



Zero Beat

March 2023

General Meeting
Wednesday March 8th
At 7:30 pm at the
Hazel Park Library
and on Zoom
With Socializing
At 7:00 pm

President's QRM

It's nice to see the HF bands in such great condition lately! This is the first time that I have been QRV during the rising part of the solar cycle. I was licensed in 2006 when we were coming down from Solar Cycle 23, and I was QRT for most of Solar Cycle 24, reactivating in 2019 near the tail end. Being able to take advantage of the good propagation – especially on 10 meters and the other higher HF bands – certainly makes for fun operation.

On February 17, the solar flux index reached 343, which is the highest that I ever remember it being. Of course, that's because the measurement was taken while an X-class solar flare was in progress, but generally, that number has been around 140 at the lowest, and often significantly higher than that. The result is that the ionosphere is charged up enough that you can often “work the world” with 100 watts and some wire, depending on which band you choose and what time of day you are operating.

February's membership meeting beat all expectations in terms of attendance, and our speaker, Paul KC8BDK (from the Central Michigan Emergency Network), did a great job in explaining what his organization is doing in regards to getting Amateur Radio groups connected with their emergency network initiative. We have several equally illustrious speakers lined up for the remainder of the term, so please stop in and say hello down at the Hazel Park Memorial Library on the second Wednesday of the next few months.

Field Day is coming! It takes place on the last weekend of June (Saturday, June 24 and Sunday, June 25). We are always looking for volunteers and other assistance for what is easily the biggest event of the year for our club and for Amateur Radio in general. If you want to get involved, please contact John AA8UU.

Club Officers

President	Mike K8WU qrz@k8wu.me
1st. VP	Marvin W5DT marvstasak@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

Let's keep making 2023 a good one for the Hazel Park Amateur

Radio Club, and Amateur Radio in general!

Thanks and 73,

Mike Phipps, K8WU
President, Hazel Park Amateur Radio Club

2023-02-08 HPARC meeting at the Hazel park library

Called to order 7:30pm
Pledge of allegiance

Introductions
New members Abraham KE2ALL Wesley KE8JKN
Bob AA8DD Tim W8TGB Mark Keskes no call yet

Presentation by Paul KC8BEK on CMEN

Badges - We have a vendor. It will be \$180 for getting engraved badges from the vendor for folks without the red badges. Membership vote on the expense- Motion by Ken AD8M, All In favor, motion carried.

Upcoming activities:
Banquet location TBA June 14th 2023
Field Day June 24-25 2023

Reminder on education classes

Exams: we had 11 people last night, 2 new to general, 8 to technician, and 1 upgrade to extra. April 4th next exams.

Election process will take place March->May; consider running if you are interested
ARRL Field day 2023

Siren testing March - Marsha is coordinator. Email n8FE@arrl.net to help out.

Treasurer Report Bob N8REL- Spent \$118 total. Dues pretty much according to budget. ~7718 In bank, ~200 in PayPal.

Sunday net
Breakfast on Saturdays at Cozy Cabin

Mentoring- Len AD8FK - Try echolink instead of an HT to get on the net because sometimes trouble hearing on HTs.

Jay WB8SBI- clubs having financial problems,

canceling swaps, etc. Where do we go from here? How do we pay for things? We need to start the process of looking at this. We can't put this off forever. Motion to direct the board to start process of looking into what kind of club we want to be proposals for discussion, preliminary. Before we go on summer personal goal to have answered these questions. Mike- We discussed this at the most recent board meeting and met with the swap committee. Vote - All in favor of motion.

Marv w5dt - anybody with a FTDX5000? (None of the crowd had)

3y0j dxpedition - discussion about Bovet Island. Cy0s soon sable island. Will do EME and satellite and HF/6. Jay - W1AW is "traveling around" Michigan QRP club coordinating, you can be W1AW for a few hours if you sign up.

Meeting Adjourned 8:51 PM

Respectfully submitted,
Reuven Gevanyahu KB3EHW
HPARC Secretary

Batteries: Your Weakest Link.

Chris Warren February 20, 2023

It cannot be avoided...

Batteries are arguably the weakest link in the off grid radio chain. Solar panels, controllers, connecting cables, and almost everything else can last years, even decades. But batteries are a consumable product and no matter how good yours are, it's almost certain they will not last as long as all the other hardware in your system. What are the signs of a battery failure and what can be done about it?

For survivalists/preppers, EMCOMM folks, and anyone else who thinks off grid ham radio is more than just a fun pastime, battery lifecycle is a constant concern. For example, my home solar power system in its current form is about twelve years old. I've had the same panels and controller since Day One. Zero issues with these devices. The batteries, on the other hand, have been replaced three times.

So to all the operators who think they'll just go about their merry way when **SHTF**: You will be ok, for a while. Maybe even a long while. What about after that? What will be your next move when your batteries finally **dirtnap**? No plan can last longer than the lifecycle of your batteries.

Another consideration is how much you use your batteries now versus how much they'll be used in a disaster/SHTF scenario. Batteries have a finite number of charge-discharge cycles. Most operators run them only occasionally for hobby/recreation purposes. If you switch to using them daily for emergency communications, you certainly can expect your batteries to wear out much sooner.

...but it can be mitigated!

Even though all batteries eventually die, there are things an off grid ham can do to extend their life.

Limit depth of discharge: All batteries have a depth of discharge rating that states how far a battery can be drained before damage may occur. Wet cell or flooded batteries have a depth of discharge rating of 50%. Lithium batteries can go down below 10%. Absorbed glass mat (AGM) batteries will only go to 70%. If you repeatedly discharge batteries lower than their respective DoD ratings, you risk permanent damage.

For example, when you buy a flooded battery, you are theoretically getting only half of battery's rated capacity because it should never be discharged beyond 50%. In other words, treat a 100 watt-hour flooded battery as if it were a 50 watt-hour battery, because that's essentially what you have. Conversely, lithium batteries, because of their deep DoD capability, can give very close to established capacities. Calculate your battery size appropriately and leave some "wiggle room"

Increase charging capacity. If you can fill a battery as fast as you drain it, then you'll be able to pull current for a longer period of time without going below the safe DoD standard. My QRP portable radio kit has a 27 watt solar panel, which is much more than I need to push an FT-817ND radio. By oversizing the panel, I can run all day, even when the sun's not strong, and barely touch the battery.

Temperature matters...a lot!

Temperature extremes, especially heat, can drastically shorten the life of a battery. Lithium batteries should not be discharged if over 114 F (46 C). Flooded and **AGM batteries** do not have a specific "drop dead" upper limit, but the hotter they get, the less capacity and lifespan they have. Generally, you'll want to keep them under 120 F (49 C)

When possible, use a charger with a temperature compensation probe. This device will tweak the charge parameters to allow for temperature changes. While this by itself will not prevent damage from temperature extremes, it will provide a margin of safety and extend battery life. Lithium batteries (

should) already have temperature compensation as part of the integrated **BMS system**.

Battery internal resistance.

One major indicator of battery health is internal resistance. Unfortunately, testing the internal resistance of a battery cannot be done with a conventional multimeter. Basic battery analyzers capable of testing for internal resistance cost less than \$100.00. They are well worth the investment

The other hurdle is knowing what a "good" internal resistance should be. The value can vary between different designs and types of batteries. In general, flooded batteries should be less than 10 milli ohms. Lithiums can run up to several hundred milli ohms. This information may be on the battery data sheet. If it is not, contact manufacturer technical support.

If you cannot find accurate data on what the correct internal resistance value is for your battery, there is a work around. When you get a new battery, charge it fully then let it sit for a few hours to stabilize. Measure and record the internal resistance. This will be your baseline. Going forward, you can check the internal resistance and compare it to the baseline. Any significant increase in resistance indicates that the battery is approaching the end of its service life.

It happened to me.

Recently I noticed that my home solar power system's batteries were dropping excessive voltage overnight. They would charge back up during the day, but as soon as it got dark things went way wrong. I also noticed a funky smell in the air. I thought the smell might be coming from a sewer, or maybe a mouse got in the house and died somewhere. After investigating, the smell was coming from the utility closet where the batteries are kept. The temperature probe on one of the batteries indicated it was at 100 F (38 C) when the ambient temperature in the closet was about 60 F (16 C).

Of the five 12 volt, 100 amp-hour batteries, one of them went bad, probably from a shorted cell, and was overheating. The resultant disgusting stink was noxious gas coming out of the battery. The suspect battery was at 11 volts, while the rest of the batteries were about 12.20 volts. The one bad battery was sucking all the energy out of the system and pulling the other batteries down with it.

When I checked the electrolyte level in the overheated battery, there was barely any in there. It had all boiled off. I refilled the battery and placed it on a 10 amp charge, taking a chance that it could be revived. After nearly an

hour, it was still taking ten amps and starting to heat up again. It was dead for real.



Failed battery could not be revived with a smart charger. OFF GRID HAM ORIGINAL PHOTO ©2023

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The best I could hope for is that the other batteries were not permanently damaged. I removed the bad battery from the string. After a few hours of strong sun on the solar, it looked like the remaining batteries were going to be ok. I never did conclusively determine what happened to the failed battery. All I now for sure is that the end came quickly, within a day or two.

The moral of the story is that even well-maintained batteries operated within their specifications will eventually go bad.

Make the weakest link a little stronger.

Since all batteries have a finite service life, the best we can do is take measures to extend that life as far as possible. Keeping them within correct operating temperature (which admittedly is not always practical), topping off electrolyte where applicable, and not allowing a battery to discharge too far are all straightforward strategies that do not require a lot of effort or technical knowledge.

Lithium batteries are the best choice for long service life and depth-of-discharge tolerance, but they have a high initial cost. If you can afford the large up-front cash outlay, lithium batteries are less expensive than other types when the cost is amortized over the life of the battery.

No matter what type of batteries you have, be aware of their operating specifications and do your best to stay within them. It may matter when you need them the most.



"A ham - pod?"

**What's your
best non-
swearing insult?
I hope you step
on a Lego.**

Cool Funny Quotes.com

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 April 4th

