

## 2023-11-28 Hamlet Net - Signal Reports

### Announcements:

- Test Session Info
  - Next VE session is Saturday, December 9th in the Clover Building at the Boulder County Fairgrounds, and starts at 10 am. 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 have some volunteer opportunities available where you can help out LARC:
  - Photographer / videographer - record team activities and upload to web site / YouTube
  - LARC Fest Coordinator -
  - Newsletter Editor - put together the monthly Splatter newsletter
  - Activities Chairperson - member of the Board of Directors
- LARC is running our annual Santa on the Air event again this year, with help from the Northern Colorado Amateur Radio Club. We are planning to have Santa, Mrs. Claus, and Santa's elves operate from next Monday, November 27th through Sunday, December 10th.

Our "professional Santa" has retired this year, so we are in need of some help! We currently have one Mrs. Claus and one Elf, so we need some volunteers to round out our team.

The only requirement is that you can get into the LARC repeater or the NCARC 447.700 repeater on Mount Buckhorn - you can also use Echolink to get into the LARC repeater.

I believe Chuck has some material put together by our old Santa on how to play the part, so if you are available, please help us out!

Contact Chuck, K0ITP, at [k0itp@w0eno.org](mailto:k0itp@w0eno.org) to see how you can assist.

- RMHAM is holding their "DMR 201" presentation which includes coverage of the RMHAM network, and cBridge, using DMR for data transfer, bridging DMR and other networks, vocoders and similar topics. The presentation will be held live on December 9th at the Cherry Creek Schools Educational Services Center (4700 South Yosemite Street, Greenwood Village, CO) and via zoom, For more information, go to their web site at: <https://www.rmham.org/> and see the RMHAM UNIVERSITY link on the menu.

- 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 2023. 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](mailto:elmer@w0eno.org)**

**Presenter: Bryan, AF0W**

**Topic: Signal Reports**

- A common part of amateur radio communications is the signal report, the primary purpose of which is to let each participant know how they are being received by the other
- If either end has a poor incoming signal, they can perhaps reorient their antenna (or switch to a different antenna), adjust their radio settings, especially filtering, or perhaps the transmitting side can switch on an amplifier
- A bad signal report would also indicate to the participants that the QSO might be kept short to avoid frustration trying to hear the other operator
- Signal reports vary with the operating mode, but a complete signal report consists of three numbers and is referred to as RST

- This quick method of reporting signal quality was originated around 1934 by CW Operators
  - a. It is much faster to send three digits than "Your sound pretty good" over CW
- Stands for Readability, Signal Strength, and Tone
  - a. R = Readability
    - 1 – Unreadable
    - 2 – Barely readable, occasional words distinguishable
    - 3 – Readable with considerable difficulty
    - 4 – Readable with practically no difficulty
    - 5 – Perfectly readable
  - b. S = Signal Strength
    - 1 – Faint signals, barely perceptible
    - 2 – Very weak signals
    - 3 – Weak signals
    - 4 – Fair signals
    - 5 – Fairly good signals
    - 6 – Good signals
    - 7 – Moderately strong signals
    - 8 – Strong signals
    - 9 – Extremely strong signals
  - c. One thing you will immediately notice is that these characteristics are very subjective
    - What is "perfectly readable" to me may be "readable with practically no difficulty" to someone else, especially if the transmitting ham has a heavy accent
  - d. Sometimes, hams will use the received signal strength reading on their S meter for the Signal Strength reading

- e. Tone is only used for CW
    - 1 to 9 - not very applicable to modern transmitters - from back in the homebrew days
    - Numbers refer to things like "Sixty cycle AC" and "Rough note, some trace of filtering" - basically, the quality of the CW tone
    - May also include a letter to indicate various conditions or issues - such as "K" for CW key clicks
  - f. Will hear on the air as "59", "You are 59," or "5 by 9" - all same thing, or possibly "You are 59 here in Longmont, Colorado"
  - g. During contests, most everyone gives 59 (or 599) because no one cares about your signal - they just want to get points for the QSO. Many logging programs default to 59 / 599 for this reason.
    - During contests or events like DXPeditions of SOTA/POTA, you may hear an operator struggle to receive the other station, perhaps asking multiple times for their callsign, yet when it comes time for a signal report, give them a 59
    - I have seen online discussion asking why the signal report is included in the exchange for contests if everyone just gives a 59, but haven't really seen any good justification for it
    - If I had to guess, I'd say back when it was originally added, hams were giving accurate signal reports, and this was used as an additional way to verify a QSO - requiring both sides to log the same RST reports
  - h. If signal is very strong, may also include number of decibels in excess of S9 - such as "Your signal is 30 over 9" - means S9 + 30dB
  - i. Since Morse code for numbers uses 5 symbols (dits and dahs), N (dah-dit) is frequently sent instead of 9
- The full three-number RST is used for CW, while AM, Single Sideband, and simplex FM use just the first two numbers - the Readability and Signal Strength

## **Repeaters**

- When operating through a repeater, a completely different signal report is used
- In this case, there are actually two things that could impact the quality of the signal received by the other station:

- a. The quality of your signal into the repeater
  - b. The quality of the repeater's signal into the receiving station
  - c. If the originating signal is weak getting into the repeater, the repeater will retransmit the "noise" - your signal strength meter may still indicate a strong signal (because you are well within the transmission range of the repeater), but you may be unable to understand the transmission if the other station is not getting into the repeater well
- A strong signal is reported as "Full quieting," meaning virtually no noise in the signal
  - Weaker signals will be heard with increasing levels of background noise
  - Terms like "scratchy" may be used, or may give percentages ("You are 80% quieting")
  - Might also say something like "You have very weak audio" if they have no static, but are not easy to hear.
  - If either station is in motion, you may hear the signal alternating between strong and weak - this is called "picket fencing"
  - "Bad copy" or "Your signal is in and out" would indicate that they're mostly unreadable
  - S Meter readings are generally not used for VHF and UHF FM because most contacts use a repeater, and the signal strength your radio receives is that of the repeater's transmitter, not the originating station's signal.

### **Other Signal Reports**

- Voice and CW aren't the only modes with signal reports - Slow Scan TV or SSTV has its own system
- When using SSTV, a three-number report is given, but in this case, there are some differences
  - a. The first is that the Readability number only goes from 1 to 5 (not 1 to 9 as with voice and CW communications)
  - b. The second is that the third number represents the quality of the received video, also on a scale from 1 (representing "Barely perceptible") to 5 ("Excellent")
  - c. I also recall seeing some system that used P's - probably for "picture" - I think it was something like P0 through P5.
- Some digital protocols include their own signal reporting mechanisms

- a. For example, FT4 and FT8 automatically exchange signal reports using a decibel measurement
- b. They are negative numbers, unless you are running too much power
- c. So how can a signal strength report be negative, yet you can still hear the other station?
- d. The numbers tell you the strength of your signal (which is 6.25 Hz wide) as it compares to the signals in an entire 2.5 kHz SSB bandwidth.
- e. FT8 can generally start decoding signals around -20 dB
- f. Weak Signal Propagation Reporter, or WSPR, is another protocol that includes a signal strength measurement when reporting results

### Receiving a Signal Report

- Some people get really hung up on signal reports
  - a. If they get less than a "59," they take offense
    - "The problem is not on my end - I've got a \$7000 FlexRadio!"
  - b. The problem might be on your end if \*everyone\* sounds bad (due to some local interference at your end), but if others sound good and just one station sounds bad, it's likely not due to your station
  - c. With HF, propagation will also factor highly into the overall signal report, so a bad report may not indicate any real issue - just the laws of physics in operation!
  - d. We tell our students to be appreciative of any reports or comments that there are issues with your signal - after all, you don't know what you sound like on the other end, and you might really have a problem
  - e. Most people would be happy to help troubleshoot the issue, or at least give you feedback as you try to fix the problem (maybe talking closer or farther away from the mic, adjusting power levels or antenna, etc.)
  - f. During a contest is not a good time to solicit feedback, however. Many users are trying to increase their numbers of QSOs and will get very impatient if you "break the rhythm"
  - g. If you think the feedback is incorrect, just say thank you and move on.
  - h. You can also try to listen to your own signal using web-based software-defined radios on sites such as <http://websdr.org/>

## Questions:

- **The question for the week is:** What originally got you interested in amateur radio?
- **In my case,** it was during the floods of 2013. Our neighborhood was evacuated, so my wife and I went to stay with friends on the north side of town. While there, we watched news programs on TV to try to find out if our house was underwater, but all the shows kept showing the same footage which didn't include our neighborhood over and over, and never really provided any details of current flood conditions.

In an attempt to obtain information, we went to an evacuation center on the north end of town, and while we were there, we noticed people with yellow vests that said something like "radio operator" on them.

My knowledge of amateur radio was pretty much that it required a test where you had to send and receive Morse code, and that was it. I decided to look into it again and see if it was something that could help provide information in situations like this.

Luckily, I found that Morse code was no longer required for the test, and started studying for my license.

## More Info:

- Signal Reports (historical info): <https://www.vk5pas.com/signal-reports.html>
- The RST Reporting System: <https://www.hamuniverse.com/rst.html>
- Practical Signal Reports: <https://www.hamradioschool.com/post/practical-signal-reports>
- JT65, JT9, FT8 SNR Explained: <http://www.arrl.org/forum/topics/view/1957>
- 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](mailto:k0itp@w0eno.org)

## Email to [elmer@w0eno.org](mailto:elmer@w0eno.org)

1. K0ITP - Chuck - Firestone
2. AE0DO - John - N of Longmont
3. KF0MXH - Art - Longmont
4. AF0W - Bryan - El Paso via Echolink
5. KN6CFI - John - Longmont
6. WA1IUF - Al - Mead

5 - Where get QSL cards printed? We have Dick, KE0VT (gwabi2@hotmail.com), that can get cards printed. Also had some at Gigaparts.

6 - Issues hitting repeaters. Got a 500 and also have a Baofeng UV-5R.

End: 7:55