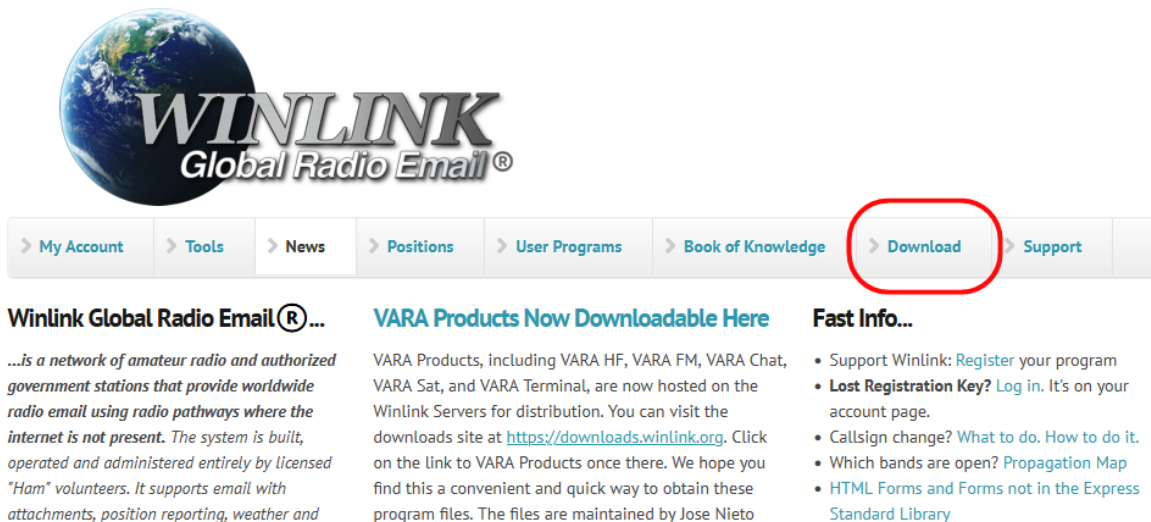# Winlink Workshop Instructions

These instructions will step you through setting up Winlink Express on a Windows computer, creating a new account, and then set up for packet operations using a Sound Card interface and the UZ7HO Soundmodem software TNC application. If you are using a different Operating System, tablet or phone, and/or different radio hardware, contact Scott Currie for information on other possible solutions. Winlink Express is the preferred application for ARES members in SLO County.

If possible, complete these steps before the workshop. We will resolve installation problems at the workshop as needed.

Install Winlink Express (if not already installed) Download from:

https://winlink.org/

Go to the "Download" section:

In the Downloads section, select User Programs:

Under User Programs, locate the Winlink Express install link and click on it to download (may be a different version than shown below):

downloads.winlink.org - /User Programs/

[To Parent Directory]

6/3/2023	6:34 PM	1846835	Paclink_install_4-3-11-0.zip
6/3/2023	6:34 PM	1101	README_Software_Install_Instructions.txt
6/3/2023	6:33 PM	847697	RMS_Link_Test_install_2-0-24-0.zip
6/3/2023	6:34 PM	12176	SCS_PTC-IIIusb_and_end_of_PTC-IIusb_IIpro__IIex.pdf
1/13/2025	10:49 PM	2483737	Standard_Forms.zip
1/14/2025	2:02 PM	40294285	Winlink_Express_install_1-7-21-0.zip

Depending on how your browser is set up, the file will either be saved in your Downloads folder, or you will be prompted to decide where to save the file. Remember where you save the file:
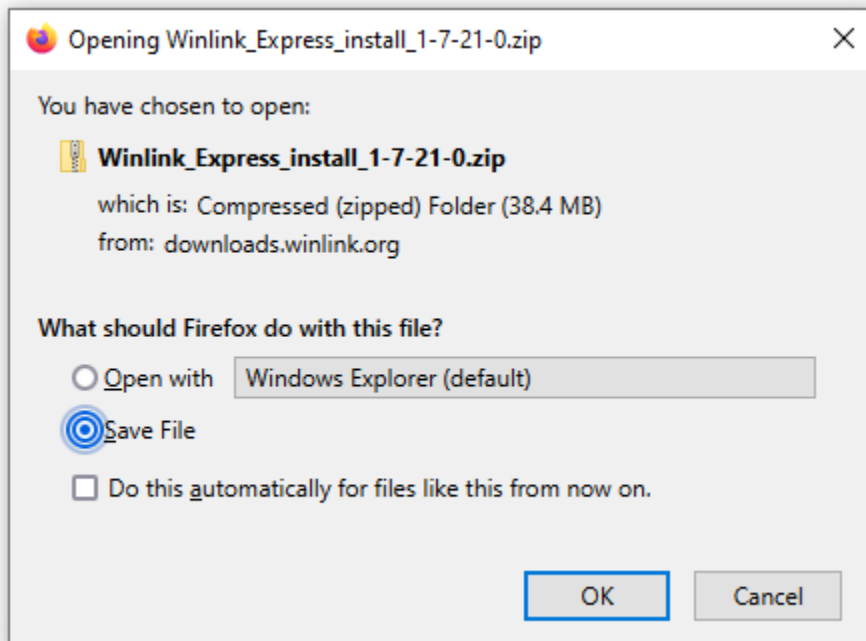
Use the Windows File Explorer and navigate to the folder where you saved the download zip. Double-click on the file name to open the zip:
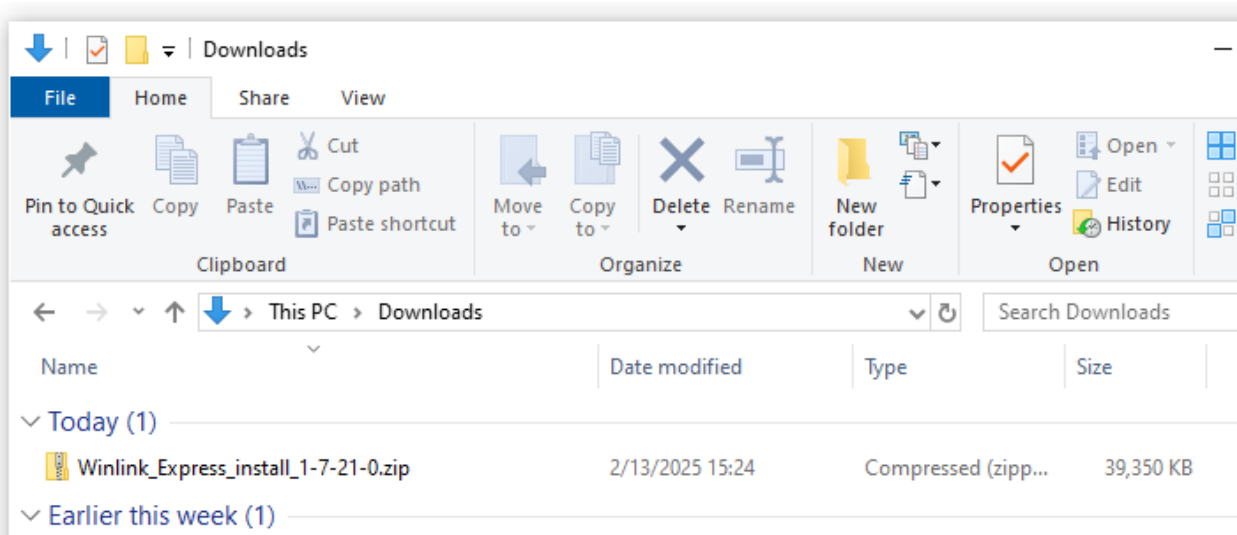
Inside the zip file you will find the Winlink_Express_install.exe, double-click on this file:
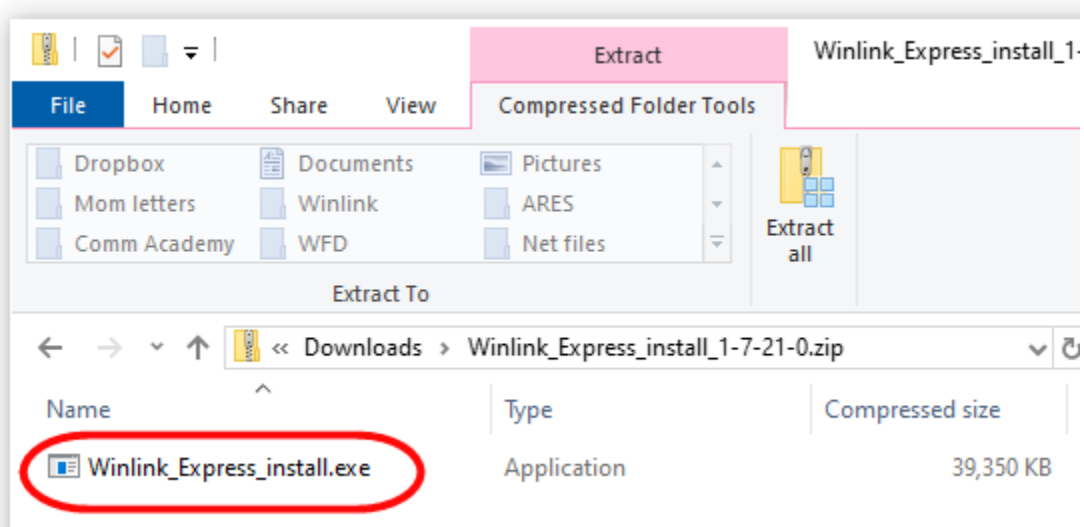
You may receive a message from your anti-virus software preventing the install program from running. Choose the option to "Run Anyway":
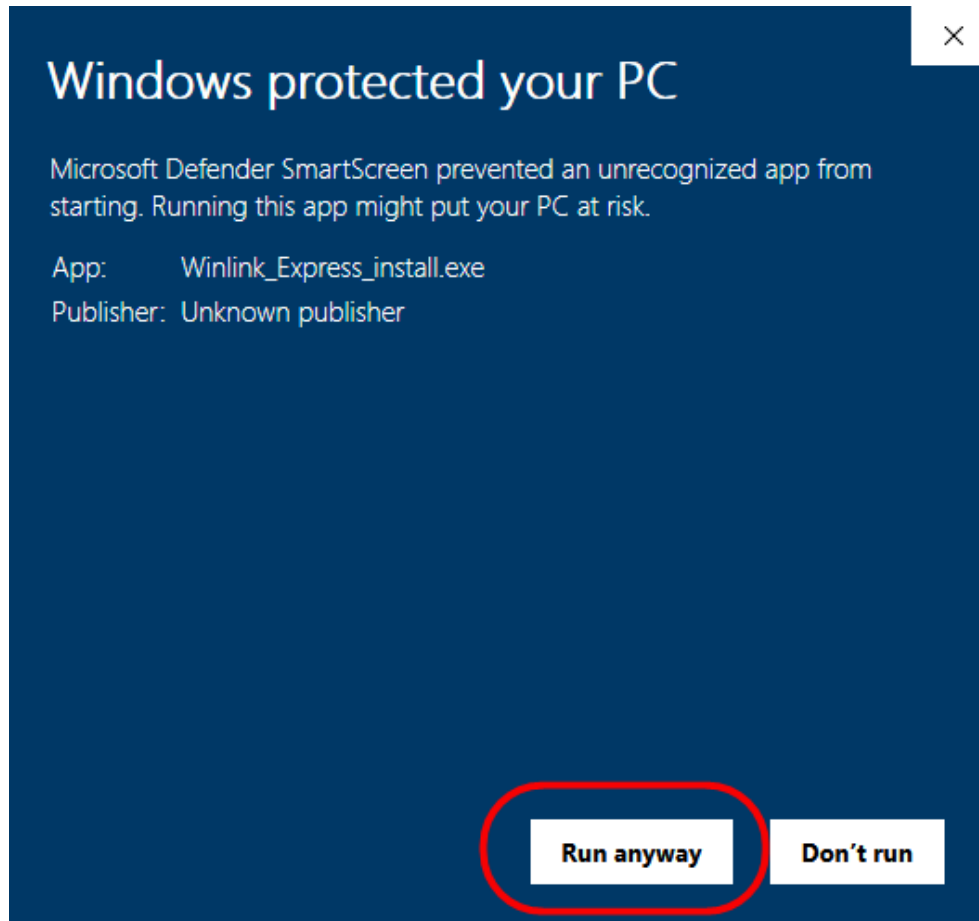
Leave the installation folder at the default location, C:\RMS Express, press Next:
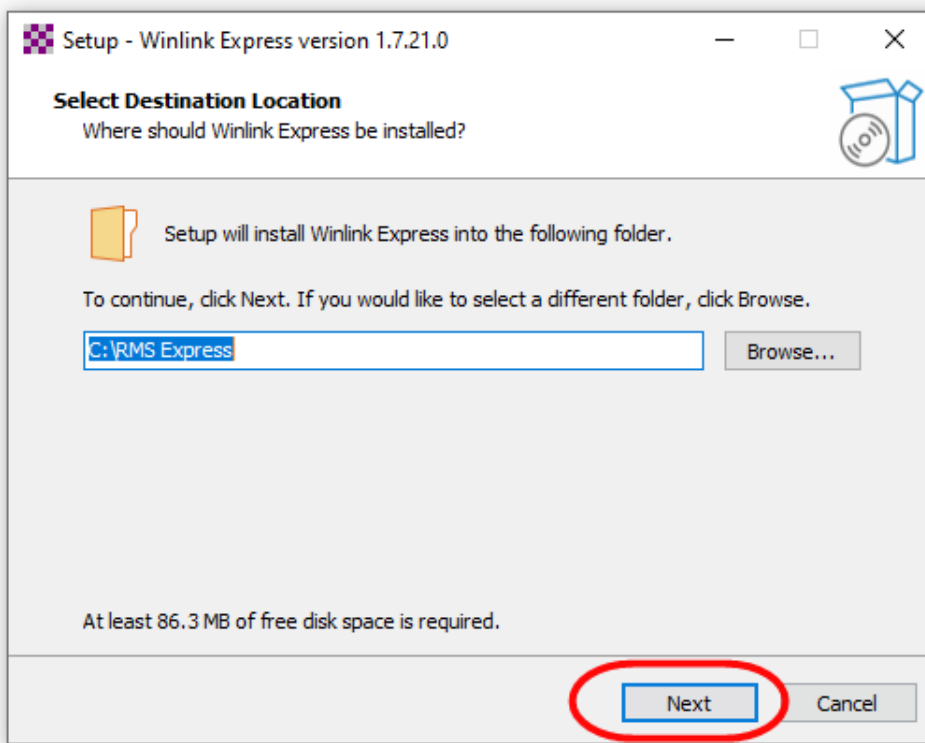
Allow the installation to create a desktop shortcut, press Next:
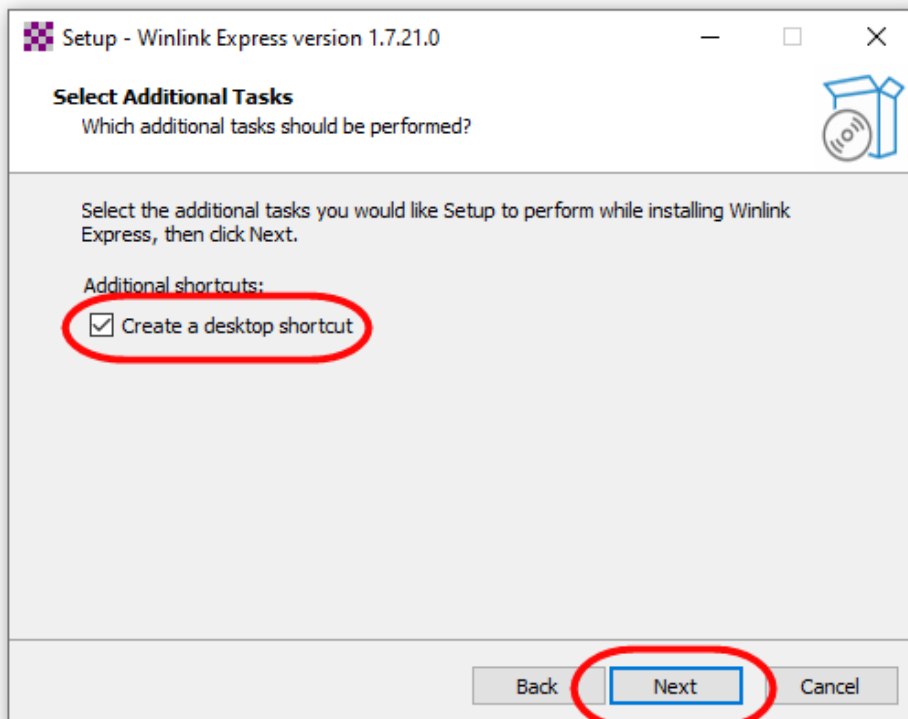
Review the selected options, then press Install:
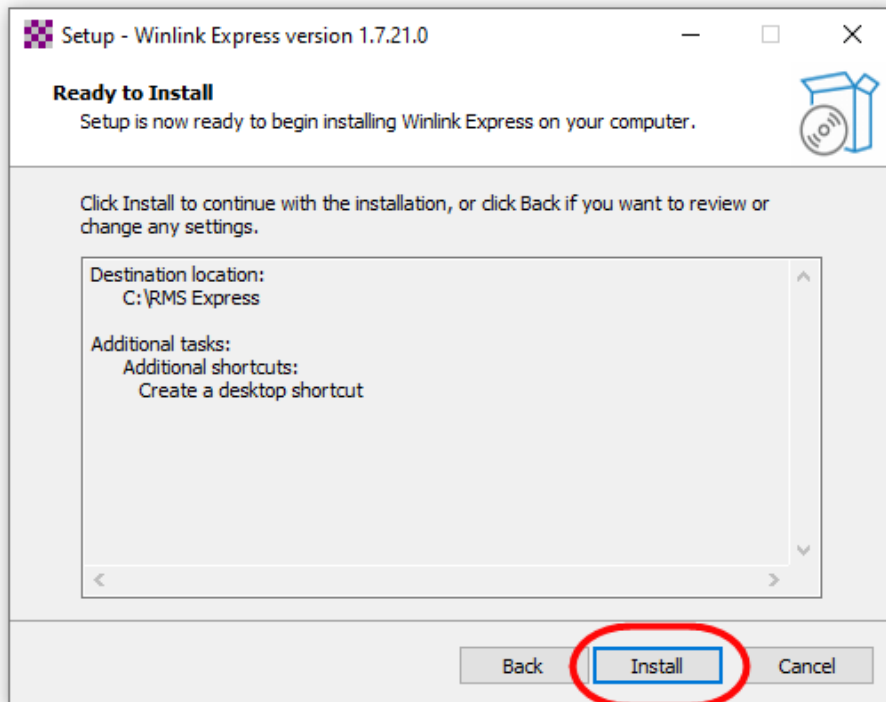
Once the installation completes, select the option to Launch Winlink Express and press Finish:
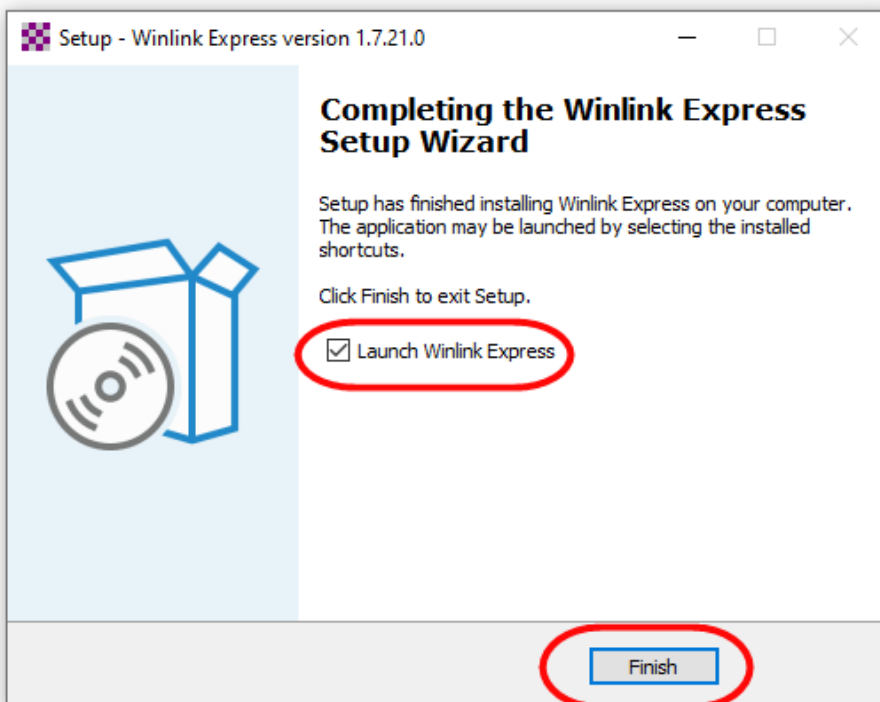
When the Winlink Express Properties window comes up, complete the fields as shown below (using your own information). Be sure to include a recovery email address and include the EMCOMM Service Code. Create a secure password for your account, and do not forget your password! Press Update when complete:

Registration is optional via donation to the ARSFI. If you choose not to donate, press Remind Me Later (unregistered versions will see this message each time Winlink Express starts, but the program will function normally):
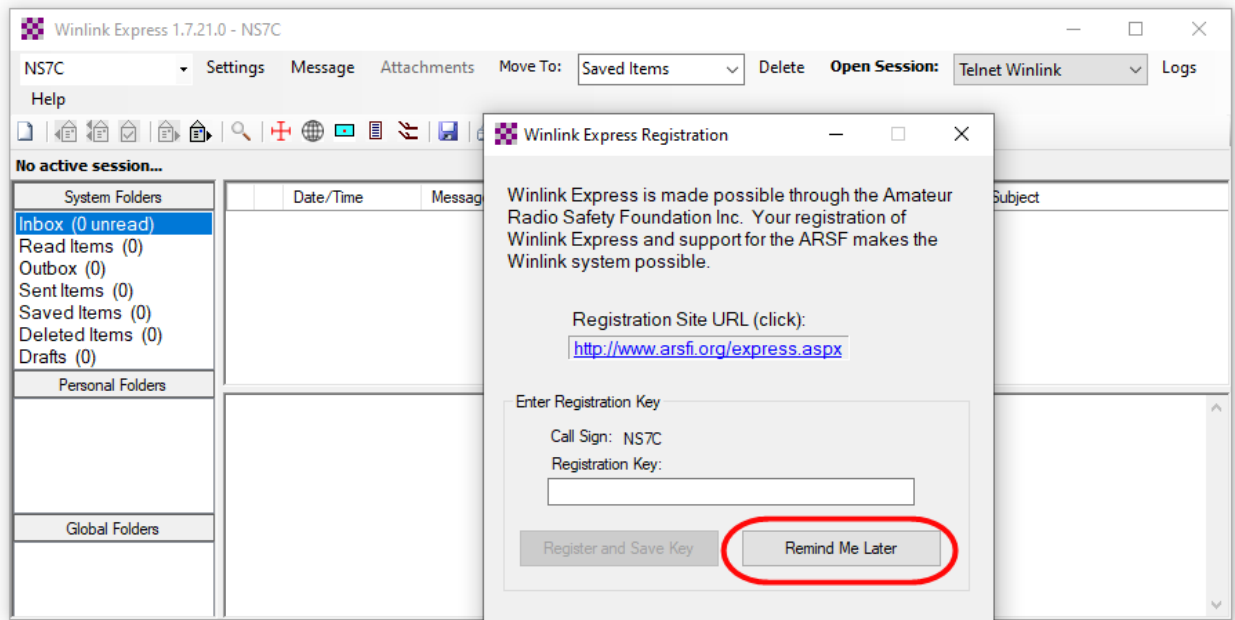
 To complete the registration of a new user (call sign), you will need to create a new message and send the message through the Winlink System. Send a message to your personal email address. The content of the message is not important. For this message, you do not need to set up a radio connection. Instead, you will use your Internet connection to send the message. Using Winlink Express with an Internet connection is a good way to learn the program and does not require any additional equipment. However, in emergency communications, we cannot assume that Internet access will be available in the disaster area, so you should plan to add RF capability.

Follow the steps below to complete sending your first message.

On the main Winlink Express window, Message, then New Message:
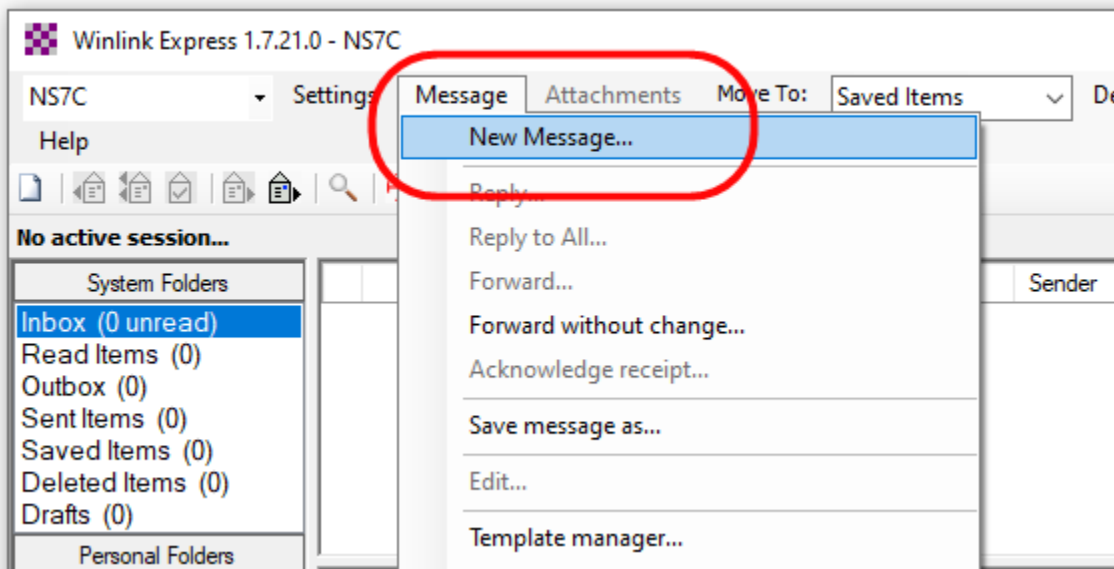
On the new message window, fill in your personal email address in the To: field, and then place whatever you want in the Subject line and message body. When complete, press Post to Outbox:
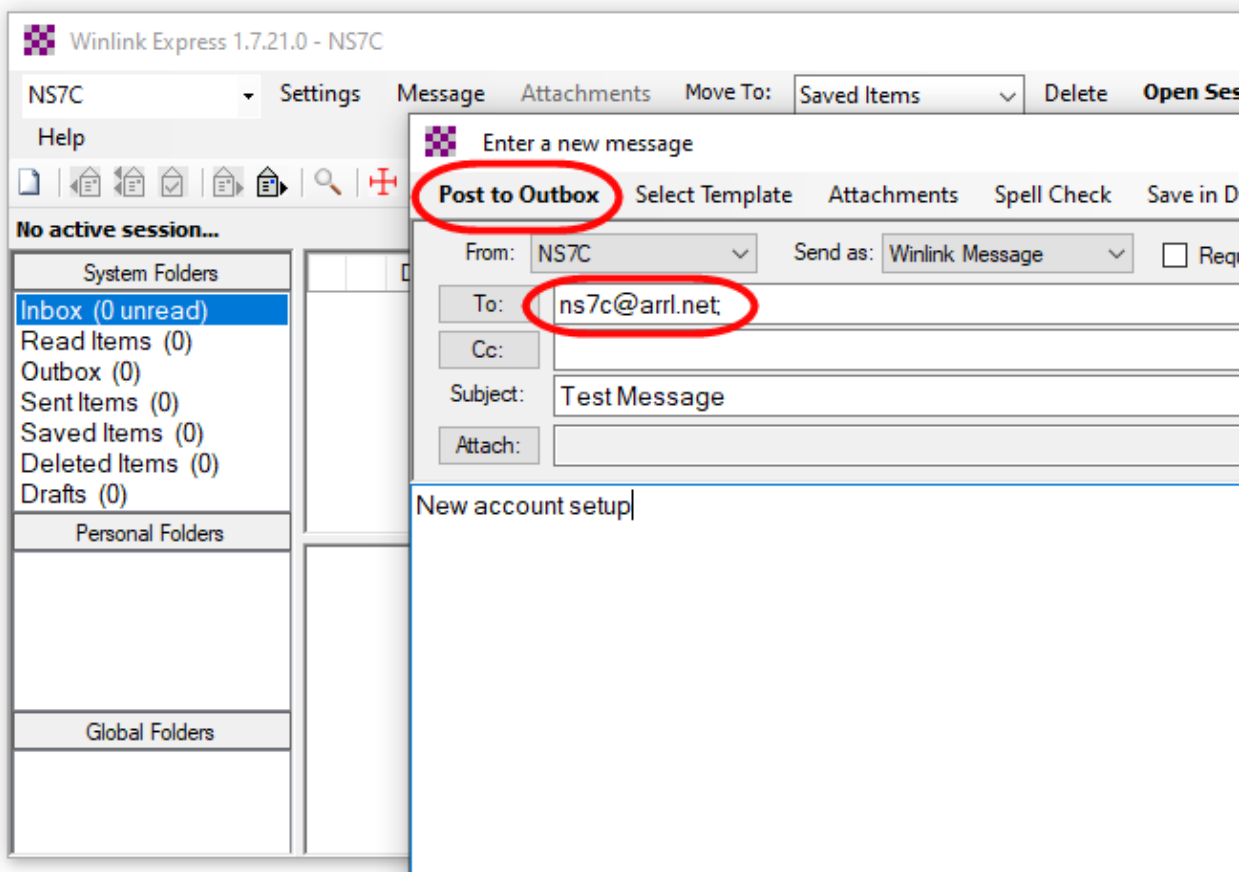
Back on the main Winlink Express window, note that you have a message waiting to be sent in the Outbox. Select Telnet Winlink in the session type pull-down menu, the press Open Session:
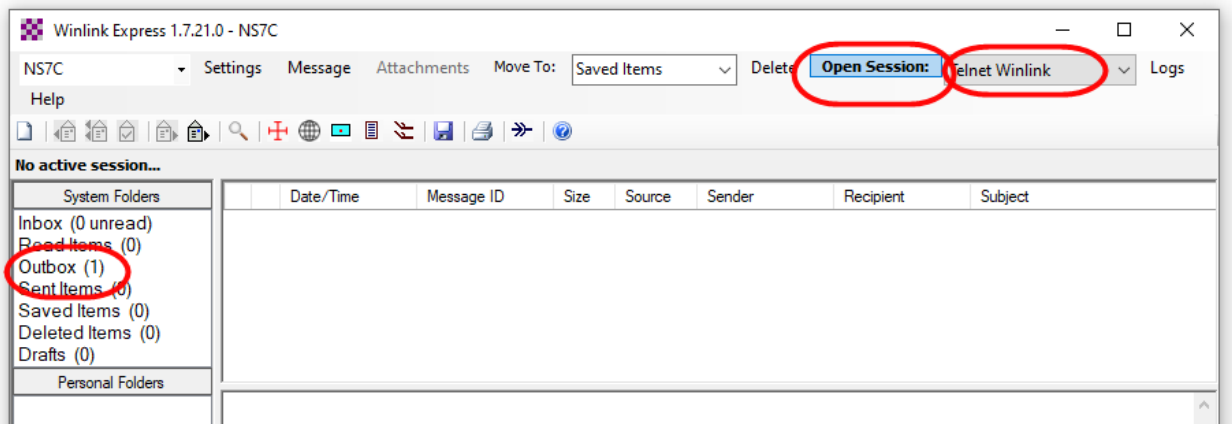
On the Telnet Winlink Session window, press Start. This will establish a connection to the Winlink CMS servers and transfer your message. Once the session disconnects, you can close the Telnet Winlink Session window by pressing Exit. Note that the Outbox will now be empty.
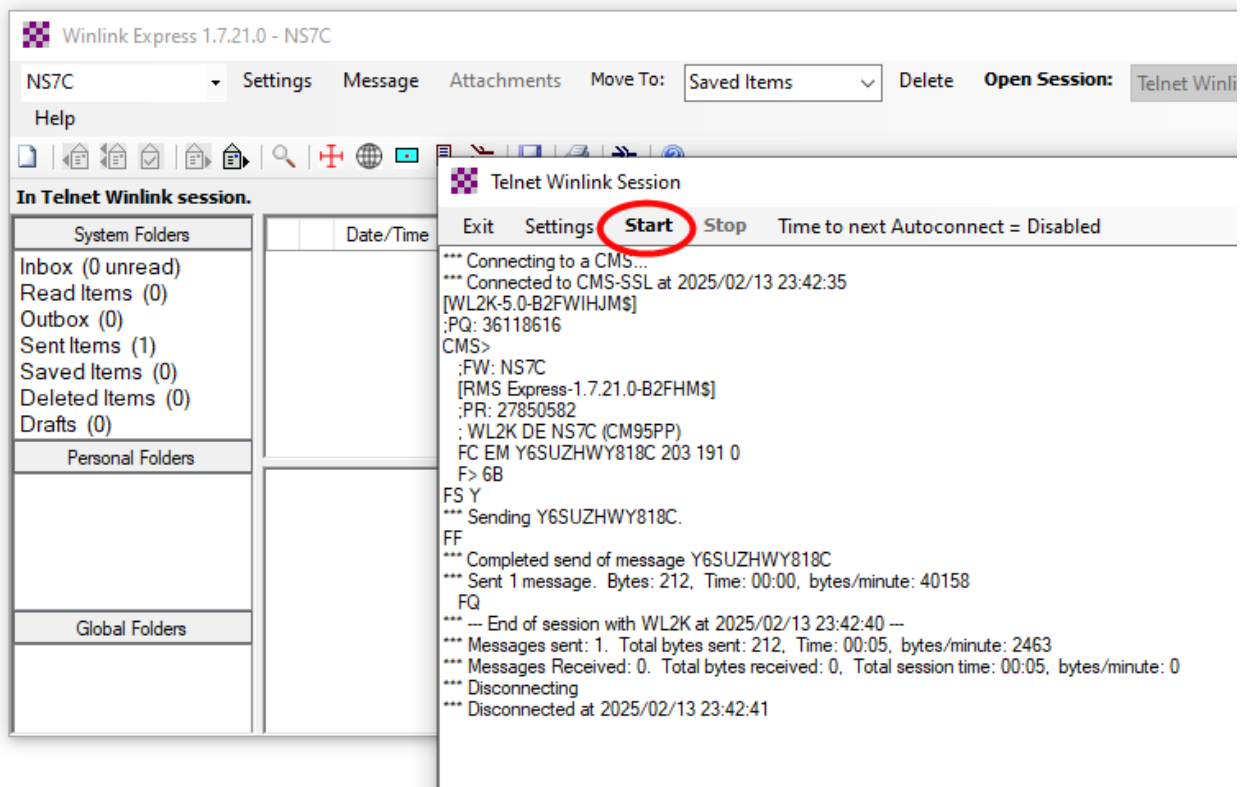
You have now completed the initial Winlink Express setup and have sent your first message, creating your account in the Winlink System. Check your email account for a new message from your call sign@winlink.org. You can reply to this message, then start another Telnet Winlink Session to check for new messages. You should receive the reply in your Winlink Express inbox and can open it like a regular email application. These instructions are just the first step. There are many skills to master using Winlink Express and the Winlink System. There are many good youtube videos that cover most of the features of Winlink Express. Please take some time to review these videos and experiment with the application. Basic usage videos are available on the North County ARES website under the training section:

https://www.sloncares.org/training

Install and setup UZ7HO Soundmodem Software TNC

The next steps will set up the UZ7HO Sound Modem software TNC. If you are using a hardware TNC instead of a sound card interface, you can skip this section and go to the Winlink Packet Radio setup.
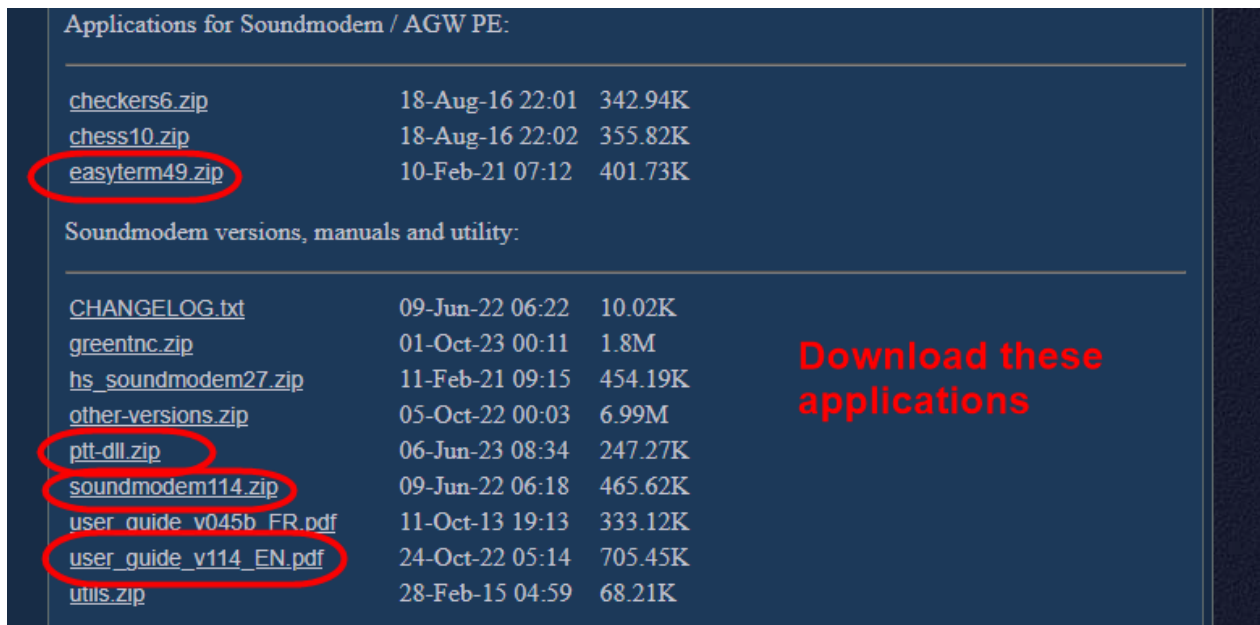
Download UZ7HO soundmodem, or copy the folder from the Workshop USB Drive. I suggest you create a "Ham" folder for these files, but any folder will work. I do NOT recommend installing them to the Desktop.

UZ7HO has both Soundmodem and High Speed Soundmodem. For 1200b packet operations, use regular soundmodem (for the workshop, use this). For 9600b or other options, use hs_soundmodem. You might also want to get Easyterm for peer to peer terminal work.

There is no installation program for Soundmodem, simply download it to the folder of your choice, unzip it, and then you can run the application.

Download Link:

http://uz7.ho.ua/packetradio.htm

Applications for Soundmodem / AGW PE:		
checkers6.zip	18-Aug-16 22:01	342.94K
chess10.zip	18-Aug-16 22:02	355.82K
easyterm49.zip	10-Feb-21 07:12	401.73K

Soundmodem versions, manuals and utility:

CHANGELOG.txt	09-Jun-22 06:22	10.02K
greentnc.zip	01-Oct-23 00:11	1.8M
hs_soundmodem27.zip	11-Feb-21 09:15	454.19K
other-versions.zip	05-Oct-22 00:03	6.99M
ptt-dll.zip	06-Jun-23 08:34	247.27K
soundmodem114.zip	09-Jun-22 06:18	465.62K
user_guide_v045b_FR.pdf	11-Oct-13 19:13	333.12K
user_guide_v114_EN.pdf	24-Oct-22 05:14	705.45K
utils.zip	28-Feb-15 04:59	68.21K

Download these applications

The suggested folder for installing Soundmodem is:
"C:\Ham\Soundmodem"

After saving the ZIP files, use the Windows File Explorer to locate the new files and unzip them to the folder you created:

Double-click on the zip file:
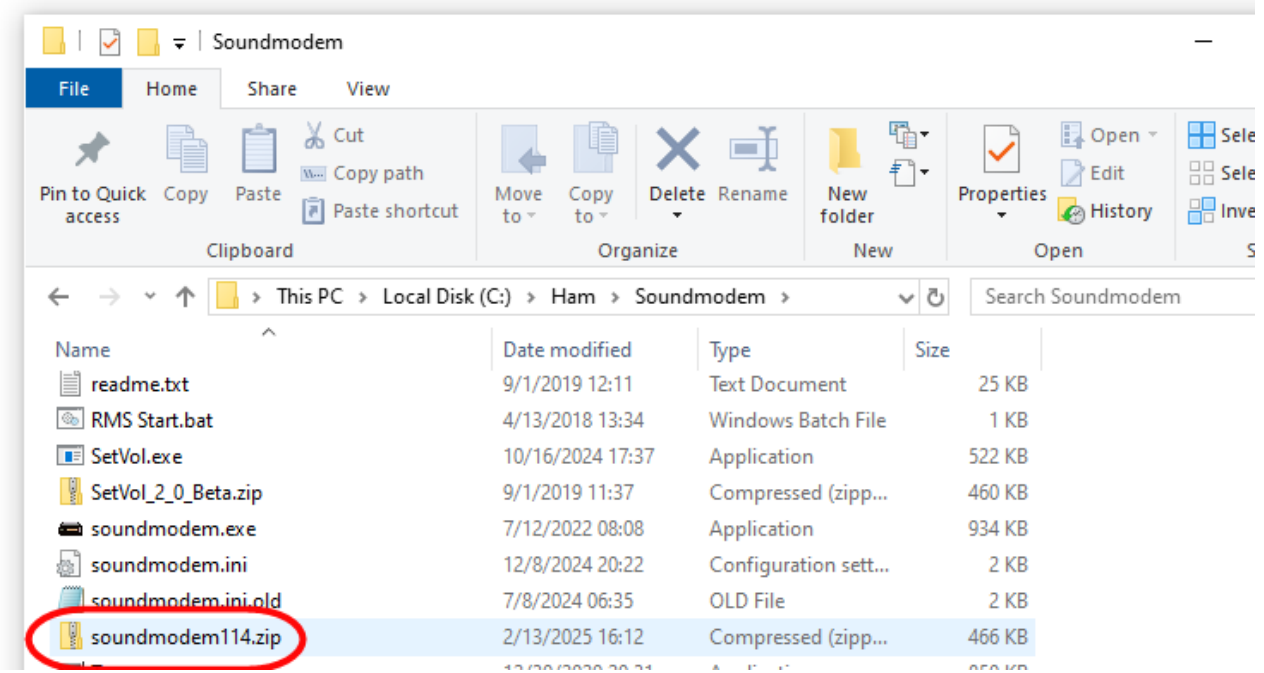
When the zip file opens, press the Extract all button:
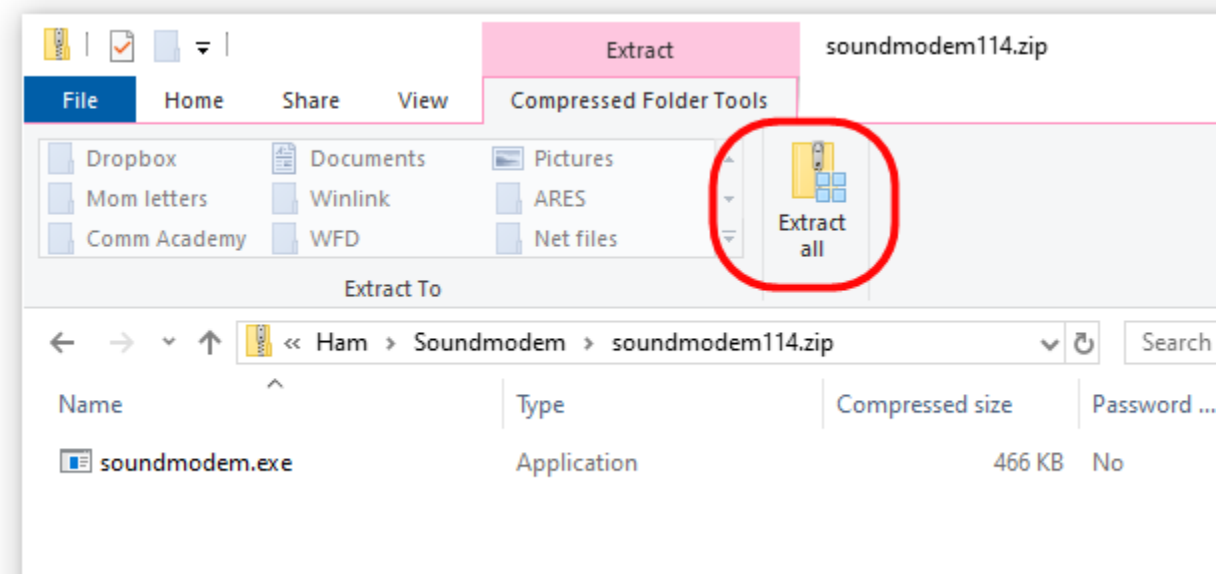
Adjust the destination for the extracted files to C:\Ham\Soundmodem (or whatever location you have chosen). Press Extract:
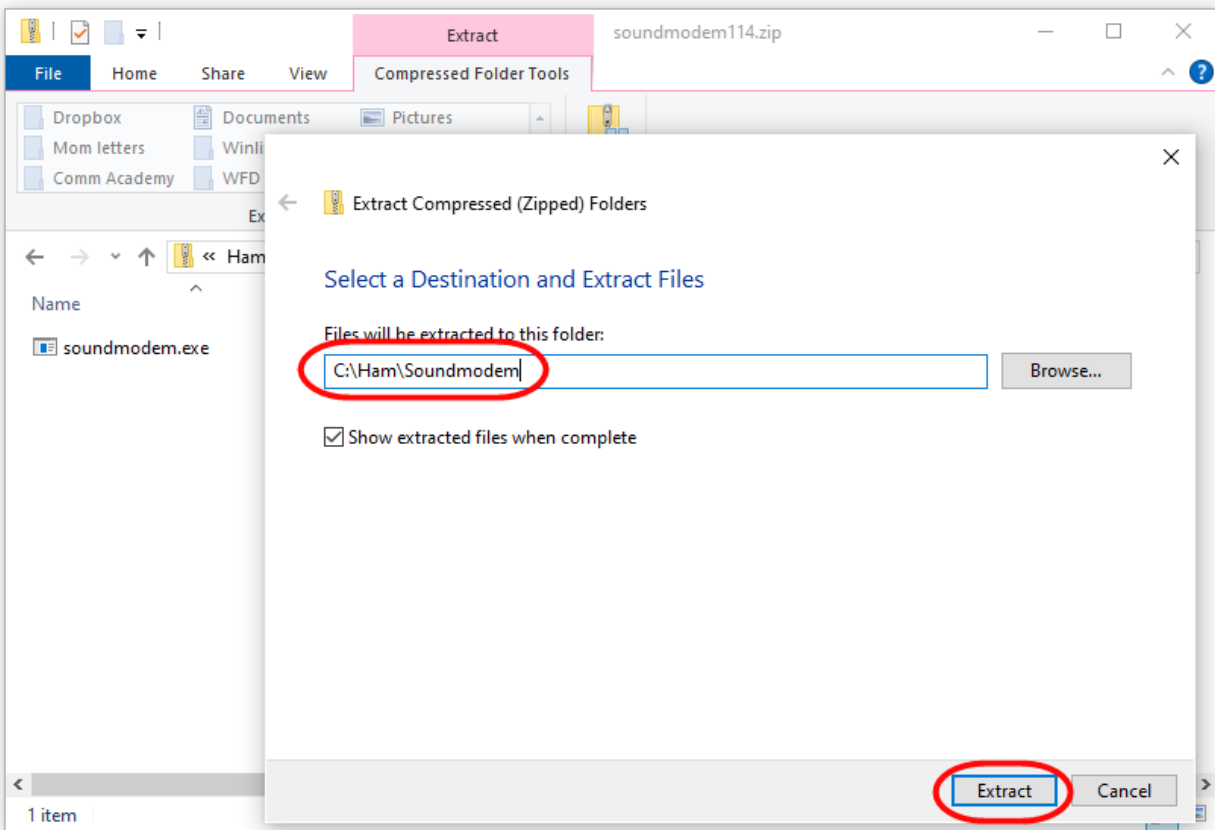
Configuring Soundmodem
The first time you run Soundmodem, you may again receive the warning message from your antivirus software, choose the option to Run Anyway.

In the instructions below you will find different PTT options for the different types of sound card interface you may be using:
Option 1, PTT Settings for Signalink or VOX type sound cards
Option 2, PTT Settings for C-Media type sound cards (DRA, RIM, URI, etc.)
Option 3, PTT Settings for CAT control (all mode, all band rigs that support CAT control)
Option 4, PTT Settings for COM port devices (DigiRig Mobile, etc.)

Choose the option appropriate for your device and skip over the other options.

Soundcard Considerations

After you have hooked up your sound card/radio, please make sure it is not selected as the Windows default audio device. You can also change the name of your device from the default Windows naming to something more descriptive. To do these steps, right mouse click on the speaker icon:

Select **Open Sound Settings**,

Under **Output**, select **"USB Audio CODEC"**

Click on **Device Properties**

Rename your device (e.g. Signalink TX)

Click the back arrow in the upper left corner

Under **Input**, select **"USB Audio CODEC"**

Click on **Device Properties**

Rename your device (e.g. Signalink RX)

Click the back arrow in the upper left corner
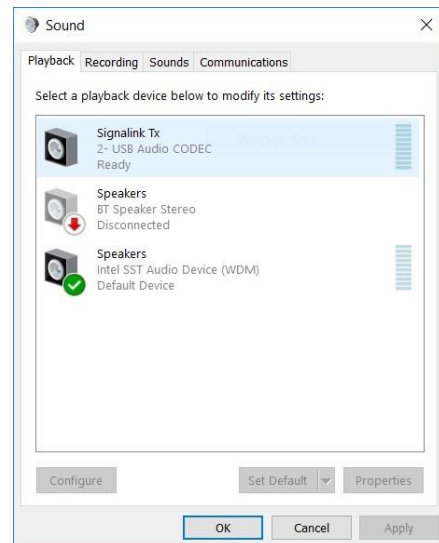
Click on **Sound Control window**

Select the **Playback** tab. Click your computer's internal soundcard (Speakers) and **click Set Default.** Then select the **Recording** tab and again select your computer's internal soundcard (Microphone) and **click Set Default**. There should be a green check mark on the internal sound card devices now.

Click **OK.**

Note: The USB device names vary depending on the device type and manufacturer, and the number of USB sound devices attached to your computer. If you are not sure which device is the correct one, unplug and then replug the USB cable while watching the Sound Control window.

Quick Tip: Build a direct shortcut to your sound cards for quick access:

- Right-click on **Desktop**
- Select **Create Shortcut**
- In "Type the location of the item" copy and paste **control mmsys.cpl**
- Click **Next**
- Type **Sound cards**
- Click **Finish**

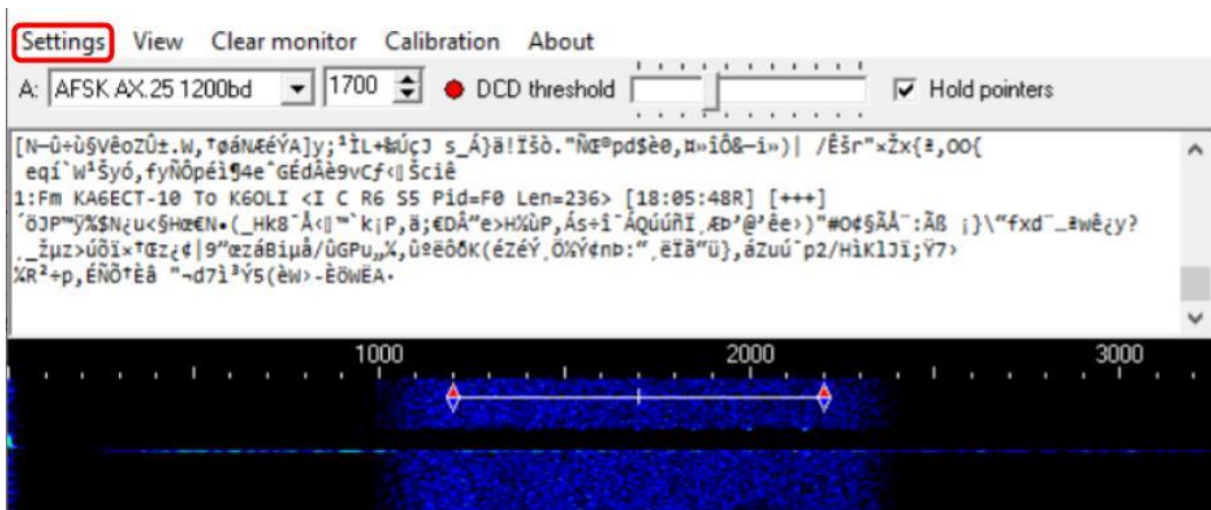Customize your Soundcards Shortcut icon:

Properties -> Shortcut -> Change Icon -> paste **C:\Windows\system32\SHELL32.dll**
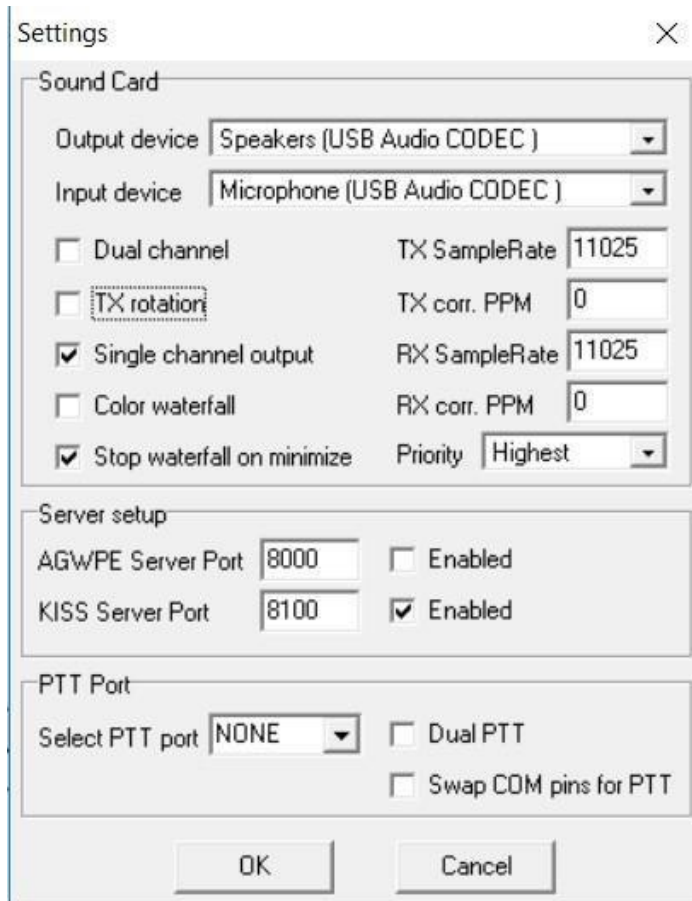

Sounds

Setting up Soundmodem Devices

Go to the soundmodem.exe file you extracted earlier. Double-click to run the program.

On the Soundmodem main window, click **Settings** then **Devices**.   You will see this window:

Use the pull-down options to select your Output and Input devices:

Output device: **Speakers (USB Audio CODEC) [or whatever name you gave it]**

Input device: **Microphone(USB Audio CODEC) [or whatever name you gave it]**

Uncheck **TX rotation**

Check **Single channel output**

>Optional: Check **Color Waterfall** (on older and slower computers leave this unchecked)
>
>Optional: Check **Stop waterfall on minimize** (also good for slower computers)
>
>AGWPE Server Port 8000 **Uncheck Enabled** (unless needed for other applications)
>
>KISS Server Port **8100 Check Enabled**

The steps below set the PTT port for different hardware configurations. Choose only the PTT option that matches your specific configuration:

Option 1 PTT Settings for Signalink

Signalink provides PTT via its internal VOX circuit, so no PTT control from soundmodem is needed. Follow these steps.

Select PTT Port: **NONE**

Uncheck **Dual PTT**

Uncheck **Swap COM pins for PTT**

Click **OK**

Continue with Modem Settings

Option 2 PTT Settings for C-Media Devices

If you are using a C-Media based sound card interface that uses GPIO pin 13 for PTT (typical of AllStar devices like the DRA series, Rim Lite, etc.) follow these steps.

Select PTT Port: **EXT**

Click **OK**

You will receive an Information message that the device could not be opened, and the option to check advanced settings, click **Yes**

The PTT driver will search for devices and display a window to select your device. If you only have one device attached, this will be your only option. If you have multiple devices attached, you will have a pull-down option to select the correct one (it is possible to have multiple devices attached, and more than one copy of Soundmodem running). The test button will cause a brief PTT action to test your device. Click **Apply** to save your settings.

Uncheck **Dual PTT**

Uncheck **Swap COM pins for PTT**

Click **OK**

Continue with Modem Settings

Option 3 PTT Settings for CAT control

If you are using a radio with a built-in sound card, and will be using CAT/CI-V commands for PTT, follow these steps.

Select PTT Port: **CAT**

Click **OK**

You will receive a Warning message that you must restart the program, click **OK.**

Close, and then restart Soundmodem, then on the Soundmodem main window, click **Settings** then **Devices.**

Click on **Advanced PTT Settings**, which will bring up the CAT settings window. Use this window to select the radio type and communications port settings. If your specific model radio is not listed, try the generic setting for your radio's manufacturer (e.g. Icom).
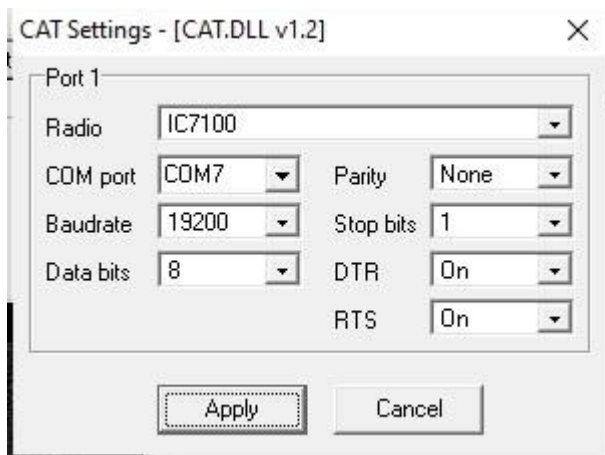
The communications parameters (baud rate, Parity, etc.) must match the parameters from your radio's settings menu. The screenshot above is just an example, your settings will likely be different. Click **Apply** to save your settings.

Uncheck **Dual PTT**

Uncheck **Swap COM pins for PTT**

Click **OK**

Continue with Modem Settings.

Option 4 PTT Settings for COM port PTT

Some interfaces control PTT by toggling a serial port control line (usually RTS or DTR). If your deivce works this way, follow these instructions:

Determine the COM port that is connected to your device. This could be a real serial port on the computer, or more likely a USB to Serial adapter cable (Use Windows Device

Manager, Ports section to display the available ports)

Select PTT Port COMxx where xx is the COM port number determined above

Depending on how your device is wired, you may need to select "Swap COM pins for PTT"
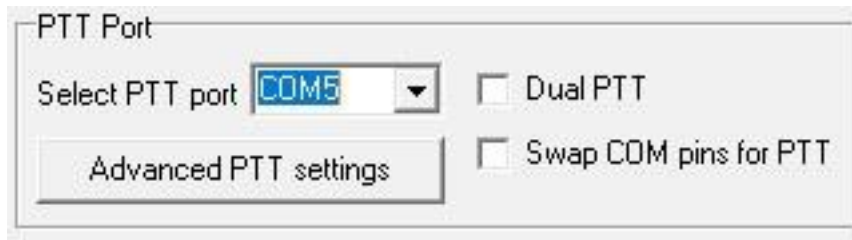
Uncheck **Dual PTT**

Uncheck **Swap COM pins for PTT**

Click **OK**

Continue with Modem Settings.

Modem Settings

On the Soundmodem main window, click **Settings** then **Modems**

You will only have to change settings in "Modem filters ch:A", ignore "ch:B"

Check – **Default settings**

Check – **KISS Optimization**

Check – **non-AX25 filter**

Under Modem type ch: A

Set Mode to **AFSK AX.25 1200bd**

Enter TXDelay **200** msec

Note: TXDelay and TXTail can be adjusted over time. 200 and 50 are good starting numbers, your radio may support lower or require higher numbers.

Click **OK**

In the main Soundmodem window make sure the modem type and center frequency
are set as follows:
A: AFSK AX.25 1200bd 1700
Check **Hold pointers** (which ensures that 1700 stays set)

Continue with Adjusting TX and RX Levels on the next page.

Adjusting TX and RX Levels

Note: Adjusting these levels properly is essential for maximum data throughput. A poorly adjusted system will result in long session times due to multiple retransmissions of packets that were not received. It is not obvious this is happening by monitoring the Winlink session windowss. TX and RX levels can be adjusted by the Windows Sound settings, hardware controls (if your interface has them) and radio menu settings. All three can change the levels. You should document all these levels once they are set. Always use open squelch for data operations.

Notes for the different hardware options:

Signalink

Set the TX and RX dials on your Signalink to the 9 o'clock position as a starting point. Set DLY (delay) to the lowest setting, i.e. no Signalink delay. In Windows Sounds, set your USB Audio CODEC Speaker (Playback) level to 100%.

### C-Media Based sound card interfaces (DRA, RIM, etc.)

These devices may or may not have any level control adjustments on the board, adjustments are done using the Windows Sound level sliders and any controls on the board.

Radios with built-in sound cards

For these radios, TX and RX levels can be adjusted by settings in the radio menus and also using the Windows Sound sliders.

To set the RX level, use the Windows Sound Record level, and/or your device controls, to achieve a clean waterfall with the radio squelch open, and no signal being received. If you selected color waterfall, this should be blue-green color. Received packet transmissions will be yellow with some red.

To set the TX level, use the Windows Sound Playback level, and/or your device controls, to achieve an undistorted transmission of about 3.2kHz deviation. If you have test equipment available, this can be easily set. If you do not have test equipment, you can approximate this level using the Calibration function in Soundmodem while monitoring your transmissions with another radio.
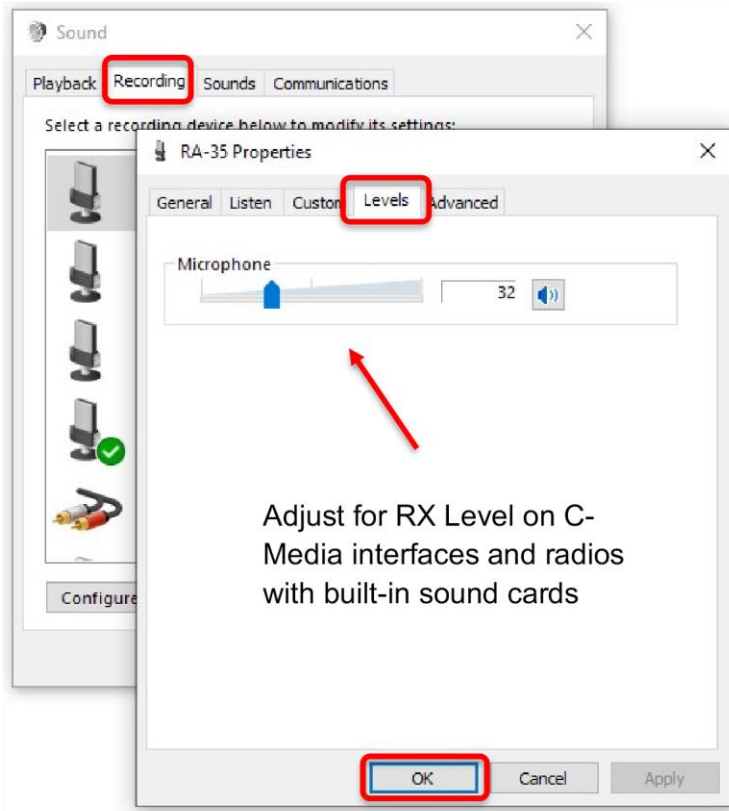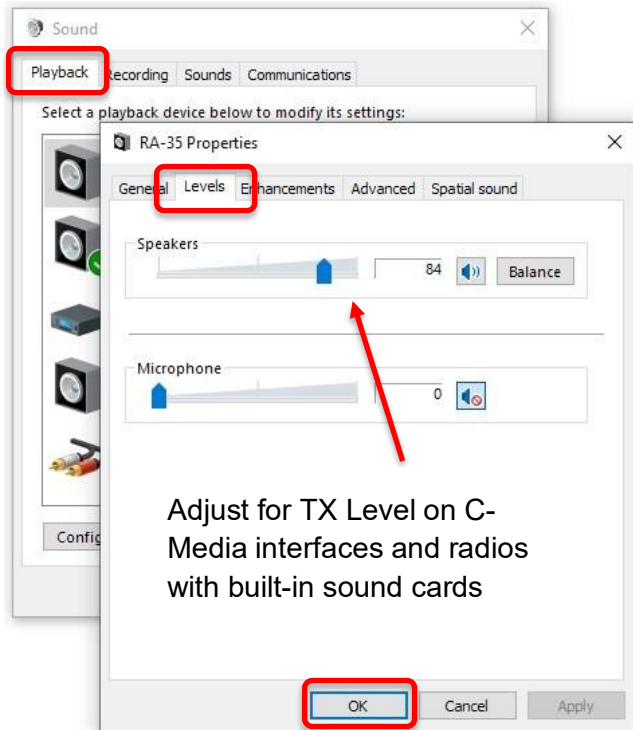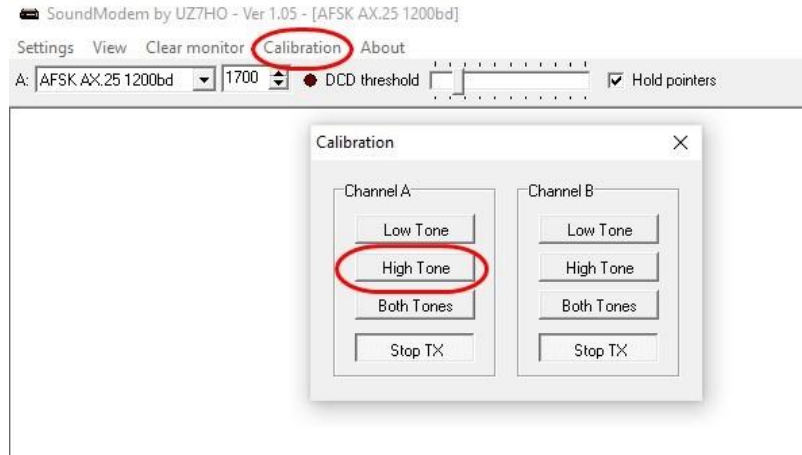
Adjust for RX Level

Adjust for RX Level on C-Media interfaces and radios with built-in sound cards
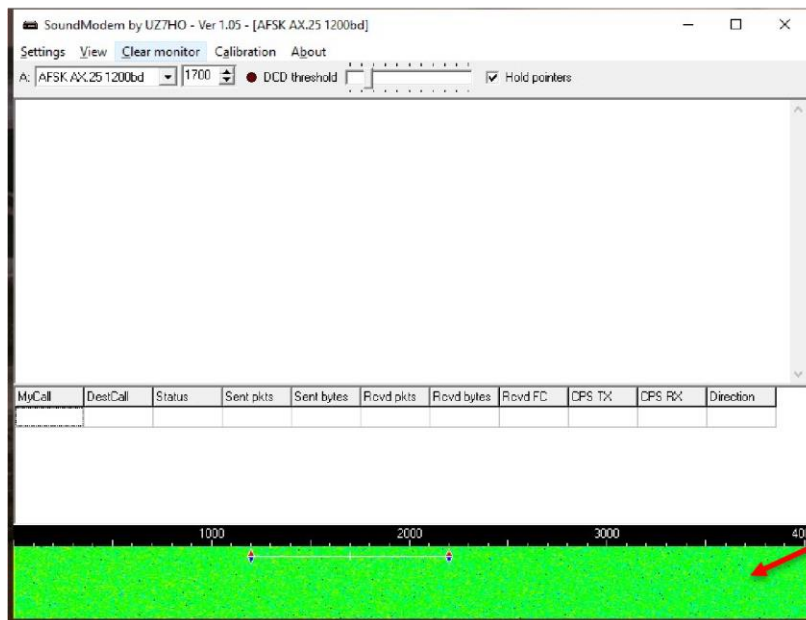
Adjust for blue-green waterfall with open squelch and no signal being received

Set your monitor radio to the same channel and adjust the volume to a comfortable level.
Set the Playback level, or TX control to a low setting.
On the Soundmodem main window, select Calibration.
On the Calibration window, click the **High Tone** button.

Your radio should start transmitting and the 2200Hz tone may be heard on the monitor radio. Adjust the playback/TX level up slowly until you reach the point where further increases in this level do not increase the receive tone level on the monitor radio.
From this point, adjust the level back down just until you perceive a noticeable drop in the receive tone level on the monitor radio.
This should be close to 3kHz deviation.
Click on the **Stop TX** button.
Close the Calibration window.

Adjust for TX Level on C-Media interfaces and radios with built-in sound cards

Adjust for TX Level

Continue with Winlink Express Setup

Winlink Express Setup
Leave Soundmodem running and start RMS Express.

Quick Tip: Winlink Express Setup

If you have not setup Winlink Express, go to **Settings -> Winlink Express Setup** and fill in the appropriate fields.

You only have to do this once (unless your personal information or location changes, e.g. Call Sign, Registration Number, Locator, etc. then update in Winlink Express Setup).

Entering your locator here will help you find Winlink Gateway stations near you. You can look up your Maidenhead Locator at
http://www.levinecentral.com/ham/grid_square.php

If you are an Emcomm station, add EMCOMM to the **Service Codes** field. It will then show both PUBLIC and EMCOMM gateways in your area.
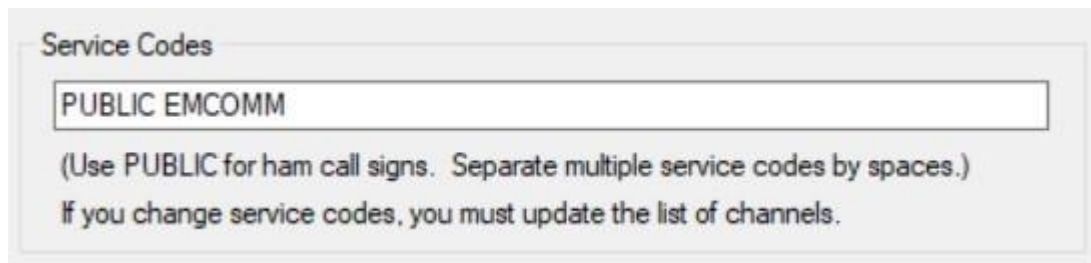
Packet Winlink

Select Open Session: **Packet Winlink**

Click on **Open Session:**

You are now in the Winlink Packet Session

Click **Settings**

Select Packet TNC Type**: KISS**
Select Packet TNC Model: **ACKMODE**

Note: Choose ACKMODE for most instances. However, when troubleshooting connections, you may want to try NORMAL.

Select Serial Port: **TCP** (instead of COM port options in the dropdown menu)
Set TCP Host / Port: **127.0.0.1 / 8100**
Packet sound modem: **C:\UZ7HO\soundmodem.exe**
Check Automatically launch packet sound modem

Note:

1. Enter the path to the folder to which you extracted UZ7HO Soundmodem, in this example C:\UZ7HO\soundmode.exe.

2. If you choose to run Packet Soundmodem manually, then leave "Automatically launch packet sound modem" unchecked.

3. Running two instances of Soundmodem on the same port will return an error: " KISS Server Port Busy". Close all instances of Soundmodem and start only one instance of Soundmodem.

4. Some users prefer to start Soundmodem and VARA FM manually, keep them running and switch between Packet and VARA FM sessions. Soundmodem and VARA FM can be run concurrently.

Select TNC Parameters **1200 Baud**
Check **Enable IPoll**
Click **Update**

Connecting to a gateway
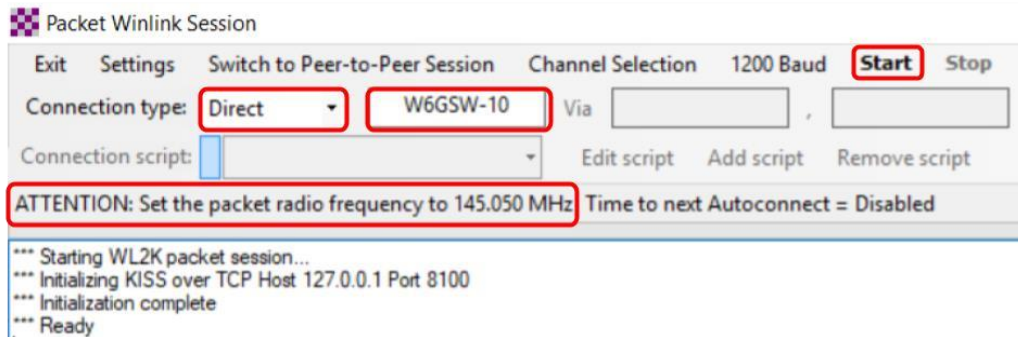
Select Connection Type: **Direct**
Enter Gateway name, in this example: **W6GSW-10**

On your radio set the frequency to the gateway frequency, in this example 145.050MHz. This frequency will be different for different gateways! Use Channel Selection (see Quick Tip below) to make sure you have the correct gateway station call sign and frequency for your area.
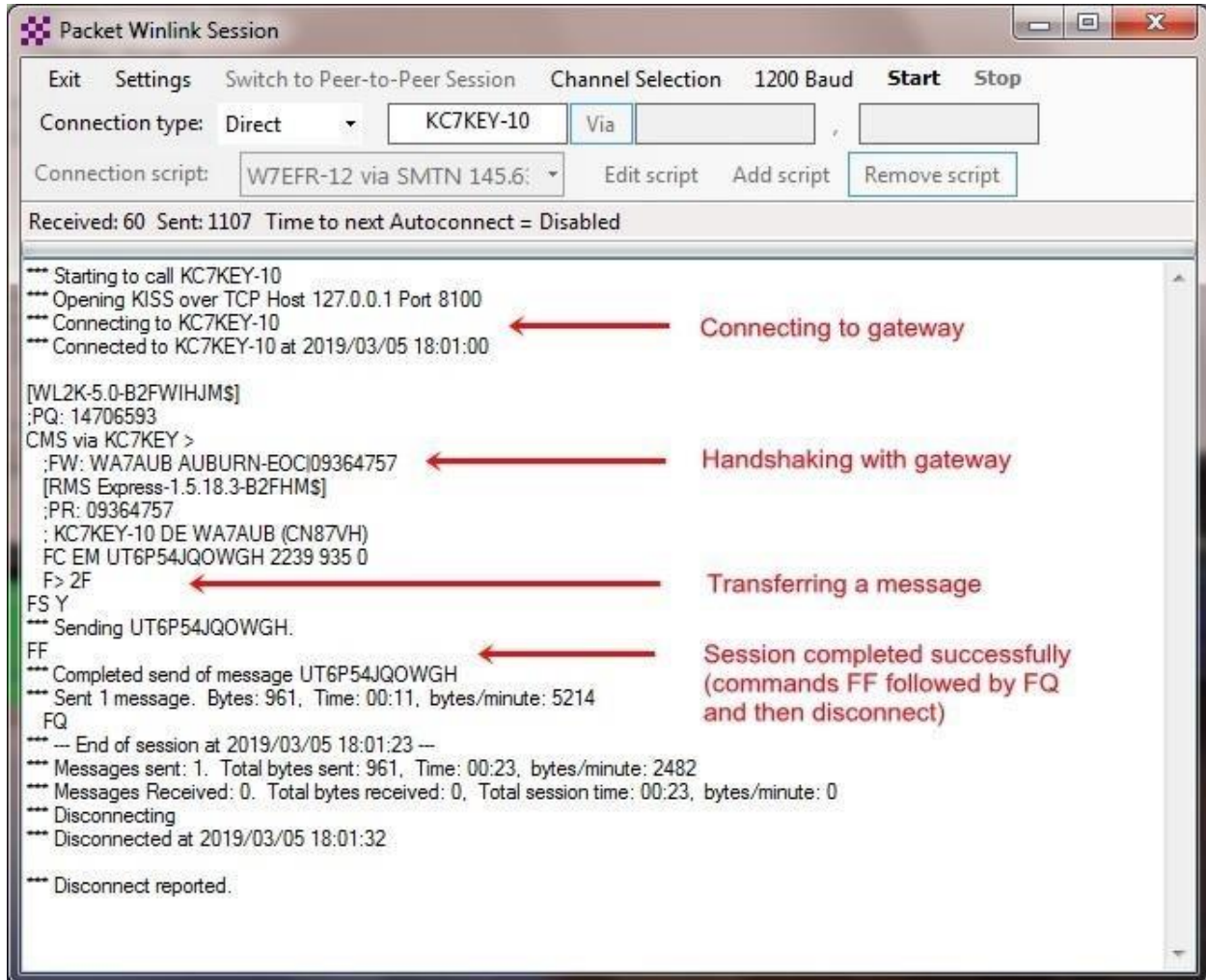Note: Some radios require digital mode to be enabled before you can make a digital connection on the selected frequency. Please refer to your radio manual for details.

Click **Start**

Successful Exchange

Here is an example of a successful Packet exchange with explanations.

For protocol details please see: https://www.winlink.org/B2F

Quick Tip: Channel Selection

Update your available channels on a regular basis, once a month at the very least. Using the Channel Selector automatically populates the relevant fields in the Packet Winlink Session window.

Click **Channel Selection**

Click **Update-via-Internet**

(if you have filled in your grid square correctly in Winlink Express Setup, the Channel list auto-populates with nearby stations)

Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (mi)	Bearing (Degrees)
NS7C-10	145.070	1200	CM95PP	EMCOMM	000	000
W6FM-10	145.730	1200	CM95PP	PUBLIC	000	000
AE6EQ-7	446.950	9600	CM95PH	EMCOMM	023	180
W6BHZ-10	446.950	9600	CM95QH	EMCOMM	024	169
KJ6VMH-10	145.050	1200	CM94SX	PUBLIC	048	163
KJ6VMH-10	446.950	9600	CM94SX	PUBLIC	048	163
KT2KT-10	145.050	1200	DM05JJ	PUBLIC	086	101
WA6LIE-10	145.690	1200	CM96CP	PUBLIC	092	319
KI6HFZ-10	145.050	1200	DM06II	PUBLIC	093	058
K6TZ-10	145.050	1200	DM04DM	PUBLIC	096	144
W6CTT-10	145.050	1200	DM06DT	PUBLIC	098	035
KF6IDK-10	144.910	1200	CM97SH	PUBLIC	115	007
K6BJ-11	145.710	9600	CM96AX	PUBLIC	115	323
W6TUW-10	144.910	1200	CM97AA	PUBLIC	117	324
KE6AFE-10	145.630	1200	CM97CC	PUBLIC	117	329
K6BJ-10	145.070	1200	CM87XA	PUBLIC	120	322
WB6RJH-10	145.690	1200	CM87WA	PUBLIC	123	321

Double-click the gateway station you want to use.
The Packet Winlink Session window will read **ATTENTION: Set the packet radio frequency to xxx.xxxMHz**, this also gives you the frequency you should set your radio to.

Note: Here in SLO County several of the gateway stations can only be reached by using the mountain top network nodes. To do that, you will need to set up connection scripts to navigate the network. This is explained in more detail on the videos available on the North County ARES website:

https://www.sloncares.org/training