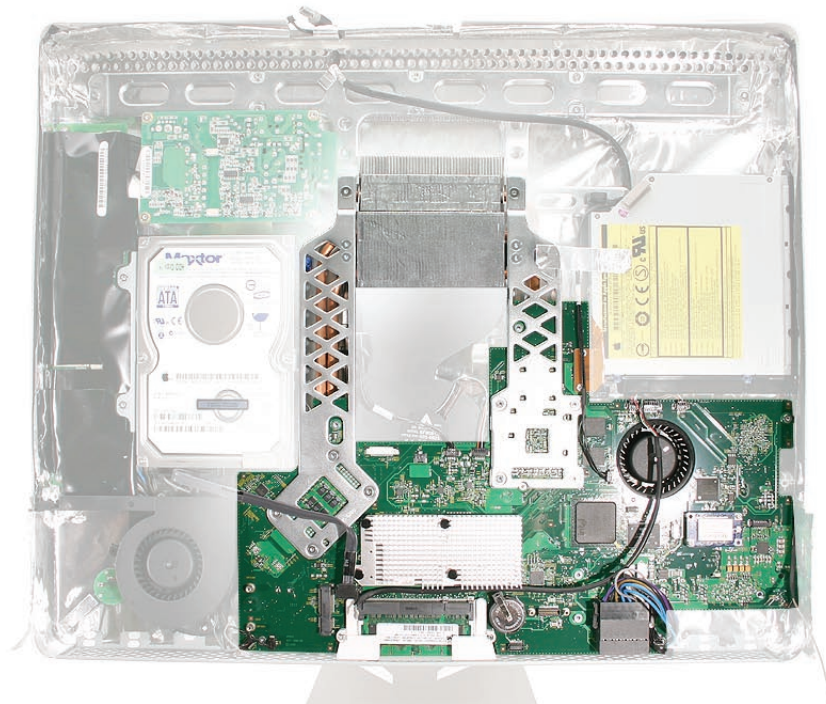
Removing the Logic Board

1. Disconnect the **AirPort** and **Bluetooth** antennas.

2. Disconnect the optical cable, flex cable, and peel back the silver EMI tape from the logic board frame.
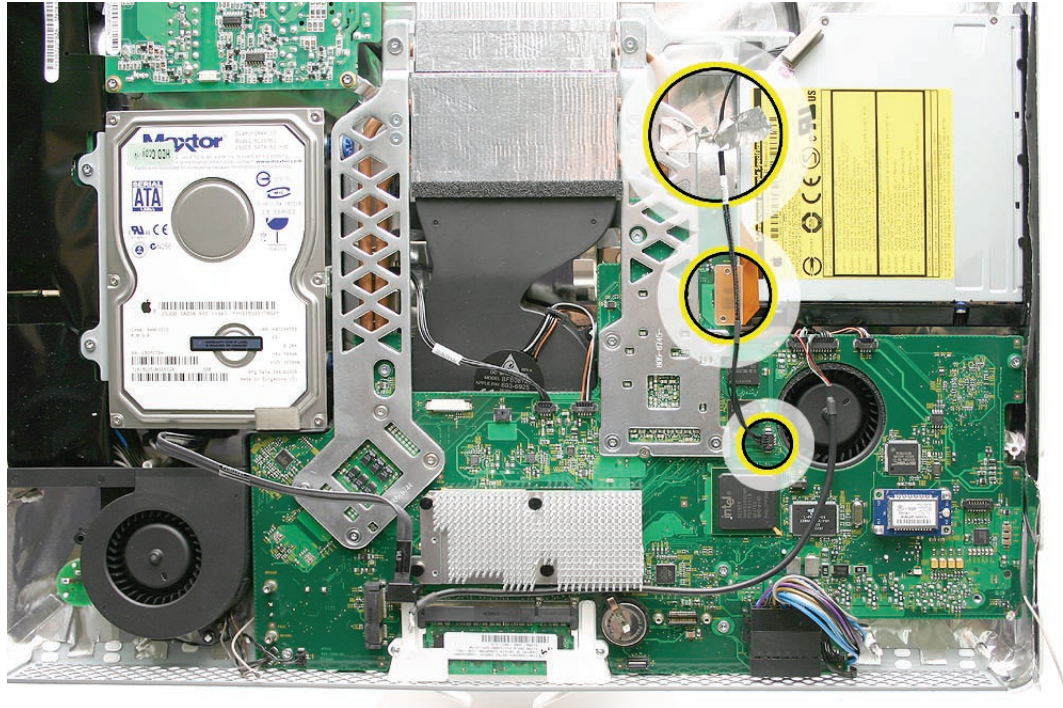
3. Disconnect ten cables from the connectors on the logic board.
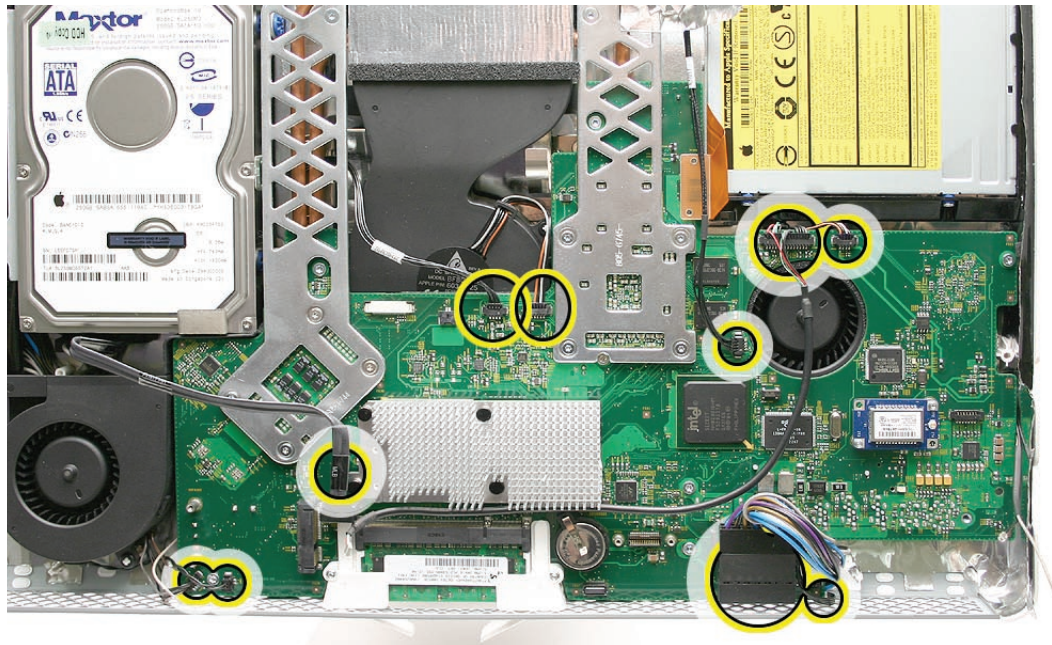
4. Using a T10 torx screwdriver, remove the seven screws on the board. **Replacement Note**: Always install the machine screws before installing the self-tapping screws
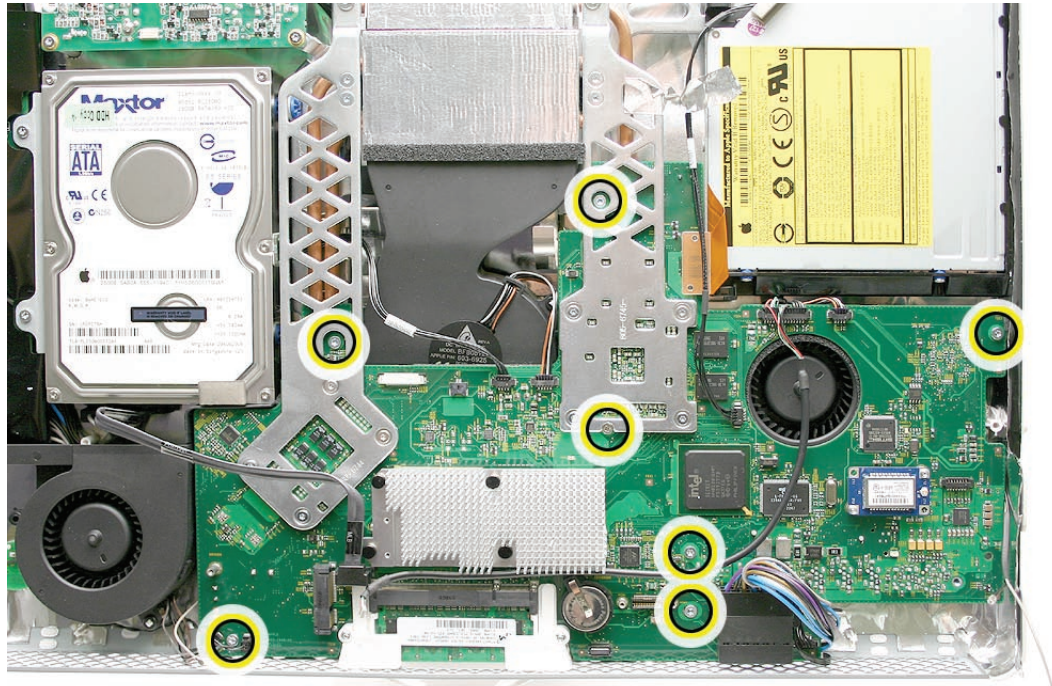
5. At the top of the heatsink, remove the two screws attaching the logic board support brackets (clips) to the chassis. Note: The support brackets (clips) must be removed and transferred to the new logic board, if replacing the logic board.
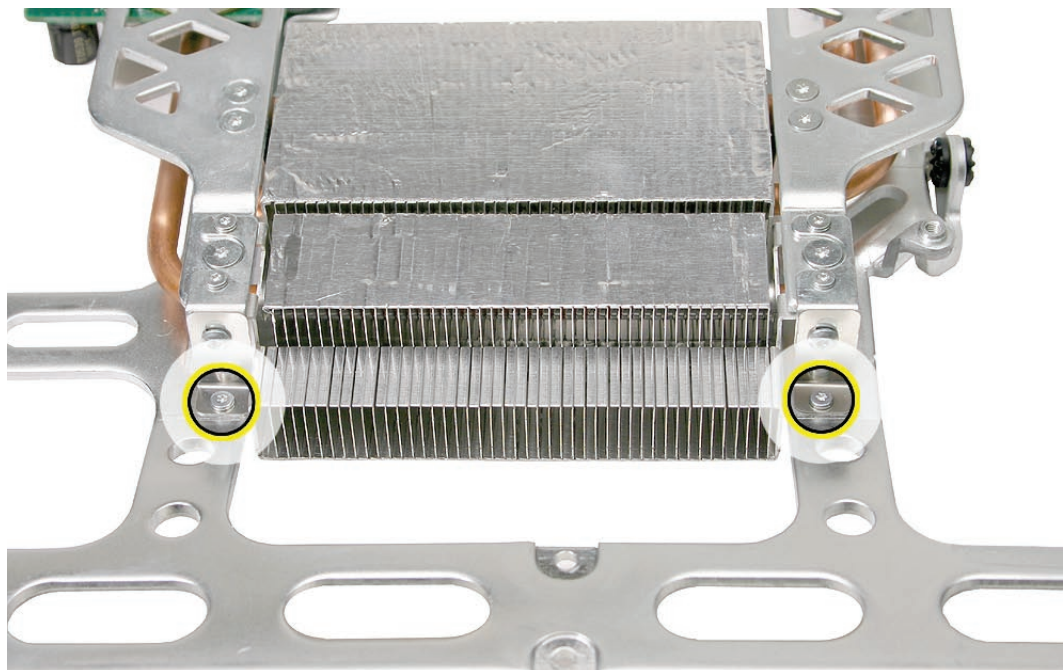
6. Holding the board on each side, lift it up and toward the top of the computer. **Note**: Remove the memory module from the slot before returning the board to Apple

7. **Important**: When handling the logic board, never handle the board by the heatsink or metal rails.

Replacing the Logic Board

1. Position all the logic board cables out of the way so the logic board can be placed into the rear housing.

2. As you lower the board into the rear housing, make sure the memory levers are lowered through the access door opening and the logic board screw holes line up with the board..
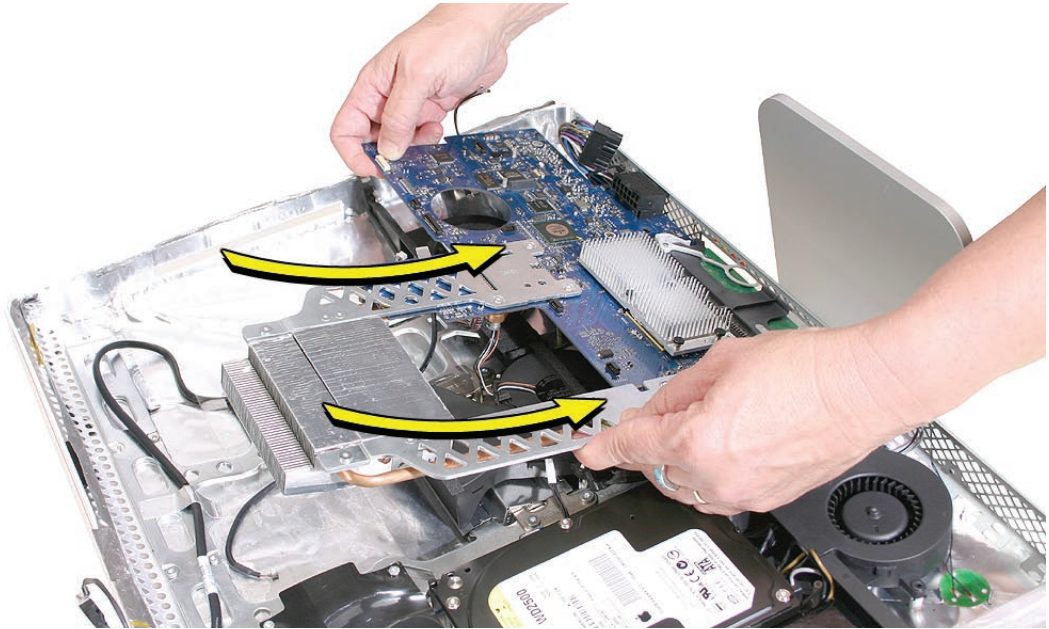
3. At the top of the heatsink, replace the two screws attaching the logic board support bracket to the chassis. Note: The support brackets (clips) must be removed and transferred to the new logic board, if replacing the logic board.
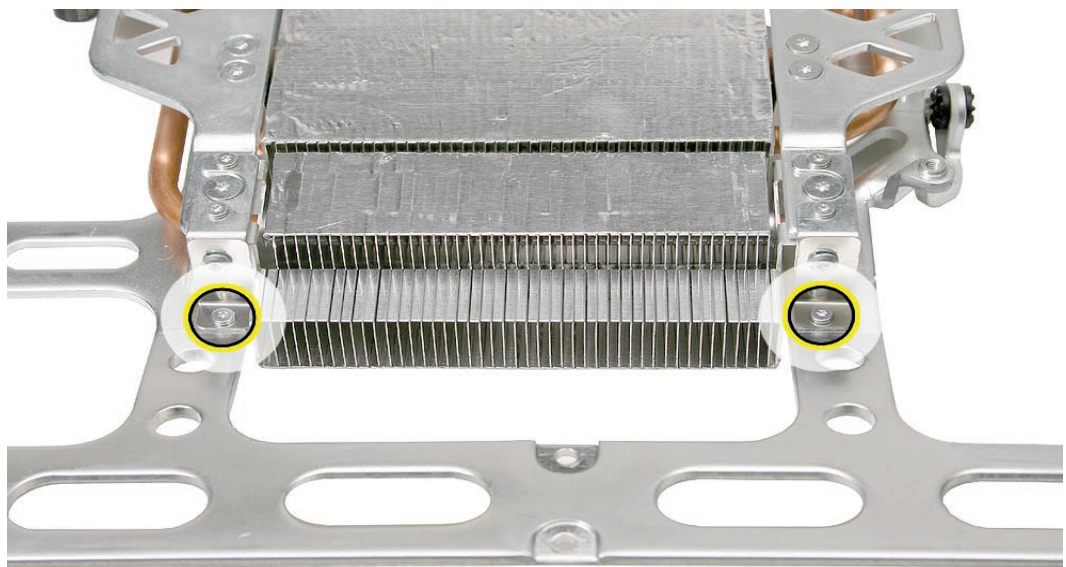
4. Make sure the hard drive sensor and the sensor cable are attached to the side of the hard drive. Route the sensor cable under the chassis and connect it to the logic board.
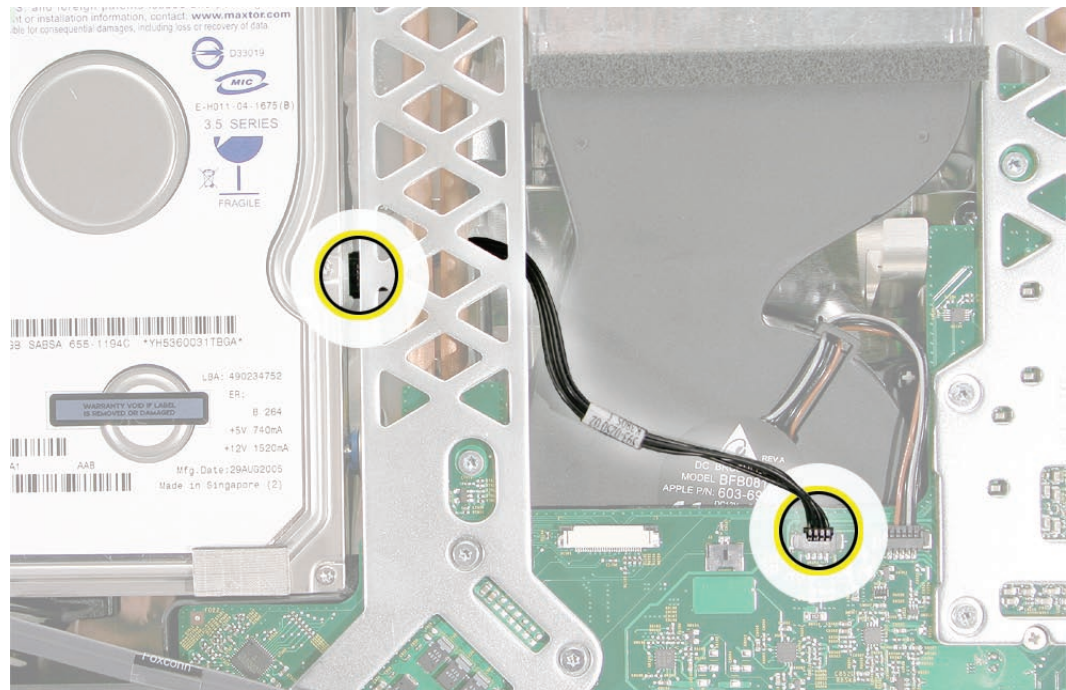
5. Replace the optical drive sensor cable, flex cable and screws, and the silver EMI tape.
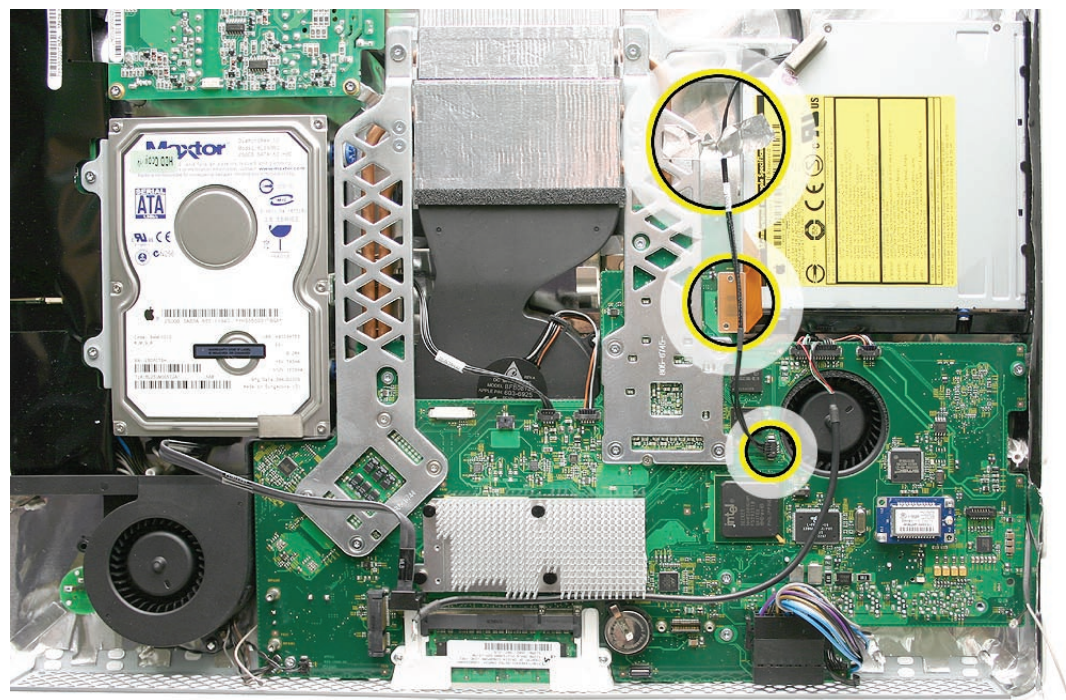
6. Using a T10 torx screwdriver, replace the seven screws on the board. Always install the machine screws before installing the self-tapping screws.
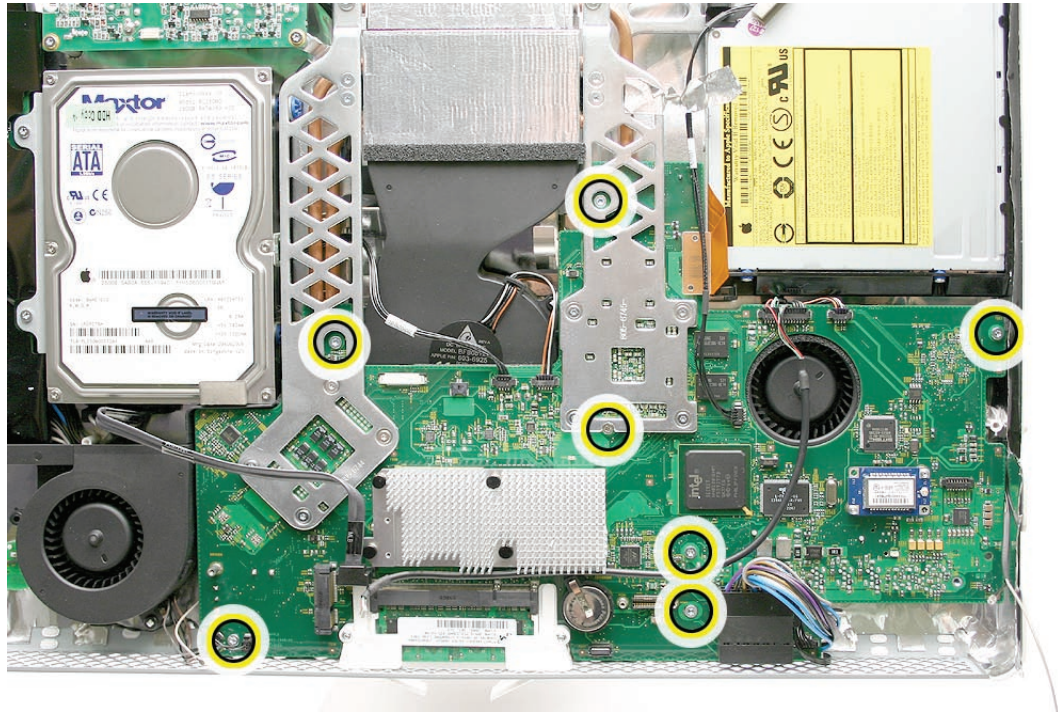
7. Connect the cables to the connectors on the logic board.
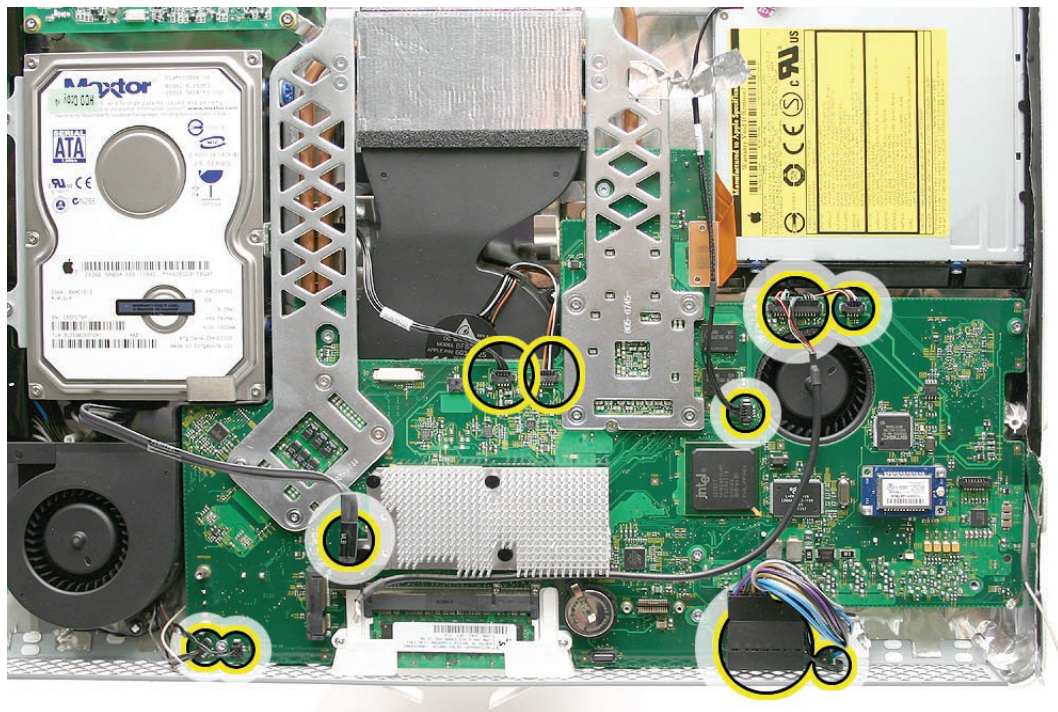
8. Connect the AirPort and Bluetooth antennas.

9. Replace the speakers.

10. Replace the IR board.

11. Replace the display panel.

12. Replace the lower EMI shield.

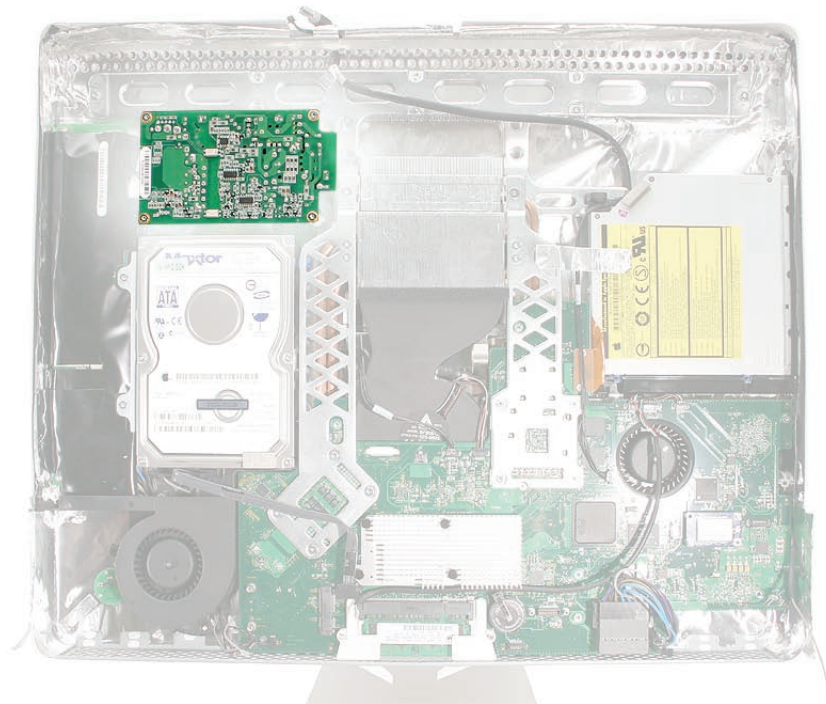13. Replace the front bezel.

14. Replace the memory access door.

AC Line Filter

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Speakers**
- **Logic Board**
- **Hard Drive**

Part Location
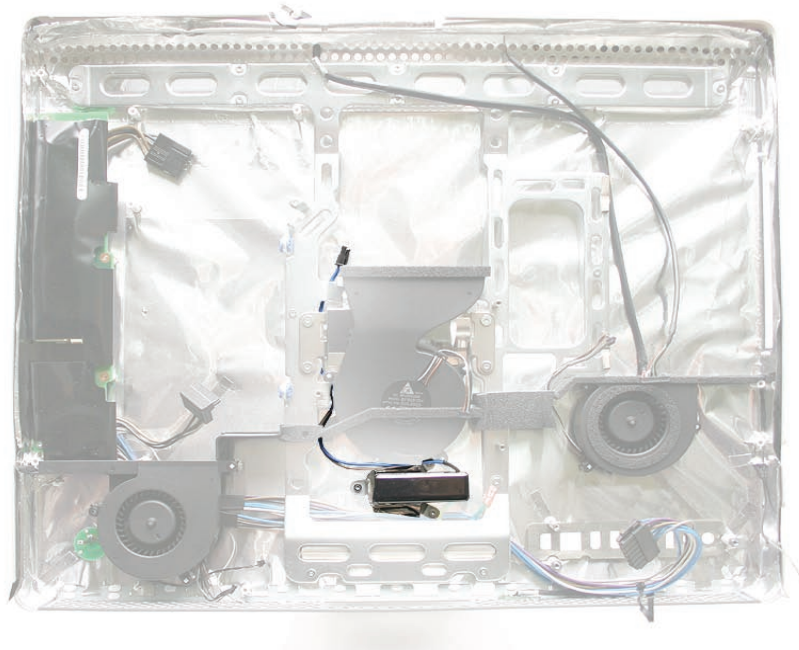
Removing the AC Line Filter

1. Using a torx T10 screwdriver, remove the three self-tapping screws from the power inlet and the machine screw from the ground cable . Remove the EMI tape on the filter.
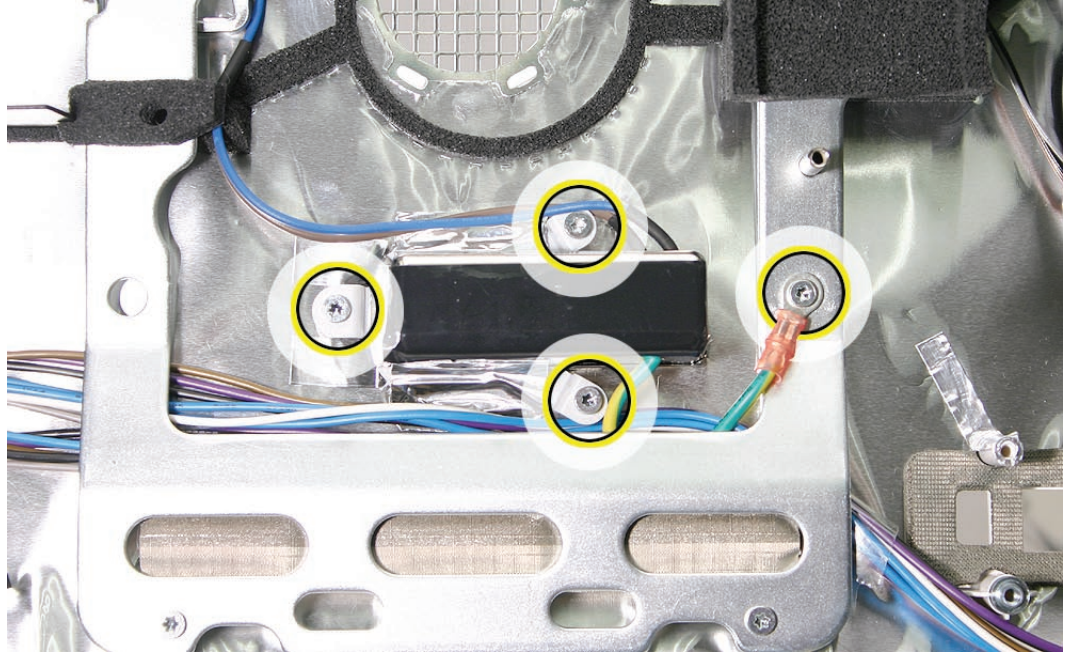
2. Disconnect the AC filter cable from the power supply. Notice the routing of the AC filter cable under the chassis.
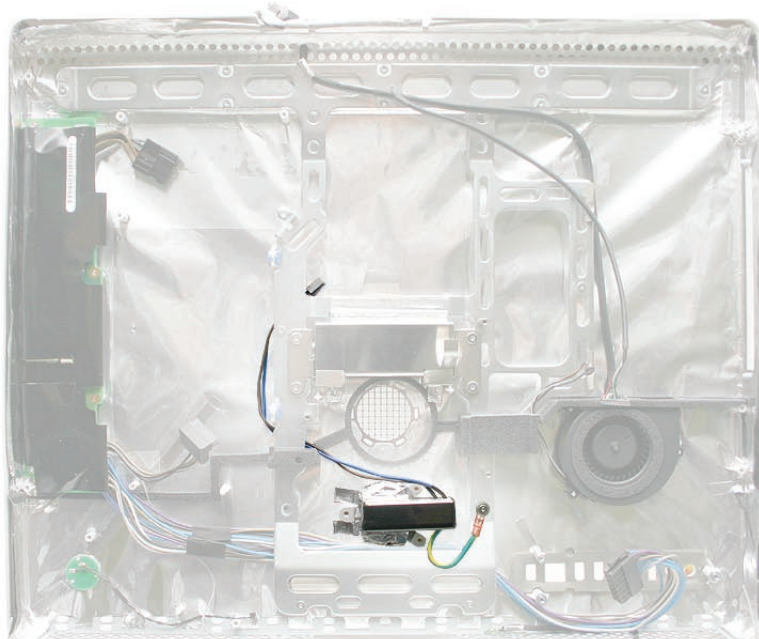
3. Lift the AC filter out of the rear housing.

Replacing the AC Line Filter

1. Install the AC power filter on the rear housing screw mounts with three self tapping screws.

2. Install the power inlet ground cable to the chassis with a machine screw.

3. Route the power inlet cable beneath the chassis as shown in the photo above, and connect it to the power supply.

4. Using the EMI tape, securely tape the top and bottom edges of the AC power inlet to the rear housing.

5. Replace the AC/DC power supply.

6. Replace the hard drive.

7. Replace the logic board.

8. Replace the speakers.

9. Replace the display panel.

10. Replace the IR Board.

11. Connect the antennas.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

Fan, Hard Drive

Tools

• No tools are required to remove the hard drive fan.

Preliminary Steps

Before you begin, remove the following:
• **Access door**
• **Front bezel**
• **Lower EMI shield**
• **Display Panel**
• **Speakers**
• **Logic Board**

Part Location
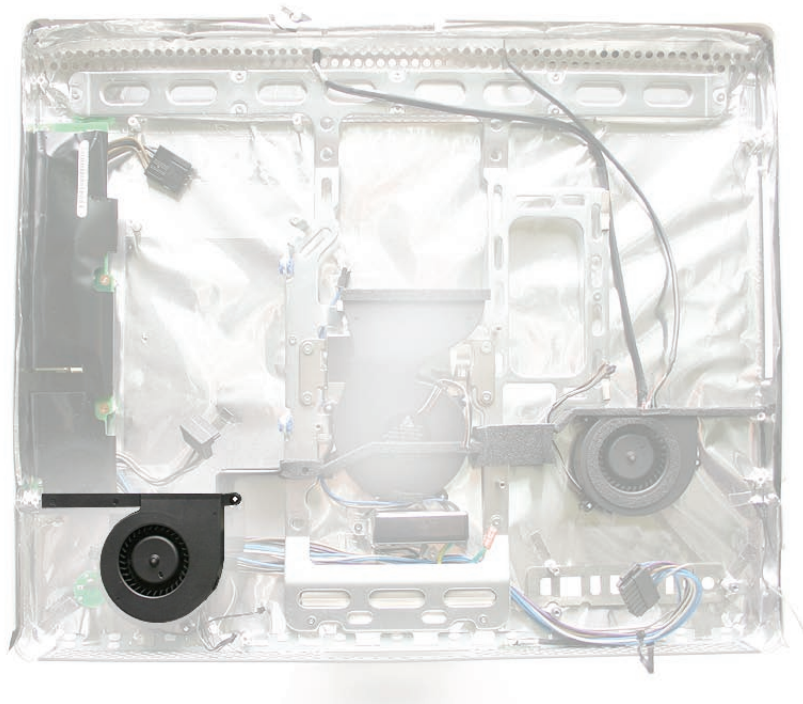
Removing the Hard Drive Fan

Once the logic board and speakers have been removed, the fan will already be disconnected. Lift the fan straight up and out of the rear housing.
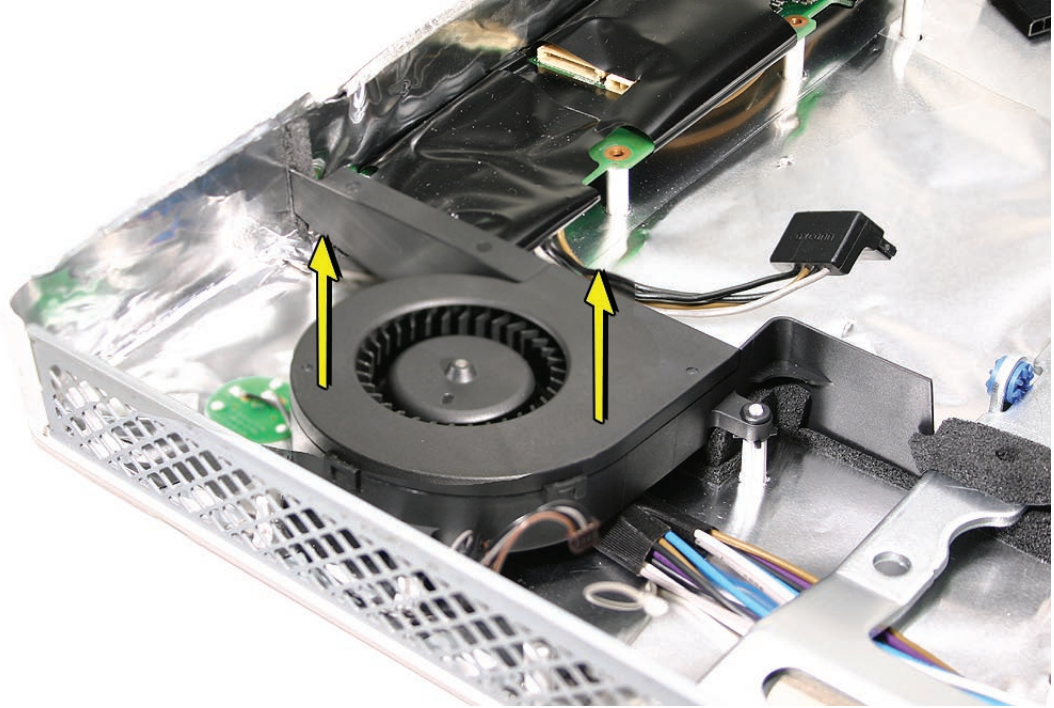
Replacing the Hard Drive Fan

1. Lower the fan onto the white posts in the rear housing. Push it down snug onto the posts.
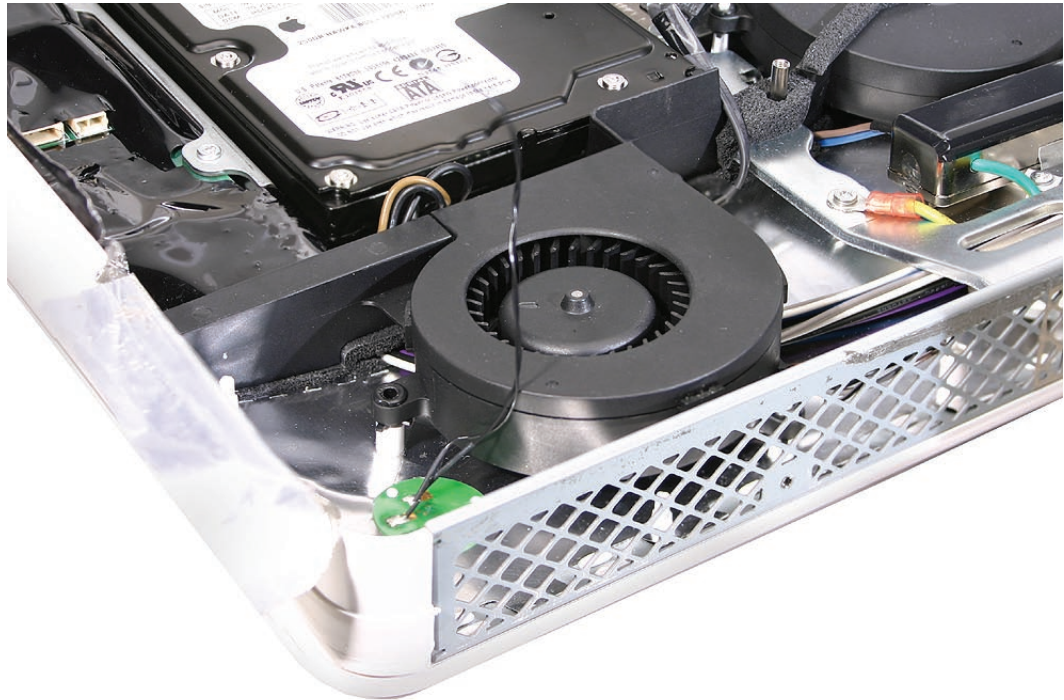
2. Replace the logic board.

3. Replace the speakers.

4. Replace the display panel.

5. Replace the IR Board.

6. Attach the antennas.

7. Replace the lower EMI shield.

8. Replace the front bezel.

9. Replace the memory access door.

Fan, Optical Drive

Tools

- No tools are required to remove the optical drive fan.

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Speakers**
- **Logic Board**

Part Location
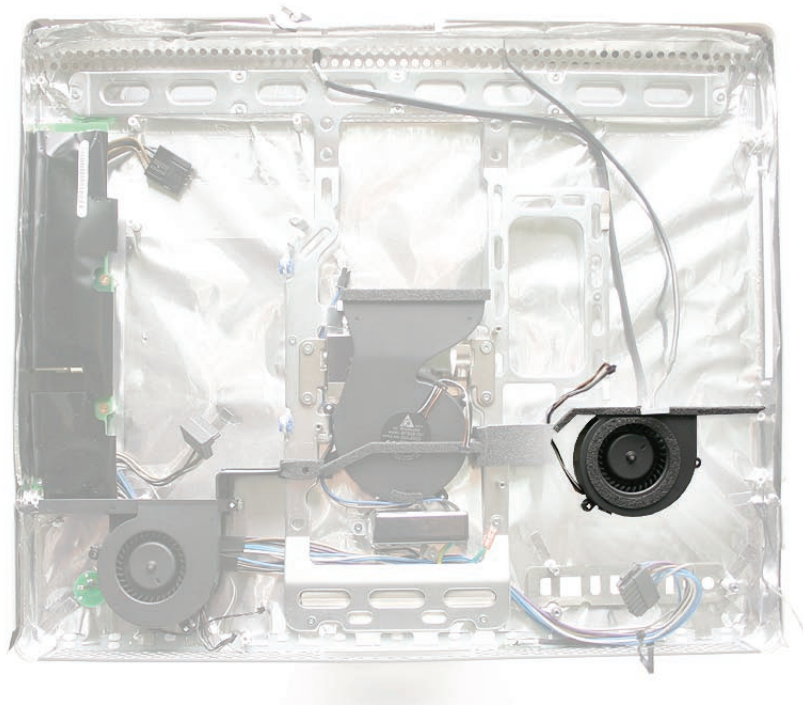
Removing the Optical Drive Fan

Once the logic board and speakers have been removed, the fan will be disconnected. Lift the fan straight up and out of the rear housing.
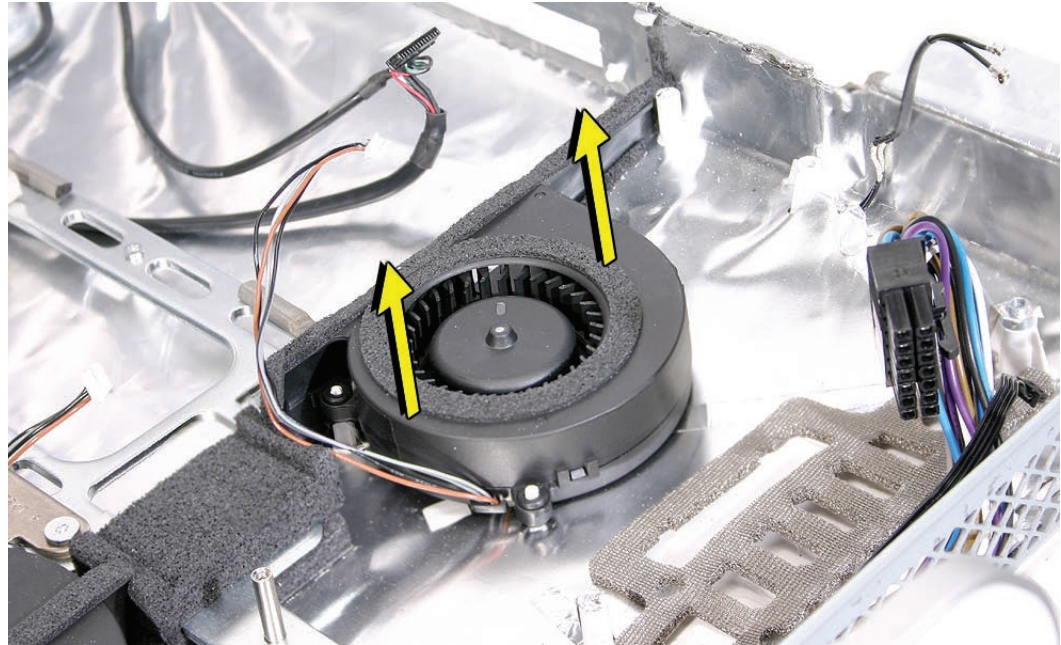
Replacing the Optical Drive Fan

1. Lower the fan onto the white posts in the rear housing, above the port openings. Route the fan cable around the left side of the fan, through the foam gaskets. Push it down snug onto the posts.
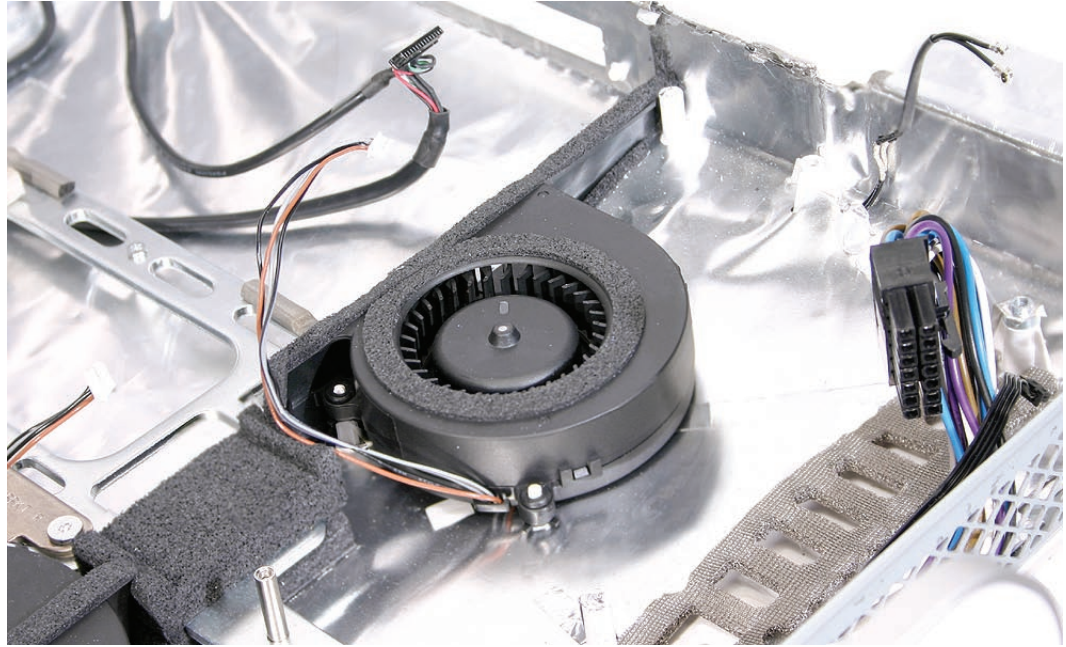
2. Replace the logic board.

3. Replace the speakers.

4. Replace the display panel.

5. Replace the IR Board.

6. Replace the antennas.

7. Replace the lower EMI shield.

8. Replace the front bezel.

9. Replace the memory access door.

Fan, CPU

Tools

- No tools are required to remove the CPU fan.

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Speakers**
- **Logic Board**

Part Location

Removing the CPU Fan

Once the logic board and speakers have been removed, the fan will be disconnected. Lift the fan straight up and out of the rear housing.
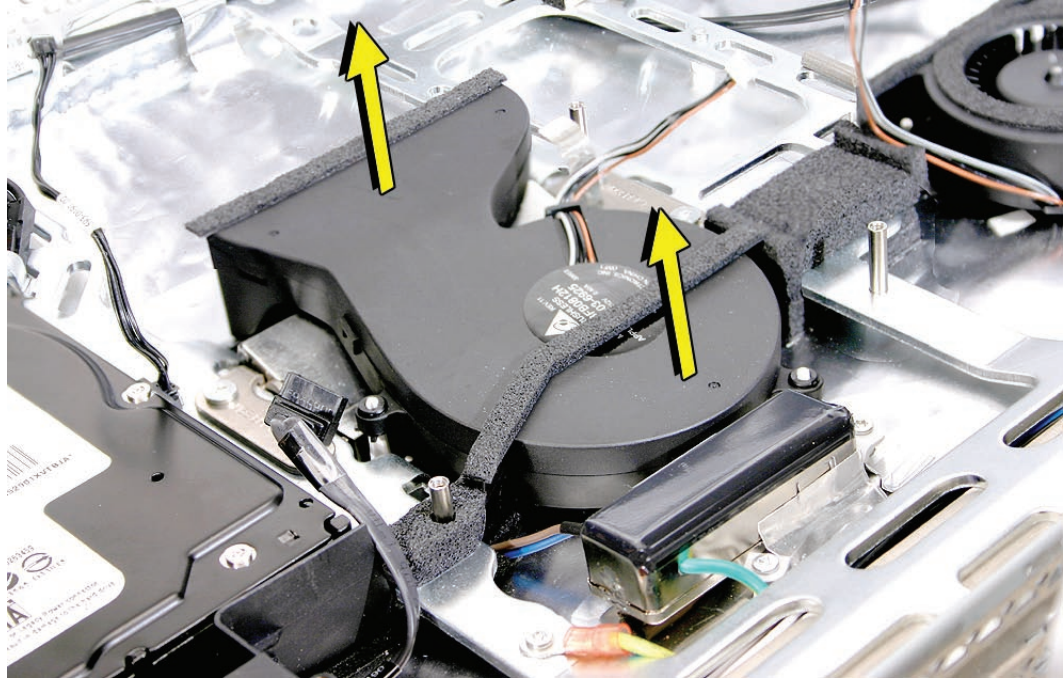
Replacing the CPU Fan

1. Lower the fan onto the white standoffs in the rear housing. Push it down snug onto the posts.
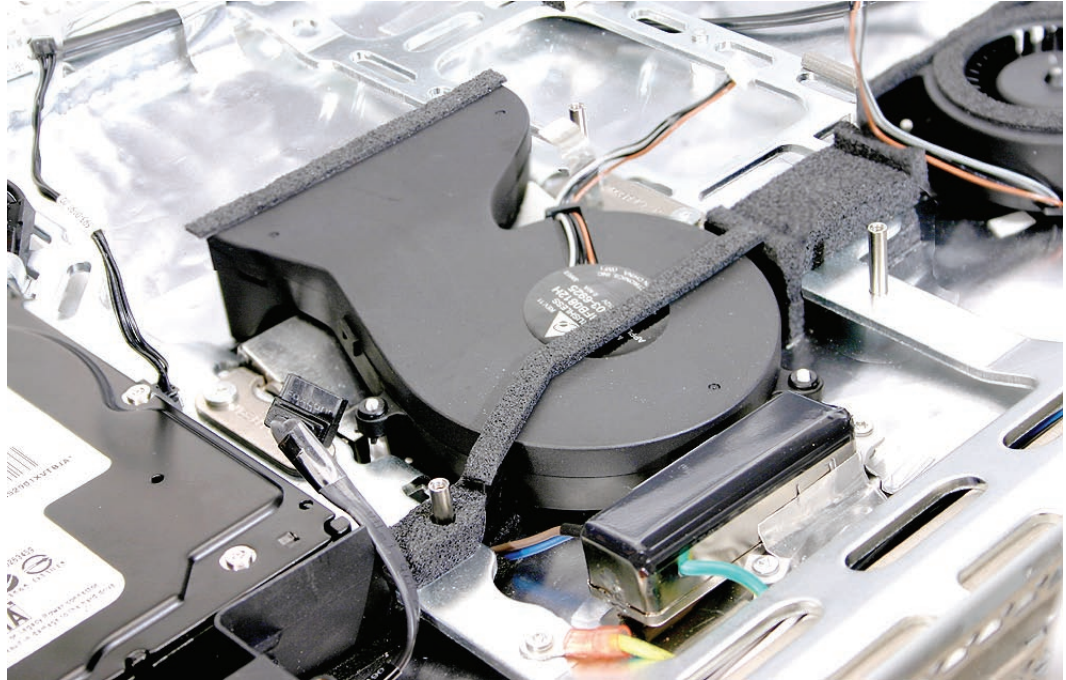
2. Replace the logic board.

3. Replace the speakers.

4. Replace the display panel.

5. Replace the IR Board.

6. Replace the antennas.

7. Replace the lower EMI shield.

8. Replace the front bezel.

9. Replace the memory access door.

Power Supply, DC/DC, Inverter

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Speakers**
- **Logic Board**
- **Hard Drive**
- **Power Supply, AC/DC**
- **Hard drive fan**

Part Location
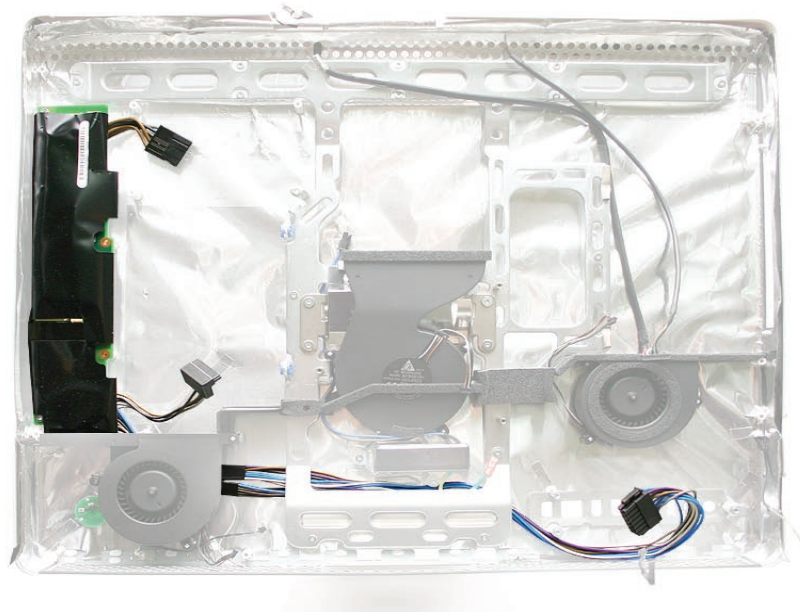
Removing the DC/DC Power Supply/Inverter

1. Using a torx T10 screwdriver, remove the two power supply, DC-DC inverter screws connecting the board to the rear housing. Disconnect the two cables; one going to the AC-DC power supply and the other connecting to the hard drive.
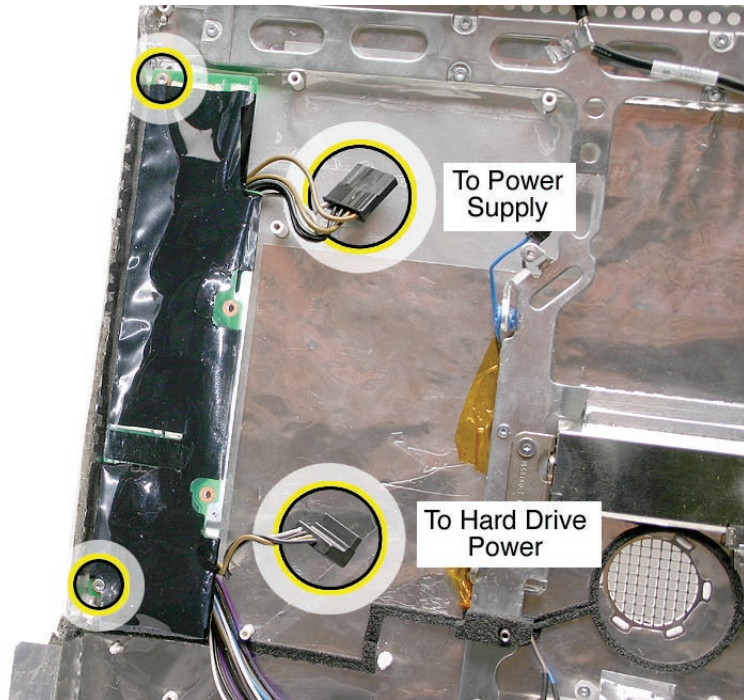
2. Remove just the circled chassis screws, one of which is the AC filter ground screw. Carefully lift the chassis frame just enough to pull the inverter cable from under the metal chassis.
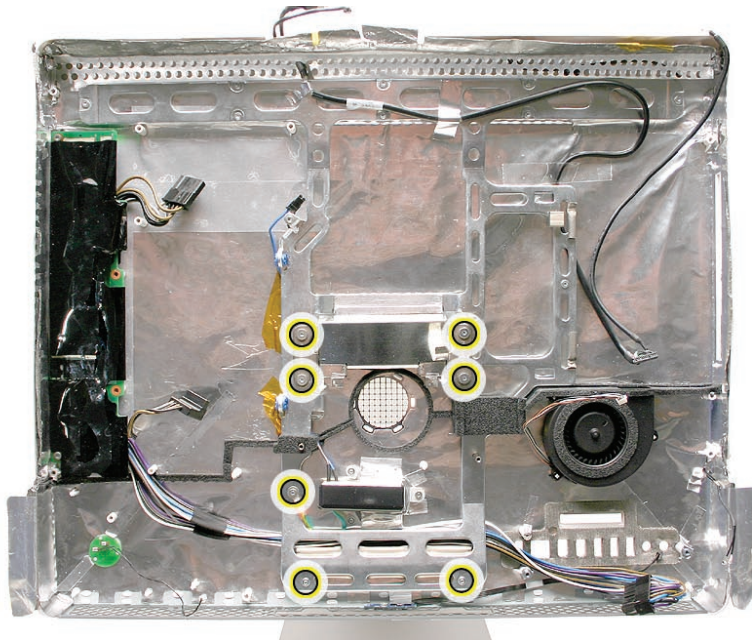
Replacing the DC/DC Power Supply/Inverter

1. Route the inverter cable under the metal chassis frame. Check the routing of the cable so it doesn't get pinched under the chassis.

2. Install the screws on the chassis frame and the AC filter ground screw.

3. Replace the CPU fan.

4. Connect the cables to the AC/DC power supply and to the hard drive. Replace the two screws connecting the DC/DC power supply/inverter to the rear housing.
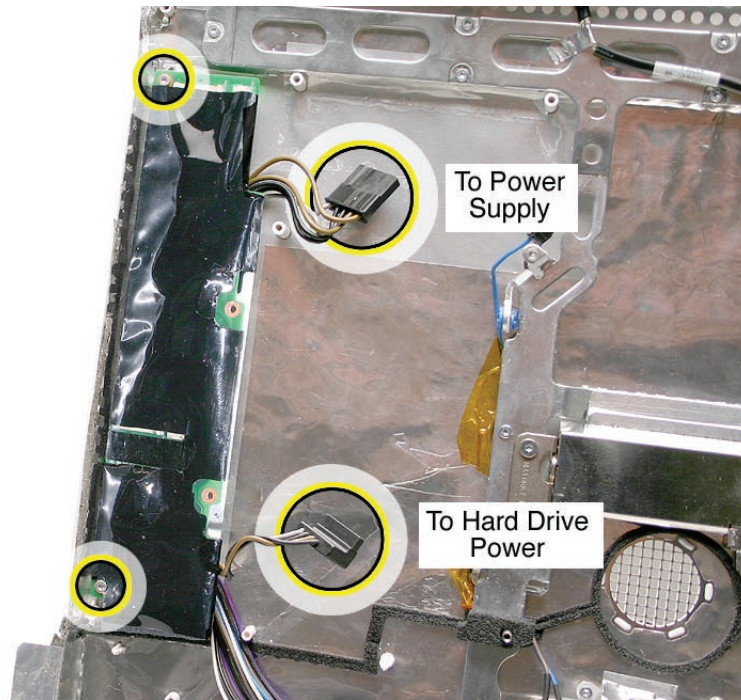
5. Replace the AC/DC power supply.

6. Replace the hard drive.

7. Replace the hard drive fan.

8. Replace the logic board.

9. Replace the speakers.

10. Replace the display panel.

11. Replace the IR Board.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

Ambient Light Sensor Board

Tools

- A black stick or equivalent tool

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Speakers**
- **Logic Board**

Part Location
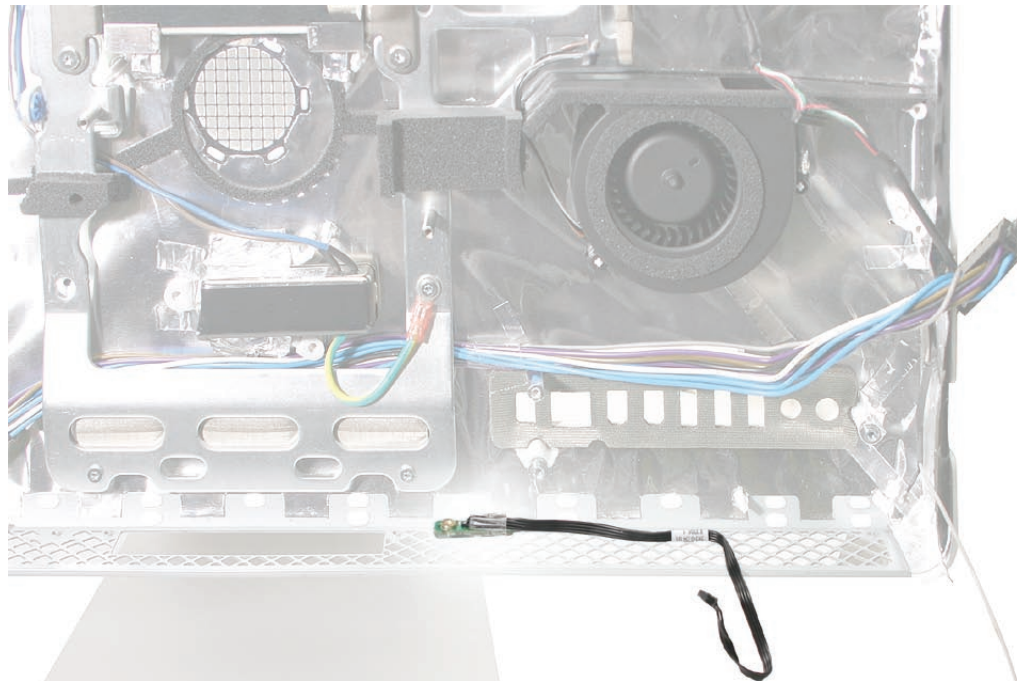
Removing the Ambient Light Sensor Board

1. Remove the rubber bumper from between the chassis and the sensor board. Note: This shows the procedure on the iMac G5 (iSight) model; the removal procedure is the same.
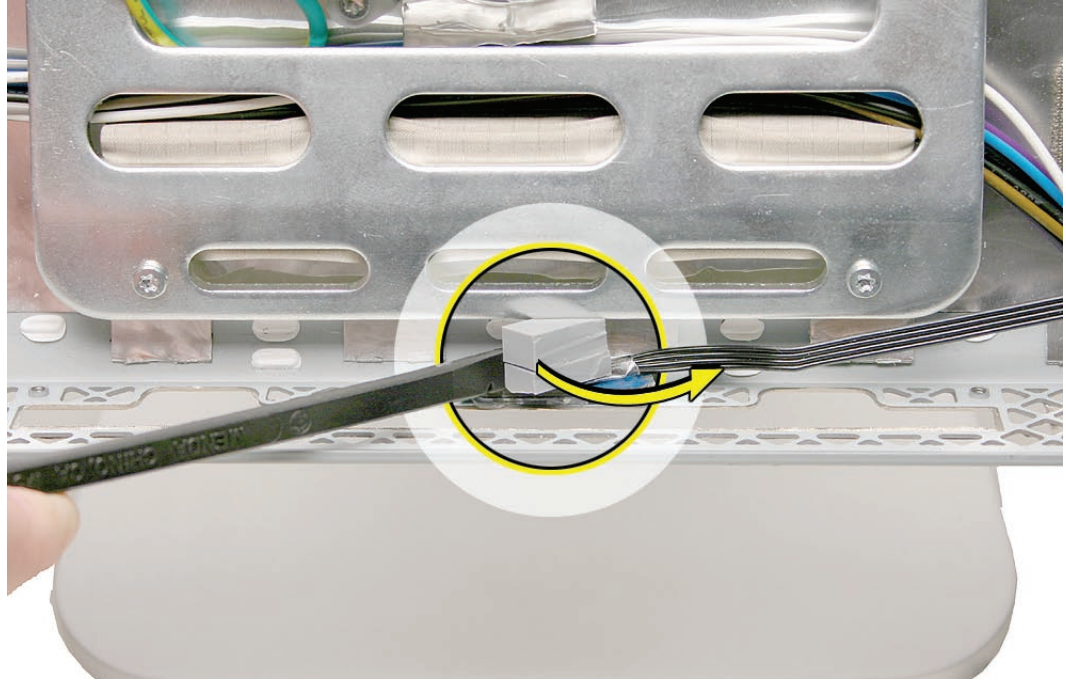
2. With the rubber bumper gone, use a black stick, pry the ambient light sensor off the inside of the rear housing. The sensor is stuck to the rear housing with double-stick tape. **Note**: never poke the ambient light or you could damage the sensor board.

Replace the Ambient Light Sensor Board

1. Press the sticky side of the ambient light sensor board to the bottom inside edge of the rear housing.

2. Install the rubber bumper between the back of the sensor board and the chassis.

3. Replace the logic board.

4. Replace the speakers.

5. Replace the display panel.

6. Replace the IR Board.

7. Replace the lower EMI shield.

8. Replace the front bezel.

9. Replace the memory access door.

Cable, Camera and IR

Tools

No tools are required to remove the camera cable.

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR Board**
- **Display Panel**
- **Optical Drive**

Part Location
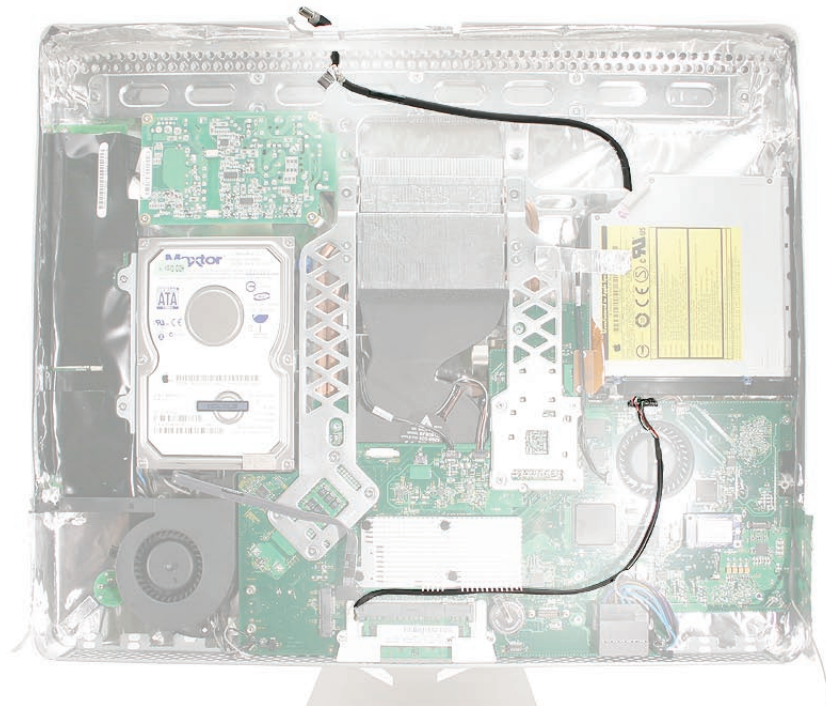
Removing the Camera and IR Cable

1. Remove the two-headed end of the cable from the access hole in the upper EMI shield.

2. Remove the tape (under the optical drive) that secures the cable to the rear housing and disconnect the cable from the logic board. Remove the camera cable.
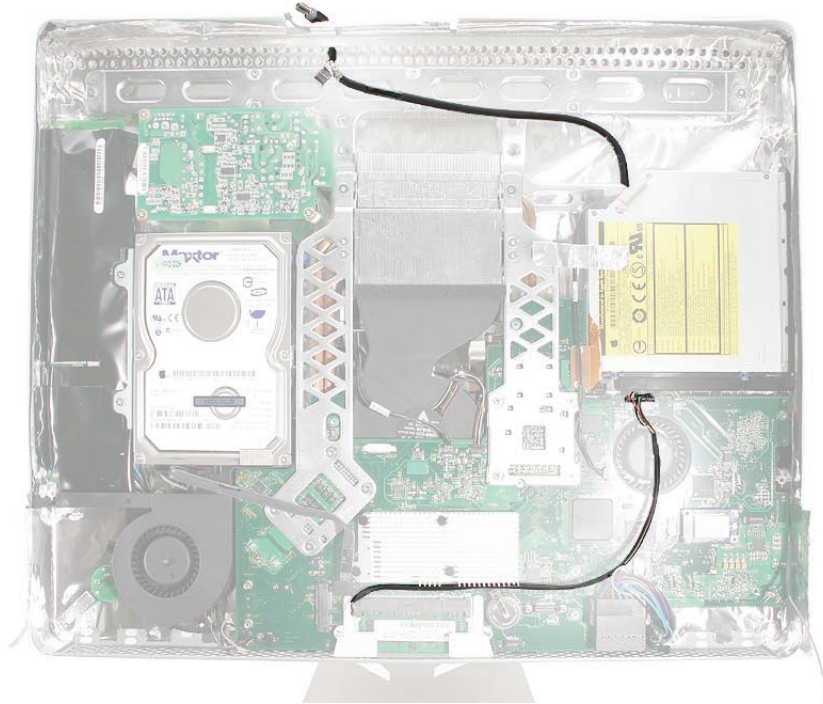
Replacing the Camera and IR Cable

1. Insert the two-headed end of the camera cable through the access hole in the upper EMI shield.

2. Route the camera cable as shown below. Tape the camera cable to the rear housing.
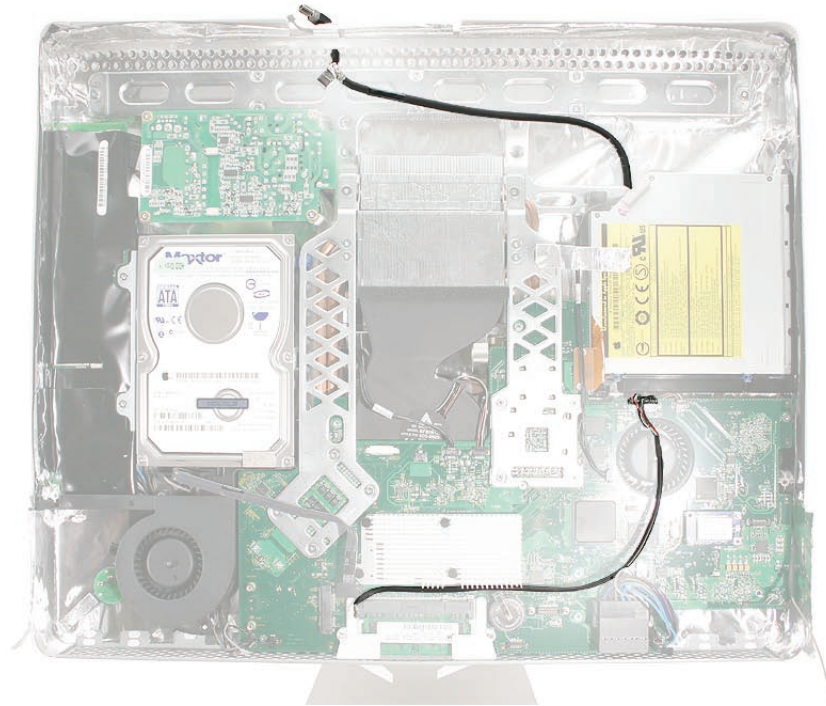
3. Replace the optical drive, flex drive cable and screws, and optical drive sensor cable.

4. Replace the logic board.

5. Replace the speakers.

6. Replace the display panel.

7. Replace the IR Board.

8. Replace the lower EMI shield.

9. Replace the front bezel.

10. Replace the memory access door.

11. Replace the front bezel.

12. Replace the memory access door.

Bluetooth Antenna

Tools

• Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, remove the following:
• **Access door**
• **Front bezel**
• **Lower EMI shield**
• **Display Panel**
• **Speakers**
• **Display Panel**
• **Optical Drive**
• **Logic Board**
• **Optical Drive Fan**

Part Location
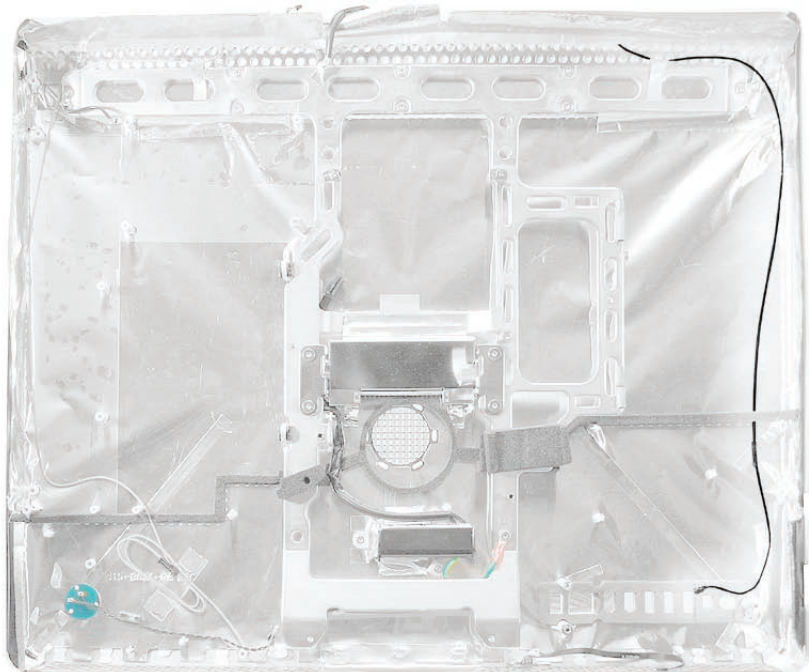
Removing the Bluetooth Antenna

1. Carefully peel back the EMI shield from the top right inside corner of the rear housing as shown below. Using a flat-blade screwdriver, pry the antenna board off the rear housing. Remove the piece of EMI tape securing the antenna to the chassis.
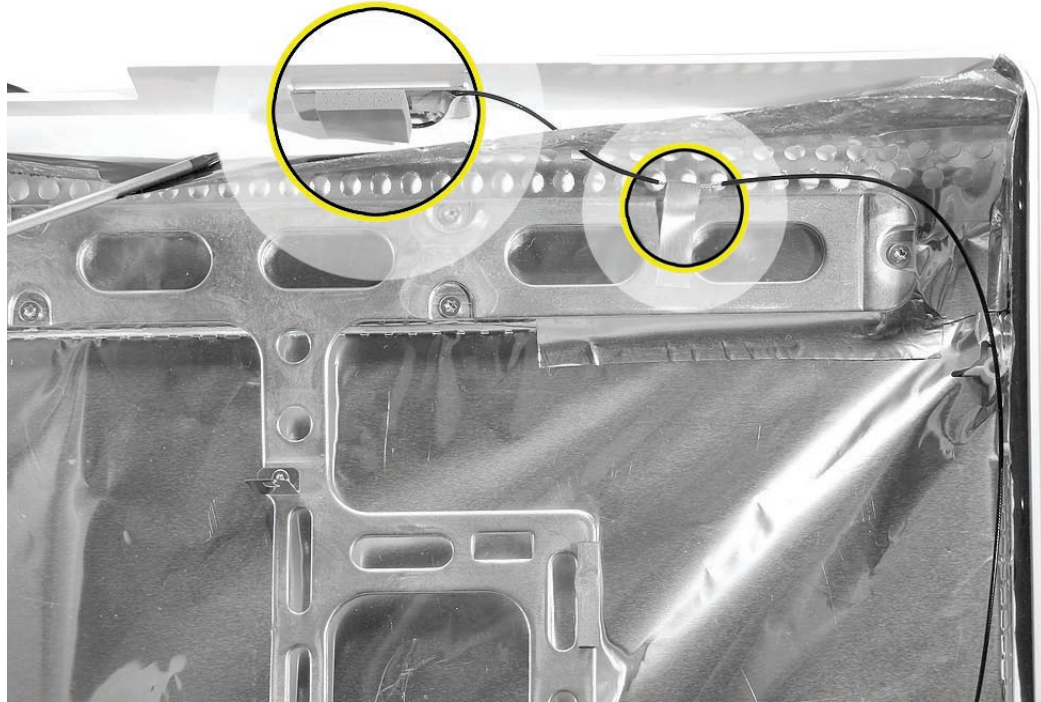
2. Pull the remaining antenna cable through the opening in the EMI shielding at the top of the EMI shield. **Replacement note**: the antenna cable runs under the foam gasket (as shown) .

Replacing the Bluetooth Antenna

1. Press the sticky side of the antenna board to the housing until securely fastened.

2. Route the antenna cable on top of the EMI shield along the right side of the rear housing and under the foam gasket.
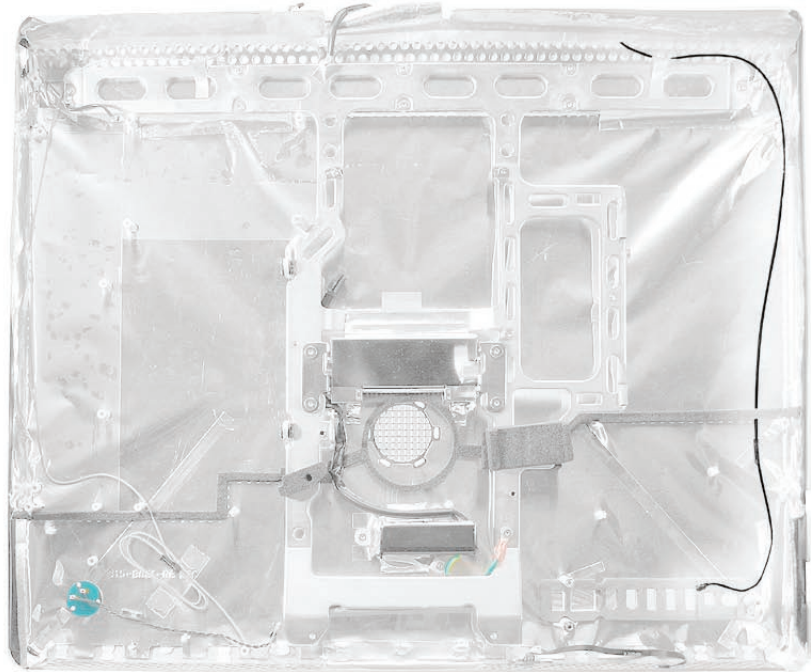
3. Secure the antenna cable at the top with EMI tape.

4. Replace the optical drive.

5. Replace the fans.

6. Replace the logic board.

7. Connect the Bluetooth antenna to the Bluetooth board.

8. Connect the IR cable to the IR board.

9. Connect the AirPort antenna to J1 on the AirPort Extreme card.

10. Replace the speakers.

11. Replace the display panel.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

AirPort Antenna

Tools

*   Black stick (or other nonconductive nylon or plastic flat-blade tool)

Preliminary Steps

Before you begin, remove the following:
*   **Access door**
*   **Front bezel**
*   **Lower EMI shield**
*   **Speakers**
*   **Display Panel**
*   **Optical Drive**
*   **Logic Board**
*   **Hard Drive Fan**

Part Location
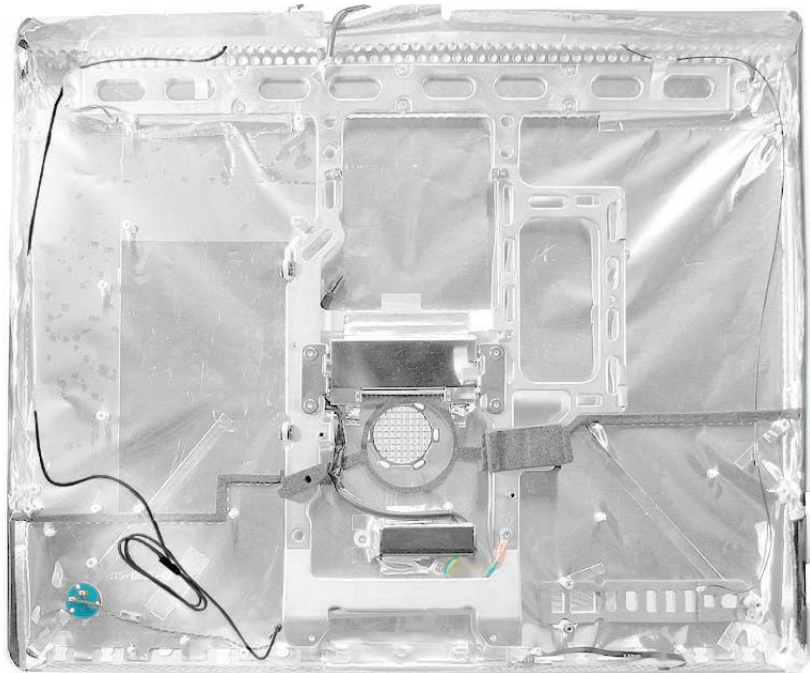
Removing the AirPort Antenna

1. Carefully peel back the EMI tape (off the chassis) and the EMI backing from the top left inside corner of the rear housing as shown below. Peel back just enough EMI backing to access the antenna board. With a black stick pry the antenna off the rear housing.
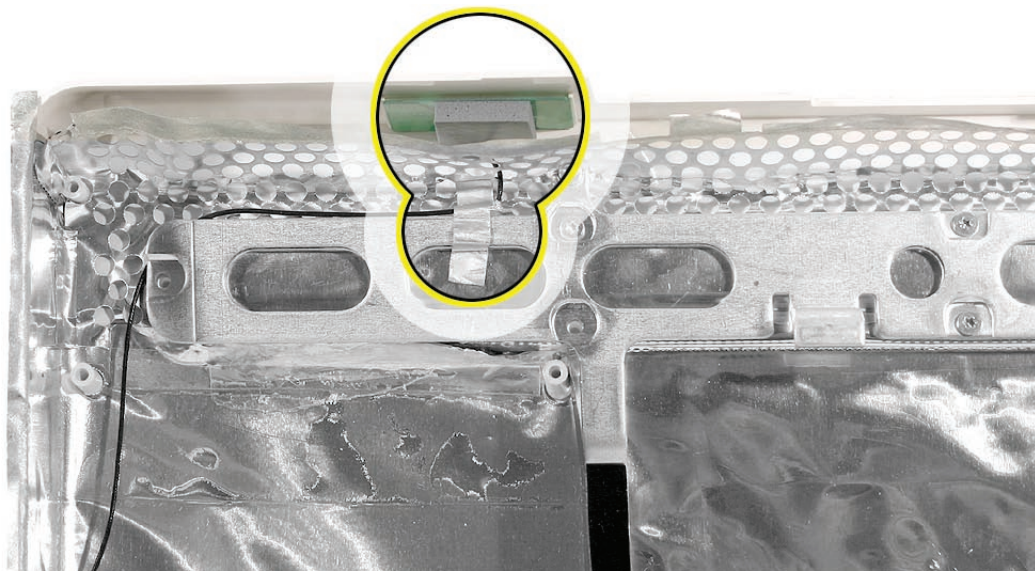
2. Remove two pieces of tape that secure the antenna cable to the rear housing. Pull the antenna cable through the access hole at the top of the EMI shield, near the antenna board.
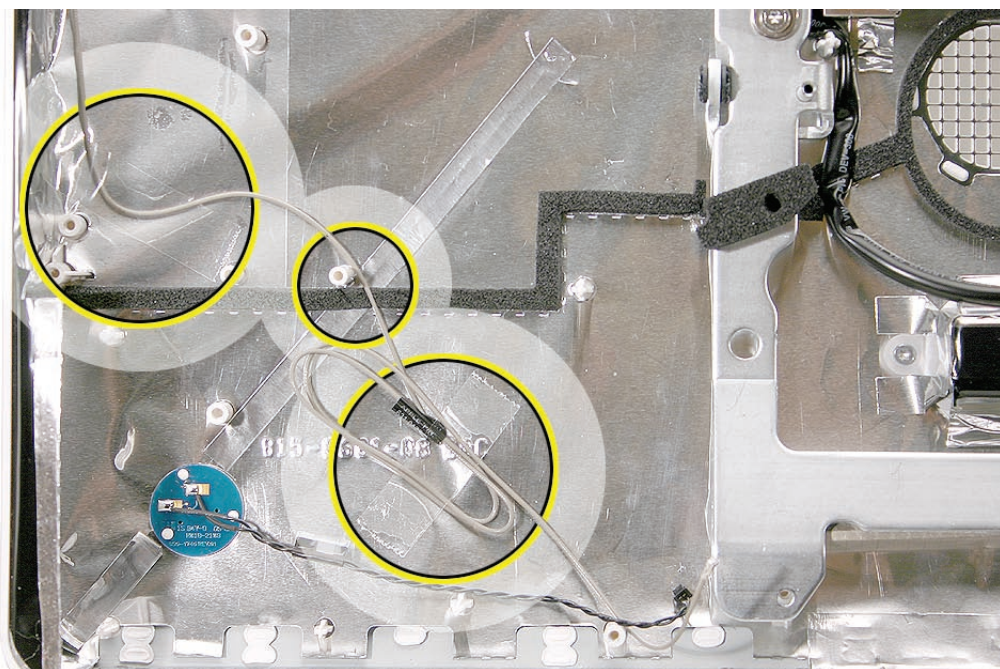
Replacing the AirPort Antenna

1. Route the antenna cable through the hole at the top of the EMI shield.
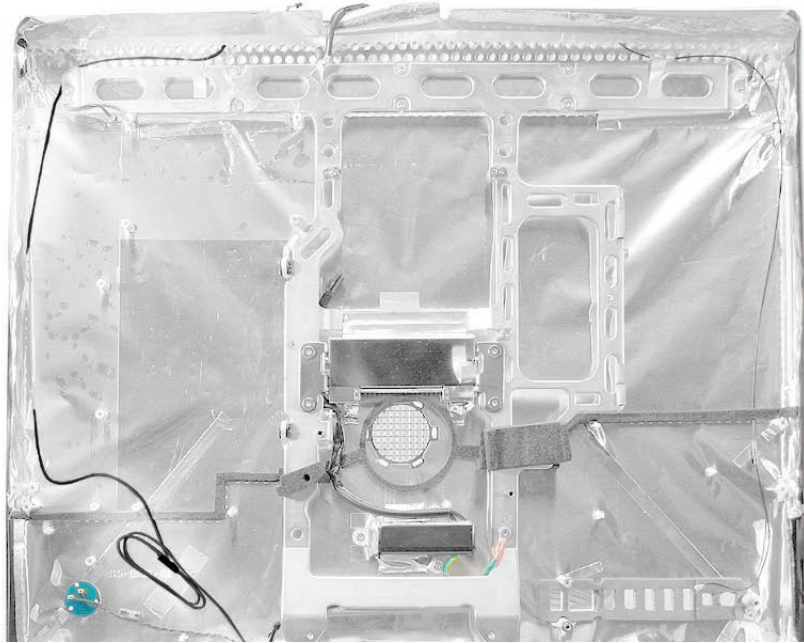
2. Route the antenna cable down the left side of the EMI shield and above the white plastic standoff (as shown in the middle circle). Secure the extra length of antenna cable to the housing with two pieces of tape .
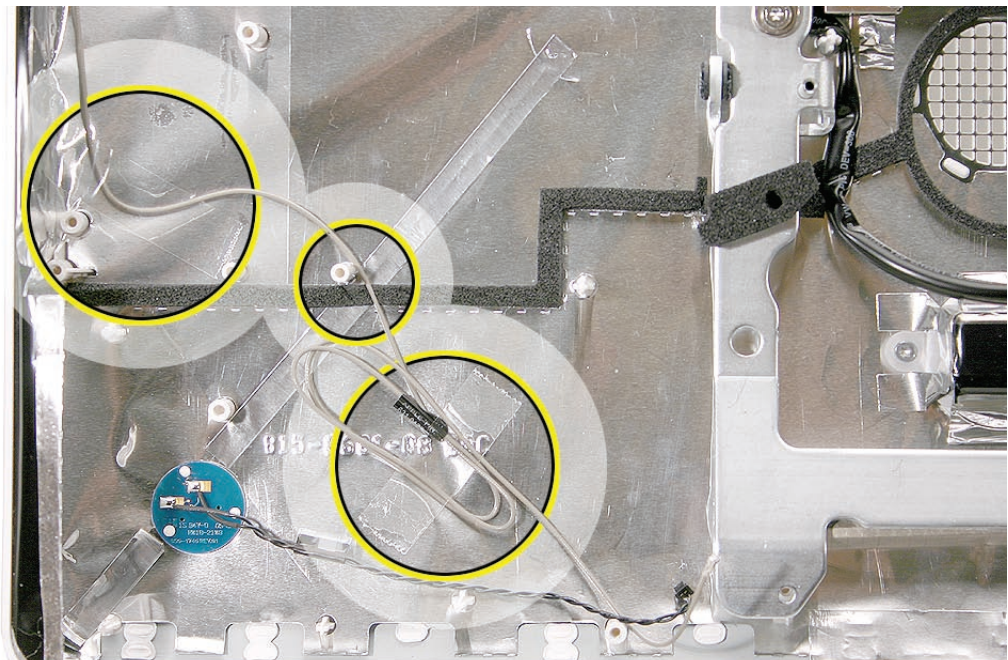
3. Replace the CPU fan.

4. Replace the logic board.

5. Replace the DC-DC board.

6. Replace the DC power supply.

7. Replace the speakers.

8. Replace the IR Board.

9. Replace the AirPort Extreme board.

10. Replace the Bluetooth board.

11. Replace the display panel.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

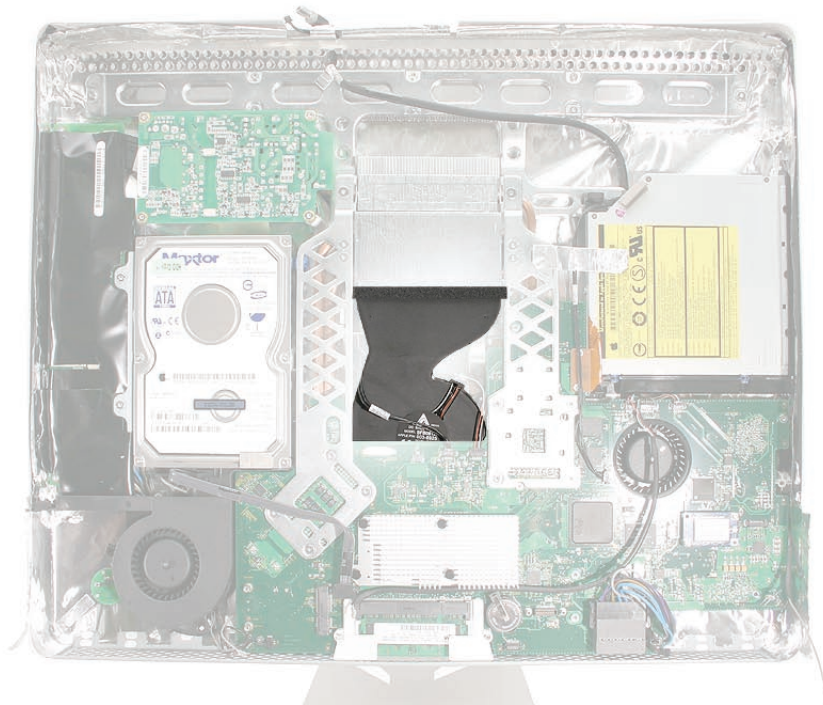# Clutch Mechanism

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:

- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Speakers**
- **IR Board**
- **Display Panel**
- **Logic Board**
- **CPU Fan**

Part Location
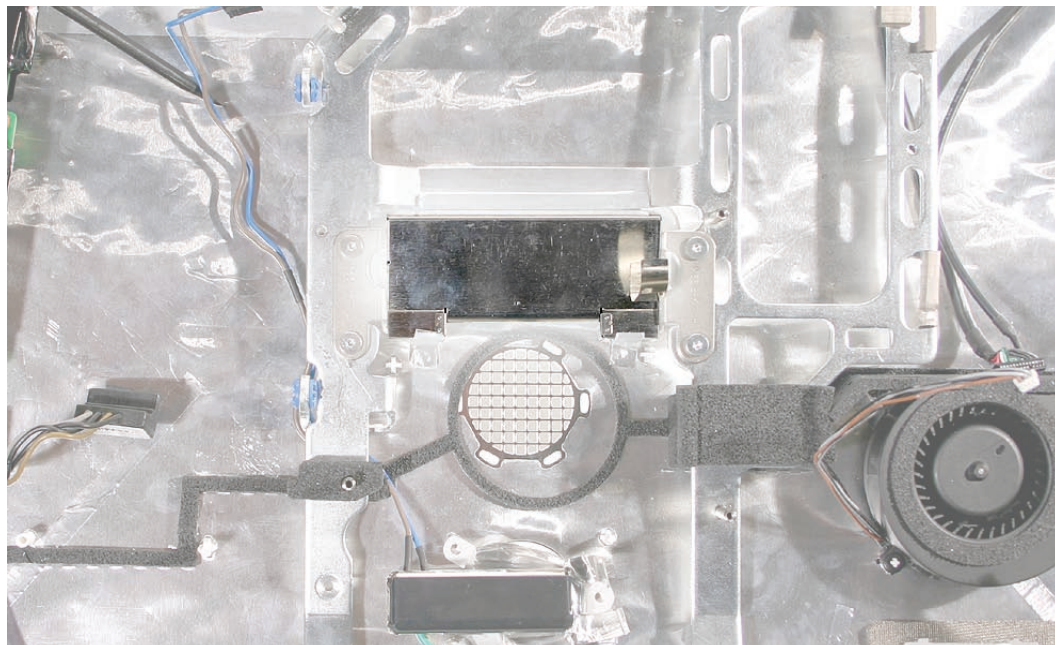
Removing the Clutch

1. Remove the EMI tape attached along the top and bottom sides of the clutch mechanism cover. After removing the tape, pull the cover straight off the clutch.
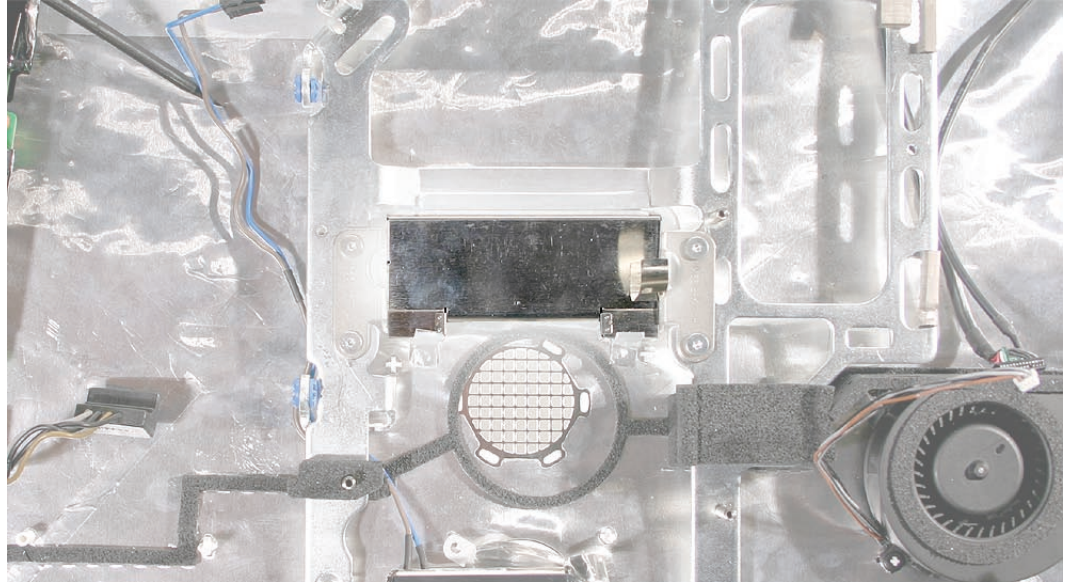
2. Peel back the EMI tape on top of the mechanism. Using a torx T10 screwdriver, remove the four clutch mounting screws.
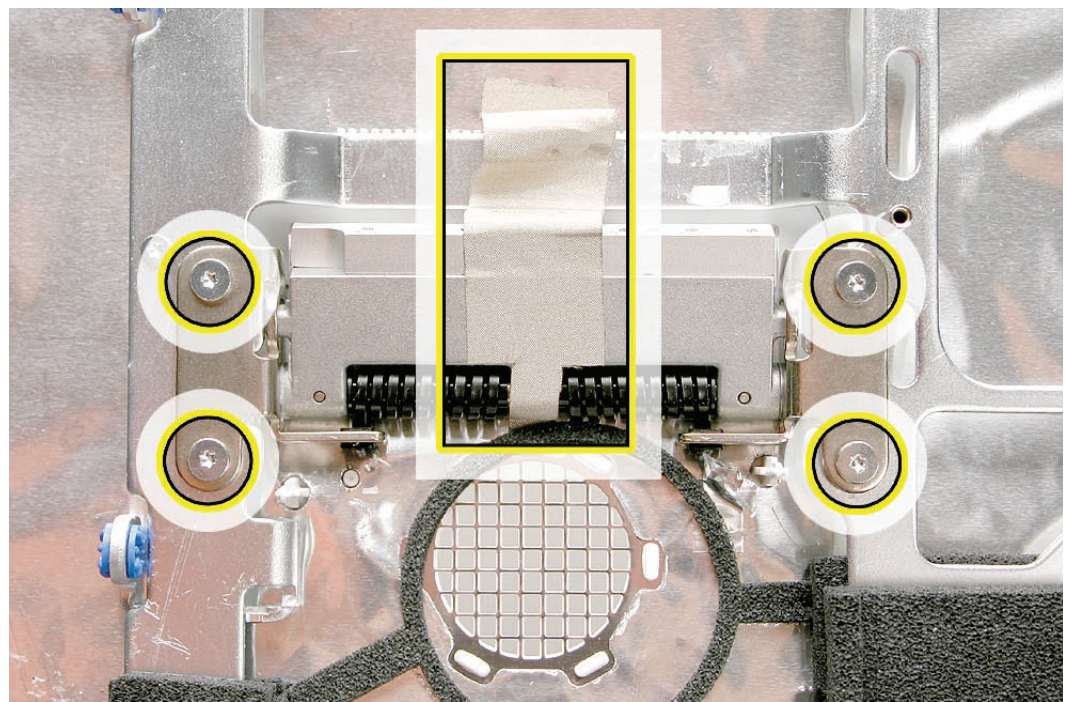
3. Stand up the unit, to access the clutch-to-stand mounting screws.

4. Using a T10 torx screwdriver, remove the seven clutch-to-stand screws. Separate the mechanism and the stand from the rear housing.
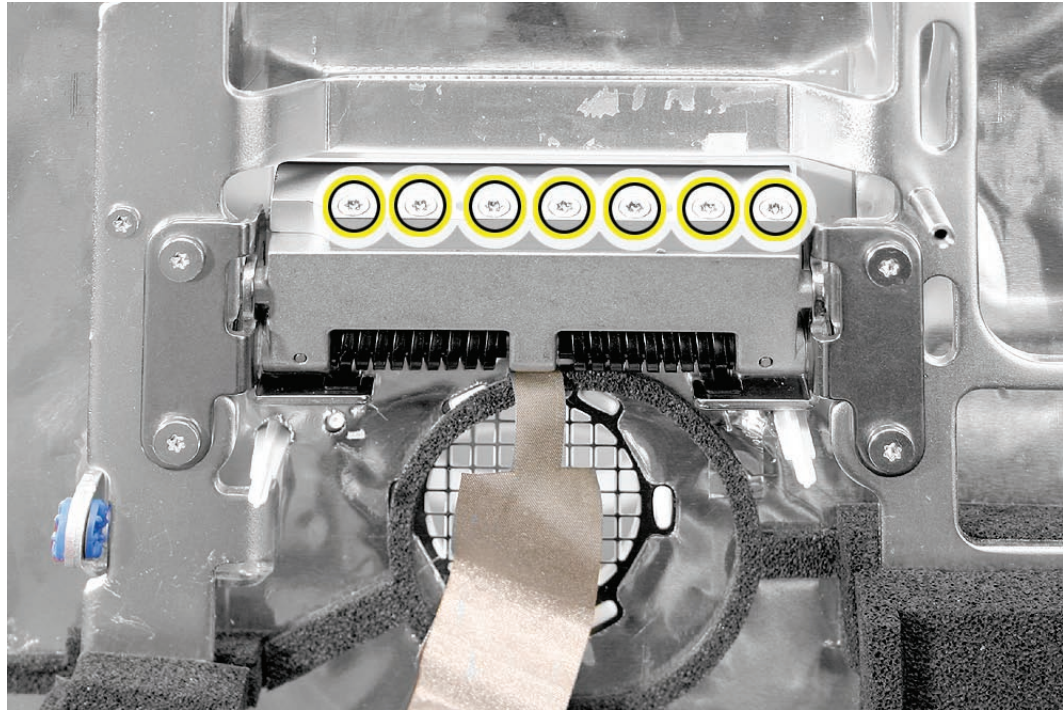
Replacing the Clutch

1. Make sure the stand is erect and the end of the stand is inserted through the mounting hole in the rear housing.

2. Position the clutch on the stand, with the clutch springs at bottom. Install the seven long, clutch-to-stand mounting screws.

3. Adjust the clutch so that its chassis mounting holes align, and install the four screws that secure the clutch to the chassis.

4. Replace the silky EMI tape on top of the mechanism, press it into place.

5. Replace the metal mechanism cover.

6. Replace the EMI tape along the top and bottom of the mechanism cover. Make sure the spring clip on the right side of the mechanism cover is attached to the mechanism cover.

7. Replace the CPU fan.

8. Replace the logic board.

9. Replace the speakers.

10. Replace the display panel.

11. Replace the IR Board.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

Rear Housing

Tools

No tools are required to remove the rear housing.

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **IR board**
- **Display panel**
- **Speakers**
- **Optical Drive**
- **Logic board**
- **CPU Fan**
- **Optical fan**
- **Hard drive fan**
- **AC Line Filter**
- **Hard drive**
- **Power supply, AC/DC**
- **Power supply, DC/DC, Inverter**
- **Camera cable**
- **Bluetooth antenna**
- **Clutch**
- **Stand**
- **Ambient Light Sensor**
- **Chassis**

Part Location
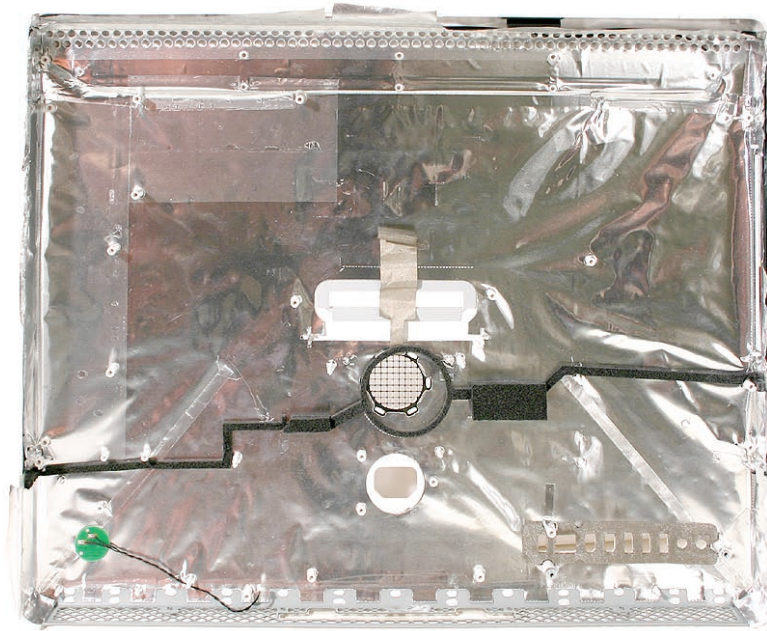
Removing the Rear Housing

Using a T10 torx screwdriver, remove 12 self-tapping screws from the chassis, and remove the chassis from the rear housing. **Note**: the EMI shield is part of the rear housing.
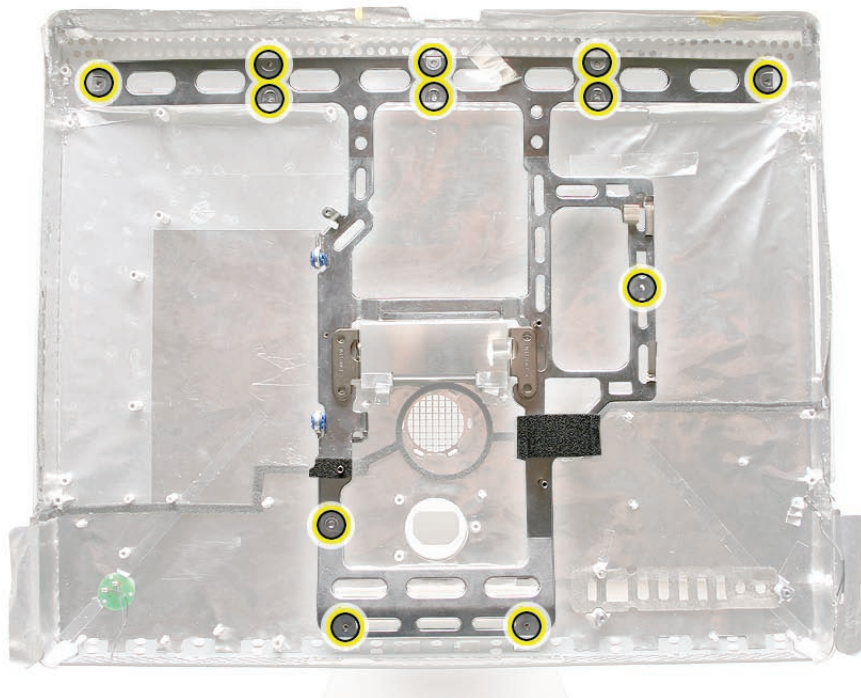
Replace the Rear Housing

1. Position the chassis on the rear housing as shown and install 12 self-tapping mounting screws.

2. Replace the clutch mechanism.

3. Replace the stand.

4. Replace the AC line filter.

5. Replace the AC/DC power supply.

6. Replace the hard drive.

7. Replace the optical drive.

8. Replace the hard drive and optical drive fans (if removed).

9. Replace the CPU fan.

10. Replace the logic board.

11. Replace the speakers.

12. Replace the display panel.

13. Replace the IR Board.

14. Replace the lower EMI shield.

15. Replace the front bezel.

16. Replace the memory access door.

Chassis

Tools
- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Speakers**
- **AirPort Extreme**
- **Bluetooth card**
- **IR board**
- **Display panel**
- **Optical Drive**
- **Logic board**
- **CPU Fan**
- **AC Line Filter**
- **Hard drive**
- **Power supply, AC/DC**
- **Clutch**
- **Stand**

Part Location
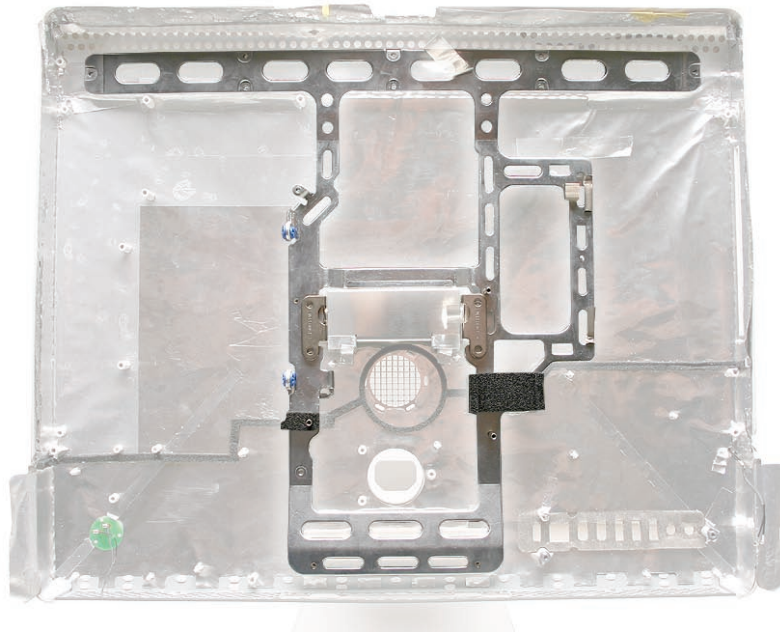
Removing the Chassis

Using a T10 screwdriver, remove 12 self-tapping screws from the chassis, and remove the chassis from the rear housing.
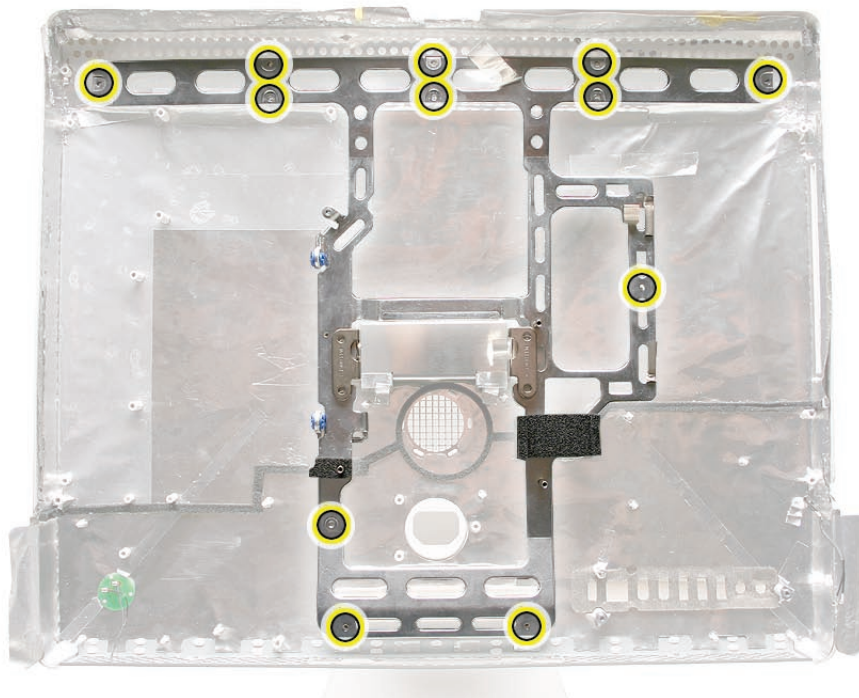
Replace the Chassis

1. Position the chassis on the rear housing as shown and install 12 self-tapping mounting screws.

2. Replace the clutch mechanism.

3. Replace the AC line filter.

4. Replace the AC/DC power supply.

5. Replace the hard drive.

6. Replace the optical drive.

7. Replace the hard drive and optical drive fans (if removed).

8. Replace the CPU fan.

9. Replace the logic board.

10. Replace the speakers.

11. Replace the display panel.

12. Replace the IR Board.

13. Replace the lower EMI shield.

14. Replace the front bezel.

15. Replace the memory access door.

Stand

Tools

- Torx T10 screwdriver

Preliminary Steps

Before you begin, remove the following:
- **Access door**
- **Front bezel**
- **Lower EMI shield**
- **Speakers**
- **IR Board**
- **Display Panel**
- **Logic Board**
- **CPU Fan**
- **Clutch**

Part Location

Removing the Stand

1. Stand up the unit, to access the clutch-to-stand mounting screws.

2. Using a T10 torx screwdriver, remove the seven clutch-to-stand screws. Separate the mechanism and the stand from the rear housing.
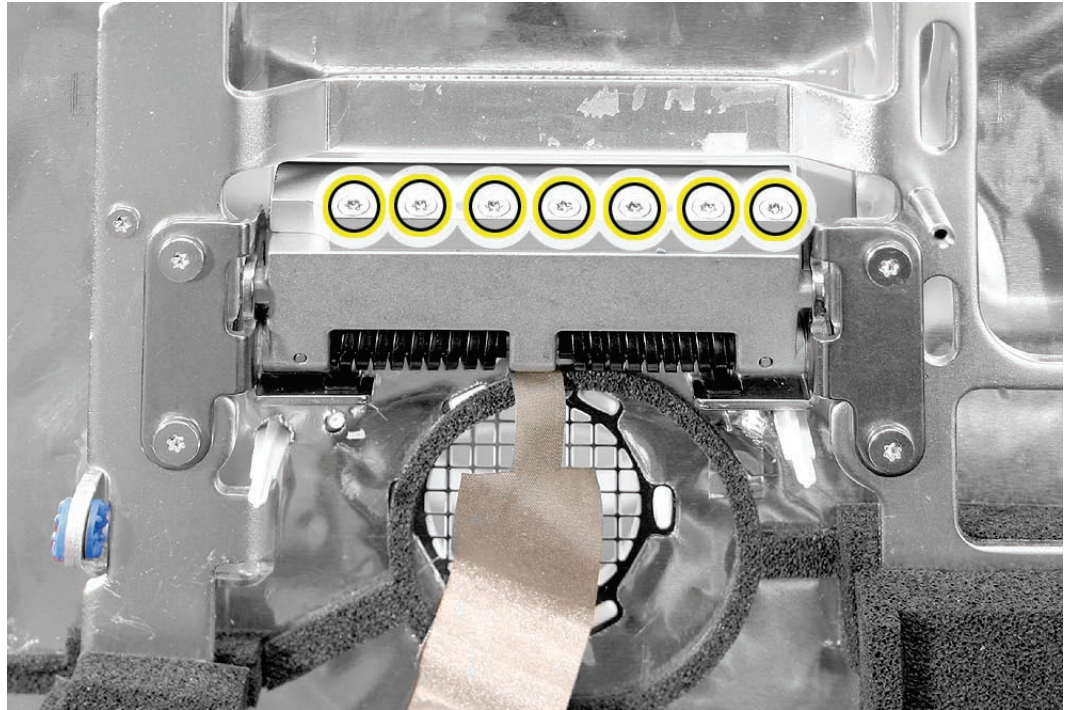
Replacing the Stand

1. Make sure the stand is erect and the end of the stand is inserted through the mounting hole in the rear housing.

2. Position the clutch on the stand, with the clutch springs at bottom. Install the seven long, clutch-to-stand mounting screws.

3. Adjust the clutch so that its chassis mounting holes align, and install the four screws that secure the clutch to the chassis.

4. Replace the silky EMI tape on top of the mechanism, press it into place.

5. Replace the metal mechanism cover.

6. Replace the EMI tape along the top and bottom of the mechanism cover. Make sure the spring clip on the right side of the mechanism cover is attached to the mechanism cover.

7. Replace the CPU fan.

8. Replace the logic board.

9. Replace the speakers.

10. Replace the display panel.

11. Replace the IR Board.

12. Replace the lower EMI shield.

13. Replace the front bezel.

14. Replace the memory access door.

Service Source

Troubleshooting

iMac (Early 2006 20-inch)

General Information

Serial Number Location

iMac (Early 2006) serial numbers are located on the bottom of the computer stand.

Power On Self Test (POST)

Intel-based Macs such as the iMac (Early 2006) rely on a combination of tones and blinking LEDs to display Power On Self Test (POST) error codes.

If the computer detects out-of-specification memory or no RAM installed, the screen will be black and the power LED on the front of the computer will blink once a second to indicate bad or no RAM. Bad RAM can include physically damaged, the incorrect type, or not present.

If the RAM is good enough to pass the POST test but it is marginal and cannot be used by the operating system, the computer will show a gray screen, three tones will sound and the power LED on the front of the computer will blink three times, pause, and repeat until the computer is turned off.

The solution to both these situations is to install known good memory.

Symptom Charts

How to Use the Symptom Charts

The Symptom Charts included in this chapter will help you diagnose specific symptoms related to the product. Because cures are listed on the charts in the order of most likely solution, try the cures in the order presented. Verify whether or not the product continues to exhibit the symptom. If the symptom persists, try the next cure.

Note: If a cure instructs you to replace a module, reinstall the original module before you proceed to the next cure.

Power Issues

No Power.

The iMac (Early 2006) will not turn on. The display remains black and there are no sounds from the fans or drives.

1. Verify the power outlet is good. Plug a different device into the socket to ensure there is power, or plug the iMac into another outlet. Does the iMac power on now?

   Yes. Resolved. Bad outlet.

   No: Go on to the next step.

2. Check the power cord. Use a known good power cord. Does the iMac power on now?

   Yes: Your power cord has failed. Replace the AC power cord.

   No: Go on to the next step.

3. Check the connection of the power cord on both ends. Verify that the power cord is securely plugged into both the AC outlet and back of the computer. Does the iMac power on now?

   Yes: You may have a loose fit to your power cord. Replace the AC power cord and test.

   No: Go on to the next step.

4. **Remove and reinstall the SO-DIMM memory** modules, located in the bottom of the computer. Does the iMac power on now?

   Yes: Issue resolved.

   No: Go on to the next step.

5. Plug a bus powered FireWire device in like an iPod using a FireWire cable or other FireWire drive or device with a power LED. Does the iPod show charging or the FireWire device show a power LED on?

   Yes: The AC Power Inlet is good. Go on to the next step.

   No: AC power is not being detected. If you've verified the outlet and power cord, replace the AC Power Inlet.

6. Plug a bus powered USB device into the USB ports on the rear of the computer like a keyboard, iPod Shuffle or USB 2.0 iPod using a USB cable and press the power button. Does the iPod show power or the keyboard caps lock LED light?

   Yes: The power supply is functioning. Go on to the next step.

   Yes, but only for a moment: The power supply cannot maintain power; replace the AC/DC power supply. If the problem continues replace the DC/DC power supply/inverter.

   No: The Power supply has failed. Replace the AC/DC power supply. If the problem continues replace the DC/DC power supply/inverter.

7. At this point in the Power On process, you should hear a boot chime and see the front LED on the computer light up. When the main logic board and LCD panel communicate to deliver video, the front LED should go out. Does the Front LED go off?

Yes: The LCD and main logic board have communicated. If there is no picture on the display, follow No Video troubleshooting.

No: Your logic board is not communicating with LCD panel. Open the unit and re-seat the TMDS cable and test again. If the issue persists, replace the main logic board.

Audible buzzing, whining, or ticking noise

The iMac (Early 2006) contains several mechanical devices such as motors and fans that may make audible buzzing, ticking, or whining noises when they are operating in a normal manner. The sounds will vary depending on how the system is used.

When troubleshooting abnormal noises try the following:

1. Verify that the computer is running a supported version of the Mac OS X operating system. If an earlier version of the operating system has been installed then the fans may run at excessive speeds.

2. Determine that this noise is related to the computer by removing and shutting down all other devices in the vicinity of the computer that could be causing a sound.

3. Eject any media inserted into the optical drive. The optical drive will make a variety of normal sounds when accessing the optical media.

4. Quit all applications and test the computer again. Processor intensive applications may cause the fans to run at a higher RPM and therefore be more audible.

5. Boot to Apple Service Diagnostic v. 3S100 or later and select the EFI test suite by holding down the D key during startup. The diagnostic tests fan speeds and thermal sensor functionality. Should tests fail, replace any parts indicated by the diagnostic.

6. Reboot the computer and check the computer again. If the noise persists and is unusually loud, contact Apple Technical Support.

No Video

No Video, No Boot Chime, White LED ON (Symptom 1)

The iMac (Early 2006) will turn on (indicated by the front LED ON), but there is NO boot chime and No Video on the display. The faint sound of the fans, hard drive, and optical drive may also be heard.

1. Reset the SMC (Formerly SMU).
   - From the Apple menu, choose Shut Down (or if the computer is not responding, hold the power button until it turns off).
   - Unplug all cables from the computer, including the power cord and any display cables.
   - Wait at least 15 seconds.
   - Plug the power cord back in, making sure the power button is not being pressed at the same time. Then reconnect your keyboard and mouse to the computer.
   - Press the power button on the back of the computer to start up your computer.

   Does the computer display video after successfully resetting the SMC?

   Yes: Problem solved.

   No: Continue to next step.

2. Verify that only supported SDRAM memory has been installed and that it has been installed correctly. Unsupported and/or defective memory can prevent the iMac (Early 2006) from booting. It may be necessary to install known good memory for testing purposes and replace any unsupported or defective SO-DIMM's identified during this process.

   Does the computer display video after verifying and/or replacing the memory with known good memory?

   Yes: Problem solved. Verify full system functionality before return the system to the customer.

   No: Replace the logic board.

No Video, Boot Chime heard, White LED ON (Symptom 2)

The iMac (Early 2006) will turn on, the boot chime can be heard, a white LED appears on the front bezel and sounds from the fan or drive activity can be heard, but the display has no picture or color.

1. Check if the computer is sleeping. Press the space bar to wake the computer from sleep mode. Did the computer wake from sleep?

   Yes: Put the computer to sleep from the Apple menu and wake the computer again to test. Check Energy Saver setting to see when the computer has been designated to sleep.

   No: Continue to next step.

2. Reset your computer's PRAM (Parameter RAM):
   - If your iMac is on, turn it off by holding the power button until the unit powers off. You should hear the fans go quiet.

- While the computer is off, with your left hand, hold down the Apple key, the Option key next to it, and the letter "R" key on the keyboard. When you have these keys all pressed down, push the power button with your right hand and then quickly move that hand to hold down the letter "P" on the keyboard. Keep these four keys pressed while the computer starts up.
- Make sure you hold down the four keys (P - R - Apple - Option) while the computer is starting up. When you hear the computer's start up chime for the second time, you can let go of the keys on the keyboard.
- If you didn't hear at least two startup chimes, go to the top of this section and begin again. It's important that you hear two startup chimes when performing this procedure. This indicates that you have successfully reset the computer's PRAM (Parameter RAM).

3. Does the computer display video after successfully resetting the computer's PRAM?

Yes: Restart the computer from the Apple menu and make sure the computer is now working correctly.

No: Continue to next step.

4. Make sure the machine is powered off; power off the machine by holding in the Power Button on the rear of the machine. Turn on the machine. Observe the white LED on the front bezel during startup; it should go out after a few moments. Did the LED go off?

Yes: If the LED went off, this indicates that the main logic board has communicated with the LCD display for video signal and your main logic board should be good. You can confirm by connecting an external monitor and checking to see that you have video out. Go to Step 8.

No: Continue with the next step to reset system power management (SMC).

5. Reset the SMC (Formerly SMU).
- From the Apple menu, choose Shut Down (or if the computer is not responding, hold the power button until it turns off).
- Unplug all cables from the computer, including the power cord and any display cables.
- Wait at least 15 seconds.
- Plug the power cord back in, making sure the power button is not being pressed at the same time. Then reconnect your keyboard and mouse to the computer.
- Press the power button on the back of the computer to start up your computer.

Does the computer display video after successfully resetting the SMC?

Yes: Press and hold the power button until the computer powers off. Start the computer again and confirm that front LED is reliably going off. If the computer still has no video but the LED is reliably going off, continue with step 8.

No: Go to the next step.

6. Unplug the iMac   and remove the SDRAM. Replace with known good SDRAM. Plug the iMac back in and power the unit on. Does the front LED go off after a few moments now?

Yes: Replace the original SDRAM and test again. If the front LED does not go off with the only

the original SDRAM installed, replace the SDRAM. If the LED is now reliably going off after a few moments, but yet you still do not have any video, go to step 8.

 No: If the LED remained on, the main logic board is not communicating with the LCD panel to generate video. Replace the main logic board.

7. With the LED going off, you may have a No Backlight condition or an LCD failure. In a dim room, turn the display at an angle to you and look closely at the display. Is the display completely black or can you see a dim, purplish light or glow to the display?
- Completely black: Replace the inverter
- Dim purplish light or glow: Replace the LCD panel.

Video Distortion After Waking From Sleep

Shimmering, Vertical Lines, Horizontal Lines

The iMac (Early 2006) will wake from sleep, but a slight shimmering of the image may be visible. In some cases the shimmering on the display may worsen so that the display fills with vertical lines, horizontal lines, or the image begins to shake (refer to the following four images samples.) Continue with the procedure to correct the issue.
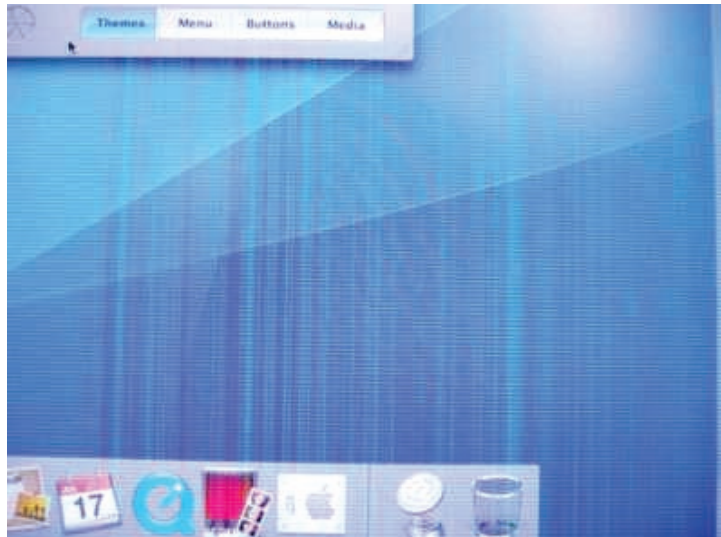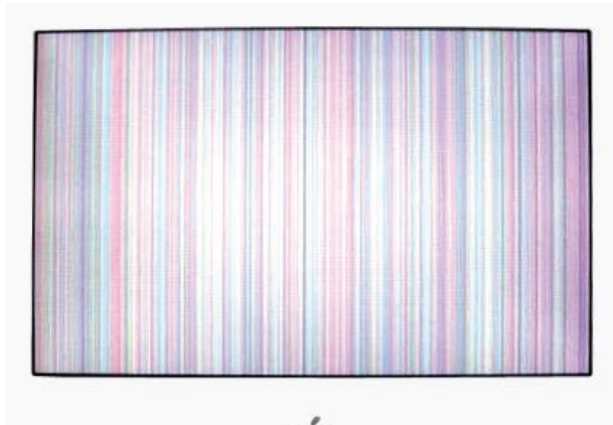
1. Open the Energy Saver System Preferences and temporarily set the display to sleep after one minute. Set the computer to sleep after ten minutes. Once the Energy Saver preferences have been set, wait for the display to go to sleep.

2. Wake the display from sleep and observe the display. Does the image on the display shimmer or fill with horizontal or vertical lines when waking from sleep?

    Yes: Replace the main logic board

    No: Continue troubleshooting using appropriate symptom charts

Note: To ensure optimal image quality the system should be left unplugged for approximately two hours after reproducing this failure. Once the logic board has been replaced wait until the system has been off for approximately two hours before powering up the system. Be sure to restore the customer's Energy Saver preferences to their previous values before returning the system to the customer.

Display

When displaying a single color over the screen area, the LCD panel shows one or more pixels that are not properly lit

Active-matrix LCD technology uses rows and columns of addressable locations (pixels) that render text and images on screen. Each pixel location has three separate subpixels (red, green, and blue) that allow the image to be rendered in full color. Each subpixel has a corresponding transistor responsible for turning the subpixel on or off.

There are typically millions of these subpixels on an LCD display. For example, the LCD panel used in the Apple Cinema HD display is made up of 2.3 million pixels and 6.9 million red, green, and blue subpixels. Occasionally, a transistor does not work perfectly, which may result in the affected subpixel being turned on (bright) or turned off (dark). With the millions of subpixels on a display, it is quite possible to have a low number of faulty transistors on an LCD. Therefore, a certain number of subpixel anomalies is considered acceptable. Rejecting all but perfect LCD panels would significantly increase the retail price for products using LCD displays. These factors apply to all manufacturers using LCD technology—not just Apple products.

To determine whether or not the display has an acceptable number of pixel anomalies, follow the steps below:

1. Set the display image to one of the following colors: all-white display, all-red display, all-green display, or all-blue display.

2. Using a jeweler's loupe, pocket microscope, or other magnifying device, identify and count each subpixel anomaly:
    • Bright subpixel anomaly = subpixel that is always on
    • Dark subpixel anomaly = subpixel that is always off

3. **Important:** Check the number of subpixel anomalies with the following chart:

LCD Size (inches)	Acceptable Number of Subpixel Anomalies			Replace the Display		
	Bright	Dark	Both	Bright	Dark	Both
17 to 20	up to 4	up to 6	up to 8	5 or more	7 or more	9 or more

4. If the number of subpixel anomalies exceeds the acceptable number listed in the chart, replace the LCD panel.

5. If the number of subpixel anomalies is acceptable, explain to the customer that the pixel anomalies are within specifications, and no repair is necessary.

Important: Do not release the specifications to customers. Instead, inform them that a certain number of subpixel anomalies is considered acceptable, and these factors apply to all manufacturers using LCD technology—not just Apple products.

Hard Drive

Flashing question mark, or an alternating question mark and Mac OS (face or a folder)

Note: When troubleshooting hard drive problems it is a good idea, if possible, to back up any important data. Some troubleshooting steps may require erasing the contents of the hard drive.

1. Boot from the system CD that came with the computer, and open Disk Utility. Does the hard drive show in Disk Utility?
    Yes: Run Repair Disk and Repair Permissions to correct any directory and permissions issues. Go on to Step 2.
    No: Go to Step 3.

2. Did Disk Utility successfully repair directory or permissions?
    Yes: Restart the computer to the hard drive. Go on to Step 3.
    No: Go to Step 3.

3. Did the computer successfully start to the internal Hard Drive?
    Yes: Run Apple Hardware Test 3A100 or later for this machine and return to the customer if it passes.
    No: Boot the machine to Apple Hardware Test 3A100 or Apple Service Diagnostic 3S100 (or later).

4. Did the machine successfully boot to the Diagnostic?
    Yes: Run the test suites.
    No: Make sure you're using the correct version of the Diagnostic, and that the disc is able to boot another machine that it supports. If so, then try booting from an external optical drive. If this is successful, you should replace the optical drive and retest the machine booting to the diagnostic disc.

5. Did the tests pass?
    Yes: Reinstall the System Software that came with the computer and test.
    No: Replace the component (s) indicated by the test results.

Hard Drive Issues

Note: The following information is for Intel-based and PPC Macintosh drive compatibility
*   Drives to be used in booting Intel-based Macintosh hardware should be formatted and partitioned with an Intel-based Macintosh disk utility running on Intel-based Macintosh hardware. That should ensure you get the correct default partition map and structure for reliable booting.
*   Intel-based Macintosh CPUs in Target Disc Mode will only mount on PPC machines running Mac OS X 10.4 or later, and may show one contiguous partition rather than separate partitions on the host machine.
*   Always make sure to use the OS that came with the machine if you need to reinstall software (ask the customer for the discs if necessary), and the diagnostics specifically designated for that hardware.

System hangs during normal startup process

1. Boot from the system CD that came with the computer and see if the hard drive mounts on the desktop.

2. Using Drive Setup, reinstall the system software drivers for the hard drive.

3. Using Drive Setup, reinitiation the hard drive.

4. Check all cable connections to and from the hard drive.

5. Replace the hard drive data cable.

6. Replace the hard drive.

7. Replace the logic board.

Optical Drive

CDs or DVDs don't show up on the Desktop.

1. Select Preferences from the Finder menu and make sure the option to show CDs, DVDs and iPods is checked: in the General window as shown below.

2. Select System Preferences from the Apple menu and open the CDs & DVDs preferences window. Make sure that audio CDs are set to launch iTunes and movie DVDs set to launch DVD Player when those media are inserted, as shown below.

3. Check that the drive can read discs normally. Insert an audio CD and check whether it shows up on your desktop or launches iTunes.
   Does the audio CD mount on the desktop or in iTunes?
   Yes: The drive seems to read CD discs okay. Go on to Step 4.
   No: Make sure the disc is readable by other computers. Try other CD discs. If none mount or no audio CDs launch iTunes, replace the optical drive."

4. Eject the audio CD and insert the iMac Software Install and Restore DVDs that came with the customer's computer, or insert a DVD movie.
   Does this disc show up on the desktop, or does the movie launch DVD Player?
   Yes: The computer is reading CD and DVD media. This may be related to a specific disc or discs the customer is using and you should examine those discs.
   No: The optical disc is reading CD media, but not DVD media. Try other DVD discs. If none mount or movie DVDs do not launch DVD Player, replace the optical drive flex cable.

5. If after replacing the optical drive flex cable the drive still won't mount any optical media, replace the optical drive. If the issue persists, then replace the logic board.

The computer won't burn discs.

1. Check whether the drive can read CDs and DVDs normally. Perform the steps above for "CDs or DVDs don't show up on the Desktop."

2. Try a test burn by creating a Burn Folder, as follows.
    • In the Finder, choose "New Burn Folder" from the File menu.
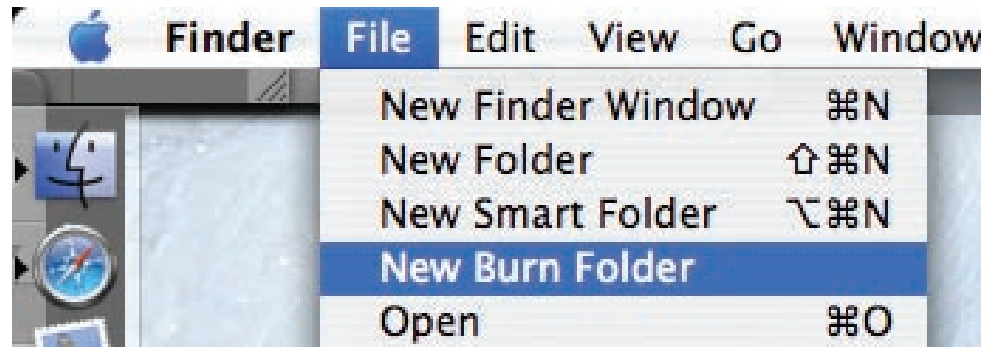
    • Open the Burn Folder, drag an item inside for testing, and click "Burn" in the upper right corner of the window.
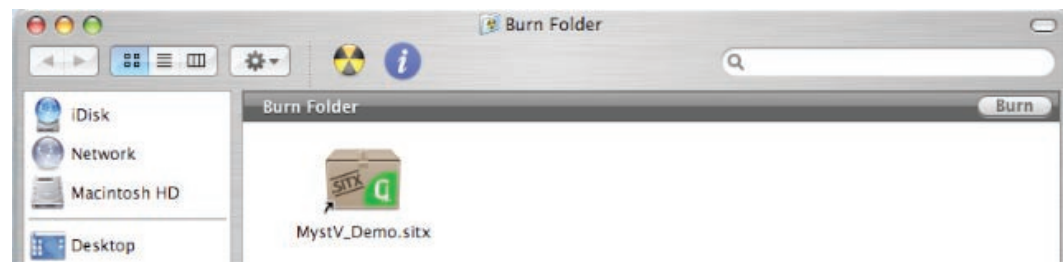
    • When prompted, insert a blank disc and follow the dialog instructions.
    Does the disc burn successfully (problem solved), fail with an error, or is the disc ejected?

3. If the disc fails to burn with an error, check for these error messages.
    Unknown Error -2147352480. See Knowledge Base article 25480 and 25750 for more information.
    Buffer underrun error. See Knowledge Base articles 25480 and 25750 for more information.
    Unknown Error. If you see "Unknown Error" without "-2147352480", you will want to see Knowledge Base article 152224 for more information.

4. If the blank disc is ejected, try another blank disc. If the issue persists, try another brand and speed of blank media; if you're using blank CD media, see if this happens with blank DVD media. If the drive consistently rejects all blank media, or only rejects blank CD media while accepting blank DVD media or vice versa, replace the optical drive flex cable and test.
    Does the drive successfully burn to disc after replacing the optical flex cable?
    Yes: Problem solved.

No: Replace the optical drive. Does it burn correctly now?

    Yes: Problem solved.

    No: Replace the logic board.

Discs won't insert.

1. Is there a disc already in the drive?

   Yes: Eject the disc before inserting another. Refer to Knowledge Base article 106752, "Macintosh: How to Eject a Disc When Other Options Do Not Work". If none of these options will eject the disc, you may have to disassemble the drive to recover the disc. See Knowledge Base article 86382 - Macintosh: How to Remove a Stuck Disc From a Slot-Loading Drive.

   No: Reseat the optical drive. Perform the "Optical Drive" procedure in Take Apart to reseat the drive in the mounting aperture and reconnect the optical flex drive cable connector.

2. After reinstalling the optical drive, can you now insert a disc?

   Yes: Issue resolved. Run diagnostics and return the system to the customer.

   No: Replace the optical drive flex cable.

   Yes: Problem solved. Run diagnostics and trying inserting a disc again.

3. After replacing the optical drive flex cable, can you insert a disc now?

   Yes: Issue resolved. Run diagnostics and return the system to the customer.

   No: Replace the optical drive.

Optical disc constantly ejects

1. Disconnect all peripheral devices, especially the mouse in cases where the disc is constantly ejecting. Retest. If the issue is resolved, reconnect peripherals one-at-a-time until faulty peripheral is identified.

2. Try cleaning the disc. If the disc is dirty or scratched, it may not mount.
    Is the issue resolved?
    Yes: Problem solved.
    No: Try a different disc. If the issue persists, go on to the next step.

3. Boot from Apple Hardware Test (hold down the "D" key at startup). If you can boot to this volume, run the Quick and Extended tests.
    Does the unit pass the tests?
    Yes: Restart to the internal hard drive and test again.
    No: Replace the component (s) indicated by the test results. If you cannot boot to Apple Hardware Test because it ejects, go on to step 4.

4. Boot from the system install DVD (use Startup Manager, hold down the Option key at startup). If you can boot from this volume, perform an Archive and Install with the Install DVD that came with the computer and test.
    Is the issue resolved?

5. **Yes:** Problem solved.
    No: If you cannot boot to Apple Hardware Test or to the Install DVD because they eject, reseat the optical drive flex cable and retest.

6. Replace the optical drive flex cable.

7. Replace the optical drive.

8. Replace the logic board

Fan Sound

Fans running at full speed after the computer turns on

The customer may have entered a diagnostic mode that causes the fans to run at full speed.*
Restarting the system will not restore normal fan operation. To solve the problem, the user or
technician should do the following:

1. Shut down the system.

2. Disconnect the power cord and wait 15 seconds.

3. Reconnect the power cord and wait 5 seconds.

4. Power on the system.

*Note: Customers reporting this symptom should be told to press the power button AFTER the
power cord has been fully inserted. Inserting the power cord while pressing the power button
will cause the fans to run at full speed.

Loud fan noise coming from inside the computer

The iMac G5 (20-inch iSight) has a trio of fans that circulate air throughout the system. It also
includes temperature sensors, and advanced thermal software that spins the fans fast or slow as
needed. As the system usage increases, the fans will adjust their speed using advanced thermal
software to meet the cooling needs of the system.

Under normal conditions, rotating fans will make a slight hum that varies in relationship with
their rotational speed and the amount of air that they are moving. In addition, the normal
functioning of the hard drive and optical drive will generate additional whirring and scratching
sounds that may be audible. All of these sounds are normal and do not indicate a failure with
your computer.

To begin troubleshooting a possible fan issue, we need to qualify the sound that you're
experiencing.

1. Does the sound occur only under specific light/heavy usage conditions?

    Yes: CPU intensive applications such as iTunes, Garage Band, DVD Player, etc., or two or more
    applications open at once will cause the fans to run at an increased rate making them more
    noticeable. If the sound only occurs when one or more of these applications is running, this
    is normal.

    No: If the sound isn't affected by CPU intensive application it may be due to other factors. Go
    on to the next step.

2. Is the sound always present, or does the sound vary?

    The sound is always present: The normal functioning of the hard drive and optical drive will
    generate additional whirring and scratching noises that may be audible. Check whether this

sound is related to one of the components. Go to step 4.

The sound varies: Under normal conditions rotating blowers will make a slight hum that varies in relationship with their rotational speed and the amount of air that they are moving. Let's see if this is indeed the case. Go to Next Step.

3. Are the fans making a normal humming sound that increases/decreases in relation to processor usage? As the fans increase their speed to cool the system the sound level will increase.

    Launch the Activity Monitor application included with Mac OS X in the Utilities folder to determine whether the noise corresponds with heavy usage of the CPU. Does fan activity increase / decrease with the CPU Usage graph in Activity Monitor? Check by running CPU intensive applications such as iTunes.

    Yes: This is normal operation and none of the fans require replacement.
    No: If the fan activity does not coincide with CPU usage, the sound you're hearing may not be fan activity. Go to the Next Step.

4. The normal functioning of the hard drive and optical drive will generate additional whirring and scratching noises that may be audible. We can isolate these noises by booting the computer to the iMac Install Mac OS X Install Disc 1.

    - Place the disc in the drive, and restart your machine while holding down the "C" key as the machine starts up.

    - Once at the Installer window, choose Open Disk Utility from the Installer Menu.

    - Once Disk Utility is open, select the system's hard drive and on the toolbar choose Unmount. **Note:** if the drive has multiple partitions, unmount each of these partitions. This will spin down the hard drive. The optical drive will also be busy at this time; wait a moment for the optical drive to spin down also and then listen to the machine.

    Is the sound still present?

    Yes: With the hard drive and optical drive inactive, all you should be hearing are the fans in the machine. While booted to the CD, these fans should be running at a lower level since CPU activity is low with both drives inactive. Fan sound that includes objectionable ticking, whistling, or squealing may require further investigation and/or replacement of the particular fan. Go on to the next step.

    No: The normal functioning of the hard drive and optical drive will generate additional whirring and scratching sounds that may be audible. All of these sounds are normal and do not indicate a failure with the machine. If you wish to check the health of the hard drive, see article 152349, "Replacing a disk before it fails."

5. Shut down the computer, remove the power cord and any other connected cables, and

remove the access door, front bezel, and EMI shield.
Stand up the computer, plug it in, and start it up by pressing the external power button.

As the machine starts up, listen carefully to each of the three fans, and see if you can locate the fan from which the objectionable ticking, whistling, or squealing sound is coming. The CPU fan is the left-most fan, the hard drive fan is in the center, and the optical drive fan is on the right.

Can you pinpoint the fan making the sound?

Yes: Replace the noisy fan.

No: If you can hear an objectionable ticking, whistling, or squealing sound, but you cannot identify the source of the sound, contact Apple Technical Support.

Fans are running at a constant high speed

If the fans on the system are running at a constant high speed, or ramp very quickly to high speed and do not vary once this speed is reached, the fans are most likely receiving incorrect thermal input. Follow these steps:

1. Reset the SMC and then test to see if the fans still exhibit the issue.

2. Boot to Apple Service Diagnostic v3S100 EF1 tests. This will test the fans and thermal input of the sensors. If the tests fail, replace the component (s) indicated by the test.

3. Verify that the hard drive temperature sensor cable, and the optical drive temperature sensor cable are plugged in correctly. If necessary, replace the hard drive and optical drive temperature sensor cables.

4. Replace the hard drive and optical drive temperature sensors.

5. Replace the hard drive.

6. Replace the logic board.

AirPort/

Not able to connect wirelessly with AirPort

1. From the Apple menu, choose About this Mac.

2- Click on More Info. System Profiler should open.

3- In System Profiler, in the column on the left, look under Network for a line called "AirPort Card". Select that line.

4- Does the section to the right say "No Information Found"?

> Yes: The computer doesn't realize it has an AirPort card installed. Go to step. 5

> No: The iMac recognizes that it has an AirPort card installed. Go to step 6.

5- Remove the front bezel, lower EMI shield, and two card mounting screws. and reseat the AirPort card. Re-install the two card mounting screws and check System Profiler again to see if the computer sees the AirPort card. Does it recognize the card now?

> Yes: Problem solved. Replace the lower EMI shield and front bezel and re-test the system to verify that the original symptom is resolved.

> No: Replace the AirPort card. Refer to the Take Apart - Logic board procedure for replacement instructions. If the issue persists after replacing the AirPort card, replace the logic board..

6- Now that we know the iMac recognizes the AirPort card, check the antenna. If the antenna is not plugged in all the way, you may have very short AirPort range.

7- Remove the access door, front bezel, lower EMI shield, and right speaker, and the two AirPort card mounting screws . Disconnect the card, turn it over and reconnect the antenna cable connectors to the card. Make sure the antenna lead is firmly seated. Replace the card and other components and re-test.

8- If the antenna lead is plugged in properly and the AirPort card is recognized but the problem persists, there are a number of other things that could cause issues with wireless networking. Refer to Knowledge Base document 106858 for more networking information.

9- Replace the AirPort card. Refer to Take Apart/Logic Board.

10- Replace the AirPort antenna. Refer to Take Apart/AirPort Antenna.

11- Replace the logic board. Refer to Take Apart/Logic Board.

IR Remote

Remote won't communicate with system applications such as iTunes or iPhoto, or with the optical drive.

Make sure of the following when using the Apple Remote:
- You are within 30 feet of the front of the computer.
- You have an unobstructed line-of-sight to the front of the computer.
- You are pointing the lens end of the Apple Remote directly at the front of the computer.
- The computer is powered on and awake.
- The "Disable remote control infrared receiver" checkbox in the Security pane of System Preferences is NOT checked.
- Make sure the active application works with Apple Remote. Apple Remote uses Front Row, and from Front Row it can access DVD Player, iPhoto, iTunes, and QuickTime Player.
- Make sure the remote is paired with the computer. Access the System Preferences/Security pane and check "Unpair" if available. Close the Security pane, and re-pair the Apple Remote with the computer. See Knowledge Base article 302545.

1. Use a digital camera to test your Apple Remote.
   If you have a digital camera or DV camera with an LCD display, you can use it to see if your Apple Remote is emitting a signal. Infrared beams are invisible to the human eye, but most digital cameras and video cameras use Charged-Coupled Device (CCD) chips or image sensors that are sensitive to infrared light.

   To use a camera to test your Apple Remote, follow these steps:
   • Turn on your digital camera or DV camera and remove any lens cover.
   • Point your Apple Remote toward the camera lens.
   • Press and hold the Menu button on the remote while looking at your camera's LCD display.
   • If you see a faint blinking light coming from the Apple Remote in the camera's LCD, then the remote is working properly.
   • If you don't see any blinking light in the camera's LCD, replace the battery in your Apple Remote and then test it again with your computer (see "iMac G5 (iSight): How to replace the Apple Remote battery" for instructions). (KBase article 302543)

2. Does the IR remote now communicate with an active application that works with Apple Remote?
   Yes: IR remote is functioning correctly.
   No: Replace Apple Remote.

IR Sensor/Receiver

Supported applications do not respond to input from the remote control.

1. Perform the checks above under "IR Remote" to verify that the Apple Remote is functioning correctly, and retest. Do supported applications now respond to input from the IR remote?
   Yes: Problem resolved.
   No: Go to the next step.

2. Verify that the IR Sensor can be seen in the Apple System Profiler. Open the Apple System Profiler and click on the "USB" section. You should see the following listed:

IR Receiver:

Version:	0.58
Bus Power (mA):	100
Speed:	Up to 12 Mb/sec
Manufacturer:	Apple Computer, Inc.
Product ID:	0x8240
Vendor ID:	0x05ac (Apple Computer, Inc.)

   Do you see the IR Receiver listed under the USB section of the Apple System Profiler?
   Yes: Go on to the next step.
   No: Replace the IR cable and retest. Refer to the "IR Board" procedure in Take Apart.
   Do supported applications now respond to input from the IR remote?
   　Yes: Problem resolved.
   　No: Replace the IR sensor board and retest. Refer to the "IR Board" procedure in Take Apart. If the issue persists after replacing these parts, replace the logic board.

3. Access System Preferences and click Security. In the Security pane check the following:
   • Make sure "Disable remote control infrared receiver" checkbox is not checked.
   • If "Unpair" is available in the Security pane of System Preferences, another Apple Remote may be paired to the computer (pairing allows only one Apple Remote to control the computer). To delete a pairing between the remote and the iMac G5 (iSight), click Unpair. (You may have to enter your Administrator password to make changes in the Security pane.) After making sure these features are disabled, does the Apple Remote control the machine now?
   Yes: Problem resolved.
   No: Replace the IR sensor board and retest. Refer to the "IR Board" procedure in Take Apart.

Built-in iSight Camera

The built-in camera is not recognized.

1. Boot the iMac (Early 2006) to the desktop and launch iChat AV. **Note**: You do not need to be connected to a network to use iChat AV to troubleshoot. Verify that the correct versions of Mac OS X and iChat AV are installed. Reinstall or update software as needed.

2. Open the iChat AV preferences and click on the 'Video' icon. Verify whether the camera is recognized by the iChat AV software. Is the camera recognized?

    Yes: the camera is recognized and video preview is normal: This indicates the camera is functioning. Pull down the 'Video' options from the menu bar and verify that the camera is enabled. The camera must be enabled to function.

    No: the camera is not recognized and no video preview is visible. This indicates the camera may not be functioning properly. Open the iMac G5 and inspect the camera board (inside the front bezel) and the attached cable. Reseat the cable on the camera board and check the other end of the camera cable connection to the logic board. The camera cable connector is on the right side of the logic board, above the AirPort/Bluetooth combo card.

3. Replace the camera cable.

4. Replace the camera board located inside the front bezel.

5. If the iSight camera still doesn't appear in System Profiler on the USB bus after replacing the camera board, replace the logic board.

Camera recognized but no video.

1. Verify that the lens assembly for the iSight camera located in the top middle of the front bezel is not obstructed by anything including Post-It notes or other objects.

2. Replace the camera board in the front bezel and retest.

Camera image quality poor.

The built-in camera is recognized by iChat AV and other supported video applications however the image quality is poor.

1. Verify that the lens assembly for the iSight camera is clean. Fingerprints and other contaminants can affect image quality. Clean the lens using a lint free lens cleaning cloth being while being careful not to scratch the lens.

2. Verify that there is sufficient lighting to produce a good quality image. Lighting which is comparable to that found in a well lit office will product a good quality image. If possible, avoid having a brightly lit background. Diffused lighting is preferred over direct lighting.

3. Launch iChat AV and open the iChat AV preferences. Click on the 'Video' tab. Is the video quality acceptable?
    Yes: The camera is functioning normally. The image quality problems may be caused by bandwidth limitations when using iChat over the internet. Instruct the customer to use the

iChat AV connection doctor feature to verify that there is sufficient bandwidth to have a video iChat session without a significant degradation of image quality.

No: The camera may not be functioning normally. Replace the camera board in the front bezel and retest.

Camera recognized but no audio

1. Open the System Preferences window and click on Sound.

2. Verify that the built in iSight camera has been selected as the device for sound input.

3. Verify that the volume settings (on the slider bar) are appropriate.

4. Launch iChat AV and open the iChat AV preferences. Click on the 'Video' icon. Speak into the microphone while monitoring the microphone level indicator. Does the line level meter respond while you are speaking?

   Yes: The microphone circuit is functioning correctly. Check the preference settings of any supported AV applications the customer is experiencing problems with to make sure that the microphone feature is enabled and that the internal iSight microphone has been selected as the input device.

   No: Inspect the microphone / camera cable attached to the camera board inside the front bezel. If the cable is damaged, replace the cable and retest. If the issue continues, replace the front bezel. The front bezel contains the microphone.

Audio Quality Poor

The camera is recognized but the built-in microphone's audio quality is poor.

1. Open the System Preferences window and click on Sound.
   - Verify that the built-in camera has been selected as the sound input port.
   - Verify that the input volume settings are appropriate. Use the volume level meter to verify settings.

2. Open iMovie and create a new project. Click on the Audio button and record a sound sample. Is the sound quality acceptable?

   Yes: The microphone is functioning normally. The audio quality problems may be caused by bandwidth limitations when using iChat over the internet. Instruct the customer to use the iChat AV connection doctor feature to verify that there is sufficient bandwidth to have an audio iChat session without a significant degradation of audio quality.

   IChat AV allows the user to limit the allocated bandwidth which could impact audio quality. Check the settings and increase the bandwidth if needed.

   No: The microphone may be faulty. Replace the front bezel which houses the microphone.

Speakers

Can't hear sound from the speakers.

1. Disconnect any external microphones, speakers, or headphones.

2. Access System Preferences and select Sound. In the Sound pane, select Output and make sure the Internal speakers are selected as the device for sound output, the Output volume is adequate, and Mute is not selected. Do you have sound now?
    Yes: Problem resolved.
    No: Go to the next step.

3. Reset parameter RAM. Press Command-Option-P-R during startup but before "Welcome to Macintosh" appears. Do you have sound now?
    Yes: Problem resolved.
    No: Go to the next step.

4. Verify that the speaker cable connector is securely attached to the logic board. Do you have sound now?
    Yes: Problem resolved.
    No: Replace the speakers.

5. After replacing the speakers, do you have sound now?
    Yes: Problem resolved.
    No: Replace the logic board.

No audio from internal speakers (may hear a faint putt-putt or motorboating noise)

One method for isolating this issue from other no audio issues is to:

1. Open the sound preference pane.

2. Click on the 'output' tab.

3. Plug in a set of earbuds or external speakers and verify that the 'plug detect' feature is working (the Port setting should change as the external speakers are plugged and unplugged)

4. If the plug detect feature is NOT working then replace the logic board after first verifying that the external speakers are being plugged into the correct port.

5. If the plug detect feature IS working, AND the external audio works then continue to the next step.

6. Remove front bezel and diaper to expose the speakers. Carefully inspect the speaker cable to determine if it has been punctured on any component leads. Add electrical tape (kapton is OK too) to the punctured area and then reroute the cable as shown in the picture to prevent further damage.

7. Retest the internal speakers to make sure that the audio has been restored and that the 'putt putting' sounds are gone.

I hear sound out of only one speaker.

1. Are there any external microphones, speakers or headphones plugged into the iMac?

   Yes: Disconnect any external microphones, speakers, or headphones. Do you hear audio from both of the built in speakers on your iMac?

       Yes: Good. It looks like the built-in speakers are working properly. This may be an issue with the microphone, speakers or headphones that were plugged into your iMac. Please work with the manufacturer to troubleshoot this issue.

       No: Go to step 2.

   No: Check your speaker balance. If your balance setting was set to the left or right speaker, you would only hear sound from one speaker. Go to step 2.

2. Open System Preferences. (System Preferences can be found under the Apple menu.)

3. Click once on the sound icon.

4. Click once on the Output tab.

5. Make sure your balance setting is in the middle. After adjusting the audio balance, do you have audio from both speakers now?
   Yes: It looks like the issue was the balance was not set properly.
   No: Replace the speakers.

6. If the speakers did not solve the problem, replace the logic board.

Mouse

My mouse doesn't work at all.

1. Turn over the mouse and check the if the red LED on the underside of the mouse. Is the LED lit?

    Yes: The mouse has power. Try using the mouse on another surface. Non-reflective, opaque surfaces without repetitive patterns work best. The surface should be clean, but not shiny. Optical mice won't work on glass, mirrored surfaces, glossy materials or mouse pads with pictures.

    No: There is no power to the mouse. Try plugging the mouse into one of the USB ports on the machine. If the mouse won't power on from any USB port, try it on a known good machine. If the mouse fails to power on with known good machine, replace the mouse. If the mouse will power on with a known good machine, replace the main logic board.

2. If the underside LED is lit and the surface is good, and the mouse still does not track, try plugging the mouse into another USB port on the machine. Does the mouse track now?

    Yes: Issue resolved. Try the other USB ports on the system to make sure you don't have a bad port.
    No: Try using a known good mouse. If a known good mouse resolves the issue, replace the mouse. If a known good mouse does not resolve the issue, replace the main logic board.

My mouse works intermittently (the cursor freezes randomly) or is slow to respond.

1. Try using the mouse on another surface. Non-reflective, opaque surfaces without repetitive patterns work best. The surface should be clean, but not shiny. Optical mice won't work on glass, mirrored surfaces, glossy materials or mouse pads with pictures. Does the mouse track correctly on a proper surface?
    Yes: Issue resolved.
    No: Check the Mouse Tracking setting in the Mouse control panel.

2. Boot to another volume (like the System Install Disc). Does the mouse track properly now?
    Yes: Reinstall System Software
    No: Try a using a known good mouse. If a known good mouse resolves the issue, replace the mouse. If the issue persists with a known good mouse, replace the main logic board.

Keyboard

Certain keys or none of the keys on the keyboard function.

1. Unplug all devices from your computer, including your mouse and keyboard as well as printer, scanner, external hard drives, and hubs. (Warning: Some devices may require you to perform steps before it is safe to unplug them, e.g, external storage devices.) Be sure to unplug your hub, if you have one.

2. Plug your keyboard into the back of your computer firmly and securely. Plug your mouse into the back of your computer firmly and securely. Take special care to make sure the connector is completely in the socket. Go on to step 3.

3. Does your keyboard work now?

    Yes: Problem solved.

    No: Unplug your keyboard and plug it into another USB slot on the back of your iMac. Does it work now?
      Yes: Replace the logic board.
      No: Unplug your keyboard and plug your mouse into the port the keyboard just occupied. Go on to step 4.

4. Does your mouse work now?

    Yes: Replace the keyboard.

    No: Replace the logic board.

My keys are sticky or slow to respond.

1. Try a known good keyboard.

2. Open System Preferences. Click on the keyboard and mouse icon. Adjust the "key repeat speed and delay until repeat" rate.

3. Replace the keyboard.

When I type, strange characters appear on the screen.

1. Depending on your iMac's settings, a simple keystroke can change your keyboard from English to Japanese. This can result in some pretty funny characters showing up when you type. To switch to the US keyboard,

2. Open System Preferences.

3. Click on the International icon.

4. Click on the Input Menu near the top of the screen.

5. Scroll down the list and uncheck any non-US keyboard layouts.

6. Close the System Preferences. Try typing a few characters. Did is solve the problem?
   Yes: Problem solved.
   No: Replace the keyboard.

The USB port on my keyboard doesn't work.

1. Unplug all devises from your keyboard.

2. Plug your Apple mouse into the left USB port on your keyboard. Does your mouse work when it's plugged into this port?

   Yes: Now plug the mouse into the right port. Does it work?
       Yes: Try a known good keyboard.
       No: Try a known good mouse to rule out the mouse. Then go to step 3.
   No: Try a different mouse or keyboard.

3. Now unplug the keyboard from the USB port on the back of the iMac, and plug the mouse into the port the keyboard had been in. Does the mouse work now?
   Yes: Replace the keyboard?
   No: It appears that your USB port isn't functioning properly. Go on to step 4.

4. Replace the logic board.

Error Beep(s)

Refer to **Power On Self Test (POST)** covered in the General Information section of this chapter.

USB

A USB device doesn't work

1. Please unplug all of your USB devices from your iMac except your Apple Keyboard and Apple mouse.

2. Now plug your device directly into the back of your iMac. Does it work as expected now?

    Yes: Your device works when plugged directly into the computer. This indicates a conflict with one of the other USB devices. You can test by gradually adding your devices back and seeing where the issue occurs, then contacting the manufacturer of the device(s)) for assistance.

    No: Unplug your device from the iMac and plug the keyboard into the port your device just occupied. Is your keyboard still working?
    >   **Yes:** Your Apple Keyboard works when plugged into the USB port your device was plugged into. This points to an issue with your device. Please review the documentation that came with your device. Install any necessary drivers and contact the manufacturer of your device for assistance.
    >   **No:** Replace the logic board

I see a message saying not enough power to function.

It appears that this device needs to be plugged into the computer's USB port, rather than the keyboard USB port. Any USB device connected to the keyboard needs to be either a self-powered device (a USB device with its own AC power supply), or a low-power device (a device that does not need a large amount of voltage to operate). Your device may draw more power than the keyboard can provide.
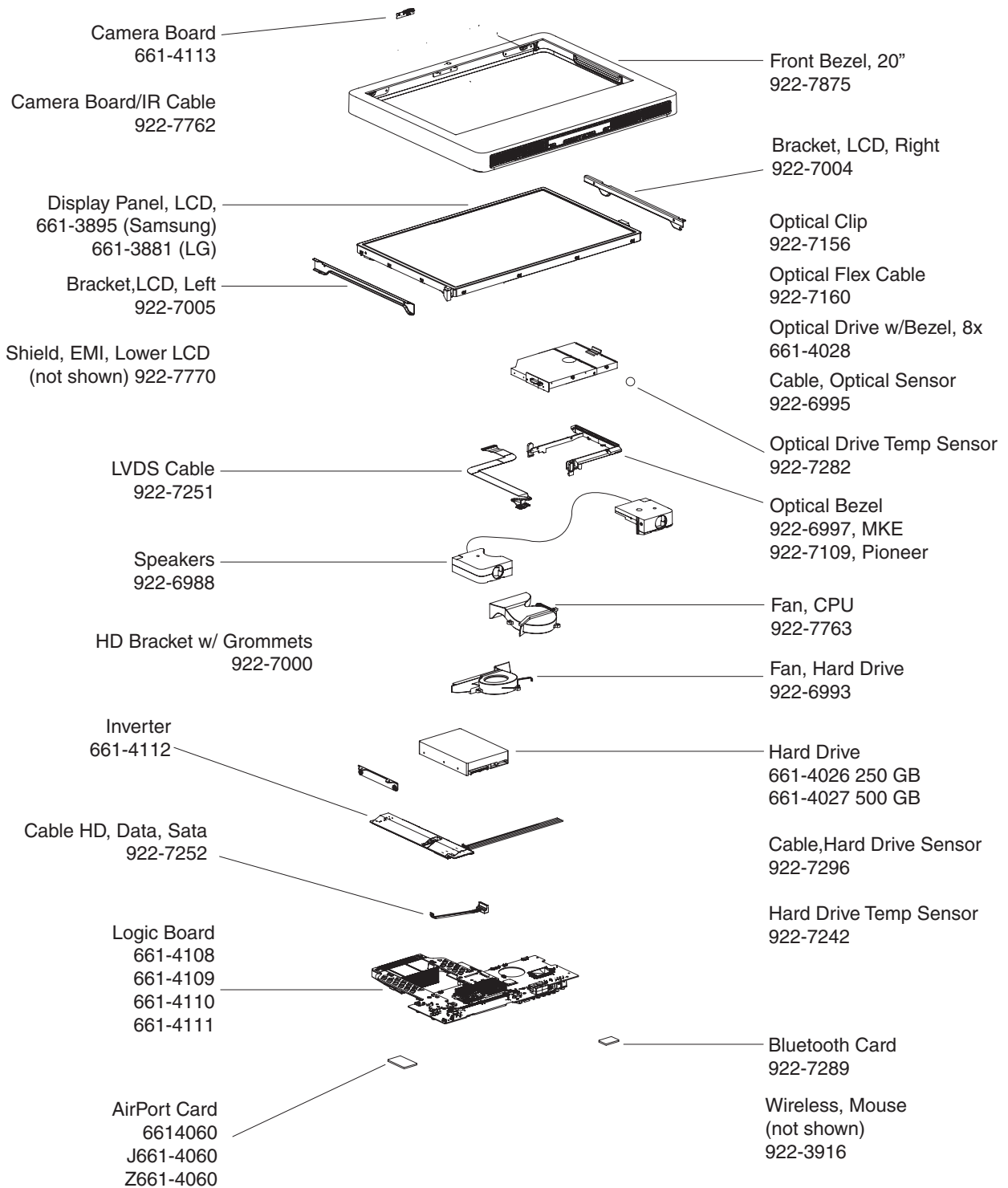
Service Source

Views

iMac (Early 2006 20-inch)

iMac (Early 2006 20-inch)—Upper Exploded View

Camera Board
661-4113

Camera Board/IR Cable
922-7762

Display Panel, LCD,
661-3895 (Samsung)
661-3881 (LG)

Bracket,LCD, Left
922-7005

Shield, EMI, Lower LCD
(not shown) 922-7770

LVDS Cable
922-7251

Speakers
922-6988

HD Bracket w/ Grommets
922-7000

Inverter
661-4112

Cable HD, Data, Sata
922-7252

Logic Board
661-4108
661-4109
661-4110
661-4111

AirPort Card
6614060
J661-4060
Z661-4060

Front Bezel, 20"
922-7875

Bracket, LCD, Right
922-7004

Optical Clip
922-7156

Optical Flex Cable
922-7160

Optical Drive w/Bezel, 8x
661-4028

Cable, Optical Sensor
922-6995

Optical Drive Temp Sensor
922-7282

Optical Bezel
922-6997, MKE
922-7109, Pioneer

Fan, CPU
922-7763

Fan, Hard Drive
922-6993

Hard Drive
661-4026 250 GB
661-4027 500 GB

Cable,Hard Drive Sensor
922-7296

Hard Drive Temp Sensor
922-7242

Bluetooth Card
922-7289

Wireless, Mouse
(not shown)
922-3916

iMac (Early 2006 20-inch)—Lower Exploded View

AC Power Inlet
922-7767

Fan, Optical Drive
922-7298

Cable, Power, AC/DC, SATA, Inverter
922-7761

Cover,
Stand Mechanism
922-7007

Cable, Ground, Power Supply
922-7760

Power Supply AC/DC
661-3780

Antenna,Bluetooth
922-7747

AirPort, Antenna, Wireless
922-7764, Left
922-7766, Right

Rear Housing
922-7769

Access Door, Memory
922-7256

Ambient Light Sensor
922-7250

SDRAM, SO-DIMM
661-4114 512 MB, DDR2, 667
661-4115 1GB, DDR2, 667

IR Board
922-7295

IR Bracket
922-7297

Apple Remote
661-3756

Stand
922-7768

Stand Mechanism
922-7002

Chassis
922-7258

Not Shown:

Modem, External 661-3797

Battery 922-6476

Power Cord 922-7139

Access Tool 922-7172

Wireless Mighty Mouse 661-3662

![Screw Chart logo] Screw Chart

Screw Chart : iMac (Early 2006 20-inch): page 1

Note: Screws are not to scale.

922-6800 T10	922-6850 T10	922-6842 T10
- LCD clips to front bezel - Rear shield to rear cover - Support channel to rear cover	- Chassis to rear cover	- DC board to rear cover - Logic board to chassis
922-7010 **T6**	**922-7159** **T10**	**922-7012** **T10**
- IR board to IR bracket, TMDS cable to standoff of MLB, AirPort card to MLB	Power supply to chassis	Stand to interconnect

Screw Chart: iMac (Early 2006 20-inch) page 2

922-7001 T8, round head	922-7163 T10	922-7023 T10
Hard drive pins (2)	LCD bracket to 20-inch LCD	LCD assembly to rear cover
922-7069 T10	**922-7066** T10	**922-6842** T10
A/C to chassis	DC board to rear cover	DC board to rear cover
922-7014 T10	**922-7015** T10	**922-7018** T8
Left speaker, 20-inch	Right speaker, 20-inch	Optical bezel to optical drive
922-7011 T8	**922-7019** T8	**922-7020** T10
Front bezel to bottom frame	Hard drive clip to hard drive	Bracket mechanism to chassis