

# Electric Vehicle Power for ARRL Field Day

## Janelle Brisbine, NØMTI

Since 1933, ARRL Field Day has given radio operators a chance to demonstrate Amateur Radio's science, skill, and service to the community. Participating groups are encouraged to use power sources other than commercial electric power. In the past, the St. Louis Metro Amateur Radio Emergency Service (ARES) team has experimented with solar power and alternate battery sources. For Field Day 2018, Norm Guittar, the husband of St. Louis Metro ARES member Dolores Guittar, KDØCIV, suggested using his 2013 Chevrolet Volt to power our station.

## Setting It Up

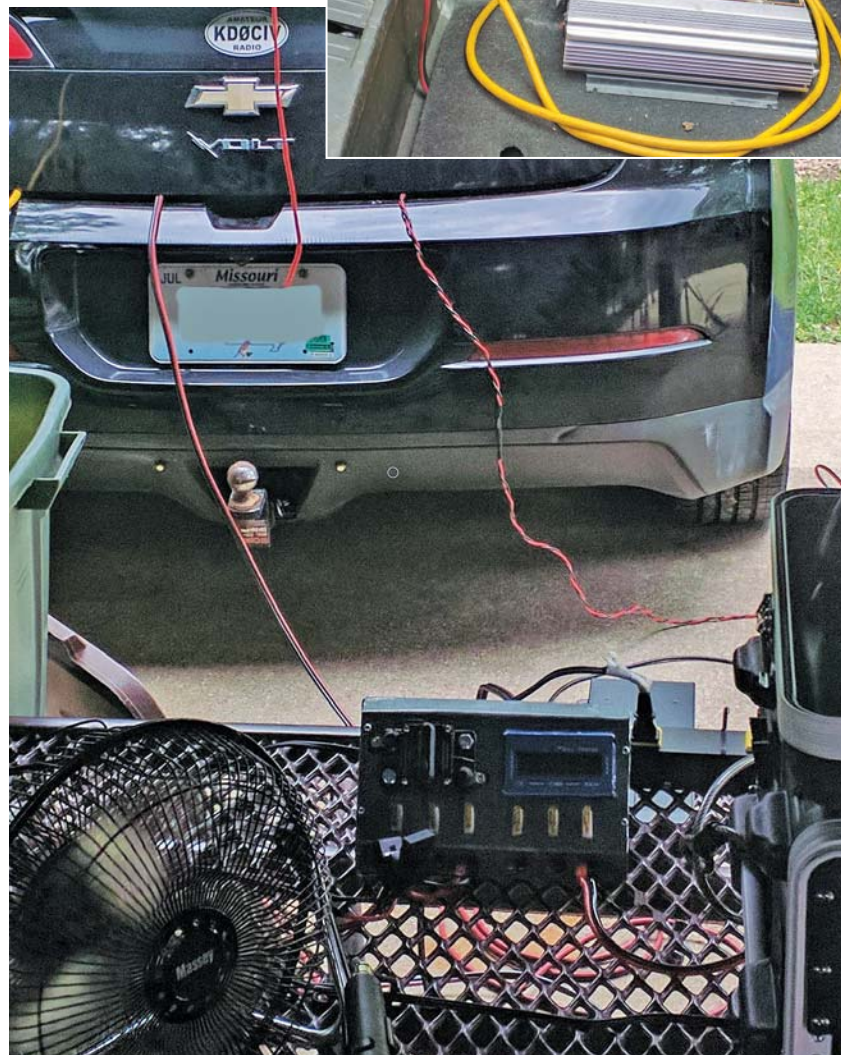
Attached to the 12 V battery under the trunk, Guittar had permanently wired in 300 A Anderson Power-poles® that power an inverter with 2,000 W continuous and 4,000 W peak power. The inverter supplies 120 V power, which would be used to cook our food on Field Day (see Figure 1). To generate power for the radios, Guittar attached additional alligator clips to the battery to route power to a distribution hub that included a wattmeter to monitor output from the car (see Figure 2).

The plan was to leave the car turned on, allowing the electronics to draw from the 12 V battery system. When power levels fell too low, the car would automatically recharge the 12 V system from the main battery pack that ran the car. When the main pack ran low, the car would start the backup generator, better known as the car's engine. But a safety feature of the car required the addition of the wattmeter to ensure radio operations wouldn't be knocked off the air.

A St. Louis ARES team uses ARRL Field Day as the stage for this experimental power setup.

► **Figure 1** — The inverter in the Chevy Volt's trunk to run our 110 V accessories.

▼ **Figure 2** — The electrical distribution from the Chevy Volt.



## 2018 Field Day Results

St. Louis Metro ARES operated under the call sign NØARS, powered by the Chevrolet Volt. Our 2018 ARRL Field Day team made 516 contacts, with 130 on Morse code or CW, and 386 on voice (see Figure 3).

A total of 44 people attended the event. We covered the event on three social media platforms. Two press releases were put out, and our setup received proclamations from the St. Louis Mayor, the St. Louis County Executive, and the Missouri Governor (see Figure 4).

## Technical Challenges

One problem we faced was that, after an extended period of no movement, the car automatically turned off, allowing the 12 V battery to run down. To get around this problem, Norm provided the power meter on the power distribution panel to give a readout of the 12 V system. When the meter fell below 12 V, we had to turn the car back on.

We also had unexpected drains on the battery system. These power parasites, which included the air conditioner, the dome light, the headlights, and the car's dashboard display, tipped the energy usage upward until each was discovered and eliminated as much as possible.

Operating the radios with the varying power available from the 12 V system did impact radio performance. At full power, the radios exhibited some fluctuations and stability issues in output performance. Dropping the radios to about 80 W stabilized their performance when operating with less than 13 V applied.

Total available power at the start of the event was 4.4 kWh. A solar panel provided about 250 W to supplement the 12 V system. The car was restarted three times from when setup began around 9 AM on Saturday through teardown at 11 AM Sunday. The system maintained three radios operating on standby or actively transmitting throughout the event, as well as the appliances needed for cooking.



**Figure 3** — The field station owned by Brian Oester, KEØEYA, who operated from the primary voice station for NØARS during Field Day 2018.

## Future Modifications

The lessons learned in 2018 will likely result in a few changes for Field Day 2019. The St. Louis Metro ARES group is considering moving the power needs for the logging laptops onto the car's 12 V system as well. The computers could be recharged using their traditional 120 V charging cords connected to the inverter. However, to eliminate any possible power losses, Guittar suggested using Powerpole adapters and powering them directly from the power distribution panel.

Another improvement will be to keep the car off for the majority of the event to avoid the car's systems putting a load on the electrical system. This will require operators to monitor power levels throughout the event, while capping the transmit power on the radios. They appear to be fully functional at 80 W power, and the lowered power levels will draw more consistent performance when the battery levels start to drop off.



**Figure 4** — Matt Gabrian from the St. Louis County Office of Emergency Management presented a St. Louis County Proclamation to Peter Brisbane, NØMTH, and Bob Gale, WA4GDJ. [George Siede, KDØPMW, photo]

The group is also considering a second tent reserved for low-power operations. The group may also have a location in St. Louis city to better showcase the group to served agencies.

Photos by the author unless stated otherwise. Amateur Extra-class licensee Janelle Brisbane, NØMTI, was first licensed in 2013. A former Emmy® Award-winning news producer, she holds a BA in Communications from the University of Northern Iowa, has completed the Professional Development Series with FEMA, and is working toward her Advanced Professional Series with Missouri State Emergency Management Agency. Janelle is the Public Information Officer for the St. Louis Metro Amateur Radio Emergency Service (ARES), a member of the St. Louis Amateur Radio Club (SLARC), and a member of the St. Louis and Suburban Radio Club (SLSRC). She also works on the Halloween Hamfest committee and serves the Cliff Cave VE Team. You can contact Janelle at [n0mti.jh@gmail.com](mailto:n0mti.jh@gmail.com).

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