



PowerBook G4

Updated 8 July 2003



Take Apart
PowerBook G4

Keyboard Replacement Instructions

Be sure to follow the instructions in this sheet carefully. Failure to follow these instructions could result in damage to your equipment and may void your warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

Tools Required

The only tool required for this procedure is a jeweler's flat-blade screwdriver.

Removing the Keyboard

1. Place your computer on a clean, flat surface.
2. Shut down your computer. Disconnect the power cord and any other cables connected to the computer.

Warning: Always turn off your computer before opening its case to avoid damaging its internal components.

3. Close the computer and turn it over. Slide the battery compartment latch (**Figure 1A**) to the right to remove the battery (**Figure 1B**).

Removing the battery will prevent you from accidentally turning on the computer.

Warning: The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting down your computer to let the internal components cool down before continuing.

4. Turn over the computer and raise the display so you can access the keyboard.
5. Make sure that the keyboard locking screw is not in the locked position (**Figure 2**). Your new PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.

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6. Release the keyboard by pulling down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**), then lift the top portion of the keyboard up and toward the display to release the tabs that hold the bottom of the keyboard in place.
 7. Flip over the keyboard and lay it on the palm rests and trackpad (**Figure 4**).
 8. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown (**Figure 5**).

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

9. Disconnect the keyboard connector cable from the logic board (**Figure 6**), and note location of the logic board connection. Remove the keyboard.

Installing the Replacement Keyboard

1. Lay the replacement keyboard in the correct orientation over the opening, then flip it forward and lay it face down on the palm rests and trackpad to expose its connector cable (**Figure 7**).
2. Connect the keyboard connector cable to the logic board.
3. Flip the keyboard back on top of the opening and insert the tabs at the bottom of the keyboard into the openings in the case (**Figure 8**).
4. Pull down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**) and then press down on the top of the keyboard.
5. Release the tabs to secure the keyboard in place.
6. Turn over the PowerBook and replace the battery (**Figure 9**).
7. Reconnect the power cord and any other cables that were connected and restart your computer.

Warning: Never turn on your computer unless all of its internal, external, and case parts are securely installed. Operating the computer when its case is open or missing parts can damage your computer or cause injury.

Figure 1

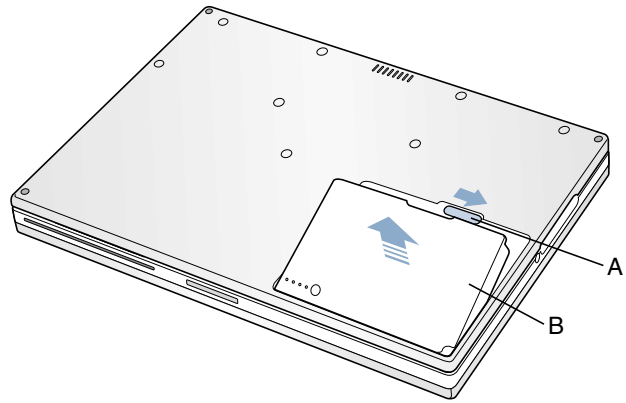


Figure 2

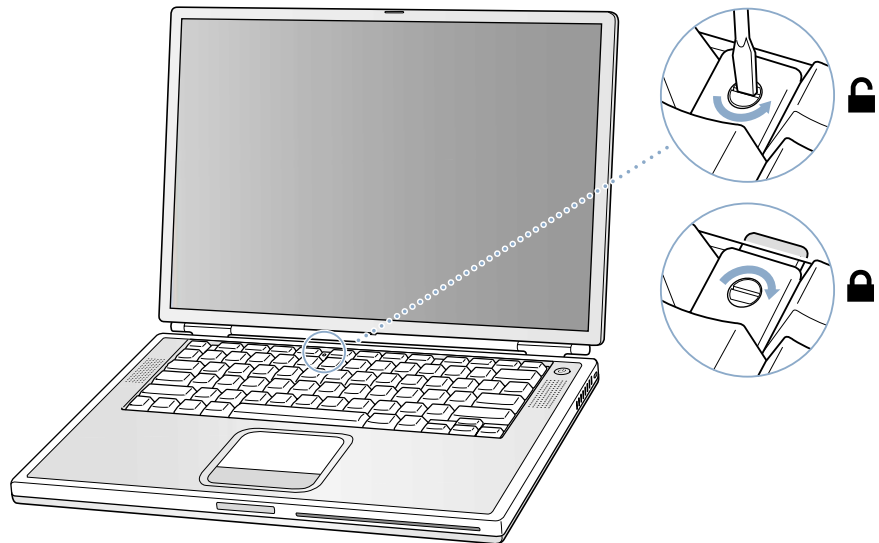


Figure 3

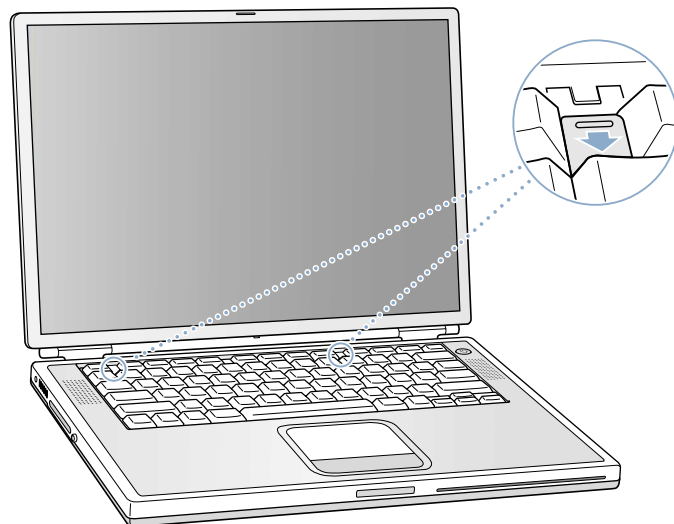


Figure 4

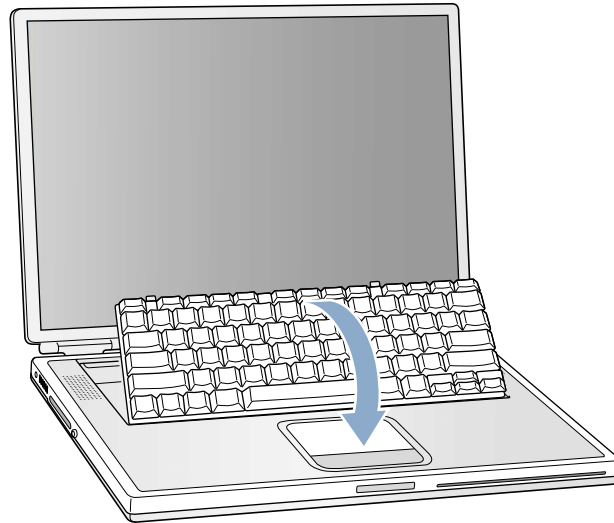


Figure 5

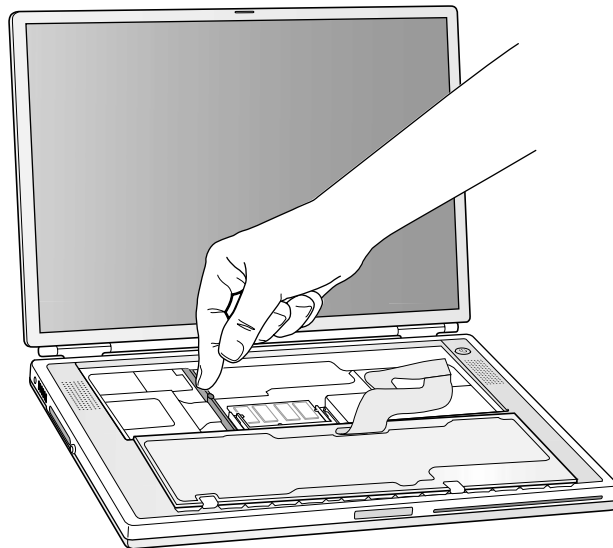


Figure 6

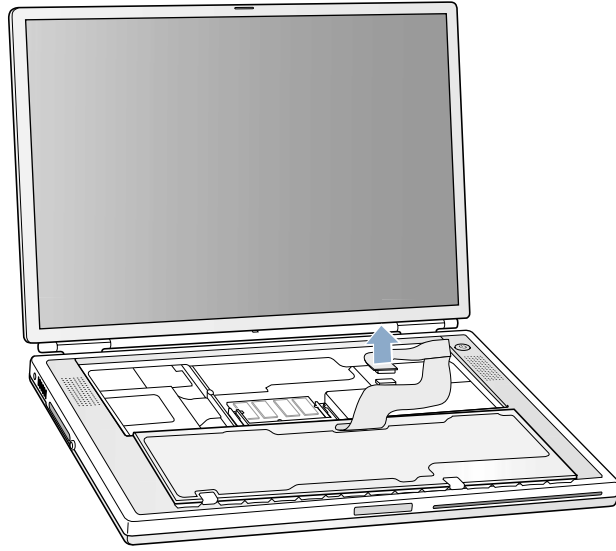


Figure 7

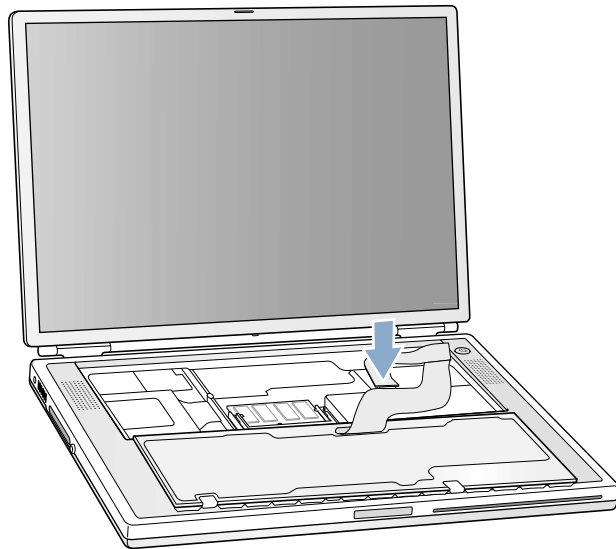


Figure 8

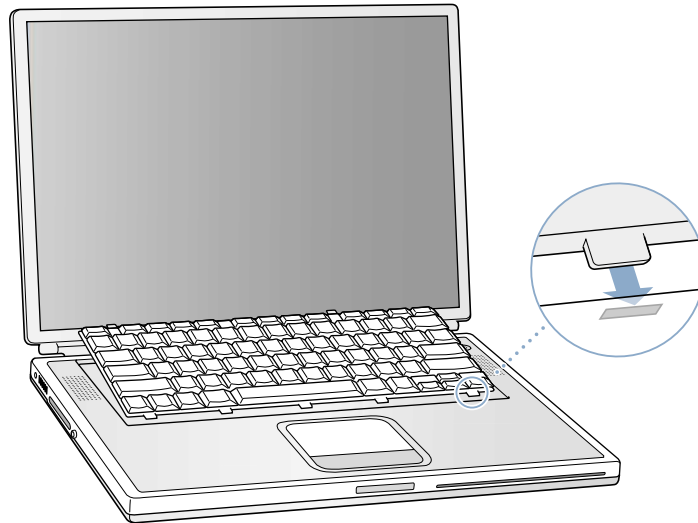
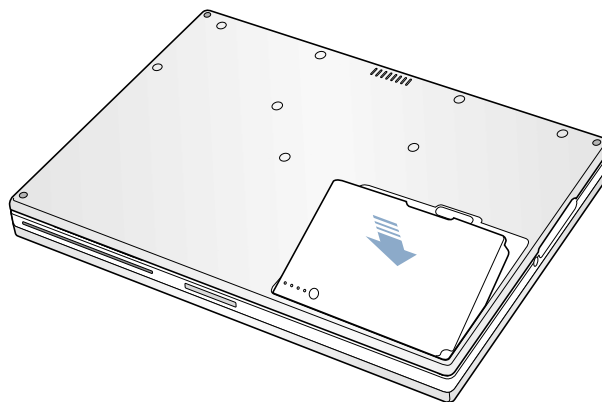


Figure 9



Memory

Replacement Instructions

Be sure to follow the instructions in this sheet carefully. Failure to follow these instructions could result in damage to your equipment and may void your warranty.

If you are adding memory rather than replacing it, skip the section “Removing Memory Cards.”

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

Tools Required

The only tool required for this procedure is a jeweler’s flat-blade screwdriver.

Memory (RAM)

Your computer comes with two memory slots, one above the other. From the factory, your PowerBook comes with one memory card installed in the lower slot.

Note: If desired, you can install additional memory in the upper memory slot or replace a memory card in either slot with one of greater memory capacity, up to a maximum of a 512 megabyte (MB) memory card installed in each slot.

Warning: Memory cards come in various specifications. Only install memory cards that are approved for your PowerBook.

Opening the Computer

1. Place your computer on a clean, flat surface.
2. Shut down your computer. Disconnect the power cord and any other cables connected to the computer.

Warning: Always turn off your computer before opening its case to avoid damaging its internal components.

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3. Close the computer and turn it over. Slide the battery compartment latch (**Figure 1A**) to the right to remove the battery (**Figure 1B**).

Removing the battery will prevent you from accidentally turning on the computer.

Warning: The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting down your computer to let the internal components cool down before continuing.

4. Turn over the computer and raise the display so you can access the keyboard.
5. Make sure that the keyboard locking screw is not in the locked position (**Figure 2**). Your new PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.
6. Release the keyboard by pulling down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**), then lift the top portion of the keyboard up and toward the display to release the tabs that hold the bottom of the keyboard in place.
7. Flip over the keyboard and lay it on the palm rests and trackpad (**Figure 4**).

Perform Electrostatic Discharge

1. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown (**Figure 5**).

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

Removing Memory Cards

Warning: When removing or installing a memory card, do not touch its gold connectors. Handle the card only by the edges.

1. To remove a memory card, locate the brackets that secure the card on both sides. Carefully spread the brackets apart until the card releases on each side (**Figure 6**). The card can then be pulled up and out.

Note: If there is a memory card in the upper memory slot (**Figure 6B**), it must be removed before removing a card in the lower slot (**Figure 6A**).

Installing Memory Cards

Warning: When removing or installing a memory card, do not touch its gold connectors. Handle the card only by the edges.

1. To install a memory card, hold the card at a 30-degree angle (**Figure 7A**). Line up the notch in the card with the small tab in the memory slot. Then push the card into the slot (**Figure 7**).

Note: You may feel some resistance. If you are having trouble inserting the card, try pushing one side at a time.

2. Gently push the card down until the brackets snap onto both sides of the memory card to lock it into place (**Figure 8**).

Closing the Computer

1. Verify that the keyboard connector cable is securely attached to the logic board (**Figure 9**).
2. Flip the keyboard back on top of the opening and insert the tabs at the bottom of the keyboard into the openings in the case (**Figure 10**).
3. Pull down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**) and then press down on the top of the keyboard.
4. Release the tabs to secure the keyboard in place.
5. Turn over the PowerBook and replace the battery (**Figure 11**).
6. Reconnect the power cord and any other cables that were connected and restart your computer.

Warning: Never turn on your computer unless all of its internal, external, and case parts are securely installed. Operating the computer when its case is open or missing parts can damage your computer or cause injury.

Figure 1

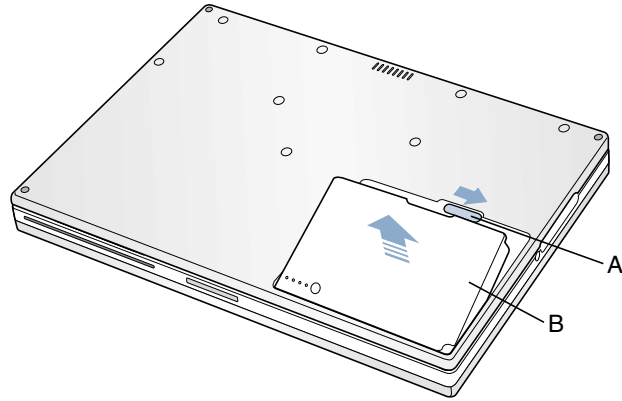


Figure 2

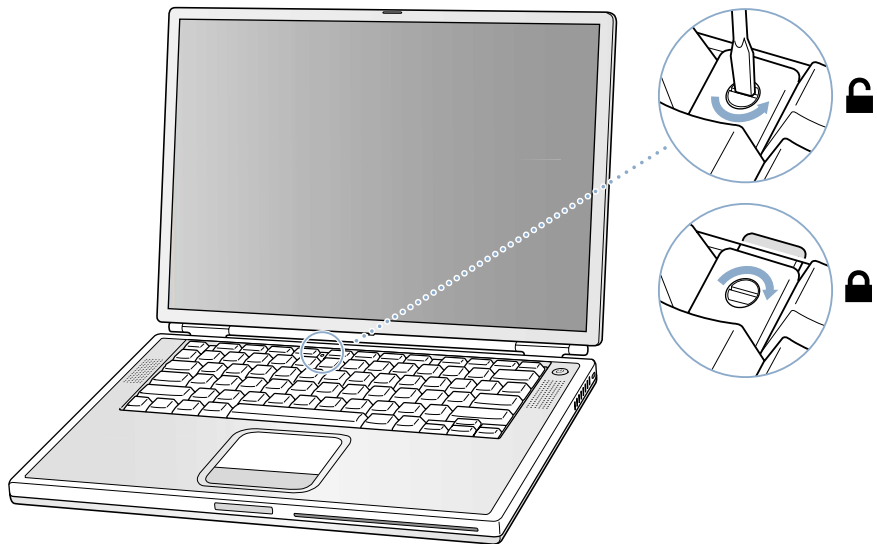


Figure 3

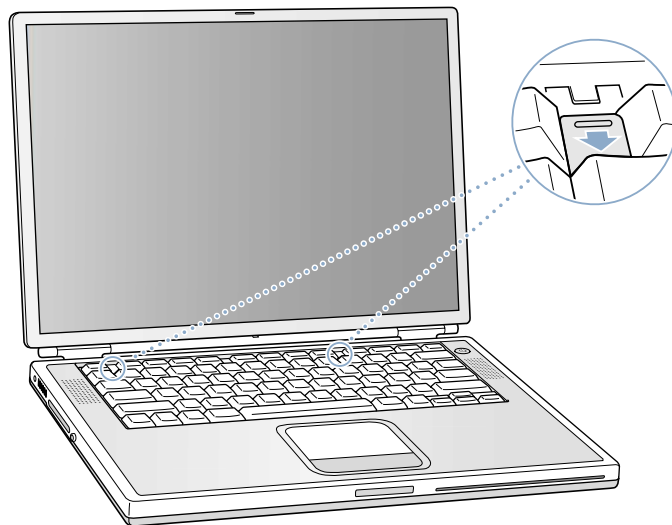


Figure 4

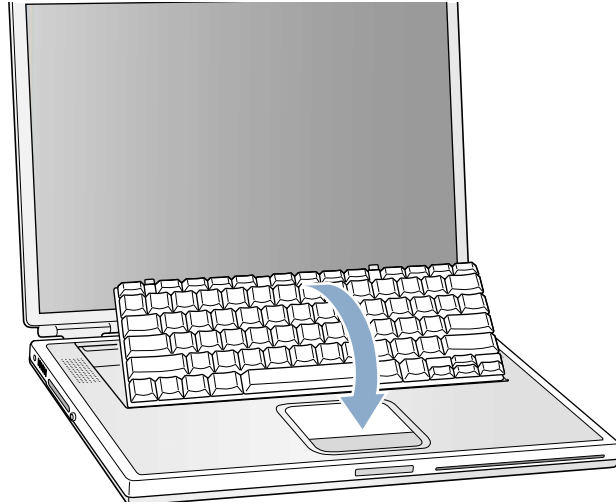


Figure 5

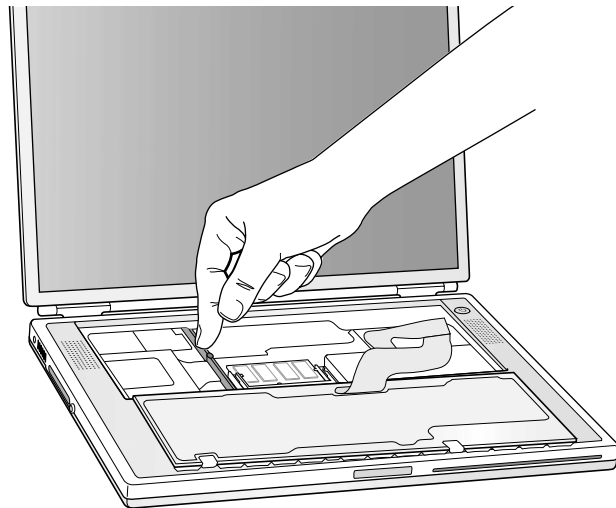


Figure 6

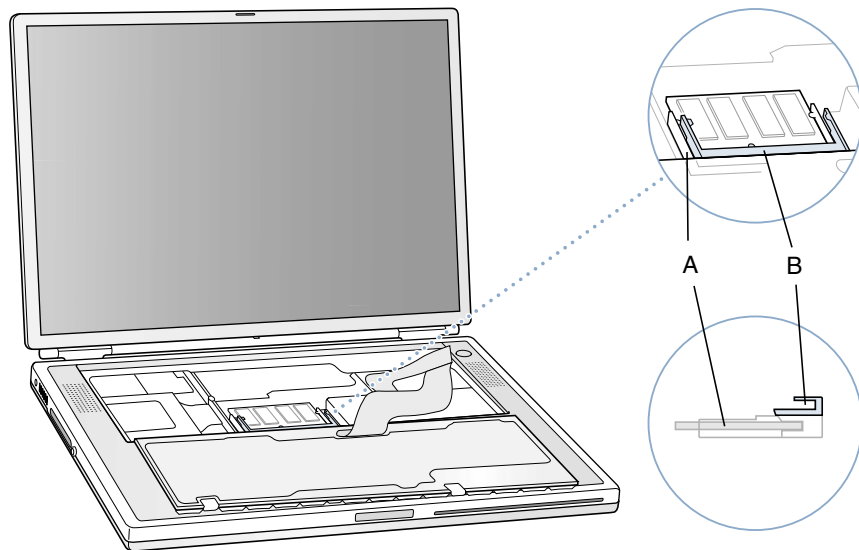


Figure 7

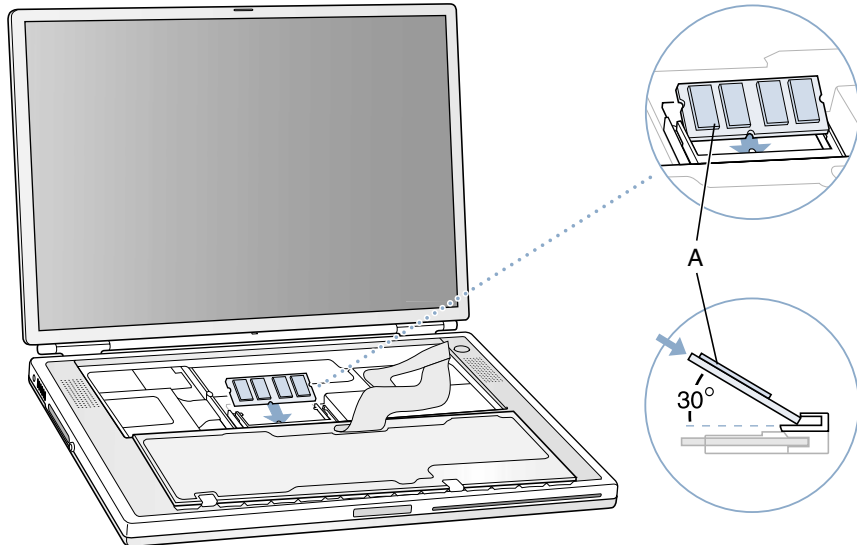


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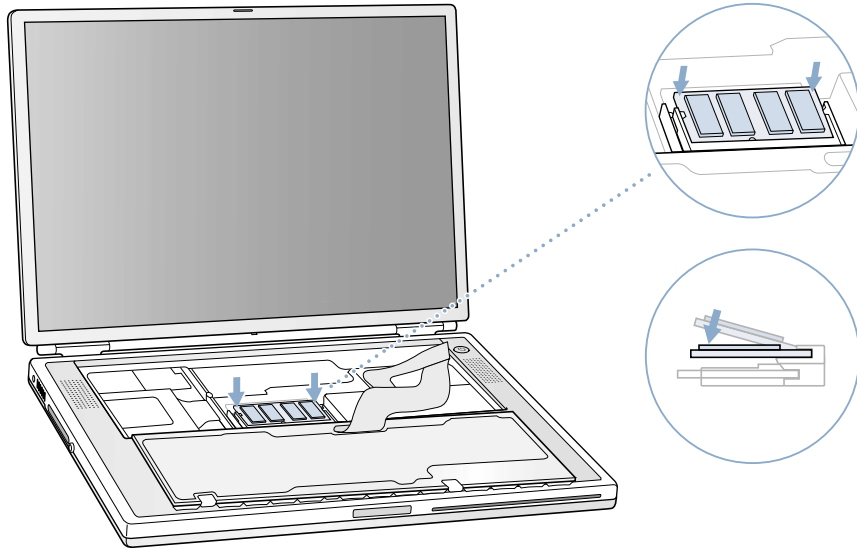


Figure 9

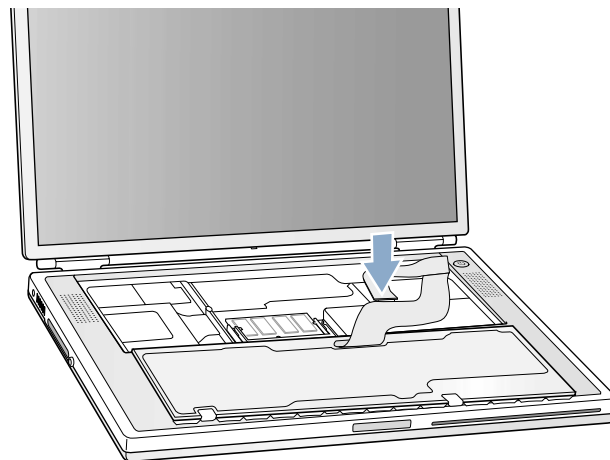


Figure 10

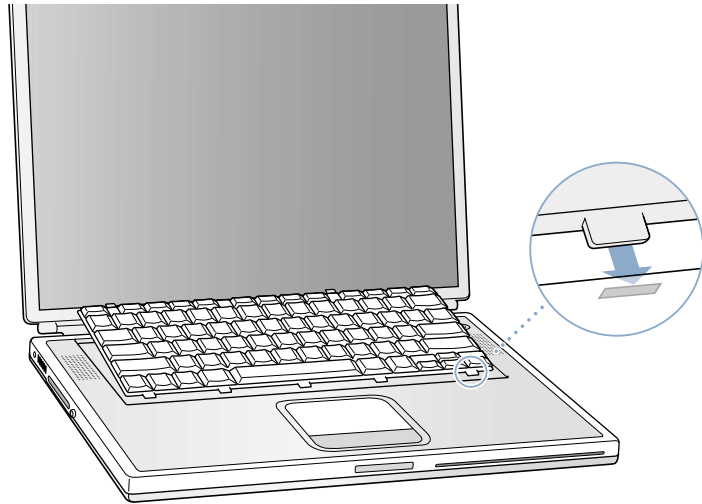
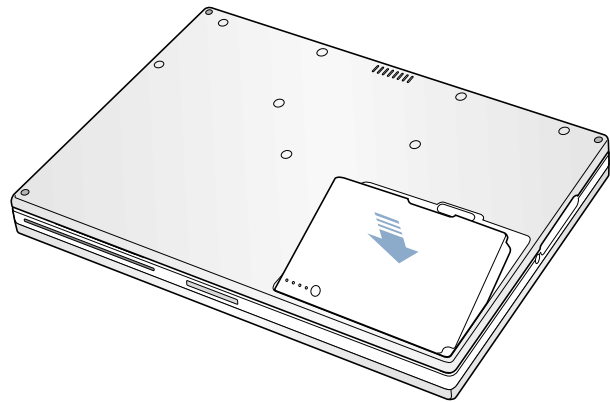


Figure 11



Modem Replacement Instructions

Be sure to follow the instructions in this sheet carefully. Failure to follow these instructions could result in damage to your equipment and may void your warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

Tools Required

- jeweler's flat-blade screwdriver
- either a 5 mm wrench or socket wrench, or needle nose pliers

Opening the Computer

1. Place your computer on a clean, flat surface.
2. Shut down your computer. Disconnect the power cord and any other cables connected to the computer.

Warning: Always turn off your computer before opening its case to avoid damaging its internal components.

3. Close the computer and turn it over. Slide the battery compartment latch (**Figure 1A**) to the right to remove the battery (**Figure 1B**).

Removing the battery will prevent you from accidentally turning on the computer.

Warning: The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting down your computer to let the internal components cool down before continuing.

4. Turn over the computer and raise the display so you can access the keyboard.
5. Make sure that the keyboard locking screw is not in the locked position (**Figure 2**). Your new PowerBook comes with the keyboard unlocked, so unless you or someone else locked the keyboard, you can skip this step.

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6. Release the keyboard by pulling down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**), then lift the top portion of the keyboard up and toward the display to release the tabs that hold the bottom of the keyboard in place.
 7. Flip over the keyboard and lay it on the palm rests and trackpad (**Figure 4**).

Removing the Modem

1. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown (**Figure 5**).

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

2. Locate the modem and remove the 5 mm hexnut screw (**Figure 6A**).
3. Pull up on the right, front corner of the modem to disconnect it from the logic board (**Figure 7**).
4. The modem must be removed carefully to avoid damaging delicate parts, including the modem connector cable. While guiding the right front corner of the modem up and out, carefully rotate the left side in a clockwise motion around the protruding metal tab where the hexnut screw attached (**Figure 8**).

Note: The mylar sheathing around the modem may catch on this protruding tab. With careful manipulation around the tab, the modem will come out.

5. Disconnect the modem connector cable (**Figure 9**).

Installing the Replacement Modem

1. Connect the modem connector cable to the modem (**Figure 10**).
2. Begin to insert the left side of the modem into the modem opening, then guide it around the protruding metal tab in a counterclockwise motion (**Figure 11**).

The right side should then set into place and lay flat.

Note: Visually verify that the modem connector cable is still attached.

3. Press down on the front edge of the modem in the center to firmly connect it to the logic board (**Figure 12**).

Note: You may need to maneuver the modem around slightly until you feel the connectors match up.

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4. Install the hexnut screw (**Figure 6A**). The screw hole on the modem should be aligned with the screw flange; if not, the modem may not be properly attached to the logic board (see step 3).

Note: It may be helpful to use a finger tip to hold the top of the screw straight and steady while turning the screw with a tool.

Closing the Computer

1. Verify that the keyboard connector cable is securely attached to the logic board (**Figure 13**).
2. Flip the keyboard back on top of the opening and insert the tabs at the bottom of the keyboard into the openings in the case (**Figure 14**).
3. Pull down on the keyboard release tabs located to the left of the F1 and F9 keys (**Figure 3**) and then press down on the top of the keyboard.
4. Release the tabs to secure the keyboard in place.
5. Turn over the PowerBook and replace the battery (**Figure 15**).
6. Reconnect the power cord and any other cables that were connected and restart your computer.

Warning: Never turn on your computer unless all of its internal, external, and case parts are securely installed. Operating the computer when its case is open or missing parts can damage your computer or cause injury.

Replacing International Modems

After you have replaced a modem in Europe or Asia, open the software utility Modem Country Selector and verify that the modem is set to the correct country. Modem Country Selector is located in the Apple Extras folder on your hard drive or can be downloaded as part of the Apple Modem Updater software bundle at <http://asu.info.apple.com>.

Figure 1

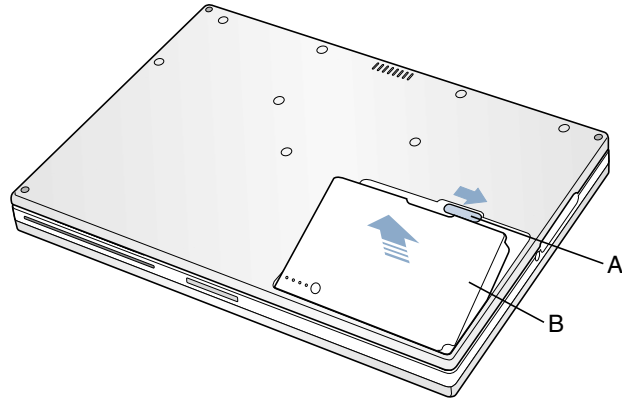


Figure 2

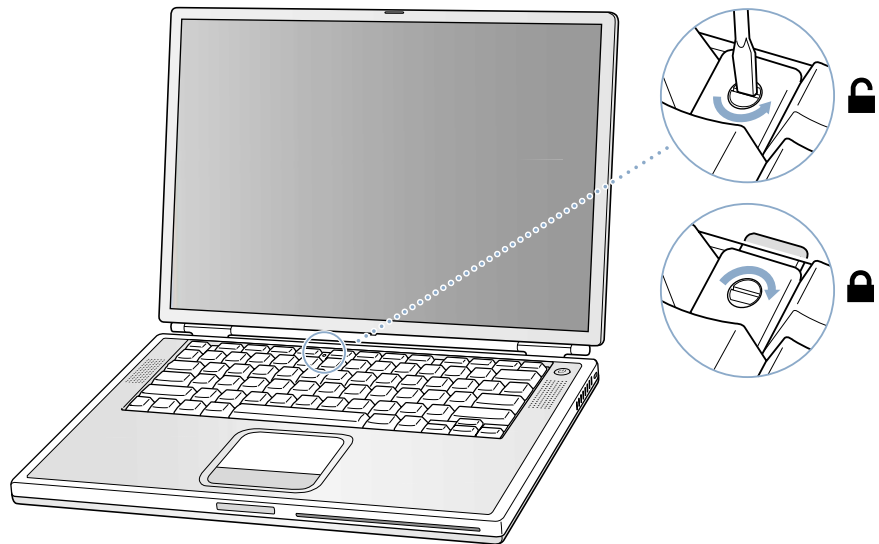


Figure 3

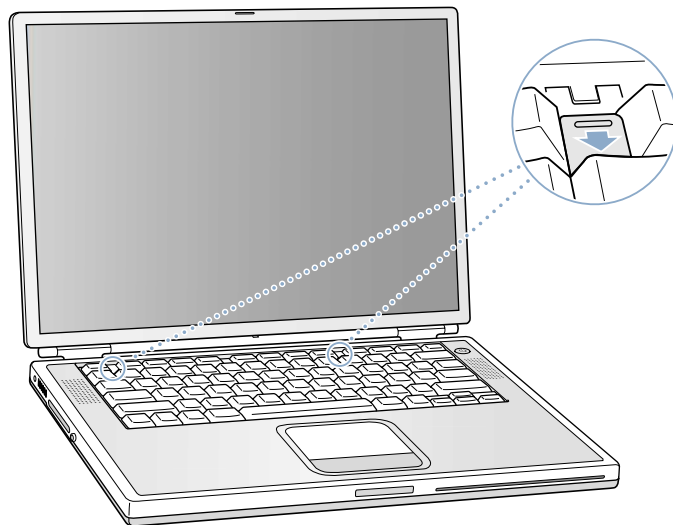


Figure 4

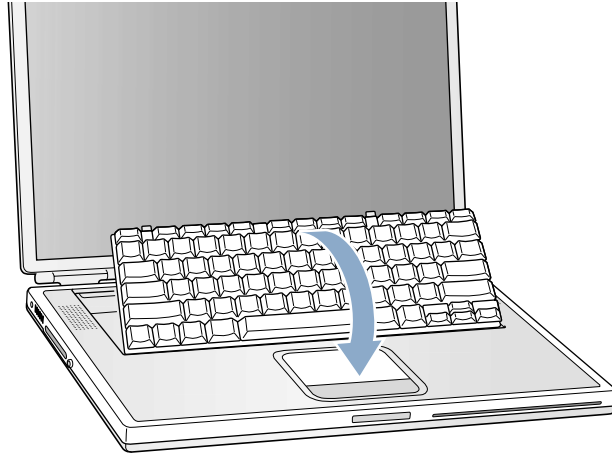


Figure 5

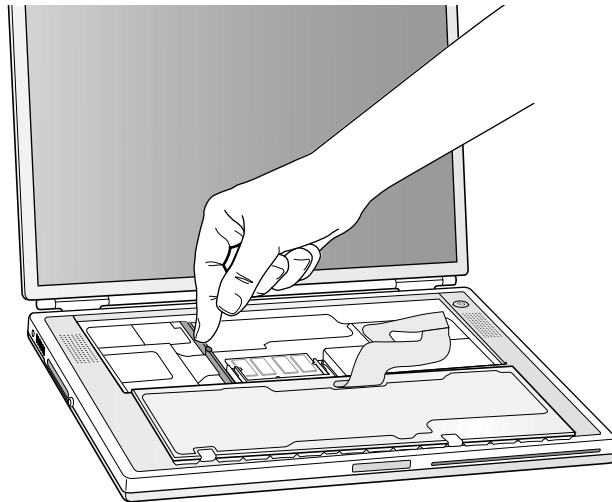


Figure 6

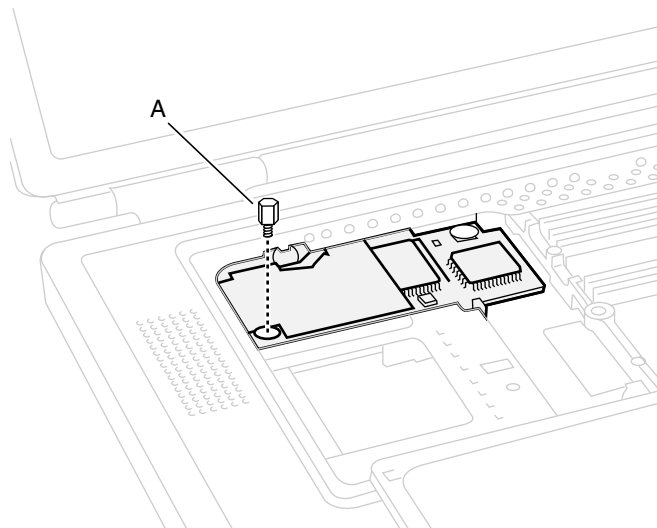


Figure 7

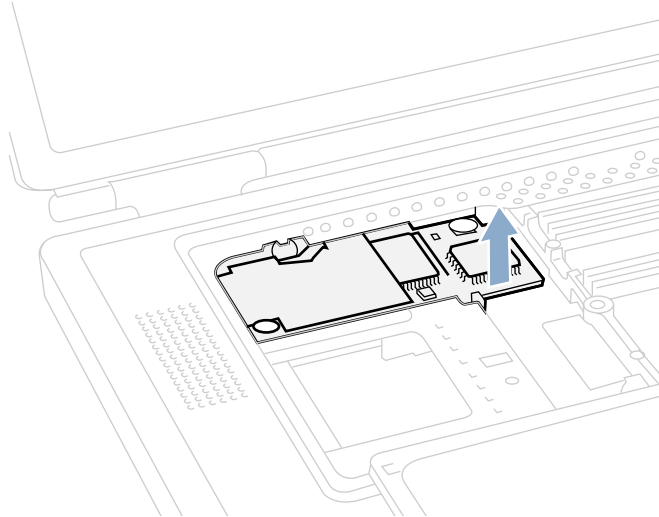


Figure 8

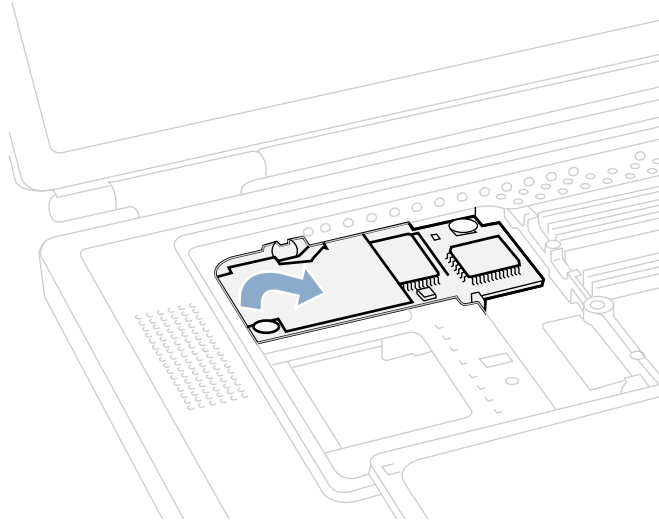


Figure 9

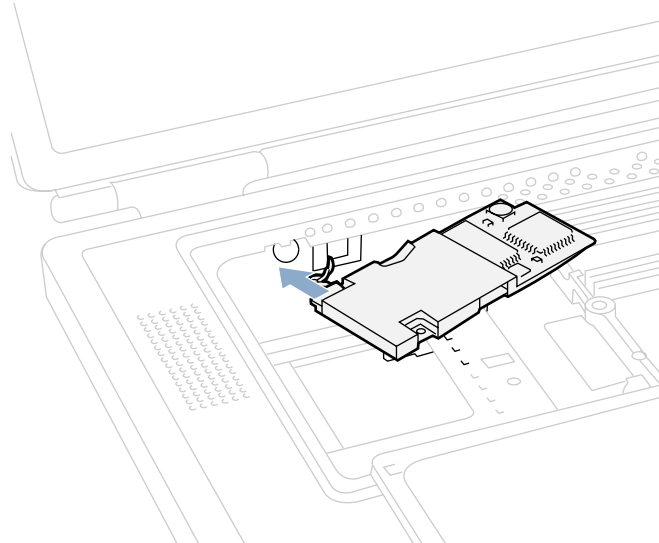


Figure 10

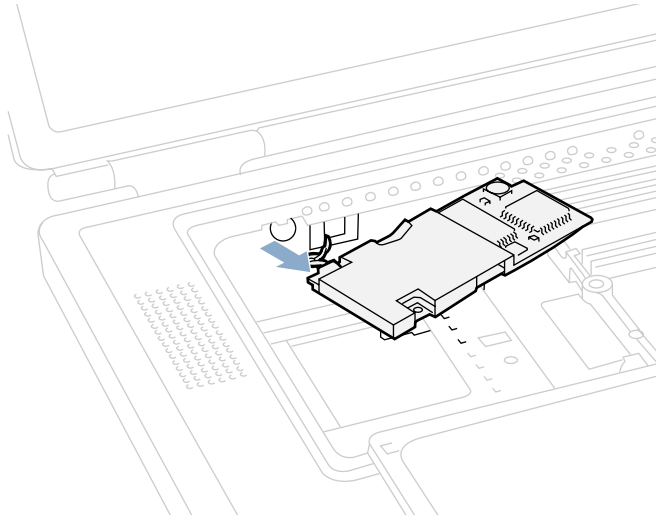


Figure 11

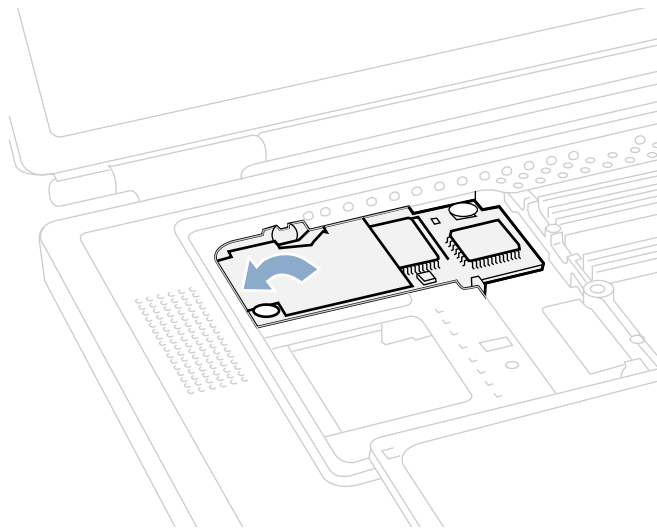


Figure 12

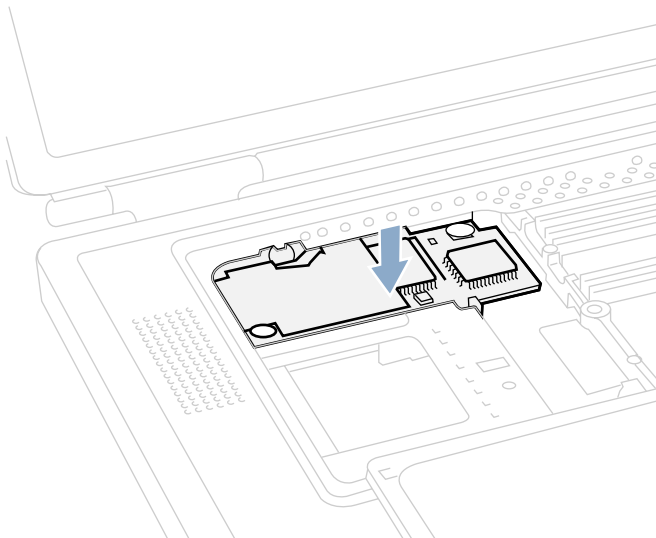


Figure 13

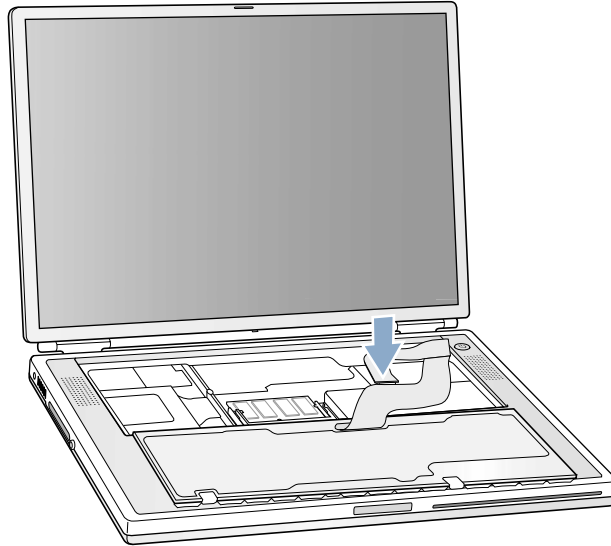


Figure 14

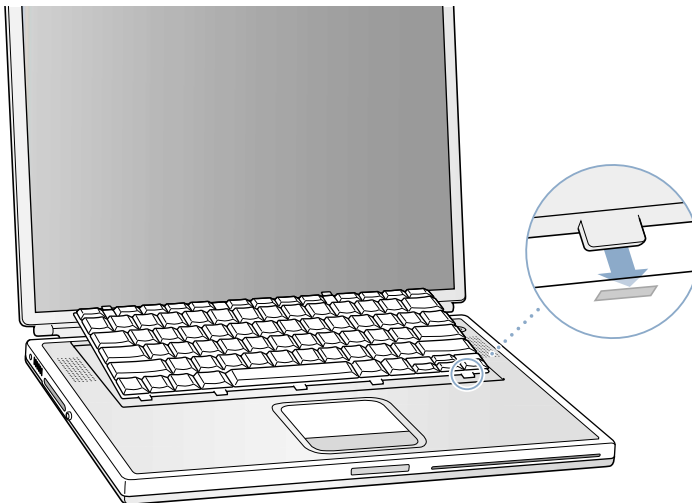
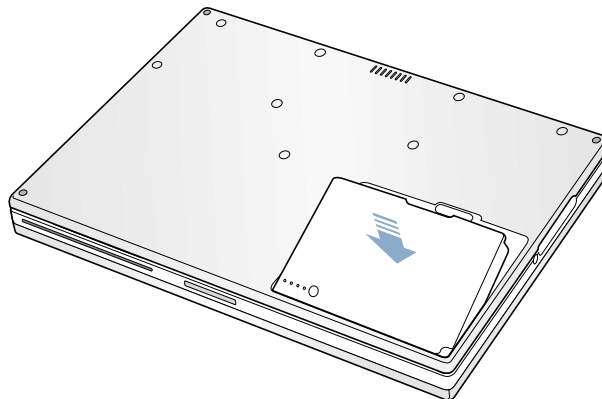


Figure 15



Bottom Case Replacement Instructions

Be sure to follow the instructions in this sheet carefully. Failure to follow these instructions could result in damage to your equipment and may void your warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

Tools Required

- Phillips screwdriver
- soft towel or cloth, larger than the PowerBook

Removing the Bottom Case

1. Place your computer on a clean, flat surface.
2. Shut down your computer. Disconnect the power cord and any other cables connected to the computer.

Warning: Always turn off your computer before opening its case to avoid damaging its internal components.

Warning: The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting it down to let the internal components cool before continuing.

3. Place a towel or soft cloth on a table in front of you (**Figure 1A**). The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.
4. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap (**Figure 1B**).

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5. Slide the battery compartment latch (**Figure 2A**) to remove the battery (**Figure 2B**). Make sure to return the battery latch fully to the right.

Removing the battery will help you remove the bottom case and prevent you from accidentally turning on the computer.

6. Using a Phillips screwdriver, remove the eight screws that secure the bottom case to the PowerBook, in the order shown (**Figure 3**).

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

7. To remove the bottom case you will need to disengage it at the left and right sides, then carefully pivot it forward to release a retaining clip near the DVD drive slot, as follows.

Important: Do not push on the rubber feet of the bottom case.

At the left side, carefully slide the bottom case slightly up and away from you by pushing on it just above the hinge of the display (**Figure 4**), and at the same time from within the battery compartment, pushing away from you on the edge of the bottom case, until the left side releases.

At the right side, again carefully slide the bottom case slightly up and away from you by pushing it just above the hinge of the display (**Figure 5**), and at the same time from within the battery compartment, pushing away from you at the right-most edge of the bottom case, until the right side releases.

8. When both the left and right sides have released, carefully pull up on the bottom case at the edge that is closest to you and rotate it away from you, pivoting evenly over the front edge to release a retaining clip that is located near the DVD drive slot (**Figure 6**).

Important: Do not force, twist or pry the bottom case if it binds or resists. The case should remove easily. If not, follow step 7 again, until the case releases.

Installing the Bottom Case

1. To attach the bottom case, align the notches on the right and left sides of the case (some of these can be viewed through the battery opening). Then press down and toward you slightly to secure the case (**Figure 7**).

Verify that the case lies flat and fits properly around the battery latch and that the alignment tab that protrudes on the underside of the bottom case (**Figure 7A**), has seated properly.

The case edges should line up smoothly.

Note: Applying pressure to the bottom case at the back of the battery compartment opening, near the latch, and on the front and back outside edges of the case can help with alignment.

2. Check that the eight screw holes on the case align with the holes on the computer. Verify that the display rests on your lap as shown (**Figure 1B**).
3. Replace the eight screws in the order shown (**Figure 7**). Do **not** overtighten or damage could result.

Note: The screws must go in straight and easily; if not, readjust the bottom case for proper alignment.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

4. Replace the battery.
5. Turn the computer over so that the DVD slot (**Figure 8A**) faces you. Just below the center of the DVD slot, verify that the bottom case is flush with the front edge of the slot. If the case is slightly bowed and there is a gap (**Figure 8B**), carefully pull the bottom edge of the DVD slot until it clicks into place and becomes flush with the bottom case.
6. Reconnect the power cord and any other cables that were connected and restart your computer.

Warning: Never turn on your computer unless all of its internal, external, and case parts are securely installed. Operating the computer when its case is open or missing parts can damage your computer or cause injury.

Figure 1

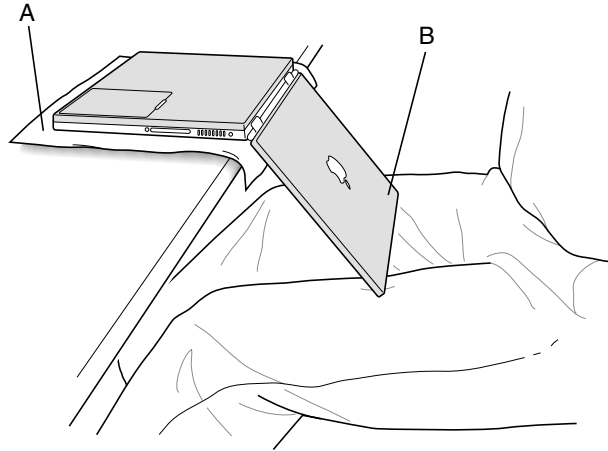


Figure 2

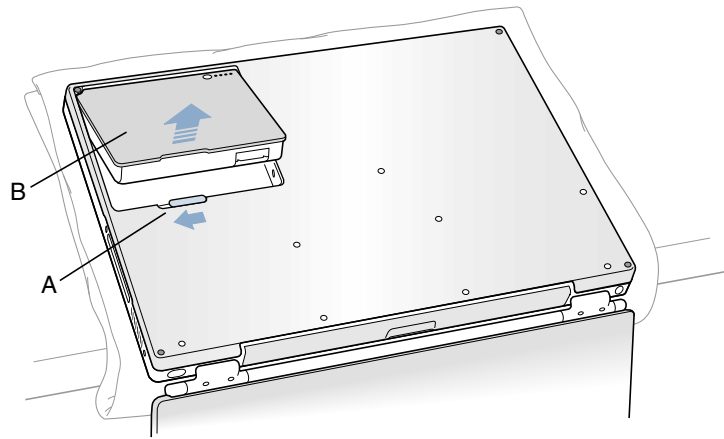


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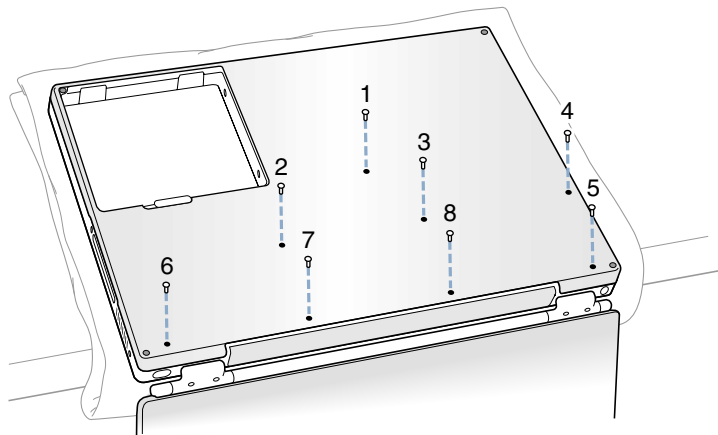


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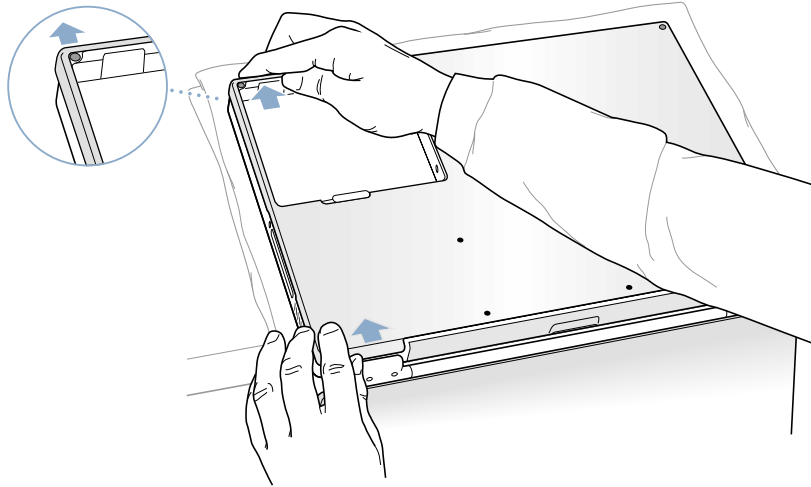


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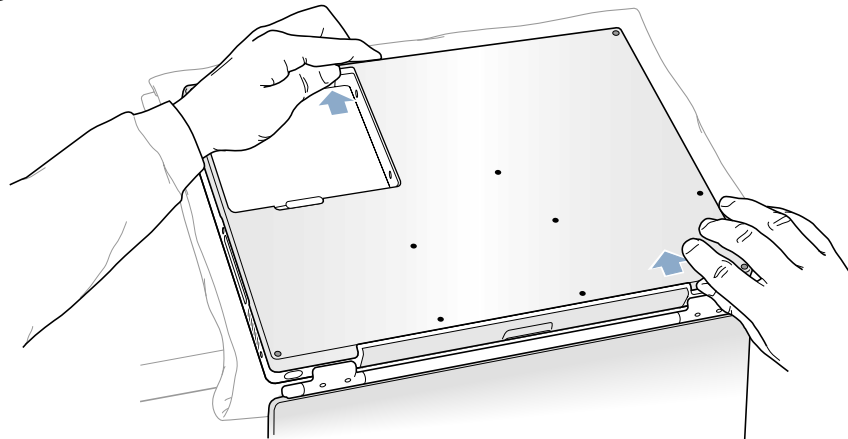


Figure 6

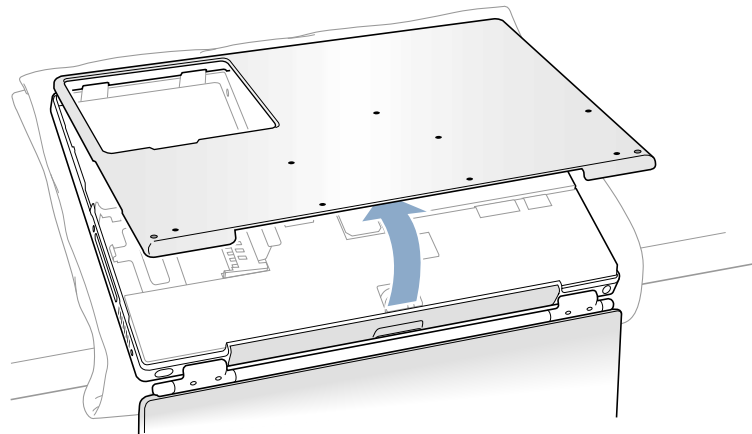


Figure 7

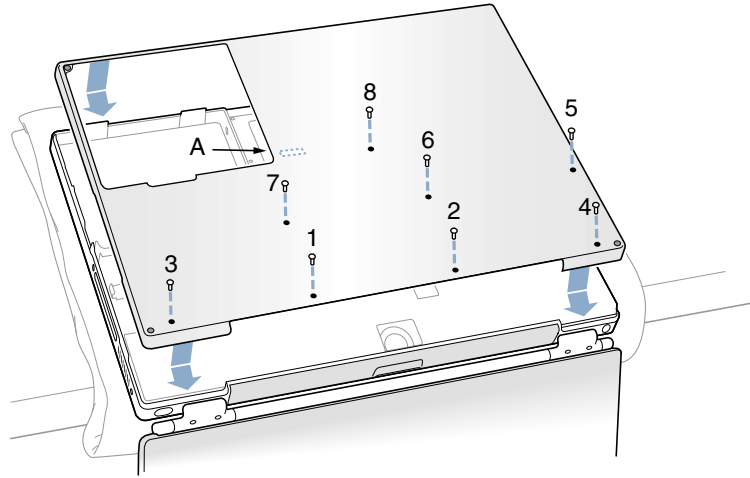
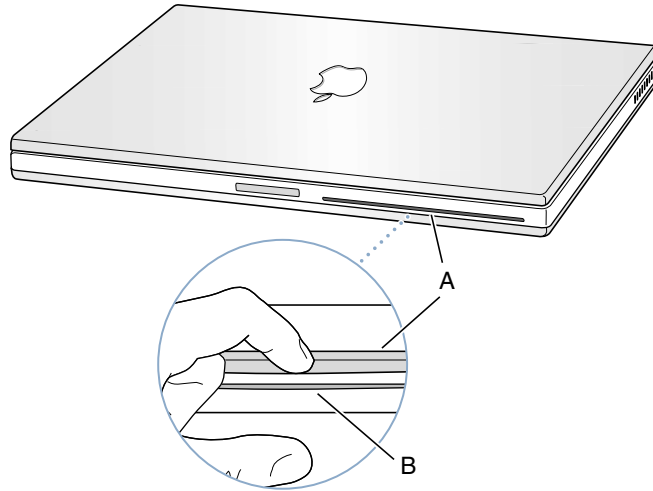


Figure 8



AirPort Card Replacement Instructions

Be sure to follow the instructions in this sheet carefully. Failure to follow these instructions could result in damage to your equipment and may void your warranty.

If you are adding an AirPort Card rather than replacing one, skip the section “Removing the AirPort Card.”

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

Tools Required

- Phillips screwdriver
- soft towel or cloth, larger than the PowerBook

Opening the Computer

1. Place your computer on a clean, flat surface.
2. Shut down your computer. Disconnect the power cord and any other cables connected to the computer.

Warning: Always turn off your computer before opening its case to avoid damaging its internal components.

Warning: The internal components of your PowerBook may be hot. If you have been using your PowerBook, wait 30 minutes after shutting it down to let the internal components cool before continuing.

3. Place a towel or soft cloth on a table in front of you (**Figure 1A**). The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.

-
4. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap (**Figure 1B**).
 5. Slide the battery compartment latch (**Figure 2A**) to remove the battery (**Figure 2B**). Make sure to return the battery latch fully to the right.

Removing the battery will help you remove the bottom case and prevent you from accidentally turning on the computer.

6. Using a Phillips screwdriver, remove the eight screws that secure the bottom case to the PowerBook, in the order shown (**Figure 3**).

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

7. To remove the bottom case you will need to disengage it at the left and right sides, then carefully pivot it forward to release a retaining clip near the DVD drive slot, as follows.

Important: Do not push on the rubber feet of the bottom case.

At the left side, carefully slide the bottom case slightly up and away from you by pushing on it just above the hinge of the display (**Figure 4**), and at the same time from within the battery compartment, pushing away from you on the edge of the bottom case, until the left side releases.

At the right side, again carefully slide the bottom case slightly up and away from you by pushing it just above the hinge of the display (**Figure 5**), and at the same time from within the battery compartment, pushing away from you at the right-most edge of the bottom case, until the right side releases.

8. When both the left and right sides have released, carefully pull up on the bottom case at the edge that is closest to you and rotate it away from you, pivoting evenly over the front edge to release a retaining clip that is located near the DVD drive slot (**Figure 6**).

Important: Do not force, twist or pry the bottom case if it binds or resists. The case should remove easily. If not, follow step 7 again, until the case releases.

9. Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown (**Figure 7**).

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed the installation and closed the computer.

Removing the AirPort Card

1. Pull back on the antenna clip (**Figure 8A**) to release the antenna cable connector (**Figure 8B**) and allow the card to rise up slightly, then pull the card from the AirPort connector (**Figure 8D**).

Hold the AirPort Card with one hand and grasp the antenna cable connector with the other. While being careful not to strain the antenna cable (**Figure 8C**), firmly pull the connector straight out of the AirPort Card.

Important: If an AirPort Card is **not** being reinstalled right away, the antenna cable connector must be replaced into its holder (**Figure 10B**) and the loop of the antenna cable pulled up slightly and away from the edge of the computer case. This prevents the cable from interfering with the PC card slot, below, or getting pinched during reassembly.

Also, if the insertion end of the AirPort Card connector is rotated up, push it down into the level position. This allows the bottom case to install properly.

Installing the AirPort Card

1. If the AirPort Card to be installed came with the AirPort adapter (**Figure 9A**), remove the metal clip (**Figure 9B**) and pull the AirPort Card (**Figure 9C**) from the adapter. (The adapter and metal clip are not used with your PowerBook.)
2. If this is a new installation, pull out the AirPort antenna cable connector (**Figure 10A**) from its holder (**Figure 10B**).
3. Pull up on the top part of the AirPort Card connector (**Figure 11B**) at the insertion end to raise it up slightly, if it is not already up.
4. Position the AirPort Card (**Figure 11A**) with the AirPort ID numbers and bar code facing up and slide the card into the connector. Make sure to slide the card all the way in until the card is securely attached to the connector.
5. Plug the antenna cable connector (**Figure 12A**) into the port, which is located just below the plastic tab (**Figure 12F**), on the end of the AirPort Card. Make sure the connector is straight before inserting it into the card.
6. Push the AirPort Card down into its space until the antenna cable connector is secured by the small antenna clip (**Figure 12B**).

Important: Route the antenna cable (**Figure 12C**) between the edge of the computer (**Figure 12D**) and the AirPort Card. Verify that the cable is away from the edge of the computer so that it will not be pinched during reassembly and that it does not sag down into the PC card slot area (below the AirPort Card). Take up any extra cable by tucking it in where shown (**Figure 12E**).

-
7. Fold the plastic tab (**Figure 12F**) on the AirPort Card over the top of the card.

Note: The plastic tab must be folded over the card during the installation of the bottom case, otherwise you will not be able to securely attach the bottom case to the computer.

Closing the Computer

1. To attach the bottom case, align the notches on the right and left sides of the case (some of these can be viewed through the battery opening). Then press down and toward you slightly to secure the case (**Figure 13**).

Verify that the case lies flat and fits properly around the battery latch and that the alignment tab that protrudes on the underside of the bottom case (**Figure 13A**), has seated properly.

The case edges should line up smoothly.

Note: Applying pressure to the bottom case at the back of the battery compartment opening, near the latch, and on the front and back outside edges of the case can help with alignment.

2. Check that the eight screw holes on the case align with the holes on the computer. Verify that the display rests on your lap as shown (**Figure 1B**).
3. Replace the eight screws in the order shown (**Figure 13**). Do **not** overtighten or damage could result.

Note: The screws must go in straight and easily; if not, readjust the bottom case for proper alignment.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

4. Replace the battery.
5. Turn the computer over so that the DVD slot (**Figure 14A**) faces you. Just below the center of the DVD slot, verify that the bottom case is flush with the front edge of the slot. If the case is slightly bowed and there is a gap (**Figure 14B**), carefully pull the bottom edge of the DVD slot until it clicks into place and becomes flush with the bottom case.
6. Reconnect the power cord and any other cables that were connected and restart your computer.

Warning: Never turn on your computer unless all of its internal, external, and case parts are securely installed. Operating the computer when its case is open or missing parts can damage your computer or cause injury.

Figure 1

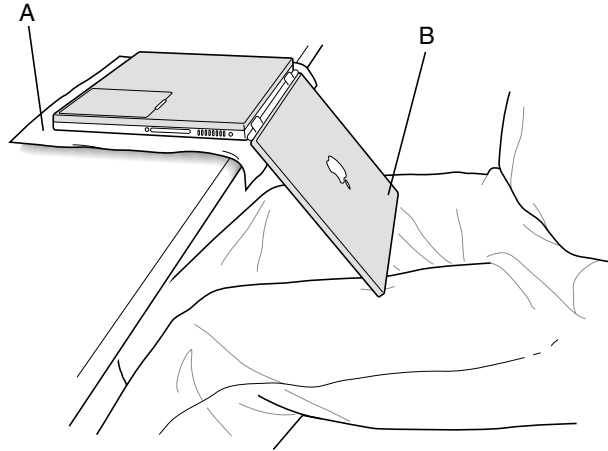


Figure 2

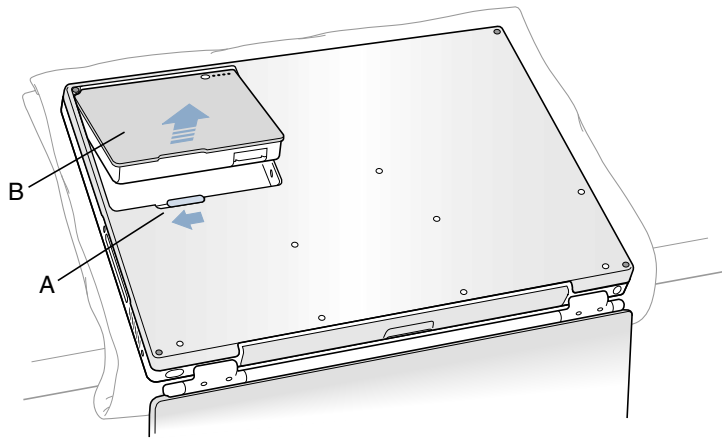


Figure 3

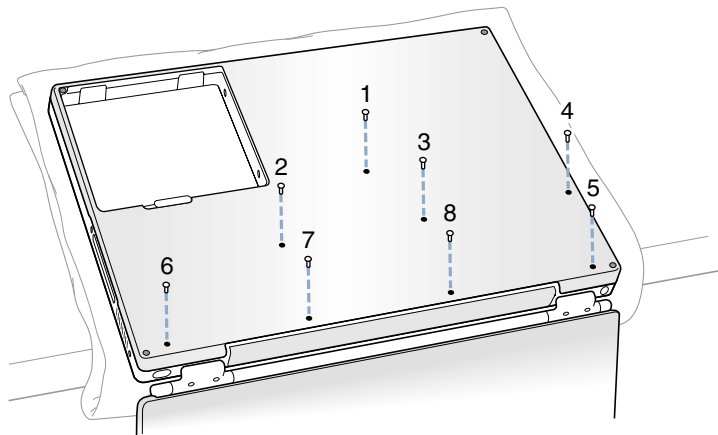


Figure 4

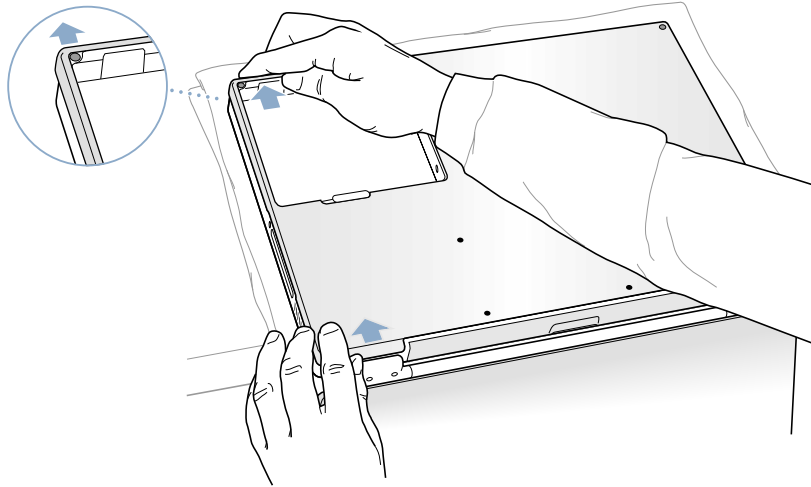


Figure 5

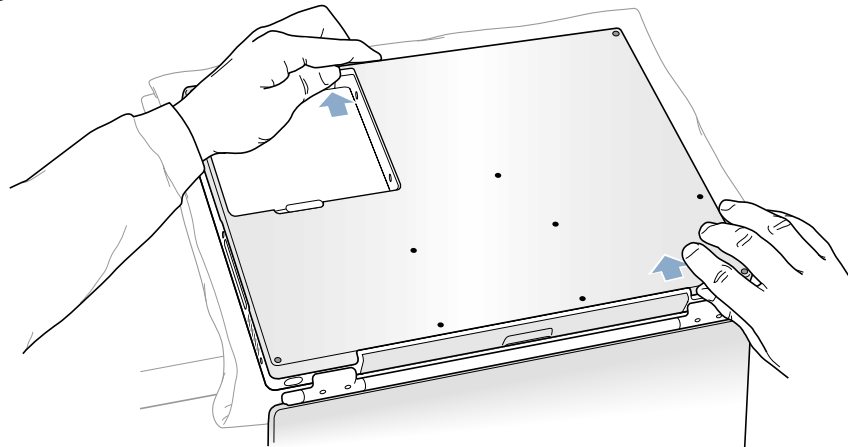


Figure 6

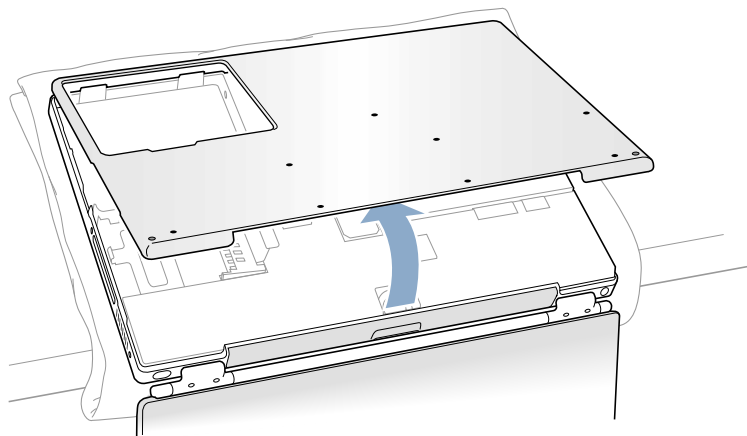


Figure 7

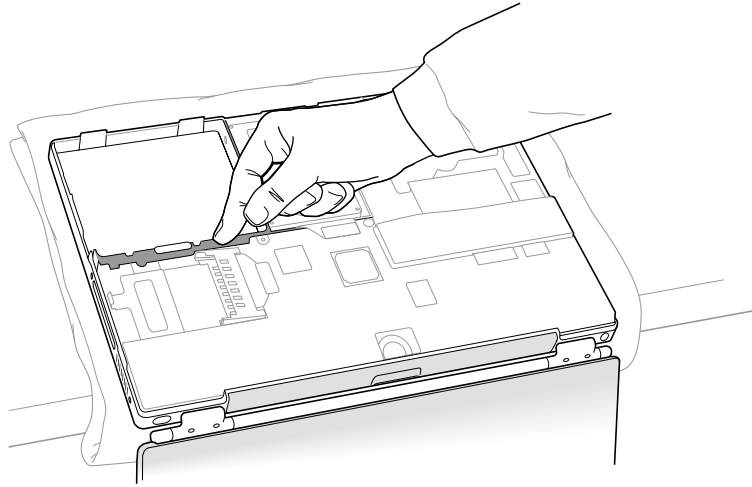


Figure 8

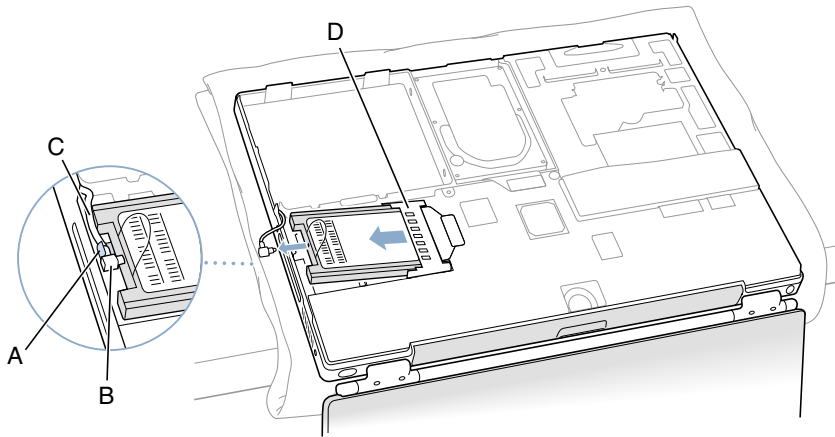


Figure 9

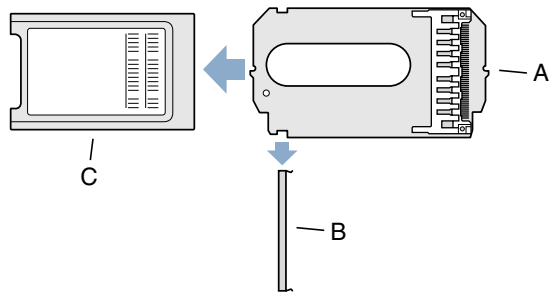


Figure 10

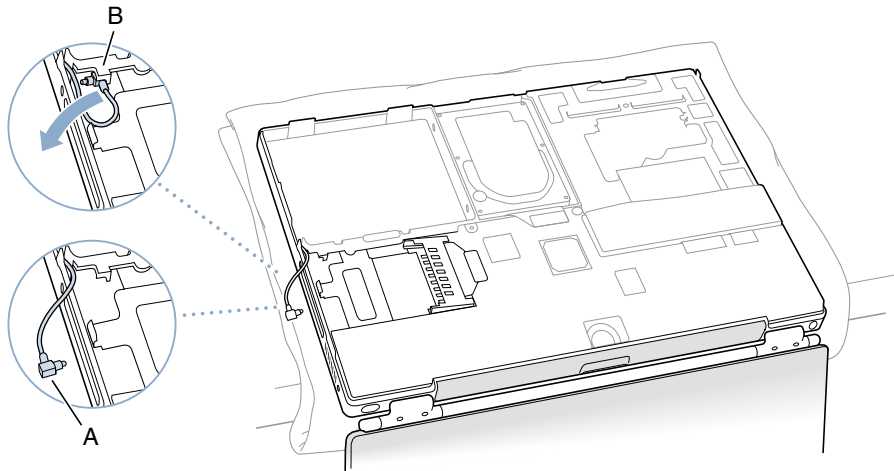


Figure 11

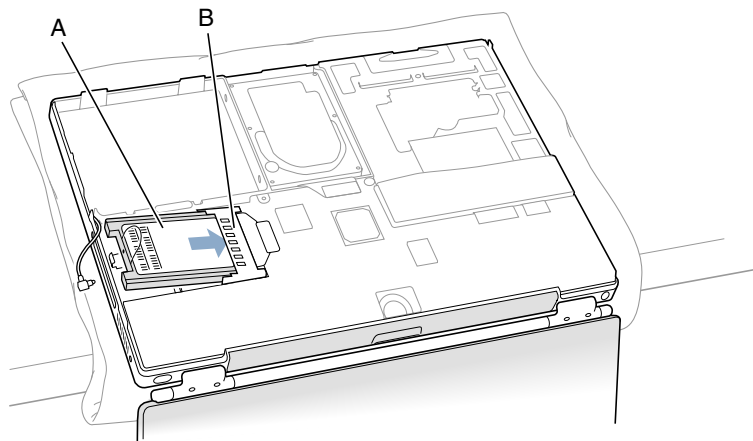


Figure 12

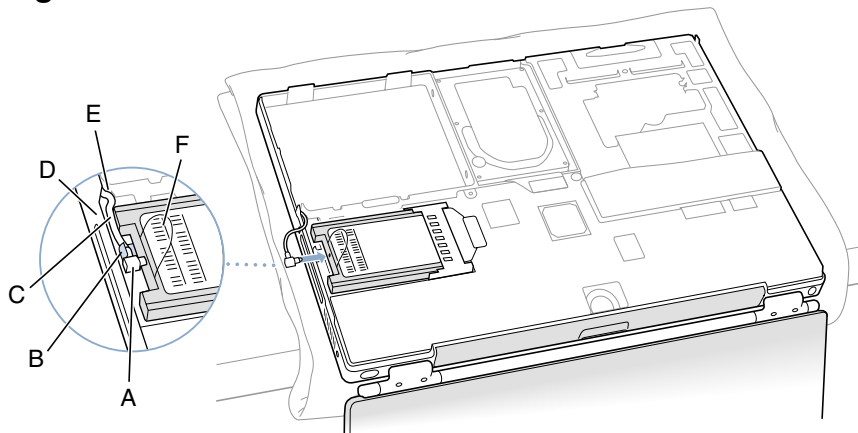


Figure 13

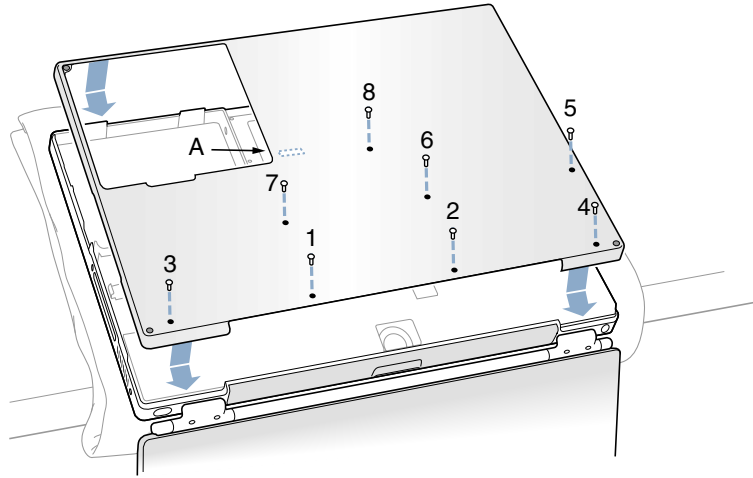
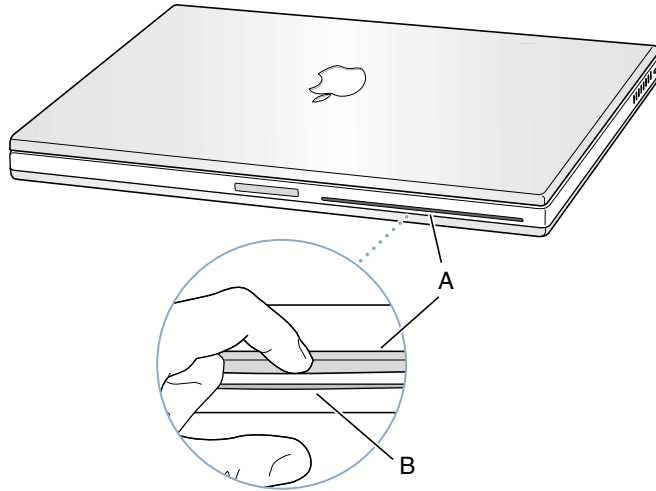


Figure 14



Hard Drive Replacement Instructions

Follow the instructions in this sheet carefully. Failure to follow these instructions could damage your equipment and void its warranty.

Note: Written and video instructions covering customer-installable parts are available at <http://www.info.apple.com/installparts/>.

Warning: Sharp edges can exist inside your computer and on any parts being removed or installed. Use caution to avoid injury.

During this procedure, keep small parts away from children.

Tools Required

- Soft towel or cloth, larger than the PowerBook
- Phillips screwdriver, size 1
- Torx T8 screwdriver (provided with hard drive)

Backing Up Your Data

Warning: Before replacing your hard drive, make sure you back up all data on the drive.

Opening the Computer

Warning: Always shut down your computer before opening it to avoid damaging its internal components or causing injury. After you shut down the computer, the internal components can be very hot. Let the computer cool down before continuing.

To access the hard drive, you must first remove the battery and bottom case.

1. Place your computer on a clean, flat surface.
2. Shut down your computer and wait thirty minutes before continuing.
3. Disconnect the power cord and any other cables connected to the computer.

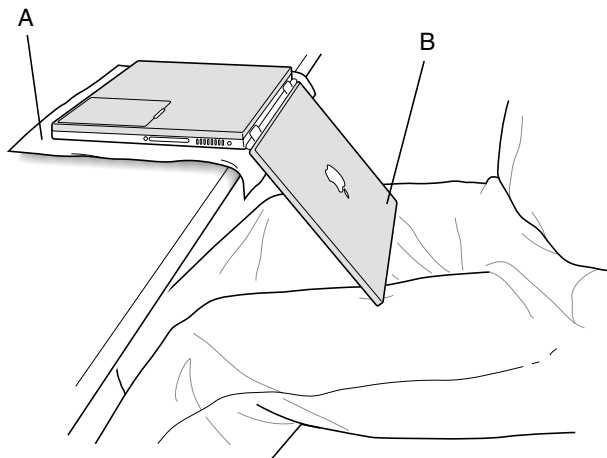
4. Place a towel or soft cloth on a table in front of you. **(Figure 1A)**

The towel or cloth will protect the keyboard and display area of the PowerBook when you flip it over to remove the battery and bottom case. Make sure it covers an area large enough for your PowerBook and that it hangs over the edge of the table.

5. With the display open at an angle greater than 90 degrees, carefully flip the PowerBook over and lay it flat, fully on the table. Make sure the display hangs over the edge of the table and rests lightly on your lap. **(Figure 1B)**

Important: Do not open the display farther than the angle shown.

Figure 1

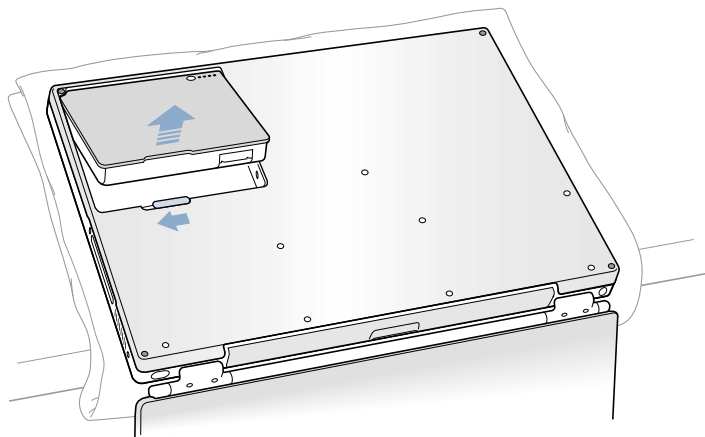


6. Remove the battery by sliding the battery latch to the left. Make sure to return the latch fully to the right. **(Figure 2)**

Removing the battery will prevent you from accidentally turning on the computer.

Warning: Removing the battery before shutting down your computer may result in data loss.

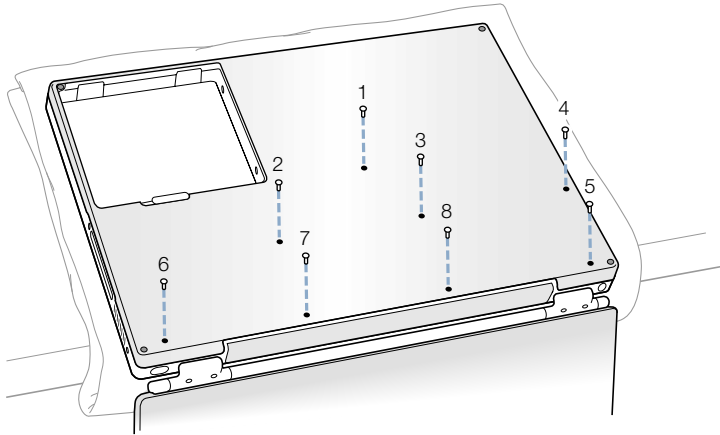
Figure 2



7. Use a Phillips screwdriver to remove the eight bottom case screws in the order shown. **(Figure 3)**

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during removal.

Figure 3

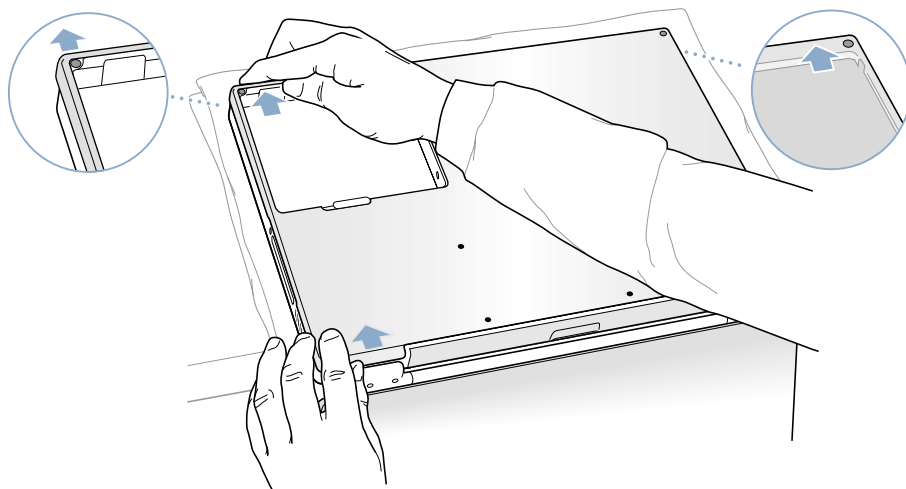


Note: In the following two steps you will disengage the left and right sides of the bottom case and then pivot it forward to remove.

8. Carefully slide the bottom case away from you. **(Figure 4)**

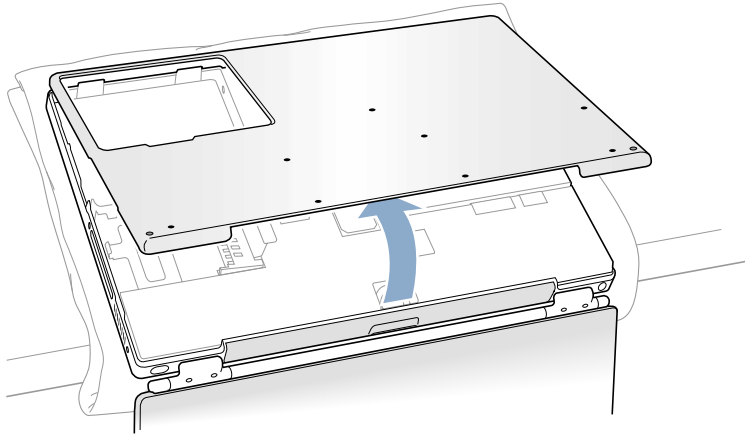
Important: Do not push on the rubber feet of the bottom case.

Figure 4



- Pivot the bottom case up as shown. **(Figure 5)**

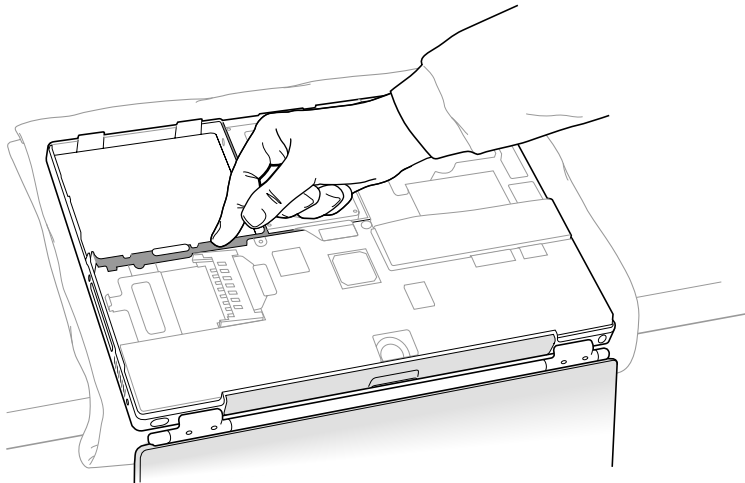
Figure 5



- Touch the computer's inside framework (a dull gray conductive composite material) to discharge any static electricity, as shown. **(Figure 6)**

Important: To avoid electrostatic discharge damage, always ground yourself by touching the computer's framework before you touch any parts or install any components inside the computer. To avoid static electricity building back up in your body, do not walk around the room until you have completed your installation and closed the computer.

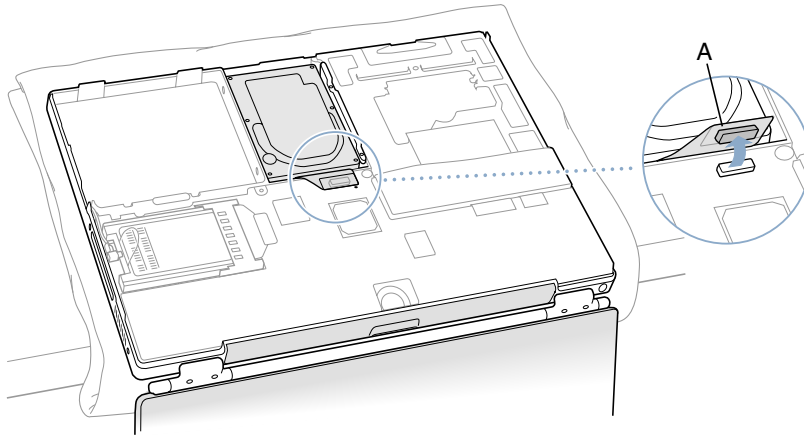
Figure 6



Removing the Installed Hard Drive

1. With your fingers, carefully pry up the hard drive flex cable connector (**Figure 7A**) at its sides to disconnect it from the logic board. You may need to pry one side, then the other, in a rocking motion.

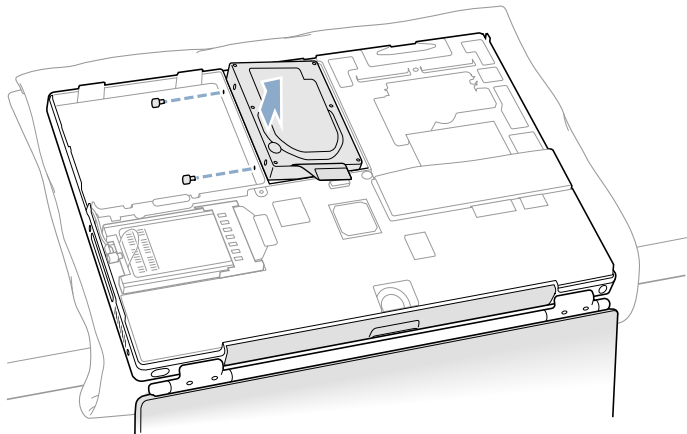
Figure 7



2. With a Torx T8 screwdriver, remove the two screws (**Figure 8**) that secure the hard drive to the mounting bracket and then gently remove the hard drive.

Important: Do not pull on the flex cable or use the cable as a handle.

Figure 8



Note: There are four rubber stoppers on the hard drive that fit over screws (two on each side). Remove any that may have fallen off or that remain in the holes in the mounting bracket inside the computer.

3. If not included with the replacement drive, remove the Mylar sheath and the flex cable to transfer to the replacement drive.

Important: The connector pins on the hard drive are fragile and bend easily. Use care to keep the pins straight when removing or installing the flex cable.

Installing the Replacement Hard Drive

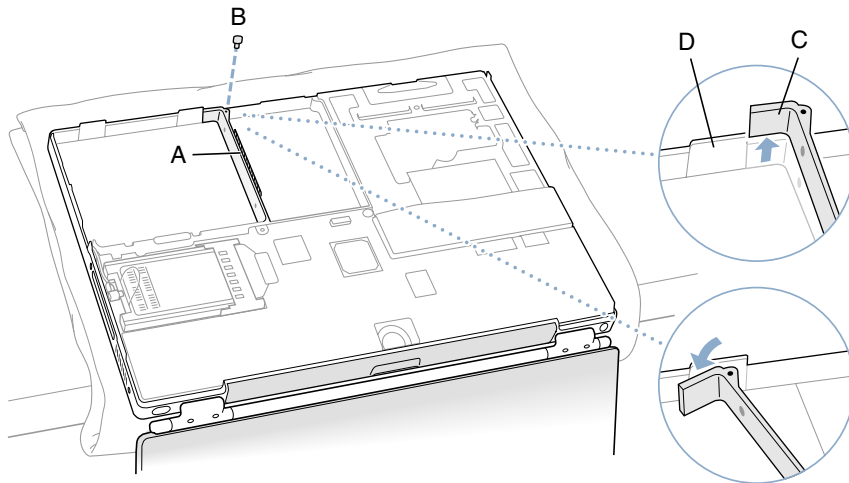
Warning: To avoid potential injury, avoid touching or brushing against the thin strip of metal that extends up from the hard drive mounting bracket (Figure 9A).

Important: Avoid touching the optical drive as you perform this procedure.

1. With a Torx T8 screwdriver, remove the screw from the top of the hard drive mounting bracket. (Figure 9B)
2. Carefully lift the mounting bracket up (Figure 9C) and gently bend it around the first battery bay tab (Figure 9D). The tab holds the bracket out of the way.

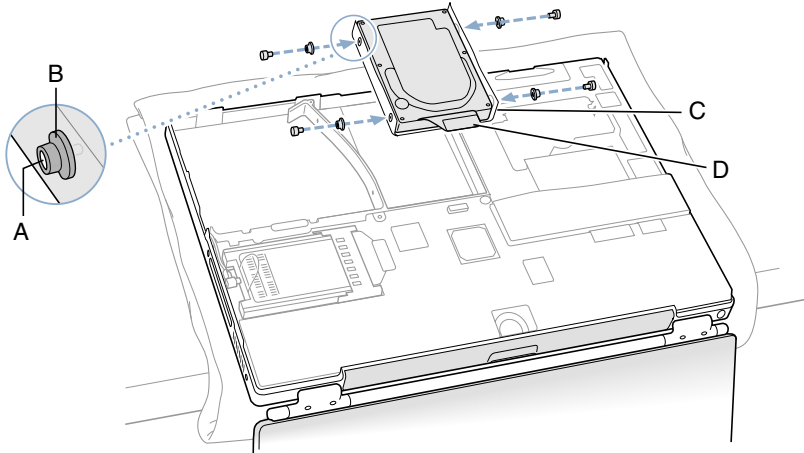
Warning: Lift the bracket just high enough to clear the battery bay tab. If you lift the bracket higher than the tab you risk damaging the bracket, and such damage is not covered by the limited warranty on your computer.

Figure 9



3. Make sure that the screws (**Figure 10A**) and rubber stoppers (**Figure 10B**) are in place on the sides of the replacement drive.
4. Install the Mylar sheath (**Figure 10C**) so that it covers the bottom and left and right sides of the drive. The sheath is directional and must be installed in the direction that does not extend beyond the front of the drive.
5. Carefully install the flex cable to the hard drive, if needed, (**Figure 10D**). The connector is keyed to fit only one way.

Figure 10

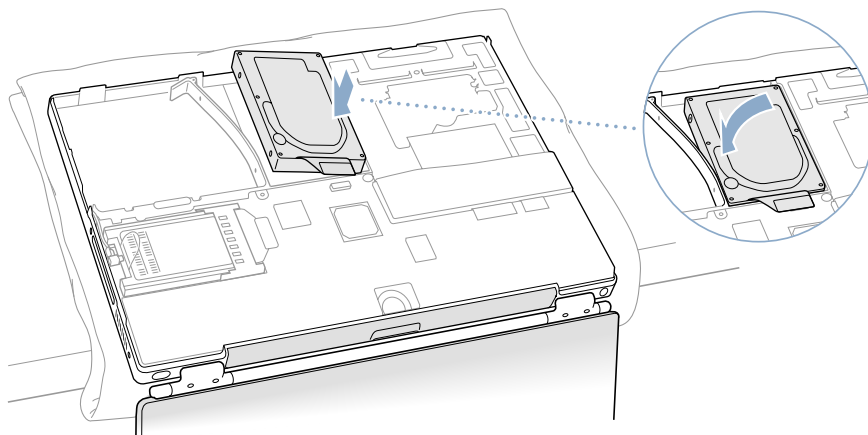


6. Insert the right side of the drive first, until the rubber stoppers fit securely into the holes in the bracket, and then insert the left side of the drive. (**Figure 11**)

Note: Make sure that the rubber stoppers do not fall off during installation.

Important: Make sure that the flex cable does not get pinched behind the drive during installation.

Figure 11



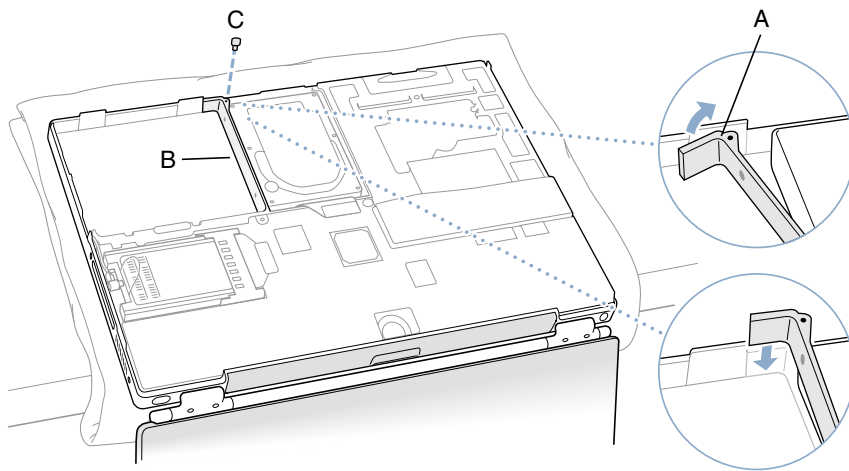
- Lift the mounting bracket (**Figure 12A**) over the battery bay tab and lower it to its original position. Line up the rubber stoppers on the hard drive until they fully seat into the holes in the bracket.

Note: To help with alignment, the Torx T8 screwdriver can be inserted into the screws on the hard drive through the holes in the mounting bracket.

Important: Verify that the bottom of the mounting bracket clears and seats behind a thin metal ridge located along the bottom of the battery compartment. (**Figure 12B**)

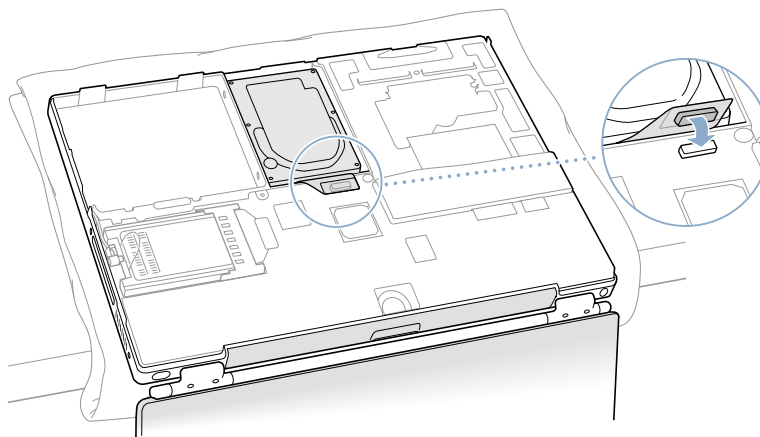
- Replace the screw (**Figure 12C**) in the top of the mounting bracket, being careful not to overtighten it.

Figure 12



- Connect the hard drive's flex cable connector (**Figure 13**) to the logic board.

Figure 13



Closing the Computer

1. To attach the bottom case, align the notches on the right and left sides of the case, then press down slightly to secure the case. Check the alignment of the eight screw holes to make sure the bottom case is properly positioned.

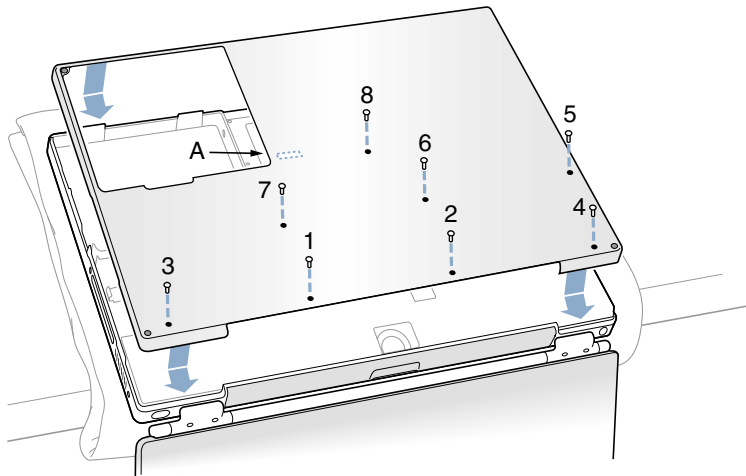
Important: Make sure that the seams between the bottom case and the frame are closed. Check the outside edges and around the battery well. Verify that the alignment tab on the underside of the bottom case (**Figure 14A**) has seated, and the case lies flat.

2. Replace the eight screws in the order shown. (**Figure 14**)

Note: The screws must go in straight and easily; if they do not, readjust the bottom case for proper alignment. Do not overtighten the screws or damage could result.

Important: To avoid damaging the case, be careful that the screwdriver tip does not slip out of the screw head during tightening.

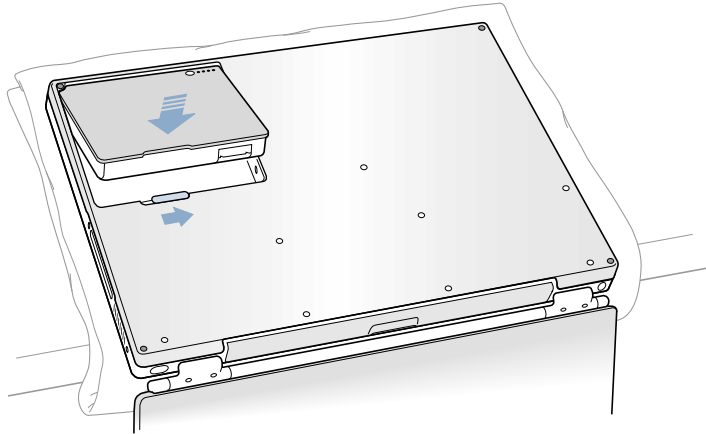
Figure 14



3. Replace the battery. **(Figure 15)**

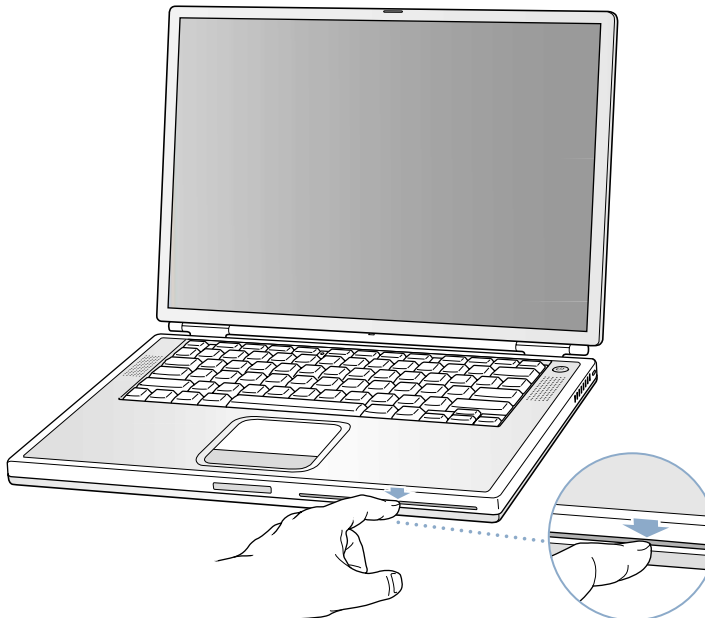
Important: Make sure that the battery locks securely into place and that the battery latch is slid all the way into the locked position.

Figure 15



4. Turn the computer over. Look at the optical drive slot to make sure that the case is properly secured. If a gap exists below the slot, gently pull the bottom of the optical drive slot toward you until it clicks into place and the gap is removed. **(Figure 16)**

Figure 16



-
5. Reconnect the power cord and any other cables that were connected, and restart your computer.

Warning: Never turn on your computer unless all of its internal and external parts are in place and it is closed. Operating the computer when it is open or missing parts can damage your computer or cause injury.

6. Restore the data from your backup to the new drive.
7. Check the operation of the optical drive. If the hard drive is installed incorrectly, the optical drive mechanism might not spin correctly and will result in mechanical noise when playing a disc.

DVD-ROM Drive Replacement Instructions

The following instructions explain how to replace the DVD-ROM drive in the PowerBook G4 computer.

Tools

- Soft towel or cloth, larger than the PowerBook
- Black stick (or other nonconductive nylon or plastic tool)

Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Bottom case

Procedure

1. With the computer on a soft cloth, locate the adhesive dust cover, a black plastic sheet that holds the PMU and DVD ribbon cables in place.

Warning: The adhesive dust cover adheres to the thin, plastic DVD drive sleeve. Removing the dust cover too quickly might cause the sleeve to tear, exposing the DVD drive mechanism.

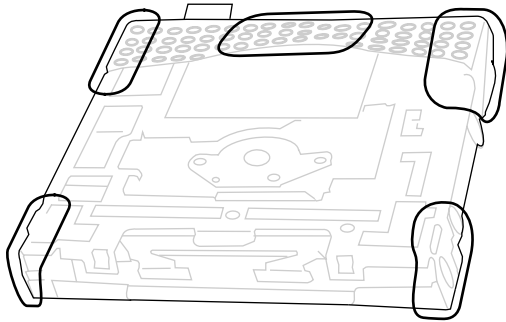
2. Starting at one corner, slowly and carefully peel off the adhesive dust cover. If the dust cover sticks too firmly to the drive sleeve, use a black stick or other nonconductive tool to gently separate the dust cover from the sleeve. Discard the adhesive dust cover when you have removed it.

Important: When reassembling the computer, apply a new dust cover after the replacement DVD-ROM drive is installed.



3. To protect the display, lay a soft cloth between the display and the top case. Then close the computer and turn it over.

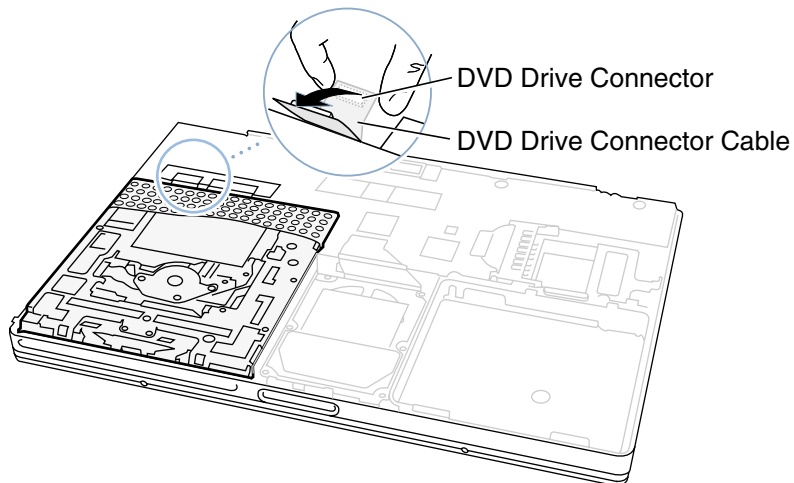
4. **Warning:** The drive is a sensitive device and should be handled carefully to avoid damage. Handle the drive only by the corners or the back end of the drive, as indicated by the safe areas shown below. Do not place anything on top of the drive nor press on the body of the drive. If mishandled, the alignment of the drive frame could be altered, resulting in issues with disk mounting, disk insertion, or disk ejection.



5. With your fingers or a black stick, carefully pry up the DVD drive connector at its sides to disconnect it from the logic board. You may need to pry one side then the other in a rocking motion.

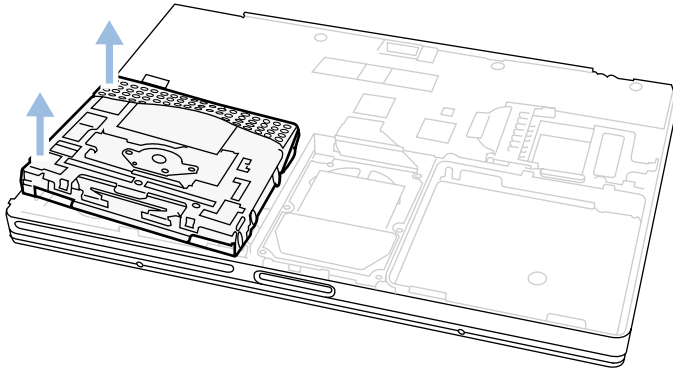
Note: If tape is covering the connector, carefully pull it out of the way just enough to remove the connector. Reuse the tape when installing the replacement drive.

Important: Do **not** pull on the connector cable or use as a handle.

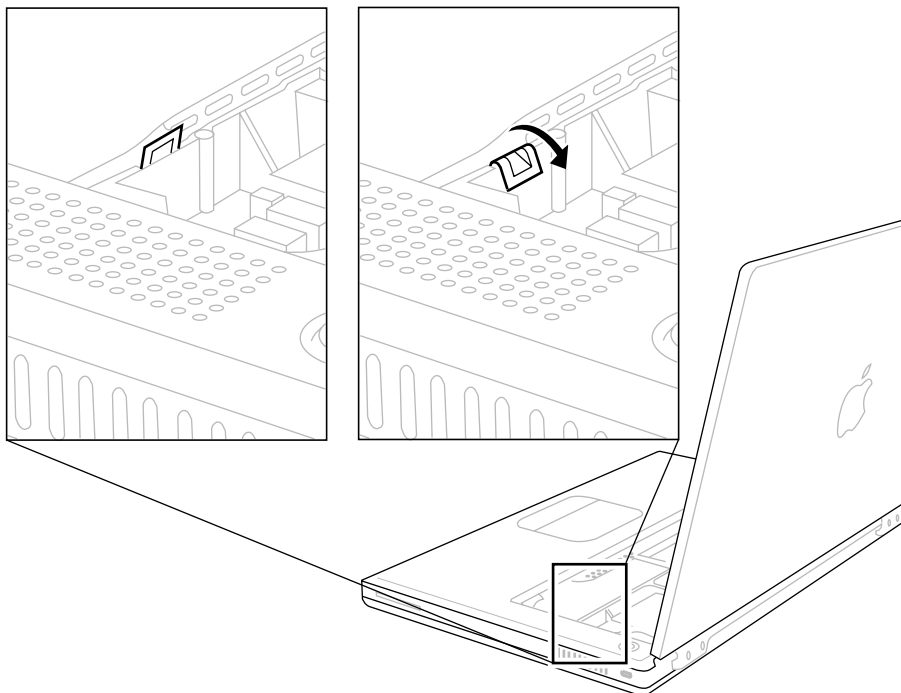


6. Holding the corners on the left side of the drive, pull up on the DVD drive until it releases from the computer.

Note: There are four rubber mounts (two on each side) on the DVD drive that are held by friction on the screws. Remove any that may have fallen off inside the computer.



7. **Before installing the replacement drive**, verify that the small, metal EMI clip, normally located between the PMU cable and the DVD cable, is securely attached to the frame rib. If the EMI clip is loose, bend it down to secure it to the rib. Check both ends of the clip to ensure it is held in place.



8. Install the replacement DVD-ROM drive (noting the additional instructions below), and reassemble and test the computer.

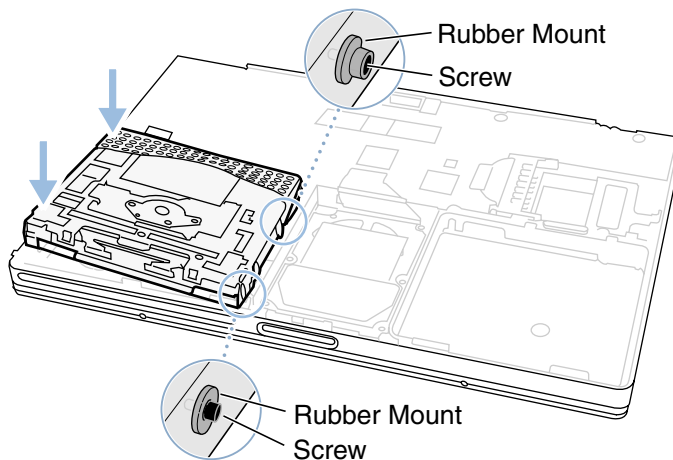
When reassembling the computer, verify that there are two screws with rubber mounts on both the right and left side of the drive.

Note: The rubber mount at the front right corner of the drive is shorter than the other three rubber mounts.

Starting with the side of the carrier closest to the hard drive, carefully guide the rubber mounts on the side of the DVD drive into the two holes on the frame rib next to the hard drive. Push down on the DVD drive corners to secure the drive.

Note: Make sure that the rubber mounts do not fall off during installation.

Important: Make sure that the connector cable does not get pinched behind the drive during installation.



PMU Card Replacement Instructions

The following instructions explain how to replace the PMU (Power Management Unit) card in the PowerBook G4 computer.

Tools

- Soft towel or cloth, larger than the PowerBook
- Black stick (or other nonconductive nylon or plastic tool)

Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Bottom case
- DVD-ROM drive

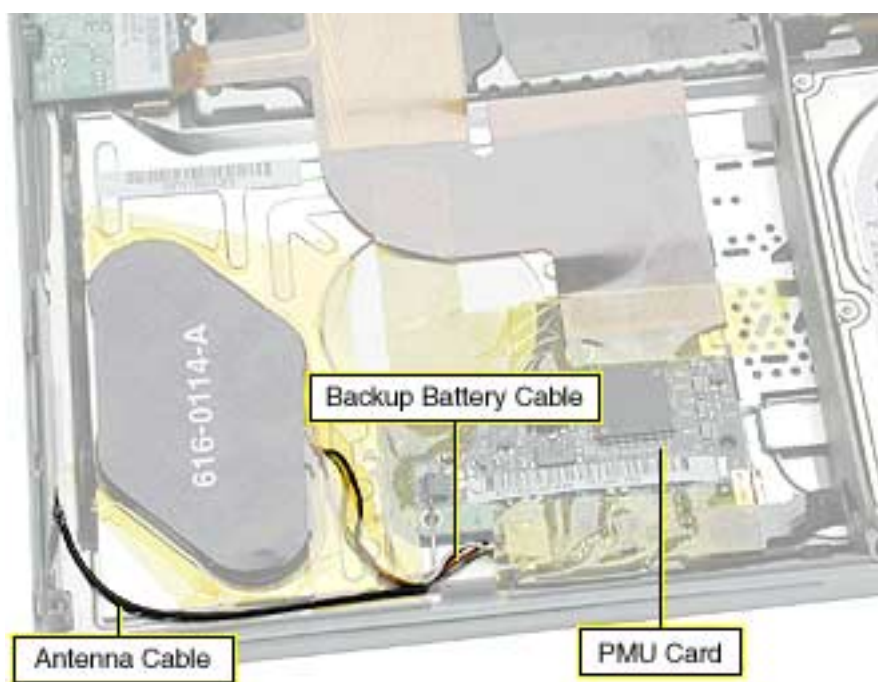
Procedure

Important: Some of the internal cables are held in place by transparent orange Kapton tape. Note the orientation of the tape before removing it, and reserve the tape to use again for the replacement PMU card connections.

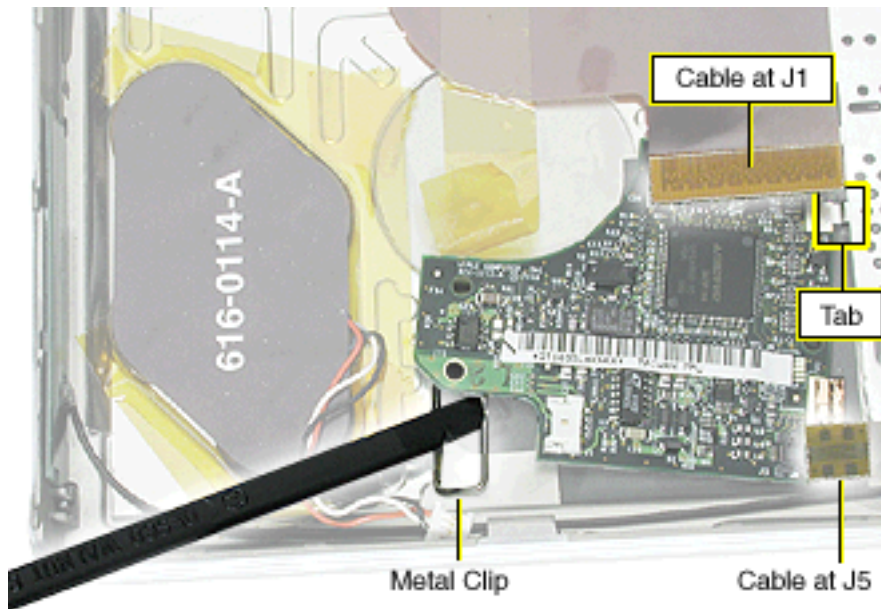
1. Carefully peel away the tape so you can disconnect the backup battery connector from the PMU card.

Important: When reassembling the computer, make sure the connected backup battery cable is routed at an approximate 90-degree angle, as shown.

Note: When reassembling the computer, apply the tape to both the battery cable and the single, black, wireless antenna cable.



2. Disconnect the ribbon cable at J1.
3. Disconnect the ribbon cable at J5.
4. From the left corner of the card, raise the metal clip out of the hole in the PMU card. Pivot the card clockwise slightly to free the PMU card from the metal clip and the metal tab at the side of the card.



5. Install the replacement PMU card, and reassemble and test the computer.

Backup Battery Replacement Instructions

The following instructions explain how to replace the backup battery in the PowerBook G4 computer.

Tools

- Soft towel or cloth, larger than the PowerBook
- Black stick (on other nonconductive nylon or plastic tool)

Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Bottom case
- DVD-ROM drive

Procedure

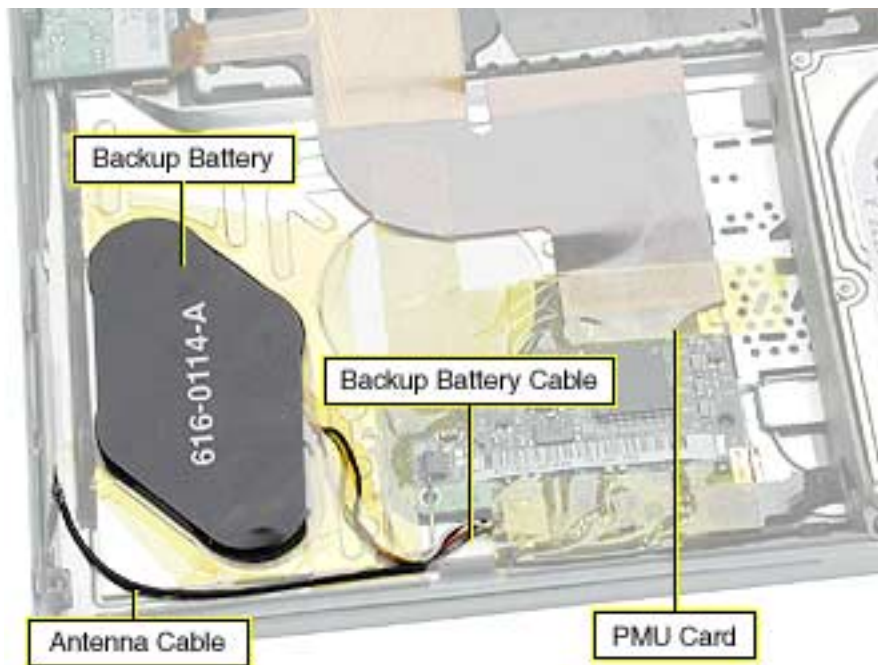
1. Notice that the backup battery cable and the single, black wireless antenna cable are held in place by transparent orange Kapton tape.

Important: When reassembling the computer, make sure the connected backup battery cable is routed at an approximate 90-degree angle, as shown.

Note: When reassembling the computer, reuse the tape to secure the replacement backup battery cable and the wireless antenna cable.

2. Carefully peel away the tape so you can disconnect the backup battery connector from the PMU card.
3. **Note:** The backup battery has four ceramic discs that are compressed between two thin plastic sheets. The battery is held in place with adhesive on the lower plastic sheet.

Pry up the battery so that the entire battery—including the lower plastic sheet—is removed from the inner top case.



4. If there is any residual adhesive left on the surface of the inner top case, remove it by rubbing it away. Do not use solvents.

Note: When installing the replacement backup battery, make sure the inner top case is clean and free of debris.

5. Peel off the cover sheet from the bottom surface of the replacement battery to expose the adhesive.

6. When positioning the replacement backup battery on the inner top case, make sure the battery fits within the ridged battery area of the inner top case, and the backup battery cable faces the PMU card, as shown below.



7. Install the replacement backup battery, and reassemble and test the computer.

Logic Board Replacement Instructions

The following instructions explain how to replace the logic board in the PowerBook G4 computer.

Tools

- Soft towel or cloth, larger than the PowerBook
- Torx T8 screwdriver
- Black stick (or other nonconductive plastic or nylon tool)
- Razor blade

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

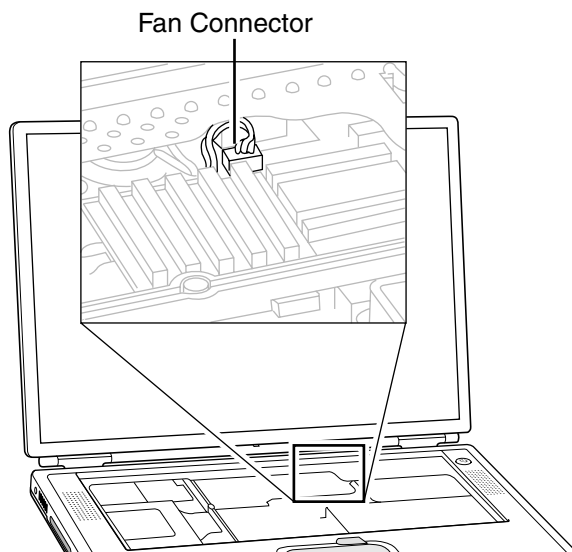
Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Modem
- Bottom case
- AirPort Card (if installed)

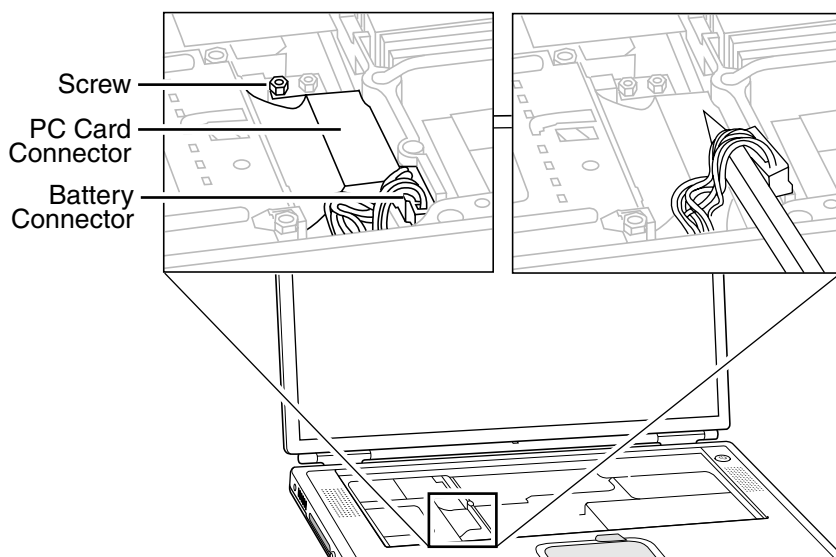
Procedure

1. From the keyboard opening, disconnect the three-pin fan connector.



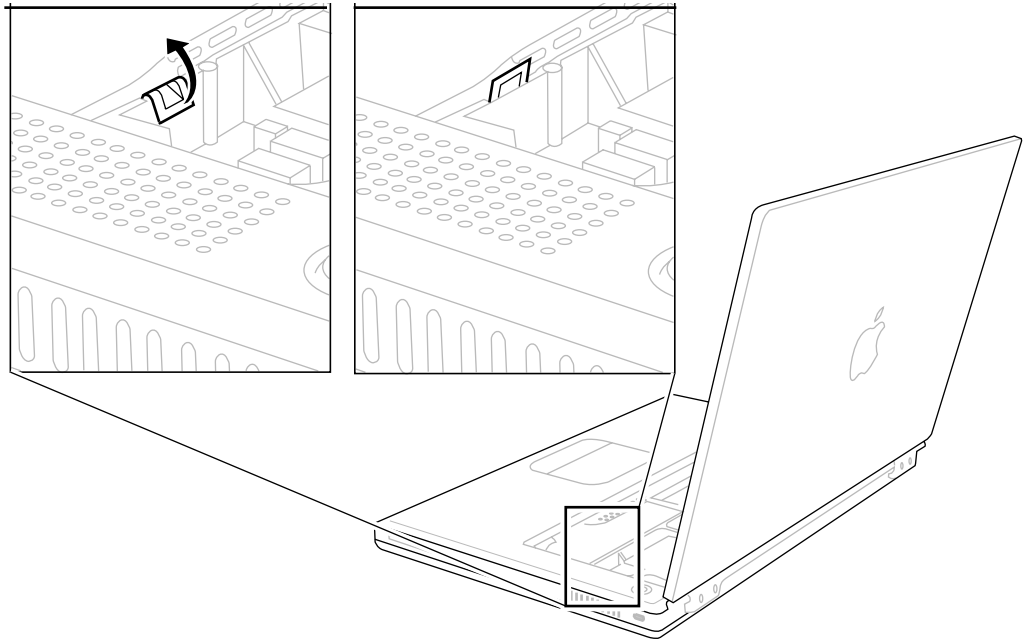
2. Remove the Torx T8 screw that is closest to the PC card carrier.
3. Disconnect the PC Card ribbon cable connector and the six-pin keyed battery connector.

Important: If the battery connector has not been disconnected before, the keyed connector may be tight. If necessary, use a black stick to loosen one side of the connector and then the other side. Then insert the black stick under the wires to pry up and disconnect the connector.

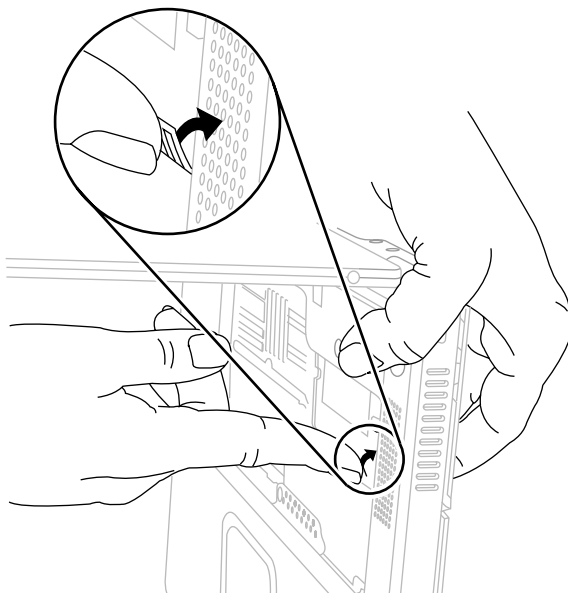


Note: When reassembling the computer, tuck down the battery and fan cables so they do not get in the way when the keyboard is installed.

4. Locate the small metal EMI clip that folds over the plastic rib by the DVD drive. Fold up and straighten the EMI clip.



Note: When reassembling the computer, hold the EMI clip in place over the frame rib while carefully tilting up the computer so you can access the other end of the EMI clip. Through the keyboard opening, bend the clip down over the rib of the frame. Check both sides of the clip to ensure that it is held in place and is not interfering with the DVD drive connector or the PMU connector.

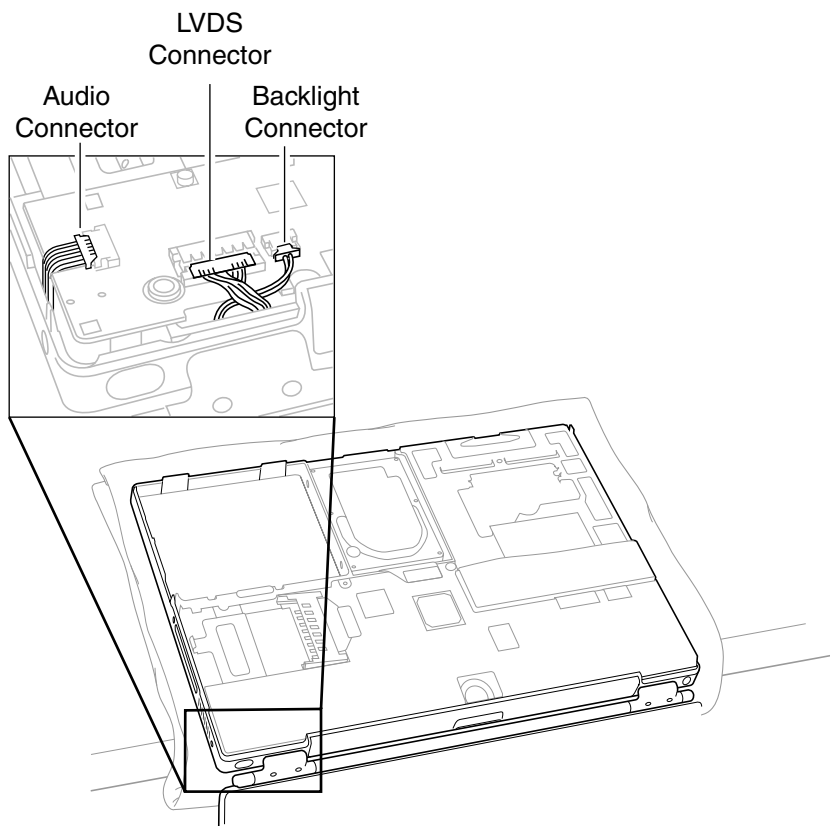


5. **Important:** With the bottom case removed, be careful when turning over the computer. Some components could become loose and fall out.

Warning: The cables connected to the LVDS (low voltage data signal) connector are extremely delicate. Do not pull or pinch the LVDS cables.

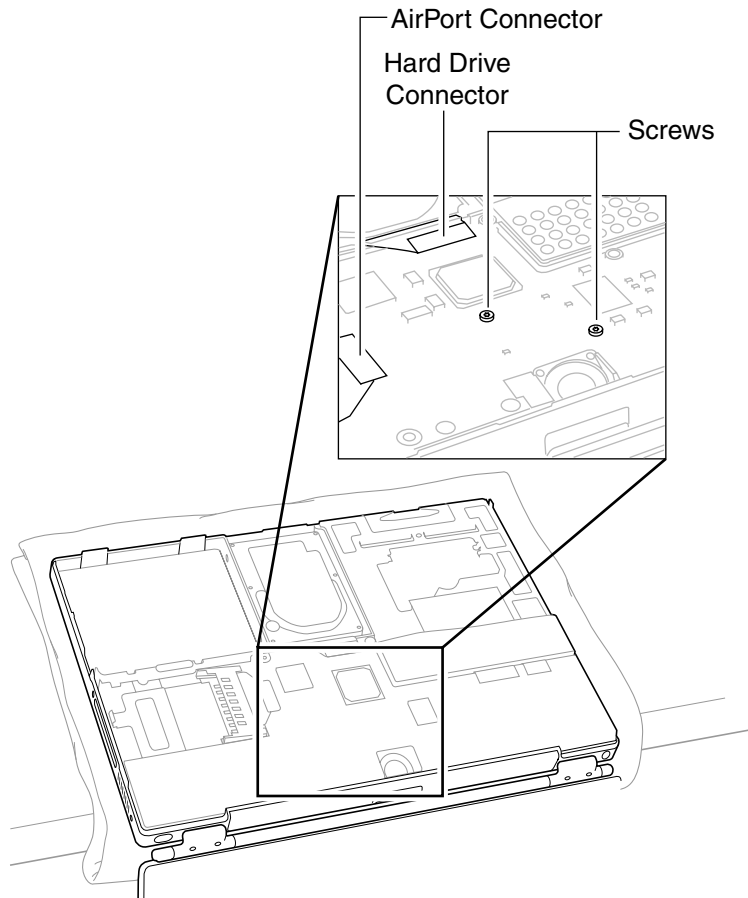
Warning: Be especially careful when working near cables that attach to the display. If any of these cables are damaged, the entire display module must be replaced.

Turn over the computer so the display rests lightly in your lap. At the left side of the logic board, disconnect the two-pin backlight connector, the LVDS connector, and the six-pin audio connector.



6. Near the center of the logic board, disconnect the AirPort connector and the hard drive connector.
7. Remove the two identical Torx T8 screws, located near the center of the board.

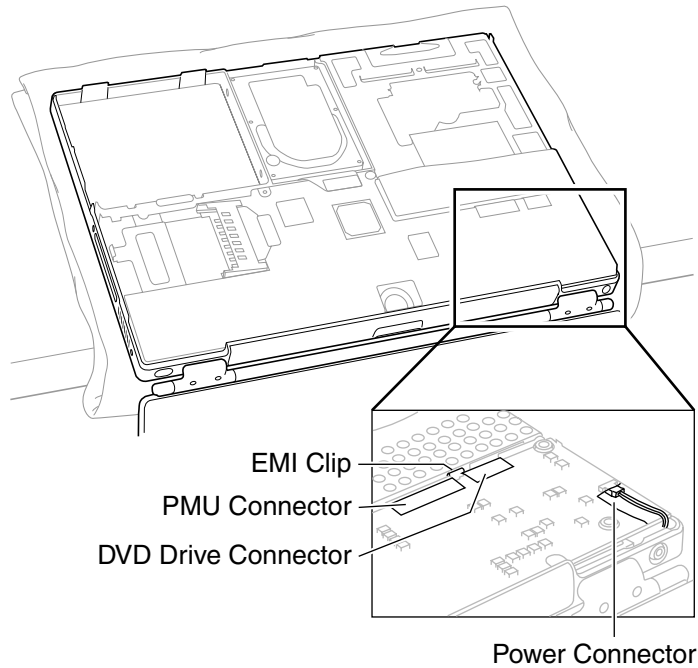
Note: When reassembling the computer, do not overtighten the screws.



8. At the right side of the board, as shown, disconnect
 - PMU connector
 - DVD drive connector
 - Two-pin power connector

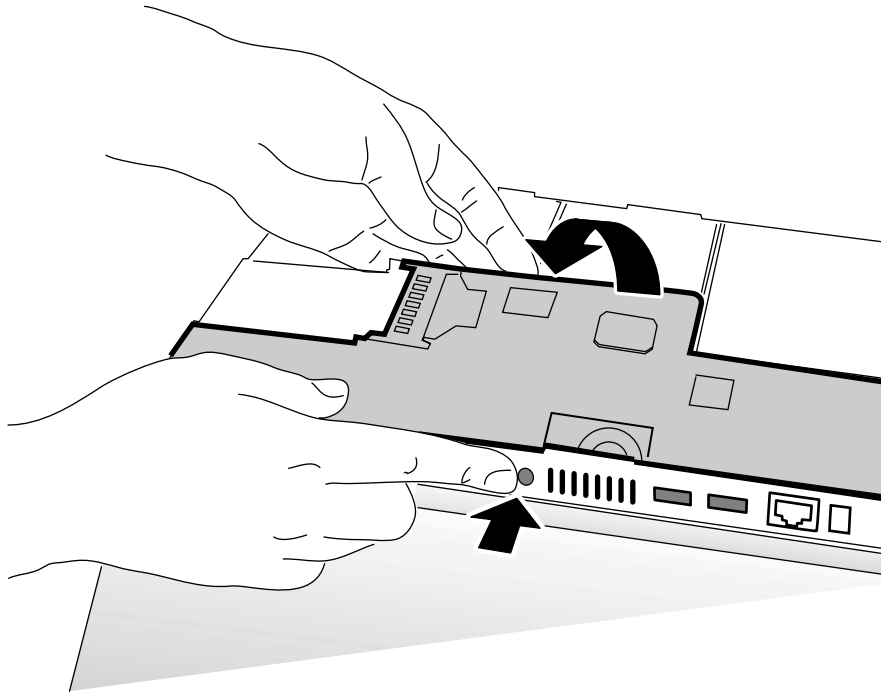
Note: If tape is covering the power connector and cable, carefully pull it out of the way. Place the tape aside for reuse on the replacement logic board.

9. Verify that the EMI clip—located between the DVD drive connector and the PMU connector—is loose and does not catch on the logic board.



-
10. Grasp the logic board near the AirPort Card carrier. Gently tilt up the board, being careful where it catches on the back panel ports, integral mesh liner, and the disconnected cables.

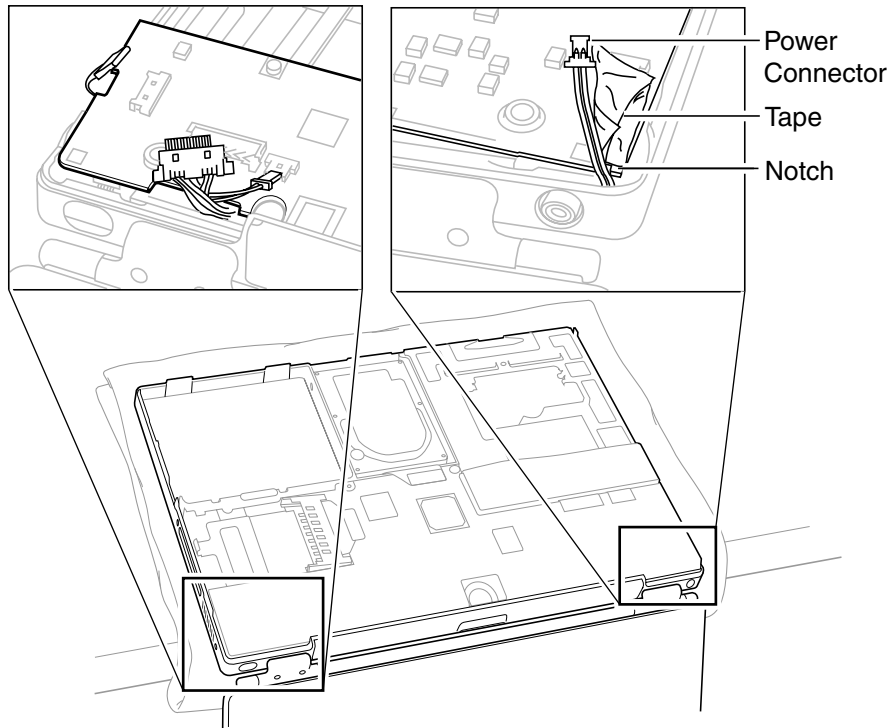
If necessary, open the panel door and press on the ports to free the logic board from the back panel.



Note: When reassembling the computer, make sure the replacement logic board ports align completely with the openings in the back panel.

Note: When positioning the replacement logic board into the computer, check that cables and connectors do not get caught under the board. Tilt the logic board toward the back panel, and place the following cables into the notches in the board:

- Power cable (reapply tape over the power cable, if applicable)
- Backlight cable
- LVDS cable
- Audio cable

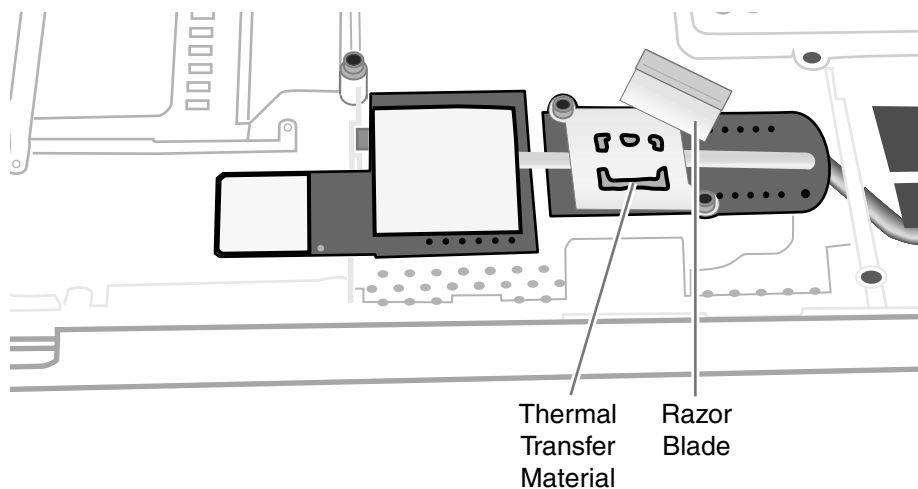


11. Remove existing memory cards from the logic board for installation on the replacement logic board.
12. Disconnect the small infrared communications board at J1 for installation on the replacement logic board.
13. Make sure the replacement logic board includes the following items. If not, transfer these items from the original logic board to the replacement board:
 - AirPort Card carrier
 - Spongy mesh “pillows” adhered to USB ports and headphones port
 - Kapton tape at underside of LVDS connector and on top of power connector
 - Rubber adhesive squares at components L7 and L8, and on the monitor port and the modem port
 - Two adhesive rubber squares on underside of board at left side
 - RJ-11 port. **Note:** If the replacement logic board has a metallic EMI cage around the RJ-11 slot but does not include the port, transfer the RJ-11 port from the bad board only if it does not have a ferrite bead around the wires. If it does, you must order the RJ-11 port that does not have a ferrite bead (part number 922-5245).

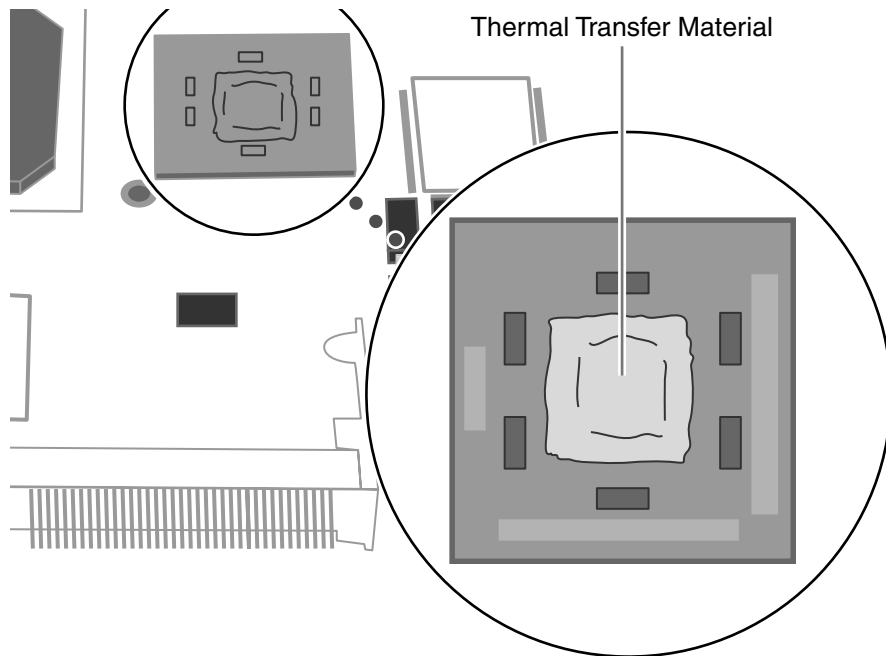
14. Check that the heat exchanger has two square thermal interface pads in place. If the pads are missing or damaged, replace them.
15. **Important:** If you have removed the logic board to access another part, and you will be placing the original logic board back in the computer, use a razor blade to gently scrape away any residual thermal transfer material from the heat exchanger and the microprocessor chip.

Warning: When scraping away the thermal transfer material from the microprocessor chip, be careful not to nick the microprocessor chip.

Apply new thermal transfer material to the microprocessor chip as described in the next step.



-
16. On the replacement logic board, center new thermal transfer material over the epoxy cap on the microprocessor chip. Press it into place.



17. Install the replacement logic board, and reassemble and test the computer.

Display Module Replacement Instructions

The following instructions explain how to replace the display module on the PowerBook G4 computer.

Warning: Make sure you carefully follow these instructions, especially when working near cables that attach to the replacement display module. If any of the cables are damaged, the entire display module must be replaced.

Tools

- Soft cloth
- Torx T8 screwdriver
- #1 Phillips screwdriver
- Black stick (or other nonconductive nylon or plastic tool)

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

Preliminary Steps

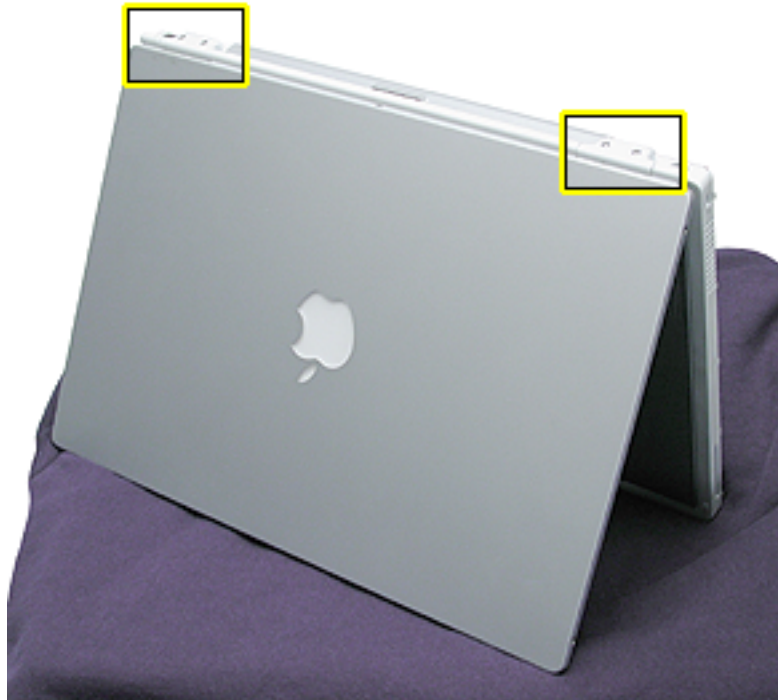
Before you begin, remove the following:

- Battery
- Keyboard
- Modem
- Bottom case
- AirPort Card (if installed)
- Logic board

Procedure

Important: With the bottom case removed, be careful when turning over the computer. Some components could become loose and fall out.

1. Open the computer to an approximate 45-degree angle, and stand it on a soft cloth with the clutch covers facing up.



2. Remove the four identical Torx T8 screws from the clutch covers (two screws on each clutch cover).



3. Close the computer, and use a black stick to pry off the two clutch covers.



Important: When reassembling the computer, note that each clutch cover has a molded number centered inside it. When the computer is positioned upside down, as shown below, the left clutch cover is labeled "1"; the right clutch cover is labeled "2". Make sure the left and right clutch covers are placed correctly on the clutches.



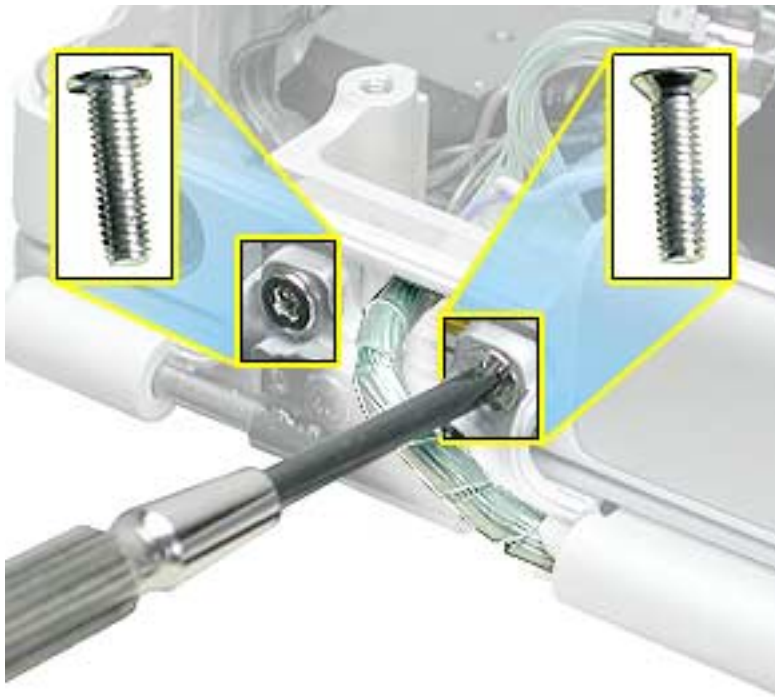
-
4. **Warning:** Be especially careful when working near cables that attach to the display. If any of these cables are damaged, the entire display module must be replaced.

Warning: At the left clutch, the wrapped cable connected to the LVDS (low voltage data signal) connector is extremely delicate. Do not pull or pinch the LVDS cable. Do not allow the screwdriver to touch the LVDS cable.

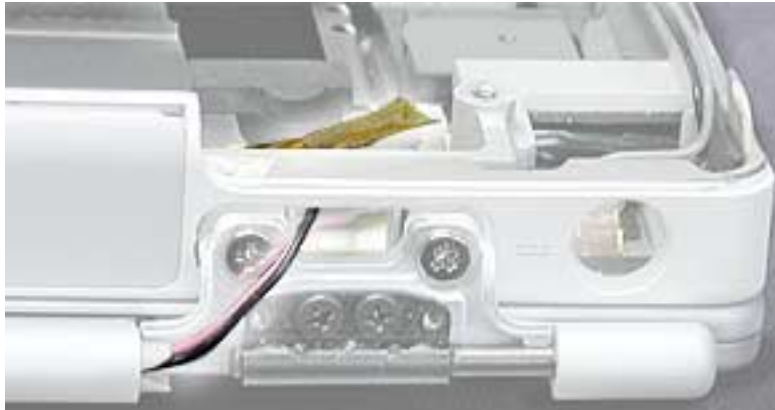
Use a black stick to gently move aside the LVDS cable so you can access the two silver-colored screws. (Do not remove the black screws beneath them.)

Remove the two silver-colored Phillips screws from the left clutch. Notice that the screw closest to the LVDS cable has a sloped screw head.

Important: When installing a replacement display, make sure the screw closest to the LVDS cable is the screw with the sloped head.



5. At the right clutch, note the routing of the inverter cable (the black and pink wires). Without straining the inverter cable, gently move it aside so you can access the two silver-colored screws.
6. Remove the two identical silver-colored Phillips screws from the right clutch. (Do not remove the black screws.)
7. Remove the Kapton tape, and reserve it for the replacement display module.

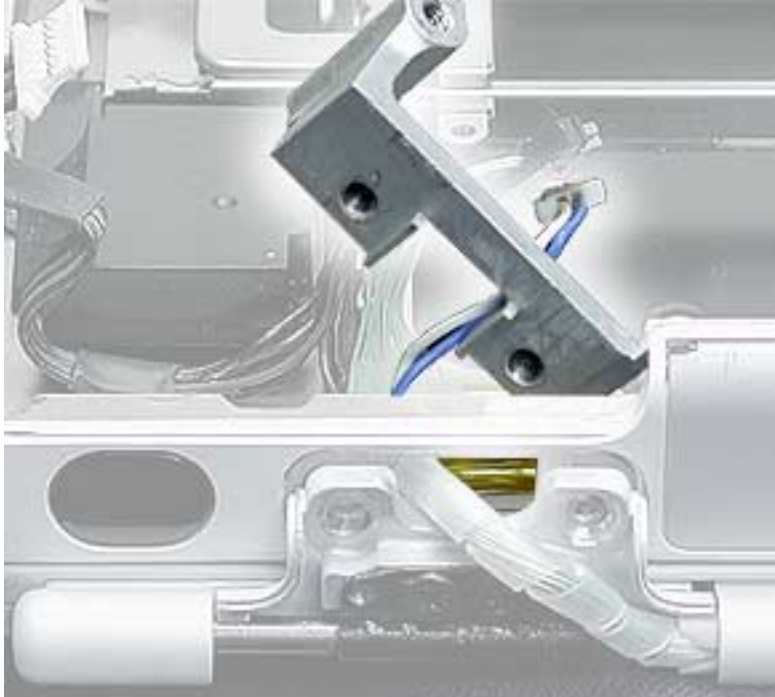


8. Disconnect the inverter cable, and lift the inner clutch mount out of the way.
9. Lift the top case up slightly from the display, and carefully slide the inverter cable out through the hole in the top case.



-
- 10. Warning: The LVDS cable and connector are extremely delicate. Do not pull or pinch the LVDS cable or connector.**

On the left side, move the inner clutch mount out of the way, and thread the blue-and-white power switch cable through the opening in the top case.



- 11. Warning: The LVDS cable and connector are extremely delicate. Do not pull or pinch the LVDS cable or connector.**

Carefully guide the LVDS cable through the hole by turning the LVDS connector sideways, as shown, to fit through the opening.



-
12. If necessary, press the computer latch on the front of the computer to release the display module from the top case.
 13. The display module includes all three cables.



14. Install the replacement display module, and reassemble and test the computer.

Important: When the replacement display module is installed, and before the clutch covers are installed, test that the display is seated properly. With the computer upright and closed, press the computer latch. The display module should pop up slightly if the module is properly seated.



PC Card Cage Replacement Instructions

The following instructions explain how to replace the PC card cage in the PowerBook G4 computer.

Tools

- Soft towel or cloth larger than the PowerBook
- Torx T8 screwdriver

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

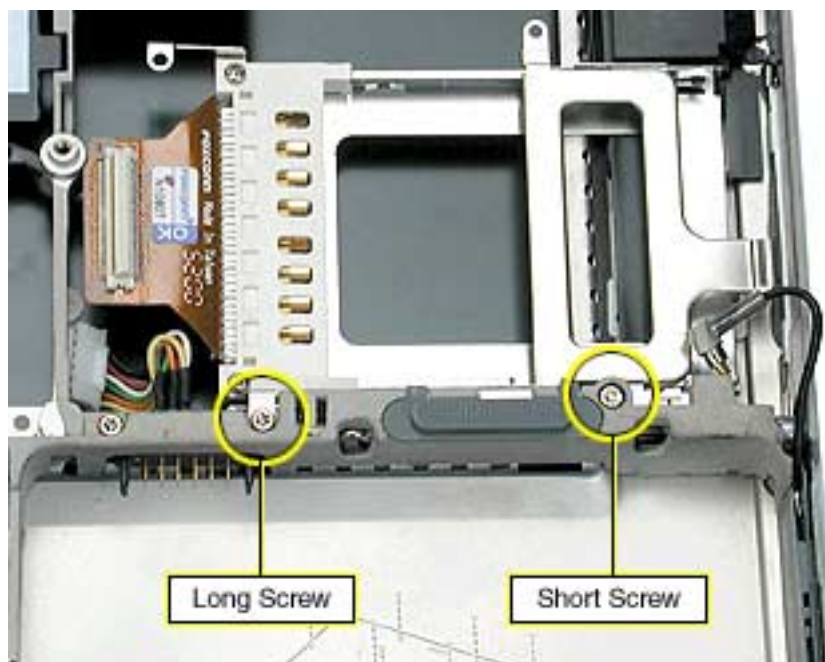
Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Modem
- Bottom case
- AirPort Card (if installed)
- Logic board

Procedure

1. To protect the display from scratches, place a sheet of paper between the display face and the top case. (Make sure the paper does not block the computer latch.) With the computer on a soft cloth, remove the two screws that attach the PC card cage to the rib frame. (The longer screw is next to the battery connector.)



2. Lift out the PC card cage, being careful where it can catch on the PC card eject button.



3. Install the replacement PC card cage, and reassemble and test the computer.

Rib Frame and Heat Exchanger Replacement Instructions

The following instructions explain how to replace the rib frame and the heat exchanger in the PowerBook G4 computer.

Tools

- Soft towel or cloth larger than the PowerBook
- Torx T8 screwdriver
- Torx T6 screwdriver

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

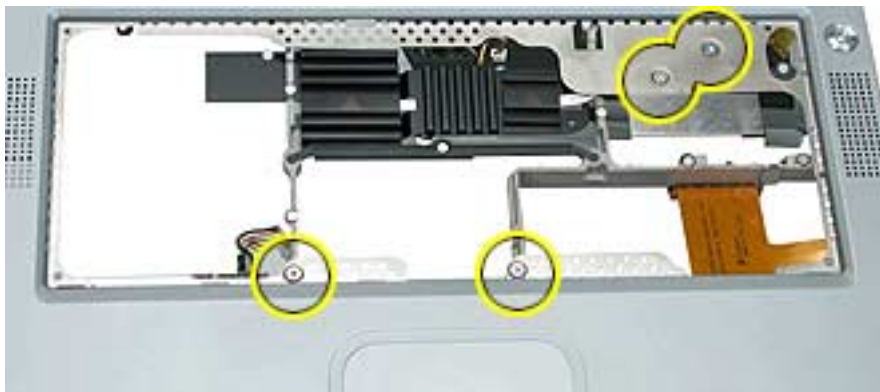
Preliminary Steps

Before you begin, remove the following:

- Battery
- Keyboard
- Modem
- Bottom case
- AirPort Card (if installed)
- Hard drive
- DVD-ROM drive
- Logic board
- PC card cage

Procedure

1. With the computer on a soft cloth, remove the four identical screws from the top case.

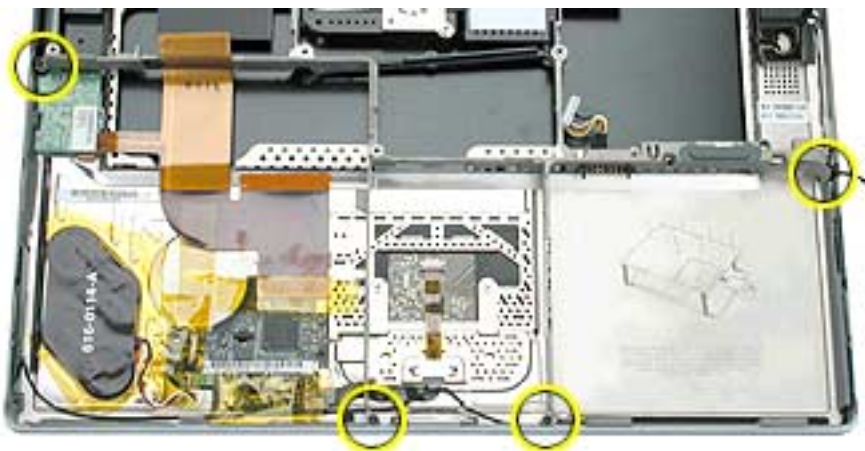


2. To protect the display from scratches, place a sheet of paper between the display face and the top case. (Make sure the paper does not block the computer latch.) Close the computer
3. Open the I/O door, and remove the four identical Torx T6 screws.



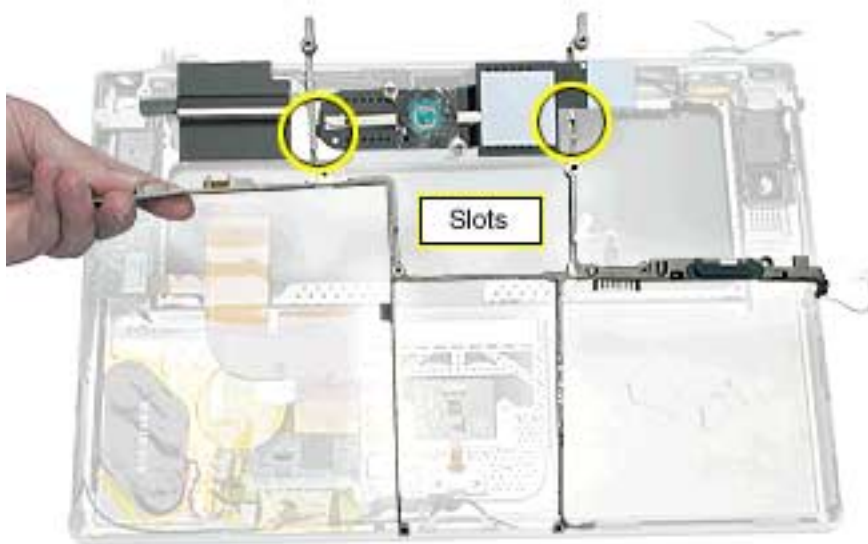
4. Turn over the computer, and remove the four identical black screws.

Note: You might need to move aside the AirPort antenna cable to reach one of the screws.



-
5. **Warning:** When removing the rib frame and heat exchanger, make sure the heat exchanger does not fall onto the display. Support both the rib frame and the heat exchanger as you lift them out.

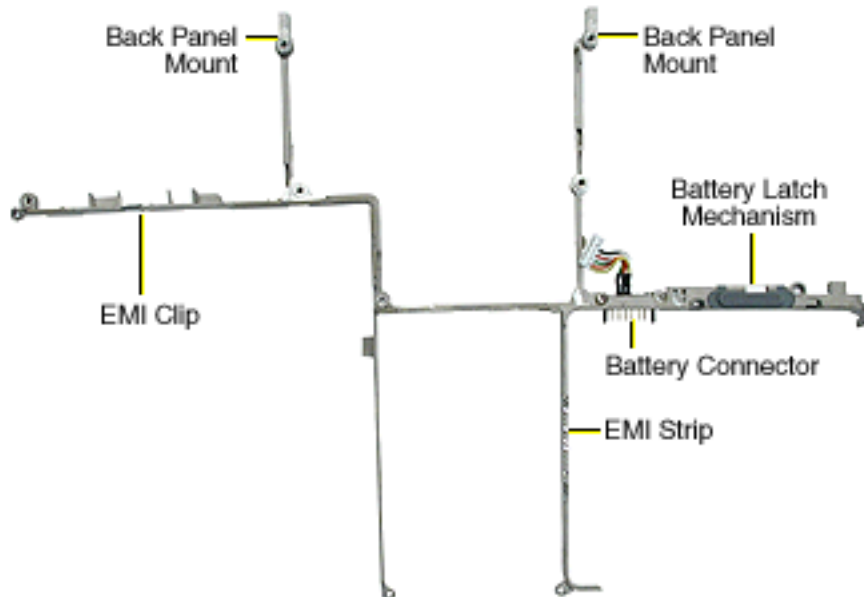
Note: The heat exchanger is loosely attached to the rib frame at two slots. Notice that the heat exchanger fits under the rib frame on the left, and over the rib frame on the right, as shown below.



6. Install the replacement rib frame and/or heat exchanger, and reassemble and test the computer.

Note: The replacement rib frame includes the following:

- Back panel mounts (two)
- EMI clip
- Battery latch mechanism
- Battery connector
- EMI strip (serrated edge)



Inverter Board Replacement Instructions

The following instructions explain how to replace the inverter board in the PowerBook G4 computer.

Tools

- Soft towel or cloth larger than the PowerBook
- Torx T8 screwdriver
- #1 Phillips screwdriver
- Black stick (or other nonconductive plastic or nylon tool)

Note: To organize the screws you remove from the computer, use a tray with divided compartments (such as a plastic ice cube tray).

Preliminary Steps

Before you begin, remove the following:

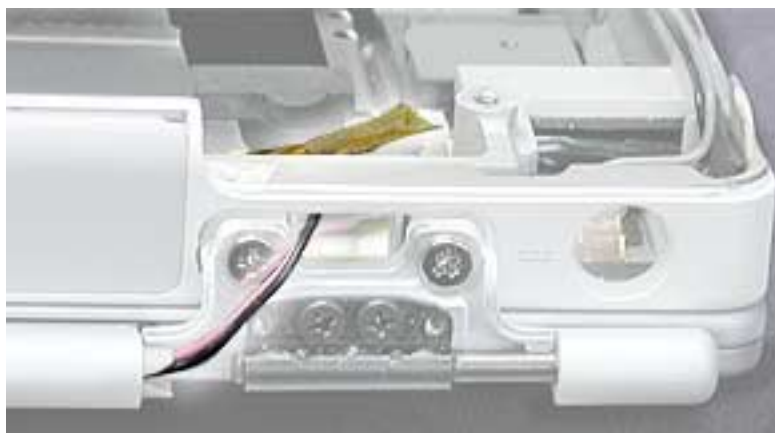
- Battery
- Keyboard
- Modem
- Bottom case
- AirPort Card (if installed)
- Hard drive
- DVD-ROM drive
- Logic board
- Rib frame

Procedure

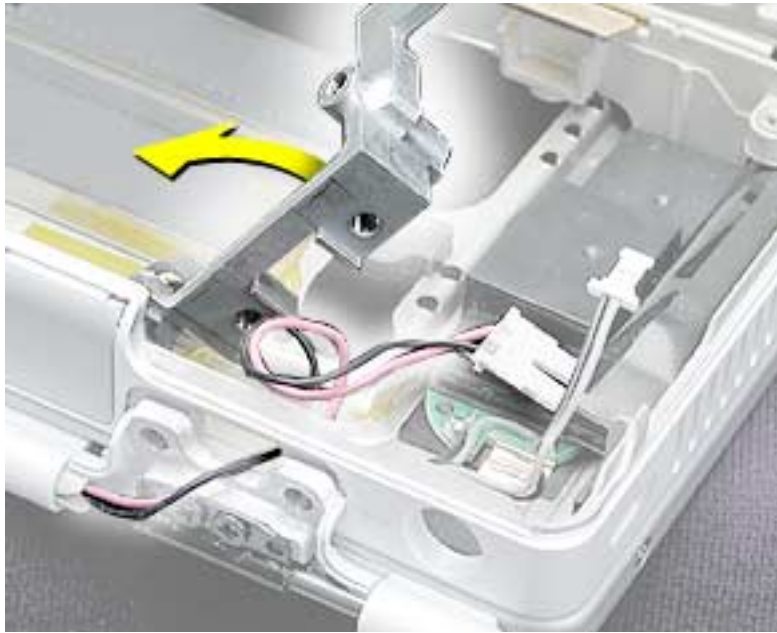
1. With the computer on a soft cloth, remove the two identical screws from the clutch cover that is next to the power adapter port, as shown.



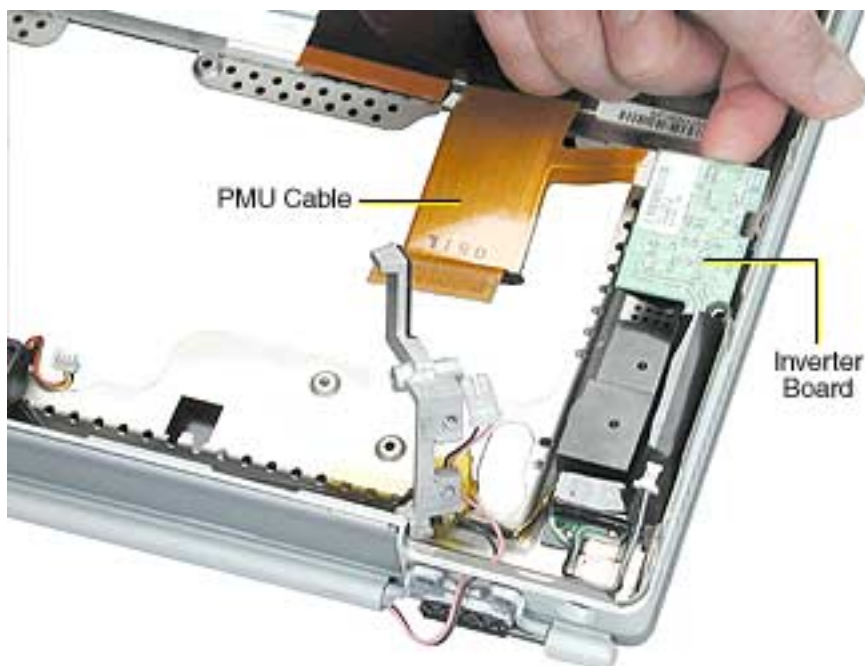
2. Use a black stick to remove the clutch cover.
3. At the clutch, note the routing of the inverter cable (the black and pink wires). Without straining the inverter cable, gently remove the Kapton tape from the inverter cable. Disconnect the inverter cable from the inverter board.
4. Remove the two identical silver-colored Phillips screws from the right clutch. (Do not remove the black screws.)



5. Lift the inner clutch mount out of the way.



6. Tilt up the inverter board, and disconnect the PMU cable. Lift out the inverter board.



7. Install the replacement inverter board, and reassemble and test the computer.

Top Case Replacement Instructions

The following instructions explain how to replace the top case in the PowerBook G4 computer.

Tools

- Soft towel or cloth larger than the PowerBook
- Black stick (or other nonconductive plastic or nylon tool)

Preliminary Steps

Before you begin, remove the following:

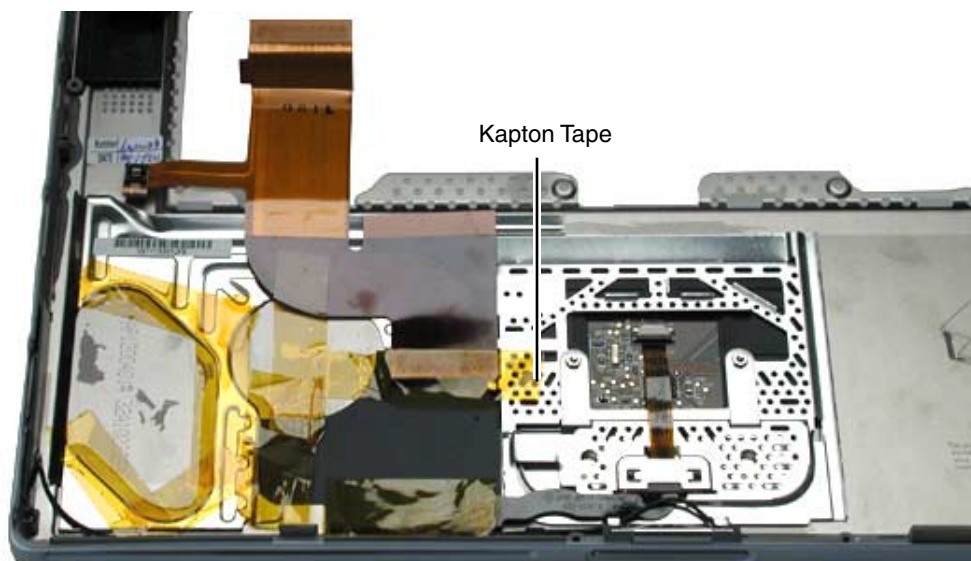
- Battery
- Keyboard
- Modem
- AirPort Card (if installed)
- Bottom case
- Hard drive
- DVD-ROM drive
- PMU card
- Backup battery
- Logic board
- Rib frame and heat exchanger
- Inverter board
- Display module

Procedure

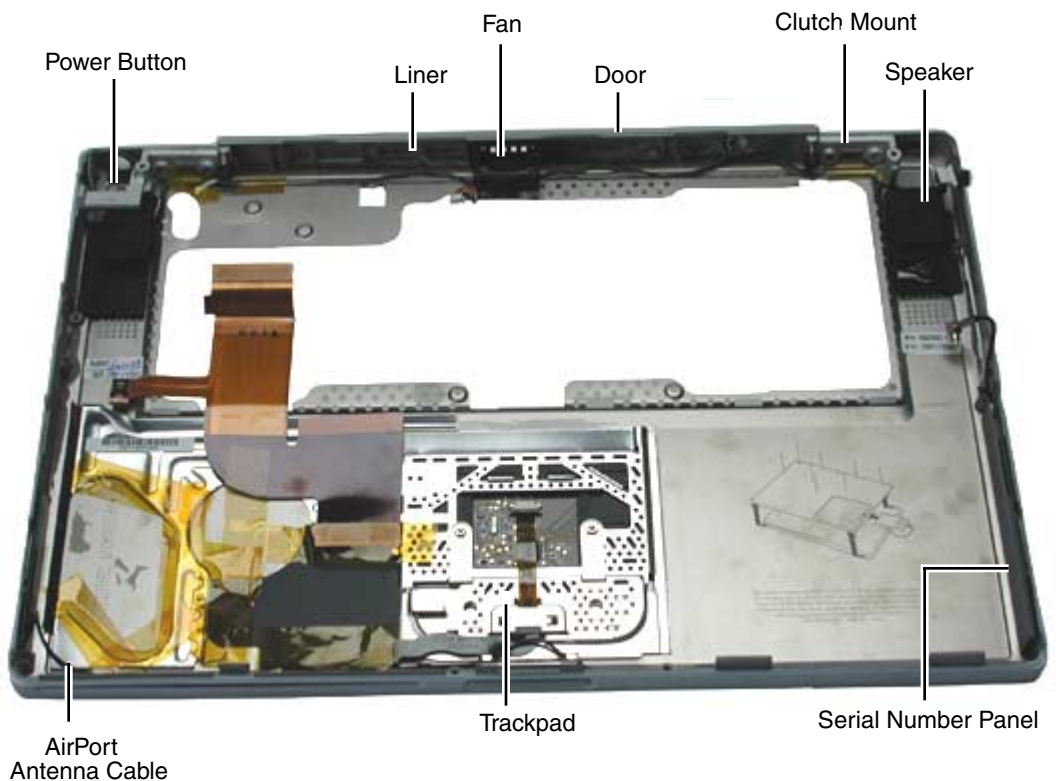
1. With the top case on a soft cloth, notice the placement of the transparent, orange Kapton tape and the routing of the PMU ribbon cable.



2. Use a black stick to peel off the Kapton tape from the PMU ribbon cable. Reserve the ribbon cable for the replacement top case.



3. Before installing the replacement top case, make sure it includes the following:
 - Fan (heatstaked to top case)
 - Speaker set and cables
 - Door at back panel
 - Mesh liner at ports
 - Inner clutch mounts (two)
 - Power button and board (heatstaked to top case)
 - AirPort antenna cable
 - Trackpad assembly with board and cable
4. **Important:** Make sure you transfer the original serial number label from the old top case to the serial number panel on the replacement top case. You can use a black stick to carefully peel up a corner of the label. Then peel off the label completely and apply it to the serial number panel. Make sure that the label lies completely flat so it does not interfere with the battery compartment.




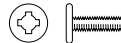
5. Install the replacement top case, and reassemble and test the computer.


PowerBook G4 Screw Reference Sheet


This sheet shows the types of screws used in the PowerBook G4 computer. To see where the screws are located in the computer, refer to "PowerBook G4 Screw Locator."


Modem, magnetic 1 @ 7 mm 


PC Card Cage 1 @ 6.5 mm 


Bottom Case 8 @ 8 mm 


PC Card Cage 1 @ 4.5 mm 


Hard Drive 4 @ 5 mm (black) 


Rib Frame 4 @ 4.5 mm 


Logic Board 3 @ 4.5 mm 


Rib Frame, Clutch, 4 @ 5.25 mm 


Logic Board 1 @ 4.5 mm 

Rib Frame, Clutch, 3 @ 16.5 mm 

Logic Board 2 @ 8 mm 

Rib Frame, Clutch, 1 @ 16.5 mm 

Rib Frame, Back 4 @ 4.5 mm 

Rib Frame 4 @ 9.5 mm (black) 

PowerBook G4 Screw Locator - 1 of 4

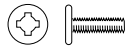
Modem Replacement



One 5 mm magnetic hex nut,
7 mm long



Bottom Case Replacement



Eight identical Phillips,
8 mm long



Hard Drive Replacement



Four identical (black) Torx T8,
5 mm long



PowerBook G4 Screw Locator - 2 of 4

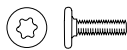
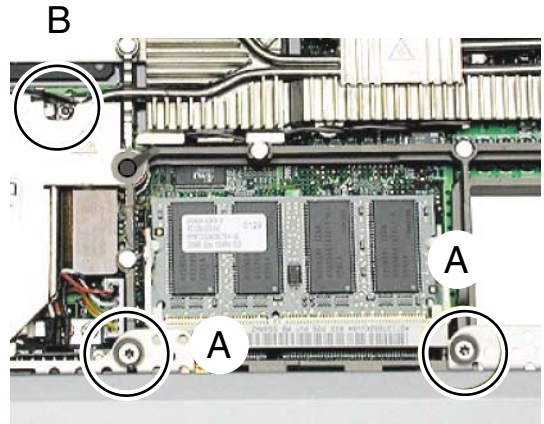
Logic Board Replacement



(A) - Two identical Torx T8,
4.5 mm long



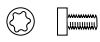
(B) - One Torx T8,
4.5 mm long



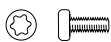
Two identical Torx T8,
8 mm long



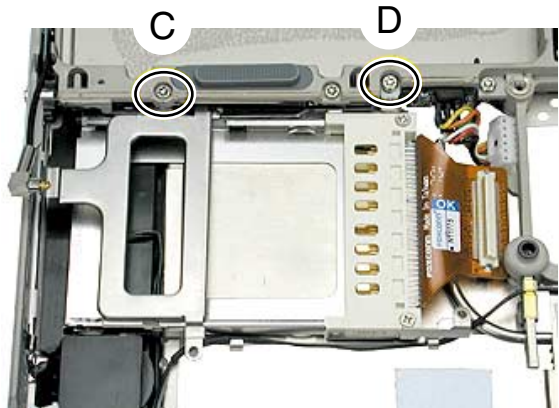
PC Card Replacement



(C) - One Torx T8,
4.5 mm long



(D) - One Torx T8,
6.5 mm long

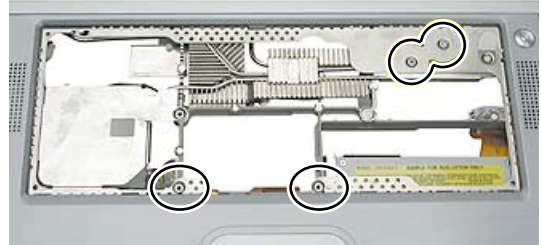


PowerBook G4 Screw Locator - 3 of 4

Rib Frame and Heat Exchanger Replacement



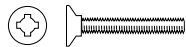
Four identical Torx T8,
4.5 mm long



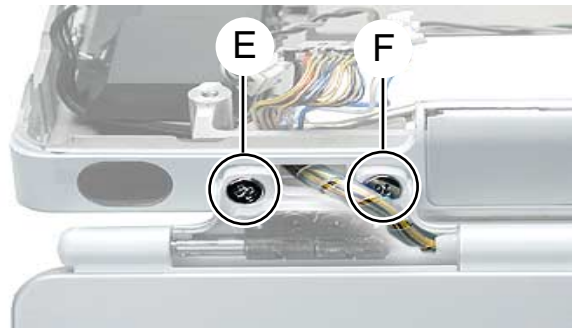
Four identical Torx T8,
5.25 mm long



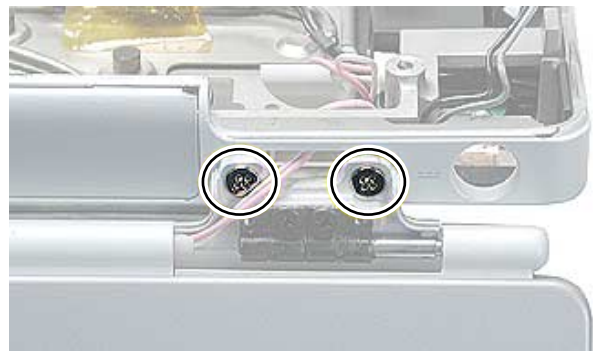
(E) - One Phillips,
16.5 mm long



(F) - One Phillips,
16.5 mm long



Two identical Phillips,
16.5 mm long



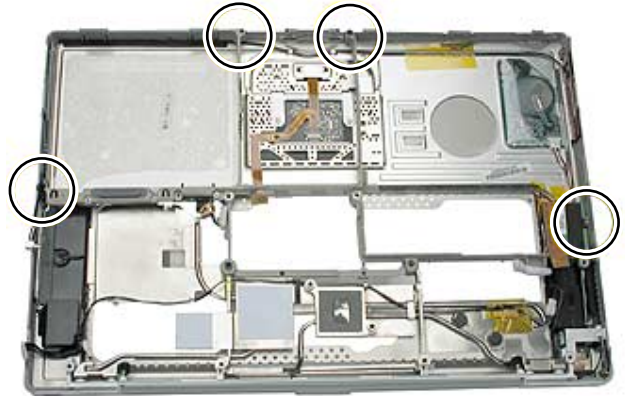
PowerBook G4 Screw Locator - 4 of 4



Four identical Torx T6,
4.5 mm long



Four identical
(Black) Torx T8,
9.5 mm long



Apple Service Source



Troubleshooting
PowerBook G4



AppleCare Knowledge Base: Assisted Search

TITLE

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-7-20

PowerBook G4: Troubleshooting Document

TOPIC

This is a PDF document of recent troubleshooting articles for Apple Specialists, Apple-Authorized Self-Servicing Providers and Internal Use.

DISCUSSION

AirPort

[AirPort Card Not Recognized](#)

Battery

[Battery Will Not Eject](#)

Hard drive

[Hard Drive Will Not Initialize](#)

Modem

[No Modem Dial Tone](#)

Optical drive

[DVD Disc Icon Does Not Show Up On Desktop, Or A Dialog Box Appears To Initialize Disc](#)

PC Card

[PC Card Will Not Insert](#)

Sound

[No Sound And Sound Control Panel Indicates An External Device Is Plugged In](#)

Video

[No Display, Or Dim Display, But Computer Appears To Operate Correctly](#)

[No Video On External Device Connected Via S-Video Port](#)

[No Video On External Device Connected To External Monitor Port](#)

Misc. symptoms

[Latch Not Working](#)

[Date And Time Resets All The Time](#)

[-3278 Error](#)

[Microphone Not Working](#)

[Beeps Are Heard at Startup \(one to four beeps\)](#)

[Dialog Box "Built-in Memory Test Has Detected an Error" Comes Up On Startup](#)

Display

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



AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: AirPort Card Not Recognized

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

AirPort Card not recognized.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Use Software Update control panel or see the [Apple Software Updates](#) web page to make sure the latest version of AirPort software is installed.
2. Boot using Mac OS All extensions setting.
3. Reseat AirPort Card.
4. Remove and reinstall the AirPort software.
5. Replace with known-good AirPort Card.
6. Replace logic board.

Document Information

Product Area: PowerBook G4
Category: PowerBook G4 Hardware
Sub Category: Troubleshooting
Keywords: kpbook kssts hts
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AppleCare Knowledge Base: Assisted Search

TITLE**PowerBook G4: Battery Will Not Eject**

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

Releasing the battery latch does not eject the battery.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Flip over the unit and release the battery latch by sliding the latch towards the PC Card button.
2. If the battery still will not eject, while holding the latch towards the PC Card button, use a small plastic flat-blade tool to pry the battery around the battery latch.
3. Verify proper latch operation, by exercising the latch. If it does not move smoothly or evenly, replace rib chassis assembly.
4. If the latch does exercise correctly, verify that the customer is not installing the battery with excessive force.

Document Information

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: Hard Drive Will Not Initialize

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

Hard drive will not initialize

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Boot from PowerBook G4 Software Install CD and see if the hard drive mounts on the desktop.
2. Launch Drive Setup and update hard drive driver.
3. If no hard drive is found in Drive Setup, verify the hard drive cable connections.
4. Replace hard drive cable.
5. Replace hard drive.

Important: If the computer is under warranty and data recovery is required, refer to Article 31077: [Hard Drive Data Recovery & Warranty Implications](#), for important information.

Document Information

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: No Modem Dial Tone

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

No modem dial tone.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Verify known-good analog (not digital) telephone line.
2. Verify known-good RJ11 telephone cable.
3. Verify RJ11 cable is not plugged into Ethernet port.
4. Inspect RJ11 connector and modem port for pin damage.
5. Verify RJ11 telephone cable is firmly installed in the modem port.
6. If using Apple Remote Access, select Ignore Dial Tone in the Modem control panel. If the modem connects with this settings selected, try another phone line. If using a terminal or communications program, enter atx1 to disable tone detection. To reset the modem back to the factory settings, enter atz.
7. Verify RJ11 modem cable is plugged into modem correctly.
8. Replace modem.

Document Information

Product Area: PowerBook G4

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: DVD Disc Icon Does Not Show Up On Desktop, Or A Dialog Box Appears To Initialize Disc

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

DVD disc icon does not show up on desktop, or a dialog box appears to initialize disc.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Use Software Update control panel to update firmware.
2. Try cleaning the disc. If it is dirty or scratched, it may not mount.
3. Try a different disc.
4. Select "Mac OS All" in the Extensions Manager control panel and restart.
5. Replace optical drive cable.
6. Replace optical drive.

Document Information

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: PC Card Will Not Insert

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

PC Card will not insert into the PC Card slot.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Make sure the PC Card eject button is in, before attempting to insert a PC Card.



2. Make sure the PC Card is right side up (cards are keyed and cannot be inserted upside down).
3. Verify the PC Card is not warped or damaged in any way; if so replace the card.
4. Try a different PC Card.
5. Carefully raise the PC Card slot cover and check for a foreign object inside the slot.
6. Check to see if the AirPort Card antenna wire is protruding up into the PC Card slot opening from below. If so, open the computer to gain access to the AirPort Card location and reposition the antenna cable so that it does not sag down into the PC Card slot area (see AirPort Card Installation Instructions).
7. If the slot cover is preventing the card from being inserted, replace the top case.

8. Replace Card Cage, PCMCIA assembly.

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: No Sound And Sound Control Panel Indicates An External Device Is Plugged In

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

No sound heard and the Speakers section of the Sound control panel indicates that an external device is plugged in (to the headphone jack or USB ports).

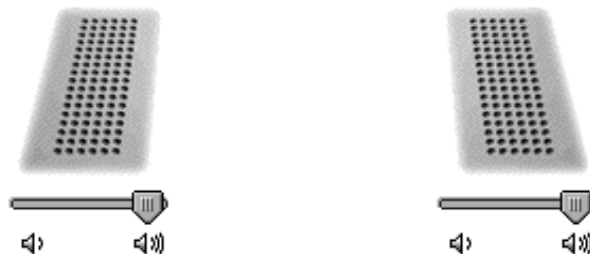
DISCUSSION

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Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. If there is nothing plugged into the headphone jack or USB ports, the picture in the Speakers section of the Sound control panel should be of the internal speakers, as shown here.



2. If not, and if nothing is plugged in, try plugging in headphones or external speakers. Restart the computer. Remove the device.
3. [Reset PRAM](#) (Press the power button, then hold down the Option-Command-P-R keys until you hear the startup chime at least one additional time after the initial startup chime).

Warning: Resetting the PRAM will permanently remove a RAM disk, if present, and all of its contents. You will also need to reset the date and time (using the Date & Time control panel).

4. Replace logic board.

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: No Display, Or Dim Display, But Computer Appears To Operate Correctly

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

No display, or dim display, but computer appears to operate correctly.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Remove any connected peripherals.
2. Try known-good power outlet, power adapter and power cord.
3. Press the F2 key (with the fn key pressed and not pressed) to increase the screen brightness settings.
4. Reboot the computer—hold down the Control and Command keys and press the Power button to restart the computer. Or, press and hold the Power button for 5 to 10 seconds to shut down the computer, then press the Power button to restart.
5. Verify inverter cable and LVDS cable connections are seated properly and that the cables are not damaged (refer display assembly replacement instructions).
6. Replace inverter board.
7. Replace display assembly.
8. Replace logic board.

Document Information

Product Area: PowerBook G4
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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: No Video On External Device Connected Via S-Video Port

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

Computer appears to work, but no video on external device connected to the TV out port (S-video out port).

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. The device must be connected to the S-video port while the PowerBook is sleeping or off for the device to be recognized.
2. If running Mac OS X, verify that this issue is also in Mac OS 9.
3. Verify monitor that is used in testing is known-good and is supported by this computer.
4. Try different cable(s).
5. Replace logic board.

Document Information

Product Area: PowerBook G4
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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: No Video On External Device Connected To External Monitor Port

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

No video on an external device connected to the External monitor port.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. In the Resolution control strip, see if the device is being recognized. If so select resolution.
2. If running Mac OS X, verify that this issue is also in Mac OS 9.
3. Verify monitor that is used in testing is known-good and is supported by this computer.
4. Try another VGA monitor cable.
5. Restart the computer and test again.
6. Replace logic board.

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AppleCare Knowledge Base: Assisted Search

TITLE**PowerBook G4: Latch Not Working**

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

The latching mechanism that holds the display closed is not working.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

Note: When the display is being closed, a hook in the top of the display housing should be magnetically pulled down to the latch. When the latch button is pushed, the hook should release and retract into the display housing.

1. Verify hook operation by exercising the latch mechanism.
2. If the hook does not operate properly, replace the display assembly.
3. If the latch or latch button does not operate properly, replace the top case assembly.

Document Information

Product Area: PowerBook G4
Category: PowerBook G4 Hardware
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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: Date And Time Resets All The Time

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

The Date and Time settings reset all the time.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

Note: Resetting the power manager or PRAM resets the date and time.

1. Verify that the [reset button](#) is not stuck.
2. Do a backup battery test:
 - Set the date and time.
 - Perform a Shut Down from the Apple menu or Special menu.
 - Remove the main battery and disconnect the power adapter for 10 minutes.
 - Connect the power adapter, insert the battery, and power on the computer.
 - If the date and time were lost the backup battery may be dead or discharged.
 - Remove the main battery from the unit and leave the PowerBook plugged in for at least 5 hours.

Note: If a discharged main battery is installed in the computer, recharging the backup battery may take up to 48 hours to completely charge. It is okay to use it while it is charging.
 - If the date and time still reset, replace the backup battery.
3. If not the backup battery, replace PMU Card.

Note: For main and backup battery part numbers, refer to article 11751: [Macintosh Family: Batteries and Part Numbers](#).

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Product Area: PowerBook G4
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AppleCare Knowledge Base: Assisted Search

TITLE**PowerBook G4: -3278 Error**

Writer: Huckabone, Michael

Created: 2001-7-20

Modified: 2001-8-17

TOPIC

AirPort Card installed and received a -3278 error.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Use Software Update control panel or see the [Apple Software Updates](#) web page to make sure the latest version of AirPort software is installed.
2. Boot using Mac OS All extensions setting.
3. Reseat AirPort Card.
4. Remove and reinstall the AirPort software.
5. Replace with known-good AirPort Card.
6. Replace logic board.

Document Information

Product Area: PowerBook G4
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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: Microphone Not Working

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

The microphone is not working.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. Check the Sound control panel and verify that the selection for input is the built-in microphone.
2. Check the signal level and level meter and adjust the gain.
3. Remove Sound Preferences from the Preferences folder and restart.
4. [Reset PRAM](#) (Press the power button, then hold down the Option-Command-P-R keys until you hear the startup chime at least one additional time after the initial startup chime).
5. If no sound as well as microphone is not working, verify cable connections.
6. Replace top case.

Document Information

Product Area: PowerBook G4
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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: Beeps Are Heard at Startup (one to four beeps)

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

The computer automatically performs a power-on self test when it is turned on after being fully shut down (not a restart). This article explains what to do if one to four beeps are heard.

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

Note: The PowerBook G4 has two memory expansion slots and accepts 1.5-inch (or shorter) PC-100 compliant, SO-DIMM memory cards; there is no RAM on the logic board itself. Refer to Customer-Installable-Parts Memory Replacement instructions for removal and installation.

One beep: No RAM is detected.

Note: There is no RAM on the logic board itself, so the computer will beep if no memory is installed in at least one of the RAM slots.

- Put the original RAM that came with the computer back in, or put in known-good and compatible RAM and restart.
 - If symptom does NOT repeat, replace RAM card/s.
 - If symptom repeats, replace logic board.

Two beeps: EDO memory is installed in the RAM expansion slot. The PowerBook does not accept EDO memory.

- Replace RAM card/s with known-good and compatible RAM and restart.
 - If symptom repeats, replace logic board.

Three beeps: No RAM banks passed memory testing.

1. If a RAM card is installed in the upper expansion slot (if not, skip to next step), remove it

and restart.

- If symptom does NOT repeat, replace RAM card.
- If symptom repeats, replace RAM in lower RAM slot with known-good and compatible RAM card and restart.
 - If symptom repeats, replace logic board.

2. If a RAM card is NOT installed in the upper expansion slot, replace RAM in lower RAM slot with known-good and compatible RAM card and restart.

- If symptom repeats, replace logic board.

Four beeps: Bad checksum for the remainder of the boot ROM. The ROM (which is located on the logic board) is bad.

- Replace RAM card/s with known-good and compatible RAM and restart.
 - If symptom repeats, replace logic board.

Related articles:

58442: [Power On Self-Test Beep Definition - Part 2](#)

95132: [PowerBook G4: Installing or Replacing Memory](#)

Document Information

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AppleCare Knowledge Base: Assisted Search

TITLE

PowerBook G4: Dialog Box "Built-in Memory Test Has Detected an Error" Comes Up On Startup

Writer: Huckabone, Michael
Created: 2001-7-20
Modified: 2001-8-17

TOPIC

During startup boot sequence and before reaching Finder, the following dialog box appears: "The built-in memory test has detected an error."

DISCUSSION

***RESTRICTED: Apple Specialists/Apple-Authorized Self-Servicing Providers *
Internal Use Only**

Troubleshooting Procedure

The steps to solve a symptom are listed sequentially. You might not need to perform every step before the symptom is solved. Start with the first step, and then test for the symptom. If the symptom persists, replace any modules you removed, go to the next step, and test again. Continue down the list until the symptom is solved.

1. If a RAM card is installed in the upper expansion slot (if not, skip to next step), remove it and restart. Refer to Customer-Installable-Parts Memory Replacement instructions.
 - If symptom does NOT repeat, replace RAM card.
 - If symptom repeats, replace RAM in lower RAM slot with known-good SDRAM SO-DIMM RAM card and restart.
 - If symptom repeats, replace logic board.
2. If a RAM card is NOT installed in the upper expansion slot, replace RAM in lower RAM slot with known-good SDRAM SO-DIMM RAM card and restart. Refer to Customer-Installable-Parts Memory Replacement instructions.
 - If symptom repeats, replace logic board.

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Display

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

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. Knowledge Base article 112125: Service Diagnostics Matrix, has the LCD Tester Diagnostic Utility that will generate these patterns on the screen.
2. Using a jeweler's loupe, pocket microscope, or other magnifying device, identify and count each pixel anomaly:
 - Bright subpixel anomaly = subpixel that is always on
 - Dark subpixel anomaly = subpixel that is always off
3. The number of acceptable pixel anomalies for this system is:

Acceptable Number of Subpixel Anomalies

Bright	Up to 3
Dark	Up to 5
Combination	Up to 7

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

Replace

Bright	4 or more
Dark	6 or more
Combination	8 or more

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 are considered acceptable, and these factors apply to all manufacturers using LCD technology—not just Apple products.

When speaking with customers, please use the following explanation:

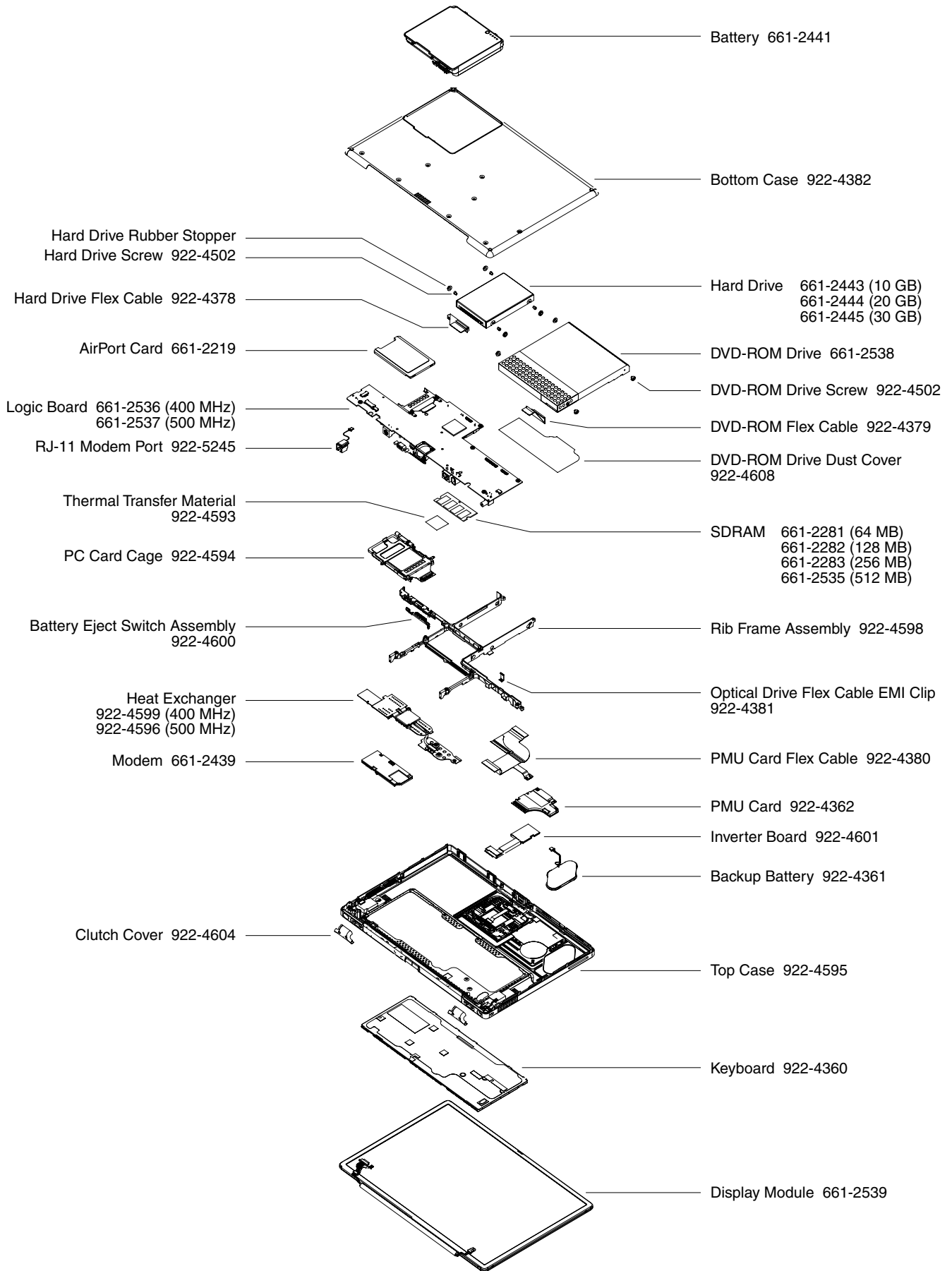
Active-matrix LCD technology uses rows and columns of addressable locations (pixels) that render text and images on screen. Each pixel location has three separate subpixels

(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 are 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.



Views
PowerBook G4



PowerBook G4 Exploded View