



Zero Beat

October 2023

General Meeting
Wednesday October 11th
At 7:30 pm at the
Hazel Park Library
and on Zoom
With Socializing
At 7:00 pm

President's QRM

We're now into the fall season, and I hope that everyone enjoyed the last few weeks of summer. I haven't been too active on the radio lately due to several reasons, but I did find time to participate in the ARRL September VHF Contest, mostly on 2 meter and 70cm FT8. I was using a dual band cubical quad antenna that was only up about 16 feet at best, but it got me heard as far as western Wisconsin and western New York state (432 MHz), and even Kansas (144 MHz)!

I regret that I had to miss the September membership meeting. Unfortunately, circumstances beyond my control meant that I could not be there. Thanks to Jim W8DPM for running the meeting, and thanks also to our presenter, Michael Kalter, W8CI, for giving his presentation as to why he is running for ARRL Midwest Division Director.

I'm looking forward to seeing all of you at our next membership meeting. That meeting is happening on Wednesday, October 11 at the Hazel Park Memorial Library. If you are in the Boy Scouts, or are interested in how they can work with Amateur Radio groups, you won't want to miss this one!

Lastly, I would like to give a heartfelt "THANK YOU" to Rick KB500 for serving as our Public Information Officer and our newsletter editor for the last few years. It was great to always be able to depend on the newsletter happening like clockwork every month. We still need a newsletter editor, and Rick certainly left some big shoes to fill, but I am sure that our membership has someone who is qualified and willing to do the job.

I look forward to continuing to serve the club for the remainder of the term, and remember, no matter what part(s) of the hobby interest you, above all else: Have fun with Amateur Radio!

Thanks and 73,
 Mike Phipps, K8WU
 President, Hazel Par

Club Officers

President	Mike K8WU qrz@k8wu.me
1st. VP	Joe WB8ADX joeraznik@gmail.com
2nd. VP	Jim W8DPM tenaciousjd@gmail.com
Secretary	Reuven KB3EHW rgevaryahu@gmail.com
Treasurer	Bob N8REL rlau6@aol.com
Parliamentarian	Bill N8QVS n8qvs@arrl.net
Director	Len AD8FK len1perkins@yahoo.com

Lithium Battery Fire Risks: Sorting It Out.

Chris Warren September 21, 2023 5 Comments on Lithium Battery Fire Risks: Sorting It Out.

Exponential market growth!

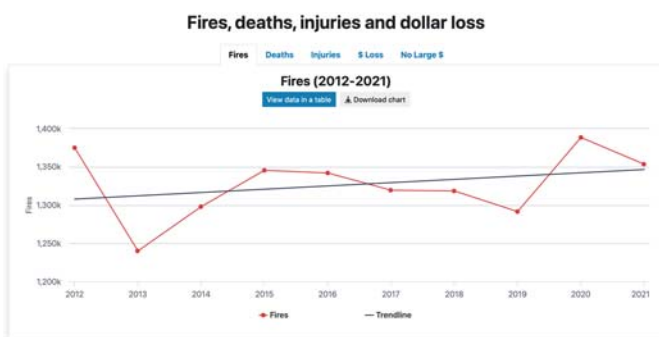
Lithium battery technology has made exponential market penetration in the last decade or so. Once an exotic and expensive platform, today nearly every battery-powered device uses lithium. Along with increased market acceptance comes attention, both good and bad. Most of the bad news circulating about lithium batteries relates to their fire risk. Is the danger real, or a big **nothing burger**? What concerns about lithium battery fires should off grid hams have and what can be done to mitigate the risks?

It's not a nothing burger, but let's keep it in context.

The U.S. **Occupational Safety & Health Administration (OSHA)** states that there are over 5000 lithium battery related fires in the U.S. every year...and that is a 2018 statistic. It's become such a large problem that the City of New York recently **enacted legislation** requiring lithium batteries to meet certain minimum safety standards

While I could not find more recent information on how many lithium battery fires occurred in the entire United States, we can reasonably conclude that, nationwide, incidents well exceed the 2018 numbers.

But let's keep things in context. In 2021, the most recent full-year reported, **there were 1.353 million fires (by all causes) in the USA**. That includes everything from simple trash can fires all the way up to multi-square mile wildfires. So while several thousand fires from lithium batteries is not "nothing," they represent a small fraction of a percent of all fires.



Graphic Courtesy of FEMA.gov

Outsized representation and reputation.

Although lithium batteries account for a very small portion of all fires, they "make up for it" in the sense that a lithium battery fire is never a small affair. Once a lithium battery begins to combust, it's difficult to extinguish. Due to the principle of **thermal runaway** and the internal chemistry of lithium batteries, a fire can burn hot and long. For example, a standard five-person fire crew can usually put out fires in traditional internal combustion-powered cars in a matter of minutes or even seconds. If a battery powered car catches fire, it's almost always a major-response incident **requiring several thousand gallons of water**.

If you're thinking, "I just have a few small lithium batteries. That's not comparable to a Tesla". Well, you're right, but you're missing the point. The take-away is that if your lithium batteries catch fire, no matter how small they are, it's going to be intense. I postulate that lithium battery fires receive media attention disproportional to their comparatively low occurrence for several reasons. A) lithium batteries are still a relatively new product, B) the fires are particularly fierce and hard to put out, and C) the media loves to stir up drama.

What you can and should do.

Lithium batteries are generally regarded as safe, but there are things an off grid ham can do to minimize the risk.

- Never operate a lithium battery that is visibly damaged: cracks, loose terminals, etc.
- Charge batteries within their specified charge parameters and with the proper charger.
- Any battery that is excessively hot, discolored, bulging; making hissing, ticking, or boiling sounds; or discharging smoke, liquid, or weird smells is an immediate emergency concern. If possible, move the battery and/or device to a safe place where it will not set fire to surrounding materials. If this is not possible and no appropriate fire extinguisher is available, evacuate the area and call the fire department.
- If a lithium battery is removed from service, for any reason, store it in a place where it is not a combustion hazard to other materials. Do not keep decommissioned batteries in your possession for extended time periods even if they are safely stored. Bring them to a proper recycling facility as soon as possible.
- Store batteries in a metal or other fireproof enclosure away from flammable material.
- Use only batteries from known, reputable sources

Fire extinguishers....it's complicated.

Regarding fire extinguishers, you'll first need to know what type of batteries you have. Lithium batteries and lithium-ion batteries **are not the same thing**.

They cannot be treated the same for fire fighting purposes. Lithium ion battery fires are considered **B-class fires** so ordinary household ABC-class extinguishers or water will be effective on these fires.

Only D-class fire extinguishers are certified for metallic fires, which includes lithium (not ion) batteries. If you've never heard of a D-class extinguisher, it's probably because they are specialty items used mostly in the aerospace, automotive, and metalworking industries. They are not available off the shelf at your local home improvement store. D-class extinguishers are only sold by fire suppression specialists & industrial product suppliers.

If you feel you need a D-class fire extinguisher, brace yourself for **eye-popping sticker shock**. D-class extinguishers can cost over \$1500.00

USD and you're unlikely to find a good one for less than \$800.00 USD. Be sure to read the data sheet carefully and fully understand what you are buying because some D's are certified for lithium (the metal) but not lithium batteries.

Don't overthink the fire extinguisher issue. Very few amateurs legitimately need a D-class unit.

Battery management systems (BMS).

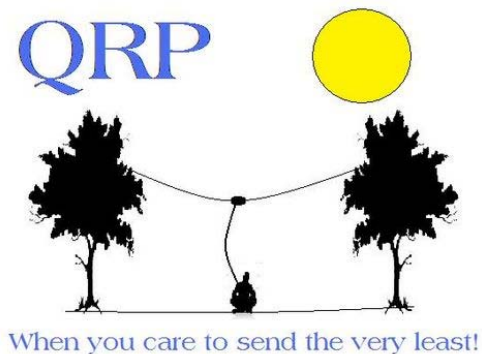
Lithium batteries typically have a battery management system (BMS). A BMS is built-in electronics that monitor & control charging, balancing, and other parameters. Many hams mistakenly think having a BMS means their batteries can never be overcharged or overheat due to excessive current. The BMS does somewhat provide a layer of safety, but it is not itself a safety device. Never assume the BMS will "save" you and prevent conditions that may incite a fire.

The bottom line.

This article is not meant to scare anyone away from lithium batteries! Frankly, there is no realistic way to avoid them anyway. The statistics show that lithium battery fires are uncommon when compared to all fire incidents. With a little knowledge and forethought, anyone can use them safely and without incident.

Battery Type	Fires involving <i>Batteries Only</i>	Fire involving <i>Batteries and Other Materials</i>
Lithium (metal) Primary, Non Rechargeable	Class D extinguishing agent. DO NOT USE WATER.	Use an ABC dry chemical extinguisher or water hose stream . Fight the fire based on the fueling material (for example, paper, plastic, solvent, etc.).
Lithium Ion Secondary, Rechargeable	Use an ABC dry chemical extinguisher or water hose stream . Fight the fire based on the fueling material.	Use an ABC dry chemical extinguisher or water hose stream . Fight the fire based on the fueling material.

Graphic Courtesy of OSHA.gov



Chairmen

Repeater	Joe WB8ADX
W8JXU Trustee	Bill N8QVS
Swap	John KD8NYF
Field Day	John AA8UU
Education	Jerry W9NPI
Sunday Net	Bob N8REL
Zero Beat Editor	Rick KB500
Public Information Officer (PIO)	Rick KB500
Webmaster	Reuven KB3EHW
Banquet	John W8TOY
Club Picnic	Jim W8DPM

HPARC Nets

HPARC Official Sunday Night 2-meter Phone Net

Every Sunday a 9:00 Pm local time on the DART repeater, 146.64 (PL 1 00), catch up on club news and information, and just to keep in touch. All amateurs are welcome to check in.

ARPSC Thursday Night 2-meter phone net

Every Thursday at 8:00 PM on the W8OAK repeater, 146.90 (PL 100). The Hospital radio check net takes place on the last Thursday each month at 7:30 PM on the W8OAK repeater. <http://www.arpdc.com>

Around Town

HPARC Buddy Breakfast every Saturday at 9:00 AM (or so)

Cozy Cabin Diner, 2129 E. 12 Mile Rd, Warren, MI Come in early for the socializing. Park in the restaurant parking lot.

Volunteers

LoTW Manager	Murray KE8UM
Club Cook	Bill N8QVS
Lark in the Park	John AA8UU
Net Control Operators	Len AD8FK John W8TOY Mike K8WU Bob N8REL
HPARC Media Dream Team	Hugh KE8BED Rick KB500 John AA8UU Mike K8WU John W8TOY

Oakland County ARPSC Siren Testing, 1st Saturday at 1:00 PM.

March through November. Contact Marsha, N8FE, at n8fe@arrl.net, to volunteer and be assigned a siren to test.

Amateur Radio Licensing Testing

Jerry has announced that license testing will be on the first Tuesday of every even month at 7:00 PM at the Oak Park Community Center.

Next Session December 5th