

Caring for a Laptop Computer's Rechargeable Battery

There is a general misconception on the proper use and care of most rechargeable batteries for laptop/notebook computers. Many people use their laptop with the AC adapter plugged in almost continuously and are disappointed one day when they are no longer able to power their machine on. Another common mistake is to use the computer's battery and AC adapter improperly; as the battery discharges under use and then recharges, its 'memory' (charge) threshold level is lowered proportionally to how deeply it was discharged. The less deeply the battery is charged the lower its life expectancy. Sometimes machines using sealed lead-acid batteries must be handled in a different way than nickel-cadmium's (NiCad's) in order to avoid damage. Nickel metal hydride (NiMH) batteries should be treated as you would a NiCad battery although they have less trouble with a lowered memory threshold level than does the NiCad battery. Be sure to check your manual to see which type battery your machine uses and for any other differences your particular machine may have. Personal usage may require you to modify the way you follow the guidelines outlined below to a certain extent but if you understand and follow the general concepts you can still help to promote your battery's good health.

Do's & Don'ts:

Normal usage: Nicad and NiMH batteries should occasionally be discharged completely before you recharge it (*for lead acid batteries see Warnings section below*). Use the computer directly from the battery; do not plug in the power adapter. When warned that the battery is low, plug in the power adapter while you continue your work. Turn the computer off when you are finished but leave it plugged in to recharge 5-12 hours (see the manual for your particular machine).

Purging NiCad and NiMH batteries (only): Depending on usage, but about once a month for NiCad batteries and once every three months for NiMH batteries, purge the battery (*sealed lead-acid batteries see Warnings section*). Leave the computer turned on *without* the AC adapter plugged in with screen blanking and sleep disabled. When the display disappears and the battery is discharged, plug the computer in (but powered off) and let it recharge 8-24 hours (see the manual for your particular machine). Periodically you should purge 2-3 times.

Short term storage: Rechargeable batteries do lose their charge over time. For short term storage, shut down and close the display. Recharge the battery and replace in computer's battery bay if it has been removed. Store in a cool, dry place where the temperatures will remain between 10°C/50°F and 40°C/104°F. The computer may be left for up to a week without plugging it into the AC adapter *provided the battery has been fully charged* (see Warnings section). You may also leave the computer plugged in for up to two weeks.

Long term storage: For long term storage follow instructions for short term storage. Periodically recharge the battery; if the battery is left for more than 6 months without being recharged it may not be able to accept a charge. For those computers so equipped, turn off the storage switch which disconnects the battery. There will be one or more backup batteries in addition to the main battery. These backup batteries hold various pieces of information such as the clock setting, RAM disks (if used), etc. If the storage switch on your machine disconnects the backup batteries you will need to restore these settings when the machine is taken out of storage.

Traveling: It is recommended that you discharge and recharge a battery fully (at least one cycle) the day before you plan to use it on a trip and/or where power will not be available.

Warnings:

- Steer clear of any third party devices which attach to the AC connector of the Apple PowerBook and claim to allow replacement of the main battery without shutting down; the logic board can be damaged if the main battery is removed while the power is turned on, even while in sleep mode.
- *Sealed lead acid battery* voltages levels should not fall too low too often; for instance the PowerBook 100 cannot fall below the level where the display shuts down automatically more than four times or the battery may refuse to charge properly. The Macintosh Portable's voltage level, on the other hand, cannot fall below 5.4V even once before it can become damaged.
- With some computers you will lose what is in the RAM disk when purging. Take the appropriate steps to save this information.

- Recharge depleted batteries as soon as possible; they can become damaged if left for more than two weeks in this state. This is particularly true if left in unfavorable conditions such as high temperatures typically found on a window sill or in the trunk of a car.
- Do not use the computer without its main battery installed; when the AC adapter is disconnected the backup battery may start to lose its charge. Some systems have up to three backup batteries.
- Be sure to use the AC adapter made specifically for your computer. Power, etc., levels may differ and could damage your computer.
- Shorting the contacts (allowing a conductive material touch both contacts at once) on some batteries can damage it at best or cause severe burns or a fire at worst. If you need to remove the battery from its bay store it in a container supplied by the manufacturer for that purpose or a non-metal container until it can be replaced.
- Be sure you do not put the battery into regular trash collections as it contains hazardous materials. Bring your used battery to your dealer to dispose of when you purchase a new one or dispose of in accordance to local ordinances.
- NiMH, NiCad and sealed lead-acid batteries may discharge chemicals which can cause severe burning of the eyes and skin. Wash any affected area with water for at least 5 minutes without soap if you come in contact with a damaged battery.

Tips:

- If you do happen to find one day that your laptop computer will not power on at all, it could be your battery. Remove the battery and plug the AC adapter into your computer. If it will now power on your battery may need to be purged or replaced, *or* the charging medium may be defective. Try recharging; it may take 15 minutes to a few hours to charge up enough to allow you to power the machine on. If after 12 hours the machine still will not power up, the main battery may need to be replaced. If the AC adapter is defective it may prevent the battery from charging properly.
- If the clock loses its setting as soon as the main battery is removed the backup battery probably needs to be replaced.
- Sometimes a battery will shift slightly in its bay or the contacts will become dirty and the computer will not power on. Remove the battery and clean the contacts with a cotton swab dipped in light alcohol (available in many computer or electronic stores). Replace and recharge if necessary.
- Batteries should last 1 to 2 years. Recharging in slightly cooler than normal temperature helps promote a more full life expectancy.
- Laptops with dual battery bays should swap batteries once a month to allow a more even usage of the battery.
- There are rechargers on the market which have an added option to run a deep discharge prior to recharging. Very often these chargers are faster than charging the battery while installed in the computer. You can recharge the battery while using the machine but it will take longer.
- Batteries can lose their charge if left in a recharger which is not plugged into an electrical outlet.
- If you use an external monitor with your machine you will most likely need to use AC power with it. Be sure to give your battery periods of direct use to preserve its use.