2024-02-06 Hamlet Net - Powerpoles

Announcements:

- Test Session Info
    - Next VE session is Saturday, February 24th in the Clover Building at the Boulder County Fairgrounds, and starts at 10 am. It is an ARRL session, so there is a $15 fee to test. For more info, and to pre-register, see the Licensing/Testing page on the club web site, https://w0eno.org/, under the Education menu.

- RMHAM is putting on their Swapfest on February 18th from 9am to 1pm at the Adams County Fairgrounds. Admission is $6. Bring your HT - there will be a foxhunt set up in the adjacent Adams County Regional Park. For more information, see their web site at: https://www.rmham.org/the-swapfest-2024/

- This weekend is also RMHAM's NERDFest is this Saturday, February 10th starting at 8:30am via Zoom. Topics this year are: Small Rotors for AMSAT, Callmon monitoring tool for repeaters, W1AW/0 Operations and Planning, Surface Mount Reflow at Home, GIT for Hams, Chasing Balloons, and WFVIEW for ICOM Remote Radio Control.

  See their web site at: https://www.rmham.org/rocky-mountain-ham-university/ for signup and Zoom meeting details under the Rocky Mountain Ham University link. If you are unable to make it, they usually post recordings and materials for their events.

- Last week, I covered RTTY. I noticed that there is a worldwide RTTY contest going on this weekend, so if you want to try your hand at operating RTTY (or just try decoding it), this would be a great opportunity.

  For contest rules, see: https://www.cqwpxrtty.com/rules.htm

- We have some volunteer opportunities available where you can help out LARC:

    - Photographer / videographer - record team activities and upload to web site / YouTube

    - Newsletter Editor - put together the monthly Splatter newsletter

- There are several Board positions that will be available in October. Currently, the President, Treasurer and Secretary are planning to make this their last year of service. If you are interested in serving on the board of a 501(c)3 non-profit, please consider running for one of these positions. The current members would be more than happy to "show you the ropes" during the year, so you wouldn't start with zero experience.

- If you are an ARRL member, remember that unless you are paying extra for the printed magazine, you will not receive any issues after January. The February QST is available on the ARRL web site.

- Also looking for volunteers to help with LARCFest on April 6. If interested, please check out web site and contact Bob Smith (N0OM) for more information. Tables are also being sold if you have stuff to get rid of.

- Our sister club up in Nederland is looking for some help with events they are running. They have a weekly Monday night net with no predetermined agenda, so you can lead it however you want. They are also planning a Field Day site at Golden Gate State Park and are welcoming anyone who wants to participate. Finally, they are looking for operators for the Ned Gravel run on July 8th. They have signup links for all these events, so head over to their web site https://w0ned.org/ for more information!

- You can start earning your 2024 membership or future renewal by acting as NCS for at least 5 nets this year. You can run either this Tuesday night net or the Thursday night net (or both). We have scripts available for both, so all you need is a good connection into the repeater, and somewhere to keep track of names and call signs as people check in. If you're going to be on the net anyway, why not save some dough at the same time! There are four free memberships available for 2023, so don't wait to get started!

- Chuck has set a goal for the Club of running at least one activity a month. This can be a hands-on construction activity, an operating activity like Field Day, a fox hunt, or a special event station. The goal is to get people together to have fun with amateur radio! We have multiple locations at our disposal, as well as lots of Club equipment, so if you have an idea for something you think others hams would like to do, please let us know, and if you're willing to run it, even better!

- The Club is also looking for presentation topics for 2024. If you have any ideas, or better yet, would like to present, please let Chuck know and we'll get you on the schedule!

- All club activities are open to anyone - members and non-members. If you have questions, ask them on a net or **send email to elmer@w0eno.org**

Presenter: Bryan, AF0W

Topic: Powerpoles

Powerpoles

- You've probably seen Powerpoles in videos or on actual ham equipment. They are plastic and metal connectors that are frequently used for power cable connections in amateur stations.

- A big reason for using Powerpoles is for compatibility.
    a. I believe ARES and RACES have both standardized on them so that when various operators show up for an event, their batteries, cables, and radios can all connect to each other.
    b. Many radio manufacturers use different power connectors on their radios
    c. Most radios come with a power cable that has a connector that mates with the radio on one end, has fuses inline, and then terminates in bare wires so the end user can either directly wire it into their power supply, or add whatever connectors they use to them
    d. By using a common connector (both type and gender) for all your equipment, you make your own life easier, and using Powerpoles in the proper configuration helps you share equipment with others without running into connector issues

Build Your Own Power Cables

- You can purchase pre-made cables or construct your own.
    a. If you build your own cables, be sure you adhere to the standard configuration so your connectors will mate properly with others.
    b. Powerpole connectors are meant to be installed using a crimping tool. LARC has a Powerpole crimping tool that is available for members to borrow as well as some Powerpole connectors.
        - This crimper is not the same as the ones sometimes found on wire strippers that are frequently used for crimping ring and spade terminals
        - Some hams attempt to use pliers to crimp the connectors
        - The problem is that if the connectors are not crimped properly, they won't fit and lock into the shells
- If you go to the Anderson Power web site and look at their Powerpole page, you'll see that there are actually a number of different types and sizes of Powerpole connectors
- Amateur radio applications use the 1327 series connector housing along with a crimped connector which slides into and is held by the housing
    a. These housings are typically red and black, but they're actually available in other colors such as green, blue, yellow, and 6 others
    b. The housings have slots and tabs that allow them to be attached to each other, which allows you to have multiple cables running into a single connector block -

for example, the ARES specification I mentioned earlier has the positive and negative connectors joined together.

c. There are three contacts that fit this housing - each with a different current / wire size rating

- They are rated at 15, 30, and 45 amps, but the size of the actual contact area is the same for all three - the only difference is the size of the wiring connection and the size of wire they will accept.
- The 15 and 30 amp connectors have a round tube into which the wire is inserted, while the 45 amp contacts have an open channel for the wire.
- The 15 amp are for 20 to 16 gauge wire, the 30 amp are recommended for 14-12 gauge wire, and the 45 amp versions are for 10 gauge wire
- The contacts are meant to be used without solder. You may think that adding solder will help solidify the wire to connector connection, but there are a few problems with this.
    a. First, if the solder extends past the edges of the connector, it can actually prevent the connector from properly seating in the housing
    b. The other issue if that if you are using stranded wire, the solder can tend to wick back up your wire making the wire inflexible and raising the chances of it breaking
- These connectors aren't only for low voltage applications. The housings are rated for up to 45 amps at 600 volts
- Some characteristics of the connectors are:
    a. The actual contact surfaces are flat and wipe against each other when connecting and disconnecting - this helps maintain a clean contact surface.
    b. The connectors are of an interchangeable, genderless design, making assembly more straightforward, and not requiring you to maintain different connector types in inventory
    c. Silver or tin-plated contact surfaces support long life and high power applications
- I actually saw another application of Powerpoles when they were reconfiguring some of the modular furniture at my workplace. The outlets and lighting built into the partitions were actually connected using Powerpoles where the partitions were joined together
- There are also a lot of optional components available for Powerpoles

a. I mentioned that the individual connector housings can be joined together. You do this by sliding the tabs and grooves together. To prevent them from coming apart, you can either glue the two connectors together, or install a pin into a hole formed between the two connectors. This pin prevents them from sliding apart.

b. One issue you may encounter is that while the Powerpole connectors snap together when making a connection, they can also be pulled apart without too much force. If you want to keep them together, you can get a retention clip that uses the holes I just mentioned to join the two sets of connectors together. The clip also replaces the pin for keeping the connectors on the same side of the connection together

c. Panel mount housings are available so that you can install a set of Powerpole connectors on something like a battery box by either drilling a round hole in the box, or by making a rectangular cutout, depending on the type of mount you get

d. A rubber dust cover can be used to cover the connector ends when not being used

e. There are also covers for the wire end of the connectors to make it look cleaner, or you can use heat shrink

f. There are also connectors made for mounting on a circuit board instead of a wire

g. Finally, there is a tool that makes removing the connectors from the housings easier

- They also have larger versions - I've got a set that I plan to use to connect to my car battery - they will support up to 75 amps with connectors for 8 gauge wire
- I've also seen larger versions of the Powerpole connector used in uninterruptible power supplies for battery connections
- As with just about everything nowadays, there are cheaper knock-off Powerpoles. The originals are made by Anderson Power, and while you may have good luck with the knock-offs, you may also find that the housings may not mate together soundly, or that the connectors may tarnish and corrode
- To see many of the Powerpole options available, take a look at the powerwerx web site at https://powerwerx.com/ (that's papa-oscar-whiskey-echo-romeo-whiskey-echo-romeo-xray-dot-com) - Click on the link for DC Power Products, and then click on the link for Anderson Powerpole Connectors
- They also have a bunch of adapter cables, panel mounts, and Powerpole power distribution devices

- For example, you can get an adapter that plugs into your vehicle's cigarette lighter that has Powerpole on the back for connection to your equipment. Or a cable that has Powerpoles on one end, and large alligator clips on the other for temporary connection to a vehicle battery.

- The distribution blocks allow connecting multiple Powerpole cables together. For example, you could have one connection running to your station power supply, and then have multiple radios and other station equipment with Powerpole connectors connect into the distribution block and all be tied together

- Some distribution systems (such as the Rig Runner series) even have individual fuses for each Powerpole connection and may include voltage monitoring, overvoltage protection, and USB power ports.

- I've also seen a few kits available where you can solder together your own distribution box. One of my first ham radio projects was making a box with a volt amp meter and Powerpole connectors. I wired them all individually point-to-point, and it was a bit of a mess. If I had it to do over again, I think I'd just put the meters in the box and use the RigRunners for the actual power distribution.

ARES standard

- I've mentioned that there is a standard used by ARES and RACES for Powerpole connectors.

- This is needed because the Powerpole connectors can be assembled multiple ways.

- The connectors only mate in one orientation, but the two housings can be assembled either vertically or horizontally, and the red housing can either be on the top or bottom (or right or left) of the pair.

- Since the connectors will all mate with each other, there is nothing preventing you from connecting a red connector to a black connector

- In fact, when my wife and I were taking the training for using the club GoBox, when we tried to connect the inverter, there was a snap and a flash from the inverter, and then it went dead. The person training us replaced the fuse in the inverter, and the same thing happened again.

    a. Upon inspection with a multimeter, he had swapped the positive and negative wires on one end of the power extension cable, causing the inverter fuse to blow. If he had used black and red zip wire, it would have been trivial to spot, but these cables were wired with white lamp cord, so it was harder to tell which was which.

    b. Luckily, once we switched to using another cable, everything worked fine and there was no permanent damage to the inverter.

- When connecting the red and black connectors together, if you are viewing them from the front connector side (and not the back wire side), you want the tongue facing down, the hood facing up, and the RED connector on the LEFT.
- This is a case where a picture is definitely worth 1000 words, so I highly recommend a quick Internet search before putting your cable together.
- If using zip cord, you also want to get your wires and connectors into the proper orientation before you crimp them on, otherwise they'll be difficult to orient properly in the housings.
- Place the wire on the table in front of you with the red / positive wire on the right with the end of the wire facing away from you. Place the contact pins on the wires with the end of the contact facing down. Then after you have crimped the connectors, just slide the wires and connectors into the housings until they click.
- The ARES standard also includes the use of 30 amp connectors, presumably to support current requirements of typical radios
- I'll put a copy of these notes with a couple of URLs on to the club web page so you can see how this all works.

Links:

- ARES/RACES Powerpole Info: https://www.qsl.net/w2vtm/powerpole.html
- https://www.steelecountyemergency.com/races-ares-anderson-powerpoles/
- PowerWerx: https://powerwerx.com/anderson-power-powerpole-sb-connectors
- Anderson Power: https://www.andersonpower.com/language-masters/en-us/resources/PowerPoleResourcesPage.html

Questions:

- **The question for the week is:** Do you use Powerpole connectors for your radio equipment, and if so, have you made any of your own cabling?
- **In my case,** I use Powerpoles for my home station. I've got a couple of RigRunner distribution systems for all my equipment. I added Powerpole connectors to all of the power cables for my equipment, and it's been working great.

- I plan to use Powerpoles for my mobile installs as well. My plan is to use the larger 75 amp connectors and 8 gauge cable to run from my battery to inside the vehicle - probably underneath the seats where I will install my radios. In that location, I'll have a Powerpole block from Powerwerx which has a single 75 amp Powerpole connection and 4 pairs of the smaller connectors to which I'll connect the radios. The radio power cables have fuses in them already, so I didn't use a RigRunner type device with integrated fuses.

More Info:

- ARES/RACES Powerpole Info: https://www.qsl.net/w2vtm/powerpole.html
- https://www.steelecountyemergency.com/races-ares-anderson-powerpoles/
- PowerWerx: https://powerwerx.com/anderson-power-powerpole-sb-connectors
- Anderson Power: https://www.andersonpower.com/language-masters/en-us/resources/PowerPoleResourcesPage.html

Backup Questions:

1. What hobbies do you have other than ham radio? Do you (or could you) use ham radio in these hobbies?
2. Share an "a-ha" moment you had with amateur radio?

- If you have ideas for net topics or general meeting topics / presenters, please let us know! Tell us on a net, or send email to k0itp@w0eno.org

Email to elmer@w0eno.org

1. AF0W - Bryan - El Paso via Echolink
2. AE0DO - John - N of Longmont
3. W7PGF - Philip - Frederick
4. KM6SJA - Steve - Longmont
5. KF0MXH - Art - Longmont
6. KC0CT - Joe - Broomfield
7. KA0CFR - Charles - Longmont
8. KE0EBW - James - Johnstown
9. KF0FEC - Will - Boulder
10. WA0JJC - Bob - Boulder

End: 8:00pm