



Trans- Canada Winlink Network

Beta Version 1.08 07-04-2022

Note

The Canadian Winlink Operations Team: Training – Independent document will be updated on a regular basis by the Canadian Winlink Operations Team. Please join the Canadian Winlink Operations Team group.io site where the most recent version of this manual will be available. Suggestions for changes are always welcome!

Ref: main@RAC-ACS-Winlink-Net.groups.io | [Home](#)

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Authors: Joel Weder VE6EI
 Ron Pettigrew VE6RWP
 Chris Bigelow VA3ECO
 Ian Snow VA3QT
 Brad Harris VE3MXJ
 Woody Linton VE3JJA
 Lori Bedford VE3VAI
 Editor: Stuart Fedak VE3SMF

Record of Changes		
Change	Description of Changes	Date
0	First release version	14-Dec-2021
1	- Edits for greater consistency in Canadian Winlink Operations Team goals and terminology - Addition of glossary of terminology/abbreviations	24-Dec-2021 Beta version 1.05
2	- Added Configuring Radios without a USB Port section	09-Jan-2022 Beta version 1.06
3	- Added VARA FM section	20 Jan. 2022 Beta version 1.07
4	Editorial review	07-April-2020 Beta version 1.08
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Training Overview

The global Winlink system, primarily using Winlink Express software, has proven the most efficient way of providing large volume data transfer. The Winlink network of amateur radio stations provides worldwide radio email using radio pathways where the internet is not present.

The system is built, operated and administered entirely by licensed amateur radio volunteers. It supports email with attachments, position reporting, weather and information bulletins, and is well-known for its role in interoperable emergency and disaster relief communications. It is capable of operating completely without the internet, automatically, using smart-network radio relays. Licensed Winlink operators/stations use worldwide amateur radio frequencies.

Note: Selected Terminology/Abbreviations produced by the Canadian Winlink Operations Team: Advanced group; are available at the end of this document in a summary table.

Software Installation

Before beginning the process of configuring and testing your Winlink station, you must download and install the Winlink Express and VARA HF software.

- 1) To download Winlink Express, open a web browser, go and click on the **<Download>** button downloads.winlink.org
- 2) Select **<User Programs>** option; then download the software by clicking **<Winlink_Express_Install_x_x_xx.zip>** (Note: the version numbers will change over time).
- 3) To download VARA HF, go to [EA5HVK | Weak signals Software \(wordpress.com\)](https://www.mega.nz/EA5HVK/Weak%20signals%20Software) and download the latest version of **Vara HF High Performance Modem**. Note that there is no need to create an account on the mega.nz website.
- 4) You may also choose to download **VARA FM (VARA FM for FM transceivers)** from the same site as VARA HF; if your local VHF or UHF **Radio Message Server (RMS)** uses **VARA FM (VARA FM for FM transceivers)** software rather than **Packet Winlink**.

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- 5) After downloading each software package, right-click to unzip the file.
- 6) For installation of **Winlink Express**, simply run its installer executable file.
- 7) For installation of **VARA HF**, right-click on the executable file and select **<Run as Administrator>**. A message may appear **<Windows protected your PC>**. If it does, click **<More info>** and then **<Run Anyway>**. At this time, the install file does not include an up-to-date signature.

Appropriate Winlink Sessions

The selection of a suitable Winlink communication session type may be left up to the individual **Auxiliary Communications Service (ACS)** operator; or may be dictated by the **Net Control Station (NCS)** or the served agency. Typically, it is best to select the session mode which will be both most reliable and provide the fastest transmission data rate.

Numerous session types are available, including Telnet Winlink; Vara HF Winlink; Vara FM Winlink; Vara HF P2P; Vara FM P2P; Packet Winlink; and others. While it may be assumed that a radio-specific session should be chosen, it's important to realize that if an Internet connection is currently available then a Telnet session will provide the best speed and reliability. If, however an Internet connection is not available, then the ACS operator must consider other options.

Some regions may have a local RMS gateway connected through VHF or UHF radio, which usually would be faster and more reliable than an HF connection. If, however the RMS gateway is within an area affected by a disaster, it must be understood that there may be no Internet connectivity. This station will most likely provide service using Packet Winlink or Vara FM Winlink. A packet RMS gateway will most typically operate at 1200 bps, though some systems may be configured for 9600 bps. Vara FM Winlink, if properly configured and on a good path; can be even faster. The system in place must be known in advance, and tested regularly for reliability.

If no Telnet or VHF/UHF connection to a CMS gateway on the Winlink system is available, the ACS operator must be ready to provide HF connectivity. There are some RMS gateways operating Pactor HF modems, but the use of a Vara HF software modem is currently more popular; due to the lower cost. Setting up an HF station is more challenging, especially during an emergency deployment, than other options, so must be carefully planned and tested.

A Peer-to-Peer session, for example Vara HF P2P or Pactor P2P, may need to be implemented if access to an RMS gateway is not available via any other session type. A

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Peer-to-Peer session will require coordination between operators, typically through a net control station. It may also require multiple relays before the message reaches its intended destination.

Message Templates

The use of message templates is recommended for ACS purposes. Selection of an appropriate template for the situation can improve communication efficiency, help with standardization of message format, ensure clarity and avoid missing information. It is highly recommended that each ACS operator know and employ the template(s) used by the served agency.

Using a Message Template

- 1) From the top bar in Winlink Express; select **<Message>**, then **<New Message>**
- 2) Select **<Template>** at the top of the email window
- 3) Expand the Standard Templates category
- 4) Select the desired template, for example Quick Message in the General category.
- 5) One of the most popular for ACS is the IMS 213 form. This can be found within Standard Templates, in the Canadian Forms, as IMS 213-R.txt.

Selecting Favorite Templates

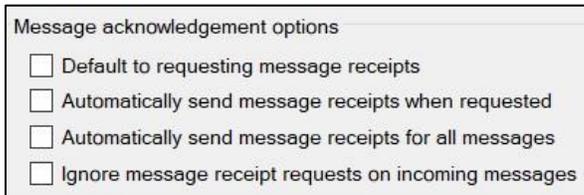
- 1) Open the **<Message>** menu in Winlink Express
- 2) Open the **<Set favorite templates...>** item
- 3) Enter the name of a desired template
- 4) Click Browse and find a template with the **<Template Manager>**
- 5) Choose the desired template, then click **<Select>**
- 6) After you enter up to four favorites, click **<Save>**
- 7) Your favorite templates will now be on the top bar of the new message form.

Bandwidth-Saving Recommendations

Before beginning to delve into configuring and testing the various radio session types, it's vital to consider one thing. With Winlink, the operator will typically not be using an Internet connection. Instead, you will be sending and receiving emails via some form of radio link. None of these modes are able to provide the type of speed that we're all familiar with. Depending on the mode and the channel conditions at the time, over-the-air data rate may on a VHF or UHF connection be as high as 9600 bps, or on a poor HF connection could be as low as (e.g.) 18 bps. Far from a multi-megabit connection!

To make the most of the very limited available bandwidth (data rate), it's vital to follow several basic recommendations:

- 1) Do **NOT** use Reply All when replying to an email, unless you absolutely must. Some emails from net controllers or managers have many recipients. Requiring every one of them to spend time downloading an unnecessary message is very wasteful of channel time.
- 2) **Disable** the Request Message Receipts feature. The system is reliable enough that a message successfully uploaded to an RMS is deemed to be delivered. Open the Settings menu and select **<Preferences>** to find this item. Disable it and the other three in this area, then click **<Update>**.



Message acknowledgement options

- Default to requesting message receipts
- Automatically send message receipts when requested
- Automatically send message receipts for all messages
- Ignore message receipt requests on incoming messages

- 3) When replying to a template-generated message, many templates can be inefficient. After creating your reply, go into the text email that's been generated and scroll down. You'll likely first see the original message, then your reply, and then ANOTHER copy of the original. If this is the case there may be a line stating something like "Text below this point may be deleted." By all means please DO delete everything from there on down before you post the email to the Outbox.
- 4) Attachments can be another source of problems. The largest attachment that Winlink will allow is 120 kB. Even that is often too large for a radio session. If the connection is very good it may go through, after an extended period of time where you are hogging the gateway. But on a typical HF connection (let alone a poor one) an attachment of even as little as 20 or 30 kB may take far longer than expected, or may very well time out the connection. Keep attachments as small as possible, using plain text or csv type files where possible.

VARA HF Configuration

USB Connection to Radio

One of the most powerful features of the Icom IC-7300 is that it includes a USB interface for both control and transmit/receive audio, so there is no need for an external interface. This means less external hardware and cables, and a simpler station, after the initial configuration.

NOTE: Do NOT connect the radio to a computer until you have downloaded and installed the USB driver from Icom's website.

- 1) Perform a web search for Icom IC-7300 USB Driver, or just go to this site: [IC-7100/IC-7200/IC-7300/IC-7410/IC-7600/IC-7610/IC-7850/IC-7851/IC-9100/IC-R8600 | Firmware / Software | Support | Icom Inc. \(icomjapan.com\)](http://icomjapan.com/IC-7100/IC-7200/IC-7300/IC-7410/IC-7600/IC-7610/IC-7850/IC-7851/IC-9100/IC-R8600/Firmware/Software/Support/Icom%20Inc.%20%28icomjapan.com%29)
- 2) At the bottom of the list of radios, click the "**USB driver installation guide**" link to download the installation instructions. Click the Agree check-box, then click the Download button. Open this pdf file and use it as your primary installation guide.
- 3) Back at the bottom of the main page, click the "**Agree**" check-box, then click the Download button. After downloading the driver, unzip the file.
- 4) At this point, follow the instructions in Icom's driver installation guide to complete the process.

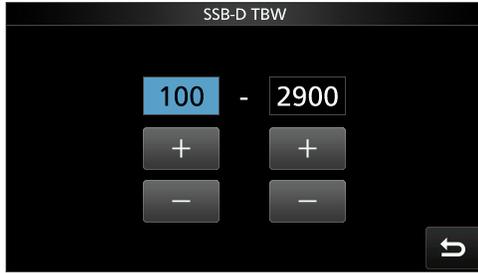
NOTE: Ensure the radio is powered OFF every time before connecting the USB cable. Only after the driver software has fully installed, and with the radio off, connect the radio to the computer with a short, good quality USB cable.

IC-7300 Configuration for Winlink

For a successful connection, the radio must be properly configured. Configuration steps may vary with different firmware versions, but these steps work with version 1.41.

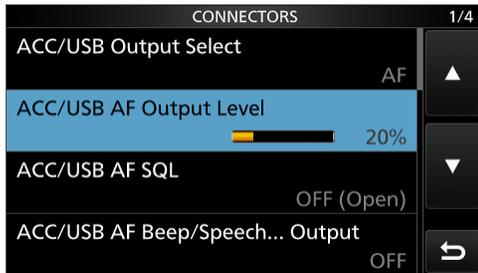
- 1) Press the **<MENU>** button, then select the **<SET>** option.
- 2) Select the **<Tone Control/TBW>** menu, then select **<TX>** option.
- 3) Select the **<SSB-D>** (data mode) option, then select **<TBW>** (transmit bandwidth).
- 4) Set the **<SSB TBW>** (SSB Digital band transmit width) to a range of 100 to 3000 Hz.

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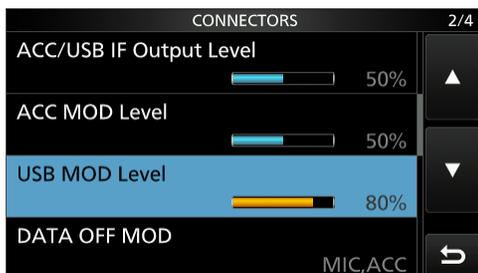


- 5) Press the back button multiple times until again at the main **<Set>** menu.
- 6) Select the **<Connectors>** menu item.
- 7) Select **<ACC/USB AF Output Level>**. This item adjusts the receive audio level, which can be seen on the VU meter in the VARA HF modem software. Begin by setting the level to 20%, but that is only an approximate starting point. Watch the VU meter while making this adjustment.

NOTE: A receive audio level somewhat into the green is desired when listening to background noise, and always remaining below the red zone during the loudest audio reception (that is not affected by the radio's volume knob).



- 8) Select **<USB MOD Level>**. This adjusts the transmit audio level, along with the Drive Level setting in VARA HF. It may be necessary to adjust this, to achieve a mid-range VARA HF drive level. The aim is to have very little ALC action. Begin by setting the level to 80%, but that is only an approximate starting point. Further adjustment may be necessary. (Drive will be adjusted in a later step)

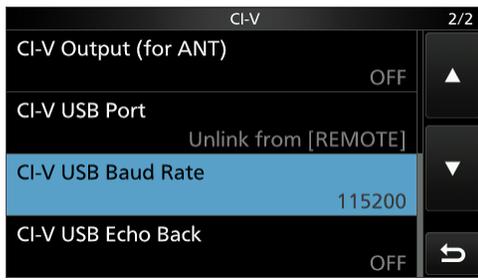


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- 9) Scroll down to **<DATA MOD>**. Select it, then set it to **<USB>**. This specifies that audio for data transmissions will enter and exit the radio through the USB port.



- 10) Select **<CI-V>**, which opens a sub-menu. Set **<CI-V USB Baud Rate>** to 115200. (Note that CI-V Baud Rate is a separate item, not needed for a USB link)



- 11) Press the Back button until the main display is visible, then press **<QUICK>**.
- 12) Select **<Meter Type>**, then **<ALC>**. It is important to monitor the radio's ALC action during transmit, to ensure minimal ALC activity which could cause distortion of transmit audio. This may change on different bands, power levels or antennas.



NOTE: To reduce ALC activity during normal transmissions, in the VARA HF software open the Settings menu then select **<Sound Card>** and adjust the Drive Level slider.

- 13) Press the **<FUNCTION>** button, set the following items while operating in data modes, then exit this screen:

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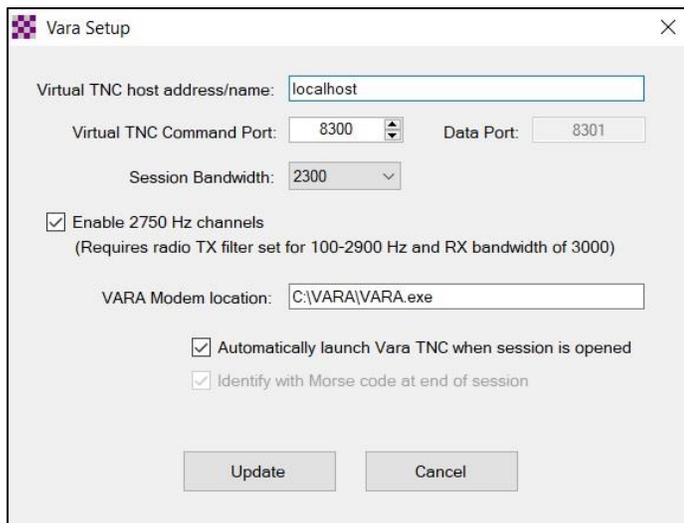
- **<AGC>** to **<FAST>** or **<MID>**
- TBW (transmit bandwidth) to **<WIDE>**
- **<NB>** (noise blanker) **<OFF>**
- **<NR>** (noise reduction) **<OFF>**
- **<COMP>** (Tx audio compression) **<OFF>**

- 14) Press the **<MENU>** button, then **<SET>**. Scroll down and select **<SD Card>**. Then **<Save Setting>** **<<New File>>** to save the radio configuration; in case it is ever necessary to reset the radio's memory. Rename the default saved file name with **Wilinkdefault** to quickly reload all required settings.

VARA HF Session Settings

VARA HF has become the standard software modem interface for many Winlink Express users and RMS gateway operators, due to the low cost of the software compared to a commercial Pactor® IV modem. Other hardware and software modems do exist, and the preferred standard may change over time. However, these instructions will assume that **<Vara HF Winlink>** has been selected as the session modem for Winlink Express.

- 1) Open Winlink Express, select a **<Vara HF Winlink>** session type, and then click **<Open Session>**.
- 2) Open the **<Settings>** menu, then select **<VaraTNC Setup>**. Ensure your settings match those shown below. Specifying "localhost" as the Virtual TNC host address/name states that the modem software is on the same computer.

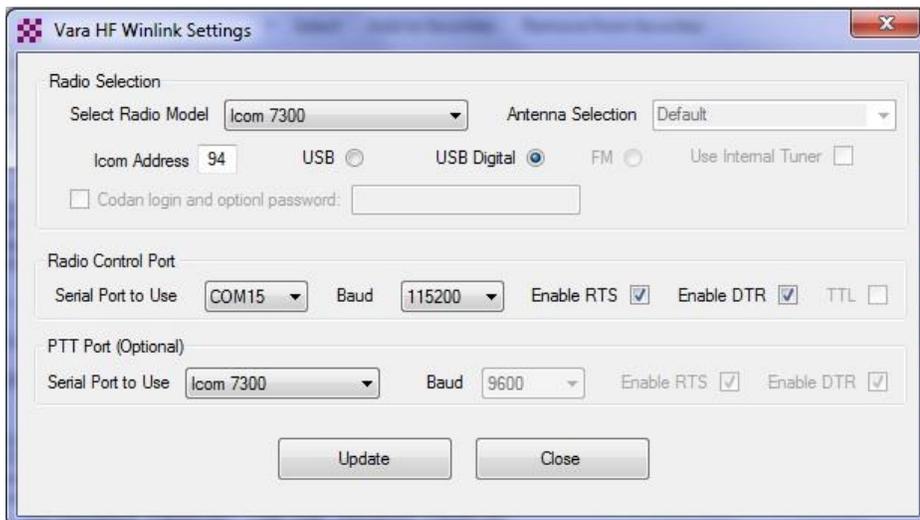


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- 3) When done, click the **<Update>** button.

It will be desirable, but not required, to purchase a VARA license. After it has been installed, this allows the modem to operate at full speed. Open the Help menu in VARA HF and click on Buy VARA License. This will take you to a website where you enter your callsign, then can pay via PayPal or other means.

- 4) In the Settings menu select the **<Radio Setup>** option.
- 5) Select the **<Icom 7300>** radio model, and ensure the Icom Address is set to **94**. A **<USB digital>** connection will be made to the radio.
- 6) Configure other settings as per the screen capture below, though the Serial Port to Use selection will vary based on the computer being used.



NOTE: To determine the USB serial port configured on your computer, open **<Device Manager>**. You can typically find it using the computer's search tool, located either in the Start menu area or on the task bar. Within Device Manager, expand the Ports (COM & LPT) section, and look for the port called "Silicon Labs CP210x USB to UART Bridge (COMx)", where x is the port number.

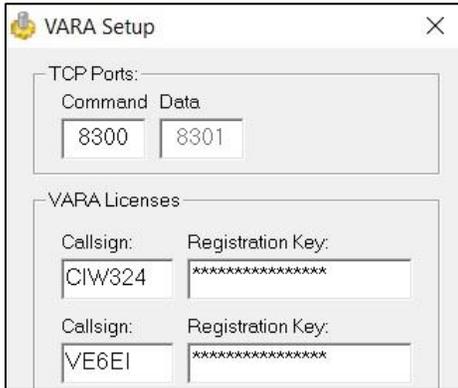
- 7) Click the **<Update>** button to complete this step.

Configuring the VARA HF Modem Software

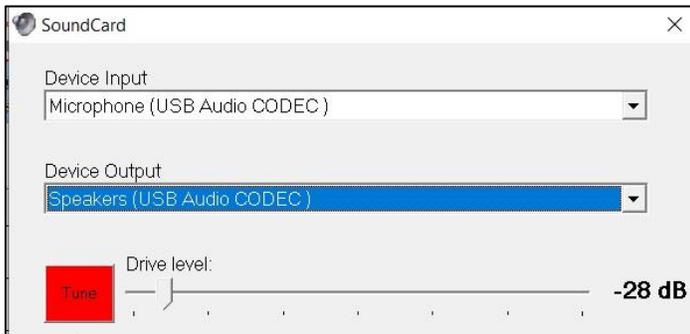
- 1) Next, the VARA HF software modem must be configured. It will have opened along with the session dialog and should currently be minimized on the taskbar.

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- 2) In the VARA HF software, open the **<Settings>** menu and select **<VARA Setup>**.
- 3) Enter your callsign, and if you have registered the software enter the Registration Key. Up to four callsigns may be registered. Press the Close button.



- 4) In the **<Settings>** menu, select the **<SoundCard>** option.
- 5) Set the **<Device Input>** and **<Device Output>** to the appropriate sound source and destination. If an IC-7300 is in use, the image below shows likely configuration.



- 6) Connect the radio to an appropriate antenna, set the power level as desired, and set the radio's meter to display ALC. Then press the **<Tune button>**. Adjust the **<Drive Level>** for minimal ALC action on the meter, to minimize audio distortion.
- 7) Close this dialog. The VARA HF Winlink session should now be ready.

Configuring Radios Without a USB Port

Configure the radio as follows to avoid distortion of transmitted and received audio, which would significantly affect link reliability:

- **<AGC>** to **<FAST>** or **<MID>**
- **<Bandwidth>** if adjustable to **<WIDE>**
- **<NB>** (noise blanker) **<OFF>**
- **<NR>** (noise reduction) **<OFF>**
- **<COMP>** (Tx audio compression) **<OFF>**

First, a brief explanation of the following terms:

CAT: Computer Aided Transceiver, it sends control signals between the radio and computer. It is called CI-V for Icom radios.

USB Sound Card: This is an external USB device that will send audio signals between the radio and computer. **SignalLink** is an example of this. Most computers have a built-in sound card which could be used for Winlink, but problems may arise with Windows system sounds going to the radio, and RF causing trouble in the computer during transmit, so this is discouraged. The device may also switch the radio to transmit mode.

PTT: Push To Talk. This is a signal to the radio that causes it to transmit.

VOX: Voice-Operated eXchange. A circuit in the radio or the USB sound card that switches on PTT when transmit audio is detected.

Audio Signals to the Radio

An external USB sound card may commonly be connected from a computer USB port to a data port at the rear of the radio (eg 6-pin mini-DIN, or similar). For older radios without such a connector, the sound card may connect to the microphone jack and either the speaker jack or a line-level audio output on the back of the radio. Some radios will have to be set to a “D” or **digital mode** to accept transmit audio into the data port.

NOTE: The word “data” applies to the mode of radio operation. The audio signals handled by the radio are actually analog.

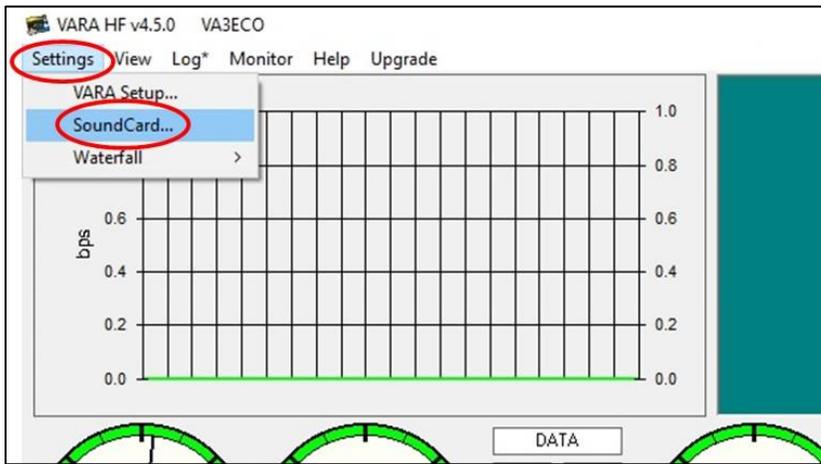
A commonly-used USB sound card is the SignalLink. It may be conveniently purchased with the appropriate radio cable when ordering. The SignalLink is not only a sound card, but includes a VOX signal included on this same cable, which is very convenient. The VOX circuit can be disabled by an internal jumper if the operator chooses one of the other PTT options listed below. <https://www.tigertronics.com/slusbmain.htm>

Transmit Levels

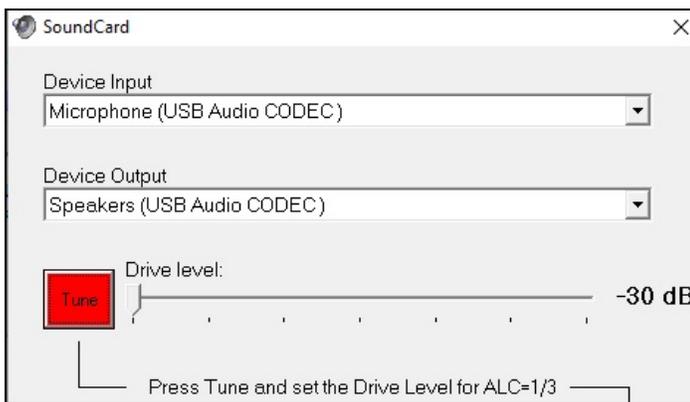
- 1) First, install the USB sound card as per manufacturer instructions. The Signalink USB includes very detailed information on installation.

NOTE: It is important to ensure that the configured interface for Windows sounds is the computer's internal sound card, not the Signalink. This ensures that computer system audio is not transmitted.

- 2) Open Winlink Express, then open a **<VARA HF>** session.
- 3) To access VARA HF audio settings, select the **<VARA HF>** icon in the Windows toolbar. (the VARA modem software opens in a minimized window)
- 4) Open the **<Settings>** menu, then select **<SoundCard>**.



- 5) Set the **<Device Input>** and **<Device Output>** to the correct **<USB Audio Codec>**.



NOTE: Windows may occasionally change these device settings, especially after upgrades. No input or output? Check the VARA Soundcard settings.

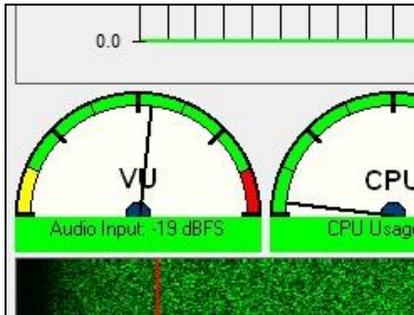
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- 6) If using the Signalink sound card, the drive level can be adjusted by both the "TX" pot on the unit's front panel and the Drive level slider as shown above. It is suggested to set the **<Signalink TX>** pot fully clockwise, and then adjust the **<Drive level>** slider to control the radio's transmit power. That way if the pot gets bumped, you will not be in danger of overdriving the radio.
- 7) With the radio connected to a suitable antenna or dummy load, press the red **<Tune>** button. Adjust the Drive level slider for the desired level of ALC action and transmit power. De-select **<Tune>** when done.

NOTE: Some operators advise adjusting Drive level for up to about 1/3 of full-scale ALC. But due to the high transmit duty cycle imposed on the radio and antenna by Winlink, it may be wise to adjust the Drive level so that the radio transmits at 1/2 to 3/4 of rated output. This may help prevent transmitter damage or overheating of the antenna balun. (eg EMCOMM II type)

Receive Levels

- 1) Select the VARA HF software modem icon from the Windows taskbar.
- 2) Observe the Audio Input VU meter while the radio is connected to an antenna on the desired frequency.



- 3) Adjust the **<Signalink RX>** pot for a midrange or lower deflection on the meter, as shown above. This level must remain in the green range even with the loudest received audio.

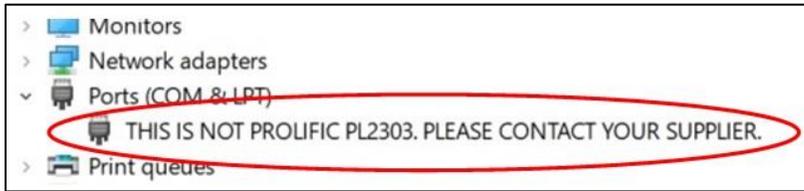
NOTE: Sound cards without TX or RX pots can be adjusted with Windows audio level controls by right clicking the speaker icon in your taskbar, Open Sound settings, choose the correct device, then Device properties, and adjust levels.

Computer Control of the Radio

The computer control or "CAT" port is either an RS-232 serial connection on older radios, or USB on newer radios. If RS-232 must be used, most new computers (especially laptops) will not have an RS-232 port. USB to RS-232 converters can be used for an older radio and a new laptop. These converters will have a chipset inside the connector that does the level conversion.

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Adapters with the FTDI chipset are preferred. It would be wise to avoid the Prolific chipset as there are many counterfeits and a Windows update will disable these. If this happens you will see an error in your Windows Device Manager similar to this:



This problem may be fixed temporarily by reinstalling older drivers.

To determine which RS-232 port number has been assigned to the adapter, open Windows **<Device Manager>**, then expand **<Ports (COM & LPT)>**. When plugging in the adapter or unplugging it, you will see the correct device appear or disappear.

PTT Signal to the Radio

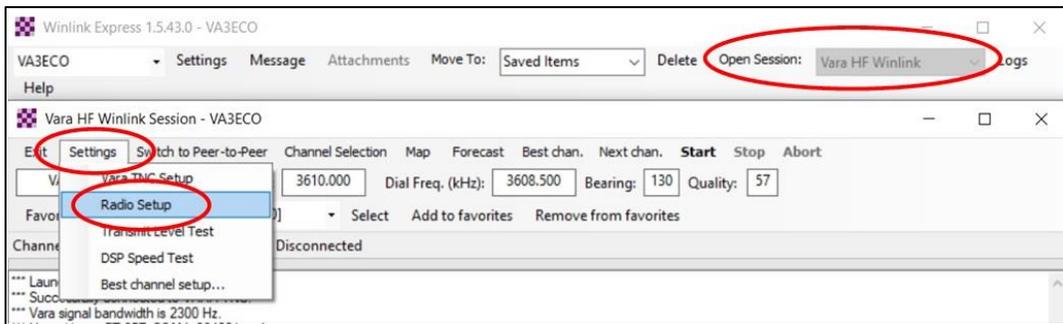
This can be handled with a VOX circuit, CAT control, or using a discrete wire.

- The VOX circuit (built into the SignalLink USB) has the advantage of simplicity. The SignalLink triggers a PTT on the cable to the radio when it detects transmit audio. This technique could be used for an older radio without CAT functionality. The disadvantages of VOX are that there is a slight delay to initiate transmitting, and the level of audio required to trip the VOX circuit may need adjustment.
- The CAT interface used for frequency and mode control can also tell the radio to transmit, and is commonly used for PTT. It has the advantage of being quick, but on some radios (like the Kenwood TS-2000) a CAT PTT signal only accepts audio from the front panel microphone jack, not the data port on the rear of the radio. If this is a problem, one solution is to bring the computer audio in through the microphone jack.
- A discrete wire PTT signal can be implemented with the RTS line from a separate RS-232 port on the computer. There should be an optically isolated circuit or relay between the radio and the computer. This method is less commonly used but can help reduce VOX-induced delays if that is a concern.

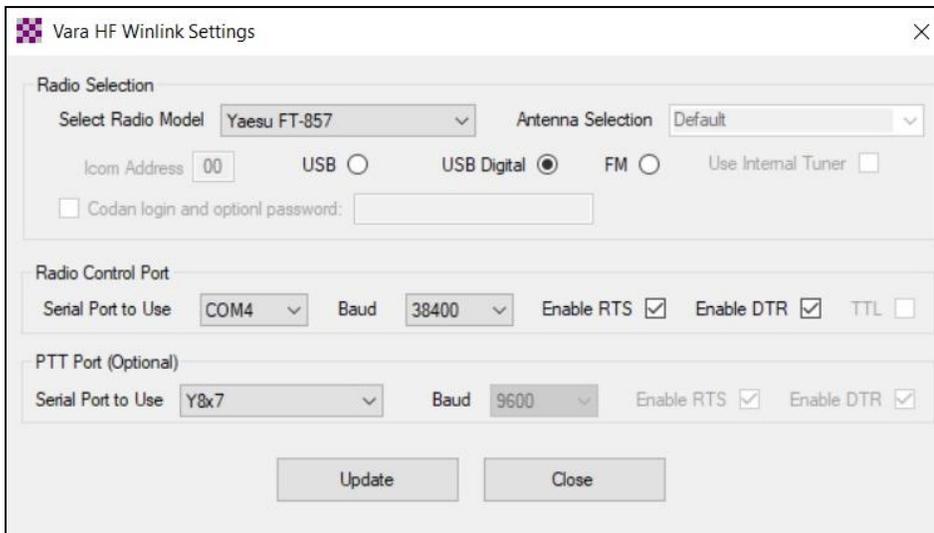
NOTE: With radios of that do not include a computer control or "CAT" interface, the frequency, mode and other settings must be manually controlled by the user.

Winlink Settings Examples

To configure the Winlink radio settings, start a VARA HF Winlink session, open the **<Settings>** menu and then select **<Radio Setup>**. As there are many radios which could be deployed in this situation, it is not possible to demonstrate every possibility. However, below are several common examples.



Below are Winlink settings for a Yaesu FT-857, using CAT control on the COM4 port, as well as CAT for PTT. Note that the Serial Port to Use is set to **<Y8x7>**, which would also apply for the FT-817 and the FT-897.



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Below are Winlink settings for a Yaesu FT-450, using CAT control on the COM4 port, and the VOX circuit of a Signalink USB generating PTT. Note that the Serial Port to Use in this case is set to External.

Vara HF Winlink Settings

Radio Selection

Select Radio Model: Yaesu FT-450 Antenna Selection: Default

Icom Address: 00 USB USB Digital FM Use Internal Tuner

Codan login and optional password: _____

Radio Control Port

Serial Port to Use: COM4 Baud: 4800 Enable RTS Enable DTR TTL

PTT Port (Optional)

Serial Port to Use: External Baud: 9600 Enable RTS Enable DTR

Update Close

Below are Winlink settings for a Kenwood TS-2000, using CAT control on the COM9 port, and RTS on the COM10 port for PTT. Note that the radio model is set to the generic Kenwood Amateur, as the older TS-2000 does not have a specific selection.

Vara HF P2P Settings

Radio Selection

Select Radio Model: Kenwood Amateur Antenna Selection: Default

Icom Address: 00 USB USB Digital FM Use Internal Tuner

Codan login and optional password: _____

Radio Control Port

Serial Port to Use: COM9 Baud: 57600 Enable RTS Enable DTR TTL

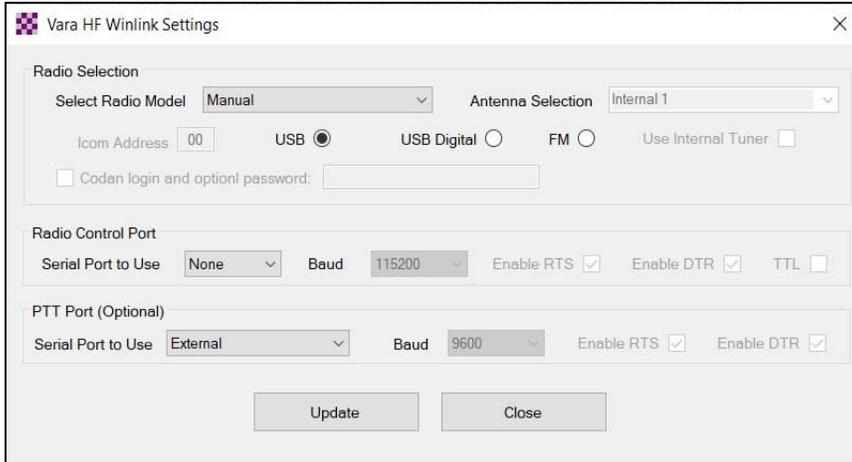
PTT Port (Optional)

Serial Port to Use: COM10 Baud: 9600 Enable RTS Enable DTR

Update Close

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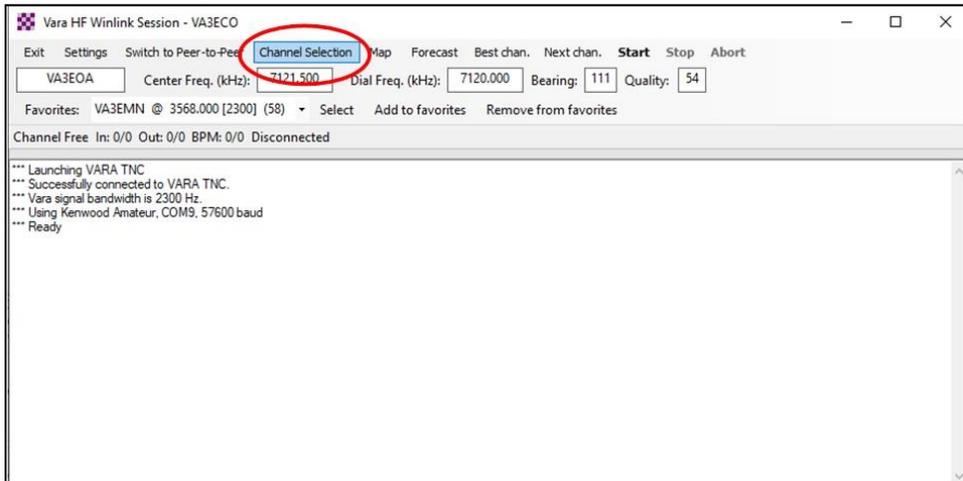
And finally, below are typical Winlink settings for a radio without computer control or CAT capability, and with the VOX circuit of a Signalink generating PTT. Note that Radio Selection is now set to Manual (manual radio control), and that Serial Port to Use for PTT control is set to External.



HF Channel Selection

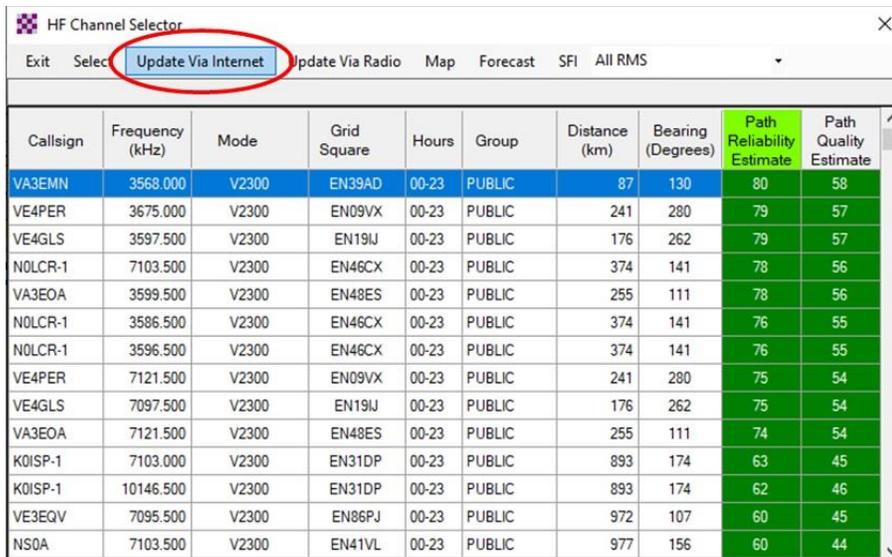
Updating HF Channel Selector via Internet

- 1) Open a Winlink session, for example VARA HF Winlink, and then click the **<Channel Selection>** button.



- 2) Select the **<Update Via Internet>** option.

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Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
VA3EMN	3568.000	V2300	EN39AD	00-23	PUBLIC	87	130	80	58
VE4PER	3675.000	V2300	EN09VX	00-23	PUBLIC	241	280	79	57
VE4GLS	3597.500	V2300	EN19IJ	00-23	PUBLIC	176	262	79	57
N0LCR-1	7103.500	V2300	EN46CX	00-23	PUBLIC	374	141	78	56
VA3EOA	3599.500	V2300	EN48ES	00-23	PUBLIC	255	111	78	56
N0LCR-1	3586.500	V2300	EN46CX	00-23	PUBLIC	374	141	76	55
N0LCR-1	3596.500	V2300	EN46CX	00-23	PUBLIC	374	141	76	55
VE4PER	7121.500	V2300	EN09VX	00-23	PUBLIC	241	280	75	54
VE4GLS	7097.500	V2300	EN19IJ	00-23	PUBLIC	176	262	75	54
VA3EOA	7121.500	V2300	EN48ES	00-23	PUBLIC	255	111	74	54
K0ISP-1	7103.000	V2300	EN31DP	00-23	PUBLIC	893	174	63	45
K0ISP-1	10146.500	V2300	EN31DP	00-23	PUBLIC	893	174	62	46
VE3EQV	7095.500	V2300	EN86PJ	00-23	PUBLIC	972	107	60	45
NS0A	7103.500	V2300	EN41VL	00-23	PUBLIC	977	156	60	44

- 3) You will see a message stating "**STANDBY - Updating RMS channels**" just below the button you just selected. The process should take less than a minute with a fair internet connection.
- 4) Clicking on the **<Path Reliability Estimate>** once or twice will put the (predicted) strongest RMS stations at the top of the chart. As seen above, VA3EMN looks like a good RMS station, so click on it, and then click the Select button. This should close that window, and change the radio to VA3EMN's frequency.

Updating HF Channel Selector via Radio

If you have no internet connection and feel your Channel Selector file is outdated, you can still get the latest RMS gateway information to make a channel selection, by using your radio in an HF or VHF/UHF session.

However; there are several caveats before doing this:

- At least one reliable RMS gateway must be available to connect to.
- Knowledge of how to perform a wireless connection is required. This is covered in the following sections.
- Downloading the large channel selector file will take a considerable amount of time over a typical HF connection.

- 1) Open a Winlink session (for example VARA HF Winlink) as per the top of the preceding page.
- 2) Select the **<Update Via Radio>** button.

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Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
VA3EMN	3568.000	V2300	EN39AD	00-23	PUBLIC	87	130	76	52
VE4GLS	3597.500	V2300	EN19J	00-23	PUBLIC	176	262	75	52
VE4PER	3675.000	V2300	EN09VX	00-23	PUBLIC	241	280	74	51
VA3EOA	3599.500	V2300	EN48ES	00-23	PUBLIC	255	111	73	50
N0LCR-1	3596.500	V2300	EN46CX	00-23	PUBLIC	374	141	73	51
N0LCR-1	3586.500	V2300	EN46CX	00-23	PUBLIC	374	141	73	51
N0LCR-1	7103.500	V2300	EN46CX	00-23	PUBLIC	374	141	70	51
VA3EOA	7121.500	V2300	EN48ES	00-23	PUBLIC	255	111	67	49
VE4GLS	7097.500	V2300	EN19J	00-23	PUBLIC	176	262	64	47
VE4PER	7121.500	V2300	EN09VX	00-23	PUBLIC	241	280	64	48
K0ISP-1	10146.500	V2300	EN31DP	00-23	PUBLIC	893	174	61	45
K0ISP-1	7103.000	V2300	EN31DP	00-23	PUBLIC	893	174	59	43
NS0A	7103.500	V2300	EN41VL	00-23	PUBLIC	977	156	54	41
XE2BC	18098.500	V2300	DM12MM	00-23	PUBLIC	2634	232	54	42
KD7UHR	14110.600	V2300	EM58BQ	00-23	PUBLIC	1280	160	54	42
NM5PB-11	14097.200	V2300	EM48UM	00-23	PUBLIC	1289	162	54	42
KF4LXS	14108.900	V2300	EM67GW	00-23	PUBLIC	1429	153	53	41

- 3) You will get a message that the update request has been posted to your Outbox. Click **<OK>** to continue.



- 4) The update request will now be in your Outbox as a message. Open an appropriate radio session, and select **<Start>** to send the message.
- 5) After several minutes the response should be ready. Perform another radio session, and the update table will be downloaded as a message; sent from SERVICE.

Message ID	Size	From	Subject
<input checked="" type="checkbox"/> SYL690ALMN0X	14006	SERVICE@winlink.org	INQUIRY: 0C1ZWVVKXZ3Z

- 6) Once the email has been downloaded, Winlink will automatically apply the contents of the email to the Channel Selection table. The received email itself

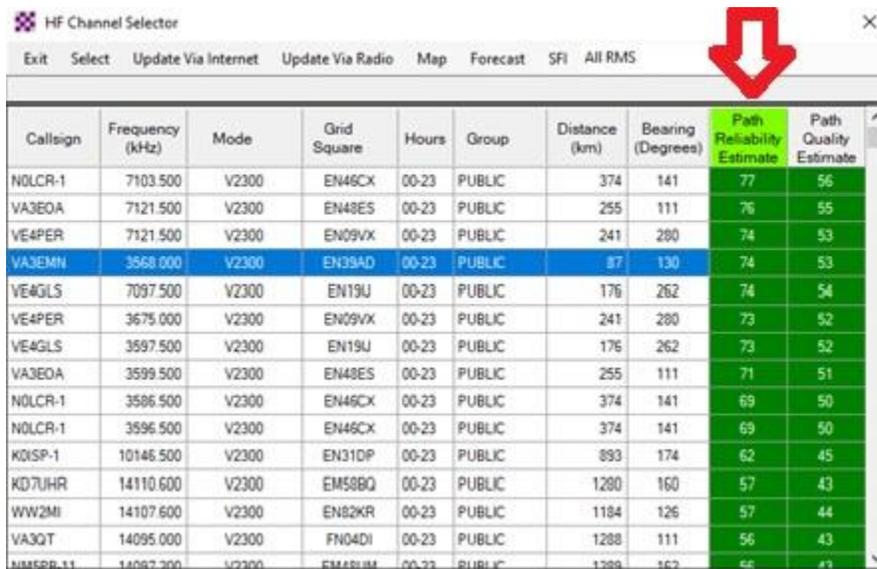
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should automatically be deleted. You will see the message: ***** Received and processed RMS HF Channels update message *****

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2021/11/25 02:47	8PM0PV3P2...	304	VE6E...	VE6EVL	VE6EI	Test Winlink msg from VE6EVL
2021/11/25 02:15	UN1HVG1W...	2372	VE6EN	VE6EN	VE6EI	Re: IMS 213-Happy Wednesday-WI

Using the RMS Channel Selector

Now that the RMS **<Channel Selector>** has been updated, we will look at it more closely. The chart below can be sorted by clicking any of the **column headers**. Clicking the header again will alternate between ascending and descending order.



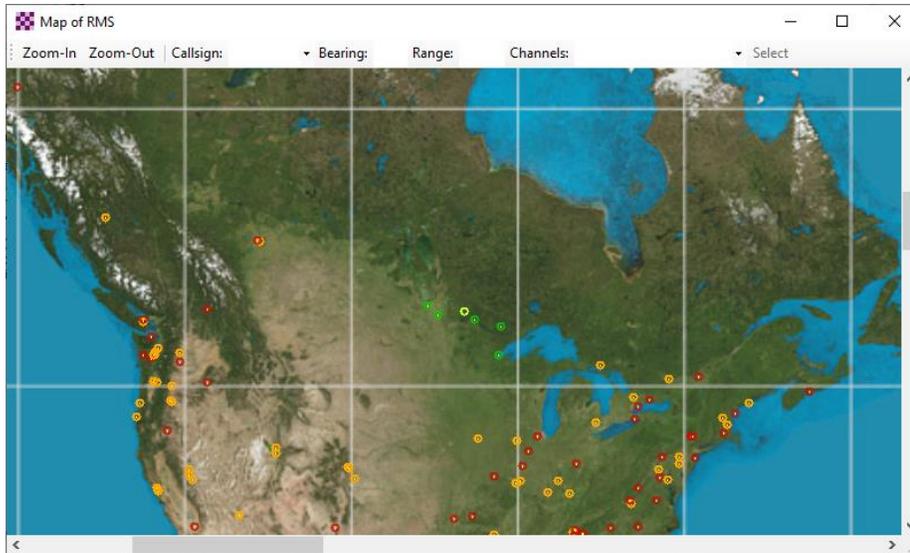
Call sign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
N0LCR-1	7103.500	V2300	EN46CX	00-23	PUBLIC	374	141	77	56
VA3EOA	7121.500	V2300	EN48ES	00-23	PUBLIC	255	111	76	55
VE4PER	7121.500	V2300	EN09VX	00-23	PUBLIC	241	280	74	53
VA3EMN	3568.000	V2300	EN09AD	00-23	PUBLIC	87	130	74	53
VE4GLS	7097.500	V2300	EN19U	00-23	PUBLIC	176	262	74	54
VE4PER	3675.000	V2300	EN09VX	00-23	PUBLIC	241	280	73	52
VE4GLS	3597.500	V2300	EN19U	00-23	PUBLIC	176	262	73	52
VA3EOA	3599.500	V2300	EN48ES	00-23	PUBLIC	255	111	71	51
N0LCR-1	3586.500	V2300	EN46CX	00-23	PUBLIC	374	141	69	50
N0LCR-1	3596.500	V2300	EN46CX	00-23	PUBLIC	374	141	69	50
K0ISP-1	10146.500	V2300	EN31DP	00-23	PUBLIC	893	174	62	45
KD7UHR	14110.600	V2300	EM58BQ	00-23	PUBLIC	1280	160	57	43
WW2MI	14107.600	V2300	EN82KR	00-23	PUBLIC	1184	126	57	44
VA3QT	14095.000	V2300	FN04DI	00-23	PUBLIC	1288	111	56	43
NMSRB-11	14092.200	V2300	EM48UM	00-23	PUBLIC	1389	162	56	43

As mentioned, selecting Path Reliability Estimate is a good place to start. Which band to choose will vary depending on: your antenna options, time of day, local noise, and general radio propagation. Perhaps a given band is “going long”, so choosing an RMS gateway at a greater distance might work better.

Using the RMS Map Selector

Selecting the **<Map>** button in the HF Channel Selector window (above) will display a map of RMS stations available as of the most-recent update.

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The RMS gateway with a high Path Reliability Estimate will be green, medium will be yellow, and low will be red.

Your station can be seen in the center of the map as a light green circle with a red dot in it. Clicking on any RMS gateway will display that station's call sign, frequencies, etc.

NOTE: Pressing **<Select>** will close the map, but NOT change the RMS station selection. if performed from the HF Channel Selector window. It WILL change the RMS station if the map is opened from the HF Winlink Session window.

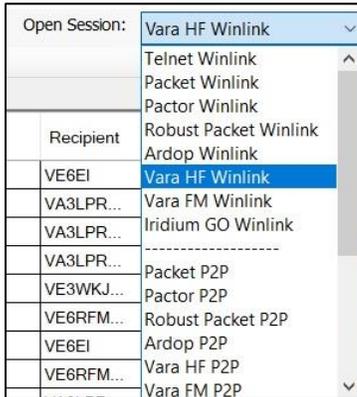
Performing a VARA HF Connection

It is recommended that the user pay the previously-mentioned VARA license fee, which allows operation at significantly higher over-the-air speeds than the free version. This also helps to ensure the software continues to be supported for years to come.

- 1) Open Winlink Express, then open the **<Message>** menu and select **<New Message>**.
- 2) **<Select Template>** if needed, otherwise compose message as desired.
- 3) In the **<To:>** box enter the destination callsign or email address.
- 4) In the **<Subject:>** box enter a meaningful subject line.
- 5) When done composing the email, click **<Post to Outbox>**. If not done, but need to move to another task, select **<Save in Drafts>** instead.
- 6) Select **<Vara HF Winlink>** or **<Vara HF P2P>** session from the drop-down list.

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7) Click the **<Open Session>** box next, to start a communication session.



8) With the session open, verify the setup is correct by going to **<Settings>**, then **<VARA Setup>**. Make sure the Session Bandwidth is at least 2300 Hz.

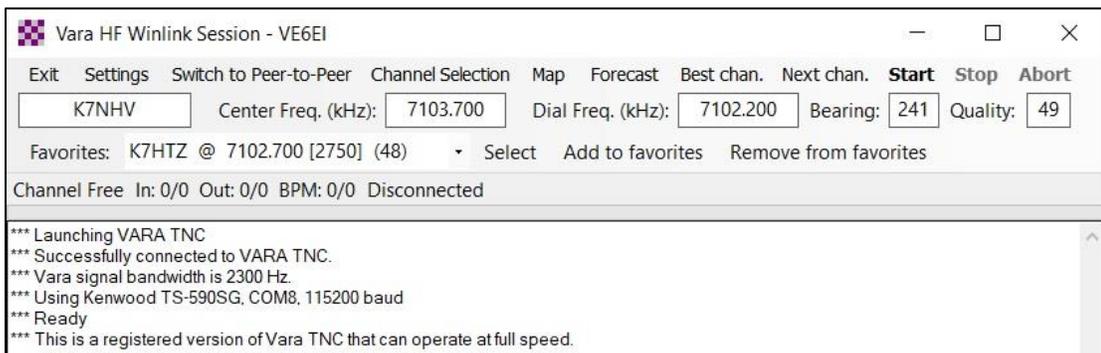
9) If you've selected the wrong type of session; you can change it by selecting **<Switch to Peer-to-Peer>** or select **<Open Session>** on the menu bar.

10) Select the desired RMS gateway from the **<Channel Selection>** tool or **<Favourites list>**.

11) If you opened **<Channel Selection>**, select the desired RMS gateway and then click **<Select>**. Its callsign and frequency will be automatically loaded into the Session.

12) Click **<Exit>** to close the Channel Selection tool.

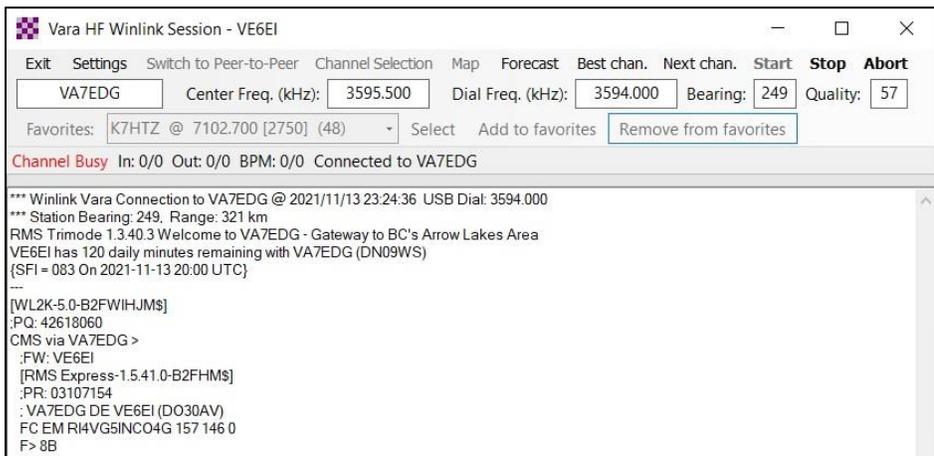
NOTE: If you require a P2P session there is a section of this manual which describes operation of that mode in some detail. However, basically you'll need to manually enter the destination callsign and frequency, as well as select a Peer-to-Peer Message type.



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- 13) Ensure the Radio is in **USB-Data** mode if this is not automatically set.
- 14) If the radio's frequency has not been properly set, adjust the radio to the displayed **Dial Freq. (kHz)** shown in the session.
- 15) Ensure a safe SWR at the chosen frequency by verifying the selected antenna, and if necessary, by the use of an antenna coupler (tuner).
- 16) Listen for activity on the channel. If busy, wait until activity has stopped; or select a different RMS gateway.
- 17) Press the **<Start>** button in the session dialog to begin communicating.

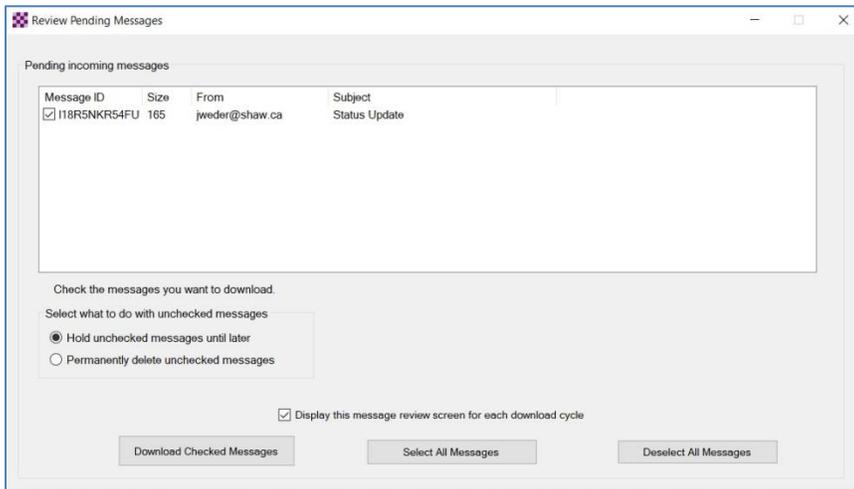
NOTE: Messages in the Winlink Express Outbox are sent before (default) the RMS responds with messages that may be waiting for you. This is done with the presumption that an outgoing message may be requesting emergency assistance.



- 18) Monitor the connection progress. Most RMS stations are scanning multiple frequencies, so the software will call the RMS up to fifteen times by default.
- 19) If it times out, try immediately again and it may connect.
- 20) You should see a "**Winlink VARA Connection to...**" statement as a connection is established.

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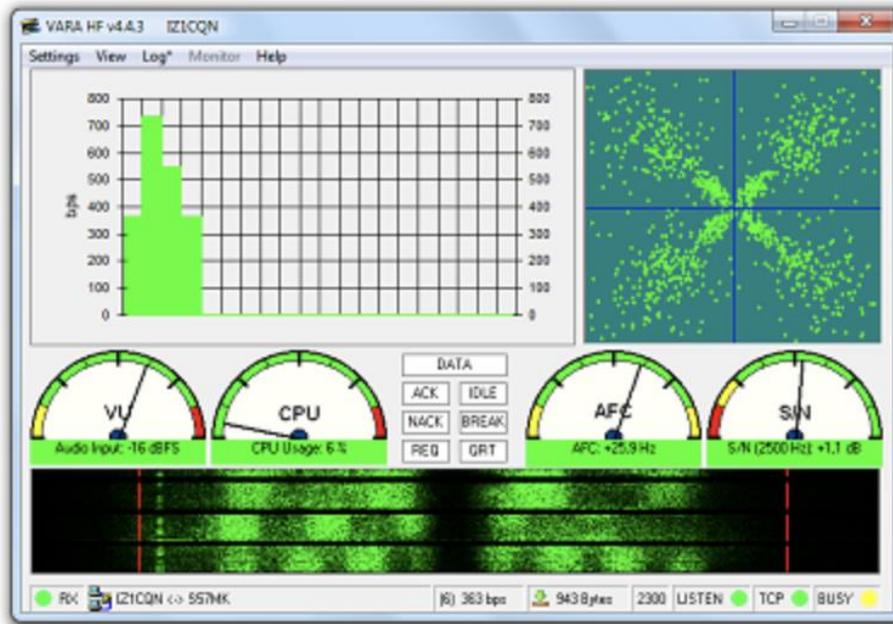
- 21) If the RMS has a connection to a CMS, you'll next see a statement such as "CMS via VA7EDG" Without connectivity to a CMS (internet); messages cannot be sent or received, unless the RMS is a **Hybrid type**. (See Advanced topics)
- 22) After any outgoing messages are sent, you may see a dialog stating that messages are waiting at the RMS. You can de-select messages if desired. (Ex: if connection is poor; or just download critical messages)



- 23) When the software is done sending and/or receiving messages it will automatically disconnect.
- 24) If the RMS gateway is one you will use regularly, you can click **<Add to favorites>**.

NOTE: Be careful with the radio's power settings especially if SWR is high. As Vara HF Winlink is a high duty cycle mode, this can stress the antenna's balun. For example, a typical maximum transmit power with the Chameleon EMCOMM II should be 50W.

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A quick tour of the VARA HF display:

- 1) The transmitted and received data rate (bits per second) are shown on a bar graph type trend display. Red is sent, green is received.
- 2) The configured bandwidth is shown as red lines on each side of the waterfall. This is also shown on the bottom status bar, 4th from the right.
- 3) The number of carrier signals in use at any time can be seen in the waterfall.
- 4) The modulation constellation is shown in the upper right. Just nice to watch!
- 5) The VU (volume units) meter shows receive audio level. Keep it in the green.
- 6) AFC (auto frequency control) shows difference between your radio and RMS.
- 7) S/N shows signal-to-noise level. Higher is better.

Common VARA HF Issues

- 1) ALC action may change on a different antenna, band or power level. Always monitor this and be ready to adjust **<Drive Level>** in the VARA HF software.

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- 2) Fading may cause a slow-down. As VARA adjusts for that it will take longer.
- 3) On P2P be ready to try another frequency, or if possible, ask for a relay.
- 4) Winlink Express may connect to the RMS gateway, but tell you there is no connection to a CMS. Try again later, or try a different RMS gateway.
- 5) If AFC shows frequency difference too great, connection may not be reliable. May need to adjust radio's calibration, or perhaps add a TCXO.
- 6) If many **NACK** (No Acknowledgement) or **REQ** (requesting a re-transmission) are shown in VARA HF modem consider hitting **<Stop>**, or **<Abort>** if necessary. Then try another RMS gateway. (Abort only if RMS doesn't hear Stop request)

Packet Winlink Configuration

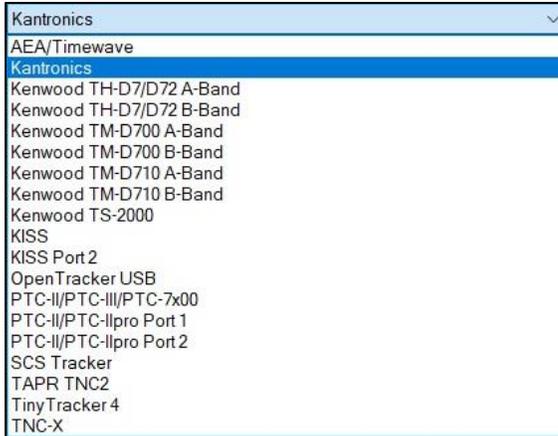
Packet Winlink Session Settings

It is assumed that the selected TNC will be a Kantronics KPC-3 Plus or similar model. This Terminal Node Controller, while having been first introduced many years ago, is still available from the manufacturer. If buying a new KPC-3 Plus, it may be purchased with a built-in USB port. This is preferable, to avoid the need for a serial port or USB-to-serial adapter on the computer.

NOTE: Older KPC-3 units do not include a USB port, so most likely a USB-to-serial adapter will be required. When purchasing an adapter, be aware that models including the FTDI chipset are most reliable.

Many of the KPC-3 and KPC-3 Plus TNC's are available on the used market at quite reasonable price. There are a multitude of other hardware and software TNC's available. Below is a list of vendors, as well as radios which include built-in TNC's, which Winlink Express will easily interface with.

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- 1) After opening Winlink Express, select a **<Packet Winlink>** session then click the **<Open Session>** button.
- 2) Click the **<Settings>** menu item. This opens the dialog below.
- 3) First, select **<Kantronics>** from the **<Packet TNC Type>** list, and then select the KPC-3+ from the **<Packet TNC Model>** list.
- 4) To determine which serial port to use, you may simply test each listed port. Alternately, open Windows **Device Manager**. Available serial devices will be listed in the **Ports (COM & LPT)** category. For example: "Keyspan USB Serial Port (COM3)"
- 5) Select the **serial port** to be used, and set the **baud rate** to 19200 if not already.
- 6) In the **<TNC Parameters>** area, select the 1200 Baud option and then set as shown in the image below as a starting point.

NOTE: In the following section, when first attempting a connection, the transmit audio level must be adjusted. This is done in the **<Settings>** menu. Ensure that **<Disable Xmt Level Adjust>** is not selected, then enter a Transmit Level value. If a deviation meter is available, try various level settings until approximately a 3.5 kHz deviation is measured. If a deviation meter is not available, it is suggested that you monitor both your own transmitted audio and the RMS received audio with a second radio, and adjust your transmit level until it is about the same as heard from the RMS gateway.

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Packet Winlink/P2P Setup

TNC Connection

Packet TNC Type: Kantronics

Packet TNC Model: KPC-3+ Serial Port: COM3

Serial Port Baud: 19200

Packet sound modem: Browse

(For KISS mode) Automatically launch packet sound modem

TNC Parameters

1200 Baud 9600 Baud

TX Delay (Milliseconds): 400 300

Maximum Packet Length: 128 255

Maximum Frames: 4 7

Frack: 2 2

Persistence: 160 224

Slot time: 30 20

Maximum Retries: 5 5

Disable Xmt Level Adjust Transmit Level: 80 100

Automatic Calling

Autoconnect time: Disabled

Automatically call when there are pending outgoing messages

Update Cancel

7) Click the **<Update>** button to save the settings.

NOTE: There is no need to perform any configuration of the TNC, for example using HyperTerminal or some other software tool. When a Packet Winlink session is started the software will automatically send the required configuration commands to the TNC. If the software cannot communicate with the TNC it will generate an error message, stating: "Initialization failed - initialization of the packet TNC failed"

Connecting TNC to Computer

If a KPC-3 Plus with built-in USB port has been purchased, this step is as easy as connecting the TNC to a USB port on the computer. Ensure the TNC power is OFF while connecting the two. There may be a serial port driver installation process. Ensure you follow the installation instructions in the instruction manual for this TNC type.

If using a serial model, a straight-through serial modem cable must be acquired or built. The computer's port will include a 9-pin male connector, while the TNC has a 25-pin female connector. The cable must have a 9-pin female connector at one end and 25-pin male at the other. Computer stores may offer such a cable, or a combination of cable and adapters might suffice.

Alternately, if building your own cable, here is a drawing from the Kantronics manual.

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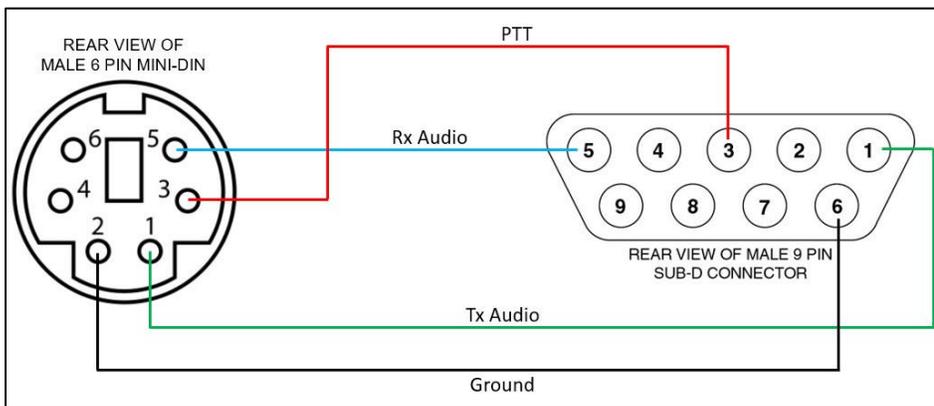
TNC: 25-pin male PC: 9-pin female

<u>KPC-3 Plus</u>		<u>Computer</u>
2	←→	3 TXD
3	←→	2 RXD
4	←→	7 RTS
5	←→	8 CTS
7	←→	5 SG

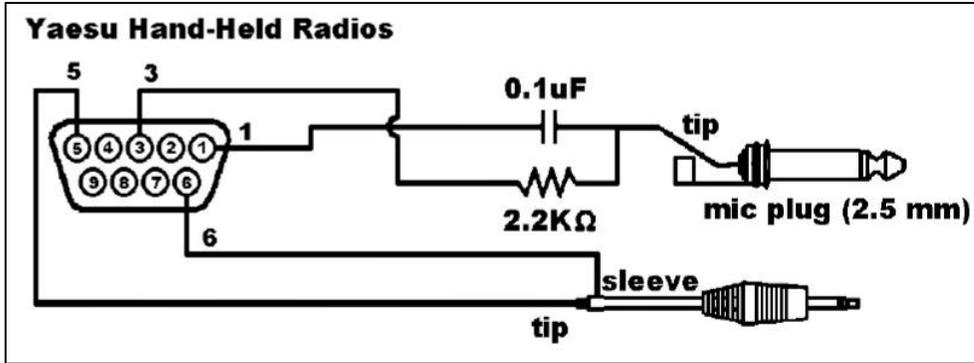
Connecting TNC to Radio

This section will first presume that a radio with a 6-pin mini-DIN connector has been acquired. This is a very common interface on many popular VHF and UHF radios for connecting data modems which require transmit and receive audio, and PTT control. Wiring for a common handheld model will also be shown.

NOTE: Kenwood sells a cable that is suitable for connection from a 6-pin mini-DIN connector at the radio end to the KPC-3 Plus DB-9 terminal. Part number is PG-5G. If it is preferred to build a cable, the cable wiring diagram is below.



Alternately, if it is required to use a handheld radio, there are wiring diagrams for several models in the KPC-3 Plus instruction manual. Below is a wiring diagram for Yaesu handhelds such as the FT-530.



Other Typical TNC Models

The Kantronics KPC-3 Plus is a very popular and easily-available packet TNC. (new or used) However, many other models do exist, as shown in the **<Packet TNC Type>** and **<Packet TNC Model>** selection menu choices within the Settings menu. This includes models by manufacturers such as AEA/Timewave, SCS, TAPR and so on. Also configurable are specific Kenwood radio models which include built-in TNC's.

In addition, several TNC emulation software packages are available. These include the **UZ7HO** and **Dire Wolf** applications. When using one of these instead of a hardware TNC, it will be necessary to include a soundcard interface, either home-made or a device such as a **Signalink USB** or **RigBlaster**.

NOTE: If considering the purchase of a Signalink or RigBlaster for use with a software TNC (in addition to the software purchase), it may be found that simply purchasing a used TNC could be less expensive and less complex. A low-cost or home-brew interface may potentially reduce the cost of this option.

The choice of TNC type is left to the individual ACS operator, but reliability must be considered when this equipment is being used for ACS purposes.

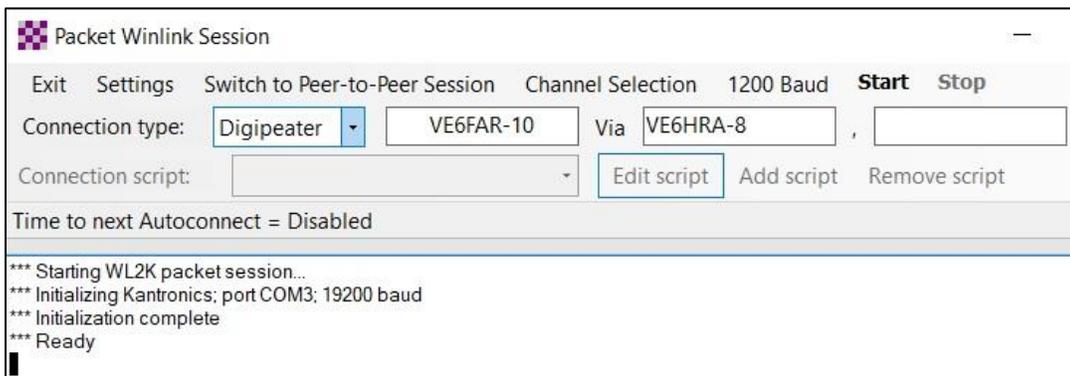
Performing a Packet Connection

Once the connection process has begun, the displayed status information is basically the same as during an HF session. The main differences are during setup.

- 1) Ensure the TNC is powered on, and connected to both the computer and radio.
- 2) Verify that the radio is powered on and set to the RMS gateway channel frequency. With fixed-level receive audio exiting the radio via the 6-pin mini-DIN connector, the volume may be set as desired for the operator's convenience.

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- 3) Select and open a **<Packet Winlink>** session.
- 4) Verify that settings are correct as per the **Configuration** section above.
- 5) If a local packet RMS gateway is not known, you may update the **<Channel Selection>** tool and select a listed RMS gateway. It is best to know which RMS to use in advance.
- 6) If the RMS gateway is sufficiently close to your station, select a **<Direct>** **<Connection type>**.
- 7) Enter the callsign of the RMS gateway. It may include a suffix such as -10.
- 8) If the RMS gateway is reached through a digipeater, set the connection type to **<Digipeater>**, then enter the digipeater's callsign in the box to the right of the RMS gateway callsign. Either one or two in-series digipeaters may be used as necessary.



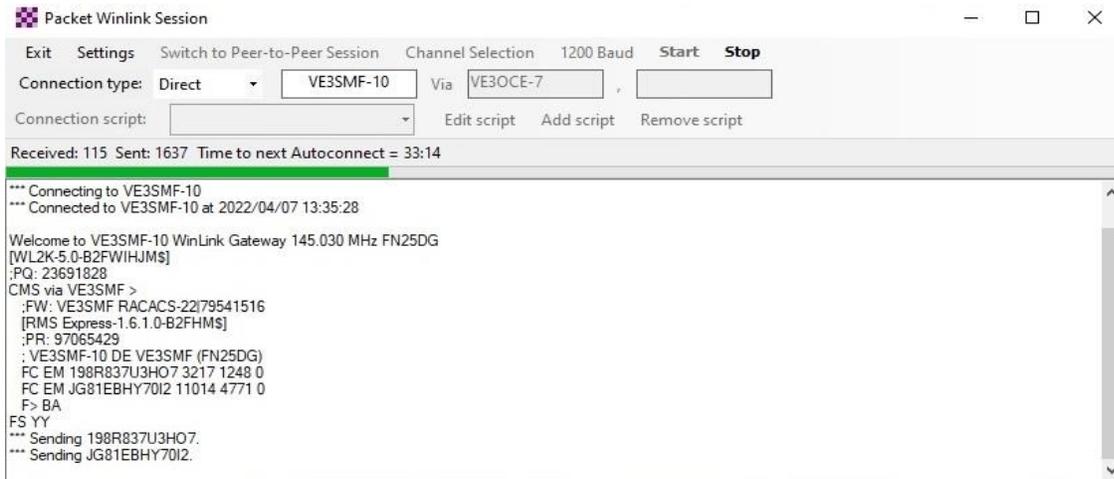
- 9) Click the **<Start>** button and monitor progress of the connection.

NOTE: When first attempting a connection, the transmit audio level must be adjusted in the Settings menu. Ensure that **<Disable Xmt Level Adjust>** is not selected, enter a Transmit Level value, click Update, then start a connection. If a deviation meter is available, try various level settings until a 3.5 kHz deviation is seen. If a deviation meter is not available, monitor your transmitted audio and the audio from the RMS with another radio. Adjust your transmit level until it sounds the same as the RMS gateway audio.

- 10) If the request is successful, a message will be seen, for example **"Connected to VE6FAR-10"**.

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- 11) Next, if the RMS gateway has Internet connectivity to a CMS, a series of transmissions will occur which are required by the **WINLINK** system.
- 12) If there are any messages waiting in your Outbox, they will be sent first. While any message is being **sent**, a green progress bar will move from left to right across the top of the white area of the screen.



- 13) After the Outbox has been cleared, the RMS will inform Winlink of whether there are any messages waiting for you. If there are, a dialog will appear asking if you want to download these messages. You may choose to de-select messages which are of lower priority, which can then wait for another connection.
- 14) Once all traffic has been sent and/or received, the RMS will automatically disconnect, and you will see a message: ***** Disconnect reported.**

Common Packet Session Issues

- 1) Ensure that the radio is on the correct frequency and with no (+) or (-) offset.
- 2) Verify the transmit power level is sufficient to reach the RMS gateway, and that an appropriate antenna has been connected.
- 3) Watch the TNC front panel. When sending, its red Xmit LED should flash on. If it does not, check the serial cable and serial port settings. Also verify that the radio display shows that it is transmitting.
- 4) When receiving data, the TNC's green Rcv LED will flash on when the radio's S meter is showing receive audio. If it does not, check the cable between the radio and the TNC. You may turn up the volume to verify the audio is not distorted.
- 5) Ensure that the correct RMS gateway callsign has been entered, and if a digipeater is required make sure that its callsign is properly entered.

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- 6) The radio's transmit deviation (audio level) may not be correct. Go back and follow the instructions above to verify a good Transmit Level has been set.
- 7) The RMS gateway may simply not be available for unknown reasons. Or perhaps you connect to the RMS gateway but get a message stating there is no Internet connection to a CMS. Best to know who the RMS sysop is, and contact them if this occurs.
- 8) The TNC's Con (connected) and Sta (status) LED's may only come on briefly.

VARA FM Configuration

In some regions, VARA FM may be used instead of a packet system. If appropriate radios and audio interfaces are used, this can allow for much faster data transmission than a 1200 bps packet system, so this mode may eventually overtake packet as the preferred mode for VHF/UHF sessions. Ensure you discuss options with the regional ACS team and served agencies.

The instructions below presume the use of a Signalink USB to provide both Tx/Rx audio and PTT control for the radio. The **Signalink user manual** is an excellent resource for setup, but the following steps will summarize basic items.

Signalink Connection to Radio

When purchasing a Signalink USB, the store should be able to provide two accessory items to ease this step. Pre-configured jumper modules are available for many radio types. These are inserted into a socket within the Signalink USB itself, to route audio, PTT and ground appropriately. Also, pre-built cables are available to connect the radio and Signalink, avoiding the need for one to be built (and avoid the need to acquire parts and do research to ensure correct wiring).

Again, the Signalink USB user manual is of great help when performing these steps. If the unit was purchased used without a manual, it can typically be found with a quick search using a favorite search engine. That document should be used as the primary resource when wiring the jumpers and radio cable, but a few key steps are noted here.

- 1) Remove the Signalink from its case by undoing the four screws on the front. Leave the knobs in place, and gently pull the front panel, with circuit board attached, out of the case. Set it on a non-static surface.

NOTE: VARA FM is capable of speeds much higher than 1200 bps if appropriately configured. Your radio may have a menu item to select either 1200 or 9600 bps. Ensure it is set to 9600 bps to allow higher data rates. Also, one Signalink jumper wire may need to be changed. The SPKR pin on the jumper socket must be connected to the 9600 OUT pin instead of the 1200 OUT pin.

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- 2) Find the jumper socket, and if a jumper module was purchased, insert it now. Ensure it is inserted with the correct orientation. Do not push too hard, to avoid damaging anything, and ensure no jumper pins are bent.
- 3) If a pre-configured jumper module was not available, navigate to the following webpage to determine the correct jumper pinout for your radio:
[Radio Wiring Information \(tigertronics.com\)](http://tigertronics.com)
- 4) Connect the RJ45 end of the radio cable (looks like an Ethernet connector) to the radio port on the back of the Signalink USB. Ensure it clicks into place.
- 5) Many VHF/UHF radios will include a 6-pin mini-DIN connector on the back of the radio. If this is the correct connector, just ensure the 6-pin connector on the radio end of the cable is correctly oriented, then carefully insert it into the radio. Some radios may use other connector types, for example an ACC connector.

If the appropriate cable was not available for purchase, one must be built. The Tigertronics website and the Signalink USB manual have information on how to do this. The radio user manual will be required also.

- 1) If the only transmit audio connector is the mic input, the data rate will be limited. VARA FM is capable of very high speed, but to allow it the microphone circuit would have to be bypassed. A transmit audio input may be available on the back of the radio, eg on an ACC connector, that bypasses the mic input.
- 2) Receive audio may best be taken from an ACC type connector, at lower level than speaker audio. (eg a line level output) The Signalink USB may accept speaker audio if necessary, though this must be wired to a separate Speaker input on the back of the Signalink USB that accepts higher audio levels.
- 3) The PTT signal must be wired from the RJ45 connector on the Signalink USB to either the microphone connector's PTT pin or to the ACC connector.

Signalink USB Connection to Computer

NOTE: Do not connect the Signalink USB to the computer's USB port until after its jumpers have been set.

- 1) Turn on the computer and ensure it is fully ready. If any updates are required, install them beforehand. Also ensure the computer is not running other software.
- 2) Ensure the Signalink power button is **<off>** (out position).
- 3) Plug the USB cable into the computer first, to bleed off static. If using a desktop computer, a rear USB port may be preferred as they can be faster type.

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- 4) Next, attach the USB cable to the Signalink. Windows will detect it, and will begin installing the required drivers. Windows should have the necessary drivers.
- 5) The process may take a minute or two. Once complete, you will likely see a message stating something like "Hardware ready for use." If this message does not appear this may be normal. Just wait to be sure the install is complete.

NOTE: Be aware that if the USB cable is moved to a different port on the computer, the driver install process will occur again.

- 6) Next, check the computer's Sound settings. Go to Control Panel (or right-click on the speaker in the system tray), then select **<Sound>**. Ensure the computer is configured to use the speakers to play system sounds and music, and if a microphone is connected ensure it is selected on the Recording tab. It is important to be sure that the Signalink is not selected in either case.

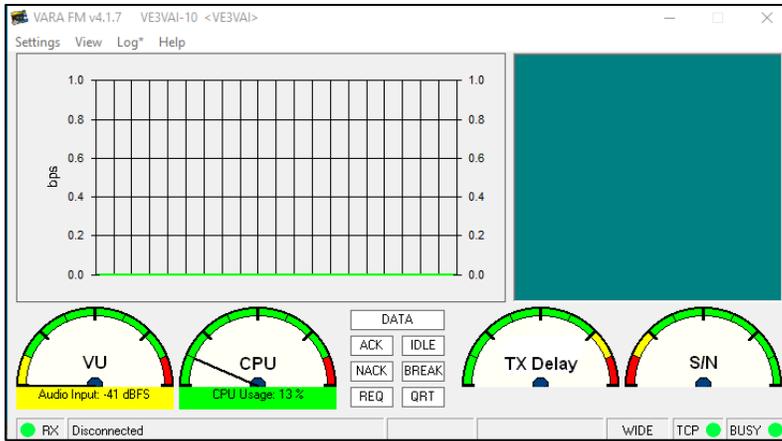


VARA FM Modem Configuration

First, you must download and install VARA FM.

- 1) Either perform a web search for VARA FM download, or go to this site: [EA5HVK software | EA5HVK \(wordpress.com\)](http://EA5HVK.com) and download VARA FM. There is no need to create an account on the mega.nz website.
- 2) After downloading, unzip the file, then right-click on the executable file and select **<Run as Administrator>**. A message may appear "Windows protected your PC." If it does, click **<More info>** and then **<Run Anyway>**. At this time the install file does not include an up-to-date signature.
- 3) Open the **VARA FM** modem software.

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- 4) Click on **<Settings>**, then select **<VARA Setup>**.
- 5) The TCP Ports default to 8300 and 8301 but can be changed if necessary. For example; to run two instances of VARA FM on the same machine, you need to change the Ports on the second instance.
- 6) Enter your **<Callsign>** and **<Registration Key>**. You can add multiple callsigns if you desire. VARA will work without registration but at greatly reduced speed.
- 7) FM System may be set to **<Wide>** if using a newer Signalink USB (with black transformers) for higher speed. However, this will also require connecting to a radio input that allows **9600 bps** packet operation. If using the standard microphone input, or a **1200 bps** packet input, select the Narrow option.
- 8) Adjust **<Retries>** as required. A value of 3 should be plenty for a VHF or UHF connection. Setting it much higher may simply waste time on the channel.
- 9) If it is desired to **enable Digipeater** capability for your station, enter the **<Callsign>** you have chosen for your digipeater.

The screenshot shows the 'VARA Setup' dialog box. It has several sections: 'TCP Ports' with 'Command' (8300) and 'Data' (8301) fields; 'FM System' with a dropdown menu set to 'WIDE'; 'Digipeater' with a text field containing 'VE3VBA'; 'Retries' with a dropdown menu set to '3'; a checkbox for 'Allow VARA check for updates' which is checked; and a checkbox for 'KISS interface' which is unchecked. The 'VARA Licenses' section contains four rows, each with 'Callsign' and 'Registration Key' fields. The first two rows have 'VE3VAI' and 'VE3VBA' in the Callsign fields, and the last two rows have 'VE3VAI' in the Callsign fields.

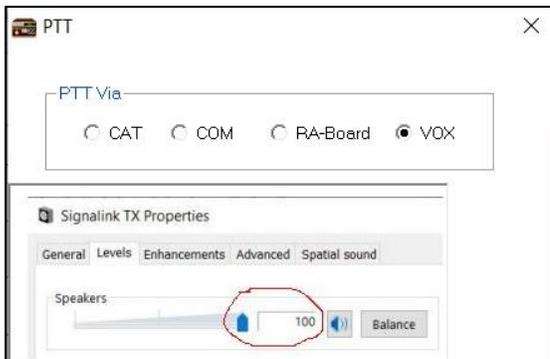
- 10) Click the **<Close>** button when done editing this page.

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- 11) Open the **<Settings>** menu again, then select the **<Sound Card>** option.
- 12) For **Device Input**, if using a Signalink select **Microphone (USB Audio CODEC)**, or alternately it may be displayed as Line (USB Audio CODEC). If using a DRA device, select **USB PnP Sound Device**.
- 13) For **Device Output**, if using a Signalink select the **Speakers (USB AUDIO CODEC)** option. Or if using a DRA device select **USB PnP Sound Device**.
- 14) If more than one such device is installed, some experimentation may be required to determine the correct one. Click the **<Close>** button when done.



- 15) Open the **<Settings>** menu again, select the **<PTT>** option.
- 16) For use with a **Signalink USB**, select the **<VOX>** option. If using a **DRA** device, choose **<RA-Board>**. Or, for a radio with a built-in sound card, choose **CAT** or **COM** as required by the particular radio.
- 17) As shown in the red-circled Speakers level image below, with a **Signalink USB** ensure the speakers audio level is set to 100%. Audio level will then be set with the **Signalink USB** front panel level control.



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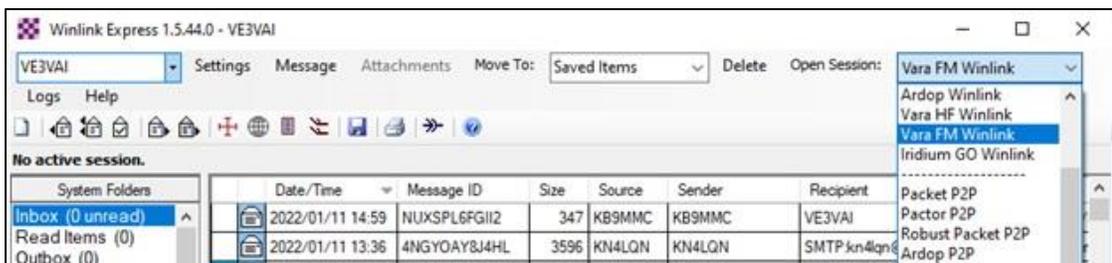
- 18) If using a DRA instead of Signalink, after selecting RA-Board an additional dialog will appear. This demonstrates that AGC must not be checked in the DRA module Properties, on the Custom tab.



- 19) The **Common VARA FM Session Issues** section below discusses a tool provided within the software to assist with setting audio levels. However, initial adjustment of receive audio can be done by watching the VU meter while varying the Signalink USB **<Rx level>** potentiometer. Set it so the pointer is at roughly half-scale with no signals present.

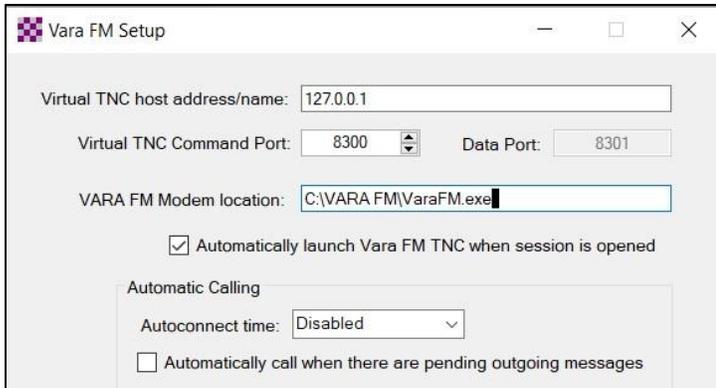
VARA FM Session Settings

- 1) Open Winlink Express, select **<Vara FM Winlink>** from the drop-down list, then click the **<Open Session>** button.



- 2) Open the Settings menu, then select **<Vara TNC Setup>**.
- 3) Note the Vara FM Modem location - where that software was installed. Not typically necessary, but change this if installed in a different directory. Also note that the Vara FM modem will automatically start when opening a session.

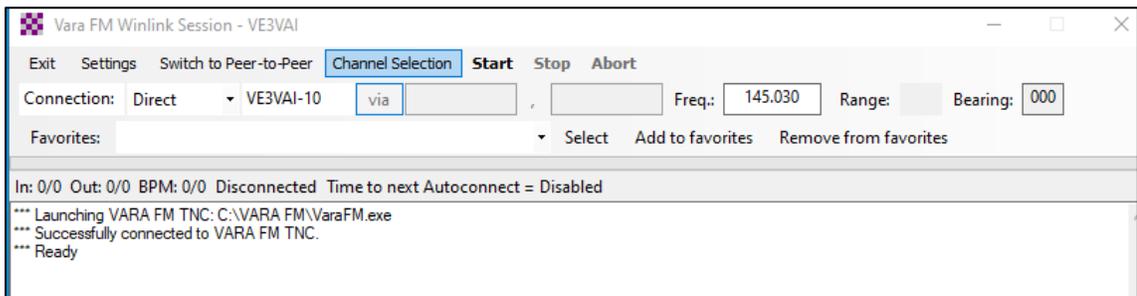
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- 4) If any changes were made (not typically necessary) click the **<Update>** button.

Performing a VARA FM Connection

- 1) Open Winlink Express, select a **<Vara FM Winlink>** session from the drop-down menu, then click the **<Open Session>** button.
- 2) Click the **<Channel Selection>** button.

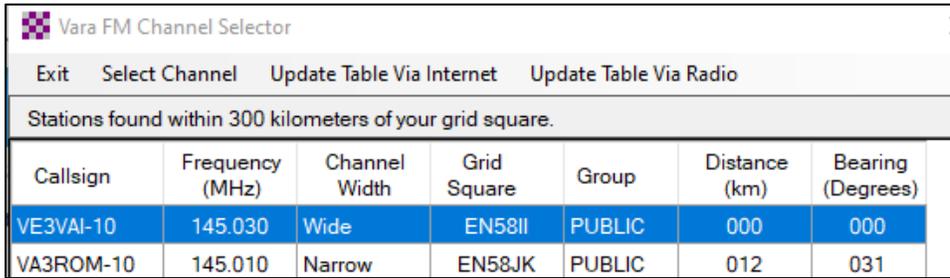


- 3) Use the **<Update Table Via Internet>** tool if necessary to determine an RMS that is close enough to contact via VHF or UHF. Alternately, **<Update Table Via Radio>** may be used, but a viable RMS connection must already be known to connect with in this case.

Callsign	Frequency (MHz)	Channel Width	Grid Square	Group	Distance (km)	Bearing (Degrees)
VE3VAI-10	145.030	Wide	EN58II	PUBLIC	000	000
VA3ROM-10	145.010	Narrow	EN58JK	PUBLIC	012	031

- 4) Select an appropriate Gateway from the list provided in the Channel Selector dialog, then click **<Select Channel>**. Or if an RMS to use is already known, enter its callsign directly into the callsign box on the main VARA FM Session window.

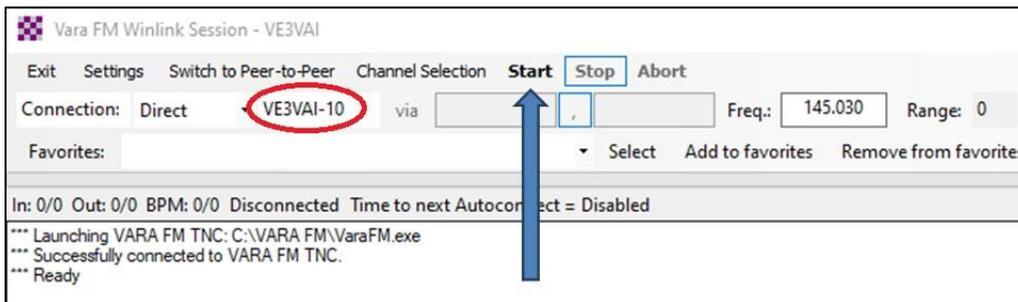
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Callsign	Frequency (MHz)	Channel Width	Grid Square	Group	Distance (km)	Bearing (Degrees)
VE3VAI-10	145.030	Wide	EN58II	PUBLIC	000	000
VA3ROM-10	145.010	Narrow	EN58JK	PUBLIC	012	031

NOTE: With a Signalink or DRA module, it will be necessary to manually set the radio's frequency, as well as any other required parameters eg transmit power. Only if using a radio with CAT control will the frequency be auto-populated.

- 5) If the desired RMS is contacted directly, the Connection setting must be **<Direct>**, and the callsign entered in the box immediately to the right. If connecting through a digipeater, the Connection drop-down menu must be set to **Digipeater**, and a digipeater callsign added in the via box.



- 6) When the radio's frequency is manually set and other parameters have been set correctly, and the callsign properly entered, click the **<Start>** button. The connection will continue in a similar manner to that seen with a packet or VARA HF connection.

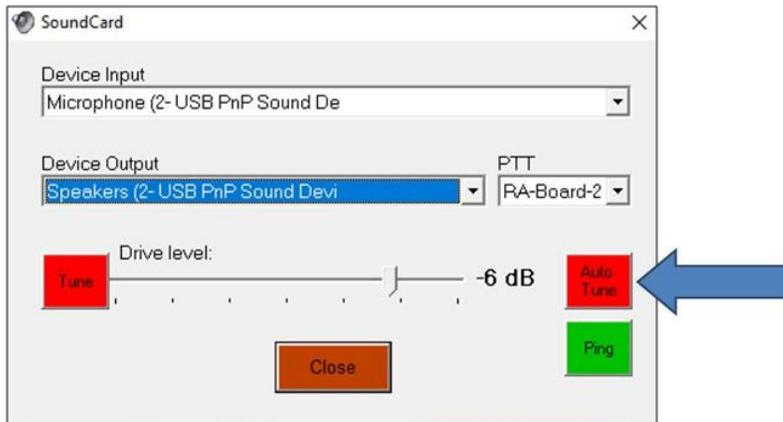
NOTE: If the RMS is not available, or beyond range, the session will time out after the configured number of Retries.

- 7) If a connection is made, Winlink will immediately send any messages in the Outbox. The RMS will then check with a CMS to see if there are messages stored for you. Winlink will then either download those messages, or if configured to do so will pop up a dialog asking if you want to download the messages.
- 8) Once all messages have been sent and/or received, the session will automatically disconnect.

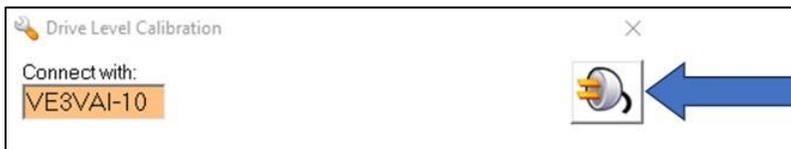
Common VARA FM Session Issues

Using Auto Tune to adjust audio levels:

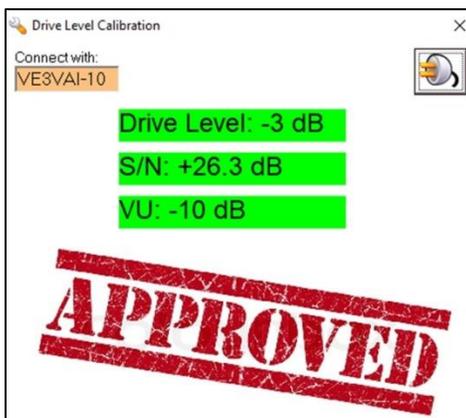
- 1) In VARA FM, open the Settings menu and select **<Soundcard>**.
- 2) Click on the **<Auto Tune>** icon.



- 3) Enter the callsign of a station you can connect with for this test, then click the **<Plug>** icon.



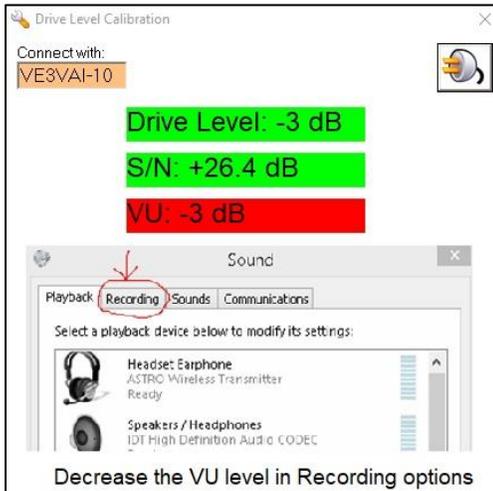
- 4) Your station will transmit 10 times to perform a test. If your sound card Tx and Rx settings are good you will receive something like this:



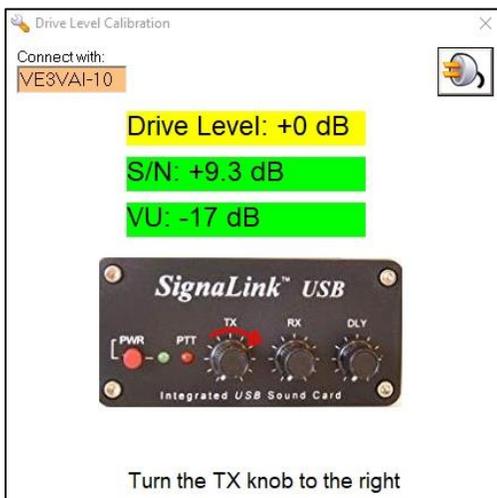
- 5) If the audio settings are not correct, you may receive something like the following image. Note the circle around the Recording tab. Levels may be adjusted with

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the PC sound settings if necessary.

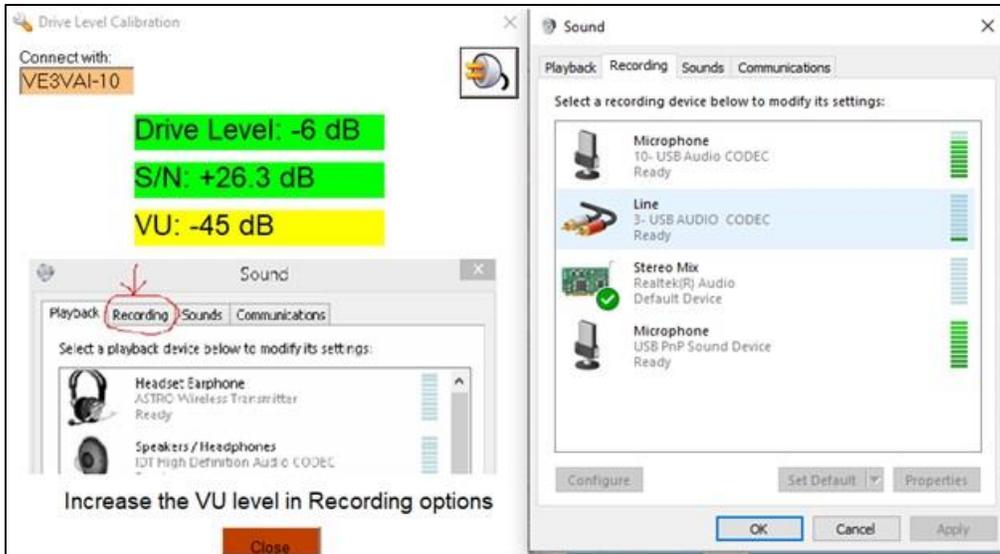


- 6) When using a Signalink, you may see something like this instead. Note the message saying "Turn the TX knob to the right." Adjust the **<Tx knob>** on the Signalink and retry the connection until you get the Approved message.



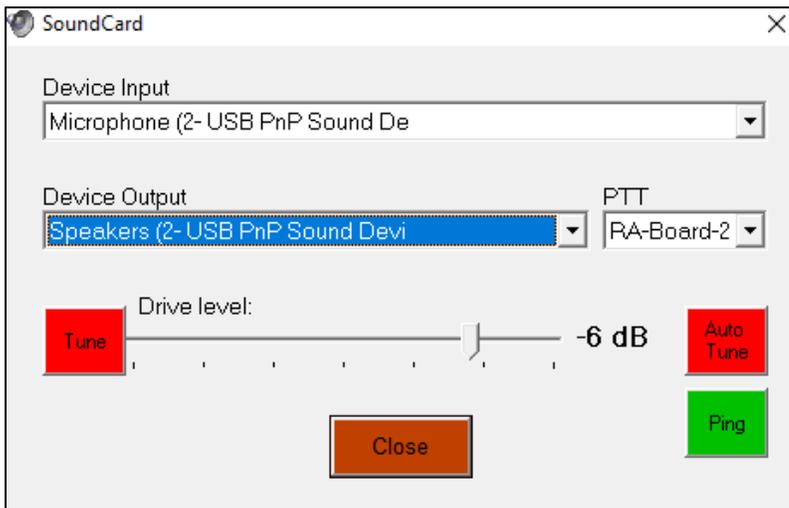
- 7) You may also see a message something like the image below. Here you can see the received level is low, as the VU meter is showing -45 dB, highlighted in yellow. Adjust the **<Recording>** levels in the sound card settings or increase the level of the Signalink **<Rx knob>**, then try to connect again. Repeat until you get the **Approved** message.

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Using Ping to see if the path to another station is workable:

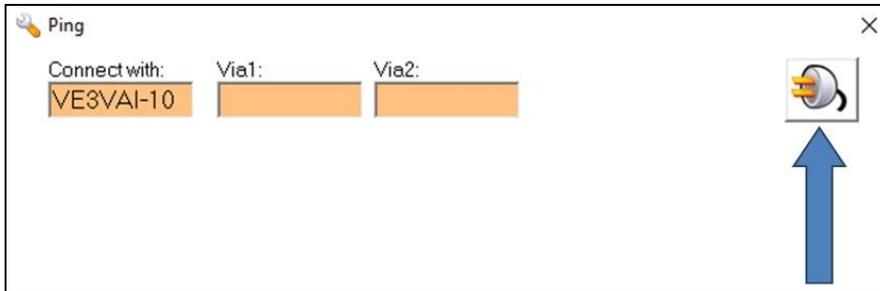
- 1) In VARA FM, open the Settings menu, then select **<Soundcard>**



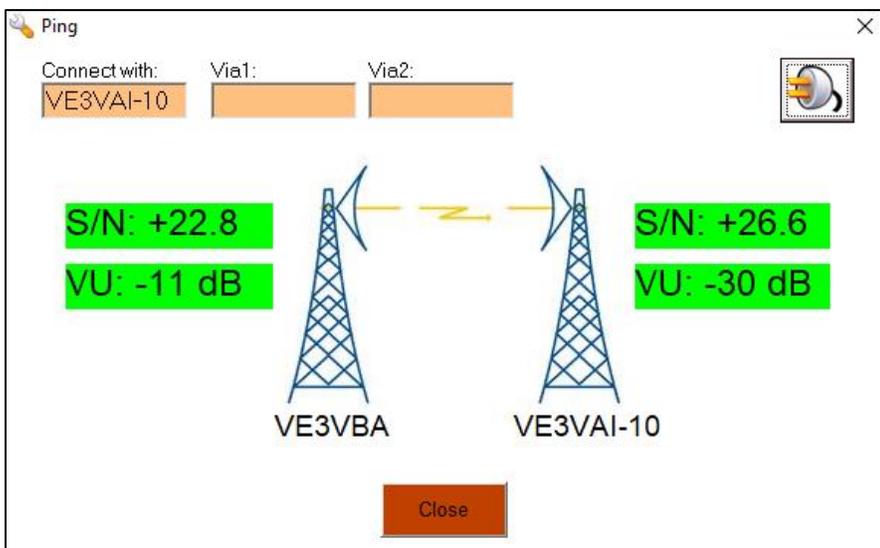
- 2) Click on the green **<Ping>** button, then in the dialog that appears enter the callsign of the station you want to connect to, and any digipeaters if required.

NOTE: The Ping tool will not work if attempting a test with another station that is configured in VARA FM Radio-Only mode.

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- 3) Next, click on the **<Plug>** icon to begin the test.
- 4) If the intended station receives a good signal, it will respond, and a dialog similar to the one below will appear.



- 5) In the Ping report shown above, the signal-to-noise ratio at each end of the link has been reported, as well as the volume level (VU). All are highlighted in green here, so the path is good.

Performing a Peer-to-Peer Connection

First what is Winlink Peer-to-Peer? This mode of operation transfers messages directly from the sender to the recipient without going through an RMS gateway or a CMS and without the Internet. This is a simplex mode, which requires both stations to be on the air at the same time, on the same frequency and having chosen a predetermined frequency that provides a reliable communication path.

Reasons for using Peer to Peer:

- Connectivity to an RMS gateway is not available
- Or available RMS gateway stations do not have access to a CMS

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- Quick accessibility between stations
- Need to free the local RMS gateway for other traffic
- Training purposes

- 1) In Winlink Express, create a new **<Message>**.
- 2) In the **<To:> box**, enter the callsign of the station you will connect with.

NOTE: It is not allowed to include a cc: address when sending a Peer-to-Peer message.

- 3) Enter the subject and text of the message.
- 4) In the **<Send As>**: box (top centre of the email), select **<Send as Peer-to-Peer>**.
- 5) Click **<Post to Outbox>**.
- 6) Open a **<Vara HF P2P>** session, or on VHF/UHF **<Packet P2P>** or **<Vara FM P2P>** session.
- 7) Enter the other station's callsign in the box where the RMS gateway callsign would normally be entered automatically by the Channel Selection tool. (Upper left)
- 8) Enter a previously agreed-upon frequency where the other station is listening into the Center Freq. (kHz) box. (Remember; dial frequency is 1.5 kHz below this)
- 9) Ensure that the radio has changed to the agreed-upon frequency.
- 10) If the radio is not automatically configured, ensure it is in **USB-Data mode** (for HF Contacts) and for VHF/UHF **FM Data mode**.
- 11) Press the **<Start>** button. The message will be passed to the destination station.

NOTE: Peer-to-Peer messages can be a bit tricky, so this must be practiced regularly. The **To: email address** must be the same as the station being connected to, and the email must have been **posted as a Peer-to-Peer type**. Both stations must be in the **same Peer-to-Peer mode**, and on the **same Center frequency**. And the stations **must be able to hear each other**.

Advanced Winlink Topics

Message Pickup Stations via Hybrid RMS

Normal operation of Winlink has your station connecting by radio to an RMS gateway (Radio Mail/Message Server) to pass traffic. The RMS gateway forwards your traffic to a CMS (Common Message Server). The CMS then sends back any traffic for you via the RMS gateway. When the recipient checks for messages during a Winlink session, the traffic is passed over the internet to the RMS they have connected to, and then by radio to their station.

However, for Auxiliary Communication Service (ACS) operations it is important to be ready for a situation where critical infrastructure such as the Internet may not be available. If the internet were to go down, **Hybrid RMS Gateway** stations can forward messages to other Hybrid RMS gateway stations until the recipient's designated **Message Pickup Station (MPS)** is reached.

This requires a more setup on your part to participate. You must first set up an **MPS** in Winlink Express, and then **register it** on the Winlink system so that the system will know where to send traffic addressed to you. It is recommended that you select two Hybrid RMS's that you can regularly connect to; for a degree of redundancy.

Any traffic for your station will be routed to your specified MPS if the Winlink system enters the Hybrid MESH mode due to loss of Internet access. Traffic for you is then sent to your **MPS stations** and held for you there. For the sake of efficiency, once an email is downloaded from one MPS, Winlink Express will not download it again from another MPS.

Traffic you send will be routed by the Hybrid (radio-only) network to the configured MPS of the destination station. Other than setting up your MPS selections, most of the Hybrid network activity will occur at the RMS gateway level, allowing you to use Winlink as normal. There is no indication that the Winlink system has switched to Hybrid mode.

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Hybrid Network Parameters

Parameters specified on this screen control the flow of messages when they are being sent via radio-only forwarding.

Message Pickup Stations (MPS)

MPS 1: VE4PER

MPS 2: VE7RBH

MPS 3:

Update list of RMS available as MPS

Display list of RMS available as MPS

Register MPS via Internet

Queue radio message to register my MPS

Last MPS list update: 2021-12-09-18:33

E-mail notification of pending messages on MPS

Send e-mail notifications to these addresses when there are pending radio-only messages being held on MPS for you.

ve6ei@rac.ca

(Separate multiple e-mail addresses with semicolons)

Hours pending before notification message is sent: 4

Save Cancel

- 1) To configure; click on **<Settings>**, then **<Hybrid Network Parameters>**.
- 2) In the dialog that appears, click **<Update list of RMS available as MPS>**. Not all RMS gateway stations are so equipped. Note that this should be done well before any concerns of internet failure, and updated fairly often as status of RMS gateway stations can change.
- 3) Click on **<Display list of RMS available as MPS>**. If you do not see any gateway stations you recognize; you may want to see if you can make a standard Winlink connection to them before selecting them as an MPS.

NOTE: It is recommended to select two MPS stations in different geographical regions, to increase likelihood of being able to connect to at least one at any time despite varying propagation conditions. Do not configure three MPS, however, as this will cause unnecessary traffic on the system.

- 4) Once you have one or two MPS tested and chosen, return to this screen and select them from the drop-down menu.
- 5) Next, optionally enter an email address where you can be reached by the Winlink system when there are radio-only messages waiting for you. Be aware that this may not work if there is a wide-spread Internet outage.

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- 6) To register the MPS you have selected, click the **<Register MPS via Internet>** button. Or if not available, click **<Queue radio message to register my MPS>** instead, then initiate a radio session to send the message. Then select **<Save>** to store your MPS information.

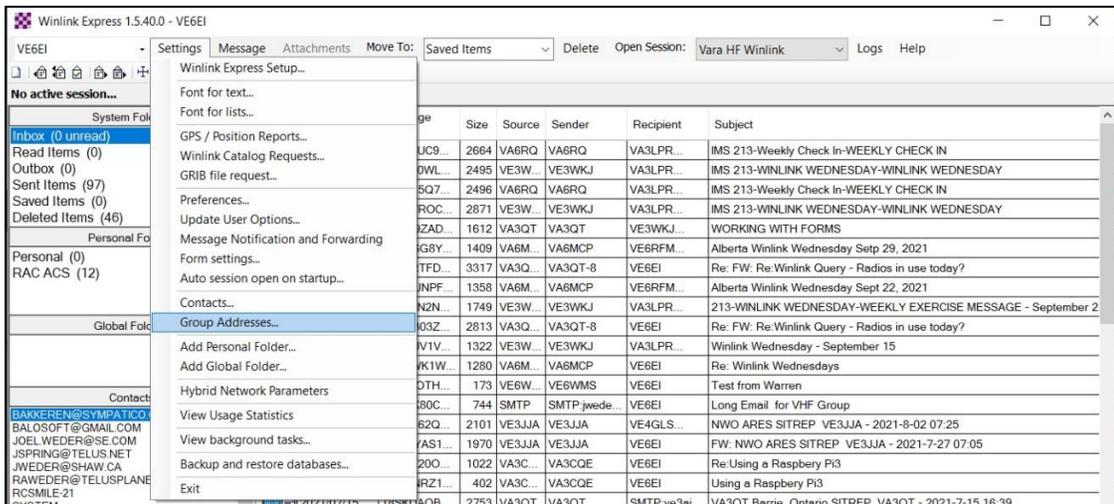
NOTE: Make sure you connect to your selected MPS stations regularly, to verify continued ability to connect reliably.

Setting up Email Groups

There will be occasions where you will need to send messages to a collection of stations on a repeated basis for status updates, operational period reports, etc. Email Groups are a simpler way of sending repeated messages to a group of stations.

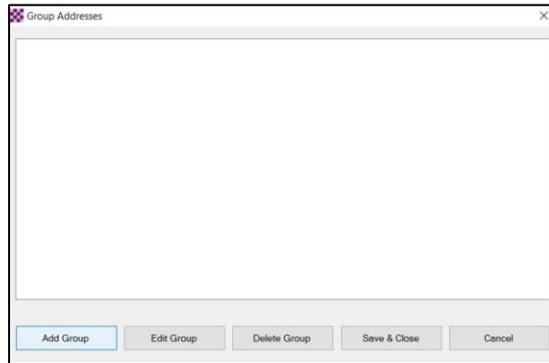
Using a Group address will create a single message with multiple addresses when posted to the Outbox, if the message type is a Winlink **<Message>**. If the message type is peer-to-peer, it will save a message in the Outbox for **each address** in the group.

- 1) Click on **<Settings>**, then select **<Group Addresses ...>**

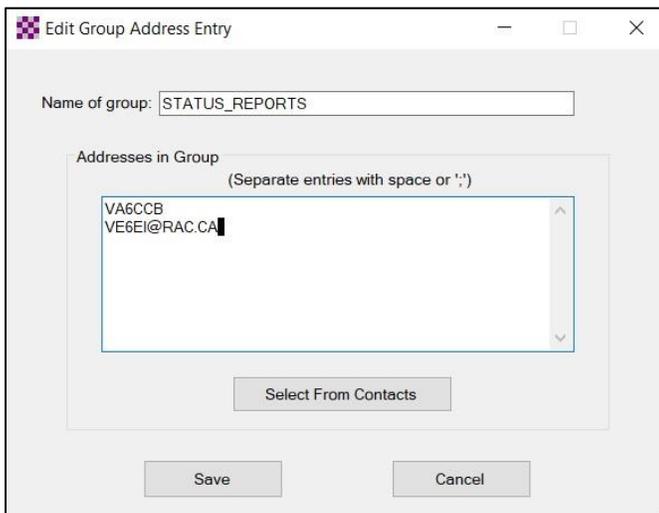


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- 2) Click on **<Add Group>**.



- 3) Type in a name for the Group, then type the addresses below, separated by spaces or semi-colons (;) You can also select from your **<Contacts>** list.



- 4) When the list of addresses is complete, click **<Save>** and then **<Save & Close>** on the next screen.
- 5) To use the **Group Addresses** you've created when you compose a message, click on the **<To:>** box and the group will show up in the **<Select Destinations>** list. The **Group Addresses** will-be at the bottom of the list – (scroll down). Highlight the required **<Group>** list name; and then select **<Add to Message>**.

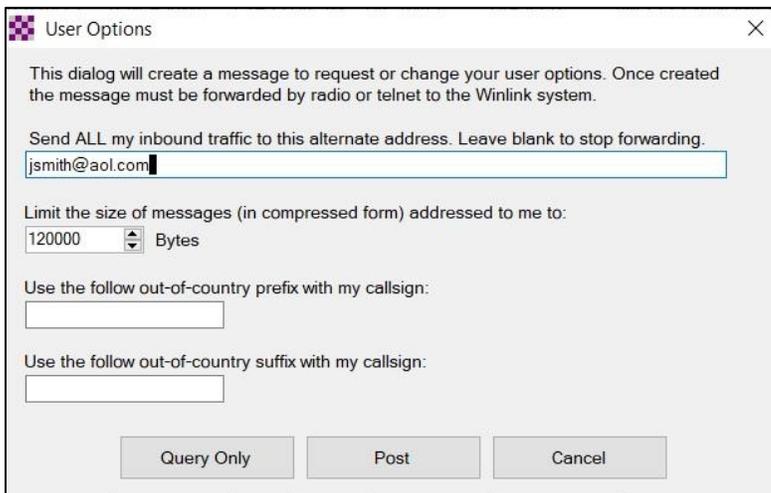
Winlink Mail Forwarding

You can set up a temporary (alternate) mail address that your traffic should be routed to (Example: jsmith@aol.com). Once an entry is made in this parameter **all messages**

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received will be sent to that address, rather than your Winlink.org account. Forwarded messages will not appear in your Winlink account. You may however send messages from your Winlink account normally.

- 1) Click on **<Settings>**, then **<Update User Options>**.
- 2) Type the address you want the mail forwarded to into the box entitled **<Send ALL my inbound traffic to this alternate address>**, then click **<Post>**.
- 3) Connect to an RMS gateway using any means and allow the message to be sent.
- 4) After this, **no more messages will be received at your Winlink address**. They will instead be forwarded to the specified address.
- 5) Repeat this process with a **blank alternate address** to restore traffic to your Winlink.org station address.



User Options

This dialog will create a message to request or change your user options. Once created the message must be forwarded by radio or telnet to the Winlink system.

Send ALL my inbound traffic to this alternate address. Leave blank to stop forwarding.

Limit the size of messages (in compressed form) addressed to me to:

Bytes

Use the follow out-of-country prefix with my callsign:

Use the follow out-of-country suffix with my callsign:

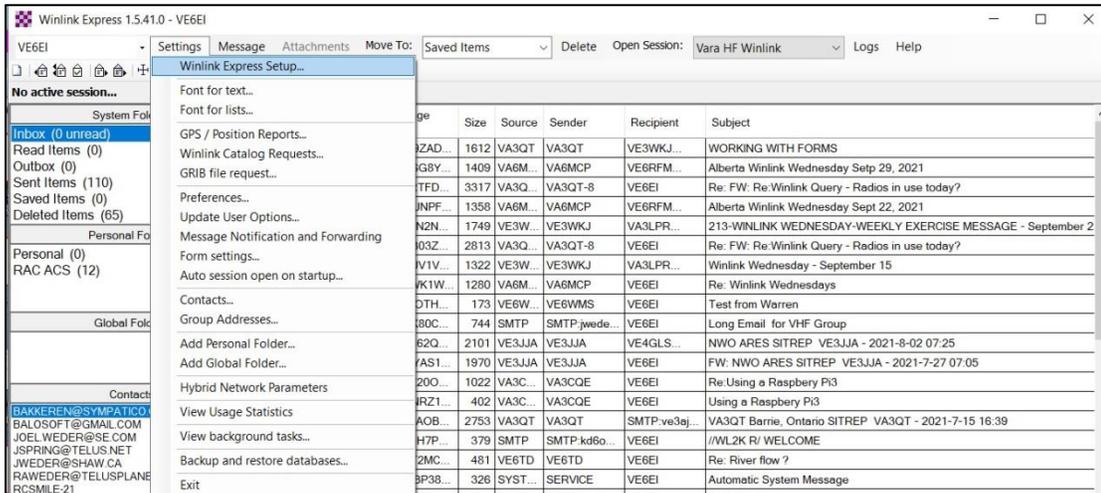
Tactical Addresses

There may be occasions during an event or incident where using a **tactical address** instead of a **callsign** would be useful. For instance, for clarity, your tactical address may be **EDMEOC** for the **Edmonton Emergency Operations Center**. This tactical address makes it easier for other operators to know who they are passing messages to.

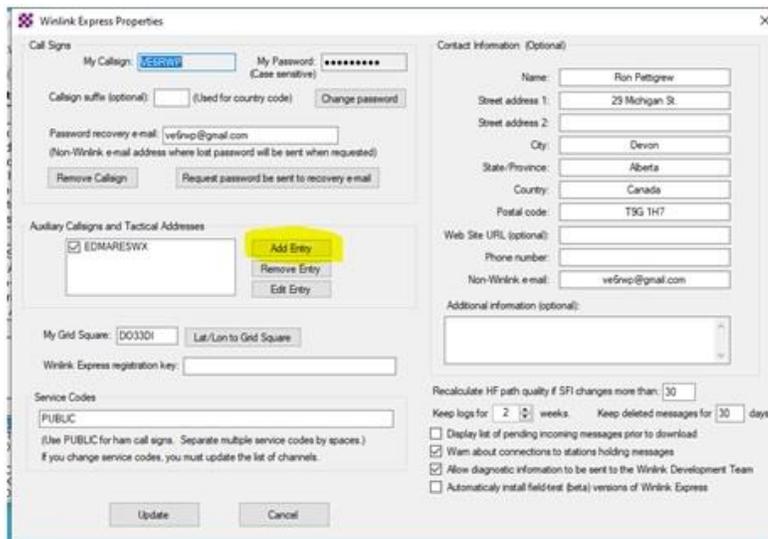
The use of Tactical addresses should be managed by the incident communication team leader, and specified for individual stations. If an operator leaves an operating position such as EDMEOC and is replaced by another, the new operator must then be informed of this tactical callsign and configure Winlink appropriately.

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- 1) Open the <Settings> menu, then select <Winlink Express Setup...>

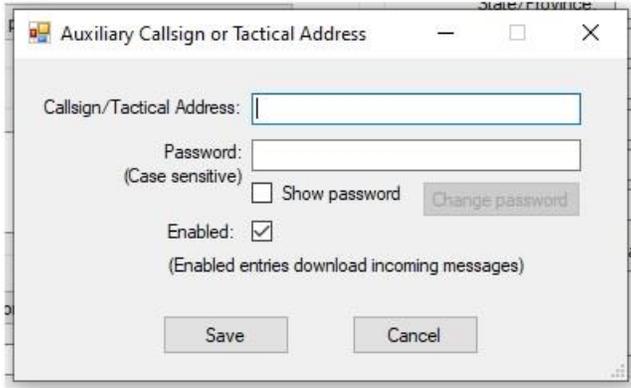


- 2) In the **Auxiliary Callsigns and Tactical Addresses** area, click <Add Entry>.



- 3) Put in your tactical address in the top line. Tactical addresses may contain from 3 to 12 total characters. **These are alpha characters only, unless they follow dash “-” at which time they may be alpha OR numeric OR mixed.** Examples: EDM-Unit1 EDM-Unit2. It is recommended you set a **password**.

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- 4) Click **<Save>**, then click **<Update>** on the main Properties page. Initiate a session and the tactical address will be registered with the Winlink CMS. Any Winlink mail messages addressed to the **Tactical address** you selected will arrive in your **<Inbox>**.

More information can be found at: [Tactical Addresses | Winlink Global Radio Email](#)

Sending a GPS Position Report

Situational awareness can be defined simply as “knowing what is going on around us.” Knowing where your team members are, is critical to Net Control Station (NCS), Incident Commanders, and planning staff within an Incident Management Team or EOC. There are several options within Winlink Express to send position information.

- The **Winlink Check-In template** is very useful for informing NCS and others of the status and whereabouts of team members. This template may be found in the **<GENERAL>** category, though there may also be regional versions.
- The **GPS Position Report template** is an excellent choice for reporting the location of team members, sites, or items of interest to emergency managers. These reports will appear on <https://aprs.fi> and other **APRS** mapping software.
- Alternately, the **GPS / Position Report dialog** found in the **<Settings>** menu may be preferred by some rather than opening a template.

Sending a Position Report via Template

- 1) Open a new **<Message>** in Winlink Express.
- 2) In the **<Select Template>** menu, expand **<Standard Templates>**, then **<General Forms>** and select **<GPS Position Report.txt>**

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- 3) If you have a properly configured GPS attached to your computer your latitude and longitude will appear at the top-right of the form. Click on the **<Connected GPS>** button to insert the position into the pale-yellow section below it.
- 4) If you DON'T have a connected GPS, you can manually click in the box labeled **<Manually Enter your Decimal Degrees>** and enter your position using the format shown. Use Google Earth, Google Maps or a non-connected GPS.
- 5) Click again on the box where you inserted your current decimal position to transfer it into the four converted coordinates shown in the yellow box. You can then if needed copy the desired position format to the clipboard.
- 6) Add an appropriate comment in the **<Comment box>**, such as your current position (e.g., Shelter 1) or the identity number assigned to the object.
- 7) Click on the **<Date/Time>** box to update the time of your position fix.
- 8) Now click on the **<Load Position Data>** box at the top to save your current position to a file. This is important if you want to subsequently remove stale Winlink information or update the position of an object that you first reported in the Comment section.
- 9) Click **<Submit>**. You will get a reminder to save the position if you haven't already done so. It will also ask you to update file name. Close the browser.
- 10) You will now see the position report has been created, and addressed to "QTH". **<Post>** it to the Outbox and send it using the Session mode of your choice.

Sending a Position Report via GPS / Position Report Tool

- 1) After opening Winlink Express, open the **<Settings>** menu, then select the **<GPS / Position Reports...>** menu item
- 2) This tool includes GPS serial port setup items including port number and baud rate. If a GPS is connected, configure these items now. After a successful connection your position will appear below (also speed and course if moving). Press the **<Use GPS Position>** button to transfer these values to the boxes below.
- 3) If you do not have a connected GPS, manually enter the details in the boxes near the bottom of the page, then click the **<Use Current Time>** button.

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- 4) Add **<Comment – 148 Characters Maximum>** if desired, and if **<Add Marine Weather Report>** if required may be selected.
- 5) Click the **<Post Report>** button. This will create a short email, again to be sent to the address "QTH". Initiate a session to send the message.

Using your browser, you can now go to www.aprs.fi, insert your callsign into the **<Track callsign>** box to the top-right and click **<Search>**. Nearby you will find a Red Diamond Icon with the Letter P in it and adjacent to it should be the identifier with your Callsign and the suffix **DP**.

Deleting a Position Report

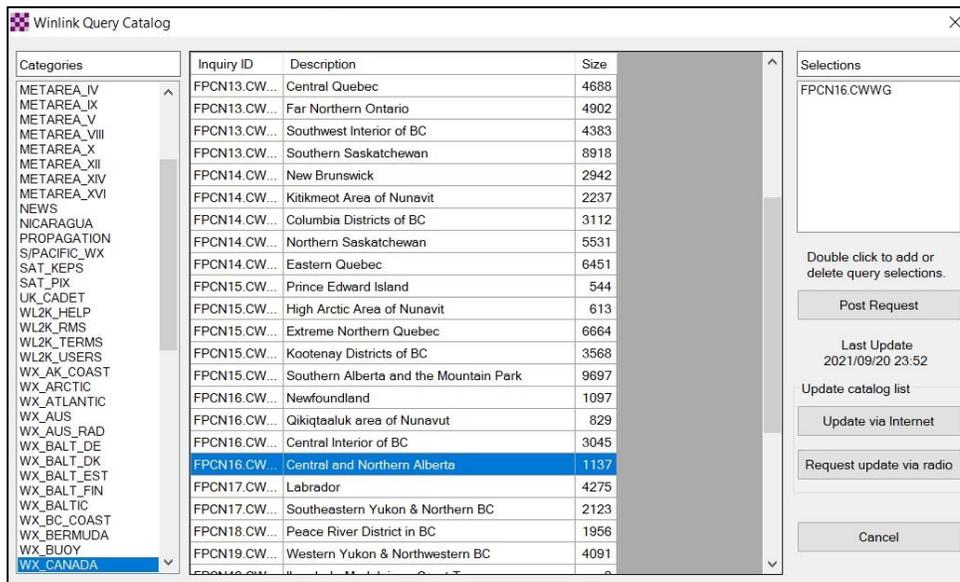
- 1) Create a new Winlink message and select the **<GPS Position Report.txt Form>**.
- 2) Note that under the **<Load Position Data>** button is a notation giving the time your last position report was made. Click the **<Load Position Data>** button.
- 3) A file Open dialog appears. Navigate to the location the position file was saved, which by default is the Downloads directory. Select the report for the time desired and click **<Open>**. That earlier submission is loaded into the Form.
- 4) Type "DELETE" (all in capitals) in the **<Comment>** box, replacing any other text.
- 5) Click in the **<Date/Time>** box to update the time, then click **<Submit>**. When asked if you want to **<Save>** or **<Cancel>**, you may select **<Cancel>** unless you do wish to re-save the position report. Then click **<OK>** to complete the form submission.
- 6) Close the now-blank browser window. You will see a duplicate of the original Position Report **EXCEPT** that the original **comment** has been replaced by the word **DELETE**.
- 7) Confirm that the email is addressed to "QTH", select **<Post to Outbox>**, and then upload it to the CMS gateway using any session mode.

NOTE: This will delete the position from the Winlink map but does not delete it from the aprs.fi map.

Requesting Weather Reports via Winlink

There are several reports that can be requested from the **Catalog**. One of the most useful for a deployed ground station would be the **local weather report**. This report will keep you up to date on what to expect weather-wise and will alert you to any weather issues that may be coming your way.

- 1) Click on **<Settings>**, then **<Winlink Catalog Requests...>**
- 2) Click on the **<WX country>** you want the report from.
- 3) Double Click on the **<Description>** of the area in the country you want the report from. The requested report will show up in the Selections list.



- 4) Click on **<Post Request>**. The request will now appear in the **Outbox**.
- 5) Connect to an RMS gateway via any means, to allow the request to be sent.
- 6) The requested report will arrive in a following session. It usually only takes a few minutes for the weather report to be generated.

Producing an ICS-309 Log

At the end of an operational period; you may be expected to send a log of the traffic you have handled. Winlink can produce an **ICS-309 (IMS-309)** communications log for you as a PDF or CSV file.

- 1) Click on **<Message>** in the menu bar.
- 2) Click on **<Generate ICS-309 Communications Log>**.

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- 3) Select the **folders** you want the report on, the **operational period** of the report, and any other required items.
- 4) Select a **location** where you would like the log to be stored.
- 5) Click either the **<Generate ICS-309 PDF>** button or the **<Generate CSV File>** button.

The resulting log will look something like the following:

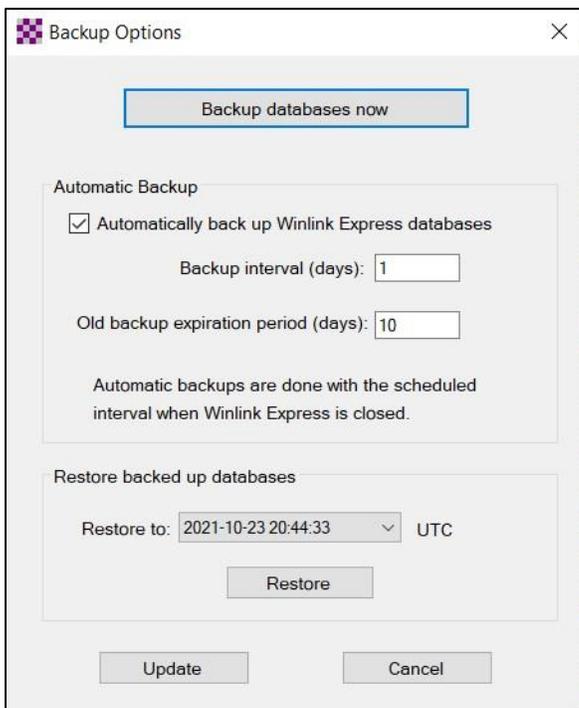
COMMUNICATIONS LOG		TASK # Winlink Training		DATE PREPARED: 10-24-21
				TIME PREPARED: 11:39
OPERATIONAL PERIOD # 10-17-2021			TASK NAME: Winlink ICS-309 Training	
RADIO OPERATOR NAME: Joel Weder			STATION I.D. VE6EI	
LOG				
TIME	FROM	TO	SUBJECT	
10-12-21 19:21	VE6EI	VE3WKJ VA6RQ	Re: IMS 213-WINLINK WEDNESDAY-WINLINK WEDNESDAY	
10-13-21 08:36	VA6RQ	VE6EI	IMS 213-Weekly Check In-WEEKLY CHECK IN	
10-13-21 19:37	VE6EI	VA6RQ	Re: IMS 213-Weekly Check In-WEEKLY CHECK IN	
10-17-21 19:50	VE6EI	jweder@shaw.ca	Attachment Test	
10-18-21 20:38	VE3WKJ	VE6EI	IMS 213-WINLINK WEDNESDAY-WINLINK WEDNESDAY	
10-20-21 07:07	VE6EI	VE3WKJ VA6RQ	Re: IMS 213-WINLINK WEDNESDAY-WINLINK WEDNESDAY	
10-20-21 08:29	VA6RQ	VE6EI	IMS 213-Weekly Check In-WEEKLY CHECK IN	
10-20-21 11:37	VE6EI	VA6RQ	Re: IMS 213-Weekly Check In-WEEKLY CHECK IN	

Backing up and Restoring Databases

To do a manual backup or Restore:

- 1) Click on **<Settings>**, then **<Backup and Restore Databases...>**
- 2) **<Backup databases now>** saves the database to the default folder.
- 3) The **<Backup interval (days)>** may be changed.
- 4) An existing database may be selected and a Restore performed.

NOTE: The folder in which Winlink Express has been installed may be changed, but typically it is installed directly under the C: drive, as either Winlink Express or the older RMS Express.



From the Winlink WIKI:

One of the new features in Winlink Express version 1.2.8.0 (and newer) is automatic daily backups of databases. If something happens that causes your message or contacts database to get deleted or corrupted, you can restore an earlier version.

The backup is done automatically once a day when Winlink Express is closed. The backed-up databases are stored in the Data\Backup folder under the folder

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with your call sign. If you have multiple call signs, there will be a separate backup folder for each call sign.

To restore databases or do a manual backup, click **<Settings>** on the main menu bar followed by **<Backup and Restore Databases...>**. On the Backup/Restore control screen you can set the backup interval, force a manual backup or restore databases from an earlier date.

Since the backup is done within the Winlink Express folder, this does not provide any protection against deletion of that folder or a catastrophic disk failure. If you use a backup system like Carbonite, it is recommended that you use it to back up your Winlink Express folders.

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Selected Terminology/Abbreviations

Terminology/Abbreviation	Meaning	Reference: Winlink Book of Knowledge.
ACS	Auxiliary Communications Service	
Hybrid Mode	Hybrid Network RMS	The Hybrid Network RMS you would use to send and receive messages (packet, PACTOR 4, or VARA HF) during a unique "internet outage".
MPS	Message Pickup Station	The Hybrid Network RMS you would use to send and receive messages (using only packet, PACTOR 4, or VARA HF) during a unique "internet outage"
NCS	Net Control Station	
P2P P-2-P	Point-to-Point Peer-to-Peer	HF/VHF/UHF connection to another Winlink Express station; NOT using a Winlink RMS gateway. You must use the same mode for communication between both stations.
RMS	Radio Message Server Radio Mail Server	RMS is short for Radio Message Server. RMS is short for Radio Mail Server
RMS Gateway	Radio Mail Server Gateway Radio Message Server Gateway	"RMS Gateway" refers to any RMS station connected to one or more CMS (Common Mail Server) in the "cloud". Or, it can refer to an HSMM or D-Star gateway connecting to any CMS using the Telnet protocol. These stations are "gateways" to the CMS for user (client) stations
RMS HF Stations	Remote Mail Server HF Stations	"RMS HF Stations" refers generally to all Winlink gateway stations in the high frequency bands, which may run either RMS PACTOR, RMS ARDOP, RMS VARA, RMS Linux Gateway software, or other HF BBS software. They use PACTOR 1, 2, 3, 4, APRDOP, or VARA protocols. This is seen on status reports and maps on the Winlink website.
RMS Relay	Radio Mail Server Relay	"RMS Relay" is optional software which may be used in conjunction with RMS Packet or RMS Trimode. Its primary purpose is to enable many of the features of RMS Packet or RMS Trimode to continue if the internet connection to the CMS is lost.
RMS Trimode	Radio Mail Server Trimode	"SysOp" software which is used by an RMS HF station. It enables the station to accept Connects from other stations using the PACTOR, VARA HF, and "Robust Packet HF" protocols. Each Sys Op has the option to enable his station to use any or all of these "protocols"

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SysOps	System Operators	The certified amateur radio gateway System Operators (sysops) who regularly monitor the messages sent and received through their stations in order to comply with regulations that govern their licenses.
VARA FM Vara FM		VARA FM (VHF/UHF) is custom modem software written by Alberto Nieto Ros EA5HVK that provides enhanced communications with RMS Express; RMS Trimode; RMS Packet; VARA Chat; and other modes.
VARA HF Vara HF		VARA HF is custom modem software written by Alberto Nieto Ros EA5HVK that provides enhanced communications with RMS Express; RMS Trimode; RMS Packet; VARA Chat; and other modes.
Winlink Express		Software used by Winlink users to interact with RMS stations; or to interact with other user stations exchanging messages in the "peer to peer" fashion. Previously named "RMS Express".