

NEMCo conducted an on-air Winlink exercise starting Saturday, February 20 until Sunday, February 28, 2021.

### 1. Introduction

Winlink is an amateur radio email system on the HAM radio bands. It has many uses in public service and adventuring. It is not a normal HAM radio mode that you can call CQ and talk to someone. You have to know that the other station is there. To get going with Winlink it takes some subordination with other stations and a bit of a learning curve. This exercise was set up to provide that opportunity to learn.

### 2. Objective

NEMCo and other organizations have found that Winlink is very helpful sending information that would be tedious to do by voice. This exercise was devised to give people the opportunity to explore the different modes of Winlink.

The objectives for this exercise are to

- a. Give new users an opportunity to learn how to use Winlink.
- b. Have an extended duration exercise to allow people the time to make mistakes and try again.
- c. Emphasize the use of Peer-to-peer Messaging.
- d. Practice using Templates.
- e. Involve other organizations and the general Ham community.
- f. Use digipeaters to extend the range of VHF communications.

### 3. Discussion

It took about two months of slow planning to get this exercise going. Mainly this involved reaching out to the neighboring organizations and having Email discussions. This time frame could be reduced to about a month. One aspect to consider is the meeting cycle of different organizations. If they are going to advertise for an event, then they need time to go through their monthly meeting cycle. If something like this of just going to happen with your organization or club, then all you really need is a week and a few volunteers to keep their computers and radio on for a few days.

Some organizations have a weekly Winlink check-in. This can be via the internet or a RF gateway. This is very helpful. But Most people don't use Winlink regularly and during a natural disaster the internet and the RMS Gateway may not have connectivity to the CMS server. So practicing the use of Peer-to-Peer is also helpful. Multiple people said that they appreciated that we focused on Peer-to-Peer communications. One individual had been advocating Peer-to-peer use in their exercises but did not find any traction to get it going.

There was a fair amount of trouble shooting to get people going that kept us busy. One interesting ones that I saw was a station, names kept confidential here, was keying their transmitter but about 2% audio. Most TNC would not hear, But a DireWolf software modem picked it up and could identify the station.

After searching all sorts of setting, it turned out that an audio cable was barely plugged in. this was a good tribute to the newer software modems that are now available.

We had hoped to hear form from some new users but unfortunately, we did not hear of any. Mostly this exercise consisted of the infrequent users and the more experienced users.

For the main users the volume of emails for the week ranged from 50 to over 100 messages on P2P. KF7RQ and K7RMZ lead that list.

The map was helpful as it gave people an immediate clue if they could reach the station or not.

Up in Mukilteo, John KG7WFQ, is in a location where he could reach one other person and then luckily the K7LDB-3 digipeater. This tuned him into an expert digipeater user with great success. While the K7LDB-3 digipeater is permanent and has a great location, the other two digipeaters, K7RMZ-15 and KF7RQ-15, were temporary and had much less elevation. But still they were useful for a few people in the lower Kenmore and Lake Forest park valleys.

John C Ki7YQR took the opportunity to go mobile with his station. With his Kenwood HT and separate 45 Watt amplifier he setup operation at Horizon view park. From there he could transmit using Winlink to stations in Lake Forest Park, Woodinville, and the K7LDB-3 repeater.

Several stations in the Woodinville area had surprisingly good connections into Kenmore. There was one station in the far east that we never heard from.

We were very please to that several other organizations were able to join us for this exercise. In advance of the exercise Paul Ki7E, In Woodinville, put on a great live Winlink P2P demo at their monthly meeting.

We were very pleased to have participation from these groups:

NEMCo	<a href="http://www.northshoreemc.com/">www.northshoreemc.com/</a>
Snohomish county ACS	<a href="http://www.wa7dem.info">www.wa7dem.info</a>
Shoreline ACS	<a href="https://sites.google.com/a/w7aux.org/shoreline-acs/">https://sites.google.com/a/w7aux.org/shoreline-acs/</a>
Woodinville Emergency Communications Team:	<a href="https://wectares.wixsite.com/wect">https://wectares.wixsite.com/wect</a>

This exercise will help us communicate better in the next 5<sup>th</sup> Saturday drills and exercises.

#### 4. Lessons learned.

- a. Safety is number one. Given the winter time of year, It is critical to consider if you really need to go up and do roof top antenna work outside.
- b. Using the soundcard TNC, DireWolf, really allowed for helping out troubleshooting other stations.
- c. The week signal receiving capability of Wirewolf made possible to decode enough of a station that was having sever audio problems.
- d. The Software TNC, Soundmodem, also has a “promiscuous mode” mode to decode and help figure out issues with other stations.

- e. In the Packet P2P Session window, a receiving station does not have to have any specific "Connection Type" selected in order for other P2P stations to connect and exchange messages. Session type MUST be correct though (Packet P2P or Packet Winlink).
- f. FX.25 implemented in DIREWOLF and UZ7HO Soundmodem is compatible with AX.25 (Packet), is best used in weak signal situations, and is further enhanced by reducing Frame Size in the Packet configuration.
- g. The "Downloaded-from:" field is populated by the last call sign entered into the Session Window.
- h. While station A is connected to station B, if station C attempts to connect to station A, message transfers between station A and B will continue but could be slowed or halted. A new session between station A and B will recover from the "broken" situation.
- i. Operators should listen to their own transmitted signals to verify proper operation. A station where a PTT light is illuminated and/or the transceiver goes into transmit but cannot connect to other stations is probably just transmitting an open carrier (dead air). Use an HT or a friend's transceiver to listen to your transmitted signal.
- j. Line-of-sight propagation changes occur on 2 meter FM. Early in the exercise K7RMZ was not able to hear packet signals from Mukilteo or N.Seattle. Later in the exercise K7RMZ \*could\* hear Mukilteo and N.Seattle, and sometimes the signal strength meter deflected 1/3 to 1/2 way.
- k. If station A \*could\* connect to station B using Packet P2P yesterday, but \*cannot\* today, then try a digipeater, or increasing power, or moving your antenna(s). Another alternative: Change the message type to Winlink Message and connect to an RMS instead.
- l. During operation the following can help improve successful connections: Open the squelch completely so weaker signals are allowed into the TNC; turn down the volume completely to reduce noise fatigue (unless using a microphone connection to your TNC - don't touch the volume in this case).
- m. In Packet P2P mode, if station B connects to station A while station A is creating a message FOR station B, station A operator can continue to create the message and post it to the outbox, and if done before all message transfers complete, station A will send that final message to station B without having to reconnect.
- n. When running more than one instance of Winlink Express using the same call sign you will need to EXPORT messages from each instance and IMPORT the message metadata into each instance to avoid REJ (rejected) error messages.
- o. If you move a message to Station A from the SENT ITEMS folder to the OUTBOX and then reconnect with Station A you will receive a REJ (reject or duplicate) informational notice and the message will not transfer. Other non-duplicate messages for Station A should still transfer.
- p. If an ICS Form does not launch your browser window try the following things: 1) Click REPLY to reply to the message; 2) Ensure TCP Port 8001 is not in use by another program (e.g.: DIREWOLF or UZ7HO Soundmodem -- change the port number in these programs, not Winlink Express).

- q. Use ICS309 and save AS A CSV to send via Winlink to your Emergency Manager or whomever is identified as the recipient according to the event action plan.
- r. Use Telnet Peer-to-peer to transfer messages rapidly if other Winlink Express installations are on the same network: 1) On a mesh network; 2) You are running two callsigns e.g. K7RMZ and NE7MC on your LAN or WiFi. Winlink Express and Windows Firewall both requires some configuration to get this going but once set up it is incredibly fast and easy to use. If two EOC's are close enough to share a WiFi or WLAN, then this should be the preferred method to exchange messages.
- s. Winlink likes higher RF power levels. If you can run 25W or 50Watts that is best to get any range through the trees around here. 2W only works if you are going a short distance.

#### 5. Ideas for next Exercise

- a. Shorten the Exercise duration from one week to Thursday to Sunday. Having more than a weekend is a good, but two weekends is too much.

- b. Set up a an independent Winlink Post office

Set up an RMS with a private email database completely disconnected from the Winlink network. It's a combo of RMS Express and RMS Relay, with RMS Relay configured to be private DB, no internet.

What this does is allow for a disconnect from the internet RMS email server. P2P is great because it is efficient. If I send a message from me to Jim, it gets sent once over the air. But, Jim and I need to be connected together at the exact same time.

With a disconnected private post office, I send the message to Jim at the RMS. Then Jim comes along and connects to the RMS to fetch any pending mail. The message goes over the air twice, yes, but Jim and I do not need to be connected at the same time. Using P2P if I want to send the same message to three people, I have to connect three times, each one with both of us connected at the exact same time. With P2P the message goes over the air three times. Doing the same message to three recipients using the RMS, it goes over the air four times, once from me to the RMS, and once each from RMS to the recipients. And again, there is no need to have anyone connected at the exact same time. Also if the Winlink Post office is geographically positioned well then it could allow stations to connect that are normally out of range.

If we do another Winlink exercise, I would like to see at least one RMS station set up for such private local passing of emails. I think the ability to message without needing to be connected at the exact same time might be worthwhile. I see this as handy when we initially enter into an incident. As people come on line, they can check the private RMS for deployment or other info posted there.

steps would be:

- 1) Become a Winlink sysop. Read the docs, promise to obey, get authorized.
- 2) Install and get working RMS Packet with your radio, and have it connecting to the CMS.
- 3) Install RMS Relay and set up for "private".
- 4) Configure RMS Packet to use RMS Relay. One check box.

This suggestion credited to Bernard KE7FEQ of WECT.

- c. Designate a voice repeater for the exercise that people can coordinate activities on. This is a good idea as there would be no internet to during an actual natural disaster.
6. Winlink improvements:

Winlink is an evolving software package. Here is one suggestion for the Winlink authors.

It would be great if Winlink would allow multiple "Enter a new message" windows to be open at the same time and to be able to go to the "Winlink Express" window.

7. Typical uses of Winlink.

We asked what types of information would be sent over Winlink and this is what we heard.

- a. Sending Incident activation plans
- b. Sending ICS forms.
- c. Situation reports.
- d. Community health and wellness messages.
- e. Rosters
- f. Initial check-ins
- g. Resource availability.
- h. Community information dissemination.
- i. USGS "Did You Feel It" reports

8. Conclusion

We received a lot of positive feedback from people in this exercise that were grateful for the opportunity to practice and participate. February turned out to be a good time of year to do this. This exercise was not competing with holidays or summer vacations. We had a captive audience.