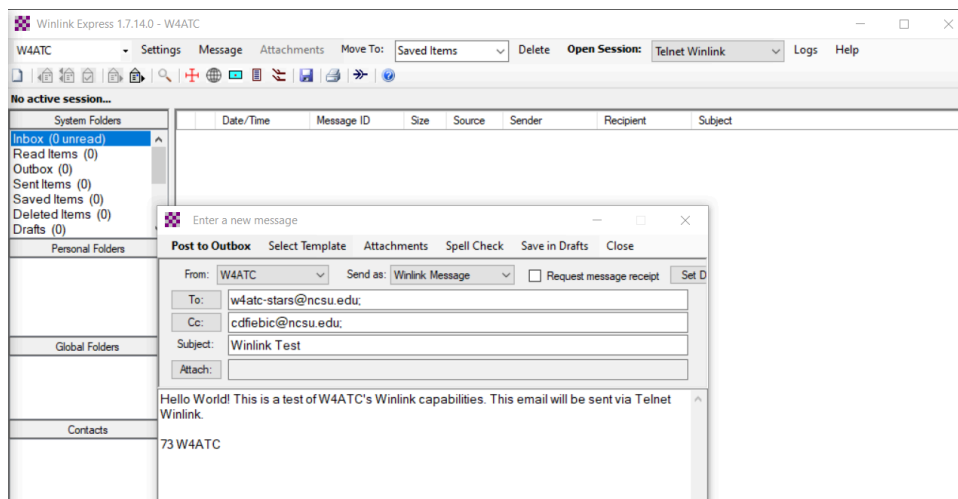This is a guide for setting up Winlink on your account on "WAVELENGTHS" using the Yaesu FTDX101MP. Written by KQ4LNE on April 2, 2024.

1. Open Winlink Express. This is the purple-gray checkerboard icon.

2. In the upper left corner right under the window's header, there is a box with a dropdown arrow. If this box does not contain your callsign, click the dropdown arrow and click (add callsign). Enter your callsign. Enter a password for your account. Enter your gridsquare (If at the W4ATC shack, this is FM05ps.) Ignore the registration key- Winlink is "nagware" meaning that it can be used for free but it will keep nagging you to pay for a registration key- you may if you wish, there are a few benefits.

3. Enter your Name, Address, City, State, etc. in the box called "Contact Information (Optional)". Most importantly, enter a non-Winlink e-mail. This can be your NCSU email. Also use this email address for "Password recovery e-mail" if you wish (reccommended).

4. Once this information is entered, click Update in the lower left hand corner of the Winlink Express Properties window.

5. A popup saying you need to now connect to a winlink server should appear. Close this. Now, in the upper right hand corner of the Winlink Express window, there should be text, "**Open Session:**" and a gray box with a dropdown arrow. If this box is empty OR does not say "Telnet Winlink", click the dropdown arrow and select "Telnet Winlink". This allows Winlink to function like a crude but normal, over-the-internet email system.

6. Now, we will write an email to test the program. This email will not be sent over radio for now, just through the internet. See the box where you entered your callsign earlier? Just below it and to the left is a small button that looks like a blank sheet of paper with its upper right hand corner folded over. For some reason, they made the most important button stupidly small. Anyway, click this to write a new message. Like a normal email system, in the "To:" box, type the email address of your intended recipient. If you wish to send the email to multiple recipients, separate the email addresses as such: example@gmail.com; example@yahoo.com; . I suggest you use your NCSU email. "Cc:" someone if you wish. Include a subject, just "Winlink Test" is fine. Leave the "Attach:" box blank. Now click on the large white space below and type a brief email. "Hello World" suffices. Once you're done writing the email, click "**Post to Outbox**".

7. The email is now in your outbox, waiting to be sent. To do so requires a few more steps. At the upper right part of the window where we earlier selected "Telnet Winlink", we will now click the text "**Open Session**". A new window appears, with the heading "Telnet Winlink Session". Click **Start** to begin. The following should appear in the window:

```
*** Connecting to a CMS...
*** Connected to CMS-SSL at 2024/04/02 16:00:13
[WL2K-5.0-B2FWIHJM$]
;PQ: 91324540
CMS>
  ;FW: W4ATC
  [RMS Express-1.7.14.0-B2FHM$]

  ;PR: 56344525
  ; WL2K DE W4ATC (FM05PS)
  FC EM 0KLFVFO36X2S 334 269 0
  F> 8F
FS Y
*** Sending 0KLFVFO36X2S.
FF
*** Completed send of message 0KLFVFO36X2S
*** Sent 1 message.  Bytes: 292,  Time: 00:00,  bytes/minute: 70378
  FQ
*** --- End of session with WL2K at 2024/04/02 16:00:18 ---
*** Messages sent: 1.  Total bytes sent: 292,  Time: 00:04,  bytes/minute: 3570
*** Messages Received: 0.  Total bytes received: 0,  Total session time: 00:04,
bytes/minute: 0
*** Disconnecting
*** Disconnected at 2024/04/02 16:00:18
```

8. This confirms that the message has been sent. It also displays that no messages were found to be in our inbox, and the link automatically disconnected. The email should now appear in the inboxes of those addressed.

9. Now for the complicated but cool part: sending emails via radio. In order to do this, we first need someone to send the email to. Our station sends the email over the air to another automatically controlled station, which receives all the information in the email and automatically forwards it to the recipients over the internet. These automatically-controlled stations are called "gateways". Use this site to find gateways: https://winlink.org/content/gateway_locations

10. You should still be seeing the Winlink Express window. Go to the "Telnet Winlink" box in the upper right, and click the dropdown arrow. Now, click "Vara HF Winlink". Be sure it is the HF option, not the FM option. Click **Open Session** again

11. Now, 3 new windows appear. One is something about updating propagation data, click yes. The other with the colorful dials is VARA HF, the program that acts as the modem to encode and decode the digital signals with which the emails are sent and received. The other is "Vara HF Winlink Session -<callsign>". This time, we need to enter more information to send the email. Go to the above link, and choose a gateway within 1500 miles or so that has a 20 meter option. I'm choosing KC0TPS in St. Louis, Missouri, for example.

12. Now, we need to enter the information listed on the gateway website into the Vara HF Winlink session. In the leftmost box, under "Exit" and "Settings", we need to enter the callsign of the receiving station. In my case, it is KC0TPS. We then need to enter the Center Frequency as displayed on the website. BE SURE TO USE A FREQUENCY THAT THE SHACK IS CAPABLE OF HANDLING. For this reason, as of April 2024, we cannot use any gateways that only have 80/40 meter capabilities. As KC0TPS has a 20 meter option, we can use the rotatable beam antenna. Enter the listed frequency in the "Center Frequency:" box. The Dial Frequency will be automatically calculated. Do not change the Bandwith or Bearing boxes.

13. Now, lets make sure the settings are correct for both the program and the radio. Click on "Settings", then VARA TNC Setup. Everything here should be correct except the Maximum signal bandwidth, which you should change to 2750. Click Update.

14. Click Settings again, then Radio Settings. Where it says "Select Radio Model", click the dropdown and select "**Yaesu FT-991/A**". Yes, we are using a FTDX101MP, but DO NOT select this option. Then, click USB Digital. Under "Radio Control Port", set "Serial Port to Use" to COM5, Baud 38400, and check the boxes "Enable RTS" and "Enable DTR". Under PTT Port (Optional), set "Serial Port to Use" to FT-991/a. Now click Update.

15. On the FTDX101MP, the Dial Frequency should now be displayed on the VFO. The mode should be DATA-U. Now, for some reason, the rig shrinks down the bandwidth. Locate the SHIFT-)WIDTH knob to the bottom right of the VFO knob. The Width control is the outer ring. Adjust it by turning it clockwise until the screen displays "WIDTH 3000Hz". Ensure the correct antenna "ANT 1" is selected, ATT is OFF< and R.FIL is set to 3 kHz. Now we are ready to start.

16. Return to the Winlink Express window. Type another message, and post it to the outbox. Return to the VARA HF Winlink Session window. To begin the connection, click **Start**. The radio will begin to attempt a connection with the gateway. It will retry calling the gateway 15 times. If it is not successful, try again or try another gateway. Try to avoid connecting when "Channel Busy" is displayed.

17. Once the connection is made, the computer will automatically transmit your outgoing emails, and will receive your incoming emails which will then appear in your Inbox on the Winlink Express window. To try out receiving emails, send one to yourself at <YourCallsign>@Winlink.org

TROUBLESHOOTING: If problems arise with VARA, go to the VARA Window, Settings, Soundcard, and ensure that Device Input is Line (4-USB AUDIO CODEC) and Device Output is Speakers (4-USB AUDIO CODEC). The rig should take care of Drive level itself. When it is transmitting, open the ALC meter and it should bounce around the ⅓ mark.