

## 2023-11-28 Hamlet Net - Weather Information

### Announcements:

- Test Session Info
  - Next VE session is this Saturday, January 27th in the Clover Building at the Boulder County Fairgrounds, and starts at 9 am. It is a Patriot VE team session, so pre-registration is recommended. 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's Santa on the Air event concluded on Sunday. Thank you to all the volunteers who made the event a success, as well as to our club president, Chuck, for organizing the event and getting all the QSL cards mailed to the North Pole so the children (and adults) will get cards postmarked from Santa at the North Pole.

We've put together a pretty good list of questions for Santa that we used when there was no one waiting to talk to him, which will make it easier for the team at next year's event.

- 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: Weather Information**

- With the approaching temperature drops, I thought weather information would make a good topic for this week's net
- This can range from a simple conversation starter in a QSO up to vital information in the case of operations during adverse weather events like hurricanes or tornadoes
- There are many ways to gather (and provide) weather information via radio, ranging from simple to complex

### **Voice**

- The simplest, most straightforward method is to simply use voice
- There are a set of seven "Voice of NOAA's National Weather Service" frequencies that include more than 1000 FM transmitters and which covers all 50 states
  - a. The frequencies are in the VHF public service band and range from 162.400 to 162.550 MHz
  - b. Many amateur radios come with these frequencies pre-programmed
  - c. Many radios (amateur and consumer weather radios) have the ability to receive weather alerts for their local area using SAME, or Specific Area Message Encoding
  - d. If you want to practice your foxhunting skills, and have a radio capable of receiving these transmissions, there are transmitters located near Longmont, Fort Collins, Greely and Fort Morgan
    - The Mead / Longmont transmitter is on 162.475 MHz
- You can also use voice on simplex or repeater communications - even those via satellite!

- During hurricane season, the Hurricane Watch Net activates for major storms that are approaching populated land masses
  - a. It's purpose is to provide information to island communities in the Caribbean, Central America, and the US Atlantic seaboard
  - b. This net is on HF on 40 and 20 meters
- There may also be local repeater-based SKYWARN nets
  - a. The purpose of SKYWARN is to provide critical weather observations to the National Weather Service or NWS
  - b. SKYWARN spotters are trained to accurately identify and describe severe local storms
  - c. This information is used along with weather predictions and Doppler weather radar to help the NWS issue timely and accurate warnings for tornadoes, severe thunderstorms, and flash floods
  - d. Radio nets in our area are run by Colorado ARES groups
- While not voice mode, you can also query other hams for weather information using a "keyboard-to-keyboard" digital mode such as RTTY, PSK31, or JS8Call
- If you really want to go old-school, of course there's always CW!

## **APRS**

- Another way to view accurate local weather information is via APRS
- Most of this information is provided by weather stations owned and operated by radio amateurs
- This information is transmitted via RF in APRS packets or via the Internet, and eventually finds its way to the APRS-IS servers
- The information can be viewed on the aprs.fi web site (that's alpha-papa-romeo-sierra-dot-foxtrot-india)
  - a. Weather stations are indicated by blue circles with the letters Whiskey Xray inside.
  - b. Click on one to bring up current weather details, and click on the "show weather charts" link for more detailed and historical information.

- There is also a NWS organization called the Citizen Weather Observer Program, or CWOP, which allows members to share information from their personal weather stations with the world
  - a. In addition to simply sharing weather information, the site also maintains a set of quality checks that members can use to check and improve their weather stations
  - b. More information can be found on their web site at [wxqa.com](http://wxqa.com) - that's whiskey-xray-quebec-alpha-dot-com
- If you have an APRS-capable radio, you can use it to directly receive local APRS transmissions
- You can also use a non-APRS radio with a soundcard interface to decode APRS packets on a computer
- There is also a bot that will reply to APRS messages with weather information called WxBot
  - a. It can respond with weather forecasts or with the latest CWOP information
  - b. Locations can be specified by your APRS position, city names, zip codes, call signs, grid squares, latitude/longitude, and airport designators (such as "DEN" for Denver International)
  - c. You can specify a "when," such as "tonight," "tomorrow night," or "Saturday night"
  - d. You can also request brief or full information - full information will be split into multiple APRS messages
  - e. Any active weather hazards, such as winter weather warnings, will be included in the reports

## Winlink

- APRS is not the only digital mode where you can request automated weather reports
- In Winlink Express, there are two entries under the Settings menu where you can request weather information
  - a. Winlink Catalog Requests includes requests for METAR airport weather, satellite imaging, propagation and solar forecasts and numerous sets of weather locations in the categories starting with "WX\_" (whiskey-xray-underscore)
  - b. Note that you will need to initiate at least two sessions to retrieve the information - the first to send the request, and then at least one more to receive the results

- c. I tried a query for Colorado weather, and it took two minutes for a reply to appear in my inbox
- One thing to keep in mind if you are using RF to make your connections to Winlink is that it can take a lot of time to send large files (such as weather maps)
  - a. The Colorado weather query resulted in a text reply of 1300 bytes, while the GRIB weather map request returned an 8300 byte message - over 8 times the size
  - b. Also, don't do as I did the first time I saw this functionality and request a whole bunch of stuff, or you will tie up the RF channel and prevent others from using it
  - c. Remember that you can use the telnet Internet connection mode to check out all the Winlink functionality without clogging up the airwaves

### **Weather Satellites**

- Yet another way to receive current weather information is directly from weather satellites
- These satellites generally fall into two categories based on their orbits
- The first is geostationary - these satellites orbit above the equator and move at the same speed as the rotation of the Earth, so they appear to be suspended over the same location at all times
  - a. This allows them to monitor weather in a given area over time
- The second category is low Earth orbit or LEO - these satellites behave similar to the amateur radio satellites in that they orbit around the Earth, so they cannot monitor a specific area continuously
  - a. They orbit closer to the Earth's surface, so they can obtain sharper images than the geostationary satellites
- The NOAA polar satellites pass within view of all areas of the Earth at least twice a day
  - a. Their cameras repeatedly scan side-to-side, essentially generating a uninterrupted picture as the satellite orbits
  - b. This image is not stored on the satellite but is transmitted to the ground immediately using both an analog format called "APT or Automatic Picture Transmission," and a digital format called "HRPT or High-Resolution Picture Transmission"

- c. The APT FM transmissions occur on frequencies just above 137 MHz in the VHF air band, while the HRPT transmissions are in the L Band around 1.7 GHz using phase-shift keying
- Many users use software-defined radios that connect via USB
- Receiving the weather satellite transmissions is only part of the puzzle - to see the maps, you will have to use a computer program
- I'm including links to a web pages that described a DIY satellite ground station for receiving weather, one on using an RTL-SDR to receive satellite images (it may be a bit out of date), and the NOAA's web page on their currently-operating satellites
- I believe Chuck has some experience with weather satellites, so hopefully he can provide current info and answer any questions that you have

### Summary

- Weather conditions can be much more than just a conversation filler - they can potentially become a matter of life or death to those involved in severe weather events
- Radio provides a number of methods for monitoring current weather conditions and hazards, but as with many things, there are different levels of equipment and procedures needed, depending on what methods you use
- Much like LARC's weekly radio nets provide you with an opportunity to test and use your radio equipment, you should be sure to explore the various methods of retrieving weather information and test them out before you need them in a crisis

### Questions:

- **The question for the week is:** Where do you get your weather information, and have you ever used amateur radio for weather-related activities?
- **In my case,** I get most of my weather info from my wife, who uses her cell phone to access weather sites.

I've used the APRS WxBot and Winlink services as well as NOAA weather radio. One thing I noticed when using weather radio alert monitoring on my ham radios is that there is sometimes a short "glitch" as the radio quickly switches to the NOAA weather frequency to check for alerts. Depending on the radio, it may or may not be noticeable, but is something you should be aware of.

### More Info:

- National Weather Service NOAA Radio: <https://www.weather.gov/nwr/>
- National Weather Radio receivers: [https://www.weather.gov/nwr/nwr\\_receivers](https://www.weather.gov/nwr/nwr_receivers)

- Colorado NWR Transmitters: [https://www.weather.gov/nwr/states\\_dyn?state=CO](https://www.weather.gov/nwr/states_dyn?state=CO) (click on pin to see frequency)
- Hurricane Watch Net: <https://www.hwn.org/>
- SKYWARN Colorado: <https://www.weather.gov/skywarn/co-skywarn>
- SKYWARN Boulder County: <https://www.weather.gov/bou/Spotternews>
- Citizen Weather Observer Program (CWOP): <http://wxqa.com/index.html>
- WxBot: <https://sites.google.com/site/ki6wjw/wxbot?pli=1>
- APT - Automatic Picture Transmission: [https://en.wikipedia.org/wiki/Automatic\\_picture\\_transmission](https://en.wikipedia.org/wiki/Automatic_picture_transmission)
- HRPT - High Resolution Picture Transmission: [https://en.wikipedia.org/wiki/High-resolution\\_picture\\_transmission](https://en.wikipedia.org/wiki/High-resolution_picture_transmission)
- DIY Satellite Ground Station: <https://publiclab.org/notes/sashae/06-26-2020/diy-satellite-ground-station>
- Group for Earth Observation: [Griddownpowerup.com](http://Griddownpowerup.com)
- NOAA Currently-Flying Satellites: <https://www.nesdis.noaa.gov/current-satellite-missions/currently-flying>
- RTL-SDR Tutorial: Receiving NOAA Weather Satellite Images: <https://www.rtl-sdr.com/rtl-sdr-tutorial-receiving-noaa-weather-satellite-images/>
- NOAA Satellite Imagery: <https://www.nhc.noaa.gov/satellite.php>

### 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](mailto:k0itp@w0eno.org)

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

1. K0DBL - Don - Mead

2. AE0DO - John - N of Longmont
3. KM6SJA - Steve - Longmont
4. WB0AFA - Jeff - Frederick
5. W7PGF - Philip - Frederick
6. AF0W - Bryan - El Paso via Echolink -
7. KF0MXH - Art - Longmont
8. KV0N - Raman - Echolink

NWS training is free, get spotter number, accuracy of reports

Don - KE0EE reports on official snowfall amounts for Longmont

Skyhub Weather Net: Daily at 1pm, also link in Severe Weather Net Room

End: 7:45