

# HOW-TO DOCUMENT FOR PACKET WINLINK EXPRESS EMAIL

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**Purpose:** This document is to assist volunteers in the Alachua County, Florida area in making VHF Winlink Express connections.

**Disclaimer:** These instructions may be less-than-perfect, and the equipment and installation may have changed between when these instructions were written and your intended operation. Use them as a starting point, be flexible and enjoy learning!

## **There are several YouTube videos that can also be helpful:**

*What is Winlink?* by K4REF: <https://www.youtube.com/watch?v=qGhUfW8pjY8>

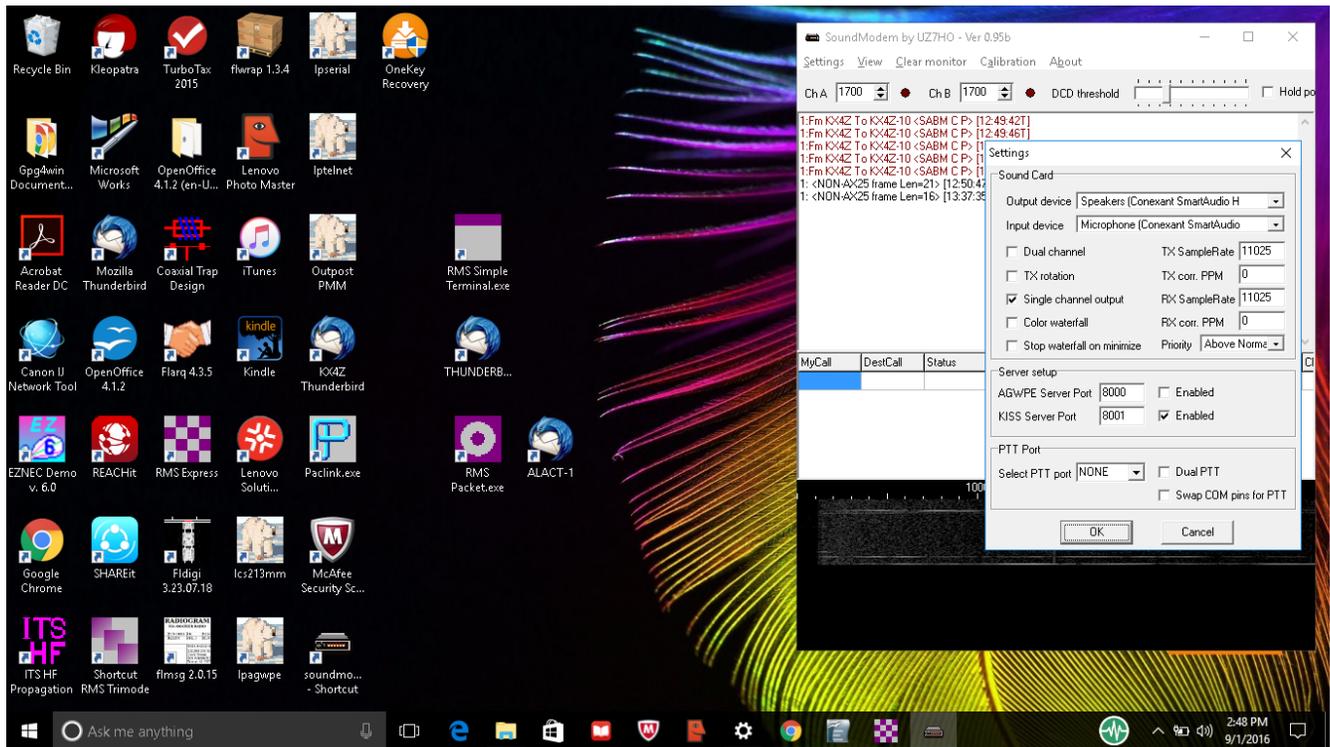
*Using a Sound modem TNC...* by K4REF: <https://www.youtube.com/watch?v=RF00MNZCEVA>

*Setting up sound levels....* by K4REF: <https://www.youtube.com/watch?v=7G1DBs-04MM>

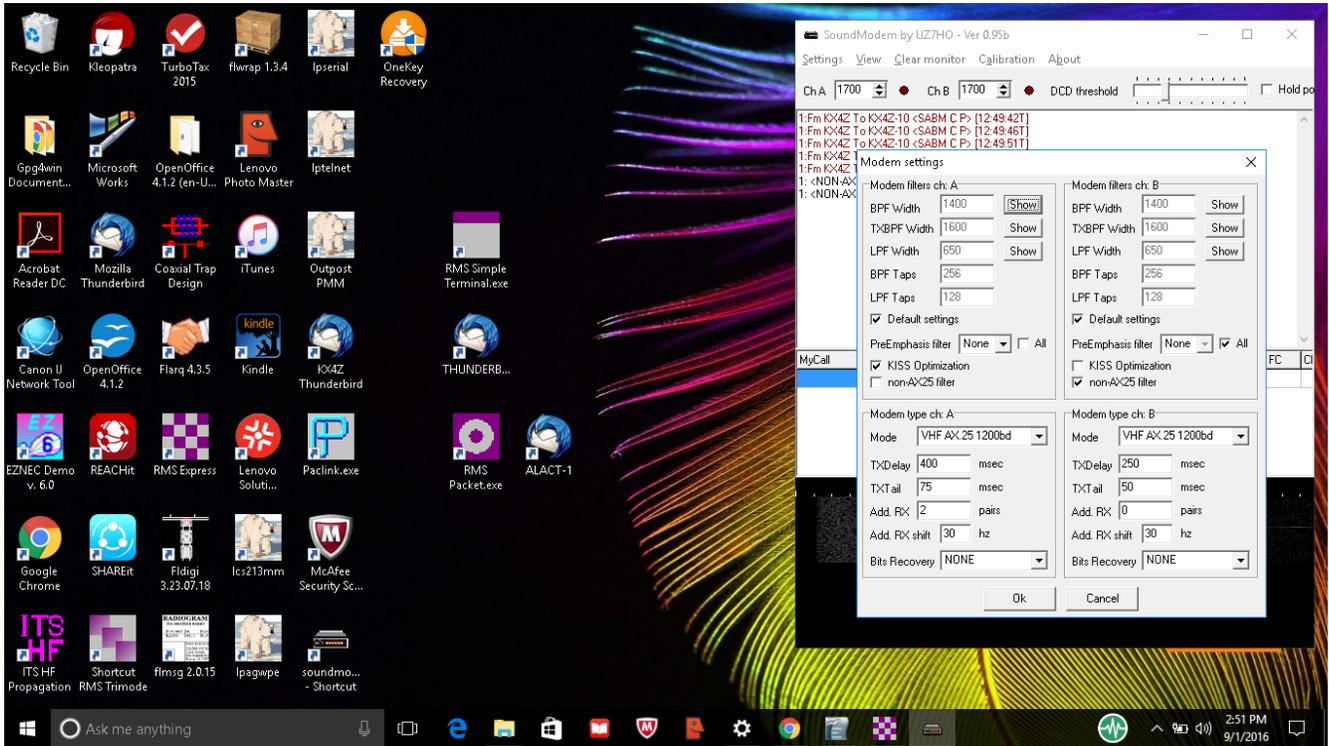
1. **COMPUTER:** You will need a Window 7, 8 or 10 computer with a properly installed copy of WINLINK EXPRESS, which can be obtained from <https://winlink.org/>
2. **USB CABLE:** In order to use the SIGNALINK audio interface, a USB cable must be inserted into a USB port of the chosen WINDOWS computer and connected to the SIGNALINK audio interface. It is suggested that a shielded cable equipped with a few loops and/or ferrite beads will be less susceptible to radio frequency interference (RFI) which, if severe enough, can “freeze” the port or the software. If this happens, close the application, remove the USB cable from the computer port; reinstall the USB cable into the computer port and re-start the program. You can also use a homebrew equivalent to the SIGNALINK, particularly the ones we have developed in Alachua County.
3. **RADIO CABLE:** The SIGNALINK must then be connected to the desired VHF radio. The cables to do so have RJ-45 modular pugs on them, and there is one cable for each radio, as they are radio-specific. Be certain that the cable you need, is plugged into the radio that you plan to use. It needs to have been properly wired to make connections for the following signals:
  - ground
  - microphone input to the radio coming from speaker out from the Signalink or sound card dongle
  - push to talk
  - speaker output from the radio going to microphone input of the computer sound card dongle or Signalink
4. **UZ7HO SOUNDMODEM.EXE:** This is (modem protocol) interface software which connects to the SIGNALINK and wraps it in such a way that it appears to be a KISS (keep it simple) mode TNC (terminal node controller, a device used to send and receive AX.25 packet data and possibly other modes as well). You will need to start this software, clicking the desktop icon for it. I suggest to arrange it in the right hand corner of the screen. It can be obtained here: <http://uz7.ho.ua/packetradio.htm> You will probably wish to have followed

instructions for installation and setup:

<https://www.qsl.net/nf4rc/UnderstandingAudioChannelConfiguration.pdf>

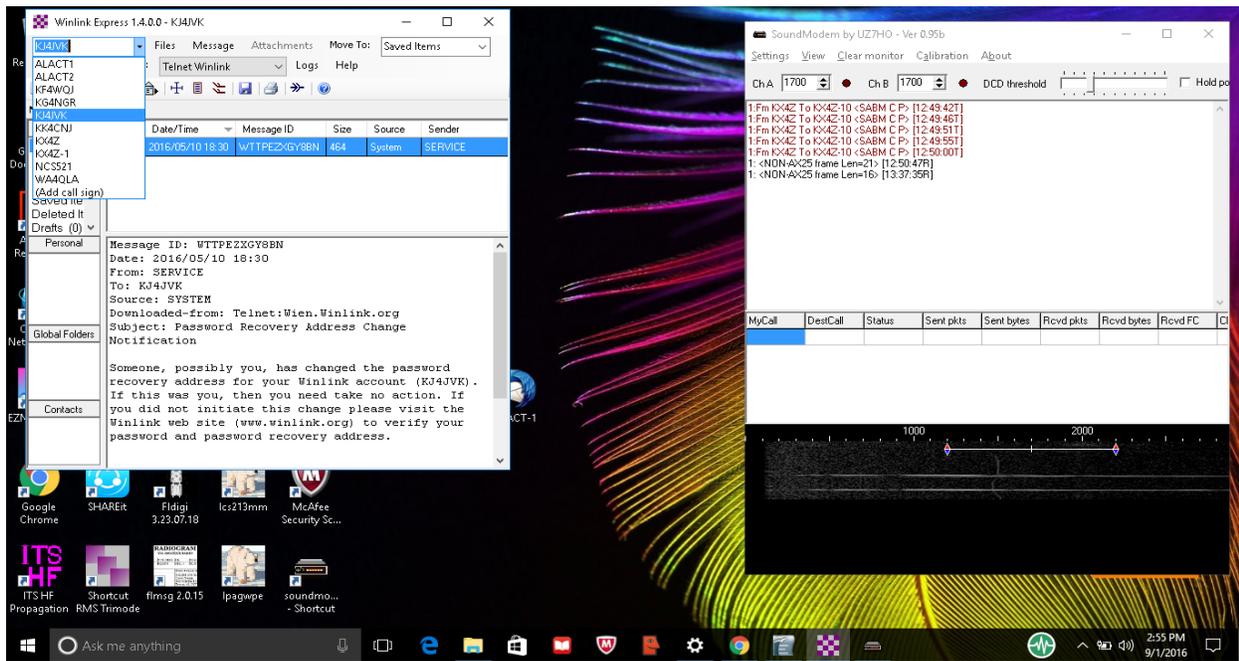


5. Check the **Setting | Devices** that the audio is going to the SIGNALINK (or sound card dongle) and not to the computer mic and speakers – the connected devices for output and input should include the word “USB”.
6. Check the **Setting | Devices** that the **KISS SERVER PORT** is checked enabled, and set to port to the same port chosen within the AX.25 Packet within WINLINK EXPRESS (we typically use 8100 for this; whereas we use 8000 for the AGWPE interface to easyterm.exe)
7. It is unlikely that you will need to adjust the **Settings | Modems** but the A modem should be set to **VHF AX.25**.



8. **WINLINK EXPRESS.** Start up the WINLINK EXPRESS software. I suggest that it be positioned in the left half of the computer screen.

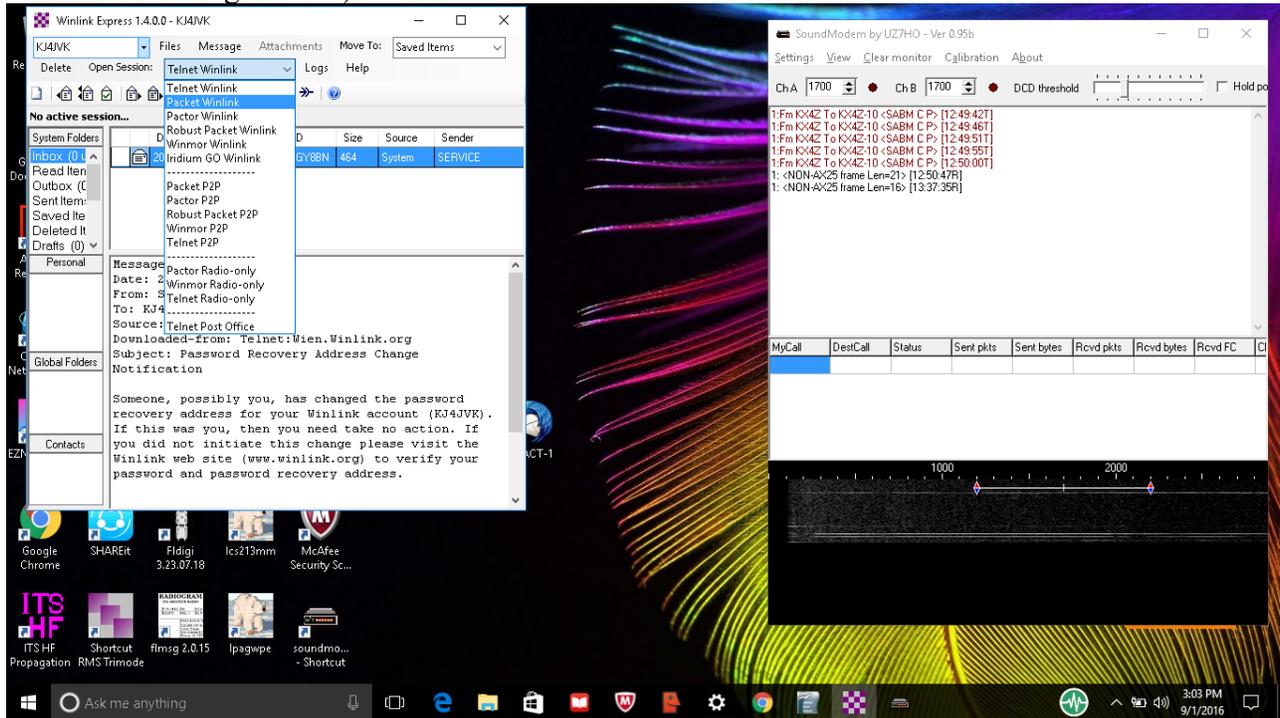
9. **CALLSIGN:** After starting the WINLINKEXPRESS software, at the upper left corner you will need to select the proper CALLSIGN for your operation.



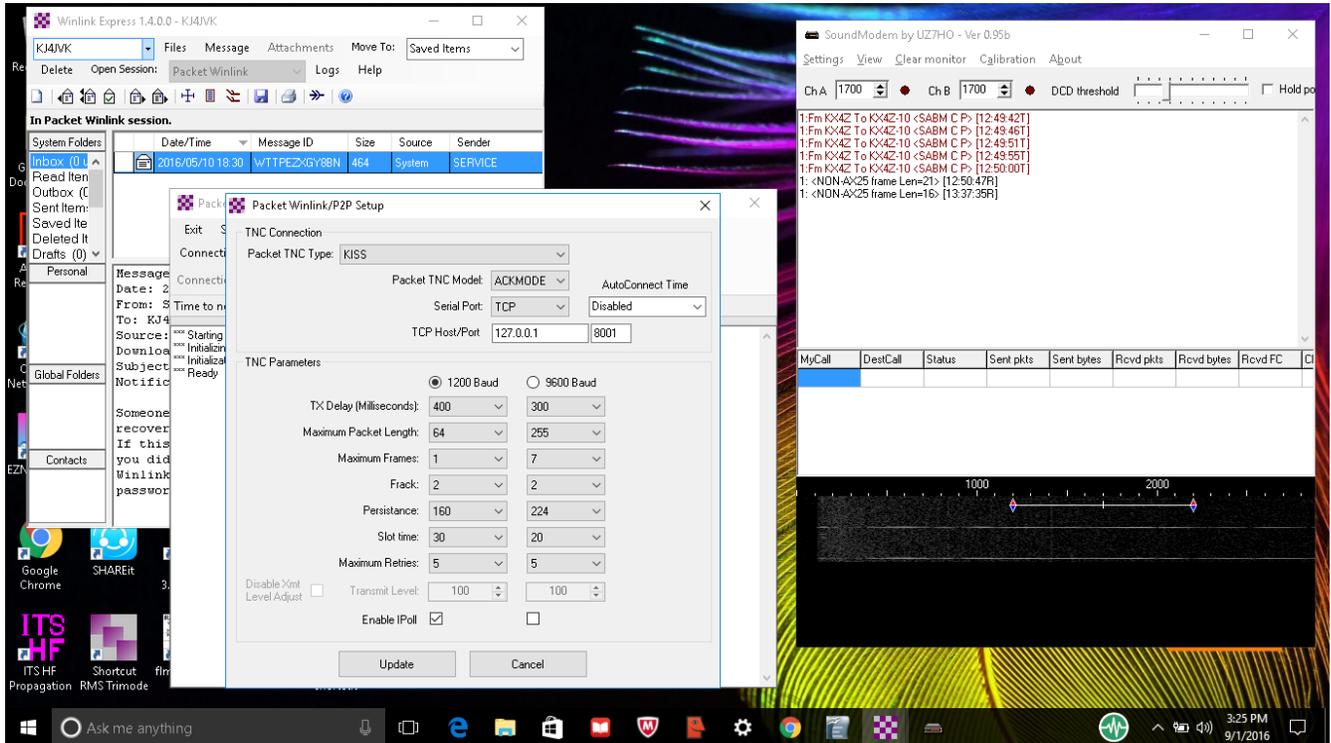
10. **OPTIONAL REGISTRATION:** If the software requests a “registration” number , just wait a moment and it will give you the option to “remind me later”

11. **Writing an Email Message.** If you wish to create an email, that option is under **Message | New Message** and works pretty much like any email system. There is a contacts list that you can access by clicking on TO: or CC: buttons. Emails allow attachments, but the size may be limited to 40K (or some other number) due to the limited bandwidth available. Once you are finished with your email, be certain to **Post to Outbox**, which queues it up to be transmitted on the next connection to a RMS (radio message server). You should see the number in the OutBox increment by 1.

12. **Selecting Packet Winlink:** In order to connect over PACKET, you will select **PACKET WINLINK** in the “Open Session” drop down, and then click either the Open Session words, or the **CONNECT** icon (which looks like a pin connecting to a jack, or an arrow catching up to the tail fletching in front)



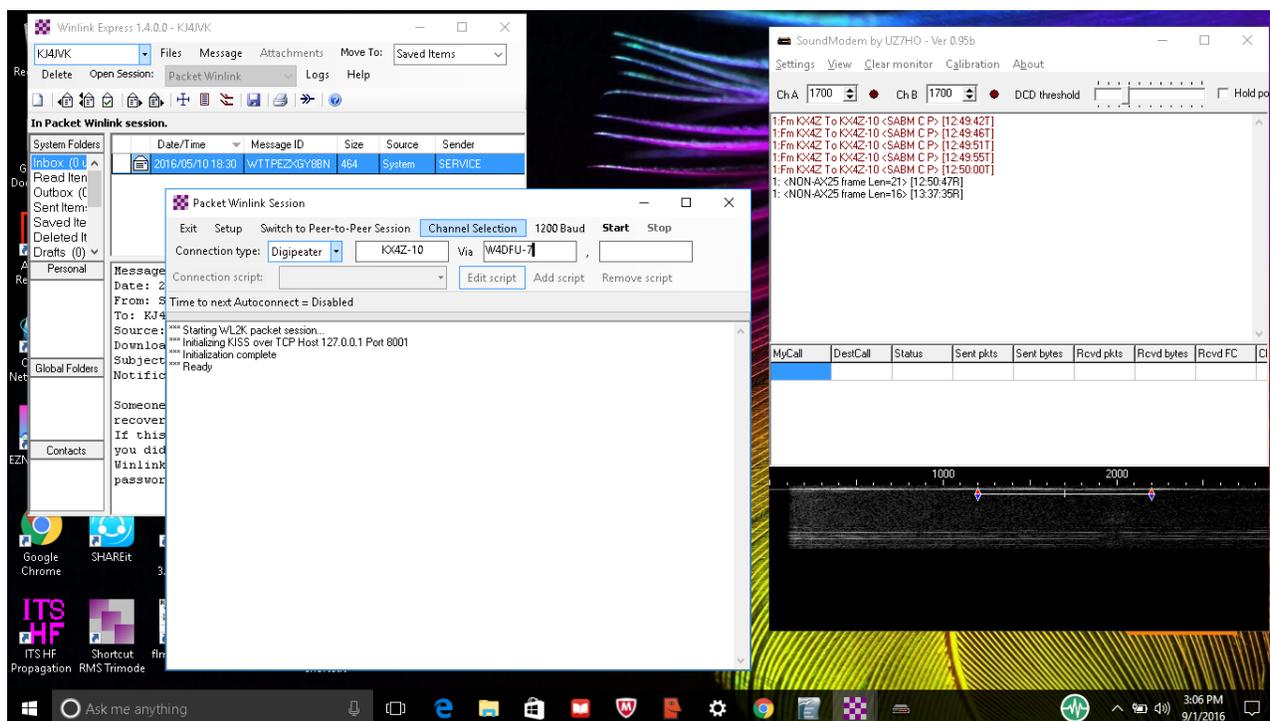
13. **Settings:** Once you have the Session dialog open, you may wish to check the **SETTING** to verify that it is correctly set for **KISS TNC** (provided in software by UZ7HO soundmodem.exe) and using TCP connections on 127.0.0.1 (your computer's “myself” address, on the exact same port (8100) that the soundmodem.exe software is expecting you to be on. Speed is 1200 baud, **MAXFRAMES=1** and the **packet length** may be either 64 or 128.



- 14. Path to RMS:** There are three possible methods by which to connect to a RMS:
- Direct (if your station is close enough to directly reach the RMS you wish to reach)
  - Digipeater: If you know of a digipeater that you can reach on a frequency that it can then reach the RMS on the same frequency (normally, digipeaters send and receive on the same frequency)
  - Connect Script: if you would like to use the more advanced technique of making connections along each step of traversing stations to reach the desired RMS station For more information see:  
[https://www.qsl.net/w4eat/w4eat/Making\\_a\\_packet\\_connection\\_to\\_a\\_.htm](https://www.qsl.net/w4eat/w4eat/Making_a_packet_connection_to_a_.htm)

If you cannot directly reach KX4Z-10 or KX4Z-11 (there are subtle differences between them that are beyond the scope of this document but either should work; if one doesn't try the other) --- then the simplest thing is to digipeat as follows:

- In Gainesville Proper: Use frequency 145.030 and digipeat through W4DFU-8 to KX4Z-10
- West of Gainesville: Use frequency 145.070 and digipeat through NF4RC-7 to KX4Z-10



15. **START** When you Click **START**, you should see the system begin to send packets in an attempt to connect to the RMS. Packets can be observed on the soundmodem.exe monitor screen, and overall progress observed on the WINLINK session dialog box. You can tell transmitted packets because they appear in RED. You can tell digipeated packets because there will be an asterisk (\*) after the callsign of the digipeater. R3 inside a packet header indicates “ready for packet #3) and S3 indicates “sending #3”. SABM is an attempt to make a contact. P means a request for immediate acknowledgement prior to any other packets being sent. REJ means that the recipient did not get a good packet and is going to ask for a repeat of something.

**NOTE:**

**RECEIVING:** You should be able to HEAR packet stations replying, SEE audio or their audio responses on your "waterfall" and SEE characters from them on your soundmodem dialog (you can't type into that) --- if you aren't seeing / hearing etc....check to see that your radio speaker is wired correctly toward your Signalink or other sound interface system.

**TRANSMITTING:** You should be able to HEAR your own signal on a handheld monitoring transceiver -- and you need to be certain that you are not OVERMODULATING --- use the Calibrate signals option in soundmodem.exe to send tones from your transmitter and adjust the TX GAIN on your Sinalink or interface system to be slightly SOFTER than the maximum audio signal. You want to be in the LINEAR modulation range of your FM transceiver --- overmodulating will just make your signal impossible to decode. Dramatically UNDERmodulating ("light audio") will make it a bit harder also --- so LISTEN to your own signal!

16. **Don't Use Stop:** If possible, avoid using **STOP** to interrupt the communications unless truly

necessary as this sometimes causes significant problems to the remote message server (which is a computer, and doesn't always respond the way you wanted.)

17. **Settings Explanations:** To give the best chance at communications (and not necessarily the best throughput) the **SETTINGS** are typically for a **PACLENGTH** of 64 or 128, and a **MAXFRAMES** of 1. The reason for the pitifully small **MAXFRAMES** (before an ACKnowledgement) is that some of the digipeaters our group is dealing with have a software bug and can't handle back to back packets.
18. After the connection is made, any emails sitting in the Outbox will automatically transfer without any further effort on your part. If there are emails waiting for you to download, depending on software settings, you may be offered a list and asked to check the ones you wish to download.

#### 19. Troubleshooting;

- You can generally see on the Waterfall (Fast Fourier Transform display) of received signals whether your received volume is right or not, and you can certainly readjust if needed.
- Listening to your transmitted packet with a spare 2 meter transceiver will allow you to confirm that your are indeed transmitting, and if need be you can adjust your TX (transmitted audio level) on the SIGNALINK by adjusting it while listening to your signal and placing it in the range where it is NOT maxed out (hence, overdeviating).
- There is always the chance that the RMS you are attempting to target has malfunctioned, if you are unable to raise it. If you are getting good digipeats of your signal, then you know you have an outgoing signal that makes sense.

#### **FREQUENCIES:**

KX4Z-10 Winlink RMS Packet server ; 145.030 and 145.070

W4DFU-7 Node, part of SEDAN, able to digipeat on 145.030; able to reach the SEDAN on 145.770

NF4RC-7 Node, not part of SEDAN, west of town 4 miles south of High Springs, on frequency 145.070

Further information of SEDAN: <http://www.fla-sedan.com/sedanhowto.html>

Florida SEDAN map: [https://www.google.com/maps/d/viewer?](https://www.google.com/maps/d/viewer?hl=en&gl=us&oe=UTF8&msa=0&ie=UTF8&mid=1bi77YLXYRDJSviGBeDs-5mzh0HU)

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## **WHAT HAPPENS TO YOUR EMAIL:**

You would be using this software for real in the circumstance that no Internet is available in your area due to any of several causes. It is likely then that KX4Z (the RMS to which you are connecting) will also be without Internet (though which your message would have otherwise flowed quickly). In this emergency instance, KX4Z will transfer your email to a WINLINK software RMS RELAY, which will queue it up to be transmitted by HF (high frequency) ham radio on the next slot, which is typically within 30 minutes. At that time, an automated digital ham radio call will be placed to the station predicted to have the best signal. If that is successful, your email heads out to that station – which normally would refuse the connection if they had no means to send it further. If that connection is unsuccessful (which can happen due to band interference, poor signals, recipient software failure and other reasons) then another station will be tried and so on. It may not be speedy but the WINLINK system tries very hard to get your email out.

If the VHF packet systems do not function for you, the next option is to send out your email over HF WINLINK using an HF transceiver. In this case, you will be searching for a receiving station with a strong signal that is functioning properly. This is more work, but has a higher probability of getting your email out quickly.

These explanations merely go over the “high points” of tactical email handling within WINLINK. For more information, consult more indepth resources via the Web.