



Start of the Ohio River Road Runners Club Xenia Marathon on April 7. XWARN has supported this event for as long as we can remember. This is the first year at the new Xenia YMCA location on Progress Drive near the Lowes and WalMart on the west side.

Wavelengths

Xenia Weather Amateur Radio Net XWARN (W8XRN)

May 2019

147.1650+ (123.0) (Analog Only)
443.1000+ (123.0) (Analog + System Fusion)

Meetings: 2nd Monday, 7:30PM, Greene Memorial Hospital
(1141 N Monroe Dr, Xenia, OH) Herman Menapace Auditorium

President's Message

Happy May!

It's almost time for Hamvention. Are you ready? Our t-shirts are in and we will be selling them at club price at the meeting. Come and get yours before the big event! While there, please sign up for a two or more hour block to help our club sell at Hamvention.

We also are well on our way to planning another great Field Day. Mark your calendars for June 22 and 23 and come see what all the fun is about. We will have several stations operating on several bands and would really welcome new operators. And, of course, have great food and fellowship. Consider continuing Hamvention's theme on mentoring and bring out some new people to learn and have fun.

I will see you all at the next meeting, May 13th.

73,

Elizabeth, KE8FMJ

Club Contacts

- Liz Klinc, KE8FMJ
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Upcoming Events Needing Help

Saturday, May 11, Trebein Elementary (1728 Dayton-Xenia Rd 45385)
Founders Run 5k, starting gun is 8:30, so we will gather about 45 minutes before that. The run should wrap up by 10:00 AM and some of us will go to Tudor's for breakfast. For more info or to sign up, contact KE8FMJ lizklinc@gmail.com

Sunday, June 2, Little Miami Triathlon, Start/Finish is at Fort Ancient State Park (Warren County). Start is 8:00 AM and the event wraps up by 3:30 PM. Some assignments start after the starting gun, some finish before the last rider comes in. We always need a few more volunteers, so please give this event some consideration. For more info or to sign up, contact Bob Baker N8ADO@arrl.net

These events are listed in ARES Connect. Please consider signing up there, but also be sure to let us know by email.

Note that there is some extraneous information listed for the LMT on ARES Connect. The info in this message is more accurate.

ARES Connect is at: <https://arrl.volunteerhub.com/lp/oh/>

Bob Baker, N8ADO



Auxiliary Battery Systems

Like many others out there, I have many more interesting projects I'd like to work on than I have time for. One of the projects that has fallen off my plate many times is installing an auxiliary battery system in my truck. Well, lately I've been able to do some focused research on modern auxiliary battery systems, and I'd like to share that information before it falls off my plate again.

What is an auxiliary battery system? Hopefully everyone knows that your car has a starter battery suitable for starting your vehicle and providing some capacitance in the system to help your alternator. But what about "house" loads? What are those? The simple way to explain is to imagine an RV with a TV and lights to run at night. You can use a generator, or you can install a battery bank and other components just for that purpose.

If you could simply hook the starter and auxiliary systems together without problems, there wouldn't be a reason for this article. So what's the issue or issues?

First, the starter system in your vehicle and the auxiliary system have almost completely competing requirements including storage capacity, charging rates, and battery types. A battery suitable for starting is not suitable for providing long-term energy and vice versa.

Second, even if the battery chemistries are similar, such as flooded lead acid and absorbed glass mat (AGM), the charging profiles are, at a minimum, slightly different — AGM uses a slightly higher voltage I believe, so it will be chronically undercharged in a system made for a flooded lead acid — and, in some cases such as the difference between lead acid starter batteries and lithium chemistries, completely different.

Perhaps the biggest difference is between a starter battery and a deep cycle battery regardless of chemistry. Starter batteries operating under their nominal conditions are never depleted to any great extent. If they get that way, it will probably be time to recycle it for a new one in the near future. Starter lead acid batteries can be depleted to around 75% state-of-charge (SOC) without damage, deep cycle lead acid batteries to around 50% SOC without damage, and lithium iron phosphate deep cycle batteries to about 20% SOC.

Your vehicle's alternator is basically dumb. It assumes your starter battery isn't very depleted, and it assumes you are using a flooded lead acid battery. That means it can simply apply a constant voltage around 14V, and it and the battery will be happy.

There are two problems if you connect the alternator to house batteries or even deeply depleted starter batteries. First, any deeply depleted battery will pull a lot of current and for an extended period of time if you connect it to a charging source. The typical alternator will get smoked under this situation. Second, deep cycle batteries, whether lead acid or other chemistries, have specific charging profiles — typically constant current for bulk charging, followed by constant voltage for absorption (top off), and finally constant voltage for float (maintain) — if they are to be safely charged and you want them to last a long time. The dumb alternator in your vehicle doesn't know anything about charge profiles. The voltage regulator for the alternator is simply adjusting the field current to keep a pre-set 14V output as best as possible.

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XWARN Mission

The mission of the Xenia Weather Amateur Radio Net (XWARN) amateur radio club is to conduct weather spotting nets during severe weather and other communication services for the City Of Xenia and all other Greene County communities.

In this capacity, we are set up to provide communication services as required to the Greene County Ohio Public Service Agencies and other local government entities. The communications services provided to the supported agencies may be for emergency purposes or to simply enhance their communications abilities. On an as needed basis XWARN provides similar services to various government entities of our surrounding counties.

Additionally, XWARN provides communications support to various community organizations in support of marathons, 5K runs, 10K runs, bicycle events, etc. to provide health and safety assistance to the participants and sponsors of said events.

In support of these goals, XWARN operates and maintains amateur radio repeaters and other equipment in Greene County.

Minutes: April 8, 2019

Call to Order-President Liz Kline. Pledge of Allegiance

Secretary Report

no corrections needed-Phyllis/Fred moved to accept

Treasurer Report

Janese/Jim S moved to accept as reported

Cracker Barrel

Nigel asked why it's called "cracker barrel", Bob Baker explained an ol'timey custom of chewing the fat around the cracker barrel at small town general stores.

Public Service

Mike Crawford report the April 7th Xenia Marathon was marginally covered but in spite of a new course and fewer hams the event went smoothly

Bob Baker will send out info for hams to volunteer for the May 7th Trebein Founders 5K Run

Bob also report the March 27th No Buts About It run was a success also.

Trailer

Mike Crawford reported the trailer is in good shape with a new battery and it's up to date tags

Repeater

Jim Simpson reported he again wasn't able to get the antennae up but will try again soon to coordinate another date

Also Brett Boggs is now retired and so anxious to do more on the committee

Mike and Janice Crawford showed off the great new design for the 2019 Hamvention t-shirts. Also Janice sent a sign up sheet around for volunteers to sell t-shirts. She asks for a minimum of 2 hours (but remember it takes a 6 hour commitment to be eligible for a free ticket.)

Remember everyone to come to May's meeting and get their shirts early.

Josh Long's mother passed away this week and the membership elected to send an arrangement

Some members reported they have not received the Emailed newsletter and so would like Jason to investigate.

Bob Baker explained what NVIS is and invited everyone to participate in the April 27th event. Look for Email and info on Facebook.

Bob Baker then did a presentation on the new DMR code plug.

Liz then adjourned the meeting

Karen Baker submitting



Jason Bowman, Secretary

NVIS Day

Apparently we had an NVIS antenna day and I had totally forgotten about it. According to Liz, we only made 3 or 4 contacts but learned quite a bit.

For those of you who don't know, NVIS is Near Vertical Incident Skywave. A typical high frequency antenna is designed to reach out towards the horizon for long-range, world-wide communication. But, in doing so, it misses the portion of the ground between where the ground wave peters out and the horizon.

This is where NVIS comes in. NVIS antennas are usually positioned stretching horizontally relatively close to the ground compared to their wavelength, something like 1/8 wavelength or less. Inverted V's will work, too. This forces the main lobe of the antenna to point close to vertical rather than horizontal.

If the frequency is 8MHz or less depending on time-of-day and where you are in the world, the energy will bounce off the ionosphere back to the ground. NVIS antennas will reach out 300 miles or more providing regional communications that "normal" HF antennas cannot.



Pictures of NVIS Day



Auxiliary Battery Systems

(Continued from page 3)

There are three basic strategies to deal with this.

1. First, you can install a dumb alternator made for charging deep cycle batteries. Basically the windings are higher gauge wire and there's better cooling.
2. Second, you can install a second alternator that's "smart". These alternators are usually very expensive and typically use an external voltage regulator that is programmed for one or more charging profiles. However, most engines do not have provisions for a second alternator.
3. Third, you can install some sort of device between the starter battery and house battery that makes them safely coexist.

What "coexist" means has evolved over time.



Battery Isolator using a mechanical relay

The first devices simply disconnected the two systems if the starter battery voltage dropped below a threshold. This keeps the starter battery in a condition to actually start the vehicle and not leave you stuck.

Decades ago these devices were mechanical relays. Then they evolved into solid state devices. Because the typical semiconductor will drop 0.7V and even a Schottky diode will drop 0.3V, this left the house battery chronically undercharged. So mechanical relays never really went away, and I even used one in my Accord until I got my truck. Finally, modern semiconductor devices started using field effect transistors (FET), which only drop something like 0.05V. Unlike normal transistors that switch based on current, FETs switch based on voltage, which is exactly what we need in a basic battery isolator to protect the starter battery from becoming too depleted to actually



start the vehicle.

An example of this last device is the West Mountain Radio [IsoPower+](http://bit.ly/2HgsIK2) (<http://bit.ly/2HgsIK2>). If you read the manual, the IsoPower+ uses alternator power if the voltage is above a threshold and house battery power if the alternator voltage is below that threshold (vehicle off or charging a deeply depleted starter battery).

These devices, however, didn't solve the problem of charging deep cycle house batteries using a dumb alternator.

A modern isolator now includes a battery charging circuit and/or DC-DC power supply and may even include provisions for solar as an input in addition to the alternator.

For smaller household batteries such as would be used with amateur radio, something like the West Mountain Radio [Epic](#)



Auxiliary Battery Systems

[PWRGate](http://bit.ly/2Hh7v18) (<http://bit.ly/2Hh7v18>) can be used. Think of the Epic PWRGate as the IsoPower+ that, in addition to alternator input, adds Maximum Power Point Tracking for solar cell input and then runs those inputs through a battery charger to keep the household battery charged.

For larger household batteries, the Epic PWRGate is simply outmatched and you have to move to something like the [Redarc 25A](http://bit.ly/2JfHYsO) (<http://bit.ly/2JfHYsO>) or 40A DC-DC battery chargers available in the US from dealers such as eTrailer.com. Whereas the Epic PWRGate costs \$190, the Redarc devices are in the \$400 range. If I'm not mistaken based on a video I saw, the Redarc devices are not just a battery charger but will do proper DC-DC conversion and not just pass alternator voltage to the house electrical system. This provides true isolation between the start and house battery systems. The only DC-DC conversion that the West Mountain Radio devices do is for the battery charging feature. West Mountain Radio devices will pass alternator voltage to the house circuits as far as I know. Basically the West Mountain Radio devices provide power to the house circuits either from the alternator or house battery but not both simultaneously.



If you would like further information, I would highly recommend [Will Prowse's](http://bit.ly/2Ly1cf0) (<http://bit.ly/2Ly1cf0>) YouTube channel and [website](http://bit.ly/2Vhtl4f) (<http://bit.ly/2Vhtl4f>) that goes into these consideration and options in much more detail.

More pictures (right) of NVIS Day



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«FNAME» «LNAME» - «CALL»
«ADDRESS»
«CITY», «STATE» «ZIP»

Wavelengths

Wavelengths is published monthly by the Xenia Weather Amateur Radio Net. Our meetings are currently held on the 2nd Monday of each month at **7:30 pm** at the Greene Memorial Hospital Auditorium. You can find additional information about our organization at www.xwarn.net. We welcome new and experienced Amateur operators and those interest in becoming an Amateur operator to attend our meetings.

