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PowerBook: Power & Battery Frequently Asked Questions (4/97)

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TOPIC -----

This document contains the answers to frequently asked questions (FAQ) about PowerBook batteries and power issues.

Questions Answered in this FAQ
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- 1) How do I reset the power manager for my PowerBook?
- 2) I do not seem to be getting the battery life I once did. What should I do?
- 3) What are the various types of PowerBook batteries? Are they interchangeable?
- 4) Through troubleshooting, I have come to the conclusion my PowerBook battery is bad. It is my understanding that this battery contains unpleasant chemicals. How can I safely dispose of this battery?
- 5) What is battery memory? Should I buy a reconditioner for my battery to address battery memory?
- 6) I recently purchased a Type 3 battery for my PowerBook Duo 230. The battery works fine in my PowerBook, but a red light appears on my external battery recharger when I insert the battery. The recharger works fine with the battery that came with my PowerBook. What could be wrong?
- 7) It is my understanding that Apple no longer sells the PowerBook 100 battery. What can I do when my faithful PowerBook 100 needs a new battery?
- 8) I recently purchased a new battery for my 500 series PowerBook. My PowerBook isn't charging/recognizing this battery. What should I do?
- 9) How long can I store my PowerBook battery?

- 10) My PowerBook will not start off battery at all. Should I just buy a new battery, or is there something else I can do?
- 11) How can I increase my PowerBook computer's battery life?
- 12) What is processor cycling and how do I turn it off?
- 13) Can I charge my PB from a car cigarette lighter?
- 14) I am taking my PowerBook to another country, do I need a power converter?
- 15) Can the PowerBook 5300/190 use two batteries simultaneously?
- 16) Where else can I go for answers?

DISCUSSION -----

- 1) Question: How do I reset the power manager for my PowerBook?

Answer: Listed below are the particular methods for resetting the power manager on all PowerBook computers. Resetting the power manager can be useful if the computer does not turn on at all or if it is displaying power-related anomalies. Corruptions in the power manager are typically caused by power surges. Plugging in the PowerBook improperly can also corrupt the power manager code. The AC adapter should always be connected to a live AC outlet before it is plugged into or removed from the PowerBook.

*** WARNING ***** WARNING ***** WARNING ***** WARNING ***** WARNING ***

All of the following Power Manager Reset procedures for all of the Macintosh PowerBook computers will permanently remove a RAM disk, if present, and all of its contents.

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What Causes The Power Manager To Need Resetting?

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While there are several reasons a PowerBook may need its power manager circuitry reset, most of which involve some kind of power interruption to the unit, there is one very common cause - improper use of the AC Adapter.

The PowerBook power manager circuitry is most often "corrupted" by the AC Adaptor not being plugged into the PowerBook in the proper order. The AC Adapter should ALWAYS be plugged into the AC (wall) outlet before it is plugged into the PowerBook itself.

If you are using a power surge protector bar, make sure the power bar is powered on (usually has some kind of indicator light) before you plug the PowerBook AC Adapter into it. Also never turn off the power to the PowerBook by turning off the power bar's switch.

PowerBook 100

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Step 1

Remove the AC adapter and the battery.

Step 2

Flip the battery contact switch on the rear of the unit to the down position.

Step 3

Let the unit sit without power hooked up for 3-5 minutes.

Step 4

Simultaneously press and hold the rest and interrupt buttons on the side of the unit for 15 seconds.

Step 5

Reinstall the battery, reconnect the AC adaptor if necessary and flip the battery contact switch on the rear of the unit to the up position.

PowerBook 140, 145, 145 B and 170

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Step 1

Remove the AC Adapter and the battery.

Step 2

Let the unit sit without power connected for 3 to 5 minutes.

Step 3

Using two paper clips, simultaneously press and hold down the reset and interrupt buttons for 5-10 seconds.

* Both recessed buttons (commonly known as the reset and interrupt buttons) are located next to the power button on the back panel of the PowerBook.

Step 4

Reinstall the battery and, if necessary, reconnect the AC adapter.

PowerBook 160, 165, or 180

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Step 1

Remove the AC Adapter and the battery.

Step 2

Let the unit sit without power connected for 3 to 5 minutes.

Step 3

Reinstall the battery and, if necessary, reconnect the AC adapter.

NOTE: Steps 1 & 2 will usually reset the power manager, however if the computer still exhibits the same problem, redo steps 1 & 2 and then follow the steps listed below before reinstalling the battery.

* Using two paper clips, simultaneously press and hold down the reset and interrupt buttons for 5-10 seconds.

* Both recessed buttons (commonly known as the reset and interrupt buttons) are located next to the power button on the back panel of the PowerBook.

PowerBook 150

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Step 1

Remove the power adapter and battery from unit.

Step 2

Push the reset button in the back of the unit with a paper clip and hold for 5 to 10 seconds.

Step 3

Plug the AC Adapter into the AC (wall) outlet.

Step 4

Reconnect the power adapter and push the reset button in back again, but just briefly. You should hear a small pop from the speaker; do not be concerned.

Step 5

Push main power button in back (large exposed button). The unit should power up.

Step 6

Apple suggests charging the battery for at least 8 hours before running on

battery power.

If the PowerBook powers on, the battery may be reinserted. If it fails to start, the PowerBook may require service.

PowerBook 500 series

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Step 1

Remove the AC adapter and the battery.

Step 2

Let the unit sit without power hooked up for 3-5 minutes.

Step 3

Simultaneously press and hold down the Command, Option, Control, and Power On keys for 5-10 seconds.

Step 4

Reinstall the battery and, if necessary, reconnect the AC adapter.

PowerBook 200 and 2300 Series

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Follow this procedure on the PowerBook 200 and 2300 (Duo) series computers:

Step 1

Press and hold the power button on the rear of the 200 or 2300 series computer for 30-45 seconds.*

Step 2 (see Caution)

If resetting the power manager chip does not solve the problem, reset the code for the power manager chip by removing all power sources and letting the unit sit for 10 minutes. (Disconnect the AC adapter, remove the battery and the internal backup batter.) This forces the PowerBook Duo to reload the power manager code from the system software.

Caution

Authorized Apple Service technicians may remove the internal back up battery to reset the power manager. If you are not an authorized Apple Service technician, please note that removing the internal backup battery is not a simple procedure and is not recommended. If anything is damaged in your attempt to remove the battery, it will not be covered under warranty.

PowerBook 190, 1400, 3400 & 5300 Series

The PowerBook 190, 1400, 3400 & 5300 Series have two different ways to reset the power manager. The only difference between series is the location of the reset button. See the table below for the location of the reset button for each PowerBook series.

Begin_Table

PowerBook	Reset Button Location (on rear of computer)
-----	-----
190 Series	Below the video out port
1400 Series	Between the ADB and Serial ports
3400 Series	Left of the Serial port
5300 Series	Below the video out port

End-Table

Resetting the Power Manager

Step 1

If the computer is on, turn it off.

Step 2

Restart the computer by holding down the reset button for 10-20 seconds. (See chart above for location of the reset button for your PowerBook series.)

Step 3

If the computer does not restart, repeat step 2 three or four times.

Resetting the Power Manager and PRAM

Resetting ("Zapping") the Parameter RAM (PRAM) when the computer is shutdown also resets Power Manager (also called the "PG&E"). This process resets both the power manager and the Parameter RAM.

Step 1

If the computer is on, turn it off.

Step 2

Make sure the Caps Lock key is not down.

Step 3

Restart the computer. Immediately after hearing the startup sound, simultaneously press and hold down the Command-Option-P-R keys. (If you do not hold down the key combination within 5-10 seconds after the computer restarts, you will need to repeat steps 1-3.)

Step 4

Hold down the keys until you hear the startup sound again. Then release the keys.

Step 5

If the computer shuts itself off, press the reset button on the back of the computer to turn it back on. (See chart above for location of the reset button for your PowerBook series.)

Step 6

When the computer has finished starting up, restore any custom settings for the desktop pattern, memory, network, AppleTalk, trackpad, power conservation and so forth.

PowerBook 5300 or 190 That Won't Power On

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This process resets both the power manager and revives PowerBook 5300 and 190 computers which do not initially turn on. In other words, reviving a machine that appears to be a "dead" unit.

Step 1

Unplug AC adapter and remove battery.

Step 2

Press and hold the Reset button on the back of the machine for about 45 seconds. (See chart above for location of the reset button.)

Step 3

Plug the AC Adapter into the AC (wall) outlet.

Step 4

Attach only the AC Adaptor to the PowerBook (don't put in the battery).

Step 5

Press the Reset button one more time and the PowerBook should startup after a brief pause.

*** WARNING ***** WARNING ***** WARNING ***** WARNING ***** WARNING ***** WARNING ***

All of the aforementioned Power Manager Reset procedures for all of the Macintosh PowerBook computers will permanently remove a RAM disk, if present, and all of its contents.

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The Power Manager code can be fully purged by having an authorized service technician disconnect the internal backup battery and let the unit sit for 1 minute with all power removed (the battery pulled and the AC Adapter disconnected). This forces the PowerBook to reload a fresh copy of the code from the system software.

*** WARNING ***** WARNING ***** WARNING ***** WARNING ***** WARNING ***** WARNING ***

Authorized Apple Service technicians may remove the internal back up battery to reset the power manager. If you are not an authorized Apple Service technician, please note that removing the internal backup battery is not a simple procedure and is not recommended. If anything is damaged in your attempt to remove the battery, it will not be covered under warranty.

2) Question: I do not seem to be getting the battery life I once did. What should I do?

Answer: The Apple Technical Information Library contains some good articles on maximizing battery life. Use the search string "PowerBook and tips" to find the article "PowerBook: Power and Battery Saving Tips." In general, for all PowerBook computers experiencing decreasing battery life, you will want to reset the PowerBook power manager, and check power conservation settings in the PowerBook control panel.

Next, with the PowerBook 140-190, 200, 2300, 500, and 5300 series computers, recondition the battery. To do this, operate as long as possible off the PowerBook battery, then shut down and charge the battery overnight. If performance is still not as good as should be expected, you are likely dealing with a bad battery. The PowerBook 270c, 280, 280c, 2300, 190, and 5300 can use the Battery Reconditioning software (included on the Battery Tools disk or in the Utilities Folder on the Hard Drive) to recondition the battery automatically. The PowerBook 500 series can use the Intelligent Battery Update.

You can download Battery Tools 2.0 and the Intelligent Battery Update at the following path:

Apple Software Updates -> U.S. -> Macintosh -> System Software -> Other System Software.

Note that the PowerBook 200 and 2300 series computers use a different version of the Battery Reconditioning program than the PowerBook 5300 and 190 series computers do. The version that the PowerBook 5300 and 190 series computers use is not currently available on-line.

3) Question: What are the various types of PowerBook batteries? Are they interchangeable?

Answer: All 100 series PowerBook computers except the PowerBook 100 use a nickel-cadmium (NiCad) battery. The PowerBook 100 uses a lead acid battery. The PowerBook 100 must use a lead acid battery, and no other 100 series PowerBook can use the PowerBook 100 type battery. Other than that, the 100 series batteries are interchangeable. Color 100 series PowerBook computers should be used with NiCad batteries model number M5654.

All 200 series PowerBook computers use nickel metal hydride (NiHy) batteries. PowerBook 200 series batteries are interchangeable, but earlier 200 series PowerBook computers, such as the PowerBook Duo 210 or 230, will require special software to use later model batteries, such as the Type 2 or Type 3 battery. The 2300 series uses the Type 3 battery. Use of a Type 2 battery requires PowerBook Duo Enabler 1.0 or System 7.5; use of a Type 3 battery requires the Type III Battery Extension, PowerBook Duo Enabler 2.0 and system software 7.1.x, or System 7.5. Note that System 7.5.1 requires the Type III Battery Extension only if you are using an Apple external battery recharger.

All 500 series PowerBook make use of a nickel metal hydride (NiHy) intelligent battery. There is only one type of battery for this family of PowerBook computers, and it can be used by any 500 series PowerBook.

The 5300 and 190 series PowerBook computers also use nickel metal hydride (NiHy) batteries.

4) Question: Through troubleshooting, I have come to the conclusion my PowerBook battery is bad. It is my understanding that this battery contains unpleasant chemicals. How can I safely dispose of this battery?

Answer: Apple utilizes lead-acid, nickel-hydride, and nickel-cadmium batteries in our portable products. These batteries should be returned to Apple for recycling or proper disposal.

Customers can take their failed batteries to an Apple-authorized service provider who can utilize the Apple Direct Air Shipping and Handling Program to return the failed batteries.

If the batteries are physically damaged, do not attempt to return them to Apple. Dispose of them according to your local ordinances.

5) Question: What is battery memory? Should I buy a reconditioner for my battery to address battery memory?

Answer: For an overview of battery memory, review the article "PowerBook Batteries: Memory Effect" available in the online Apple Technical Information Library. Use the search string "powerbook battery and memory" to locate this article.

In general, any PowerBook battery except the lead acid battery used by the PowerBook 100 can experience battery memory. Battery memory describes a condition where a battery is only partially discharged, then recharged. Over

time, the battery can reach a point where the perceived capacity of the battery is that level to which it has been draining to. If the battery is fully drained periodically, this effect can be minimized or eliminated.

There are third-party external battery rechargers that perform a deep discharge of the PowerBook battery as a prelude to charging. There are also a variety of software utilities made by Apple and third-party companies that will automatically fully discharge and recharge the battery.

6) Question: I recently purchased a Type 3 battery for my PowerBook Duo 230. The battery works fine in my PowerBook, but a red light appears on my external battery recharger when I insert the battery. The recharger works fine with the battery that came with my PowerBook. What could be wrong?

Answer: First, check the model number on the bottom of your battery recharger. A recharger with a model number of M7778 will only charge Type 1 batteries. A recharger with a model number of M1812 will charge Type 1, 2 or 3 batteries, but may need to be updated to use a Type 3 battery.

To update your battery recharger for a Type 3 battery, follow these steps:

If a red light appears when you place a Type 3 battery into the recharger, the recharger is either the older model or the recharger needs to be updated.

If you have a recharger model M1812 and you need to update it, follow these steps:

Step 1

Shut down the PowerBook Duo computer, make sure the Type 3 battery and any necessary software has been installed. If you're running System 7.5.1 the Type III Battery extension must be installed.

Step 2

Plug the power adapter into an AC outlet using the power cord that came with the computer.

Step 3

Snap the recharger onto the side of the power adapter.

Step 4

Plug the power adapter cable into the power adapter port on the back of the Duo computer.

Step 5

Turn on the PowerBook Duo to download the update to the charger.

7) Question: It is my understanding that Apple no longer sells the PowerBook 100 battery. What can I do when my faithful PowerBook 100 needs a new battery?

Answer: Apple continues to make PowerBook 100 batteries available as a service part and any Apple-authorized service provider can order it. The service part number for a PowerBook 100 battery is 661-0782. Additionally, a number of third-party companies make batteries for the PowerBook 100.

8) Question: I recently purchased a new battery for my 500 series PowerBook. My PowerBook isn't charging/recognizing this battery. What should I do?

Answer: Try running the Intelligent Battery Update on your battery. This will update and fix the battery if needed, or let you know that the battery needs to be replaced. The Intelligent Battery Update can be found at the path Apple Software Updates -> Macintosh -> System Software -> Other System Software.

If the Intelligent Battery Update does not alleviate the symptoms, try resetting the power manager on the PowerBook by following these steps:

Step 1

Shut down the PowerBook using the Special menu.

Step 2

Press the Command-Option-Control-Power On keys simultaneously and let go. Pressing the keys will not appear to do anything.

Step 3

Press the Power On key to start up the PowerBook. Your brightness and contrast settings may be reset and you may need to adjust them in order to see the screen.

If the symptom is still not resolved, the battery may need replacement. You can contact the Apple Assistance Center at 800-SOS-APPL (800-767-2775) or contact the Apple Referral Center at 800-538-9696 to obtain a phone number for an Apple-authorized service provider in your area.

9) Question: How long can I store my PowerBook battery?

Answer: Apple uses three different types of batteries in the PowerBook series of computers. All 100 series PowerBook computers, save the 100, use a Nickel Cadmium (NiCad) battery. The PowerBook 100 uses a lead acid battery. Both 200 and 500 series PowerBook computers use a Nickel Metal Hydride (NiHy) battery.

A lead acid battery should retain the minimal charge needed to operate a PowerBook 100 for at least 3 months. Once a lead acid battery becomes fully discharged, it may experience sulfation. Sulfation occurs when the lead electrodes inside the battery convert to lead sulfate. This destroys the battery making it unable to hold a charge.

A NiCad battery should retain the minimal charge needed to operate a 100 series PowerBook for at least 2 months. A NiCad battery stored for 6 to 12 months should still be able to accept a charge.

A NiHy battery should retain the minimal charge needed to operate a 200 or 500 series PowerBook for at least 2 months. A NiHy battery stored for 6 to 12 months should still be able to accept a charge. In the case of the Intelligent Battery used by the PowerBook 500 series, the Intelligent Battery Recondition software is often needed to revive a battery that has discharged fully while in storage.

The environmental temperature will affect the storage life of any battery - cool environments are best.

10) Question: My PowerBook will not start off battery at all. Should I just buy a new battery, or is there something else I can do?

Answer: Generally when a PowerBook battery goes bad, it provides less operating life over a period of time. If your PowerBook suddenly will not work with its battery at all, this could be an issue with the battery itself, or the logic board of your PowerBook. If possible, try your battery with another PowerBook, or try a verified-good battery in your PowerBook to help isolate the issue.

If you are not in a position to try a known good battery or verify your own battery with another PowerBook, there are still some steps you can take. First, reset the power manager of your PowerBook. Instructions for resetting the power manager on various model PowerBook computers are available in this document or at the online Technical Information Library. Use the search string "power manager and reset" to locate the article "PowerBook: Resetting Power Manager." Charge the battery overnight following this reset.

If your PowerBook still will no longer work with its battery after this process, you should seek service. Contact your local Apple-authorized service provider, or call 800-767-2775 for further assistance.

11) Question: How can I increase my PowerBook computer's battery life?

Answer: The two operations of your portable computer that drain the battery the most are using the backlight on your screen and using your hard drive. To increase battery life reduce these two factors. Set your hard drive to spin down quickly and turn off your backlight or sleep the machine when not in use. In addition, turning on processor cycling or using the slower processor speed available on some models will increase your battery life. These options are available in the PowerBook control panel.

Some steps to reduce hard drive usage are disconnecting any external peripherals, removing PC (PCMCIA) cards, increasing your disk cache in the Memory control panel, increasing the memory allowance for programs, and running frequently used programs off a ram disk, esp. if they are disk intensive.

For more information on this subject read the Tech Info Library article titled,

"PowerBook: Power and Battery Saving Tips".

12) Question: What is processor cycling and how do I turn it off?

Answer: All PowerBook models except those using the PowerPC processor implement a feature called processor cycling (formerly known as processor rest) intended to save battery life. This feature activates when the computer detects that the keyboard, mouse, trackball, or Trackpad has not been used for more than a few seconds. At this time, the processor speed is reduced to about 3 MHz and all processing functions become extremely slow. Processor cycling will not activate while the computer is doing any sort of data transfer.

Note that by default processor cycling is on, and although it is intended to for battery life conservation, it will also activate while running off AC power.

The method of turning off processor cycling will depend on the version of the system software you are using:

System 7.0.1

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Step 1

Open the Portable control panel.

Step 2

While holding down the Option key, click on the word "Minutes".

Step 3

Select Don't Rest and click OK.

System 7.1

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Step 1

Open the PowerBook control panel.

Step 2

While holding down the Option key on the keyboard, click the Options... button in the control panel.

Step 3

Select "Don't allow cycling".

System 7.5 or later

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Step 1

Open the PowerBook control panel.

Step 2

Make sure the toggle switch in the control panel is set to Easy.

Step 3

While holding down the Option key on the keyboard, drag the toggle switch from Easy to Custom and let go.

Step 4

Uncheck the "Allow processor cycling - more battery savings" checkbox.

13) Question: Can I charge my PB from a car cigarette lighter?

Answer: Yes, there are several commercial auto adapters on the market. We have not been able to get a complete listing of the available adapters, but a trip to your local computer store, or a call to standard mail order companies should provide you with enough information.

14) Question: I am taking my PowerBook to another country, do I need a power converter?

Answer: All of the PowerBook AC "bricks" are capable of AC power specifications from around the world. To verify, there should be a line on the AC adapter stating

AUTO RANGING INPUT:100-120V~1.5A 200-240V~0.75A.

If your AC adapter has this on it, it will adjust to the proper voltage.

Note: You will need an adapter to allow you to plug your power cord into a "foreign" plug. These are available at stores such as Radio Shack.

15) Question: Can the PowerBook 5300/190 use two batteries simultaneously?

Answer: Yes, the PowerBook 5300/190 expansion bay (where the floppy disk drive normally is) can accept a battery. BTI (800-982-8284) is in the process of releasing such a battery as of this writing. Since the expansion bay does not pass AC power through, any battery used through the expansion bay will require its own power supply for charging.

16) Question: Where else can I go for answers?

Answer: If you haven't done so already, check the other PowerBook FAQ documents. Also, depending on where you found this FAQ, you should have access to Apple's Technical Information Library (TIL). This library contains thousands of technical articles which are easily searchable using boolean search strings.

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This article is one of many available through the Apple Fax center. For a complete list of available fax documents, search the Tech Info Library for Apple Fax Document Index or call the Apple Fax line at 1-800-505-0171 and select document number 20000 (Apple Fax - Document Index - Product Support Literature).

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