Winlink Basics

Midwest Superfest 2022

Peoria Illinois

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Scope of this Presentation

- What's In
  - Winlink for the typical amateur radio operator
  - The basics to send and receive messages

- What's Out
  - Settings for particular radios and interfaces
  - Many fine-points, tips, and tricks for using Winlink
  - Details regarding use of Digipeaters/Nodes
  - How operate an RMS Gateway

Winlink Global Radio Email®

- The Winlink system is a worldwide radio email service that uses radio pathways where the internet is not present, and is capable of operating completely without the internet--automatically--using smart-network radio relays.
- The Winlink system uses the Internet (when available) to send messages between users. Multiple servers worldwide provide the backbone.
- Winlink provides users email messaging with attachments, position reporting, weather and information bulletins, and is well-known for its role in emergency and disaster relief communications.
- Winlink can send messages to & from regular Internet Email Addresses.
- Winlink can also send messages direct between users (Peer-to-Peer).
- User software was formerly called RMS Express, now Winlink Express.

Winlink Background Info

- Does not replace your normal email account
- Regulations prohibit commercial content over the air
- All messages passing through licensed US amateur radio stations by radio are freely readable by other licensed amateurs
- Messages sent via Radio transmit slower than most home internet or cell phone connections
- Max size of email and attachments=120,000 bytes
- Earliest version was in use in 1990. Now full-featured software.
- Regular updates are made, including fixes and new features.
- Winlink messages are NOT encrypted, are NOT private, and can be easily read by Gateway SYSOPS and licensed amateurs.

Why Use Winlink?

- Regional Internet outages can occur during natural and man-made disasters
- Detailed, accurate messages can be transmitted via ham radio with Winlink
- Send messages out of an effected region
  - Quickly alert family of your status
- Support emergency services within effected region
  - Served agencies are familiar with email messages

Multiple Modes in One Program

- Winlink Express includes multiple modes in one program - Packet, VARA-FM, Pactor, ARDOP, VARA-HF, and directly between user's systems (Peer-to-Peer)
- VHF/UHF & HF & Telnet (Internet)
- I recommend Winlink Express – a full-featured email client, which is free. Donations accepted.
- More Mode info can be found at www.winlink.org or in the Winlink Express program.

Uses & Users

- Popular with ARES & EmComm folks
- Used during at least 20 recent hurricanes
- 2021 Texas Winter Freeze
- 2020 California Earthquakes
- 2019 Mexico City Wildfires
- Other high profile disasters
- Lives and property saved, damage mitigated
- Sailors stay connected at sea, over marine radio

Statewide Winlink Growth

- Over 40 VHF Gateways are online in Illinois, most are operating on VHF frequency 145.610 MHz
- Former IL State Police Radios have been repurposed and are used in some of these gateways
- Peoria County now has one VHF Winlink Gateway
  Name is KD9ANU-10, Digipeater Name = PEORIA
- Tazewell County has one VHF Gateway
  Name is W9TAZ-10, Digipeater Name = TAZWEL
- A VHF Digipeater is also operating in Mason County
  Digipeater Name is WD9FMB-1 or MASON
  (Use of Digipeater can increase your range)

Illinois VHF RMS Gateways

- Go to winlink.org
- Select >Tools
- On the RMS Map, choose the radio button “Packet”
- Zoom in to the region of interest

RMS Stations – ARDOP HF

- Go to winlink.org
- Select >Tools
- On the RMS Map, choose the radio button “ARDOP”
- Zoom in to the region of interest

Getting Going with Winlink

- Practice using Winlink software without Radio
  - Use only an Internet Connection (Telnet mode)
  - All the non-radio software features are available
- Start sending radio messages at later time
  - After you become comfortable with Winlink

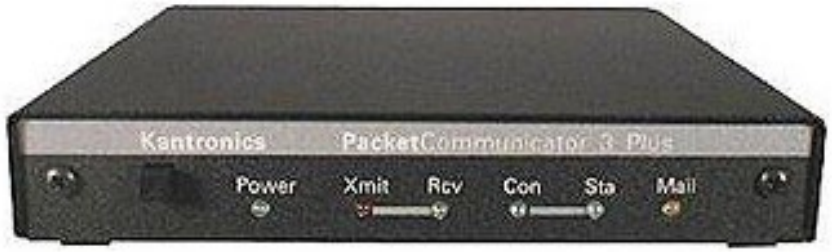
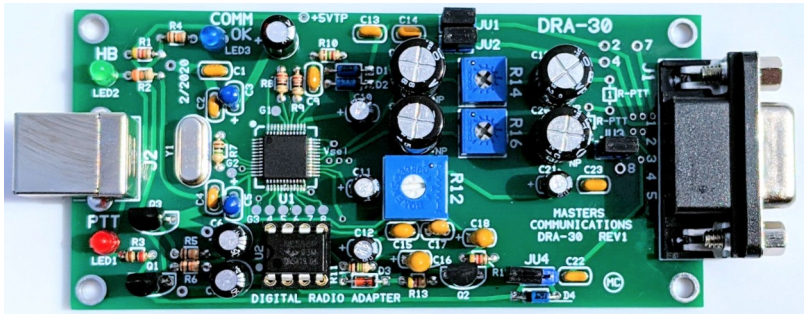
Software & Equipment Needs

- Winlink Express client software runs only on Windows (7 thru 11)
- Microsoft .NET Framework 3.5 must be enabled (it's typically loaded)
- Create your own Winlink account using Winlink Express software
- VHF radio uses Packet or VARA-FM modes
- HF radio uses Pactor, ARDOP, or VARA-HF modes
- You may need as Interface (TNC or external sound card) and Cable
- Some radios have built-in TNC (Kenwood D700 & D710)
- Some radios w/built-in sound card (IC-7100/7300/7410/7600/9100/9700)
- Radio 101 applies – higher Antenna, SWR, Propagation, Power Level
- RFI can cause issues – remote antenna mount, ferrites on cable ends
- Handi-Talkies and rubber duck antennas may disappoint users

Interface Box Examples

- If not built-in to your radio, there are many options
- TNC (Terminal Node Controller) for VHF Packet
  - Kantronics KPC-3+ USB ($239)
- Sound Cards (with SoundModem or Direwolf - free software that forms Virtual TNC)
  - Signalink USB ($135, cable adds $22)
  - Masters Communication Radio Adapters ($41 kit to $86 built)
  - West Mountain RigBlaster line ($70 to $320)
- High End Modem for PACTOR I thru PACTOR IV
  - Spezielle Communications Systeme GmbH & Co. KG
  - P4dragon DR-7400 ($1500)

Some External Interface Options

	
Kantronics KPC-3 Plus TNC	Signalink USB Sound Card
	
Masters Communication DRA-30	P4dragon DR-7400 PACTOR Modem

Winlink Modes

- Internet Only
  - **Telnet** – Uses an Internet connection to the Winlink web servers.
- VHF/UHF Radio
  - **Packet** – (TNC or Sound Card) Uses the AX.25 (Amateur X.25) data link layer protocol, adapted for amateur radio use in the 1970's.
  - **VARA-FM** – (Sound Card) Number of such IL Gateways is small, Check www.Winlink.org/RMSChannels to locate a nearby VARA-FM Gateway.
- HF Radio
  - **PACTOR I-IV** (SCS Modem) - Utilizes a combination of simple FSK modulation, and the ARQ protocol for robust error detection and data throughput.
  - **ARDOP** – (Sound Card) HF software modem offering high-throughput and adaptive multi-bandwidth operation.
  - **VARA-HF** - (Sound Card) HF sound-card software modem offering high-throughput, fixed 2.5 KHz wide-bandwidth operation. (Free & paid versions)

How to Install Winlink Express

- Visit the Winlink Download page to obtain Winlink Express software, at https://downloads.winlink.org/
- In the directory list, click on “User Programs”
- Click on “Winlink_Express_install_1-7-0-0.zip” to download
- Extract the files to another directory
- Double-click the file named “Winlink Express Install.msi”
- Select the Run button in the next window
- After the installation finishes, find and click on the “RMS Express” Program Icon. Might need to look in c:\RMS Express for RMS Express.exe.

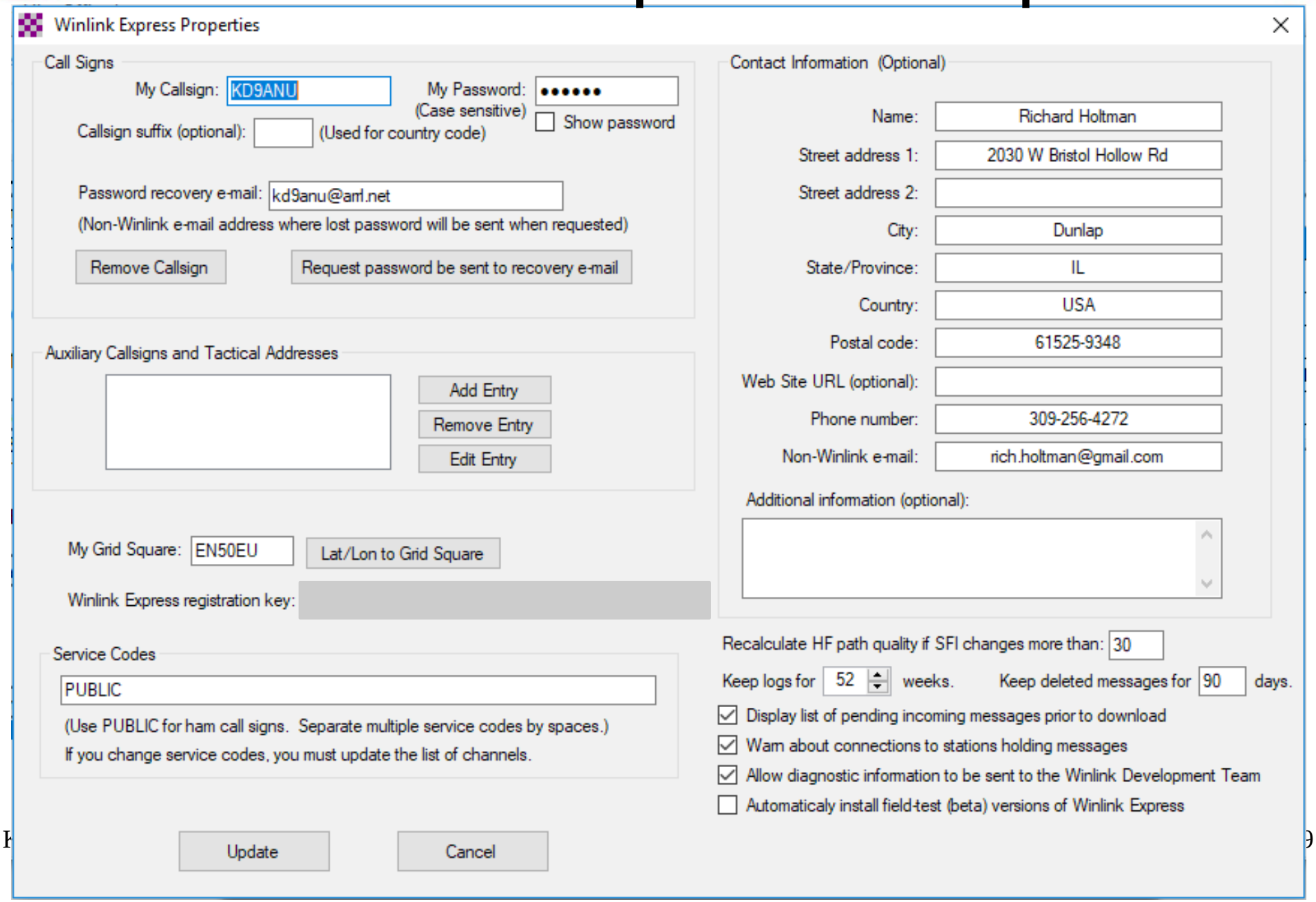
Create a Winlink Account (1 of 2)

- Must have a valid Ham Radio License
- When run the first time, the program opens the “Properties Tab”
- Fill the blanks as much as you can
- Don’t change or delete any default values that may be provided
- Be sure to include your email in the fields labeled Password recovery email and also Non-Winlink e-mail
- You DO NOT need a Winlink Express registration key, leave that blank. (The key can be purchased and avoid Nag screen.)
- When finished, click on the “Update” button

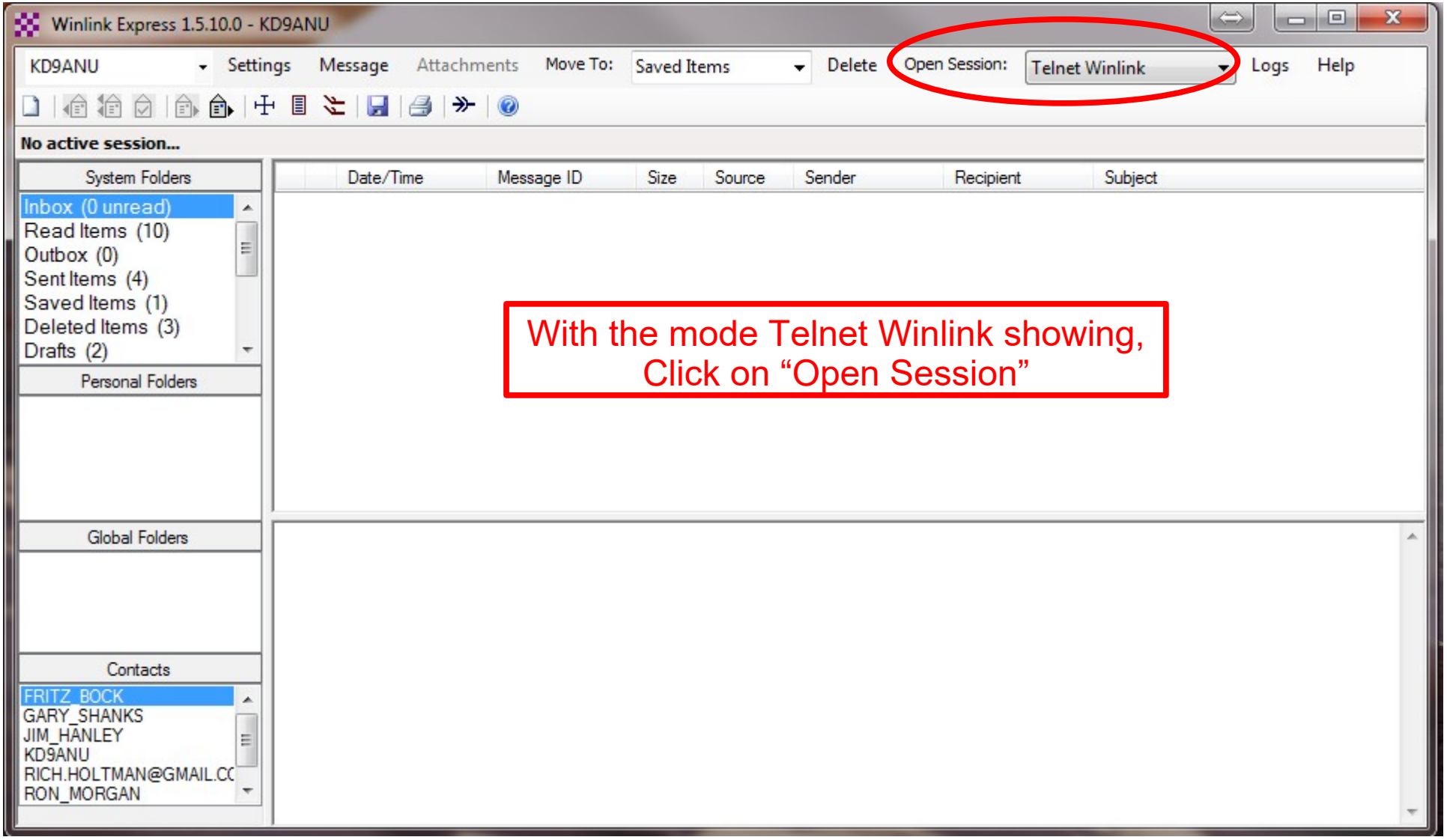
Create a Winlink Account (2 of 2)

- Connect with the Winlink system to create your account (use the Telnet mode Internet connection)
- Do not use a password on your first connection
- A message containing your password will be sent to your account. (Can change the password later.)
- Retrieve password with a second Telnet connection
- Enter password in “Settings”, “Winlink Express Setup”
- Your email address will be CALLSIGN@winlink.org

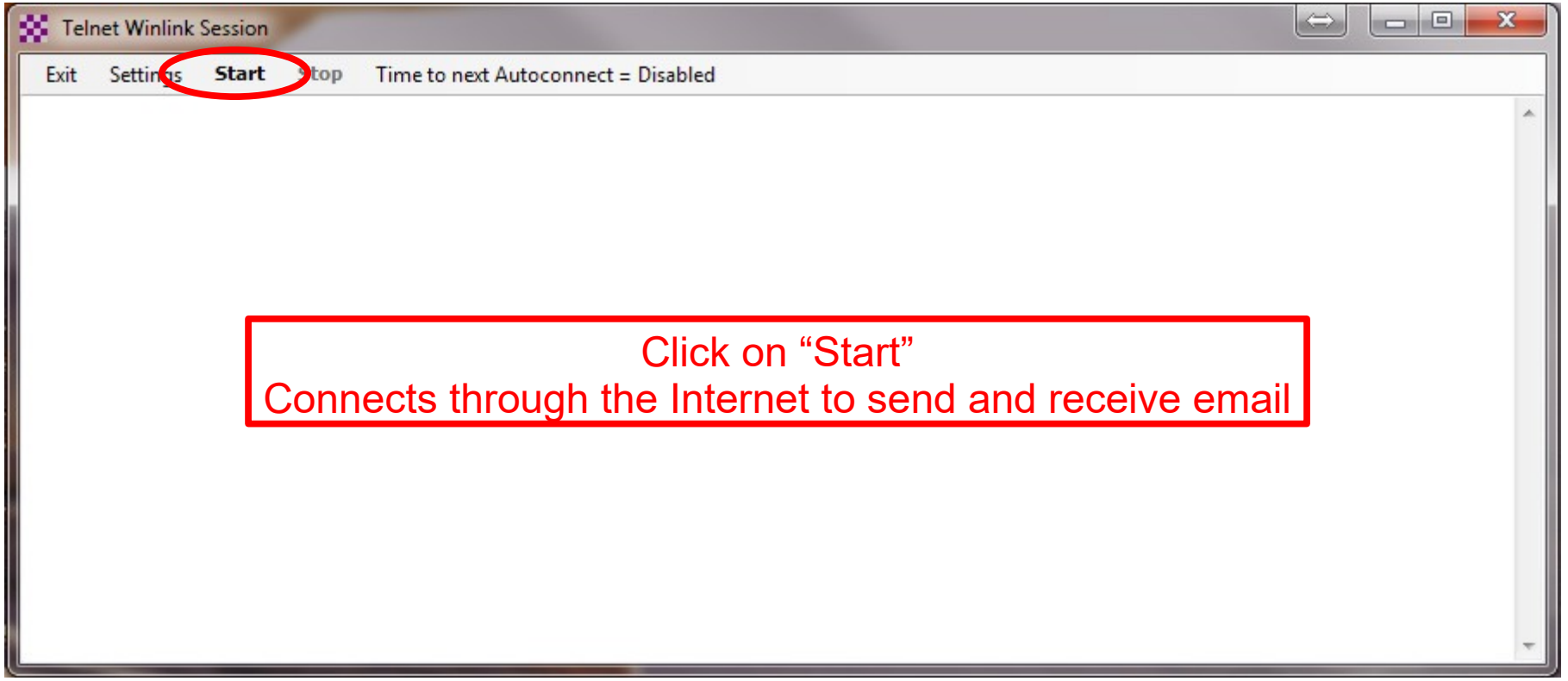
Winlink Express Setup



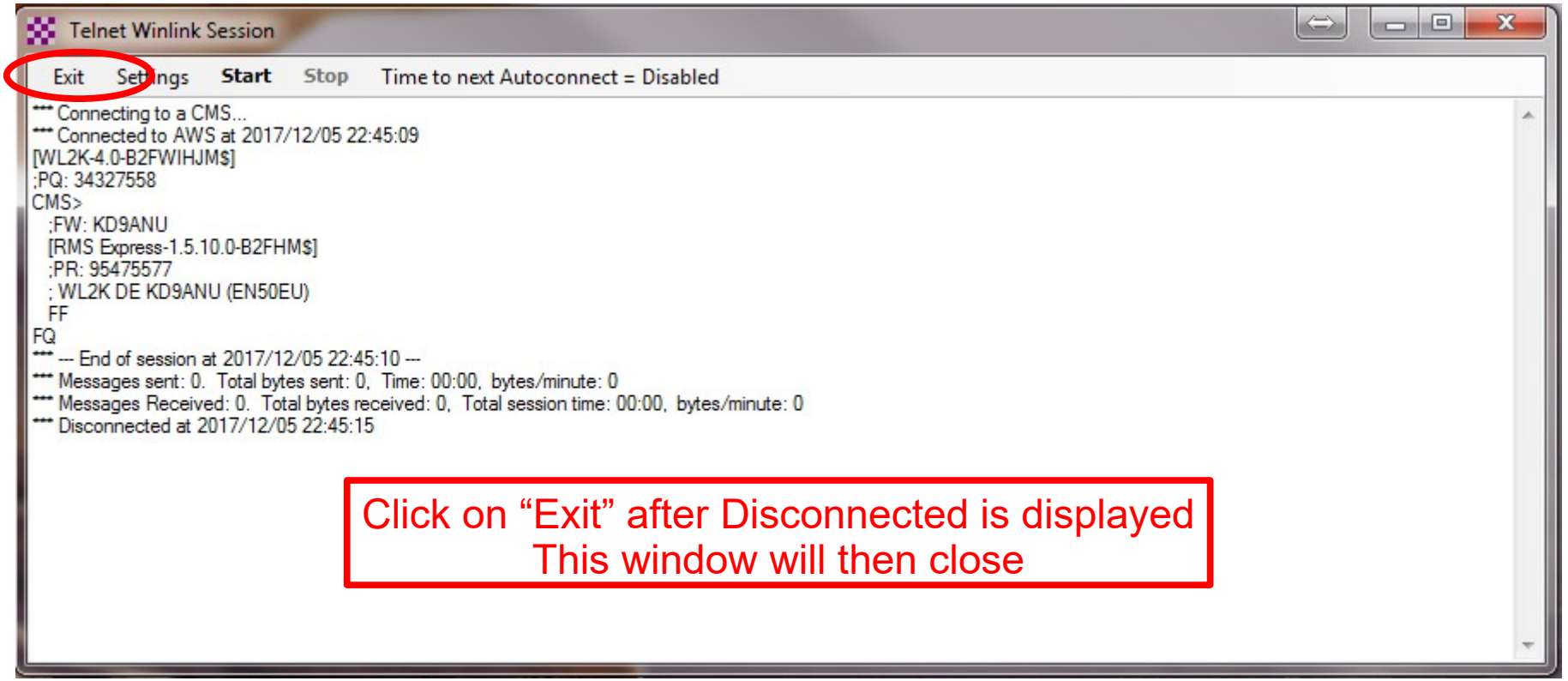
Connect to the System (1 of 3)



Connect to the System (2 of 3)

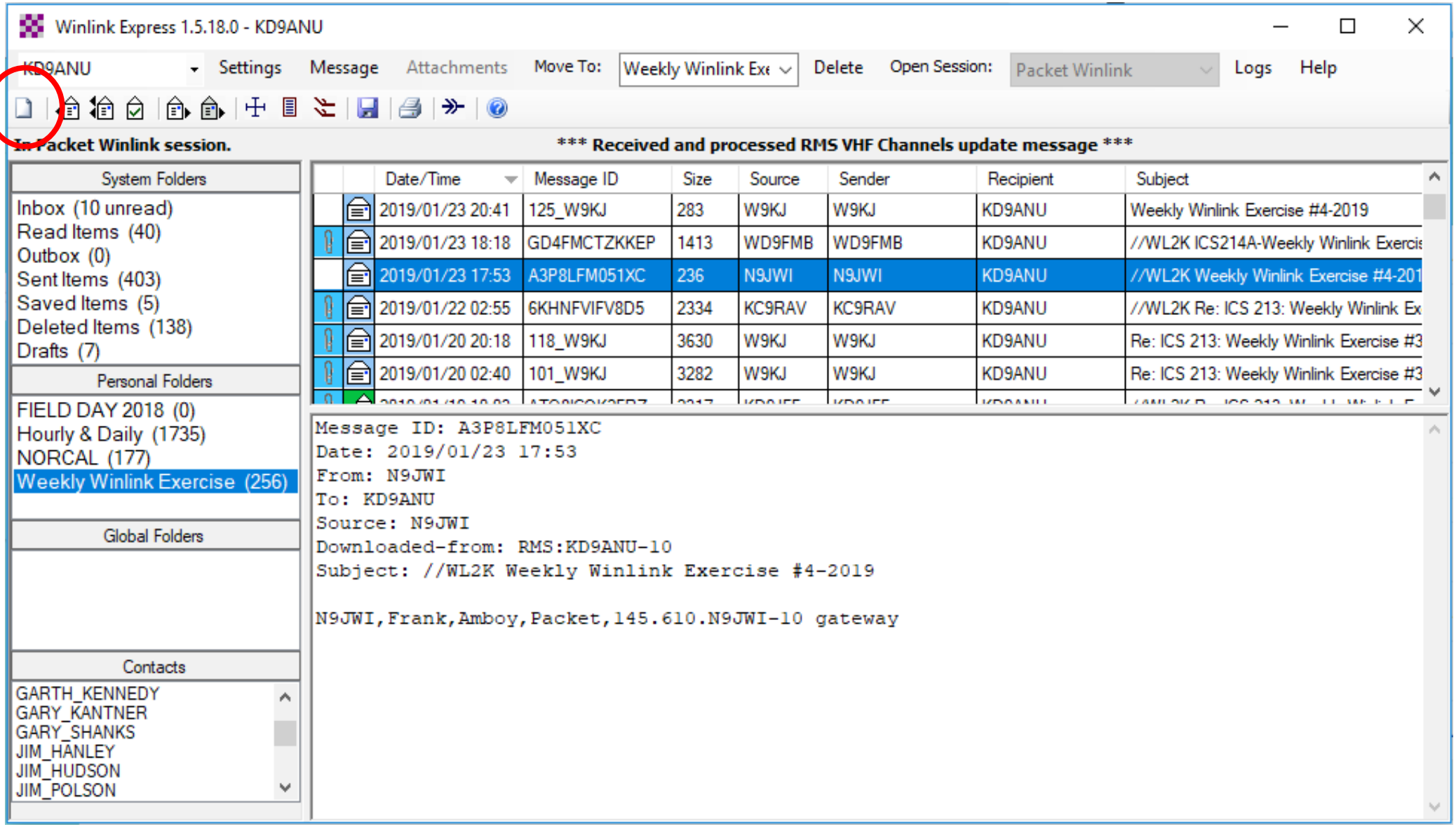


Connect to the System (3 of 3)

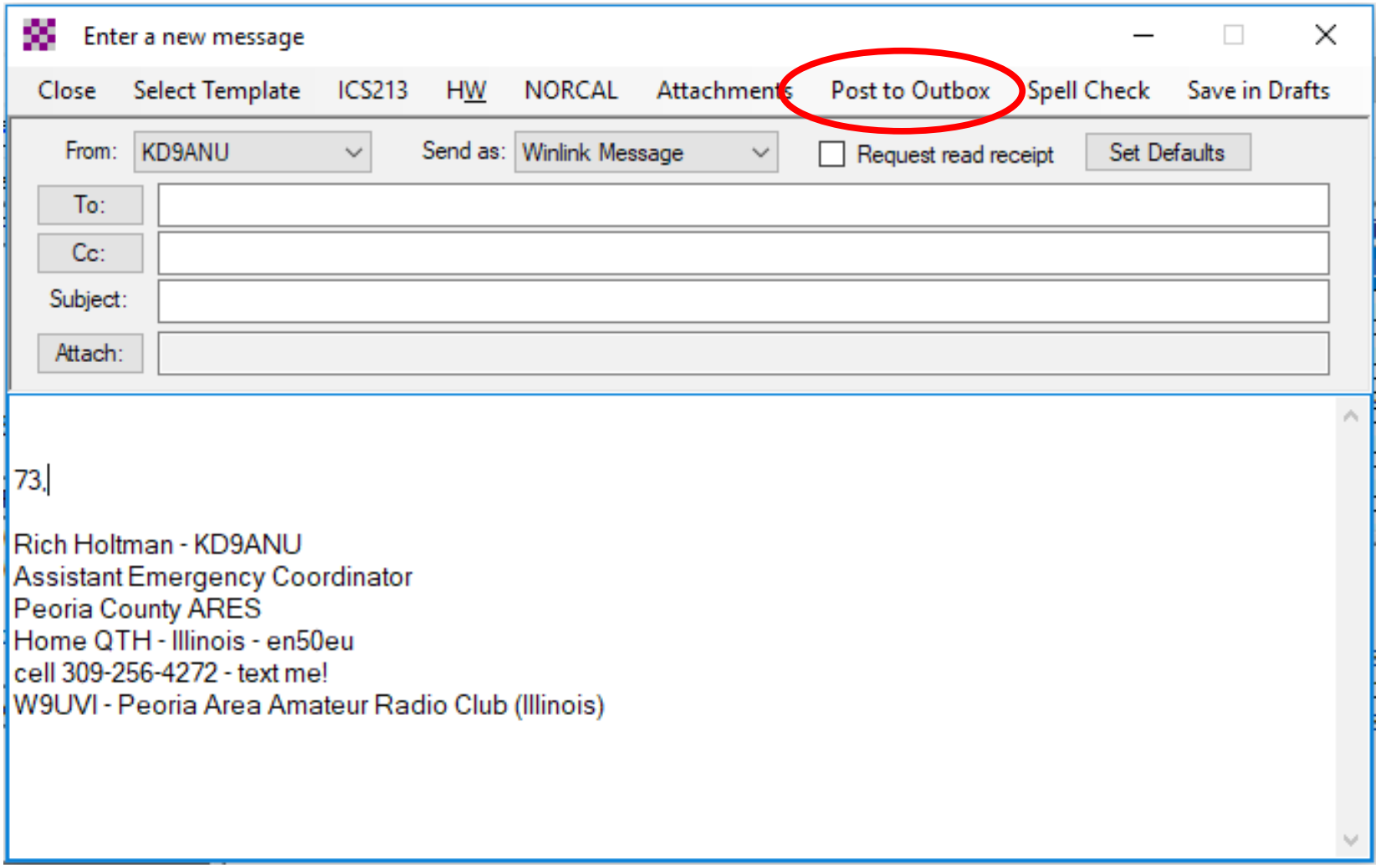


Click on “Exit” after Disconnected is displayed
This window will then close

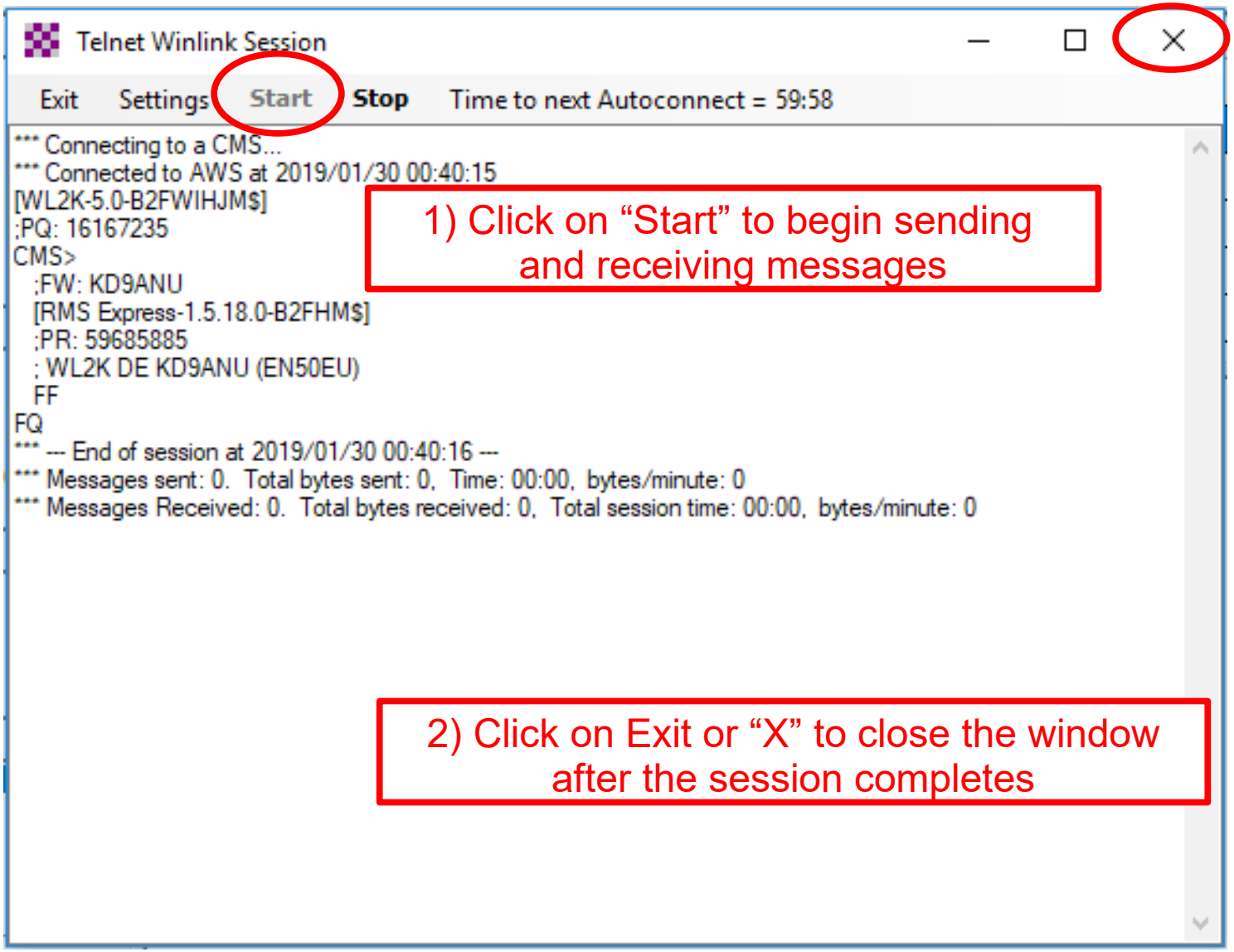
Create a New Message



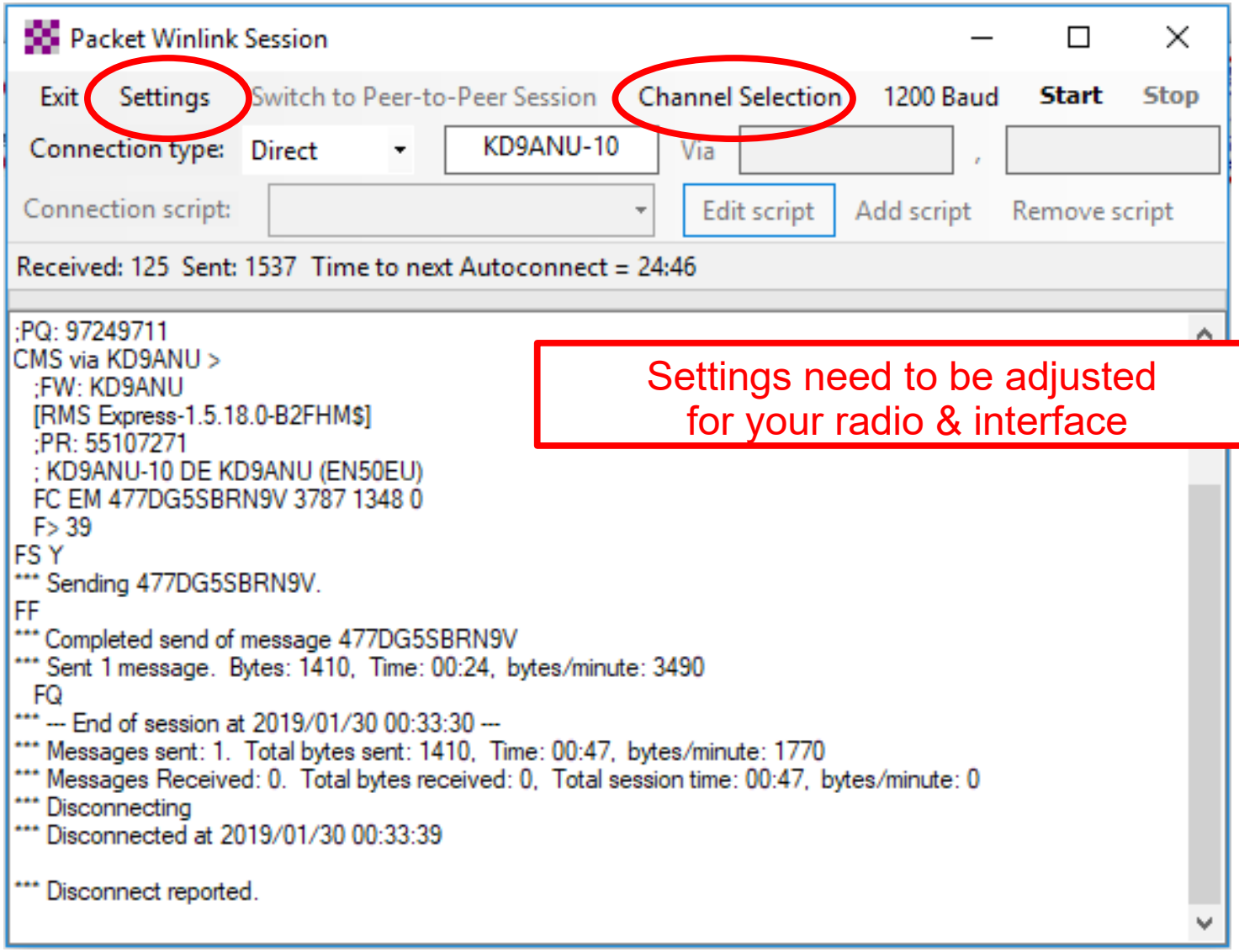
Sending the New Message



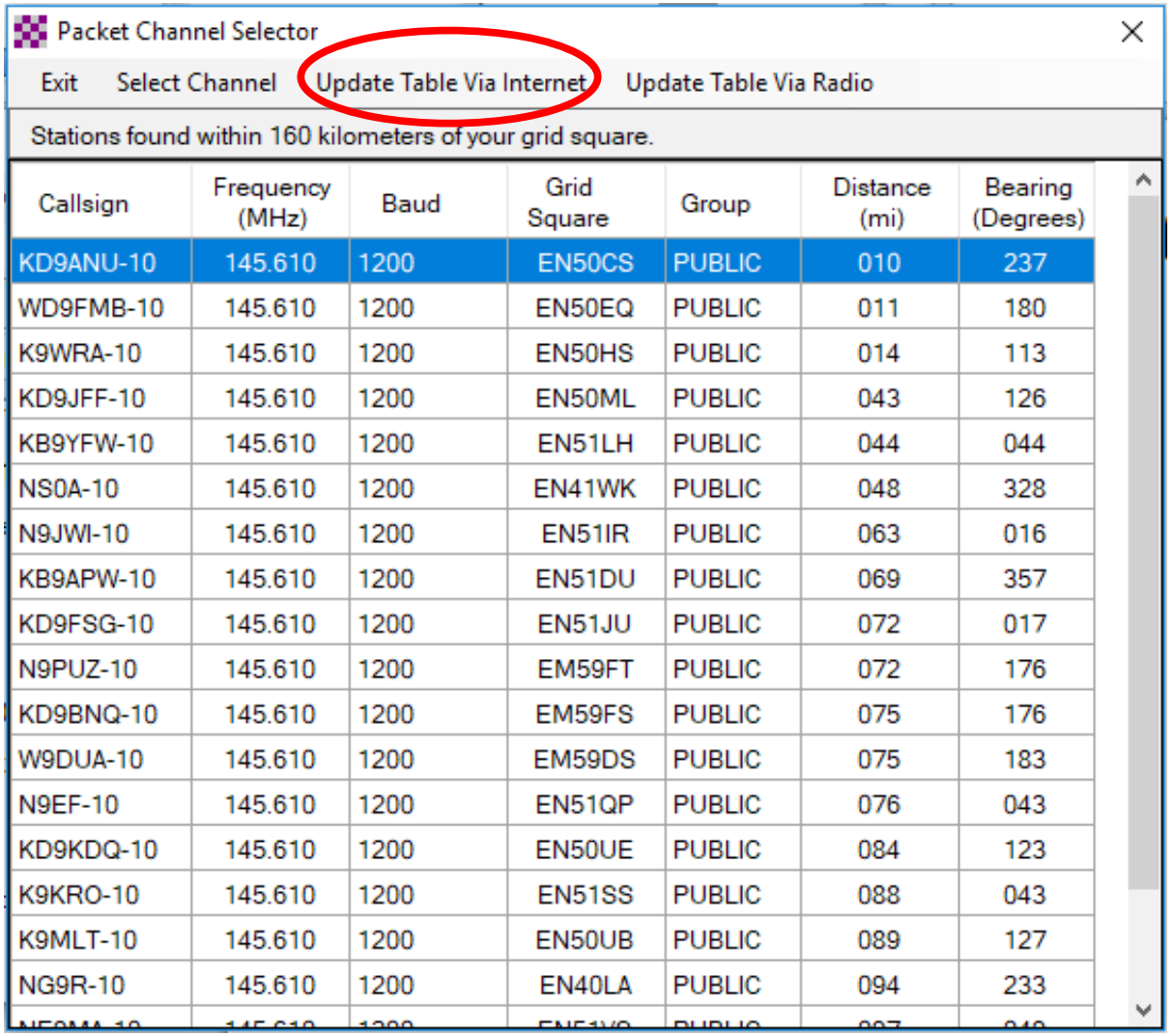
Telnet Session Screen - Internet



Packet Session Screen - VHF

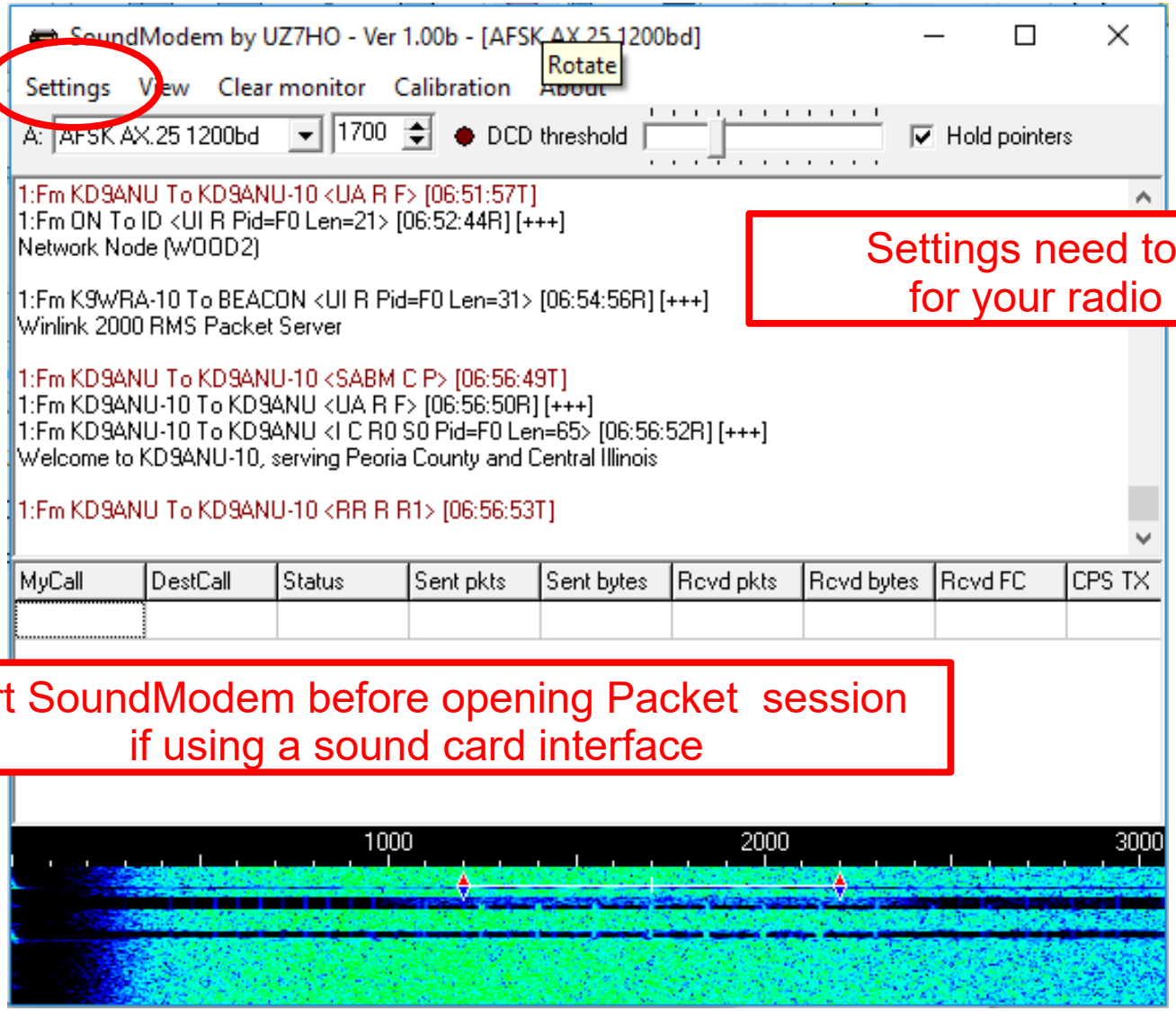


Packet Channel Selection



Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (mi)	Bearing (Degrees)
KD9ANU-10	145.610	1200	EN50CS	PUBLIC	010	237
WD9FMB-10	145.610	1200	EN50EQ	PUBLIC	011	180
K9WRA-10	145.610	1200	EN50HS	PUBLIC	014	113
KD9JFF-10	145.610	1200	EN50ML	PUBLIC	043	126
KB9YFW-10	145.610	1200	EN51LH	PUBLIC	044	044
NS0A-10	145.610	1200	EN41WK	PUBLIC	048	328
N9JWI-10	145.610	1200	EN51IR	PUBLIC	063	016
KB9APW-10	145.610	1200	EN51DU	PUBLIC	069	357
KD9FSG-10	145.610	1200	EN51JU	PUBLIC	072	017
N9PUZ-10	145.610	1200	EM59FT	PUBLIC	072	176
KD9BNQ-10	145.610	1200	EM59FS	PUBLIC	075	176
W9DUA-10	145.610	1200	EM59DS	PUBLIC	075	183
N9EF-10	145.610	1200	EN51QP	PUBLIC	076	043
KD9KDQ-10	145.610	1200	EN50UE	PUBLIC	084	123
K9KRO-10	145.610	1200	EN51SS	PUBLIC	088	043
K9MLT-10	145.610	1200	EN50UB	PUBLIC	089	127
NG9R-10	145.610	1200	EN40LA	PUBLIC	094	233

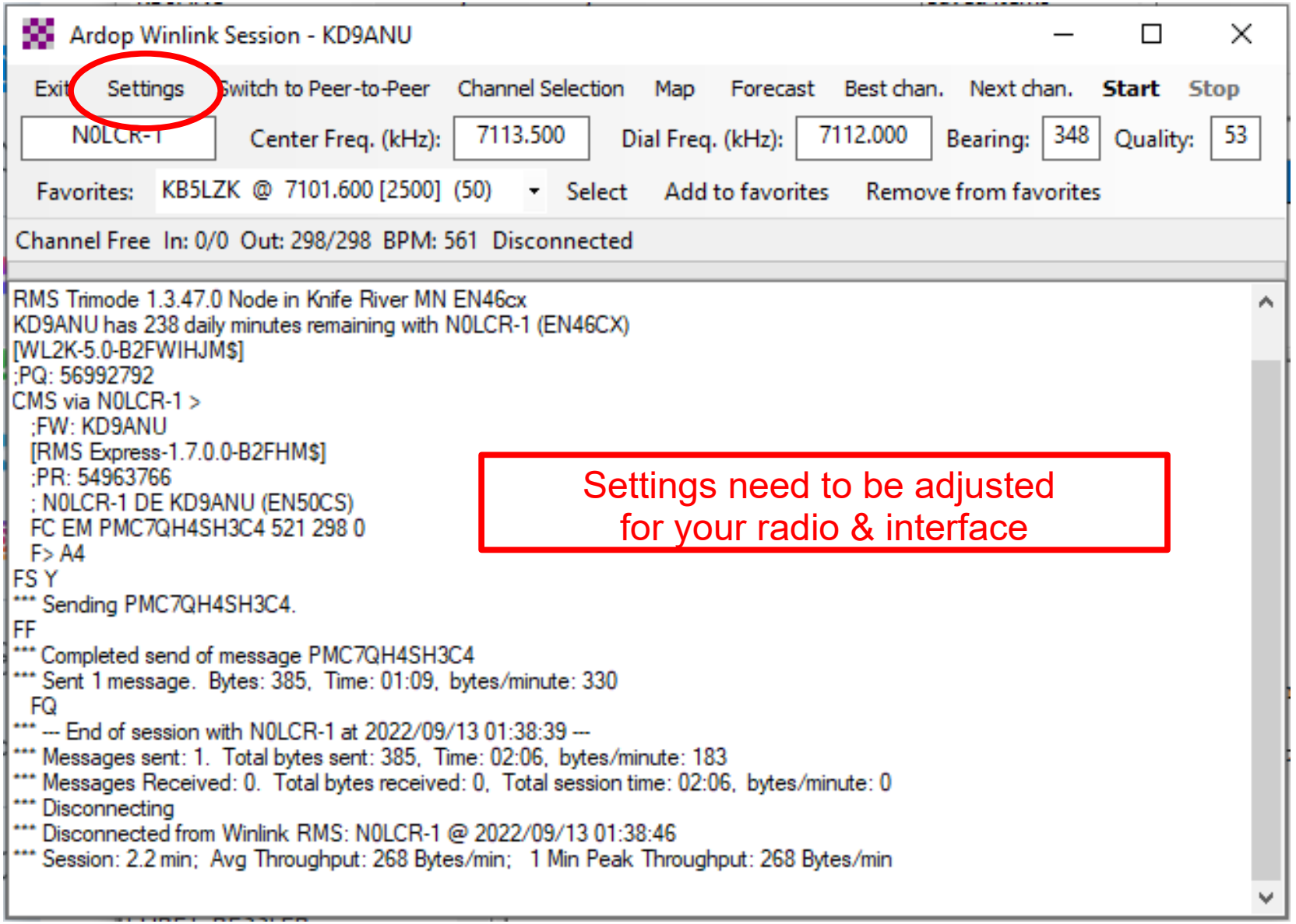
SoundModem (Virtual TNC)



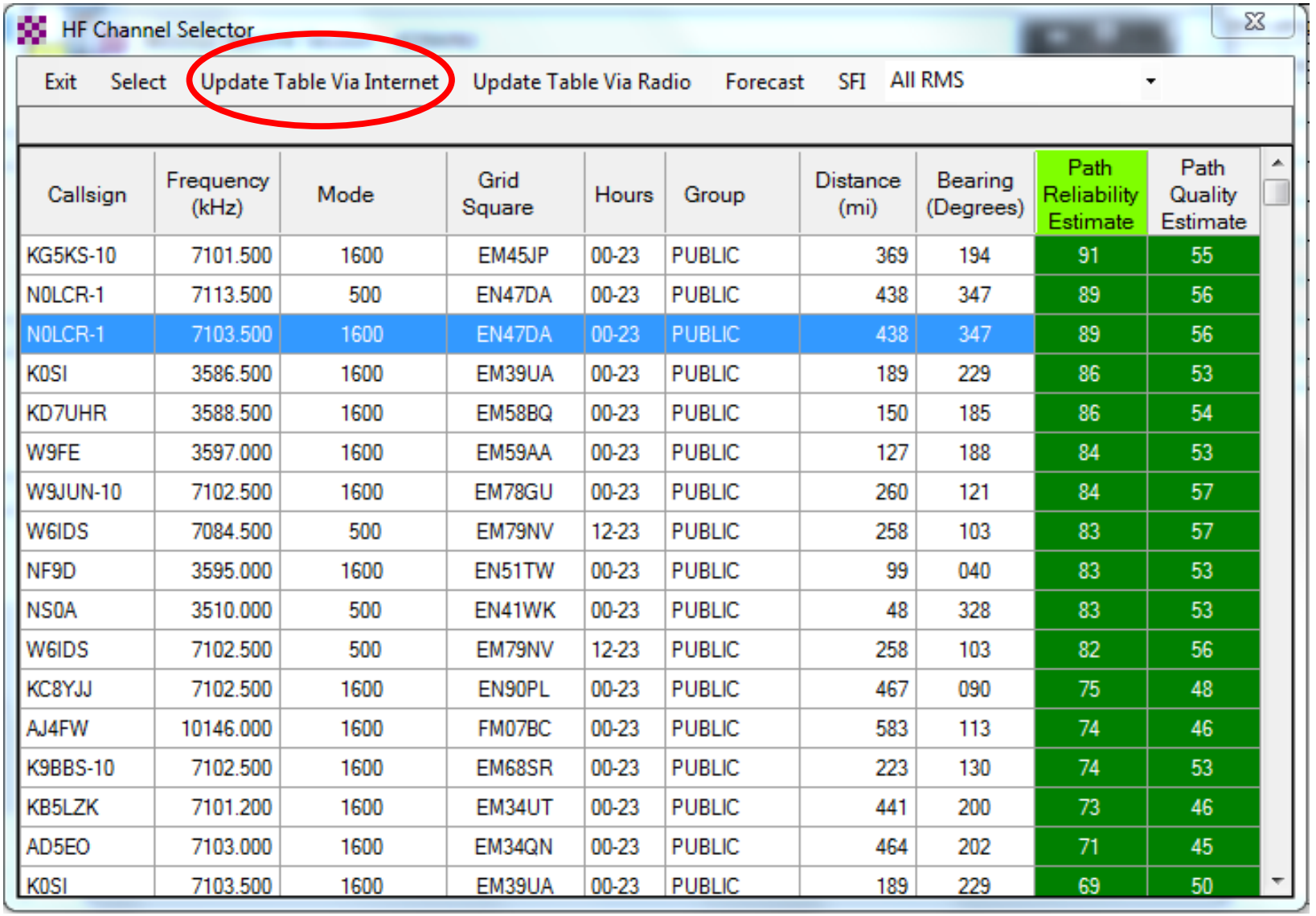
Settings need to be adjusted for your radio & interface

Start SoundModem before opening Packet session if using a sound card interface

ARDOP Session Screen - HF

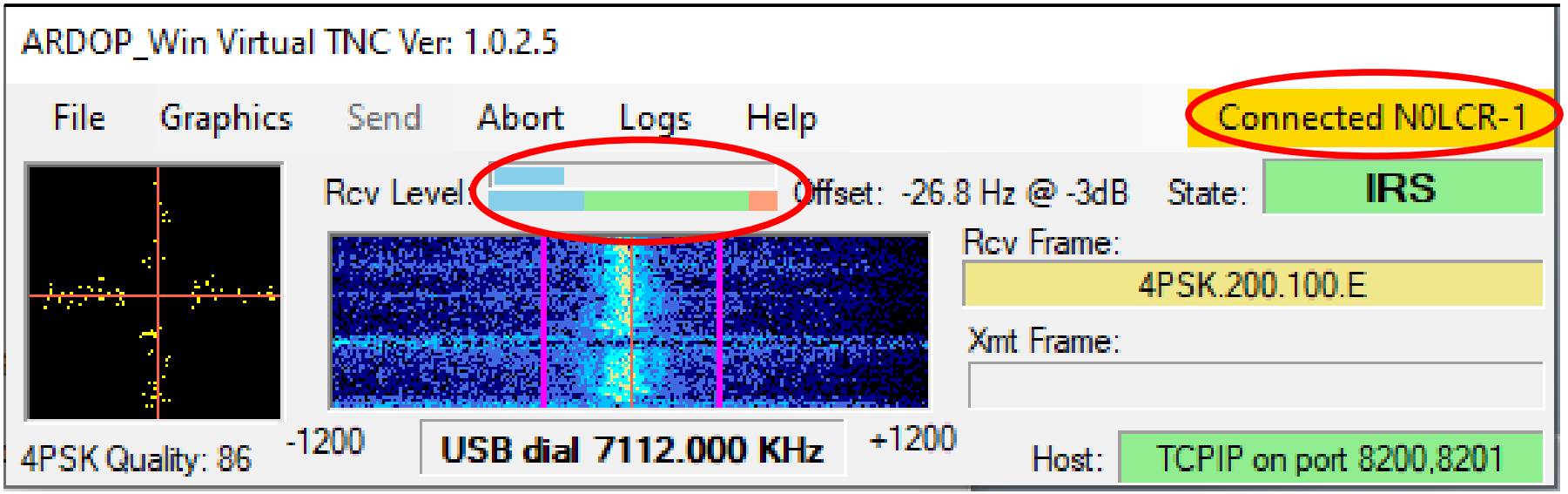


HF Channel Selection Tool

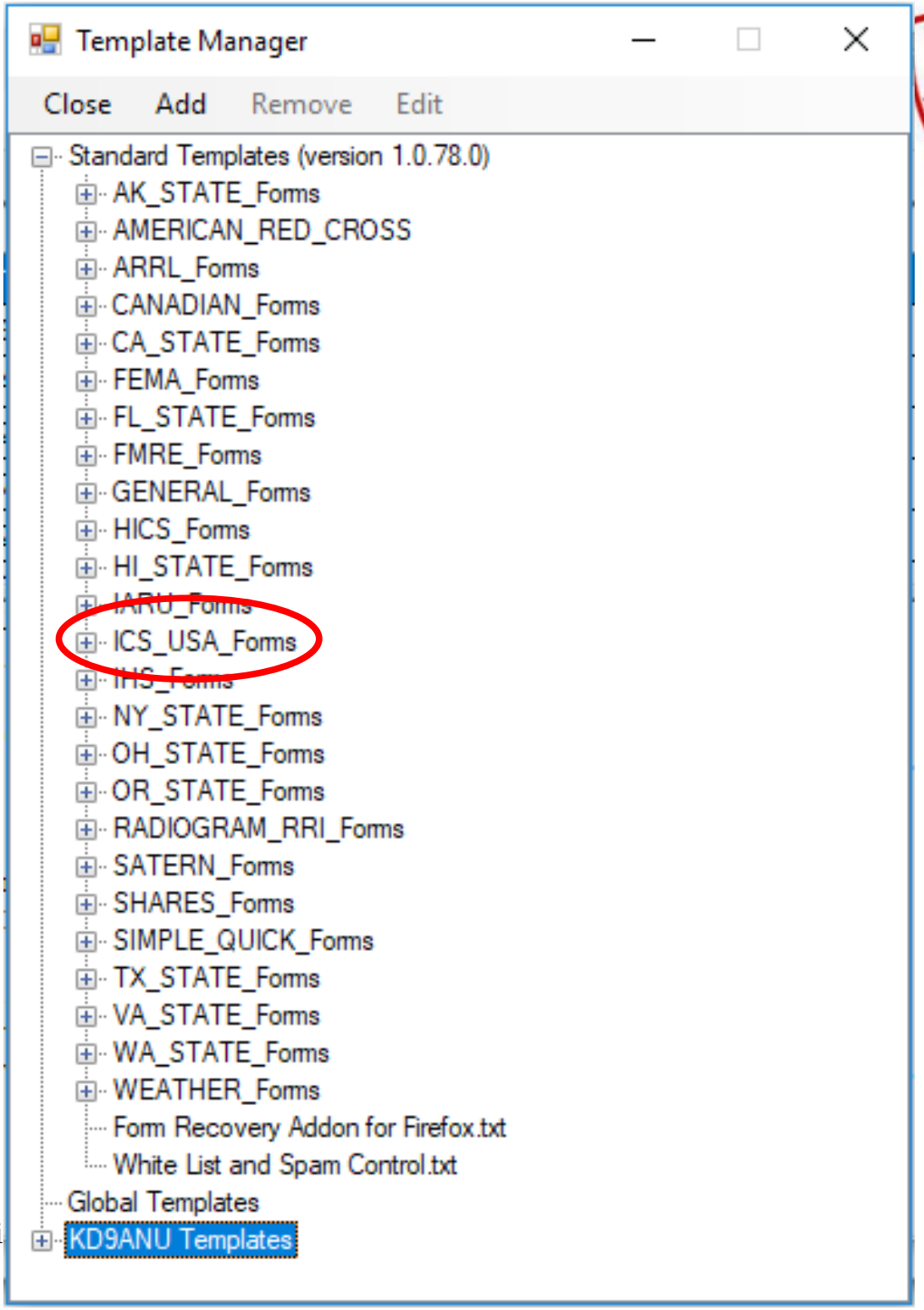


Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KG5KS-10	7101.500	1600	EM45JP	00-23	PUBLIC	369	194	91	55
N0LCR-1	7113.500	500	EN47DA	00-23	PUBLIC	438	347	89	56
N0LCR-1	7103.500	1600	EN47DA	00-23	PUBLIC	438	347	89	56
K0SI	3586.500	1600	EM39UA	00-23	PUBLIC	189	229	86	53
KD7UHR	3588.500	1600	EM58BQ	00-23	PUBLIC	150	185	86	54
W9FE	3597.000	1600	EM59AA	00-23	PUBLIC	127	188	84	53
W9JUN-10	7102.500	1600	EM78GU	00-23	PUBLIC	260	121	84	57
W6IDS	7084.500	500	EM79NV	12-23	PUBLIC	258	103	83	57
NF9D	3595.000	1600	EN51TW	00-23	PUBLIC	99	040	83	53
NS0A	3510.000	500	EN41WK	00-23	PUBLIC	48	328	83	53
W6IDS	7102.500	500	EM79NV	12-23	PUBLIC	258	103	82	56
KC8YJJ	7102.500	1600	EN90PL	00-23	PUBLIC	467	090	75	48
AJ4FW	10146.000	1600	FM07BC	00-23	PUBLIC	583	113	74	46
K9BBS-10	7102.500	1600	EM68SR	00-23	PUBLIC	223	130	74	53
KB5LZK	7101.200	1600	EM34UT	00-23	PUBLIC	441	200	73	46
AD5EO	7103.000	1600	EM34QN	00-23	PUBLIC	464	202	71	45
K0SI	7103.500	1600	EM39UA	00-23	PUBLIC	189	229	69	50

ARDOP Virtual TNC - HF



Forms or Templates



ICS213 Template (in Browser)

General Message (ICS 213)

Load ICS213 INITIAL Data Form Instructions

1. Incident Name: Incident number is optional

2. To (Name/Position):

3. From (Name/Position):

4. Subject: 5. Date: 2019-1-29 6. Time: 17:50

7. Message:

Be Brief and Concise

8. Approved by: Position / Title:

Save ICS213 INITIAL Data Submit Reset Form Senders Base Call: KD9ANU Ver 36.2

Winlink Support

- Good indexed Help within the Winlink Express program. USE THIS!
- Winlink Book of Knowledge (download latest pdf file)
  https://winlink.org/content/winlink_faq_september_29_2019_revised_frequently_asked_questions
- Winlink Forum on Google Groups (text-searchable)
  - Winlink Programs Group
- The San Diego ARES group has a series of short videos. Search for “San Diego Winlink Series youtube”
- Can also be hard to find up-to-date detailed help using general Internet searches. Yet this may be a good way to find help for specific radio and interface, if you include enough specifics in the search string.
- Ask other Winlink users

Reminders

- Log in and use regularly – after 400 inactive days your account is turned off – Contact Admin to fix
- Winlink Express software updates automatically while open or when opened, also auto updates the Templates/Forms
- If your software become out-of-date too much, a full reinstall is necessary
- You cannot send a Winlink message to your Winlink address – rejected as a duplicate. Send messages to your personal Internet address for testing.

Take Aways

- Download Winlink Express Software on your PC
- Create your Account
- Debug and practice using Telnet Internet Mode
- Move to Winlink via Radio – VHF and/or HF
- Practice! Send messages to yourself & others
- Plenty of practice sessions exist – Talk to me afterwards
- Use Help in Winlink Express, FAQ, & Google forum
- Post issues in the Google forum if you need help

Questions?