3 Things You Should Already Know About Your Lithium Ion Battery

April 7th, 2007 Paul Mah Leave a comment Go to comments

Too many people I've met have misconceptions, wrong understanding or simply no idea at all about how to maintain the batteries inside their new spanking new electronic gadgets. More often than not, it will be one of those nifty, super-slim lithium-ion variants. So I decided to write this little primer to help you, erm, I mean, your techno-phobic friends along.

Note that my recommendations are catered along the lines of practical convenience as well as pure battery maintenance facts alone. As with everything, there is often more than a way to skin a cat. I do try to explain my rationale behind my recommendations, so do try to read on before clobbering me on the head with your PhD in advanced materials science.

Tip #1: Lithium-ion batteries are limited by their life-spans

Found an e-bay offer for a lithium-ion battery pack for your ageing notebook or PDA at bargain prices? Or saw that battery pack for your gadget in its dusty sealed package at the corner store of the flea market? Before you jump and snap it up, be sure to first check the manufacturer date.

We all know that all batteries are limited by a finite number of charging "cycles". However, it is a little publicized fact that the lifespan of lithium-ion batteries are also limited by their manufacture date.

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The fact is, your lithium-ion battery starts dying the moment it leaves the factory! Of course, the actual life-span of an unused lithium-ion battery can vary by a fair amount based on its internal charge as well as the external temperature. But suffice to say that you can expect to irreversibly lose 20% of a lithium-ion battery's charge every year from its original date of manufacture.

PDA came with more than one spare battery? Take it out of its shrink-wrap and use it interchangeably – today. Thinking of buying a "spare" battery for use in future? Well, just save the money and buy it only when you are ready to use it.

Tip #2: Avoid allowing your device to discharge completely

Every wondered why your modern phone, PDA or iPod is able to cheerfully tell you that "Your battery is now exhausted" for several seconds on its brightly-lid LCD screen before switching

off? The reason is simple; there is an artificial circuit that shuts off the device when the charge in the battery is too low.

This extraneous circuit is built to protect from the damage that could result if the charge of your lithium ion battery falls too low. If you still don't get it: if the charge of your lithium ion battery falls too low, the battery can get irreversibly and permanently damaged. So since Lithium Ion has no "memory effect", it is better to simply charge your portable device as and when you can or remember.

To set your mind at ease, a "charge cycle" means a single iteration of depleting followed by a re-charge until 100% of battery charge. If you consume 50% of your iPod's battery on day 1, recharge to 100% at night, and do the same thing on day 2, then you would have just finished up one charge cycle of its battery life.

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Hence constantly recharging a lithium ion battery does not shorten the battery life more than normal usage would. Avoid letting it sit on empty for too long; instead, keep it charged-up if you can.

Tip #3: Take the battery out of your notebook computer when connected to AC helps... not!

Well ok, actually, taking out the battery from your notebook computer might help, but the reason it does is not really what you think it is.

It is not because of over-charging as most people might believe. There are some really smart circuits monitoring your lithium ion battery (See reason #2 above), and these circuits also ensure that your precious lithium ion never gets overcharged. So leaving the battery in when the AC is on has no detrimental effect whatever on the health of the battery.

However, if there is another killer of lithium ion batteries other than old-age, then it would be heat. Long term exposure of a lithium ion battery to temperatures higher than 40 degrees Celsius permanently reduces its total charge capacity by noticeable percentages chunks per year. Having said that, I would hazard that modern processor like the Centrino Duo runs quite coolly overall.

On the other hand, it is really painful to see someone plug their AC adapter to their laptop, carefully remove the battery and put it aside, then finally sit down and switch on their laptop. Then have someone trip over their AC adapter an hour into an unsaved document. Ouch.

Unless you are setting up the laptop at Wal-Mart or Carrefour to run practically 24/7 until its time to sell it off at "display unit" pricing, my recommendation would be to save yourself the

trouble and just leave the battery in. Actually, I think the real motivation to take the battery out of shop display units is to prevent theft. Really, why make it so inconvenient for yourself when the battery will be literally unusable in a few years time.

So there you go – just my 2 cents worth. Feel free to leave your comments.