



# Short Skip

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All Lake County ARC Repeaters are open to all amateurs. All repeaters must have a PL of 131.8 set in order to access.

## FROM THE PARADE STAND

by Tim, N9CA, LCARC President



Hi everyone,

My first order of this column is to let you know that for the meantime, Club meetings at Tyler's Tender are suspended. Specifically June's and July's. A possible new meeting location that allows for better "social distancing" is being worked on. If it makes you feel any better, all Club meetings of any kind, not just us, are all in the same boat.

May 8th we held a virtual Club meeting via the ZOOM app. E-mail logins links were sent to all 62 Club members using your reported e-mail address.

Friday June 12, 7:00pm Club meeting: we will e-mail a new link to all Club members to log into the LCARC virtual meeting a day or two before the 12th. You do not have to purchase the app! When you click on the e-mail link, ZOOM will place a file on your device (phone or computer) giving you access to our Club meeting's virtual waiting room. The Club moderator will then admit you into the meeting. You will have the option to turn on audio only, video only, or both. So, if you

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If for some reason you cannot connect, close the app, and relaunch the emailed link from the LCARC. If you have; a HR story to share, a new radio, new antenna, hot

DX contact, something to sell, a radio question, those are all appropriate. I expect the meeting will last 40-60 minutes. I will ask if you wish to share specific topics throughout the meeting.

\*BTW: Unless you mute your audio, or cut your video, everyone can hear (or see) what's going on at your QTH!

LCARC Net is still going strong on Wednesday evening at 8:00pm on 147.000 & 442.075 pl 131.8 New Net Control Stations are welcome. Contact VP Bill Leaming N4GIX

WSJT-X version 2.2.0-rc2, is now available for downloading from the WSJT-X website, along with a list of new features. Including near real-time decoding of contacts. Also new from the WSJT-X development team; additional FT8 "overflow" frequencies.

The WSJT-X 2.2.0-rc2 Release Notes explain:

"Increasing FT8 usage on 40, 30, and 20 meters means that the default 3 kHz sub-bands are often wall-to-wall with signals. Overcrowding encourages some to turn on their amplifiers, which only makes things worse. On a trial basis, and in response to numerous suggestions from around the world, we have added a second set of suggested dial frequencies for FT8 on three HF bands and a additional one on 6 meters VHF ...7.071, 10.133, 14.071, and 50.310 MHz.

If you download the new Beta version, "These frequencies will

*Continued on page 7*

# MOBILE DC POWER: ONE FUSE OR TWO?

by 7 March 2020 Bob K0NR

Sometime during the 20th Century, I learned that fuses (or circuit breakers) are used in electrical circuits to prevent catastrophic failure. Fuses open in response to an electrical fault that causes excessive current to flow. The job of the fuse is to minimize the damage and keep things from catching on fire. When I started installing amateur transceivers into vehicles, I learned that you should connect wires directly to the car battery (or darn close) and you should fuse both the positive and negative power leads. I was surprised by the need for two fuses, but there are technical arguments for it. Besides, the transceiver manufacturers recommend it in their manuals. (See figure below.)

I am focusing this discussion on a typical 2m/70cm FM transceiver installation – that is what I have the most experience with and that is the most common ham mobile installation. Such a radio typically draws ~10 A on transmit, so the DC power is usually fused with something like a 15 A (or 20 A) fuse. Keep in mind that a 15 A fuse is not going to protect delicate circuitry but might stop more serious damage or fire.

## Connect To The Battery?

Alan/K0BG has an excellent website that provides guidance on mobile radio installations. He points out that modern vehicles usually have an Electrical Load Detector (ELD) inserted into the negative lead of the battery, so that the vehicle control systems can monitor the state of the battery. It is important to connect your radio on the “other side” of the ELD, near where it connects to the vehicle chassis. Oh, and never use the existing vehicle wiring to power your radio (especially not the 12 V accessory plug).

## One Fuse or Two Controversy

Recently, I became aware of controversy with regard to proper fusing. Some people are questioning the practice of fusing both DC

power leads, while others are vigorously defending it.

For example, there is a lively eham.net discussion here. Ed/W1RFI provides some useful insight on the ARRL forum. Alan/K0BG covers the topic of DC power on his wiring and grounding page. Tom/W8JI argues for the one fuse approach on his website.

What Do The Manufacturers Say?

Generally, you should follow the advice of the manufacturer on any equipment installation, so I took a look at a few owner’s manuals. Most (or all?) of the manuals for the amateur gear show the two fuse method. See the ICOM example below. (Note that they don’t show the presence of the ELD.)

I also took a look at some commercial land mobile radio manuals. Motorola shows the single fuse approach.

ICOM makes both amateur and commercial land mobile gear, so I wondered what they recommend for their land mobile product line. Ha, funny thing, they show two fuses, with a comment that says, “Depending on version, the fuse holder may not be attached to the black cable.” Well, isn’t that special?

So is the two-fuse thing some kind of ancient amateur radio practice and the land mobile industry has gone a different path? Sometimes industries adopt “standard” approaches and then forget why with time.

## Some Circuit Analysis

After reading through all of the arguments, I tried to distill them down to their essence. I created a wiring diagram that may help explain the concepts. Or maybe not. An automobile is a complex electrical and electronic system, so any practical diagram risks oversimplifying the situation. But here’s my best shot at it.

The center of the diagram shows the body/chassis of the vehicle which is connected to the negative lead of the battery, through the ELD. The transceiver is directly connected to the + terminal of the battery (via Fuse 1) and the chassis side of the ELD (via Fuse 2). The engine starter is connected to the battery with heavy cables and is also connected to the body/chassis. While there are a large number of other electrical devices in a modern vehicle, only one is shown here as an example (with a switch and fuse).

The circuit shows the antenna connected to the radio with a coaxial cable. The shield of that cable is almost always grounded to the vehicle chassis at the antenna. (Magnetic mount antennas are one exception and I am sure there are others. Update: Ron/N0IVN pointed out that the on-glass antennas are not grounded.) I can say that every mobile installation I’ve ever done had the coaxial cable connected to the chassis. This is an important point because it provides a chassis connection for the transceiver at point C (whether you wanted it or not). There may be other ways that a transceiver is connected to chassis (point B), including the mounting bracket, external speaker, microphone or other accessories.

## Arguments For and Against

The argument for fusing the negative lead is to protect against return current from other devices that find its way back to the battery through the transceiver’s negative power lead. For example, the starter could have a fault in its negative cable, causing the current to flow through the chassis to the

*continued on page 7*

## MEETING MINUTES

*Sometime in the spring of 2020 Russ, KB9HO*

The COVID-19 virus destroyed them. I have taken great precautions to prevent this from happening in the future. Sorry.

## SIGNAL IDENTIFICATION GUIDE

Ever hear a signal on the radio and you don’t know what it is? Check out this website for audio files of over 377 different digital signals, both amateur and commercial. Most interesting.

[https://www.sigidwiki.com/wiki/Signal\\_Identification\\_Guide](https://www.sigidwiki.com/wiki/Signal_Identification_Guide)

## NEED HELP? CALL ON THESE ELMERS

- Tim N9CA
- Bill N4GIX
- Bill Young N9QLS
- Russ KB9HO
- Andy W9FXT.
- Mark K9MQ is an ARRL Tech Specialist and can also be called on.

## Radio enthusiasts worry about interference from LED streetlights

By Melissa Voetsch | Posted: Thu 3:40 PM, Feb 13, 2020 | Updated: Fri 7:06 AM, Feb 14, 2020

TOLEDO, Ohio (WTVG) — As the City of Toledo replaces its street lights with LEDs, some are wondering if the sound emitted from the devices will interfere with radio communications.

"The Universe is full of noise," Mike Kehr, an instructor for amateur radio licensing, said. "When you turn the radio on and hear that it has sound and there's no signal there, that's the noise of the universe."



The noise that the amateur radio community is concerned about is LED lights. "The prices have come down enough that we can use them in applications like lighting our parking lots and our streets," says Kehr.

However, Kehr says the lights make a lot of electrical radio noise and, "That noise can rise to the level of actual interference."

So 13abc asked the city about the quality of the LED lights that are being installed.

"These are the lights that Maumee is using right now, I believe Detroit as well," says Abby Arnold, the Deputy Chief of Staff for the City of Toledo. "These are General Electric lights. They are all well tested so they meet all the clearances. They're safe

lights going in."

13abc also asked Toledo Edison about the LED lights that are being installed. A spokesman tells us they have had no problems reported so far in dozens of other cities where the same types of LED lights line the streets. ;Check out the entire video report at: <https://www.13abc.com/content/news/Are-LED-Lights-A-Threat-To-Communication-567847131.html>

## HAM RADIO ON LOCAL TV?

Larry Brechner, WB9FQS

Dear Local Hams,  
Lakeshore PBS looking for a local ham or hams to discuss Ham radio and how it is used in the modern era. They should be able to speak a bit to the history/origins of ham radio and its present day uses and benefits. If you are interested in being part of this TV event, please contact:

Tony Santucci  
Production Manager, Lakeshore PBS  
219 756-5656  
asantucci@lakeshorepublicmedia.org

Also if you contact Tony please drop me an email. Thanks and 73, Larry A Brechner, WB9FQS Board Chair, Lakeshore Public Media  
219 746-6609 wb9fqs@arrl.net LAB@brech.com www.brech.com/WB9FQS

## HAM RADIO Q & A

from Ham Radio Hijinks — [Ham Hijinks](#)

Well this was supposed to be the humor for April 1 edition but I guess I was laid up for a few months. Not to worry, I am back and fortunately had some of the newsletter done. Hope you enjoy. -- ed.

- "Newly licensed Technician here! I got this sharp Yaesu VX-3R HT and it works great into the local VHF repeater. Thing is, these guys are kinda boring. Is this the best ham radio has to offer? With hope, Bored to Silence"
- Dear Silence, we hope we didn't mislead you. Yes, it's the best we have. You might try buying more radios, to make yourself feel better, like us. 73
- "I got a Baofeng UV5R for my wife. How did I do? Thanks, Betrothed in Bedford!"
- Dear Betrothed, sounds like a good trade! 73!
- My neighbor says my new off-center-fed dipole is ugly. What should I do? Sincerely, Sensitive Receive"
- Dear Sensitive, We heard your neighbor said your hair was ugly, too. Going to the barber tonight? Of course not! Carry on, OM! 73
- "I've always wanted to be a policeman. Sometimes I walk outside and yell 'UP! UP! UP!' at cars. Where do I apply? Thanks, Brainless in Seattle."
- Dear Brainless, Sounds like you're already on the job! Now go to the lower end of 20m phone and get those DX chasers transmitting UP where they belong! 73!

FOR SALE: Got some radio gear for sale? Looking for some radio gear to purchase? Check out the new FOR SALE page on the club's website — <https://lcarc.weebly.com/> -sale. Scroll down to see the most current items or click on the ARCHIVE section to see items for sale in previous months. If you have something that has been sold, be sure to contact John, W9WY for information to have your listing removed. There is no charge for club members to list their items. This is a service for members.

# TEMPORARY RULE WAIVERS ANNOUNCED FOR 2020 ARRL FIELD DAY

ARRL Letter 5/28/2020

With one month to go before 2020 ARRL Field Day, June 27 – 28, the ARRL Programs and Services Committee (PSC) has adopted two temporary rule waivers for the event:

1. For Field Day 2020 only, Class D stations may work all other
2. Field Day stations, including other Class D stations, for points. Field Day rule 4.6 defines Class D stations as “Home stations,” including stations operating from permanent or licensed station locations using commercial power. Class D stations ordinarily may only count contacts made with Class A, B, C, E, and F Field Day stations, but the temporary rule waiver for 2020 allows Class D stations to count contacts with other Class D stations for QSO credit.
3. In addition, for 2020 only, an aggregate club score will be published, which will be the sum of all individual entries indicating a specific club (similar to the aggregate score totals used in ARRL affiliated club competitions).
- 4.

Ordinarily, club names are only published in the results for Class A and Class F entries, but the temporary rule waiver for 2020 allows participants from any Class to optionally include a single club name with their submitted results following Field Day.

For example, if Podunk Hollow Radio Club members Becky, W1BXY, and Hiram, W1AW, both participate in 2020 Field Day — Hiram from his Class D home station, and Becky from her Class C mobile station — both can include the radio club’s name when reporting their individual results.

The published results listing will include individual scores for Hiram and Becky, plus a combined score for all entries identified as Podunk <http://www.arrl.org/news/temporary-rule-waivers-announced-for-2020-arrl-field-day>

The temporary rule waivers were adopted by the PSC on May 27, 2020.

ARRL Field Day is one of the biggest events on the amateur radio calendar, with over 36,000 participants in 2019, including entries from 3,113 radio clubs and emergency operations centers. In most years, Field Day is also the largest annual demonstration of ham radio, because many radio clubs organize their participation in public places such as parks and schools.

Due to the COVID-19 pandemic, many radio clubs have made decisions to cancel their group participation in ARRL Field Day this year due to public health recommendations and/or requirements or to significantly modify their participation for safe social distancing practices. The temporary rule waivers allow greater flexibility in recognizing the value of individual and club participation regardless of entry class.

ARRL is contacting logging program developers about the temporary rule waivers so developers can release updated versions of their software prior to Field Day weekend. Participants are reminded that the preferred method of submitting entries after Field Day is via the web applet. The ARRL Field Day rules include instructions for submitting entries after the event. Entries must be submitted or postmarked by Tuesday, July 28, 2020.

The ARRL Field Day web page includes a series of articles with ideas and advice for adapting participation this year.

## MICROWAVE OVENS AS AN EAVESDROPPING DEVICE . . . . EXPLAINED

By Michael Cozzi via YouTube

I just came across the following interesting fact . . . the government is spying on you via your microwave oven! Yes, this is true. Most people think the microwave oven in their kitchen is only great for warming leftovers, heating TV dinners, etc. but new research indicates the Federal Government has found a way to use the same microwave energy to see and hear what is going on in your kitchen! The author of this video is a technology guy who has spent many years working with all things electronic.

Click on the link below for a short video on how this is possible and what one can do to prevent this from happening in your home. Please note, this video was released on April 1, but while you may not get this newsletter until after that date the information is still valid.

Click on this link for the full story: <https://youtu.be/cx3QdeQpsgc>

## WEBSITES OF INTEREST

Click on the highlighted links to go to the website

Check out the West Mountain Radio Website at <http://www.westmountainradio.com/pdf/Quarter-2-2019.pdf>. Lots of good information not just on their products but ham radio topics as well.

Interested in DX? Join (FREE) the NWI DX Club and/or read the monthly newsletter. See them on the web at: <http://nwidx-club.weebly.com/>



Want to buy or sell “stuff”. Checkout the club’s website for great deals. <https://lcarc.weebly.com/for-sale> Right now there are some GREAT deals on Motorola Mobile and Portable (HTs) DMR radios and accessories.

# Alkaline cells – A comparison to NiMH and NiCds Technology

from Prezhost -- <https://prezhost.com/2020/02/22/alkaline-cells-a-comparison-to-nimh-and-nicds/>



February 22, 2020 "Resistance is NOT futile... it's E/I!"

While alkaline cells generally more energy per-cell than rechargeable types (NiMH or NiCd) this energy may not be accessible to the appliance using that cell – particularly if it is a device that draws a lot of current. One good example of this is a Digital Camera.

Digital cameras are notorious for seeming to have appallingly short battery life: A brand new set of batteries, in some cameras, may only allow one or two dozen pictures to be taken before they are “dead.” A NiCd or NiMH battery, on the other hand, may last several times as long – even if that NiCd you used is rated to have about half of the amp-hour capacity of Alkaline, why did it seem to last longer?

Internal resistance is the culprit. When fresh, the internal resistance of a good-quality AA alkaline cell is on the order of 0.15 ohms per cell, increasing to 0.3 ohms per cell when the it is 50% discharged. If your camera uses a battery of 4 cells, that means that the total resistance of new cells (excluding resistance of battery contacts and wiring) is

Note: There are some newer types of Alkaline cells specifically designed for “High-Drain” electronic devices. While these cells do not necessarily have more capacity, they do generally maintain a lower resistance than standard alkaline cells and thus, the appliance may be able to utilize more of the cell’s capacity. For more information on these newer types of cells, visit one of the manufacturers’ web sites. Furthermore, more-recent digital cameras have been better-designed to handle the characteristics of alkaline batteries, enabling more usable operational life to be extracted from them.

If the digital camera consumes, say, 800 milliamps (a reasonable amount when a flash is charging, a backlit display is operating, etc.) then cell resistance alone will dictate a voltage drop of 0.48 volts for a battery with new cells, and 0.96 volts or so for cells that are 50% discharged. Again, this does not take into account other resistive losses – such as contacts and internal wiring – some of which can be significant!

For new cells in a 4 cell battery, this voltage will (optimistically – assuming a nominal 1.5 volt unloaded output) amount to about 5.5 volts under these conditions, dropping to about 4 volts when

the cells are 50% discharged – a voltage that may be inadequate for operation of the camera.

There is yet another problem: Often, cameras contain switching-type voltage converters. While these are efficient in their energy conversion, they attempt, by their nature, to maintain a constant power output over a varying input voltage. What this means is that, as the battery voltage drops, the current consumption will increase as the voltage converter attempts to maintain the constant voltage output – exacerbating the problem of already-low voltage. This problem can get worse when the camera’s load changes because of a charging flash, a backlit display being illuminated, or the camera’s CPU pulling more current when processing the image and saving it to memory.

In other words, the cells may be, say, only 50% discharged, but the equipment (the digital camera, in our example) may simply be unable to use the energy that is still available. If this is the case you’ll probably get plenty of life out of those same batteries if you put them in a small flashlight or portable FM radio, or TV remote control. In other words – don’t throw them away just yet!

## NiMH and NiCd cells and internal resistance:

NiCd and NiMH cells, on the other hand, typically have a much lower internal resistance over their charge life and this resistance (which varies depending on state of charge, temperature, age, condition of the cell, the cell’s internal chemistry and its construction) is typically lower than that of an alkaline cell – even when the NiCd or NiMH cell is significantly discharged.

According to info from a well-known manufacturer, a relatively new AA NiMH cell typically has about 0.17 ohms per cell when fully charged (as opposed to 0.15 ohms for a “fresh” Alkaline AA cell) and this rises to about 0.18 ohms at the “100% discharge” point. A typical AA Alkaline cell, on the other hand, can reasonably have over an ohm of internal resistance at 80% discharge – and this value skyrockets as the battery is discharged further. From what information that I have been able to find, a typical NiCd seems to have about half the internal resistance of the same-sized NiMH and is one of the factors that explains its suitability in very high current situations.

What this means is that while an alkaline cell may be able to run the digital camera (our equipment example) only until the cell is at its 50%-70% charge level, a NiCd or NiMH battery can probably output the required current and voltage until it is at or below its 15% charge level. The lower intrinsic resistance also means that they are more likely to be able to tolerate impulse loads (i.e. additional current drawn by the flash charging, for example) without causing the camera to shut down due to low voltage.

Comment: At the current level of technology, NiCd cells are usually preferred over NiMH cells for certain applications, most notably those requiring very high current consumption such as in battery-powered tools, etc. In these applications, the high current drawn by the tool may over stress a “typical” NiMH cell and likely result in shorter operational and useful life than a NiCd cell.

# HOW THE NATIONAL BUREAU OF STANDARDS HELPED MAKE "RADIO"

by Dan, KB6NU

*This was originally published as "NIST's Role in the Early Decades of Radio (1911-1933)" on the National Institute of Science and Technology's blog, Taking Measure.....Dan*

Even if you weren't able to watch the recent Super Bowl on TV, you could still listen to the play-by-play commentary on the radio. But radio does more than just broadcasting sporting events or playing music. It plays a major role in emergency response, navigation and science.

The word "radio," however, didn't become part of our regular vocabulary until 1911, and it happened thanks in part to J. Howard Dellinger, a radio scientist at the National Bureau of Standards (NBS), the agency that became the National Institute of Standards and Technology (NIST). This came about when the second International Radiotelegraph Conference was being planned in London, and a professor sent Dellinger a paper that he was going to present to the conference for review.

At the time, "wireless" was used as the term for radio communication, especially by the British. However, NIST was charged with revising standards in preparation for the conference, and Dellinger suggested that the professor use "radio," which was already becoming a popular word in the U.S., instead of "wireless." The professor agreed, and the word "radio" went on to become the universally accepted term.

Dellinger not only played a role in popularizing the word "radio," but he also played a role in the first radio work done at NIST. A commercial company asked NIST to calibrate a wavemeter, a device developed by one of its engineers that measures electromagnetic waves like those of radio. Dellinger was known as the wireless expert and took on the project of calibrating the first radio instrument at NIST.

## A New Type of Radio Receiver

But for radio to become mainstream, it first had to be commercialized, which began with its introduction into households. However, the challenge was building a radio set that used the electrical current, called alternating current (AC), which powered lights, fans and kitchen appliances when plugged into wall sockets. The predecessor to this technology was developed and patented by two researchers, Percival D. Lowell and Francis W. Dunmore, at NBS in 1922. They

*Percival Lowell with his patented radio set powered by alternating current. Credit: NIST*

called their invention the "mousetrap."

The "mousetrap" was a receiver for a radio amplifier that could run on AC. This was considered a breakthrough because at that time radios were only able to be powered by direct current (DC) provided by batteries. These batteries were bulky and heavy, had to be charged from time to time and were considered dangerous because of the acid used in them. The researchers' prototype meant the radio could be used in homes without causing damage and with the same performance quality.

Lowell and Dunmore filed two more patents together for other innovations, and for the "mousetrap" they sold the rights to the Dubilier Condenser Corporation. Little did they know that, be-

cause there was no uniform policy on patents issued to government employees, their actions would result in more than a decade of litigation over who legally had the rights to the patent.

While they were tied up in court, the Radio Corporation of America (RCA) developed its own model of the AC radio in 1926. Its model later became the first AC-powered radio sold to consumers.

## Flying by Radio

During the early years of flight navigation, NIST was doing research to assist pilots while they were flying and landing. Pilots needed three things to get their bearings when flying "blind," meaning it's foggy, too dark or too cloudy to see. They needed to know the longitudinal position, altitude and speed of the aircraft, which were all achieved by various beacons installed in the plane. The remaining issue was that there were two frequencies the pilot constantly had to switch between the frequency that the Department of Commerce used to send weather information to planes and ships, which sometimes caused interference for pilots, and the frequency the radio beacon operated on, which gave altitude and other information.

Dunmore created a prototype, but Harry Diamond, a radio engineer who joined NIST in 1927, completed the device, called the radio guidance system. Diamond solved the problem by developing a separate device that allowed for voice communication to the pilot without receiving any outside interference from ships' radios.

A Curtiss Fledgling, a trainer aircraft developed for the U.S. Navy, was equipped with the device, and flight tests were performed between NIST's experimental air station at College Park, Maryland, and Newark Airport in New Jersey in foggy weather. After a series of successful tests were performed, the device was turned over to be used by the Department of Commerce in 1933.

### Praise From a Famous Inventor

While mostly intended for serious users, some of NIST's journals and publications were popular with the public. One such book, titled *The Principles Underlying Radio Communication*, covered topics such as elementary electricity, radio circuits and electromagnetic waves and was also published as a textbook for soldiers in the U.S. Army. The famous inventor Thomas Edison received a copy from NIST and wrote a letter thanking the first director, Samuel W. Stratton, for publishing it, saying it was "the greatest book on this subject that I have ever read."

*continued on page 6*

As these and other examples show, NIST had a significant influence on radio research between 1911 and 1933. However, NIST's radio work didn't end with the first blind landing. NIST would continue to contribute to the field leading up to and during World War II, and research continues to this day in areas such as 5G, public safety communications and spectrum sharing.

### ABOUT THE AUTHOR

*Alex Boss is a general assignment writer in the NIST Public Affairs Office and covers standard reference materials (SRM). She has a B.S. in biology from Rhodes College and an M.A. in health and...*

## MOBILE DC POWER: ONE FUSE OR TWO?

by 7 March 2020 Bob K0NR

### Continued page from 2

transceiver and back to the battery. The starter current can be hundreds of amperes which would likely overload the radio wire which is sized for 15 amperes. The fuse will open and protect the negative lead (and maybe the radio, to some extent).

The argument against fusing the negative lead is that if the fuse opens up, it could cause problems. Suppose Fuse 2 opens up due to some transient condition. If the transceiver is completely isolated, Fuse 2 would remove power from the transceiver. However, the return path at the antenna coax (point C) will most likely allow the radio to continue functioning using the coax as the negative return. Typically, this is RG-58 or similar cable, which is not intended to carry significant DC current and may fry under the load. If the current is coming from a fault in the starter wiring (big current), this is going to be a bad day for your mobile.

### My Conclusions

I think both arguments have merit but choosing one fuse or two requires estimating which problem is most likely and judging the overall impact of the fault. The negative lead fuse can do only one thing well: protect the negative lead. It might provide some protection to the transceiver but there are a lot of sensitive circuits inside the radio that will get destroyed with 15 A flowing. Again, the connection at point C means that the radio will be connected to chassis and current can flow.

If Fuse 2 is eliminated it allows for the flow of high currents through the negative lead of the transceiver. This is not desirable but is it better or worse than the current flowing through the coax shield? Probably better. If a high current device (the starter) has a wiring failure that dumps large currents into the chassis, it may find a number of return paths. Lots of current is going to flow somewhere and potentially cause damage, with or without a negative lead fuse.

I will note that bonding the transceiver to the vehicle chassis has some benefit (point B in the diagram). You may or may not have this connection depending on how you mounted the radio. This electrical connection can shunt any currents away from the coaxial cable, hopefully doing less damage that way.

What am I going to do? My future mobile installations will have only one fuse in the positive lead. I'll also bond the radio body to the vehicle chassis, with a hefty, low-resistance connection.

My existing mobile installations all have two fuses. I won't be changing them out because the risk of inducing a problem with the negative lead fuse is rather low. I don't see the negative lead fuse as a big risk. If you choose to follow the amateur radio manufacturer's two fuse recommendation, I understand.

### A Request

The amateur radio equipment manufacturers need to give this issue a fresh look. At a minimum, the presence of ELD's needs to be addressed and the common recommendation of wiring directly to the battery is obsolete. But the one-fuse-or-two issue should also get a careful look by the manufacturer's engineering teams.

That's my analysis. What do you think?

*Note: This article is my technical opinion but my attorney says to tell you that you are responsible if you destroy your vehicle while wiring up your transceiver. -- ed.*

## FROM THE PARADE STAND

by Tim, N9CIA

### Continued page from page7

appear in your drop-down band-selector list after you go to the "Settings" then to the "Frequencies" tab. Right-click on the frequency table, and select "Reset". Alternatively, you can add the new FT8 frequencies manually. When the conventional FT8 sub-band on 6, 20, 30, or 40 meters seems too full, please try moving your dial frequency down 3 kHz! [A]s currently implemented, WSJT-X will set your dial to the lowest frequency for the selected mode and band, when you switch bands."

The latest "general availability" (GA) release is WSJT-X 2.1.2. WSJT downloads are free at [www.physics.princeton.edu](http://www.physics.princeton.edu)

Field Day is June 27th and 28th on all HR bands except for the WARC bands. i.e. 160, 80, 40, 20, 15, 10, 6, and above and contacts count... on all modes (just not through a repeater).

One club is still planning to conduct its Field Day as a 4A club group, with participants spaced to comply with social distancing guidelines within the required 1,000-foot diameter circle and operating individual stations.

Another club is planning to set up a remote-controlled station at its usual Field Day site, with club members taking turns controlling the station from their homes.

Instead of participating in a group event this year, consider operating as a Class B, C, D, or E station, utilizing your own call sign, and/or submitting your results as "1D" under the Club W9LJ call sign. ARRL will include Club names with all participating Club members' stations in the published results, so the efforts of a Club's membership can be acknowledged.

Please contact me if you want to operate FD as a Club and combine our scores via this method. Again... the ARRL will not publish an aggregate Club score, just list your call and individual member scores under W9LJ in the results. [tim2020@sbcglobal.net](mailto:tim2020@sbcglobal.net)

On a personal note, the past few weeks, I have had a lot of fun operating FT8 on 15, 10, and 6 meters. I have been working; the southern US, the Caribbean, and South America - regardless of the sun spot count.

I told my wife to embrace her mistakes... and she gave me a great big hug!

Rain or shine, Covid-19 or not, I'm grateful HR is my hobby. Stay safe my friends !