Bits & Bytes

Arkansas' Premier Computer Club

June 2024

The Bella Vista Computer Club - John Ruehle Center

Highlands Crossing Center, 1801 Forest Hills Blvd Suite 208 (lower level), Bella Vista, AR 72715

Website: http://BVComputerClub.org **Email: editor@bvcomputerclub.org**

MEETINGS

Board Meeting: June 10, 6pm, in John Ruehle Training Center, Highlands Crossing Center.

General Meeting: June 10, 7pm. Program: "Q & A: Panel of Experts", with Woody Ogden and Joel Ewing.

We will meet in-person in John Ruehle Training Center, Highlands Crossing Center, lower level, 1801 Forest Hills Blvd, Bella Vista, or you may attend the meeting on-line via Zoom. Zoom access information is published on our website.

Visitors or Guests are welcome.

Consider attending by Zoom if you are unable to attend in-person.

HELP CLINICS

June 1, 9am - noon at John Ruehle center
June 19, 9am - noon at John Ruehle center
Members may request Remote Help on our website at https://bvcomputerclub.org at menu path Member Benefits ►Remote Help .

MEMBERSHIP

Single membership is $30; $15 for each additional family member in the same household.

Join on our website at https://bvcomputerclub.org at menu path Get Involved ►Join/Renew, by mailing an application (from the web site) with check, or complete an application and pay in person at any meeting.

CLASSES

(At BVCC Training Center)

Tuesday, June 18, 9am-noon "Using MS Windows", with Joel Ewing.

Friday June 21, 1pm-4pm, "Introduction To GIMP", with Joel Ewing.

Advance sign up required for each listed class: For reservations: email to edu@bvcomputerclub.org, or sign up at the General Meeting. Classes are **free to Computer Club members.**

Check the monthly calendar and announcements for any last minute schedule changes at https://bvcomputerclub.org .

NEW OR RETURNING BVCC MEMBERS

We are pleased to welcome the following new members or members returning as BVCC members after an absence:

George Ann Billingsley Marcy Flickinger Andy Phillips

Mike Leonard

LITHIUM BATTERIES REVISITED

By Joel Ewing, President, Bella Vista Computer Club
Bits & Bytes, June 2024
https://bvcomputerclub.org
president (at) bvcomputerclub.org

Many mobile devices today use lithium batteries as a power source because of their smaller weight and size. One finds conflicting beliefs and information about how to treat lithium batteries to preserve their performance.

What degrades the Life of A Lithium Battery

Aside from the obvious physical abuse that damages the battery case, which can even result in a hazardous situation, there are several factors that result in gradual degradation of battery capacity. To compensate for this, batteries for specific applications may be deliberately over-designed so that the application requirement will be completely satisfied even if the battery degrades to say 80% of its original capacity. Alternatively, a device could be designed to extend the life of the battery by charging to less than the battery's rated capacity when that is sufficient for the advertised running time.

If a lithium battery is operated within its design constraints, its useful lifetime is approximately related to the total amount of power transferred through the battery. A lithium battery does not have "charge memory" like a NiCad battery, so recharging it after using only a small amount of the battery capacity, does not effectively reduce its capacity.

Lithium batteries do degrade chemically over time. Each cell of the battery contains anode and cathode electrodes with a porous separator between the electrodes and an electrolyte solution that allows lithium ions to move between the electrodes. During charging, the lithium ions move to the anode; during discharging to the cathode.

Over the normal lifetime of the battery a film gradually grows at the interface between the anode and the electrolyte (the Solid Electrolyte Interface or SEI), consuming some of the electrolyte and lithium ions. This reduces the number of lithium ions available for charging, and the film also offers resistance to the ability to charge and discharge the battery cell.

Having a lithium battery sit for an extended period of time at 100% charge causes the battery to age faster than sitting at 80%. If you don't expect to need a full charge and there is an easy way to limit max charge to 80%, limiting the max charge will extend the battery life. You can always top off the battery to 100% when you expect to need the extra capacity for a trip.

Charging a lithium battery at an excessively high rate can cause faster aging by depositing solid lithium on the anode. This can rapidly deplete the number of lithium ions, and the lithium plating inhibits the anode's ability to react even more than the SEI film. Obviously, a battery should be matched with a suitably-designed charging system that avoids this problem.

Overcharging (above 100%) or over-discharging (below 0%) shortens the life of the battery. Overcharging can also cause lithium plating on the anode and in extreme case could result in a fire or other thermal event damage.

The chemical reactions that shorten the battery's life are accelerated by high temperatures. The internal temperature of the battery is affected by its charging or discharging current, and as the battery ages the maximum safe current declines. As the battery ages, its internal resistance increases, further increasing heating during the charging process. When nearing its end-of-life, this causes a lithium battery to decline more rapidly.

All of these factors mean that you would never just plug a lithium battery into a device just because it has the right voltage rating. To effectively and safely utilize a lithium battery requires that the device be designed around the battery and provide a Battery Management System that assures that both the charging and discharging current and voltage fall within the safe operating range of the battery during the battery's lifetime.

iPhone Optimized Battery Charging

The iPhone 13 has an option under Settings, Battery, Battery Health & Charging for "Optimized Battery Charging". If this option is enabled, the iPhone will charge up to 80% and then stop for several hours. If you leave it connected to the charger, after about 3 hours it resumes charging at a slower rate until it eventually reaches 100%.

I think the logic behind this behavior is that the last 20% of charging is the most difficult for the battery in terms of heat production, so stopping for several hours to let the battery cool down and then resuming at a slower rate minimizes the battery temperature and the aging of the battery, while still allowing a 100% overnight recharge.

There is no option on the iPhone 13 to automatically stop charging at an 80% limit, but apparently that is an additional option on the iPhone 15. If you don't need the full 100% charge to make it through the day, turning that option on is an additional option for extending battery life. You can always override the setting to get a 100% charge if you expect to be away from a charging station for longer than usual.

I would expect other Apple mobile devices wold have similar settings. I understand there are comparable settings for Android devices.

STRANDED ALASKAN SNOWMOBILER SAVED BY IPHONE'S EMERGENCY SOS VIA SATELLITE FEATURE

By Kurt Jefferson, Editor, Central Kentucky Computer Society
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Apple's new iPhone 14 offers a feature called Emergency SOS via Satellite. It automatically calls Apple's Emergency Response Center when cell phone or Wi-Fi service is unavailable and a 911 call is placed. A snowmobiler stranded in a remote area of Alaska is the first person to use this service according to the Apple Emergency Response Center.

Courtesy: Apple

In early December, [2022,] the Alaska Department of Public Safety issued a brief report about a man stranded on a snowmobile in a remote part of the state.

The man pulled out his iPhone 14 and used the Emergency SOS via Satellite feature to call for help. The Emergency SOS via Satellite service is automatically triggered on all iPhone 14 models when an attempt is made to call 911, and cell service or Wi-Fi is unavailable.

This was apparently the first time the iPhone's satellite phone feature was used to rescue a stranded individual.

From the Alaska Department of Public Safety report (according to 9to5Mac):

"On December 1, 2022, at around 2:00 am, the Alaska State Troopers were notified that an adult male traveling via snowmachine from Noorvik to Kotzebue had activated an Apple iPhone Emergency SOS via satellite on his iPhone after becoming stranded. Working with local search and rescue teams, the Apple Emergency Response Center, and the Northwest Arctic Borough Search and Rescue Coordinator, the NWAB SAR deployed four volunteer searchers to the Nimiuk Point area directly to the GPS coordinates provided by the Apple Emergency Response Center. The adult male was located and transported to Kotzebue by the volunteer search team. There were no injuries reported to Troopers."

MacRumors reports: "Apple's Emergency Response Center worked with local search and rescue teams and the Northwest Arctic Borough Search and Rescue Coordinator to send out volunteer searchers directly to the GPS coordinates relayed to Apple using the emergency function. The man was rescued successfully, and there were no injuries. However, the area where he was located is remote and on the fringes of where satellite connectivity is available. Apple says satellite connectivity might not work in places above 62° latitude, such as northern parts of Canada and Alaska, and Noorvik and Kotzebue are close to 69° latitude."

Business Insider reports authorities located the man at Nimiuk Point and was taken to Kotzebue by the rescue team at 6 am 9to5Mac writes the emergency satellite service is available in iPhone 14 models because of a new radio chip included in those phones.

Garmin, a long–time maker of smartwatches and exercise apps, launched a similar service in 2011 called inReach Messenger.

As of October 2022, Garmin reported that its emergency service had helped 10,000 people who needed immediate assistance.

Garmin says its service is often used to help other folks who don't own the device make the emergency call. In addition, Garmin lists the top five reasons people have used its emergency service over the past eleven years:

1. Injury
2. Medical issue
3. Vehicle accident
4. Stranded/Stuck
5. A vehicle problem

The top five incidents requesting emergency help from Garmin:

1. Hiking/Backpacking
2. Driving
3. Motorcycling
4. Climbing/Mountain climbing
5. Boating