2025-06-24 Hamlet Net - QRP

Announcements:

- Test Session Info
    - Next VE session is Saturday, July 26th in the Clover Building at the Boulder County Fairgrounds, and starts at 9 am. It is a PVET session, so there is no 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.
- We are looking for presenters or presentations for November. We'd love to have club members present something they're interested in or working on, and there's plenty of time to get your presentation ready!

  We're also interested in hearing any ideas for presentations that we could find someone to do.
- This month's General topic is 3D Printing. The next is Fred (AF4BY) putting on a BBQ and putting together the club's SpiderBeam antenna. In Sept, we may have Edge of Space Sciences coming out.
- Chuck said he's probably going to plan another outdoor meeting for August - the "Movie in the Park" event last year was great - even though we got a bit of rain. The plan is to provide food as well, so be on the lookout for more info!
- If you are interested in find out more about the Amateur Radio Emergency Services (or ARES) in the local area, check out the Boulder County ARES web site at https://bouldercountyares.org/

  They have a VHF net on Monday nights at 8:00pm, as well as a DMR net on the 2nd, 3rd, and 4th Mondays at 8:30pm.
- Upcoming Club Volunteer Opportunities:
    - HAMCON Colorado 2025 for Rocky Mountain Division is October 23-26, 2025 in Grand Junction. For more information and to register, see their web site at: hamconcolorado.com They are also looking for presenters.
- Breakfast Saturday at 7:30 - 8:00 am at the Hidden Cafe.
- Mark - RMHAM is taking over the summer swapfest this year from the Denver Radio Club, Sunday August 24th at the Adams County Fairgrounds from 9am to 1pm. Admission is just $6, so plan on dropping by! Tables are also available for $13 in advance, and $20 at the door.

- If you are an ARRL member, remember that you have digital access to four magazines - QST, On the Air, QEX, and National Contest Journal.

- We have a new net on the LARC repeaters. It's run by Timothy Moss, KFØLAR, on the 22nd of every month at 6pm. The 22nd was chosen to highlight the average of 22 vets who commit suicide each day. While the purpose of the net is to connect veterans, non-vets are welcome to participate as most all of us have friends or family who are or have served.

- The ARRL Colorado Section Net occurs on the second Monday of the month from 7 to 8pm. The net is run by Amanda Alden, K1DDN, our Colorado ARRL section manager, and is open to hams and non-hams alike. This net is a place where Colorado hams can ask questions of ARRL leadership and request help, guidance, club support, and technical support. This net meets on the second Monday of each month at 7:00 pm Mountain time. The net is on the Colorado Connection, Rocky Mountain Ham Radio DMR Talk Group 700, The Fun Machine, WE0FUN, and the NCARC Buckhorn Repeater 447.700 – with 100 Hz tone.

- 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

    - Event Coordinator

- Time's up for this year, but you can earn your 2026 membership or future renewal by acting as NCS for at least 5 nets next 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!

- 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 2025. If you have any ideas, or better yet, would like to present, please let Chuck know and we'll get you on the schedule! We would like to get some presentations from club members on stuff they've been doing, projects they're working on, or just things that interest them.

- 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: J Pole Antennas

- If you've been around ham radio for a while, you've probably heard of (and likely seen an example of) the J Pole antenna
- A J Pole antenna is a vertical, omni-directional, single-band antenna that is fairly easy to build
- If you've seen one, you know that the name comes from the physical shape of the antenna, which resembles an upper-case J
    a. There are two vertical elements - one longer than the other - connected by a short horizontal element
    b. The feed point is located near the bottom of the antenna
- This type of antenna was invented in 1909 for use in Zeppelin airships which trailed lengths of wire out of their gondolas for radio communications
- It has a few advantages over typical ¼ and ⅝ wavelength antennas
    a. One of the major advantages is that it does not require radials or a ground plane to function
    b. This makes it easier to construct and install, and reduces wind resistance on the antenna itself
    c. J Pole antennas provide a small gain of around 2 dB over a quarter-wave ground plane antenna
    d. They also have low angles of radiation
- The J Pole antenna is effectively an end-fed half-wave antenna
    a. The end of such an antenna is the point at which the voltage is at a maximum and the current at a minimum
- Ohm's Law (voltage equals current times resistance) can be rewritten as resistance equals voltage over current
    a. High voltage and low current means this point on the antenna also has a high impedance - somewhere in the neighborhood of 1000 to 4000 ohms

    b. This is much higher than the 50 ohms that are typically used for amateur feedlines and devices

- An impedance mismatch will result in a high standing wave ratio, or SWR, and poor performance from the antenna system
- To address this, the antenna feedpoint impedance needs to be transformed into something close to 50 ohms
- In the J Pole antenna, this is done by using a quarter wavelength of balanced feed line, only the feedline is part of the antenna itself
    a. When looking at a J Pole antenna, you will see a long element on one side - this is the half wave radiator portion of the antenna
    b. At the bottom of the antenna, there is a section with two parallel elements - one at the bottom of the half wave element, and the other spaced apart from it and connected to the first by the horizontal part of the antenna
    c. These parallel elements comprise the quarter wavelength feeder that transforms the impedance
- The antenna is fed across the parallel elements at the bottom of the "J"

Construction

- J Pole antennas can be constructed from many different materials
- A common choice is copper pipe, but portable versions (sometimes called "roll up J Poles") can be made from 300 ohm TV antenna feed line or 450 ohm window line
- The upper section of the antenna is the antenna's half wave radiator, while the lower section is the quarter wave tuning stub
- If you recall from the Technician exam, you can calculate the wavelength in meters by dividing 300 by the frequency in MHz
    a. Using a frequency of 146 MHz, which is at the center of the 2 meter band, this results in a wavelength of 80.9 inches
    b. This formula assumes a very thin bare wire in free space
    c. To adjust for constructing the antenna using ½ inch copper pipe, this number is multiplied by a factor of 0.958, as determined from a chart in the ARRL Antenna Book - resulting in a corrected wavelength of 77.5 inches

    d. Half a wavelength is therefore 38.8 inches, and one-quarter of a wavelength is 19.4 inches

- The other dimension needed for the antenna is the spacing between the quarter wave elements

    a. There is a link to a web page with calculations for determining this distance - it says the distance is not critical, and should be chosen to make the antenna easy to build

    b. The distance does impact the feed point for the antenna

    c. The web site suggests a separation distance of 2.5 inches

- The coax feeding the antenna is attached to the parallel section of the antenna -

    a. The bottom of the parallel section of the antenna is shorted together by the horizontal element, and is at 0 ohms.

    b. The top of the matching section is an open circuit, so the impedance is very high

    c. The feedline is attached at the point where the impedance is approximately 50 ohms

    d. The center conductor of the coax is attached on the side of the antenna with the half wave radiator, and the shield to the shorter side

- To tune the antenna for lowest SWR, move both feed point connections up or down

    a. If the lowest SWR is not 1:1, change the radio frequency until it is.

    b. If this frequency is lower than the center of the band, then shorten the halfwave radiator

    c. If this frequency is higher than the band center, then you will have to cut a longer radiator for your antenna

- There is nothing to prevent you from making a J Pole for any band, but antennas for HF frequencies will be fairly large

    a. Remember that the long side of the J consists of the halfwave and quarter wave portions of the antenna - for 10 meters, this would be over 24 feet!

- Suppression of feed line RF currents will likely be required - ferrites or open-air baluns comprised of loops of the coax feedline can be used for this purpose

Slim Jim

- You may have heard the term "Slim Jim antenna" and wondered if this is the same thing as a J Pole antenna
- The Slim Jim is actually a variation on the J Pole antenna
- It was introduced by Fred Judd, G2BCX, in 1978
- While it uses more material for the antenna elements, it exhibits no performance advantage over the conventional J Pole antenna design
- The construction of a Slim Jim antenna is the same as a regular J Pole, except there is a horizontal element at the top of the J which extends down almost the full half wavelength toward the bottom of the antenna
- The half wavelength radiator now appears similar to that of a folded dipole
- According to Michael Martens, KB9VBR, of KB9VBR Antennas, there are some differences between the Slim Jim and traditional J Pole antennas:
    - The overall length of his Slim Jim antenna is 11 inches shorter
    - The gain of the Slim Jim is twice that of the J Pole
    - The bandwidth of the Slim Jim is slightly over double that of the J Pole
    - The takeoff angle of the Slim Jim is much lower than that of the J Pole (8 degrees versus 20 degrees)
    - One downside of the Slim Jim is that the antenna needs to be isolated from the mast system, whereas the J Pole does not
        - For example, if you have a metal mast, you would need to do something like attach a piece of PVC pipe to the top of the mast, and then attach the Slim Jim to the top of that
    - Another is that the antenna requires more materials so costs more
        - As an example, he sells his 2m copper J Pole antenna for $46, and the Slim Jim for $58
- He also states that the J Pole is a good choice if you are mounting the antenna at a lower mast height or are in an urban area or valley - the Slim Jim would need to be mounted in the air at about the 20 or 30 foot level

Ed Fong Antenna

- Another popular antenna is from Ed Fong, WB6IQN, available as either the DBJ-1 dual band base antenna, or the DBJ-2 Dual Band Roll Up Antenna
- Ed designed these antennas to perform as half wave radiators for both the 2m and 70 cm bands (remember, the traditional J Pole antennas are designed for a single band)
- The roll up antenna is an extremely portable antenna that is great for hiking and camping
- Ed has graciously provided detailed plans for building these antennas in his articles published by the ARRL (DBJ-1 in Feb 2003 QST, and DBJ-2 in March 2007 QST) so you can make one yourself
- He's also got a tri-band model, the TBJ-1 that adds 220 MHz support.
- He also sells antennas which are produced by his graduate students - both the DBJ-1 base antenna and DBJ-2 rollup antenna are around $60
- The DBJ-1 base antenna will handle up to 75 watts, while the DBJ-2 roll up antenna will handle 50
- Ed did a presentation at a LARC meeting back in January of 2021. A recording of this meeting can be found on our Club website and Youtube channel (https://www.youtube.com/watch?v=JR9BGE2HcDw)
- N9TAX also sells a dual band rollup Slim Jim antenna for $33 that handles 100 watts
- There is also an interesting antenna from VE6SFX called the Fara-J which is made with Faraday cloth and tape that makes it lightweight, compact and durable. The antennas are single band, and a bit expensive - the 2m antenna sells for $75 or $50 in kit form.
- He also has antennas for 70cm, GMRS, Meshtastic, and 6 meters, as well as a 2 meter Moxon antenna.

Questions:

- **The question for the week is:** Do you use a 2m and/or 70cm antenna for a base station antenna, and if so, what type do you use?
- **In my case,** I've got three different base station antennas. My primary station is connected to an Ed Fong DBJ-1 antenna I have mounted in my attic. I also have one of his DBJ-2 rollup antennas that I purchased for operating while out of the house - I've used it on multiple vacations connected to an HT to listen to local nets and communicate via APRS. Finally, I have a secondary station with a collinear dual-band antenna from Diamond Antenna, the X-50. Externally, it looks similar to the PVC pipe used on the Ed Fong DBJ-1 antenna, but it does have three ground plane elements.

More Info:

- Copper Pipe J Pole Antennas: http://www.cvarc.org/resources/Tech_Articles/buildjpole.html
- J Pole Vertical Antenna: https://www.electronics-notes.com/articles/antennas-propagation/vertical-antennas/j-pole-vertical-antenna.php
- J Pole Antenna on Wikipedia: https://en.wikipedia.org/wiki/J-pole_antenna
- Slim Jim and J Pole Calculator: https://m0ukd.com/calculators/slim-jim-and-j-pole-calculator/
- J Pole Antenna Design Calculator: https://www.hamuniverse.com/jpole.html
- Slim Jim 2 meter Aerial: https://www.hamuniverse.com/g2bcxslimjimantenna.html
- Slim Jim Antenna Project: https://www.hamuniverse.com/slimjim.html
- Slim Jim vs. J Pole Antennas: https://www.jpole-antenna.com/2012/10/21/slim-jim-vs-j-pole-antennas/
- Ed Fong's Antennas: https://edsantennas.weebly.com/
- Ed Fong's antenna plans (DBJ-1, DBJ-2, TBJ-1): https://edsantennas.weebly.com/about.html (scroll to bottom of page)
- Review of DBJ-1 Antenna: https://www.miklor.com/COM/Review_DBJ1.php
- N9TAX Labs: https://n9taxlabs.com/
- Diamond X-50 Antenna: https://www.diamondantenna.net/x50a.html
- Spectral IsoPole (mentioned on net): https://www.isopole.com/index.php#productos
- Fara-J Antena: https://vfcomms.com/shop/antenna/fara-j-antenna/

Email to elmer@w0eno.org

- 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. KØITP - Chuck - Firestone
2. AFØW - Bryan - Longmont
3. AI7JW - Ian (eye-an) - Thompson Park (mobile)
4. AFØXS - John

5. WØMYK - Mike - Longmont
6. KFØOKA - Ben - Pinewood Springs

End: 7:45pm