



SalCo ARES Digital Messaging Reference

ICom IC-7100

FOREWARD

I would like to thank S. Porter, KA5GOQ and J. Bratton, AA5AD for their assistance in testing and preparation of this guide. It takes a team!

Some additional notes about Winlink Gateways: You may get frustrated or think you can't connect to _____ gateway when it doesn't respond on your first connection attempt (usually 10 tries), but don't give up! The way the Winlink Gateway software works is it "scans" each frequency for approximately 6 seconds before moving to the next. So, for example, our Gateway (AD5EO) has (in essence) two possible gateways – 40 meters narrow and wide modes. The narrow and wide modes reside on different frequencies within the same band. (In our case, 7.096.00 (40m narrow); and 7.103.00 (40m wide). So it takes approximately 12 seconds to complete the cycle. When you click "start" to start the connection from your radio it is probable you will not hit perfectly within the scanning software of the gateway.

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Icom IC-7100

Direct USB Connection to IC-7100

Winlink Installation

Download RMS Express from <https://winlink.org/ClientSoftware> ; Winlink Express (right side of page), then scroll to bottom of page for download (do not install yet).

For Icom radios, go to this link to download the most current virtual Com port drivers:

<https://drivers.softpedia.com/get/Other-DRIVERS-TOOLS/Icom/Icom-ID-7100-Transceiver-USB-Driver-120.shtml> or

https://www.icomjapan.com/support/firmware_driver/?keyword=7200&open=tab2&type=5#download_result

Select the appropriate download for your operating system.

Install the drivers as directed (before you connect the USB cable to the computer !).

Install a **shielded** USB A to mini B cable between the computer and the radio using the mini B USB port on the rear of the radio. Correct procedure: insert USB Micro B connector into back of radio, **turn radio on**, then insert USB cable into the computer. Failure to follow these steps will result in the incorrect drivers to be installed.

Your computer should automatically load the appropriate drivers and create two com ports.

(FOR Windows 7 Pro; Windows 10 Pro)

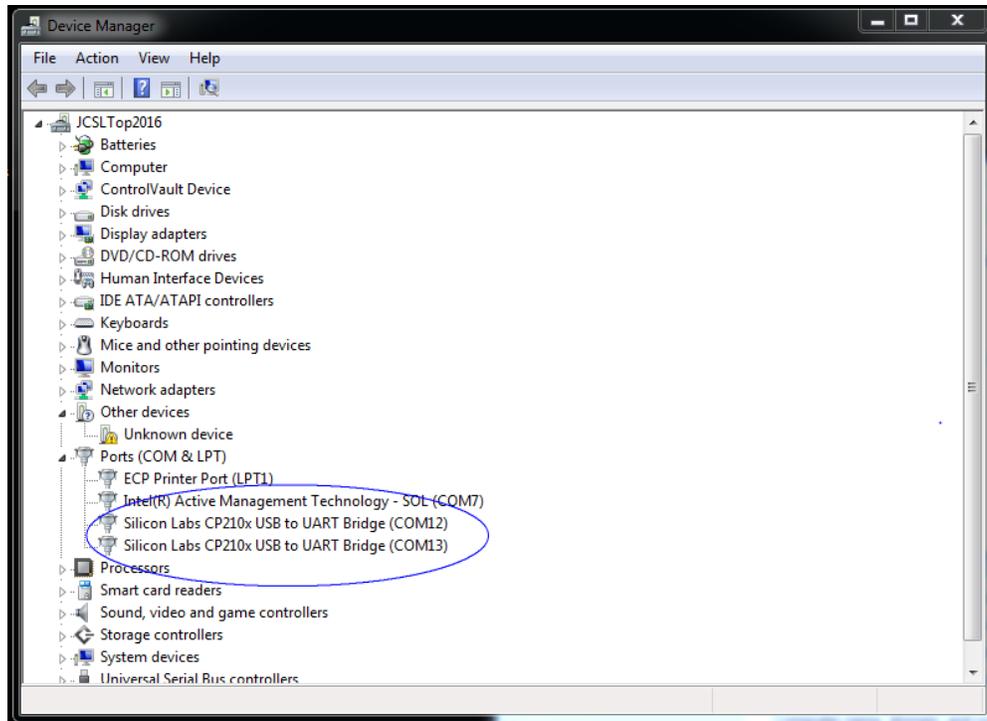
Click on the Windows orb at the lower left side of the screen

Navigate to “Computer” and right click.

Select Properties

Select Device Manager

Expand Ports (Com and LPT)



NOTE: your com port number may be different than mine.

Make note of these two com port numbers, they will be required in the Winlink set-up process.

Install Winlink Express (following the screen prompts).

Open Winlink Express and you will see:

The screenshot shows the 'Winlink Express Properties' dialog box. Several fields are circled in red to indicate required information:

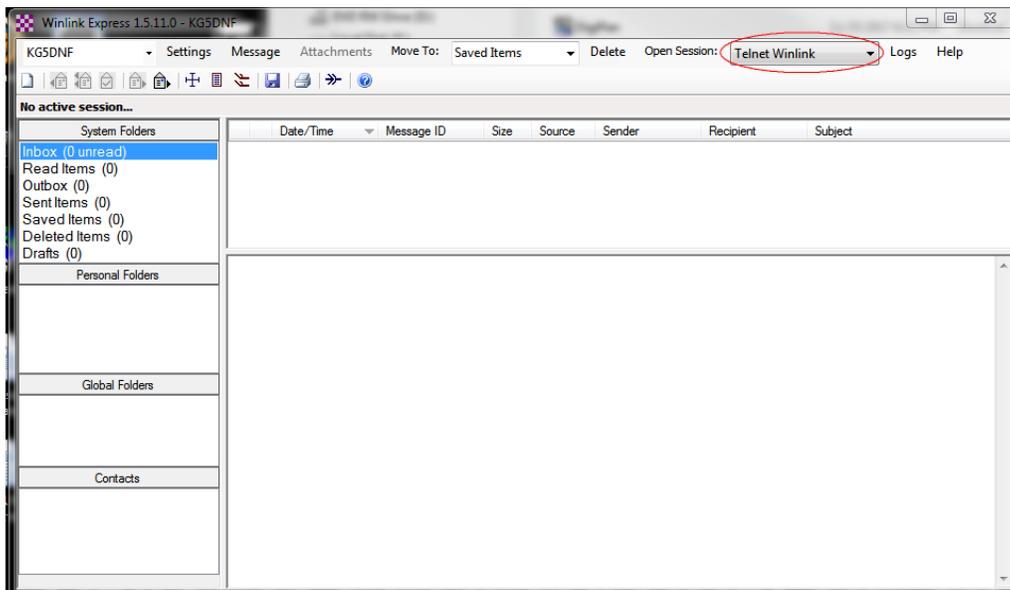
- My Callsign:** A text input field.
- My Password:** A text input field with '(Case sensitive)' written below it.
- Password recovery e-mail:** A text input field with '(Non-Winlink e-mail address where lost password will be sent when requested)' written below it.
- My Grid Square:** A text input field.
- Path to propagation forecast program:** A text input field containing 'C:\tshfbc\'
- Update:** A button at the bottom of the dialog.

Other visible fields and options include:

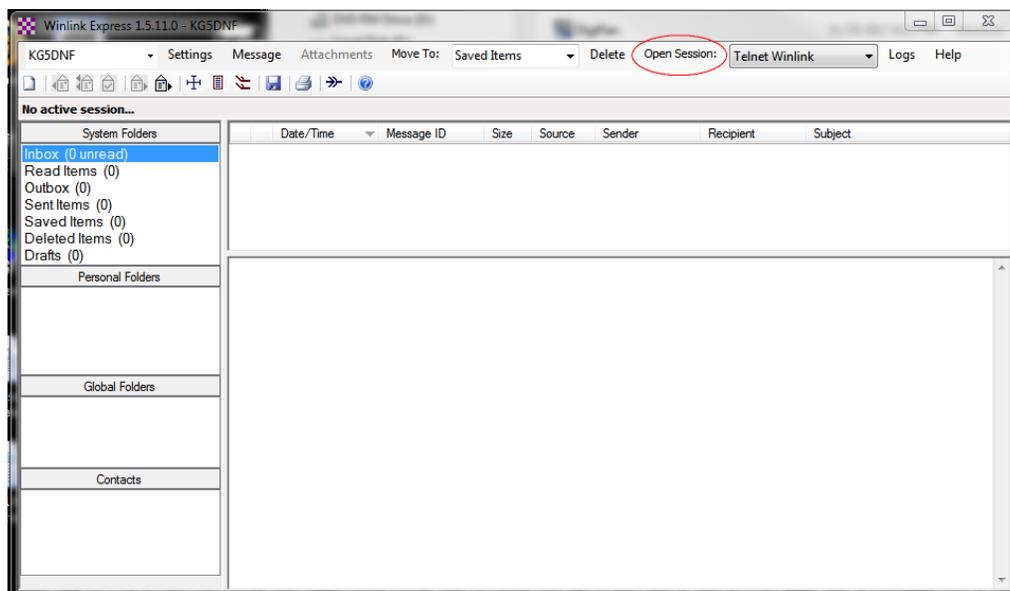
- Call Signs:** 'Callsign suffix (optional):' (Used for country code) and a 'Show password' checkbox.
- Auxiliary Callsigns and Tactical Addresses:** A list box with 'Add Entry', 'Remove Entry', and 'Edit Entry' buttons.
- Winlink Express registration key:** A text input field.
- Service Codes:** A text input field containing 'PUBLIC'.
- Contact Information (Optional):** Fields for Name, Street address 1, Street address 2, City, State/Province, Country, Postal code, Web Site URL (optional), Phone number, and Non-Winlink e-mail.
- Additional information (optional):** A large text area.
- Recalculate HF path quality if SFI changes more than:** A numeric input field set to 30.
- Keep logs for:** A spinner set to 1 weeks.
- Keep deleted messages for:** A numeric input field set to 30 days.
- Options:** Checkboxes for 'Display list of pending incoming messages prior to download', 'Warn about connections to stations holding messages', 'Allow diagnostic information to be sent to the Winlink Development Team', and 'Automatically install field-test (beta) versions of Winlink Express'.

At a minimum, fill in the areas I have circled. (The Winlink Express Registration key is not required, however if you wish to donate to the furthering of this software, \$24.00 is the registration fee (as of February 2018)). After you've filled in these blanks, please press "UPDATE".

To verify the program was installed correctly (and to complete the installation),
On the pull-down menu near the top of the window, select “Telnet Winlink” from the options:

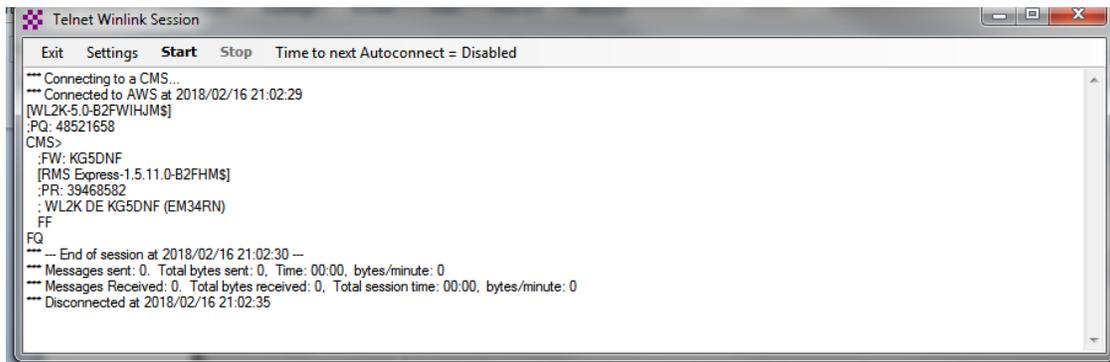


Then “click” on the “Open Session” text (it actually is a button).



On the window that opens up, press “Start” to begin the session

You will then connect to one of the RMS (Radio Message Servers) via your internet connection.



After Winlink completes its connection press either Exit or the Red “X” to exit the session.

The email you provided in the set-up process will receive an email from Winlink Express.

Now you’re ready to set up Winlink Express for use with your radio.

Before you proceed, some setting on your radio need to be verified/changed:

Press the [SET] button on the radio, navigating to the third page of the menu (3 of 4), selecting Connectors. Ensure your radio is set to the following options:

USB Audio SQL:	Off (Open)
ACC/USB Output Select:	AF
ACC/USB AF Level:	50%
ACC/USB IF Level:	50%
ACC MOD Level:	50%
DATA MOD Level:	50%
USB MOD Level:	50%
DATA OFF MOD:	MIC,ACC (This will need to be set to USB for non-data mode rig control, MIC, ACC for Voice)
DATA MOD:	USB
External Keypad:	(No changes)
CI-V:	
CI-V Baud Rate:	19200
CI-V Address:	88h
CI-V Transceive:	OFF
CI-V Output (for ANT):	ON

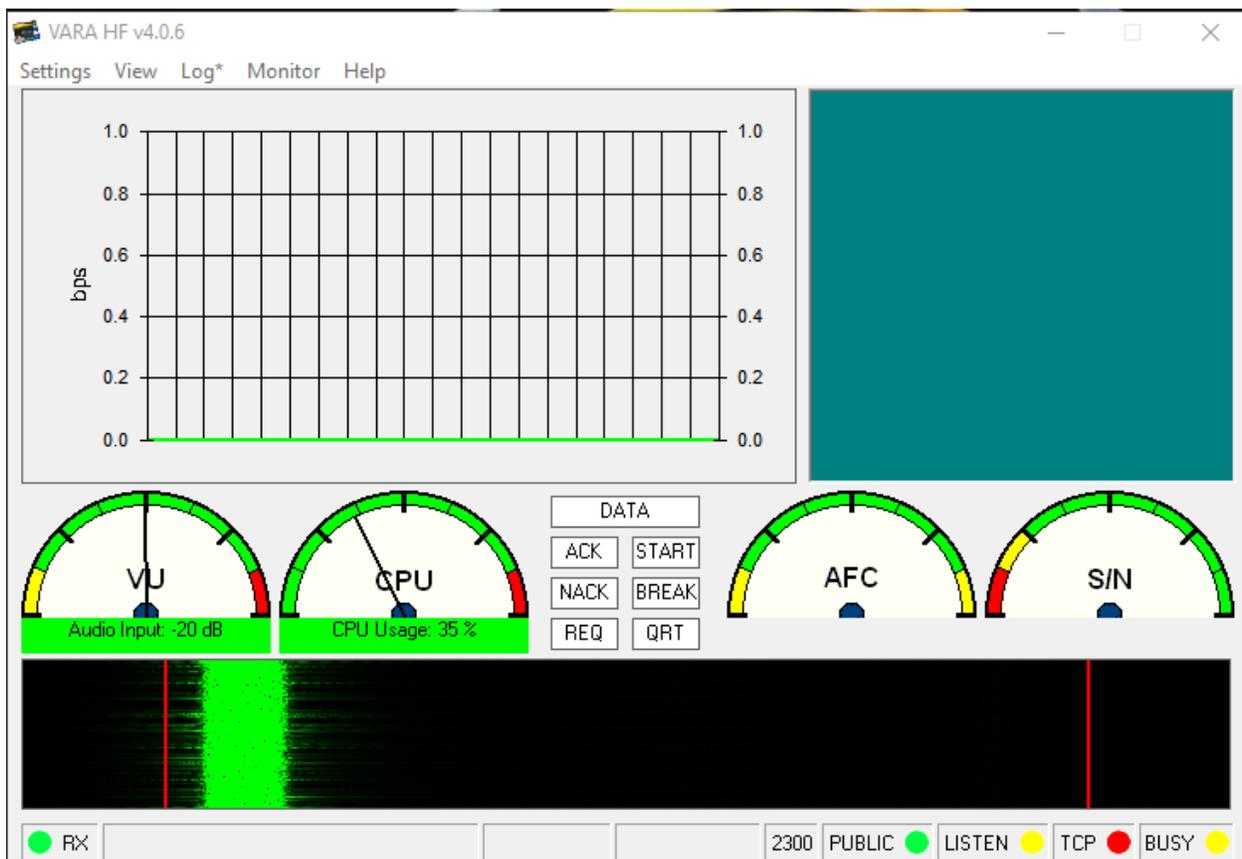
Press the [SET] button once again to return the radio to normal operating mode.

Winlink Vara HF Setup

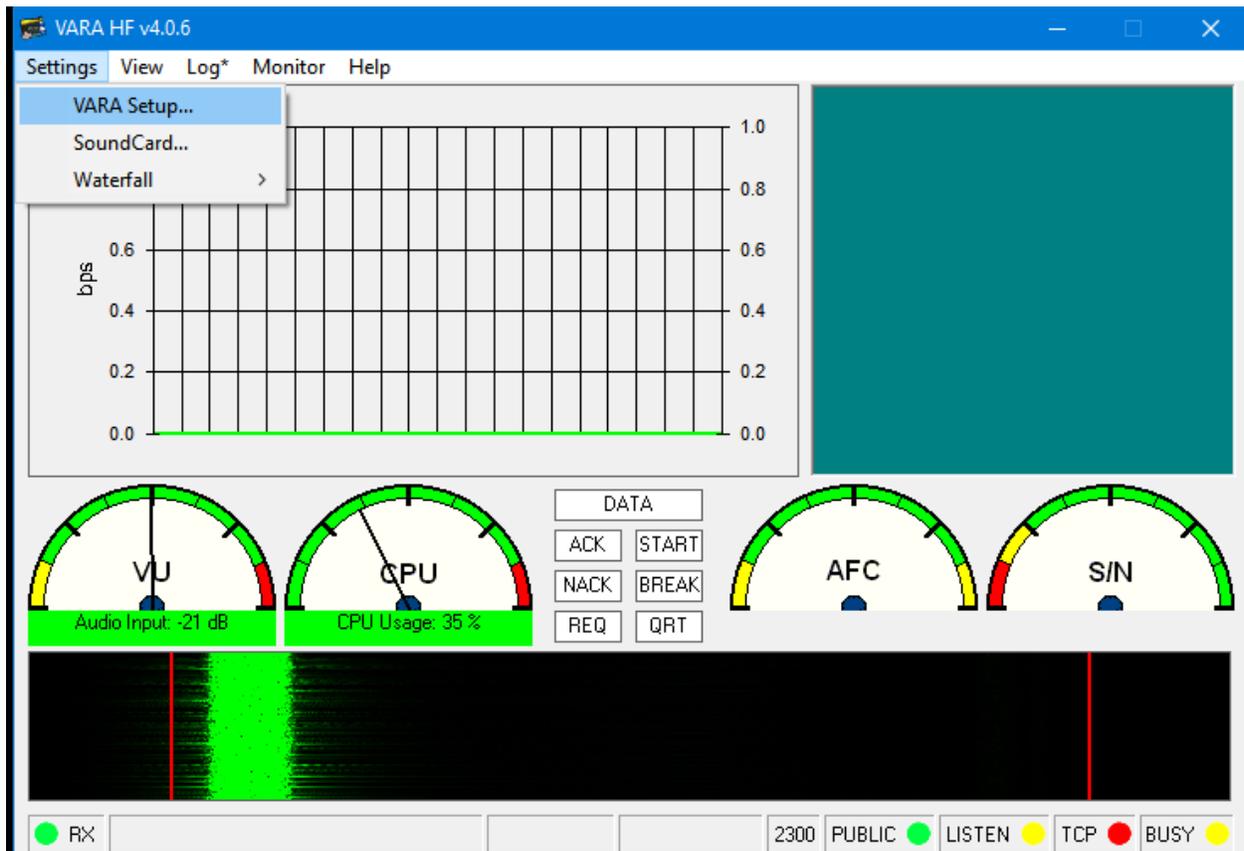
VARA HF is a high-speed Digital HF modem. It is usable without a license key (\$69.00 at time of writing) but higher speeds will not be available without the license.

Before setting up Winlink Express for VARA HF, you must first close Winlink express, and download the VARA HF software: <https://rosmodem.wordpress.com/> . Once the software has downloaded, install following the screen prompts.

The option at the end of the install is to “Launch Application”. This will allow you to setup VARA HF.



Select [Settings] [VARA Setup]



The Main VARA settings screen will be as follows:

VARA Setup

TCP Ports:

Command	Data
8300	8301

VARA Licenses

Callsign:	Registration Key:
KG5DNF	XXXXXXXXXXXXXXXXXXXX
Callsign:	Registration Key:
AD5EO	XXXXXXXXXXXXXXXXXXXX
Callsign:	Registration Key:
Callsign:	Registration Key:

Allow VARA check for updates via internet server

500<->2300 Gateway Compatibility

Tuner enhancement

CW ID

RA-Board PTT

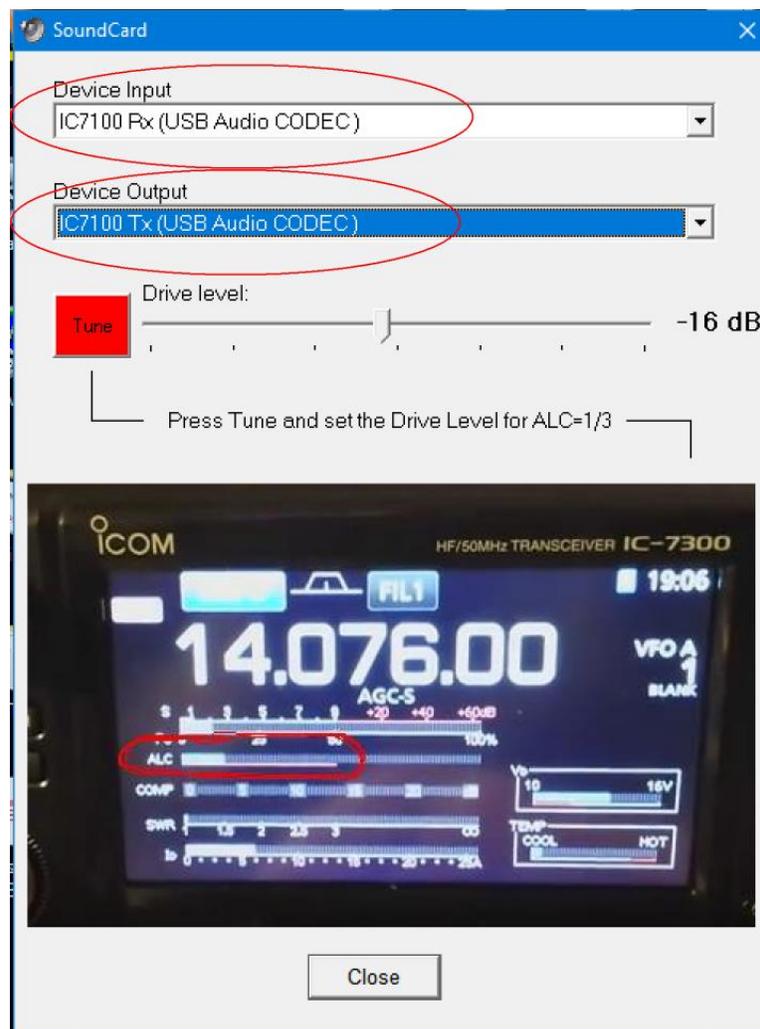
Retries:

10

Close

Enter your calls sign (and registration key if you have one) and ensure the indicated boxes are checked. Then press [CLOSE].

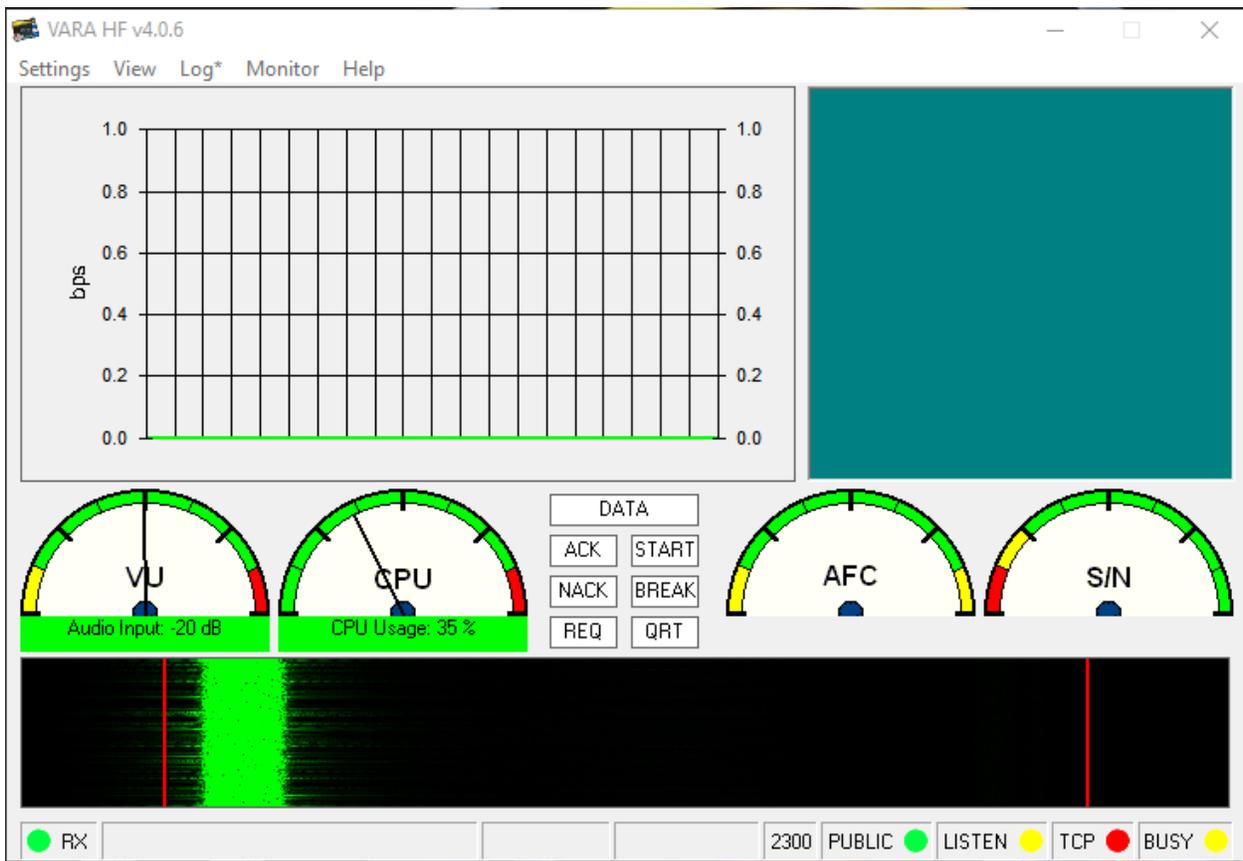
Select [Settings] [Soundcard Setup]



In the two pull-down lists, select the USB Audio CODEC (NOTE: I have renamed my CODECs to appropriately indicate which Soundcard is being used since I have multiples; If you have multiple USB Audio CODECS you may have to try a few times to select the correct one).

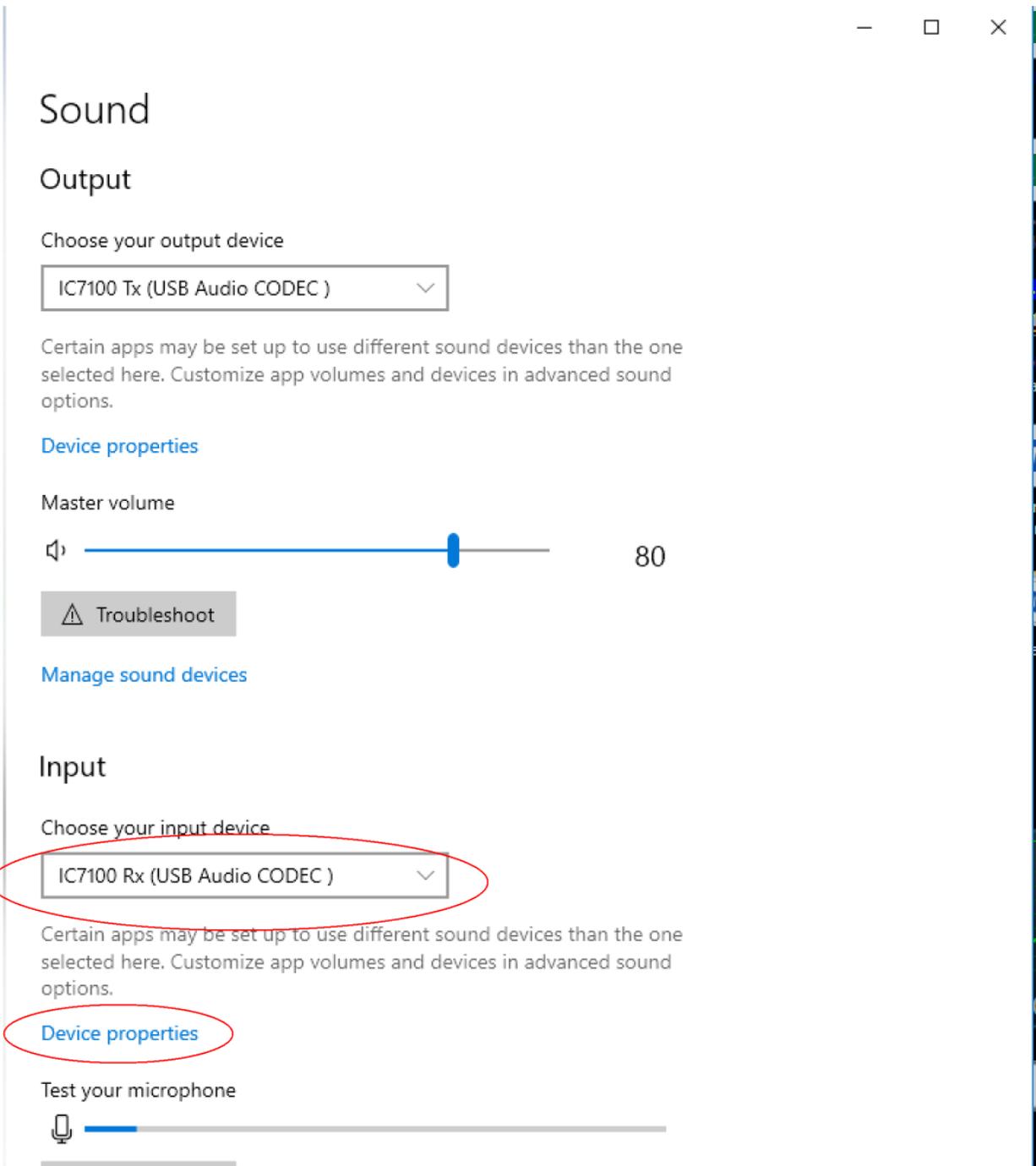
When finished, press [CLOSE]

Providing your radio (and soundcard) are turned on, the main screen of VARA should look similar to the following image:



Please note the “VU” meter should have the needle pointing in the green section at or below the midway point. If it is higher than that, you will need to adjust the microphone level.

To do so, leave the VARA main screen up on your display, move your mouse to the lower right corner of the display and [Right Click] on the speaker icon. Click on [Open Sound Settings]



Select the appropriate USB Audio CODEC from the [Input] pull down box, then click [Device Properties]

← Settings

🏠 Device properties

🎤 IC7100 Rx Rename

Disable

Volume

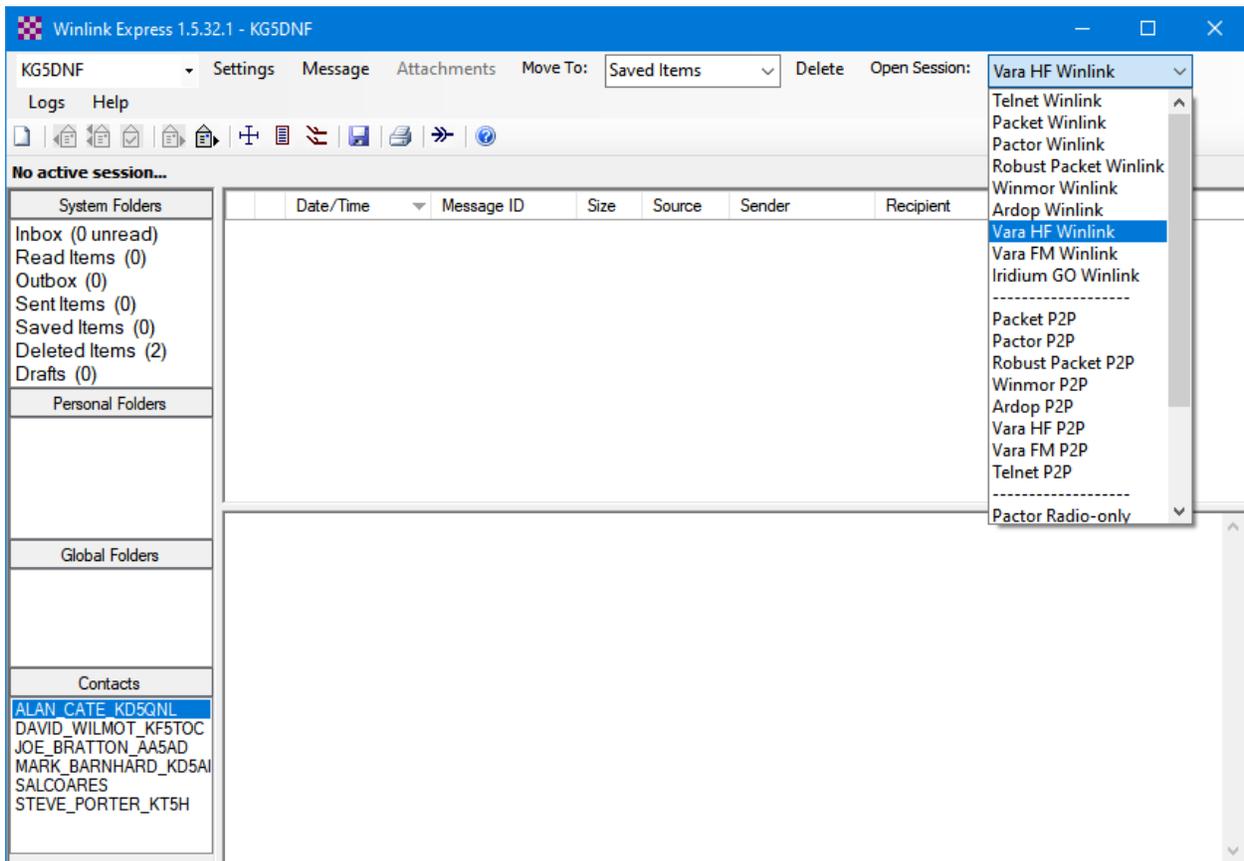
🎤  41
Start test

Adjust the [Volume] slider until the VU meter is adjusted appropriately.

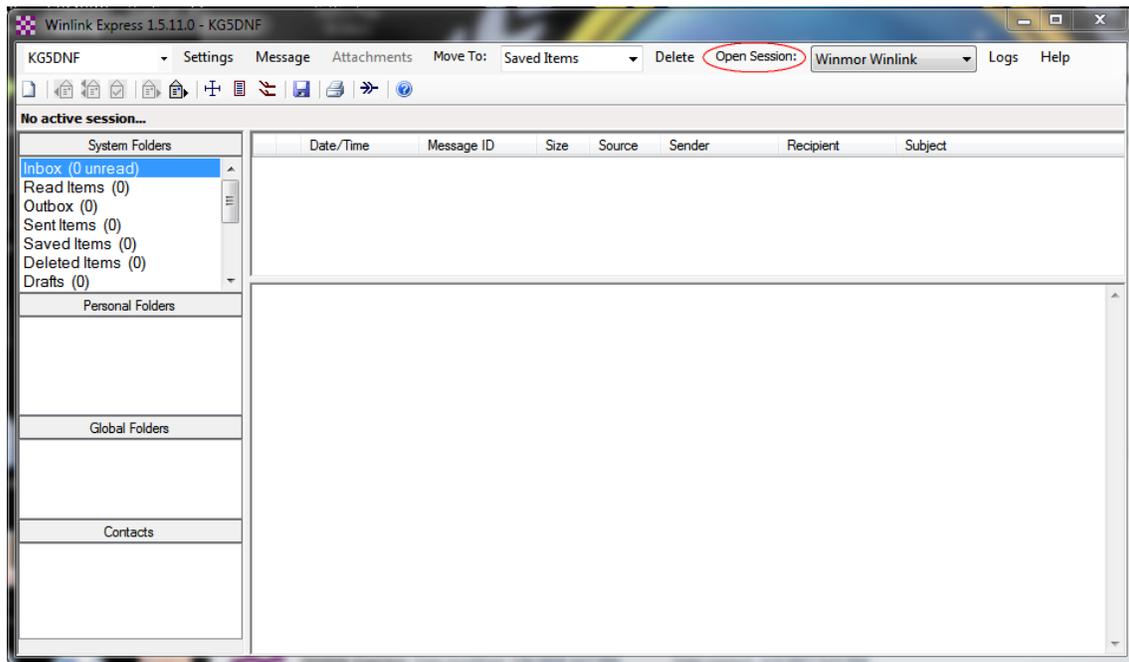
Please note the screenshots for computer settings are from a machine running Windows 10.

Now you may close all these open windows. (VARA and Sound Settings)

Now, restart Winlink Express, Select [VARA HF Winlink] from the pull down:

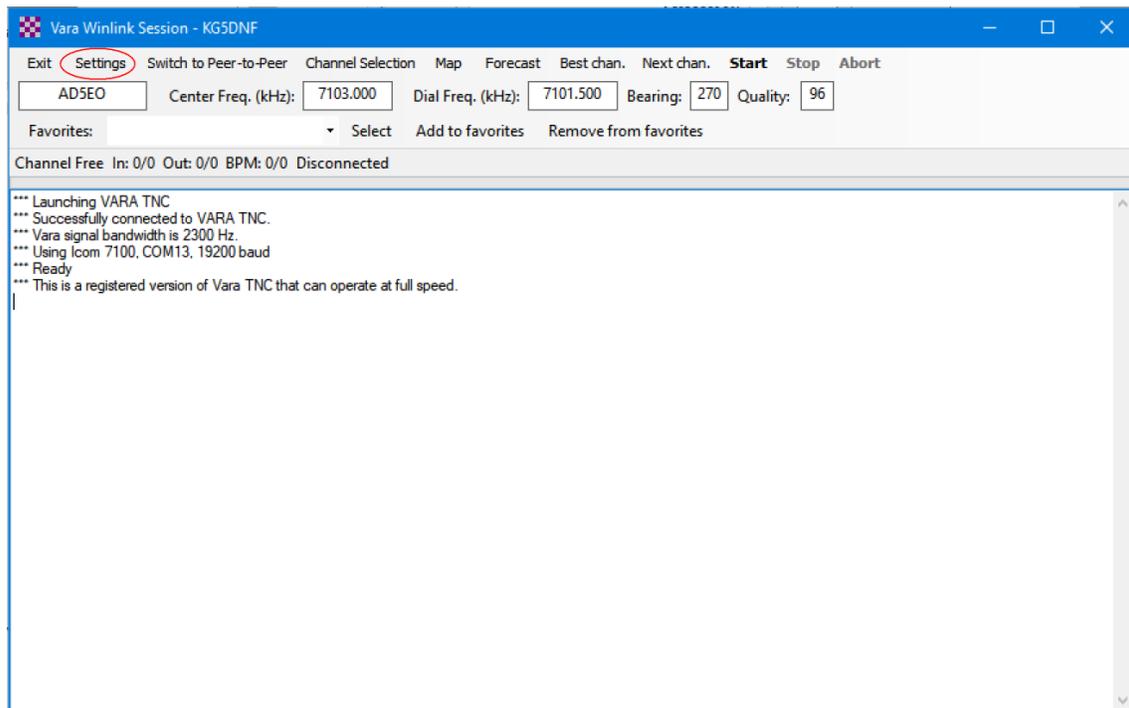


Then press the “Open Session” button:

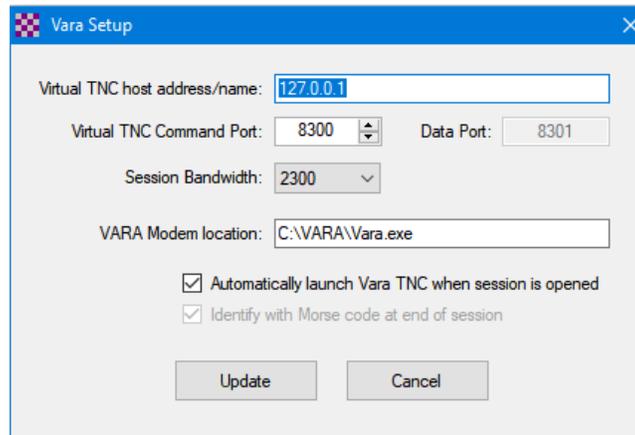


Yes, [Open Session] is an actual button not text!

A new window will appear entitled VARA Winlink Session. Click on [Settings]:

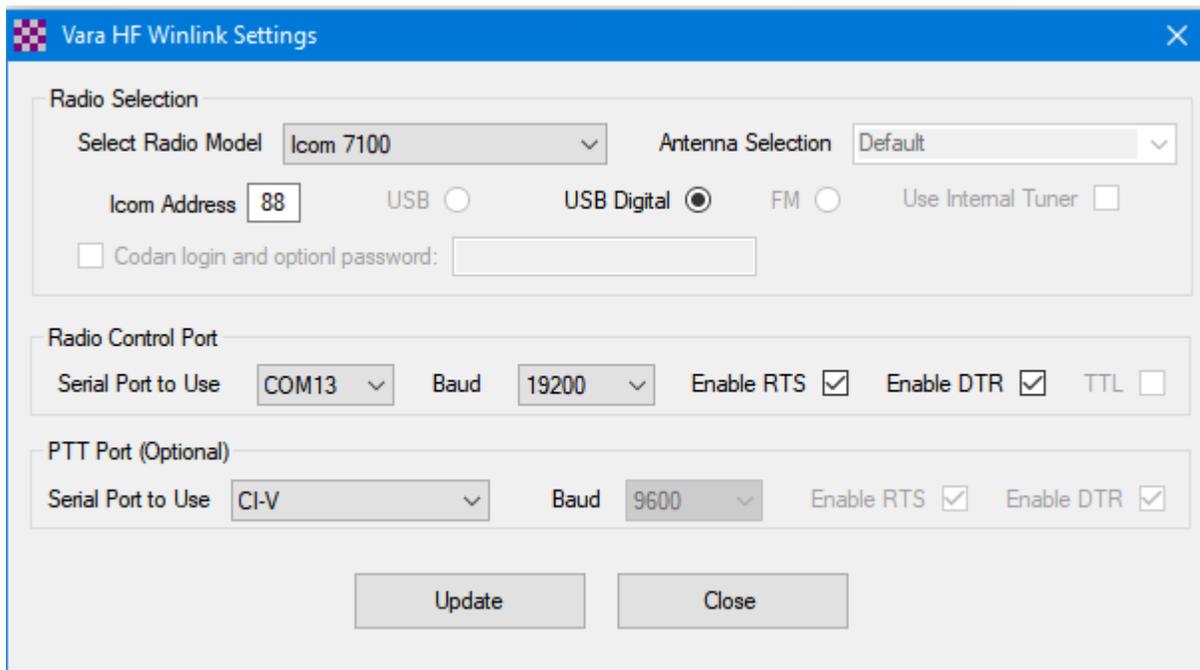


Select [VARA TNC Setup]



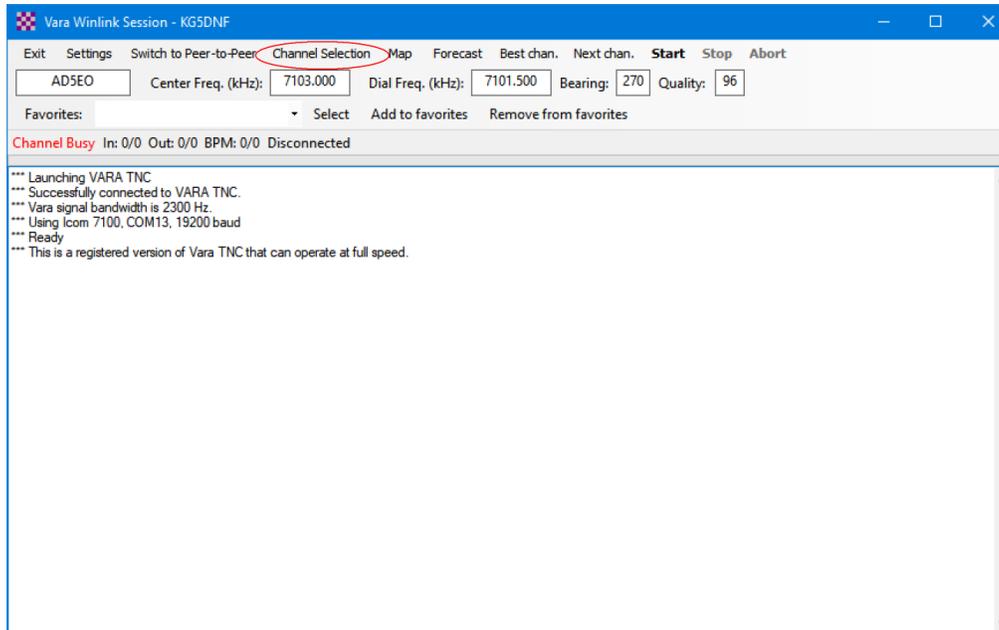
Ensure all items are as indicated in the above screenshot. When finished, Click [Update] then click [Close]

Next, click on [Settings] [Radio Setup]



Ensure settings are as indicated in the above screenshot (**NOTE**: your serial port (COM) will more than likely be different from mine. The two COM ports that appeared when you connected the radio USB to your computer are the comm ports required for this section (use the lower of the two numbers)! When finished, click [Update] then click [Close].

The next step is to click on “Channel Selection”:



A new window will appear. Select (click) on “Update Table Via Internet”:

Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KB5LZK	3598.500	1600	EM34UT	00-23	PUBLIC	36	039	99	99
AD5EO	3590.000	1600	EM34QN	00-23	PUBLIC	8	270	99	99
AD5EO	7103.000	1600	EM34QN	00-23	PUBLIC	8	270	96	96
KB5LZK	7101.200	1600	EM34UT	00-23	PUBLIC	36	039	96	96
N4JGW	3597.000	1600	EM74LR	00-23	PUBLIC	686	086	91	55
K9EYZ-10	3589.100	1600	EM50PM	00-23	PUBLIC	574	140	91	54
KD7UHR	3588.500	1600	EM58BQ	00-23	PUBLIC	516	027	90	56
KF5FNP	3583.500	1600	EM30WI	00-23	PUBLIC	469	175	90	55
AK4SK	3570.000	500	EM60VL	23-12	PUBLIC	746	126	90	52
AK4SK	3591.000	1600	EM60VL	23-12	PUBLIC	746	126	90	52
WX4PCA-10	3591.000	1600	EM73NU	00-23	PUBLIC	708	094	90	55
W9FE	3597.000	1600	EM59AA	00-23	PUBLIC	546	024	90	56
WW4MSK	3592.500	1600	EM74UW	00-23	PUBLIC	754	084	90	54
K0SI	3586.500	1600	EM39UA	00-23	PUBLIC	496	002	89	56
NS0A	3510.000	500	EN41WK	00-23	PUBLIC	793	015	88	54
NF9D	3595.000	1600	EN51TW	00-23	PUBLIC	896	023	87	53
AJ4FW	3595.000	1600	FM07BC	00-23	PUBLIC	1174	072	86	53

Just a few words on this. This part of the program uses the new software to project the propagation for the various RMS stations. (Your table may not look like the picture until it has completed updating.)

Once the table has been updated you select which station you wish to connect to by double clicking on the call sign. Please note that considerable information is provided here: The frequency used by the RMS station, where it is located, distance from your location, bearing (in degrees) from your location and the path reliability and quality projected at the current time.

Note that the information from the channel selection window has been propagated into the fields on the Winmor Winlink Window, AND your radio should have been automatically set to match the frequency and mode (USB-D). [NOTE: if your IC-7100 does not respond to the rig control, on the radio check [SET][Connectors][DATA MOD] (Should be USB).

At this point, I usually manually enable the tuning on my AT-100ProII to ensure it doesn't attempt to tune while the Winlink program is attempting to establish communications with the RMS server. Also, it is extremely important to note that LDG recommends a power level setting of 35 watts OR lower to ensure the tuner is not damaged by the intensity of the signal. (You may be surprised how little power is required to make contact! I usually start at 5 watts and increase only if band conditions are unfavorable.)

When ready, press "Start" on the VARA Winlink screen to initiate contact. If all settings are correct, your radio will switch between transmit and receive is indicated by the Winmor TNC Soundcard screen with the waterfall. Do not assume program problems if you do not initially make contact with a station. All the facets of USB communication come into play including band fading.

Sit back and enjoy the show! This type of message transmit and retrieval is nowhere near as fast as an internet connection, however, it will get through when internet infrastructure is inoperable.

When the connection has completed, you may exit all windows including the main Winlink Express window. If you have received a message you will see it in the System Folders (Inbox) section of the main Winlink Express screen.

VARA FM Setup

This setup assumes you have already set up Winlink Express and Vara HF.

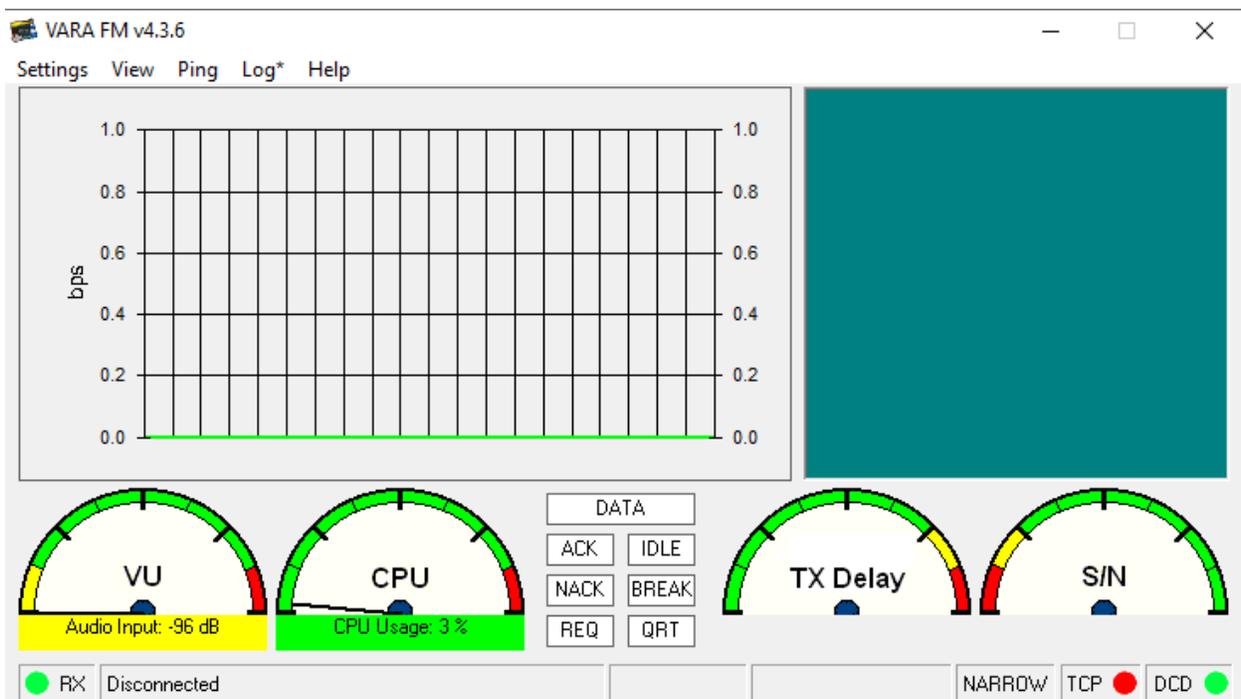
You do not need CAT7200 nor Soundmodem for VARA FM to work

Download the most current version of Vara FM here: <https://www.winlink.org/tags/vara>

Once the zipped folder has completed downloading, Expand all files and install to default folders.

(Your computer may balk at installing this file as it does most non-microsoft applications. Bypass the warnings and install anyway).

When the program has completed installing the VARA FM modem window will appear.



Click on the Settings item.



Then Click on VARA Setup

VARA Setup 10.0.0.16

TCP Ports:

Command: 8300

Data: 8301

FM System: NARROW

Digipeater:

Retries: 2

Allow VARA check for updates

KISS interface SysLog

VARA Licenses:

Callsign:	Registration Key:
AA5FO	*****

Compatible with Signalink USB

SQL

DATA OUT 9600bps

GND

DATA

DATA OUT 1200bps

PTT

DATA IN

to PC input

from PC output

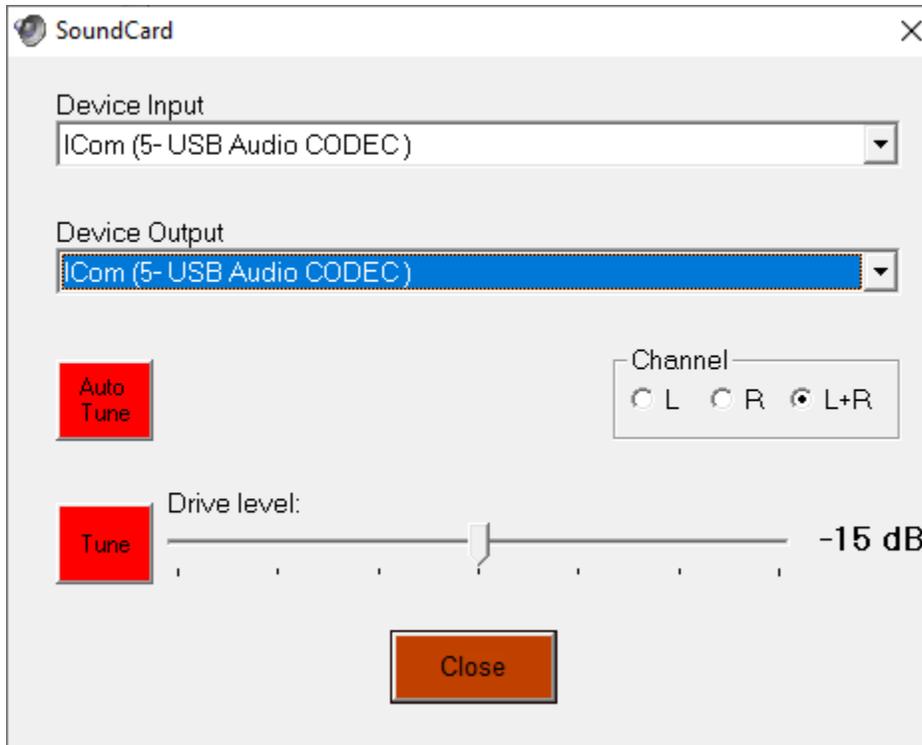
Close

* VARA FM WIDE needs a FM rig set for 9600 Packet operation, with a special soundcard interface (6 kHz BW) connected to rear panel: RA-Board, Signalink "Black" transforms, Modified Signalink (red audio transforms removed), homebrew interface (a simple direct cable)...

* In other case, you must select VARA FM NARROW

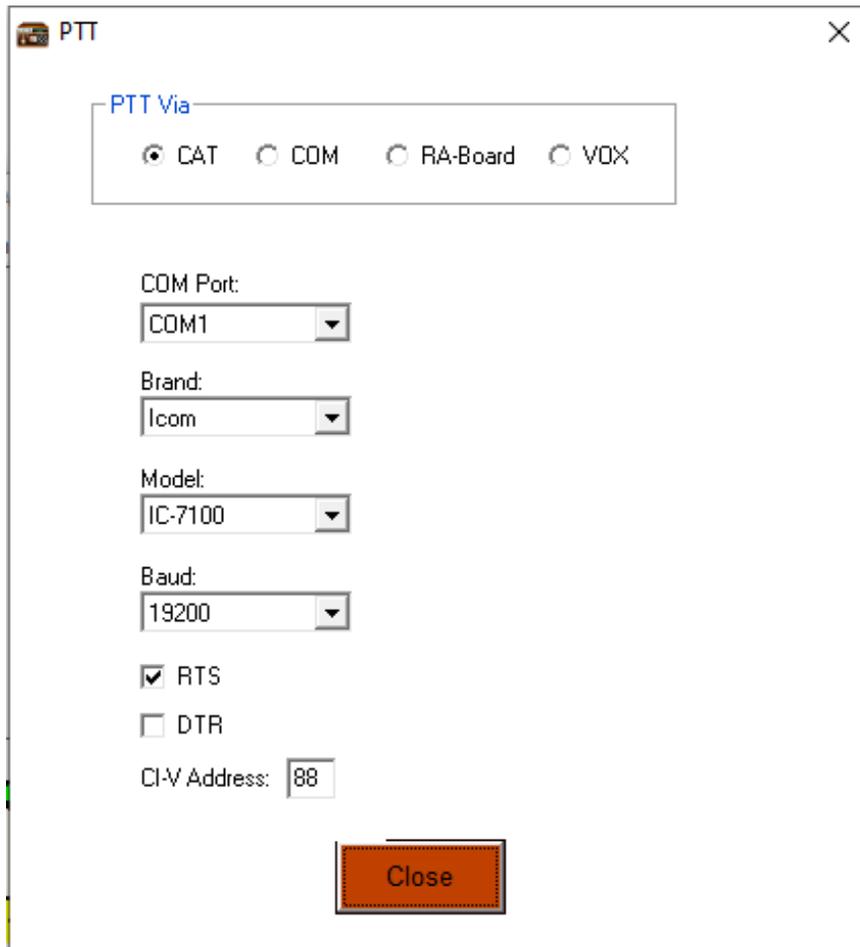
Be sure to enter your call sign and Registration Key (If you have one). For now, leave all other settings alone. When finished, click on the [CLOSE] button.

Next, click on the settings button and click on Soundcard.



As previous, select the USB Audio CODEC related to you IC-7100 for both items. When finished, click on the [CLOSE] Button.

Next, click on the Settings button and the PTT button.

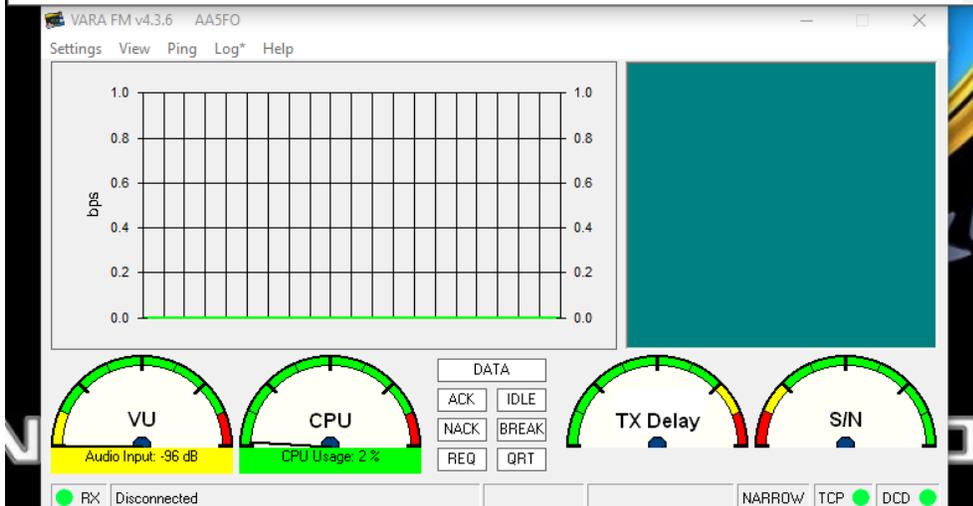
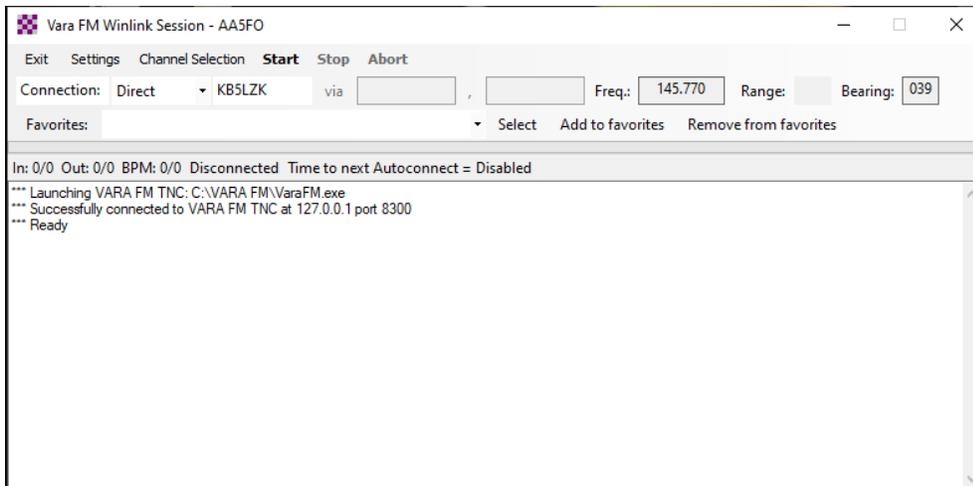
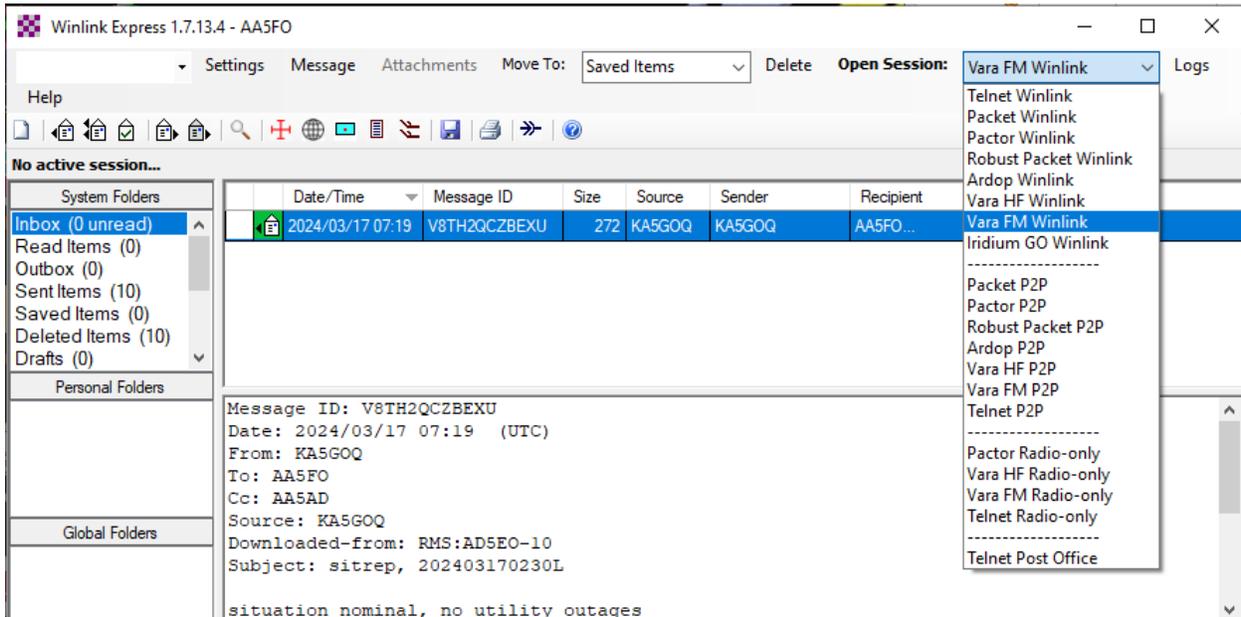


The COM Port number will be the same one you used previously. Ensure all other settings match the window shown above. When finished, click on the [CLOSE] Button.

Finally, close the VARA FM Modem window.

Now, open Winlink Express.

Select Vara FM Winlink from the session type then click on [Open Session].



Click on Settings, then click on VARA TNC Setup

Vara FM Setup

Virtual TNC host address/name: 127.0.0.1

Virtual TNC Command Port: 8300 Data Port: 8301

VARA FM Modem location: C:\VARA FM\VaraFM.exe

Automatically launch Vara FM TNC when session is opened

Show Vara FM TNC screen when it's launched

Automatic Calling

Autoconnect time: Disabled

Automatically call when there are pending outgoing messages

Update Cancel

Ensure settings are as shown. When finished, click on the [Update] button.

Finally, if you are connected to the internet, click on the [Channel Selection] button, then [Update Table via Internet] this will populate the table of the closest Vara FM RMS Gateways. Double click on the station of your choice and it will set the parameters for your session.

NOTE: Vara FM CAT control will not tune your radio to the selected station – you will have to do that manually.

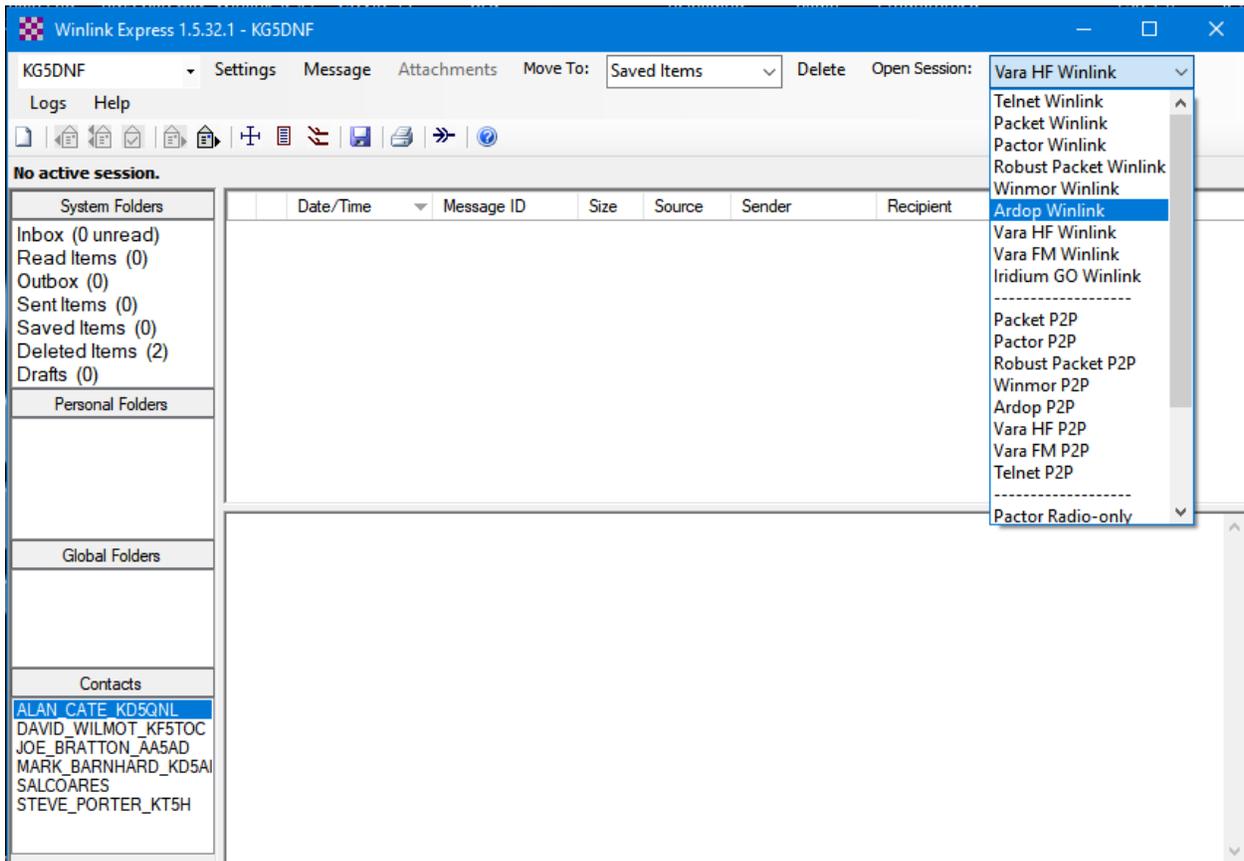
When finished, click on the [Start] button and let the program do its' magic.

NOTE: creating and sending/receiving messages is the same as in all other Winlink sessions.

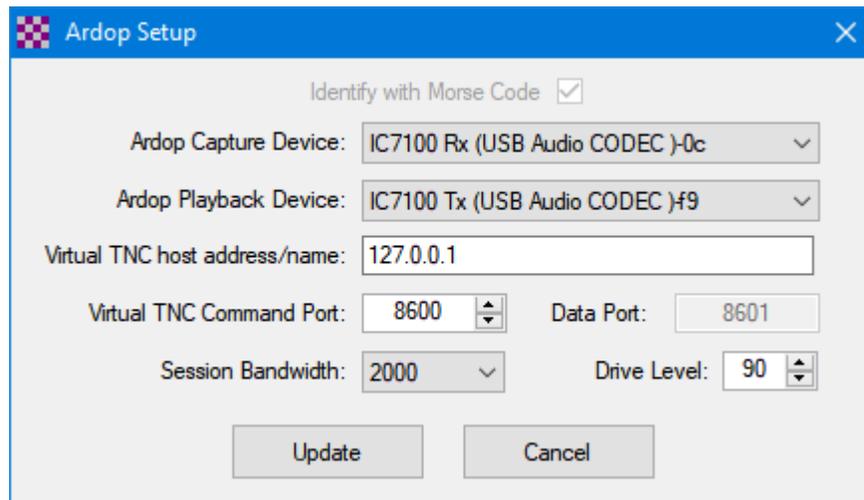
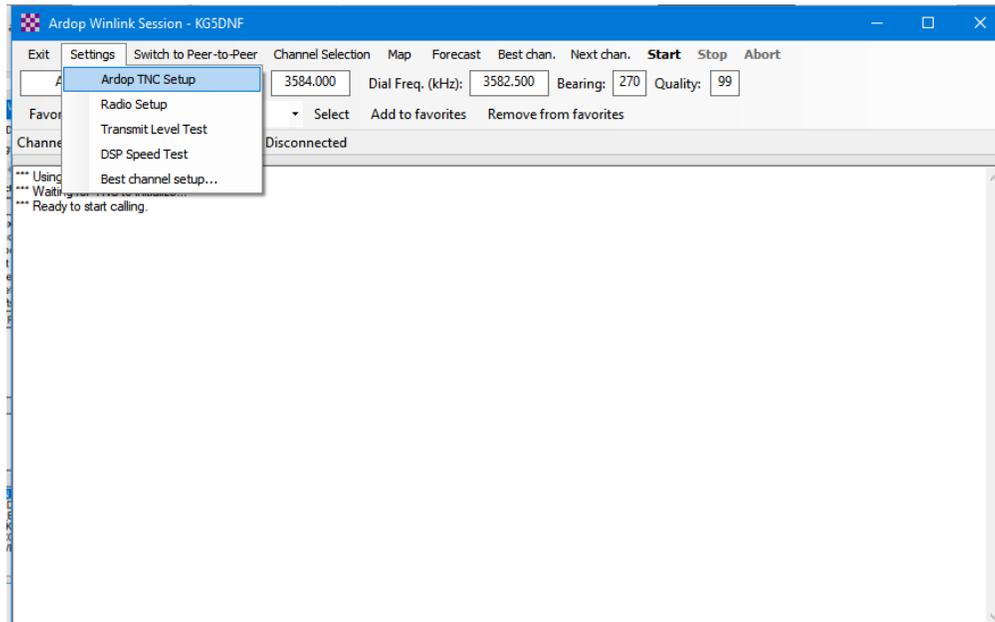
Winlink ARDOP Set-up

The procedure for setting up ARDOP is very similar to VARA HF, but you do not need to download any additional software. All ARDOP software is included in the Winlink Express software.

Select [ARDOP Winlink] from the pull-down menu, then click [Open Session]



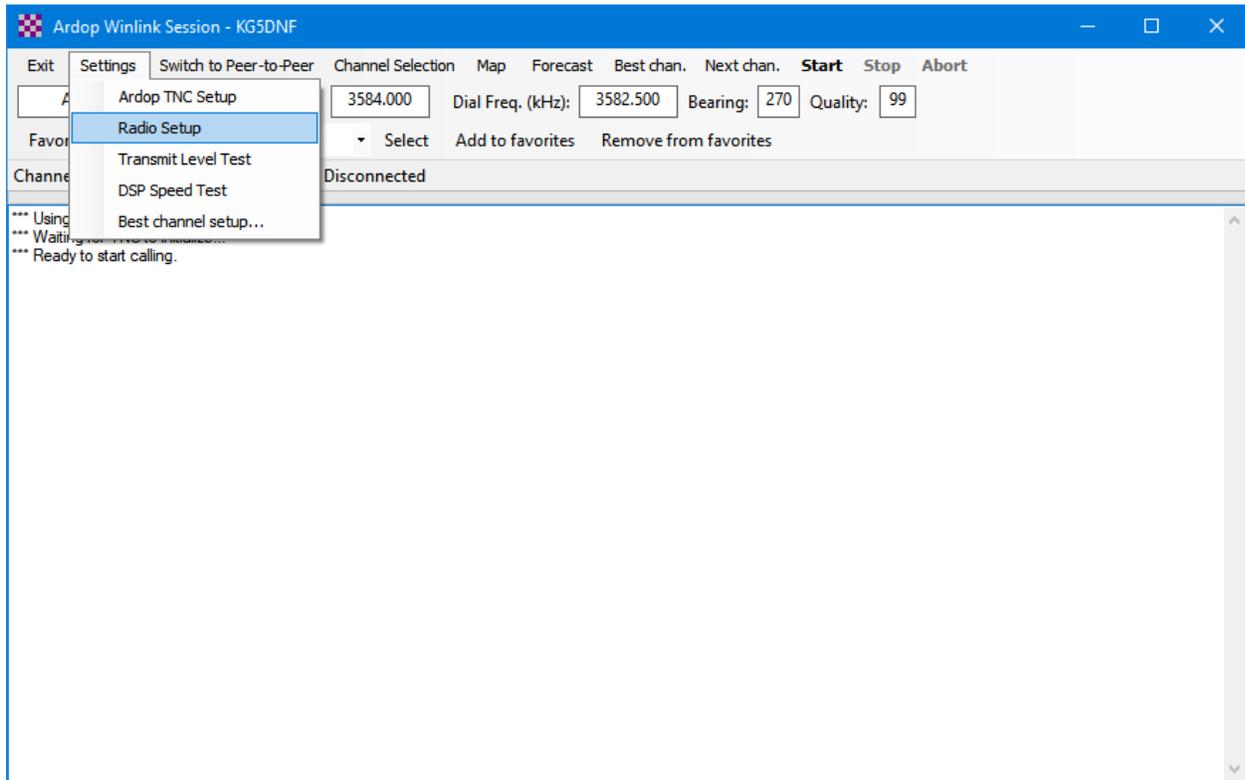
Select [Settings] [ARDOP [TNC Setup]

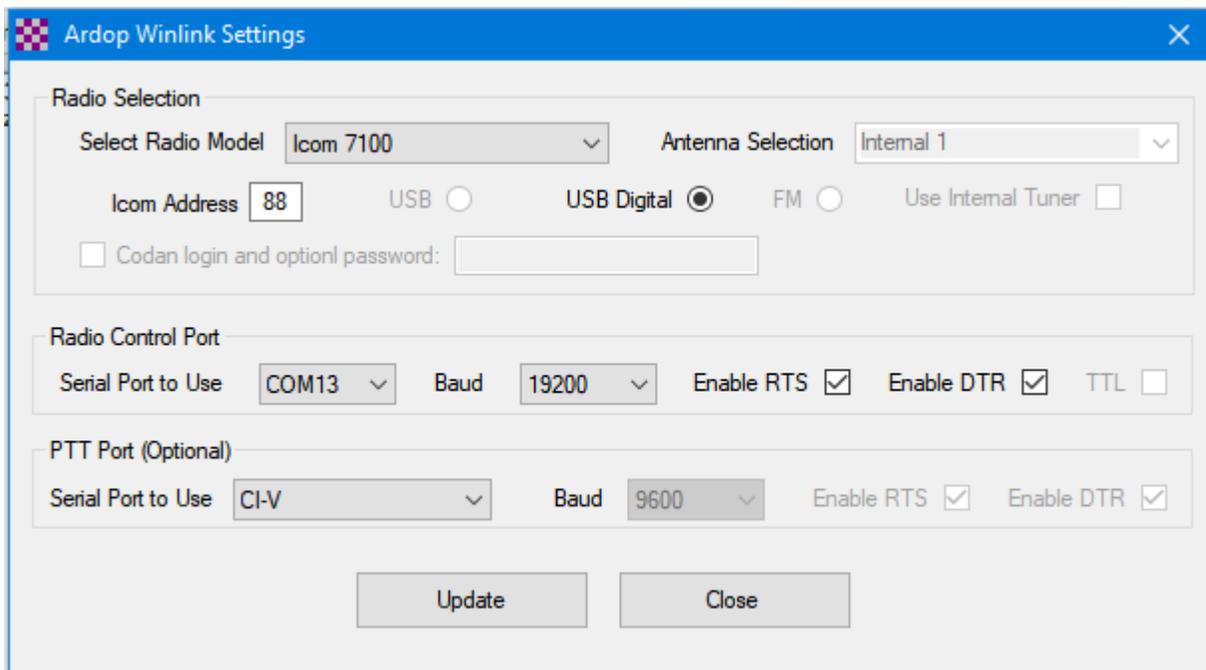


Again, your USB Audio CODEC name will be different than mine! Please select the appropriate CODEC from the pull down menus in both the Audio Capture Device and the Audio Playback Device.

Then ensure the other fields are propagated as indicated in the above screenshot. When finished, click [Update], then click [Close]

Next, select [Settings, [Radio Setup]:





Select Icom 7100 from the [Select Radio Model] pull-down, and ensure all other fields are filled in as indicated remembering that your COM port number will more than likely be different from mine.

When finished, click [Update] then click [Close]

Just to ensure everything is correct, click on [Channel Selection] and [Update via Internet]. When this window has finished updating, double click on the station you wish to connect to, the window will close and the station fields on the ARDOP Winlink Session will be propagated.

Click on [Start] to connect to the station you have selected and enjoy the show!

Winlink Packet Set-up

This is still part of the Winlink suite of software.

In order to use this mode, you will need two additional free software downloads. First is the UZ7HO soundmodem file which can be found here: <http://uz7.ho.ua/packetradio.htm> scroll down the page until you reach the soundmodem##.zip file (where the ## = the most recent number). Download and extract (or unzip). (we'll configure that shortly.)

Also you will need the CAT7200 program which can be found here:

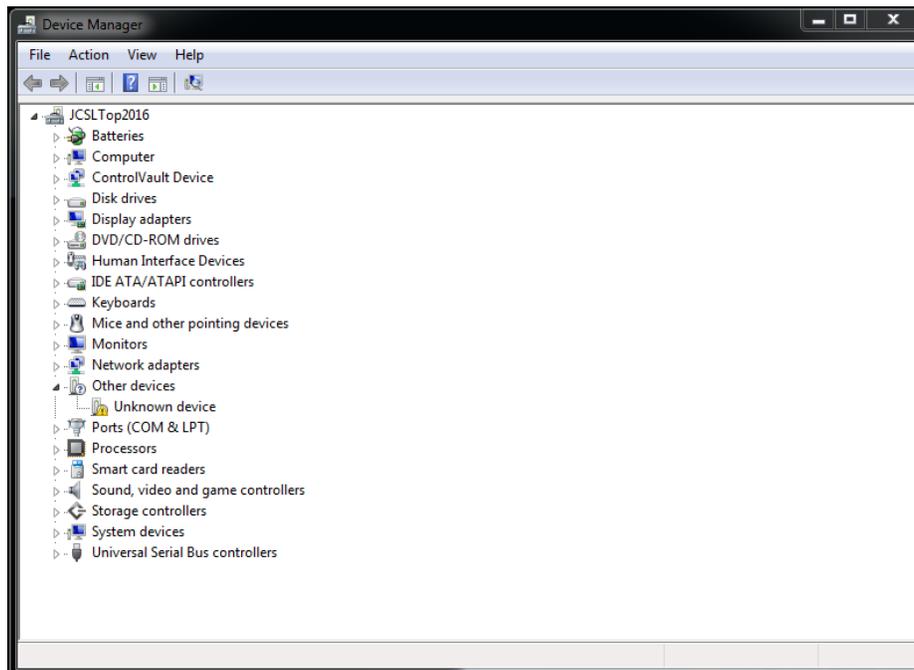
<http://www.cantab.net/users/john.wiseman/Downloads/CAT7200.zip> download. We'll get into the install shortly.

CAT7200 Installation:

Move the downloaded CAT7200.zip file to a "permanent" location on your pc. (I have made a directory on the C: drive called installation packages.) Double click on the "CAT7200 application" file and extract the files into the same directory. After extraction is complete, you will need to perform some manual configuration in the device manager. (DO NOT attempt to start the program at this point!)

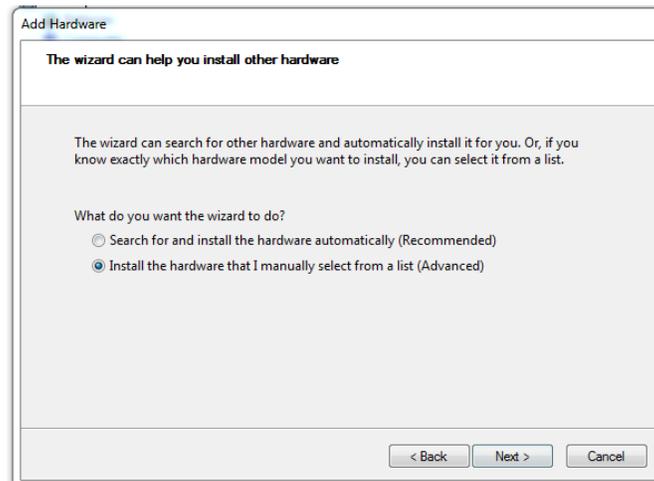
Click on Settings -> Devices

Click on the windows "orb" in the lower left corner of your screen; click on computer -> System Properties -> Device Manager:

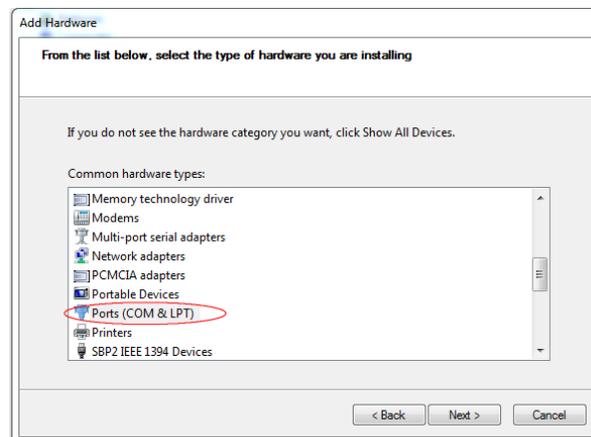


RIGHT click on the computer name (In this case my computer name is “JCSLTop2016”). Select “Add Legacy Hardware”. A new window opens, select “Next”.

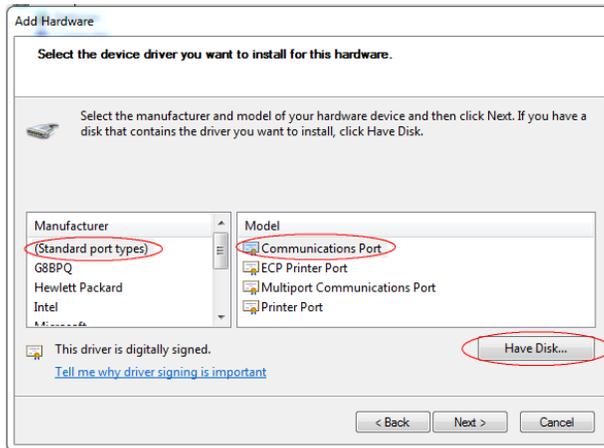
Then, select “Install the hardware that I manually select from a list (Advanced)”, followed by clicking the “Next” button.



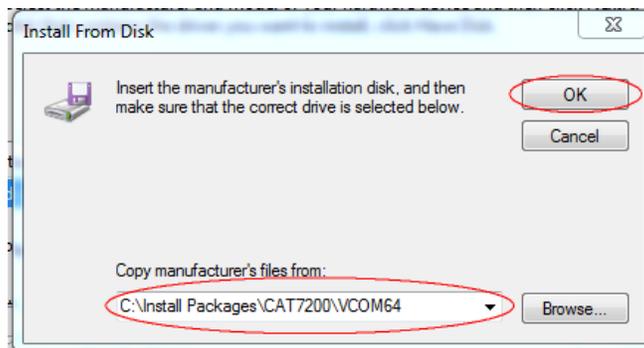
Scroll down and select “Ports (COM & LPT), then click “Next”



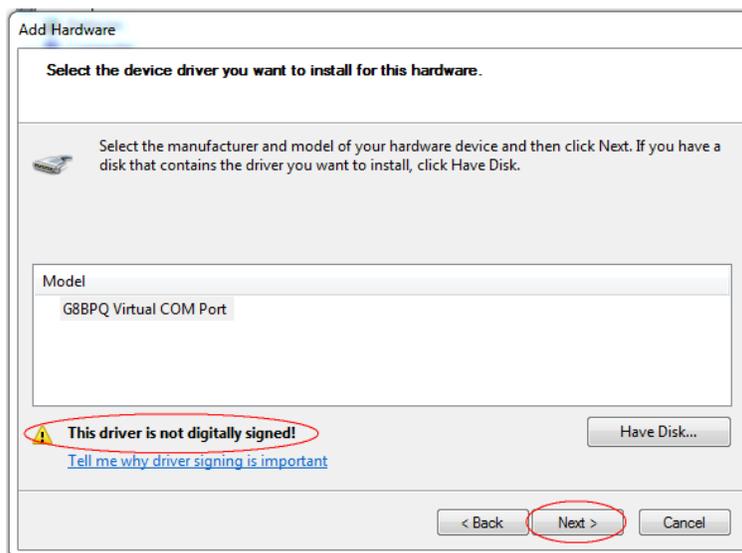
Ensure “Standard Port Types” is selected in the left window, and “Communications Port” is selected in the Right Window. Click “Have Disk”



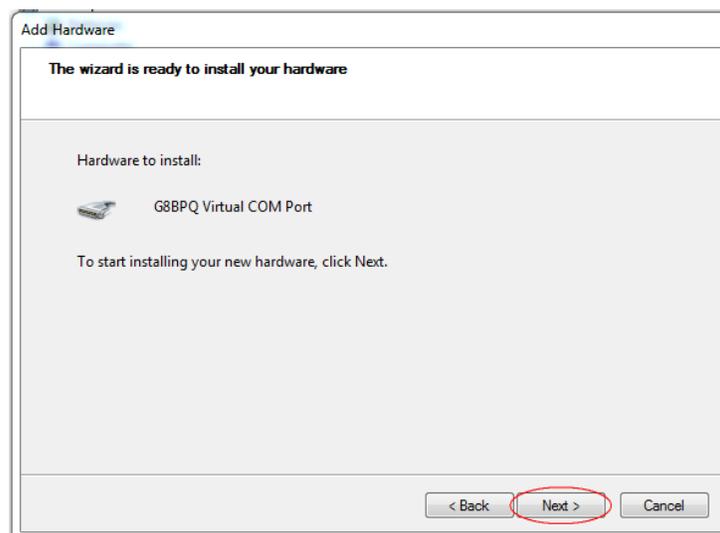
In the "Install from Disk" window, go to the pull down window and open it, select "...\\CAT7200\\VCOM64" (If you have a 64 bit machine). If you have a 32 bit computer select "...\\CAT7200\\VCOM32", then click "OK".



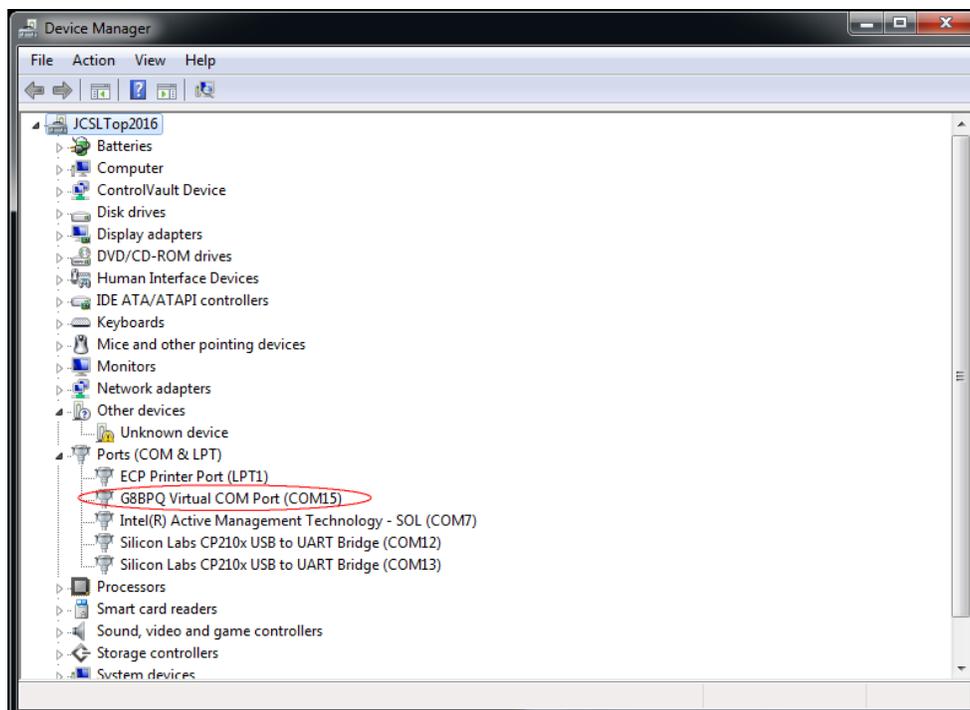
Ensure the "G8BPQ Virtual Com Port" is shown. (Please ignore the "This driver is not digitally signed" prompt) Click "Next"



Your new window that appears should resemble this:

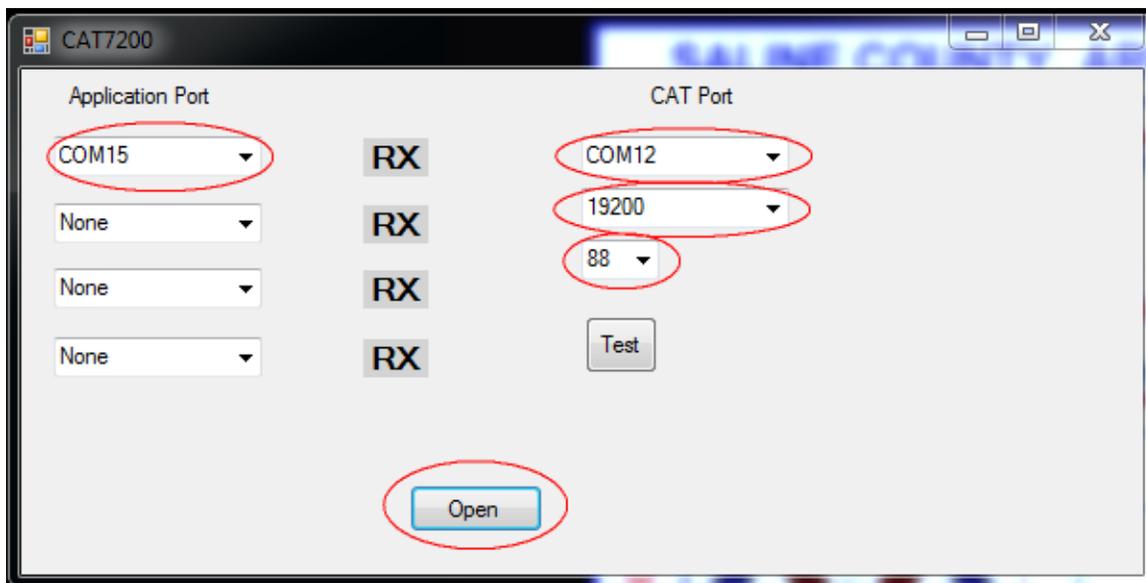


After you click “Next”, the virtual com port will be created. Then, in Device Manager, expand the “Ports (COM & LPT)” group and make note of the new COM port number associated with “G8BPQ Virtual COM Port (COM xx)”:



Now you are ready to install the CAT7200 software. (Which is required to send the CI-V commands to the IC-7100 via the Data2 port on the rear of the radio. Without this piece of software, the other software cannot key the radio.)

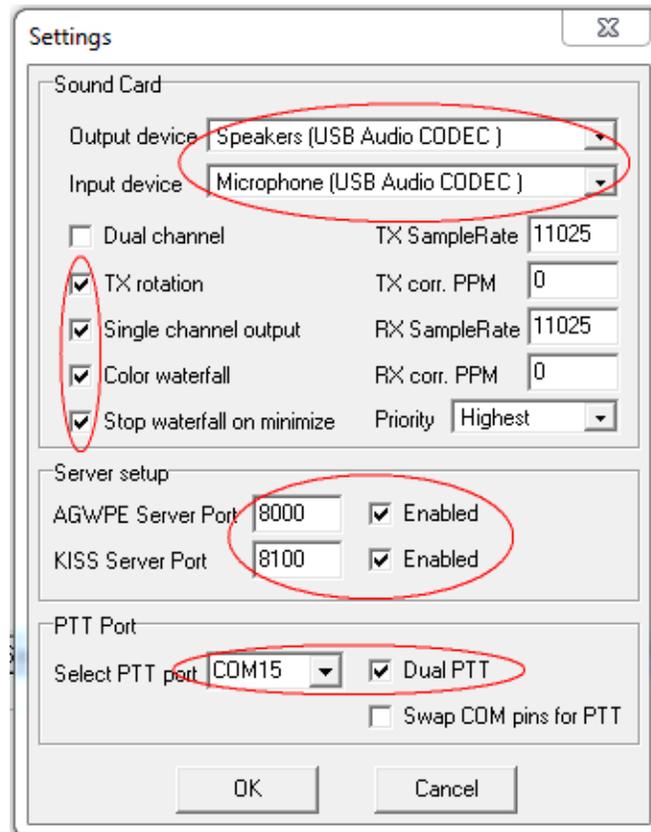
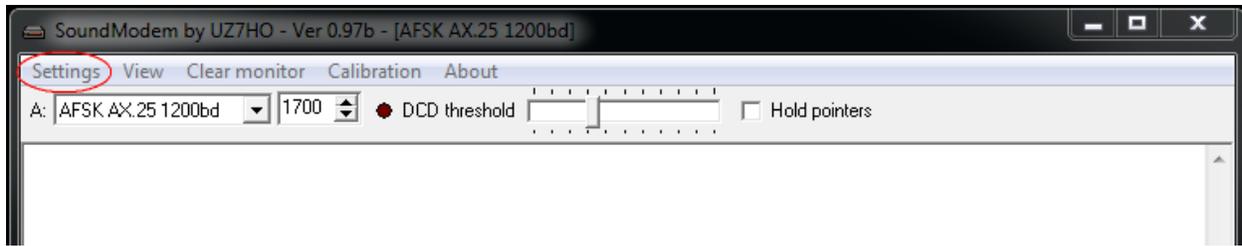
Navigate your way back to where the unzipped folder for CAT7200 resides on your computer. Once there, double click on "CAT7200" application. The new window appears and this is where some of the notes you took earlier will pay off! On the left side of the new window, select the COM port number associated with the G8BPQ Virtual COM Port (Application Port), On the Right side of the window, select the COM port number associated with the lowest number USB CODEC from the previous USB connection with your radio (CAT Port) (We'll finish configuring this application after the screen shot):



Select 19200 from the drop down menu item (This should correspond with the CI-V Baud Rate setting on your radio (Set -> Connectors -> CI-V Baud Rate)). Next select "88" (default address) associated with your radio (Set -> Connectors -> CI-V Address). (note: the "h" is silent). Finally press "Open". Then minimize this window.

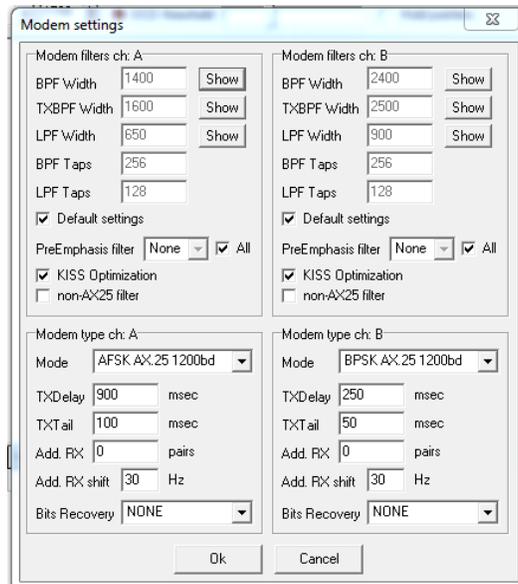
Soundmodem Installation

Navigate to where you extracted the files from the download and double click "soundmodem.exe". Once the new application window opens, select "Settings -> Device Settings".



Ensure you select the USB Audio CODEC for both the speakers and microphone output/input devices. Ensure the AGWPE Server port is set to 8000 and is enabled; and the KISS Server Port is set to 8100 and enabled. Then elect the COM Port number associated with the new virtual COM port you recently created. Finally, click on OK and close the window.

Next, click on “settings -> Modems”



If I recall correctly, the default settings are correct. The previous screen shot is for comparison. If all items match, click on OK, then close the window.

Since Packet (AX.25) is a non-digital mode, on the radio, double check the following:
[SET] [Connectors] [DATA MOD OFF] {Setting should be USB} (Don't forget to change this setting back to Mic, Acc for voice operations.

After all settings have been established, Close Soundmodem.

Winlink Express Packet Session Setup

Start CAT7200

Start Winlink Express

Select [Packet Winlink] from the sessions menu

The screenshot shows the Winlink Express 1.7.13.5 - AA5FO interface. The 'Open Session:' dropdown menu is open, displaying a list of session options. 'Packet Winlink' is highlighted in blue. The interface also shows a message list and a message details pane.

	Date/Time	Message ID	Size	Source	Sender	Recipient
	2024/03/23 18:46	9MT5CJADQJBG	397	KA5GOQ	KA5GOQ	AA5FO
	2024/03/23 08:03	EZ4V38159DUB	320	KA5GOQ	KA5GOQ	AA5FO
	2024/03/22 15:06	NF4140SRP1D5	226	KA5GOQ	KA5GOQ	AA5FO
	2024/03/22 13:45	6F8YNPDK2M50	258	KA5GOQ	KA5GOQ	AA5FO
	2024/03/22 11:18	AL7U1CWVTE89	278	KA5GOQ	KA5GOQ	AA5FO
	2024/03/21 16:15	IJC2DGE65WGY	163	KA5GOQ	KA5GOQ	AA5FO

Message ID: V8TH2QCZBEXU
Date: 2024/03/17 07:19 (UTC)
From: KA5GOQ
To: AA5FO
Cc: AA5AD
Source: KA5GOQ
Downloaded-from: RMS:AD5EO-10
Subject: sitrep, 202403170230L

situation nominal, no utility outages

Then click on [Open Session]

In the Packet Session Window, click on [Settings]

Packet Winlink/P2P Setup

TNC Connection

Packet TNC Type: KISS

Packet TNC Model: NORMAL Serial Port: TCP

TCP Host/Port: 127.0.0.1 8100

Packet sound modem: F:\software\Digital HAM Software\Winlink\soundmodem.e Browse

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: 100 100

Enable IPoll:

Automatic Calling

Autoconnect time: Disabled

Automatically call when there are pending outgoing messages

Update Cancel

Ensure settings are as above. In the Packet Soundmodem for KISS Mode, click on [Browse] and go to the location where Soundmodem.exe resides, select it, then ensure the box for [Automatically launch packet sound modem] is checked. Then click [Update].

Packet Session Channel Selection

Click on [Channel Selection], then click on [Update Table via Internet]

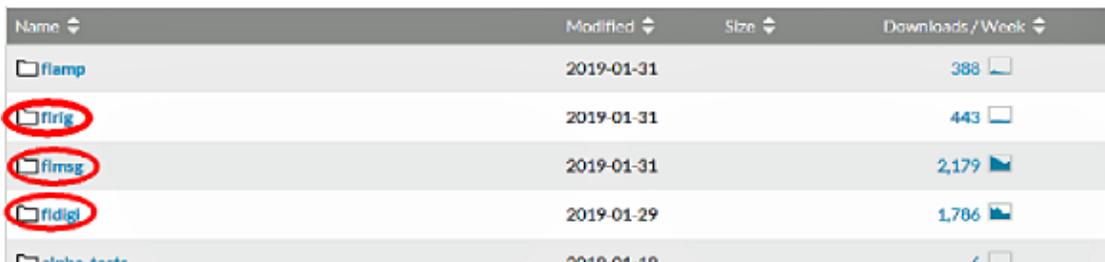
Packet Channel Selector						
Select Channel Update Table Via Internet Update Table Via Radio Exit						
Stations found within 300 kilometers of your grid square.						
Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (km)	Bearing (Degrees)
AD5EO-10	145.030	1200	EM34QN	PUBLIC	008	270
KB5LZK-10	147.495	1200	EM34UT	PUBLIC	036	039
KB5LZK-10	145.590	1200	EM34UT	PUBLIC	036	039
W5TCB-15	145.010	1200	EM34MN	PUBLIC	038	270
KB5IOC-10	145.010	1200	EM23XL	PUBLIC	183	229
W5VG-10	145.050	1200	EM32PU	PUBLIC	191	185
N9SEO-10	145.050	1200	EM36TG	PUBLIC	191	004
NA0D-10	145.050	1200	EM25WU	PUBLIC	203	315
W5HB-10	145.090	1200	EM25VU	PUBLIC	209	314
KB7QL-10	145.010	1200	EM32QN	PUBLIC	222	182
KD5BS-10	145.090	1200	EM54BW	PUBLIC	246	079
K4SPB-10	144.990	1200	EM55CD	PUBLIC	259	075
WB5L-10	145.050	1200	EM26TK	PUBLIC	267	322

Select the station you want to connect to, then double click to select. NOTE: Winlink does not support CAT operation on VHF/UHF so you will need to manually tune your radio to the frequency indicated.

Fldigi (NBEMS) Software

Fldigi (Fast Light Digital Modem) by W1HKJ also associated with NBEMS (Narrow Band Emergency Messaging System) is a suite of open source software for the most popular OS (Windows, MAC, Linux) that you can use with or without an interface between your computer (tablet, smart phone) and your radio. Which allows an opportunity of any licensed operator to be capable of interfacing into the digital data system. There are many facets of the software that can be used together to form a comprehensive Messaging system. In this section, I am going to focus on what is necessary to install and configure this suite of software for the Icom IC-7100 to a laptop computer (running Windows 7 Professional) using only a usb cable.

Sourceforge.net is the preferred source for the required files. (Again, I reiterate this section will focus on the IC-7100 connecting to a laptop or computer running Windows 7 Professional 64 bit). Here is the location of the files: <https://sourceforge.net/projects/fldigi/files/?source=navbar>



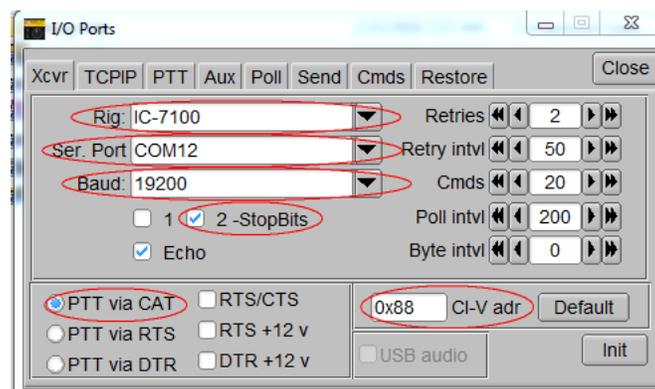
Name	Modified	Size	Downloads/Week
flamp	2019-01-31		388
flrig	2019-01-31		443
flmsg	2019-01-31		2,179
fldigi	2019-01-29		1,786

(I recommend “save as” to your desktop to download all the required files instead of downloading and installing directly from the site.) You will need to download: fldigi, flrig and flmsg. One you have saved these files to your desktop, move the zipped folders to a common location (I have created a repository folder on my C: drive entitled Install packages to keep everything together in a location I can find again).

Flrig Installation

First, we’ll start with flrig: navigate to where you stored your downloaded folder/program and double click on “flrig-####_setup: (the #### sign is for the current version number you downloaded). Agree to the license information and accept the default information to create shortcuts, etcetera.

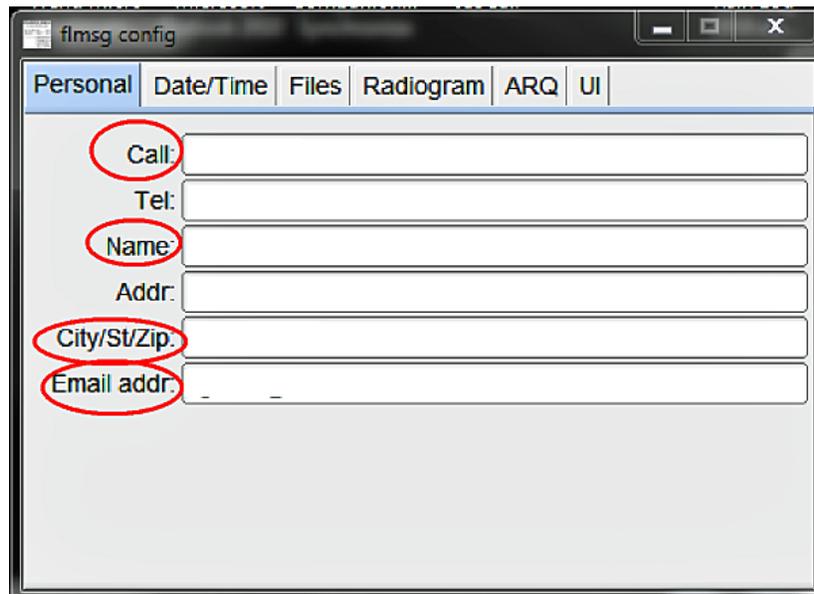
On your desktop, you will now see a shortcut to flrig. Double click on the shortcut. Once the program has initialized, click on [Config] [Setup] [Transciever]



In the [Transceiver] [Xcvr] tab Rig pull down, select "IC-7100"; in the Ser Port pull down select the lowest com port number associated with the Silicon Labs CP210x USB to UART Bridge you created when installing Winlink Express; In the Baud pull down, select 19200 (or the baud rate listed in your IC-7100 [SET] [Connectors] [CI-V] [CI-V Baud Rate] setting); Select 2 Stop Bits; Select PTT via CAT; and finally select "0x88 (or the appropriate CI-V address listed in your IC-7100 [Set] [Connectors] [CI-V] [CI-V Address]). Then click Init. (NOTE: Radio should be on to avoid errors). Then close the window.

Flmsg Installation

Install FLMSG that you previously downloaded from sourceforge, allowing for the standard options. Once complete, double click the flmsg icon placed on your desktop. Click on [Config] [Personal Data]



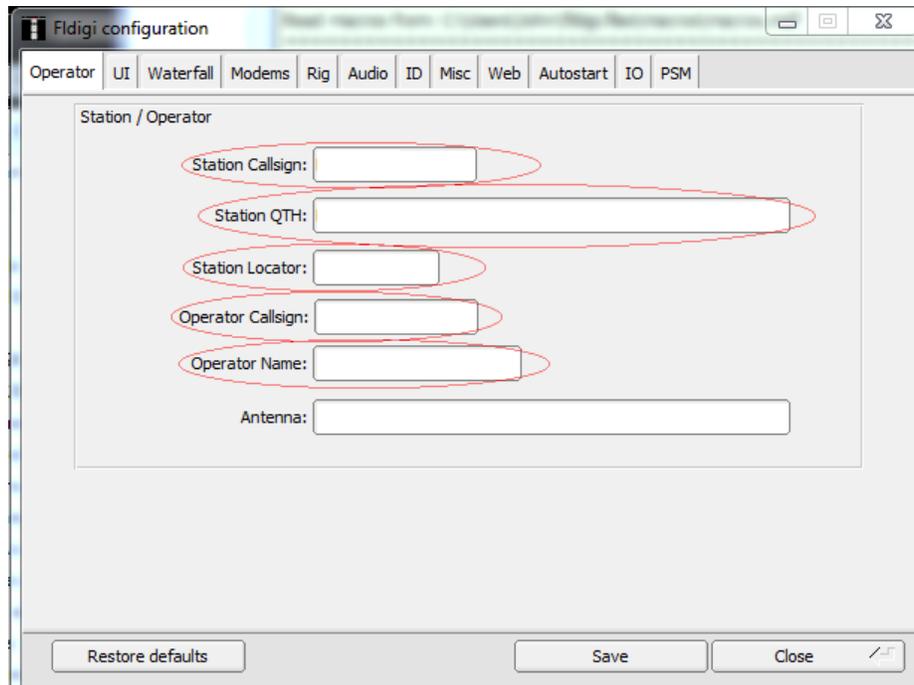
The image shows a screenshot of the 'flmsg config' window. The window has a title bar with the text 'flmsg config' and standard window controls (minimize, maximize, close). Below the title bar is a tabbed interface with the following tabs: 'Personal', 'Date/Time', 'Files', 'Radiogram', 'ARQ', and 'UI'. The 'Personal' tab is selected. Under the 'Personal' tab, there are six text input fields, each with a label to its left. The labels and their corresponding fields are: 'Call:' followed by an empty text box; 'Tel:' followed by an empty text box; 'Name:' followed by an empty text box; 'Addr:' followed by an empty text box; 'City/St/Zip:' followed by an empty text box; and 'Email addr:' followed by an empty text box. The labels 'Call:', 'Name:', 'City/St/Zip:', and 'Email addr:' are each circled in red. The 'Email addr:' field contains two dashes '-'.

Fill in the indicated fields. When finished, click the red [X] to close the configuration window, then close FLMSG.

Fldigi Installation:

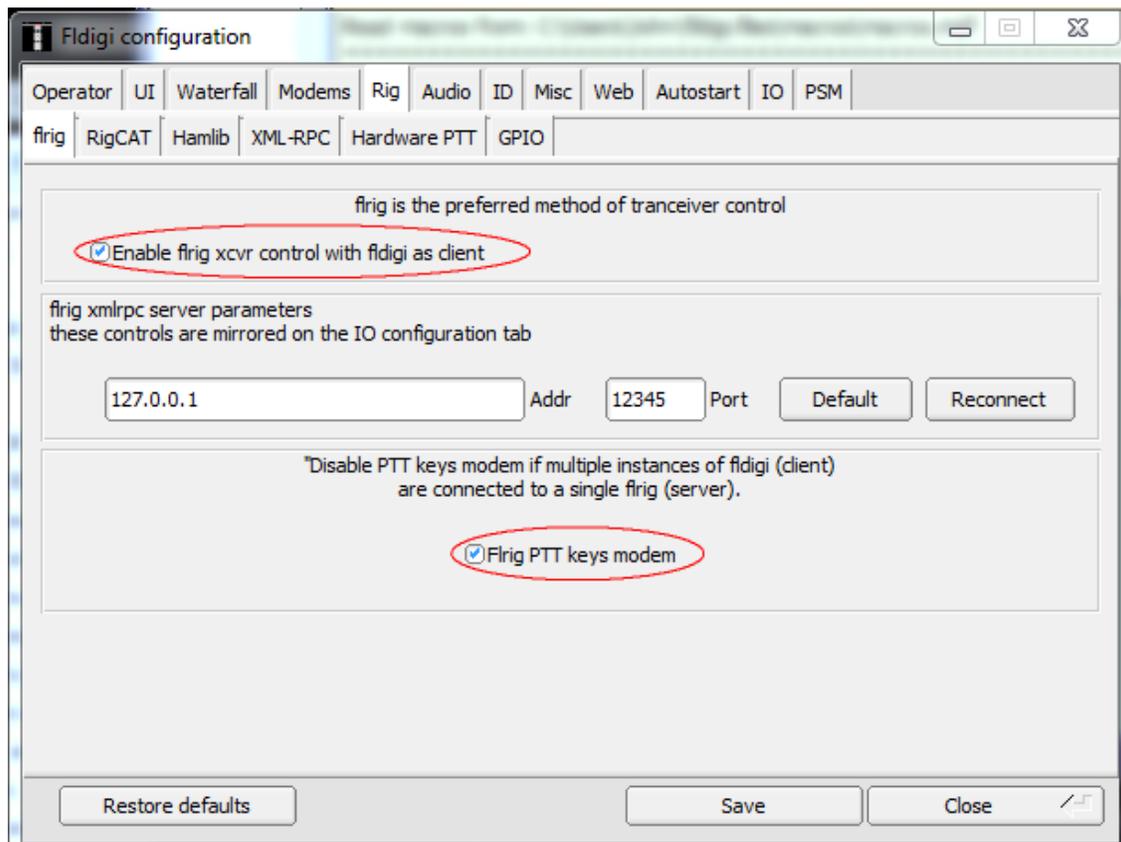
Navigate to where you stored the downloaded “fldigi-####_setup” file (Where the #### is the current version number of the downloaded file). Agree to the license information and accept the default information to create shortcuts, etcetera. On your desktop there will now be a shortcut for fldigi. Double click on the icon.

Select [Configure] [UI] [Operator]



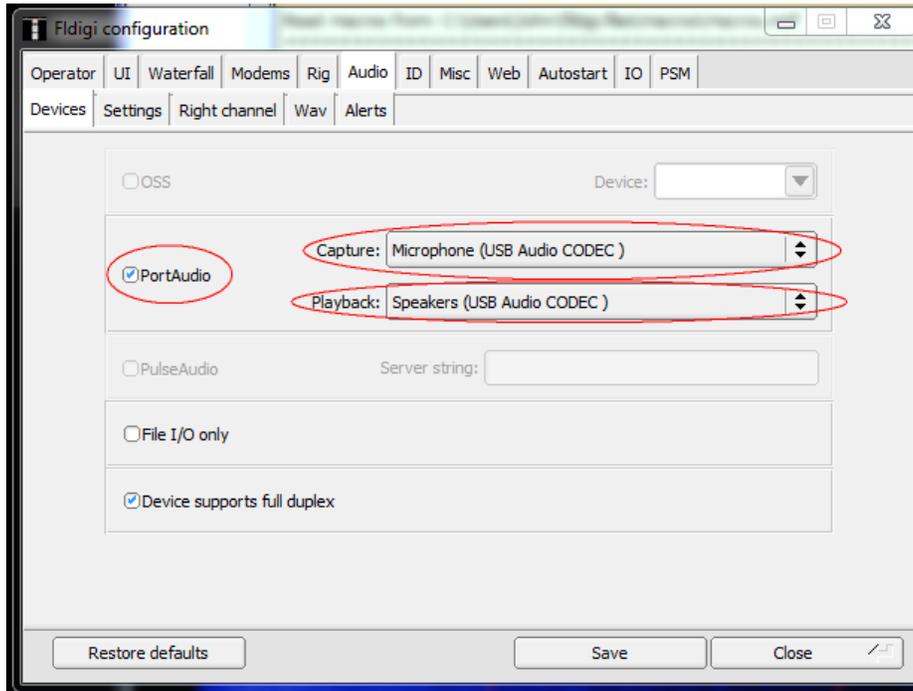
Most of this is self-explanatory, but for clarity, Station callsign is your callsign; Station QTH is your home city and state; Station Locator is your Maidenhead grid coordinates; Operator callsign is your callsign; and Operator name is your first name. Antenna is optional. Once filled in, click “Save”.

Next, click on the “Rig” tab then on the second row of tabs, click on “flrig”.



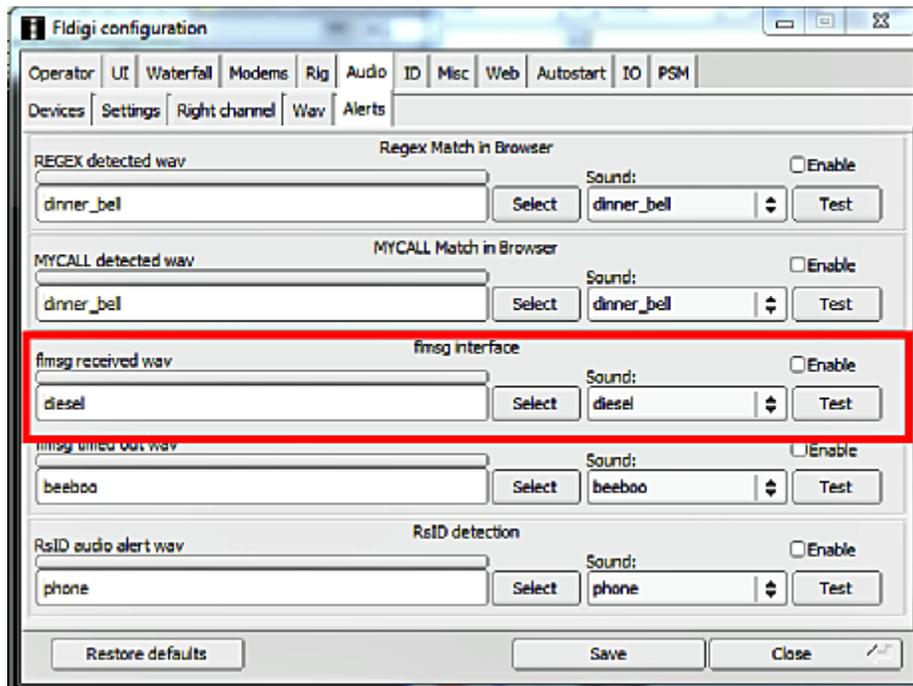
Ensure both the “Enable flrig xcvr control with fldigi as client” and “flrig PTT keys modem” are both checked, then click “Save”. (Note: do not change the address from 12345!)

Next, click on the [Audio] [Devices] Tab.



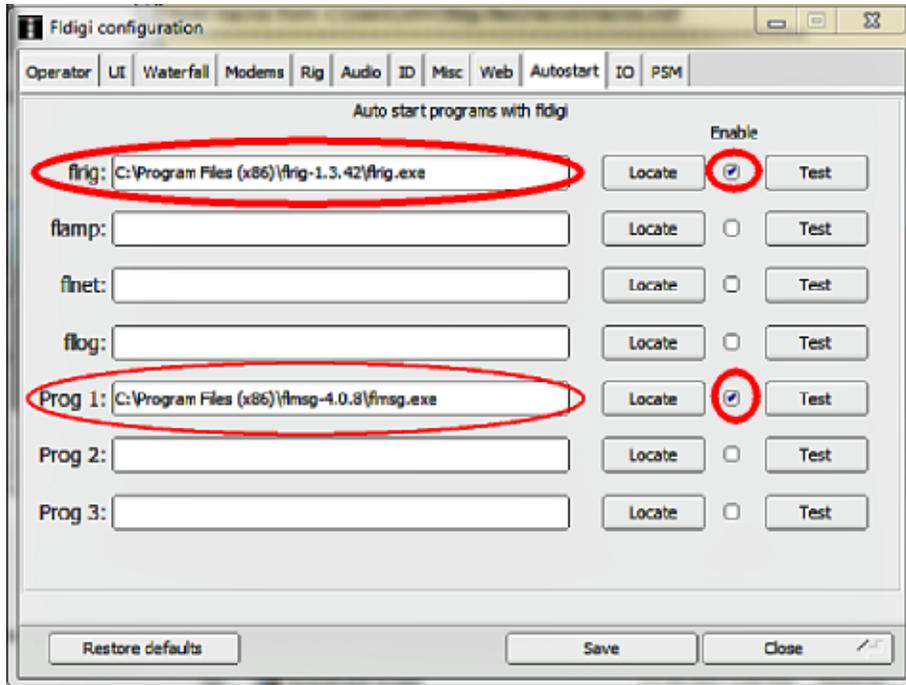
Ensure “Port Audio” is checked and that the appropriate USB Audio CODEC settings are selected in both the Capture and Playback drop downs. Once completed, click “Save”.

If you would like an alert sound to be played when FLDMSG receives a message, click on the [Alerts] tab.



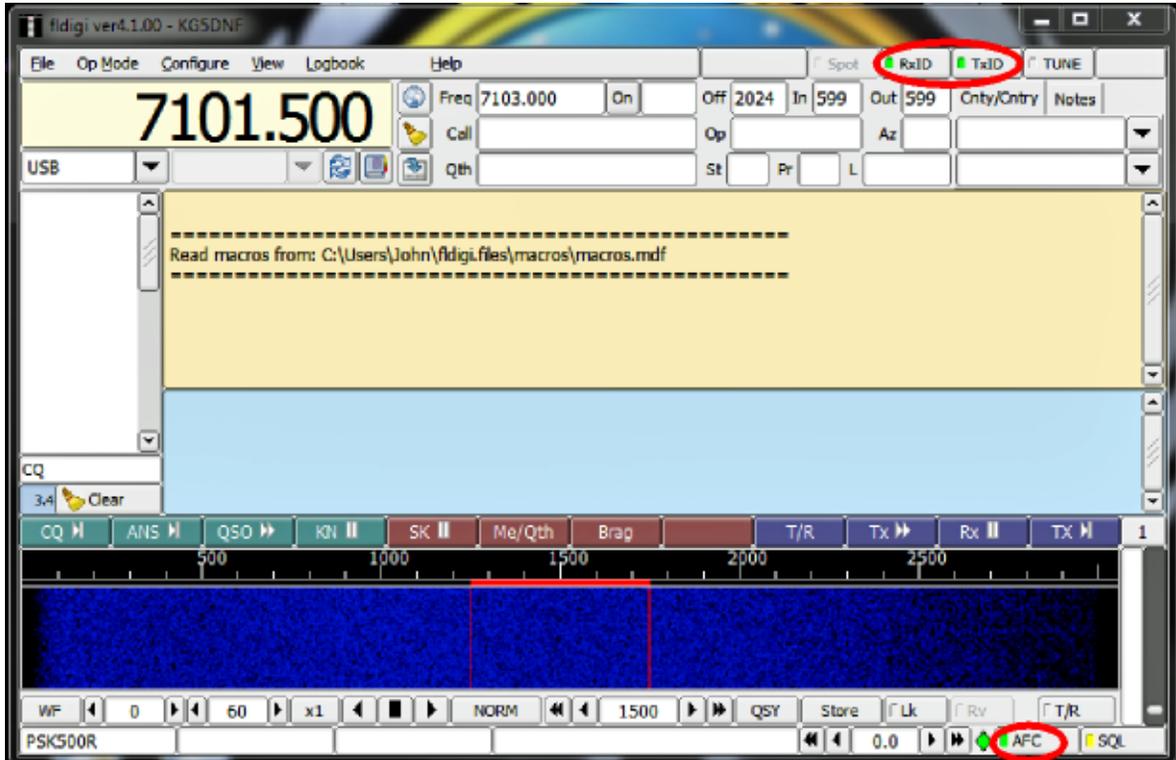
You can select the sound that will play by clicking on the pull-down box under Sounds. When finished with your selections ensure the “enable” box is marked.

Next, click on the “Autostart” tab.



To automatically start flrig when you start fldigi, click on the “Locate” button on the line for flrig and navigate your way to “C:\Programfiles (x86)\flrig-####\flrig.exe” where the #### represents the current version of flrig you are using, and note: the flrig-#### is a folder in the Program Files folder!). Single click on the flrig.exe file then click “Open” This should populate the blank field next to flrig. One this is accurately accomplished click in the “Enable” box to activate the sequence. Repeat under Prog1 for FLMSG. Click [Save] then Click [Close].

One last thing before you close the program, on the main window, please ensure that RxID, TxID and AFC are all “checked” to allow for automatic mode switching (automatically changes to the correct digital mode the transmitting station is using) and automatic signal following (in case someone transmits slightly off center of the passband).



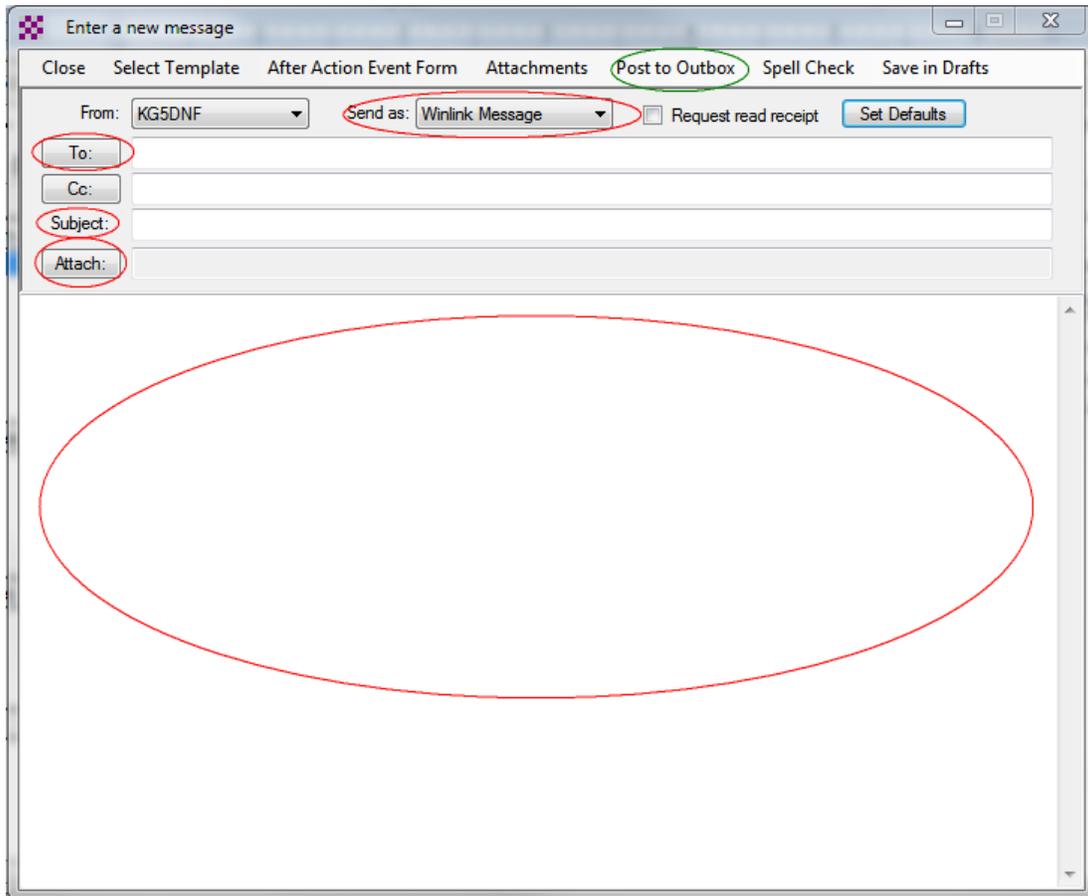
Once these items have been verified, please close the program and agree to save the configuration.

WINLINK EXPRESS USE:

Using the Winlink Express software is fairly universal to any radio once the radio and appropriate interface has been set up. (NOTE: Winlink (any mode) does not permit keyboard to keyboard interaction. If you wish to converse keyboard to keyboard prior to sending a message, use FLDIGI.)

Winmor/ARDOP Winlink to RMS

In the main (first) screen of the Winlink express suite, click on “Message -> New Message”.



Select “Send As” Winlink Message (!). Fill in any appropriate information including subject)and select attachments (if there are some), Compose the main body of the message, then click “**Post to Outbox**”.

The next time you connect to an RMS server, you message will be sent. If you are sending to an RMS server for another operator to pick up, just enter their call sign in the “To” block. If you wish to send the message to an internet based email account, enter the appropriate email address(es) in the “To” block. (Multiple addresses may be separated by a comma.)

Packet RMS Message

Packet Winlink is slightly different. First you must ensure CAT7200 and Soundmodem are running. If not, close Winlink Express, start CAT7200 (verify settings then click [OPEN]). Then start Soundmodem (verify settings) , then start Winlink Express. Select Packet Winlink from the session mode menu, click on [settings]:

Packet Winlink/P2P Setup

TNC Connection

Packet TNC Type: KISS

Packet TNC Model: NORMAL

AutoConnect Time: Disabled

Serial Port: TCP

TCP Host/Port: 127.0.0.1 8100

If Auto Connect is enabled, open session when Winlink Express is started

TNC Parameters

1200 Baud 9600 Baud

Parameter	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

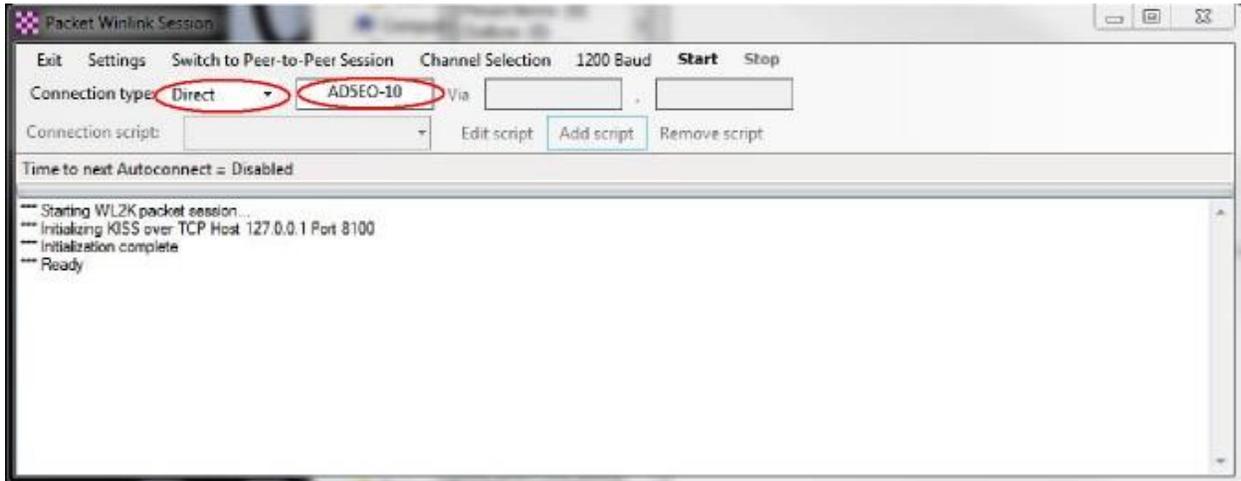
Disable Xmt Level Adjust Transmit Level: 100

Enable IPoll

Update Cancel

After ensuring the settings are as illustrated above, click on update.

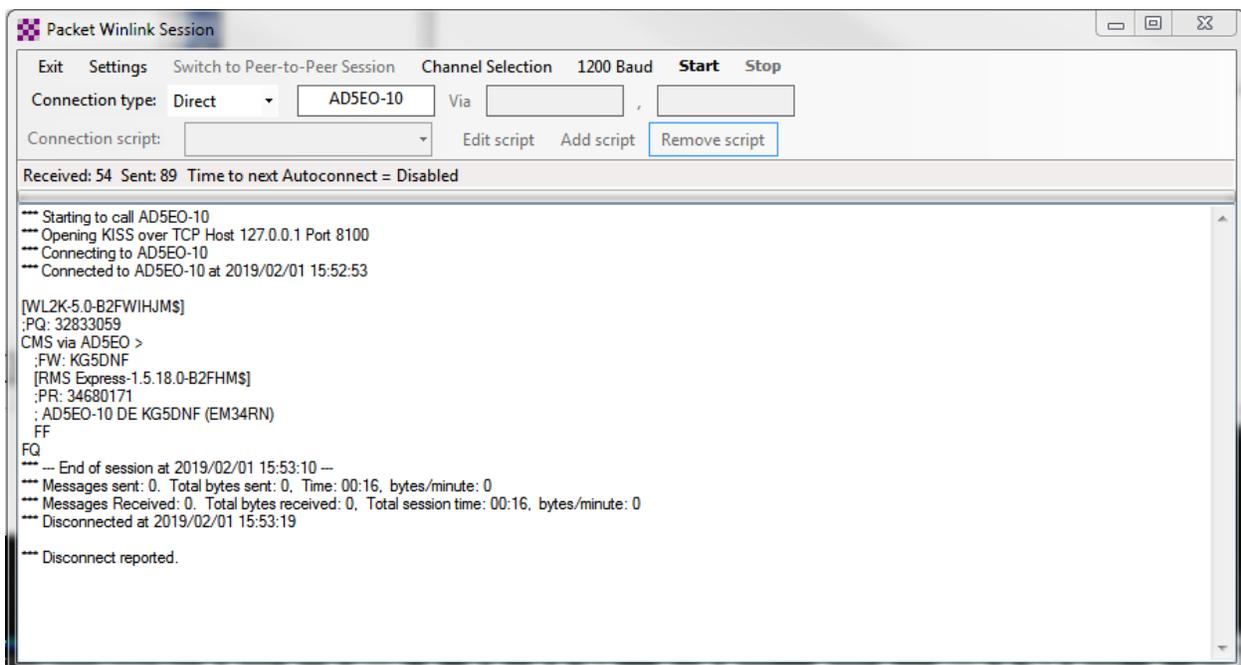
Next, click on the Open Session Button. A new window opens:



For those of us in the local area, select [Direct] in the connection type and enter [AD5EO-10] for the gateway selection. This is the Packet Gateway at the Saline County EOC (NOTE: this can also be done in the Channel Selection window).

Ensure your radio is tuned to 145.030 MHz FM. (NOTE: Rig control is not supported for VHF operations). Once you are prepared to transmit, click on the [Start] button and the software does the rest for you. Once the entire communication process has completed, (indicated by “disconnect reported”), close the session window and check your inbox to see if you have received any new messages.

Illustration of completed session (no messages sent or received):



When completed, close all programs to ensure you don't have anything running in the background the next time you wish to use these programs.

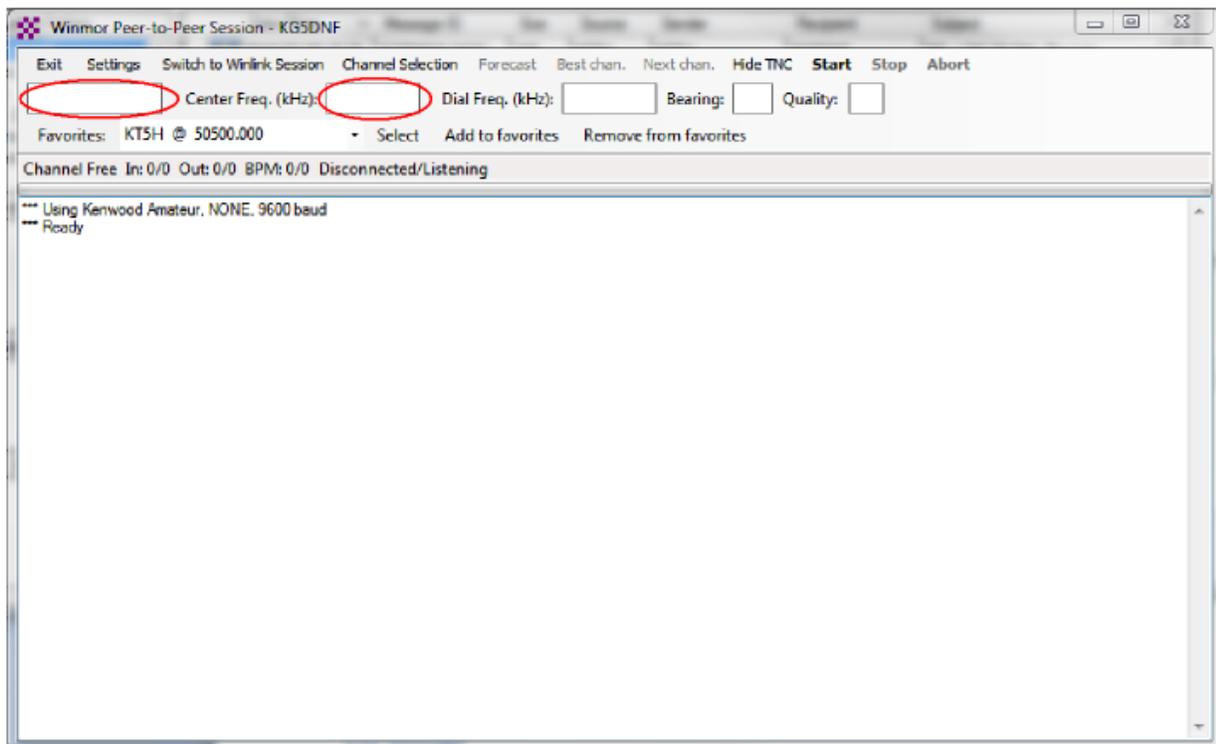
VARA HF/ARDOP P2P

P2P (Peer to Peer) protocols differ only slightly from messages being sent to/through an RMS Server. P2P is exactly what it sounds like! In very simple terms – SIMPLEX. You will be connecting directly to the other operator's radio to pass traffic.

The only difference in composing the message is you will select [Peer-To-Peer Message] in the "Send As" block instead of Winlink Message. Once finished click [Post to Outbox].

When you are ready to connect to the other operator, you will need to select "VARA HF P2P, or "ARDOP P2P" in the session mode. Once completed, click on the [Open Session] button.

In the window that appears, instead of using the channel selection window, you will have to input the connection information manually:



In the first highlighted block, enter the call sign of the station you are going to connect with. (NOTE: you will not connect to this operator if you mis-enter the call sign!). In the second highlighted block, you need to enter the "Center Frequency" for the frequency to use. This is a little strange. Ultimately, when you enter this center frequency, the actual frequency you will be using will be listed in the Dial Frequency block, but you cannot enter any information in that block. The center frequency will be 1500 Hz higher than the dial frequency! One advantage of the IC-7100 using the flrig software, is you may manually tune your radio to the desired transmit frequency and the software will reflect that change.

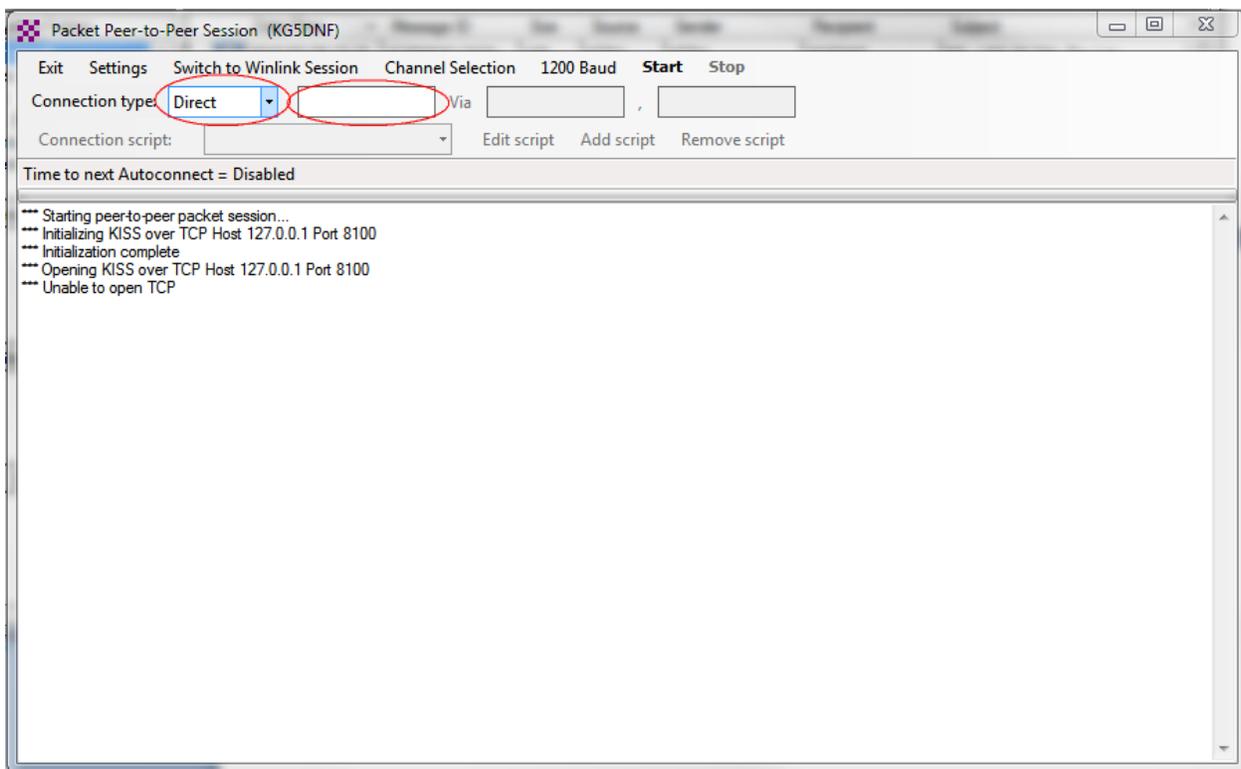
Once the Operator and dial frequency has been correctly entered, click on the [Start] button. (Software takes over and does the rest for you). Once the session is complete, close the session window and check your inbox for any new messages received.

Packet P2P

As previously mentioned in the Winmor/Ardop P2P message composition, enter all the information as required, select [Peer to Peer] as the message type, then post to outbox.

As with any packet operation, soundmodem must be running. The Icom IC-7100 also requires use of the CAT7200 software for keying the radio. If these programs are not currently running, close Winlink Express start CAT7200 verify settings then click [OPEN]), then start Soundmodem. Finally, restart Winlink express.

Select “Packet P2P” in the session type, then click on the “Open Session” button.



Ensure “Direct” is selected as the connection type, then enter the call sign of the operator you wish to connect to.

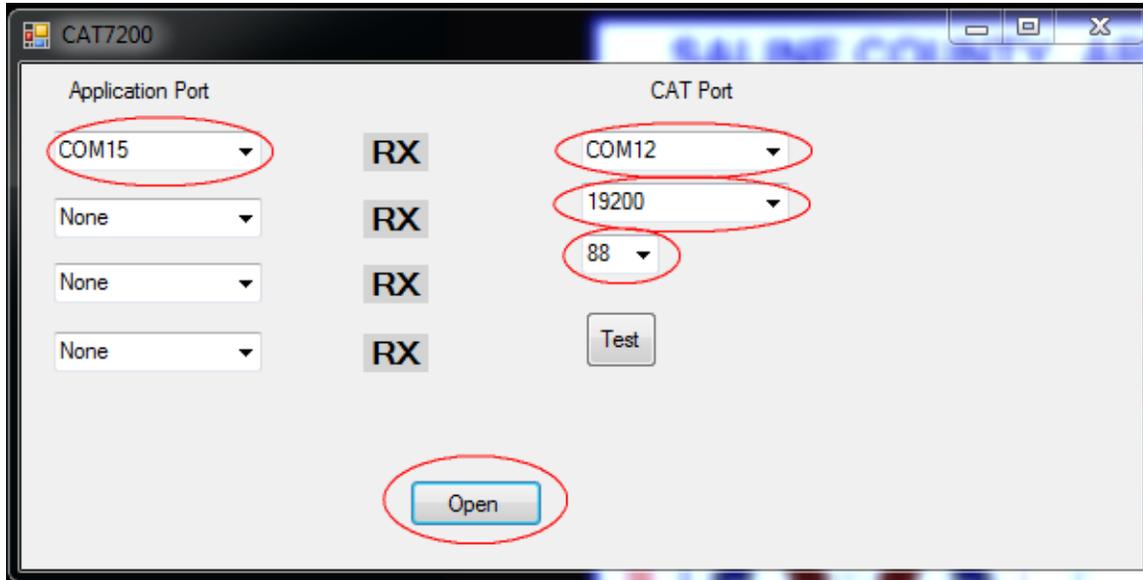
Tune your radio to the agreed upon frequency, then click “Start”. The software will then take over and transmit your message to the other operator (providing the other operator has Packet P2P up and running). When the comm is complete, close the window and check your inbox for any received messages.

Appendix A

This quick reference guide is not for initial installation of the programs, however, it is intended for those of us who haven't used the system for a prolonged period to refresh our memories and ensure all the settings are correct.

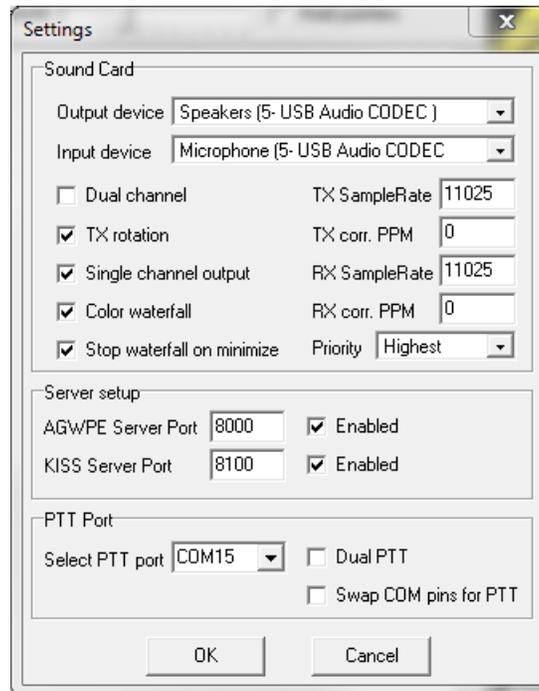
Packet Configuration Quick Reference

Start CAT7200



Application port is the G8BPQ virtual com port you created
(If you have forgotten which one it was, Open Device Manager -> Ports (Com and Lpt).
CAT Port is the com port assigned to your IC-7100
Don't forget to click [Open]

Start Soundmodem



Ensure the correct audio COIDECs are selected for Output and Input Devices,
Select the G8BPQ virtual com port for the PTT port

RMS Express (Winlink Express)

Start RMS Express (Winlink Express)

Select Packet Winlink under [Open Session]
Then click on [Open Session]

Select the appropriate gateway you wish to connect to
(the AD5EO-10 gateway's frequency is 145.030)

Press [Start]

If you are able to reach the gateway, the rest of the operation is automatic.

Ending Session

Close Rms Express (Winlink Express)

Close Soundmodem (Soundmodem has a nasty habit of hiding in the hidden icon box)

Close CAT7200

Appendix B

Windows Update Issues

Windows 10 ver 2004

If your computer receives the Windows 10 2004 Update, there are some issues that will need to be resolved. The Audio CODECs for ARDOP, VARA and Soundmodem will all need to be reestablished in Winlink when you first open the respective session.

Additionally, the virtual Port created for the CAT7200 will also need to be recreated in the Device Manager, however, this update (June 2020) precludes installation of unsigned drivers (therefore, will not create the required virtual COM port). Follow the guide below for the work-around:

In order to achieve maximum security, [Windows 10](#) requires [digitally signed drivers](#).

This is usually a good feature if you're concerned about your safety, but sometimes you need to install [drivers](#) that aren't digitally signed, and today we're going to show you how to do that.

As a quick reminder, 64-bit versions of Windows require that you install digitally signed drivers. Digitally signed drivers come with an electronic fingerprint that guarantees that the driver was created by the hardware manufacturer and that it hasn't been modified since it was created. Thanks to driver signature enforcement you'll be sure that your drivers are authentic and not altered by a malicious third party. This feature is great if you want to protect your PC, but some manufacturers don't make digitally signed drivers and this can lead to all sorts of problems.

If your drivers aren't digitally signed you won't be able to install them at all which means that you won't be able to use the hardware that is associated with them.

This is a big problem, but fortunately, you can disable driver signature enforcement with ease.

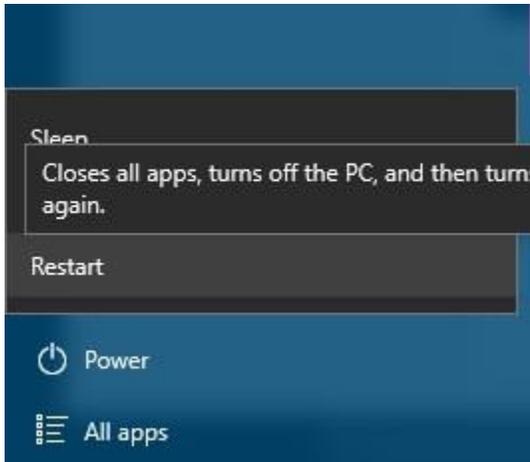
Change the Startup settings:

This is the simplest way to disable driver signature enforcement on Windows 10 but bear in mind that this method will only disable driver signature temporarily.

After you restart your computer driver signature enforcement will automatically turn itself on.

To disable driver signature enforcement do the following:

1. Press and hold the **Shift** key on your [keyboard](#) and click the **Restart** button.



2. Choose [Troubleshoot](#) > **Advanced options** > **Startup Settings** and click the **Restart** button.
3. When your computer restarts you'll see a list of options. Press **7** on your keyboard to select **Disable driver signature enforcement**.
4. Your computer will now restart and you'll be able to install unsigned drivers.

Bear in mind that this method only temporarily disables driver signature enforcement, so be sure to install all the unsigned drivers as soon as you can.

Appendix C

Download Links Quick Reference

Winlink:

<https://winlink.org/ClientSoftware>

Icom Comm Port Drivers:

<https://drivers.softpedia.com/get/Other-DRIVERS-TOOLS/Icom/Icom-ID-7100-Transceiver-USB-Driver-120.shtml>

or

https://www.icomjapan.com/support/firmware_driver/?keyword=7200&open=tab2&type=5#download_result

Vara HF

<https://rosmodem.wordpress.com/>

Vara FM

<https://rosmodem.wordpress.com/>

UZ7HO Soundmodem

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

CAT7200

<http://www.cantab.net/users/john.wiseman/Downloads/CAT7200.zip>

FLDIGI

<https://sourceforge.net/projects/fldigi/files/?source=navbar>