WINLINK VARA HF PEER-to-PEER (P2P) OPERATIONS MADE EASY

By David Blubaugh - ND1J

VERSION 5.03 dated 15 May 2024
REVISION HISTORY AT END OF DOCUMENT

INTRODUCTION:
Why did I write this article? Because I encounter so many avid Winlink users who are actively involved in EmComm using RMS but who are very hesitant or reluctant to use Peer-to-Peer (P2P for short). Many have no idea what it even is. **P2P can be a critical component of EmComm in a disaster** and it is not difficult. Take the time to learn about P2P and get on the air!

GOALS:
You will understand what Peer-to-Peer Winlink operations are, how they are used, and what limitations they have.

You will understand the concept of Field P2P Stations who initiates the call vs Target (Host) P2P stations that are being called.

You will be able to set up and conduct Winlink Vara HF P2P operations both as a field station and as a Target station.

You will be able to pass P2P message traffic to and from two P2P stations.

Note - the assumption is that you are already a Winlink and Vara HF user with some RMS experience and already have the general setup done for rig interface / CAT control / etc. If you are not familiar with Winlink and Vara HF, you might want to learn more about them before proceeding. Ok, let's dive into P2P. It's easy!

BACKGROUND:

WHAT is P2P? Peer-to-Peer is just another means to connect, send, and receive messages using Winlink Express. Winlink has several modes built in for passing traffic. We are all familiar with the most common two- TELNET or RMS (Radio Mail Server) stations, either VHF or HF. With RMS, we can use several different protocols such as Packet, Vara FM, Ardop, Pactor, Vara HF and others.

However, there are other ways to pass traffic with Winlink Express that do not rely on Internet, such as Winlink Peer-to-Peer and Radio-Only. Similar to RMS, you can conduct P2P sessions using several different protocols – Packet, Pactor, Vara FM, Vara HF, etc. **This article is specifically covering Vara HF Peer-to-Peer,** although most of the discussion will apply to any P2P operation**.**

All we need to do to connect in P2P mode is set up our end and find another station who is also running in P2P mode. It's NOT difficult, so don't shy away from trying P2P. It's a lot of fun and this article will help you get going in no time. I provide a lot of in-depth information but once you are up and running with P2P, you won't need to keep studying. There is no written exam, just results!

PREVIEW:

The next few sections will provide setup info for P2P. Then, I will go into detail about P2P operations – limitations and restrictions – basically what it can and cannot do for us. Finally, I will detail how to actually conduct a P2P session, whether initiated by you or by someone calling you.

This is everything you would likely need to set up your station for incoming and outgoing P2P operations. Once you do, go ahead and play with P2P. One great source for practicing P2P is to use the Florida Winlink W4AKH Net. This net has several P2P host / target / anchor stations (whatever you want to call them) that are available 7 days a week so you can experiment with P2P. These stations are spread out over the country.

Terminology for P2P stations we will contact: The station that one calls and connects **TO** in P2P operations is normally called the host or target or anchor station. These three terms all mean the same thing in P2P. Organizations normally use one of these three terms to describe one of their stations that is assigned a specific frequency and time to be active in P2P mode, waiting for anyone to make contact with them. Unlike an RMS station, they typically **do not** run 24-7, rather at assigned times and frequencies.

I mentioned Florida Winlink Net above, as a great source for finding P2P stations who are available to practice with. Volunteer P2P station operators chose their own frequencies and make their own schedules when they will be available so that anyone can practice connecting with them and pass traffic virtually every day of the week. So have at it! See W4AKH.net for details and the schedule of stations, which changes daily and oftentimes, hourly.

Once you get comfortable with P2P operations, please consider signing up as a target or anchor station for the Florida Winlink Net. It's easy, fun, and will give you more confidence and experience in conducting P2P operations both in and out. No, you do not need to live in Florida! Again, see W4AKH.net on how to sign up as a host station.

SETUP:

You already know from using Winlink RMS stations that Vara HF utilizes three different band-widths: 500Hz, 2300Hz, or 2750Hz. **In order to conserve spectrum, the vast majority of P2P stations run in 500Hz mode.** Why? This helps conserve bandwidth. P2P will work at 2300 and even 2750. But why use 2300Hz of bandwidth when you can do the same thing with a fifth of that and free up room for four other stations at the same time?

NOTE: IF a target station is running in P2P 500Hz ONLY mode, that station *will NOT* answer you unless you are also in 500Hz mode. This is pretty much the standard for national organizations, including EDM– Emcomm Direct Messaging, so you might as well just set it up that way now and avoid problems later!

Set 500 Hz bandwidth in TWO locations within the Winlink application. It's easy to do.

1. Open Winlink Express

2. Select Vara HF P2P in the Session Window and click Open Session.

3. Now you will see the Vara HF Peer-to-Peer Session window open. You will also now see an icon down in the taskbar for Vara HF. Click on it (or Alt-Tab to it) and another window will open up that says Vara HF version#. This is called the Vara HF TNC Window. The Vara HF TNC window will show the waterfall, meter dials and transmission speed for the session once underway, along with other information. You will make one configuration change in the setup of each of these windows as follows.

4. In the main *Vara HF Peer-to-Peer Session window, select:* ***Settings>Vara TNC Setup*** *and for Session Bandwidth,* ***select 500*** *and click Update.*

5. In the other window, the Vara HF TNC window with the meters, select: **Settings> Vara Setup.** Check the box that **says Accept 500 Hz Connections** and click Close.

6. Close the Vara Session Window. That action will also close the Vara TNC window.

7. **OPTIONAL** but strongly recommended for all and I think mandatory for those who are going to be a host/target/anchor station: You don't want a connected station to wait for a minute before their message can start sending to you, so you need to change the following setting in the main Winlink Express Program - **Settings > Preferences> Message Review Before Downloading > uncheck** the box "Display the list of pending incoming messages prior to download. That way, an incoming message will be sent without that extra dialog box popping up and delaying the process.

VIDEO HELP:
There is a good, short video on Youtube by the ETO EmComm Group for P2P setup. See the **ETO # 2102 Vara HF P2P 500 Hz Setup** tutorial on YouTube for instructions: **https://youtu.be/tNgncCVXrHM**

Ok, now you are all set. You will not have to do any of these steps again, unless you choose to use P2P in other bandwidths by changing those settings. Note: Once you actually start the session, you can confirm 500 Hz mode by noting the bandwidth of 500 at the bottom, below the AFC meter and waterfall.

P2P PURPOSE & LIMITATIONS:
P2P mode enables us to pass message traffic between two specific stations. Remember, however, that P2P messages do **NOT** continue on automatically. With a Winlink message sent to an RMS station, it is then passed onto the internet and ultimately delivered to recipients. P2P does not do that. You pass a message to another P2P station and the operator at that station **must take action** to pass that info onto someone else. This is an important concept.

To illustrate the difference between P2P messages and regular Winlink messages:
With RMS: Let's say you want to check into the Florida Winlink W4AKH Net. If you send your check-in message via an RMS station (as a Winlink message), it gets forwarded to the intended addressee – W4AKH. Bingo and it is there.

With P2P: Let's say you want to check into the Florida Winlink W4AKH Net via Peer-to-Peer instead of RMS. First, you draft a check-in message as a **P2P message** addressed to, let's say me – ND1J. Then you connect to my P2P station ND1J and send me the check-in message. Now, I have to pass that info on, somehow, in some form or format, so that it gets to W4AKH or you won't ever be checked in. That illustrates the main difference between P2P messages and Winlink messages. Always remember the P2P target station's operator has to do something with that message before it will get anywhere else. In the case of FL Winlink W4AKH Net, the check-in info is passed by each of the P2P anchor stations at the end of each Net week to the W4AKH Net Control Station. The data is then crunched for the weekly report.

DRAFTING P2P MESSAGES:
This is easy but also easy to mess up! In the Main Winlink window, draft the message and **also select Peer-to-Peer Message** in the "Send As" window. Post the message to the outbox. Check the outbox message and make sure it shows as an outgoing P2P message, not a Winlink Message. You can tell it's a P2P message in the Outbox by looking at the recipient address. A (P2P) will follow the callsign. If it isn't P2P, click on the message to open the editing box and change the Send As to Peer-to-Peer, then post it again. **When connected to a station in P2P mode, only P2P messages can be sent or received.** As I said in the first sentence, easy but it's also easy to forget making the message a P2P message. Later, if you connect to a station to send that message **but it doesn't send**, don't scratch your head wondering why. It's because you forgot to make it a P2P message. Personally, I have never had this happen to me. Of course not!

REVIEW:
Winlink Express can have three types of messages in the Outbox – Winlink Messages (for RMS and Telnet), P2P Messages, and Radio-Only Messages. You need to "post" your message to the outbox as a P2P message in order to send it P2P.

SENDING & RECEIVING P2P MESSAGES:
The following five (5) notes pretty much sum up P2P messaging:

Note 1: You can only address a P2P message to one callsign, not multiple stations. For the same message to multiple stations, you must generate a P2P message addressed to each of them.

Note 2: (REV 5.03) Email or Tactical Addresses Paragraph Revised.

Email addresses: You cannot send a P2P message to **an email address.** Hint: ND1J is ok. ND1J@winlink.org is not, even if they are the same thing in a Winlink Message.

TACTICAL ADDRESS: Winlink Express **now allows** P2P messages to be addressed to a Winlink Tactical Address. You address the message to the desired Tactical Callsign, but you connect to the callsign of the station operating as a P2P Target Station. For this to work, the Target Station must have the specific Tactical Address ENABLED in Winlink Express before a station tries to connect. After the connection occurs, Winlink Express will send the message to that station, even though the message is not addressed to that station. How does this work? When a station enables a tactical callsign, Winlink Express reconfigures so that this station can now *send or receive* messages *to or from* either that station's callsign or the enabled tactical address callsign.

P2P Tactical Address Example:
ND1J is serving as NCS for a P2P Net. The Tactical Callsign to be used for check-in messages is GAARES-P2P. ND1J enables this tactical callsign in Winlink Express and then opens a P2P Session in order to receive traffic.

Station K5MEG wants to check in and prepares the check-in P2P message addressed to GAARES-P2P. She then connects via P2P to ND1J. After the connection is established, her P2P message will be sent to ND1J since he has GAARES-P2P enabled.

Note 3: You can have a mix of P2P Messages, Winlink Messages and, for that matter, Radio-only Messages in the Outbox at the same time. If you connect to an RMS station, all messages in the outbox that are **Winlink Messages** will be sent. If you connect to a P2P station, only P2P messages **addressed to that specific P2P station** will be sent. The other P2P messages and regular Winlink Messages will remain in the outbox.

Note 4: Once connected to a P2P station, that station will also send messages to you, but only those messages that are addressed specifically to your callsign, only if they are P2P messages, and only if they were already in the outbox when the connect occurred.

Expanded info on Note 4: With Winlink Express, a message will not be sent unless it was posted to the outbox **before** the connection was established. If you are connected to a station and then proceed to draft and post a message, you must disconnect and then reconnect for that message to be sent. This is the case with RMS stations, P2P stations, and also Radio-only Stations. For P2P operations, it becomes a common routine to answer or reply to a message you just received.

Example 1 - You send a message. The target station wants to reply to it. A reconnect is required after that station drafts and posts a response.

Example 2- You are a target station. A station initiates a connect to you to check into a net. You want to send him a message right back, saying thanks for checking in. Unless you already had that thank you message pre-drafted and posted for that station before the connect, you would have to reconnect to send it. When I host a P2P station for a net, I often draft thank you responses to all stations I think might check in and have these messages posted in the outbox. Then, when one of those stations connects to send me a check in message, they get my pre-posted message right back during the same session.

OK, NOW IT'S TIME TO ACTUALLY CONDUCT A VARA HF P2P SESSION:

STEP 1 Open a Session using Vara HF P2P.

NOTE: You can use an already-open Vara HF Winlink Session window and click on the Switch to P2P button. **However**, if you do this, the P2P session will be in the bandwidth that Vara HF Winlink last used, which in most cases is 2300. This can result in no connects to a 500Hz P2P station. I **strongly recommend** closing any open RMS Vara HF sessions and reopening them rather than using the "Switch To" button selection.

STEP 2 Select the desired P2P target station. Enter the Center Frequency and Callsign. The app will insert the Dial Frequency automatically and if you have rig control working, the rig will go to the correct frequency. So let's put in ND1J with a dial frequency of 7073.5 MHz. All set? WAIT- that's right on top of the FT8 frequencies for 40 meters. Oh, so that's why ND1J wants to use 500Hz mode! The

dial frequency is now 7072 and with 500Hz signals, there is no interference with the FT8 signals starting at 7074. See, you are getting this!

STEP 3 Set Rig filters and other bells and whistles as desired but here are my suggestions: For 500Hz mode, you can use a 600Hz roofing filter or Digital Filter or both. DNR – Digital Noise Reduction – try it both on and off. There are times when it is better on and others when off. With weak signals and little QRM, you may want to use a wider filter setting to avoid attenuation of the incoming signal. You do not want excessive digital noise reduction.

Remember each of these tools will attenuate and with a weak signal, it is best to experiment. Having done thousands of digital contacts, I find there are times when better results are achieved with DNR on and others when off. The same goes for using wide vs narrow filters. If you are having difficulty completing a session, play with the settings. Never use any IF shift, DNF Digital Noise Filters or Contour as these can prevent a connect. Do not use PROC or MIC EQ as these can distort the signal.

STEP 4 Session Open Status
Once the session is open, the Vara HF Peer-to-Peer Status Line will show:
Channel Free In: 0/0 Out: 0/0 BPM: 0/0 **Disconnected/Listening**

The Session Window will show something like:
*** Launching VARA TNC
*** Successfully connected to VARA TNC.
*** Vara signal bandwidth is 500 Hz.
*** Using Manual, COM10, 19200 baud
*** Ready

You are now active in P2P Mode. Y**our station is now LISTENING on that frequency for any incoming connect requests.**

STEP 5 P2P Host or Target Operations Setup (for INCOMING g connects)
If you want to be a target station, this is all you have to do. It's that easy!
If another P2P station was to initiate a call to you, your system would automatically answer, starting the transmit/listen/negotiating process to connect. Once the connect occurred, you would see that displayed on the screen. It really looks just the same as if you had initiated a connect yourself. Once disconnected, your setup is again listening and waiting for another connect request.

Now for OUTGOING Calls to another station. This is often called Field Operations. You have this P2P message posted for ND1J. Rechecking the outbox, it is addressed to ND1J (P2P), right? Let's get that P2P message in your outbox on its way to me. You have ND1J in the window, have the frequency set. Now:

STEP 6 Click **Start** and the process will take off. From this point, everything is the same as connecting to an RMS station. When you get a successful connect and handshaking, any P2P message(s) in your outbox addressed to ND1J will be sent. Any message in ND1J's Outbox that is P2P and addressed to you will be sent to you. Then the stations will disconnect. Remember that, after disconnect, your station is basically armed and ready to be called again until you close the session window. **I recommend** keeping the P2P window open for a couple minutes in case ND1J tries to connect to you and send you a reply message.

WRAP-UP:

Well, that's about it for Winlink Peer-to-Peer operations. It really is pretty easy and I encourage you to play with it. The more comfortable you are with P2P, the better qualified you will be when something big and bad happens to the internet. This article is intended to give you a real in-depth understanding of how to conduct P2P messaging with Winlink and Vara HF. After getting set up and doing a few sessions, come back and go through the article again to pick up on some of the "nice to know" things you missed the first time around.

I regularly have my station on the air for P2P operations, supporting the Florida Winlink Net. You are welcome to connect to me any time and for that matter, with any of the other P2P stations that host for that net. The schedule changes daily, sometimes hourly, and can be found at w4akh.net.

I hope you found this article helpful and informative. If you see errors or have any suggestions for refining it, I can be reached at nd1j@arrl.net. Or even better, to my winlink address ND1J. Or even better than that, via a P2P message straight to me!

73!

David Blubaugh - ND1J
Senoia GA

REVISIONS:

Revised Ver 5.03 – 15 May 2024 –

a. See Note 2 on page 6: Entirely re-written. Revised with updated info on P2P addressed to Tactical Addresses, which are now permitted.
b. Adds copyright markings

Revised Ver 5.02 – 15 Jun 2023 –

a. Corrected email address to ND1J@arrl.net

Revised Ver 5.01 – 11 May 2023 –

a. Added note about vara session window displaying "Disconnected/Listening" after started
b. Expanded info on Target Stations
c. Edited goals

Revised Ver 5.0 – 9 May 2023 –

a. Major Rewrite and also reformatting
b. Expanded explanations of P2P ops
c. Expanded explanation concerning messages in outbox
d. Expanded explanations on rig filtering, etc.
e. Expanded info on the FL WLK Net

Revised Ver 4 – 22Sep2022 –

a. Note 3 on page 4 rewritten for clarification
b. Added NOTE on page 4 about problems when switching between Vara HF Winlink and Vara HF P2P
c. Reformatted page 4-5
d. Added sentence at end of STEP-6 about keeping P2P window open for a couple of minutes waiting for the station to call back with a message.

Revised Ver 3 – 3Sep2022 –

a. Added page numbering
b. Added step 7 on page 2.