

# All About Winlink

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A word cloud featuring various digital modes and protocols. The word "Digital" is the largest and most prominent, centered in the image. Other large words include "Winlink", "Modes", "Fusion", and "FT-8". Smaller words scattered around include "RTTY", "DSTAR", "DMR", "C4FM", "JT44", "WSTJ-X", "Packet", "JS8CALL", "WIRES-X", "APRS", "JT65", "Fldigi", "PSK31", and "Winlink". The words are in shades of blue and black, with varying font sizes and orientations.

RTTY  
Winlink  
PSK31  
DSTAR  
C4FM  
DMR  
Fldigi  
JT65  
APRS  
JT44  
WSTJ-X  
Fusion  
Packet  
FT-8  
Modes  
JS8CALL  
WIRES-X

# Winlink Presentation

Winlink is a different mode of sending and receiving messages other than trying to get a voice message through to the receiving party via HAM radio.

This achieved like sending an email message, but over the air waves. These messages are more likely to be received than a voice message.

# 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.

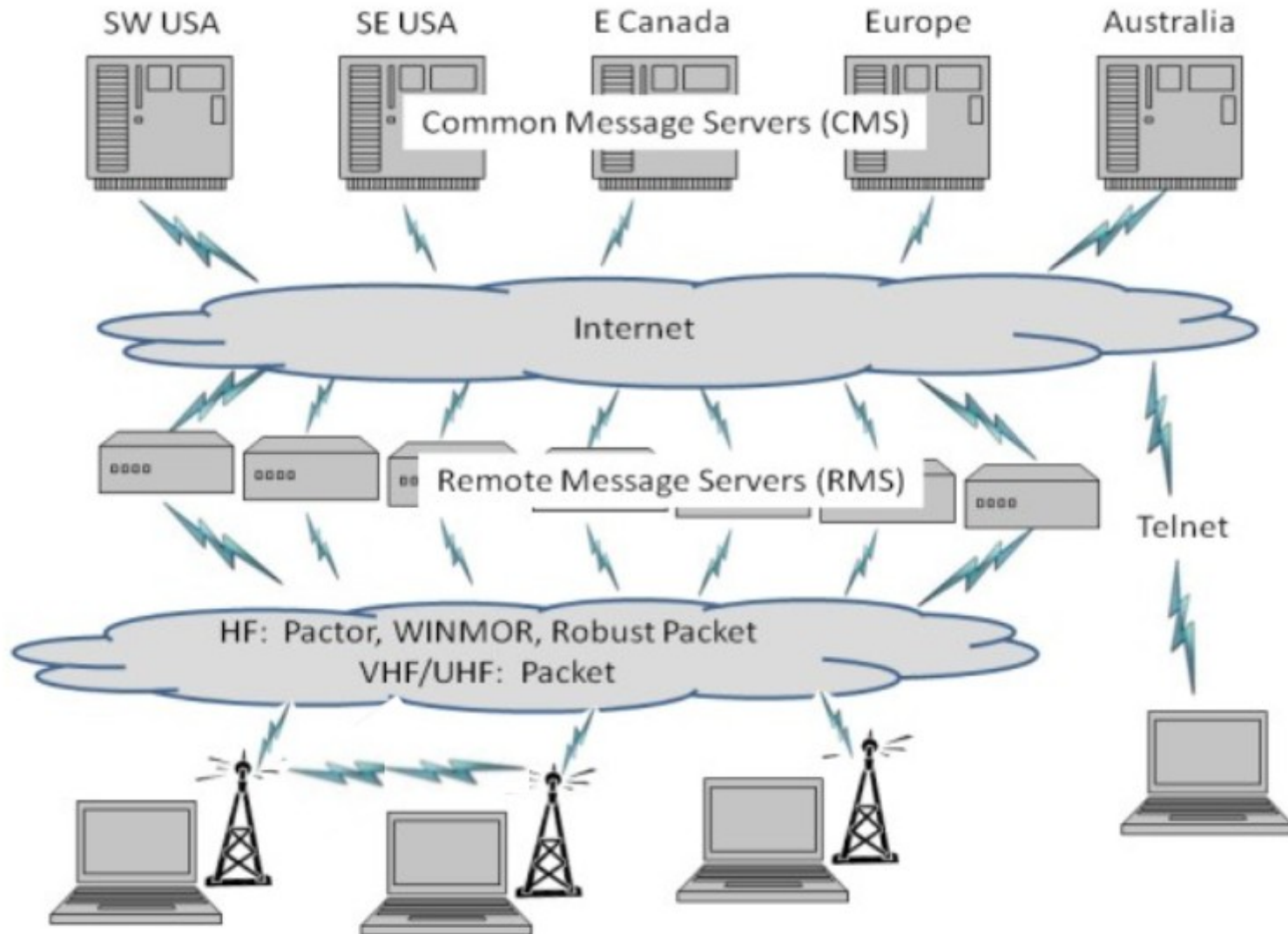
Winlink provides users email messaging with attachments, position reporting, weather and information bulletins, and is well-known for its role in emergency and disaster relief communications.

The Winlink system uses the Internet (when available) to send messages between users.

Winlink can send messages to & from regular Internet Email Addresses.

Winlink can also send messages direct between users (Peer-to-Peer).

# WinLink Network



# Winlink Limitations

Backup messaging system

Does not replace your normal email account

Does not replace your internet service provider

Does not provide any ability to surf the Internet

Most messages sent via Radio transmit slower than most home internet or cell phone connections

Max size of email and attachments=120,000 bytes No cloud database for messages - stored on your PC

# Origin of Winlink

- Winlink is an all-volunteer project of the Amateur Radio Safety Foundation, Inc. (ARSFI), a non-profit public benefit corporation.
- Built, maintained and supported entirely by volunteers of the Winlink Development Team.
- Winlink is happy to take donations for support.
- Winlink grew from Packet Radio. Packet has been around for many years.
- 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 read by at least the Gateway SYSOPS.

# Why Winlink?

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



# Uses & Users

- Popular with ARES & EmComm folks Used during at least 14 recent hurricanes 2018 Western Wildfires
- 2017 Mexico City Earthquake Other high profile disasters
- Lives and property saved, damage mitigated Sailors stay connected at sea, over marine radio

# Live Stations - Winmor



- Go to [winlink.org](http://winlink.org)
- Select >Tools
- On the RMS Map, choose the radio button “Winmor”
- Zoom in to the region of interest

# Interface Box Examples

- If not built-in to your radio, there are many options
- TNC (Terminal Node Controller) [many models]
  - Kantronics KPC-3+ USB (\$199)
- Sound Cards (w/SoundModem or Direwolf - free software)
  - Signalink USB (\$115, cable adds \$22) RigBlaster (\$70 to \$230)
  - More models
  - Unified Microsystems SCI-6 PC Sound Card Interface Kit (\$35 with DIY cables) (an isolation card, uses PC's soundcard)
- High End Modem for PACTOR I thru IV
  - Spezielle Communications Systeme GmbH & Co. KG
  - P4dragon DR-7400 (\$1500)

# External Interface Options



Kantronics KPC-3 Plus TNC



Signalink USB Sound Card



SCI-6 PC Sound Card Interface Kit



P4dragon DR-7400 PACTOR Modem

# WinlinkModes

- 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.
- HF Radio
  - **Winmor** (Sound Card) - Alternative to external Pactor hardware that works with a PC sound card to provide a virtual TNC enabling throughput performance approaching Pactor 2.
  - **FACTOR 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. Faster than Winmor in my experience.
  - **VARA** - (Sound Card) HF sound-card software modem offering high-throughput, fixed 2.5 KHz wide-bandwidth operation. (Free & paid versions)

# Additional Software Features

- Forms/Templates – simplify information and the amount of data being sent, transmitted as text to all users without Winlink
- Store individual and group Contacts list.
- Use Personal Folders to store messages how you desire.
- Has Built-in Spam filter using Whitelist
- Automatically check for new messages periodically (unattended)
- Forward received messages to Internet email account
- Preview messages before downloading

# WinlinkExpress Setup

Winlink Express Properties

**Call Signs**

My Callsign:  My Password:   
(Case sensitive)  Show password

Callsign suffix (optional):  (Used for country code)

Password recovery e-mail:   
(Non-Winlink e-mail address where lost password will be sent when requested)

**Auxiliary Callsigns and Tactical Addresses**

My Grid Square:

Winlink Express registration key:

**Service Codes**

(Use PUBLIC for ham call signs. Separate multiple service codes by spaces.)  
If you change service codes, you must update the list of channels.

**Contact Information (Optional)**

Name:

Street address 1:

Street address 2:

City:

State/Province:

Country:

Postal code:

Web Site URL (optional):

Phone number:

Non-Winlink e-mail:

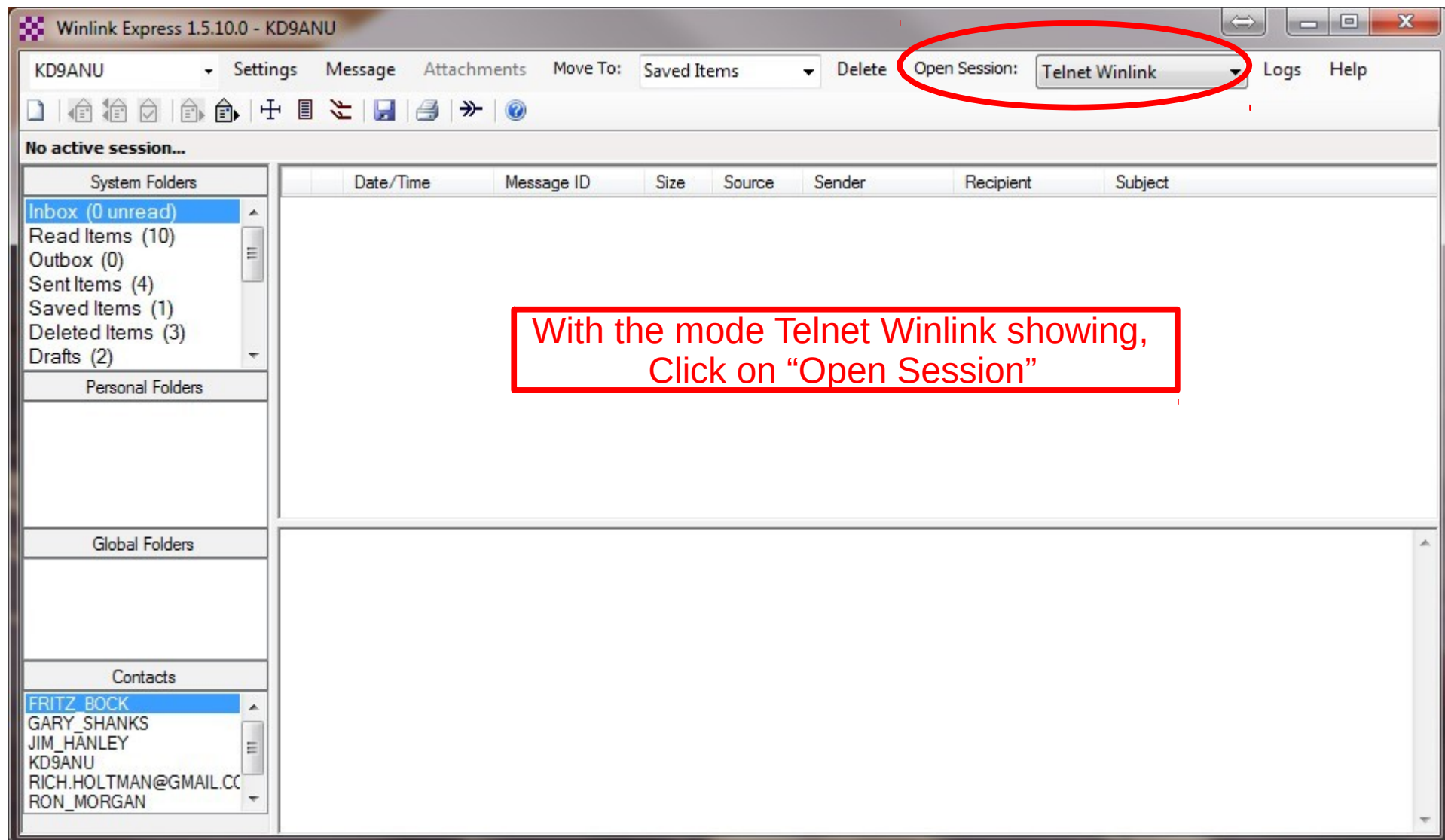
Additional information (optional):

Recalculate HF path quality if SFI changes more than:

Keep logs for  weeks. Keep deleted messages for  days.

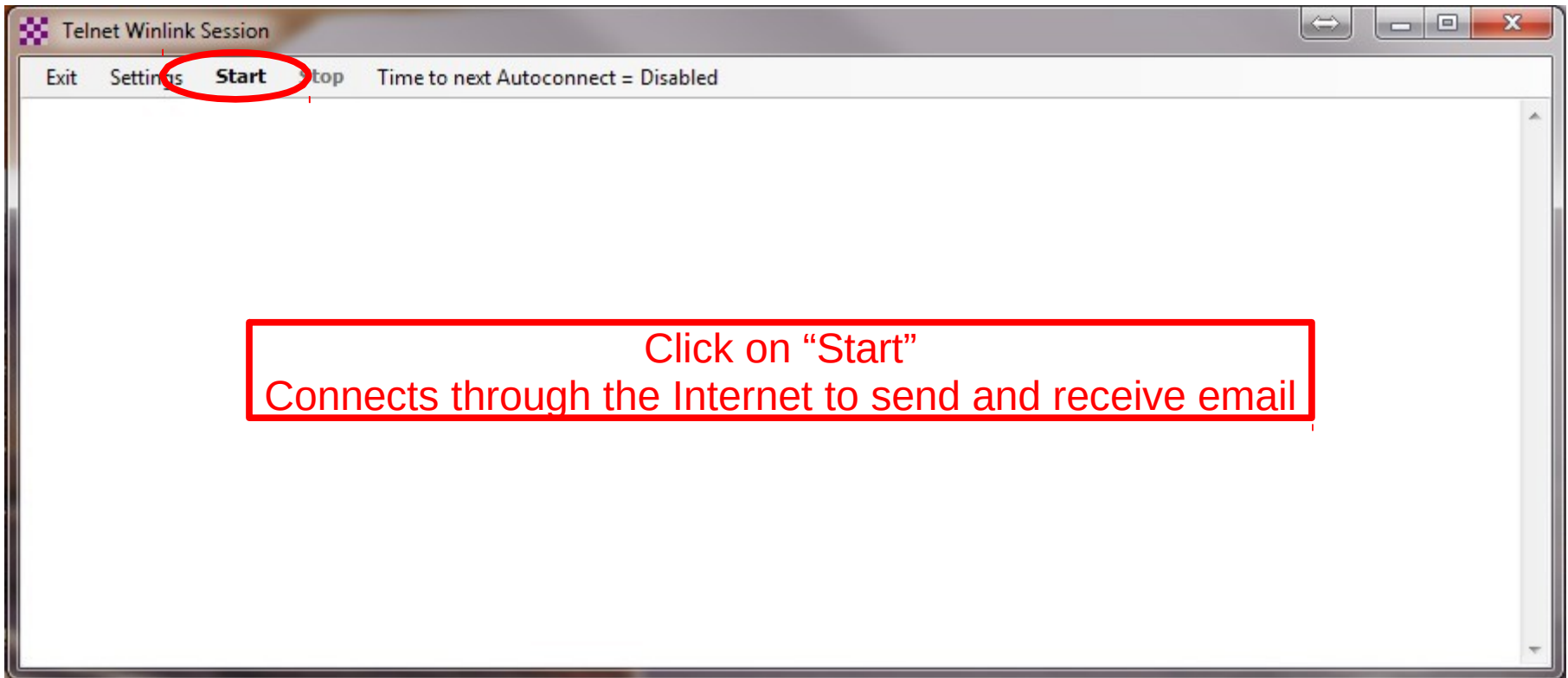
- Display list of pending incoming messages prior to download
- Warn about connections to stations holding messages
- Allow diagnostic information to be sent to the Winlink Development Team
- Automatically install field-test (beta) versions of Winlink Express

# Connect to the System (1 of 3)

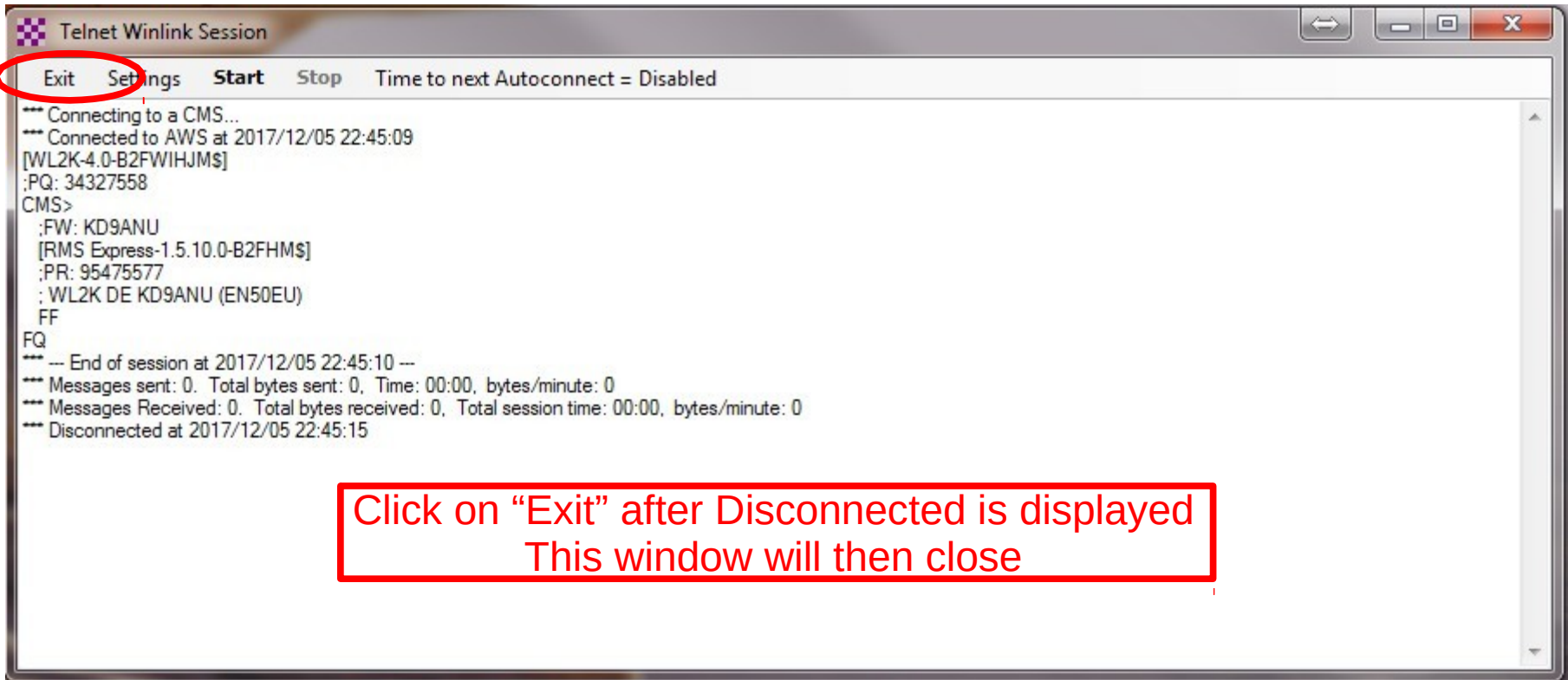




# Connect to the System (2 of 3)



# Connect to the System (3 of 3)



# WinlinkExpress Screen

Winlink Express 1.5.18.0 - KD9ANU

KD9ANU Settings Message Attachments Move To: Weekly Winlink Ex Delete Open Session: Packet Winlink Logs Help

In Packet Winlink session. \*\*\* Received and processed RMS VHF Channels update message \*\*\*

	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
	2019/01/23 20:41	125_W9KJ	283	W9KJ	W9KJ	KD9ANU	Weekly Winlink Exercise #4-2019
	2019/01/23 18:18	GD4FMCTZKKEP	1413	WD9FMB	WD9FMB	KD9ANU	//WL2K ICS214A-Weekly Winlink Exercis
	2019/01/23 17:53	A3P8LFM051XC	236	N9JWI	N9JWI	KD9ANU	//WL2K Weekly Winlink Exercise #4-201
	2019/01/22 02:55	6KHNFVIFV8D5	2334	KC9RAV	KC9RAV	KD9ANU	//WL2K Re: ICS 213: Weekly Winlink Ex
	2019/01/20 20:18	118_W9KJ	3630	W9KJ	W9KJ	KD9ANU	Re: ICS 213: Weekly Winlink Exercise #3
	2019/01/20 02:40	101_W9KJ	3282	W9KJ	W9KJ	KD9ANU	Re: ICS 213: Weekly Winlink Exercise #3

Message ID: A3P8LFM051XC  
 Date: 2019/01/23 17:53  
 From: N9JWI  
 To: KD9ANU  
 Source: N9JWI  
 Downloaded-from: RMS:KD9ANU-10  
 Subject: //WL2K Weekly Winlink Exercise #4-2019

N9JWI, Frank, Amboy, Packet, 145.610.N9JWI-10 gateway

System Folders  
 Inbox (10 unread)  
 Read Items (40)  
 Outbox (0)  
 Sent Items (403)  
 Saved Items (5)  
 Deleted Items (138)  
 Drafts (7)

Personal Folders  
 FIELD DAY 2018 (0)  
 Hourly & Daily (1735)  
 NORCAL (177)  
 Weekly Winlink Exercise (256)

Global Folders

Contacts  
 GARTH\_KENNEDY  
 GARY\_KANTNER  
 GARY\_SHANKS  
 JIM\_HANLEY  
 JIM\_HUDSON  
 JIM\_POLSON

# Preferences

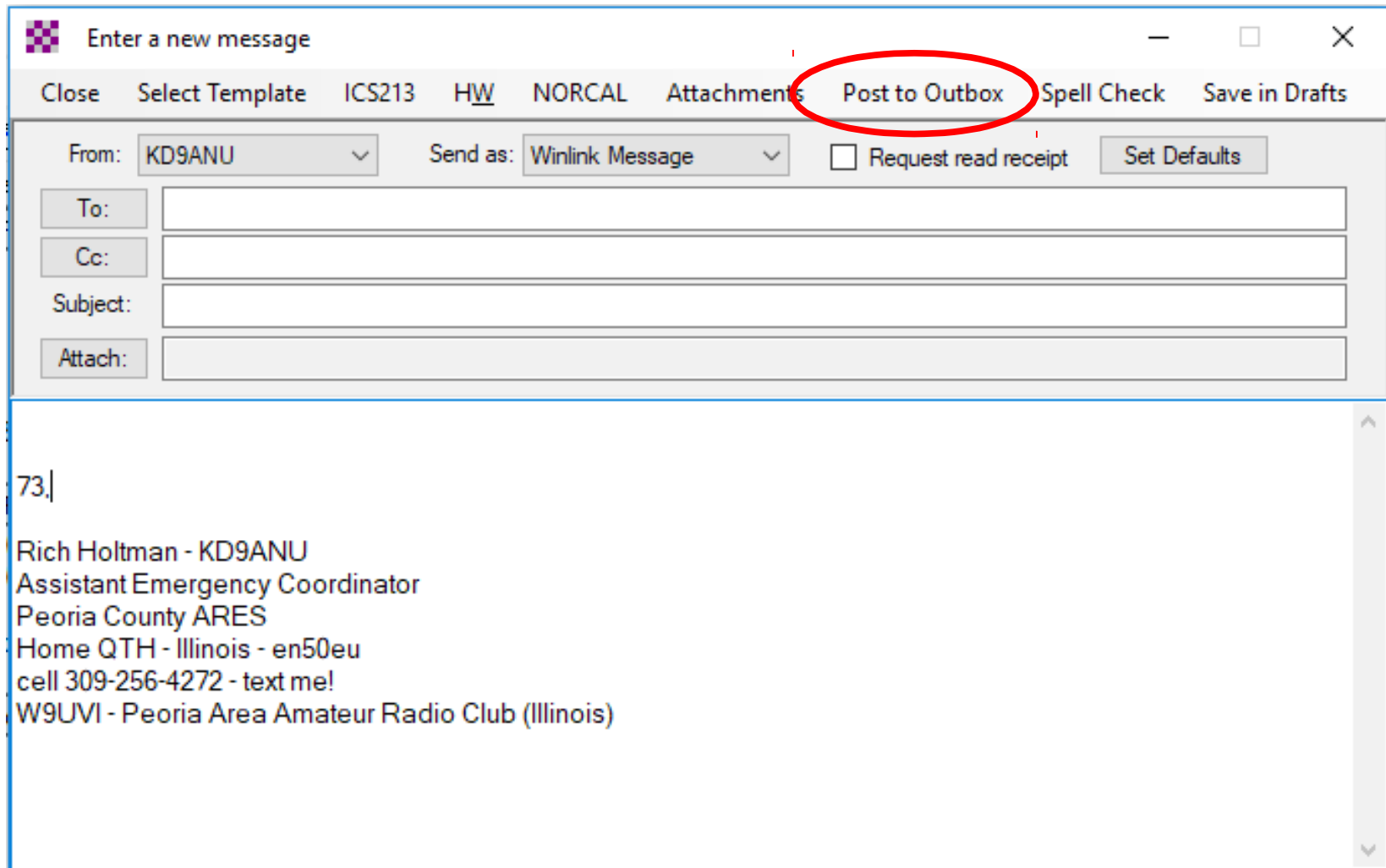
Settings,  
Preferences...

The screenshot shows a 'Preferences' dialog box with the following sections and options:

- Message Reading Options**
  - Viewing seconds before marking message read:
  - Automatically move read items to Read Items folder
- Message review before downloading**
  - Display list of pending incoming messages prior to download
- Message acknowledgement options**
  - Default to requesting message read acknowledgements
  - Automatically send message read acknowledgements when requested
  - Automatically send message read acknowledgements for all read messages
  - Ignore read acknowledgement requests on incoming messages
- Message sending options**
  - Automatically add contact entry for each destination address
  - Add "//WL2K" to the subject of messages
- Line wrapping**
  - Wrap print lines after this many characters:
- Distance Units**
  - km
  - Miles

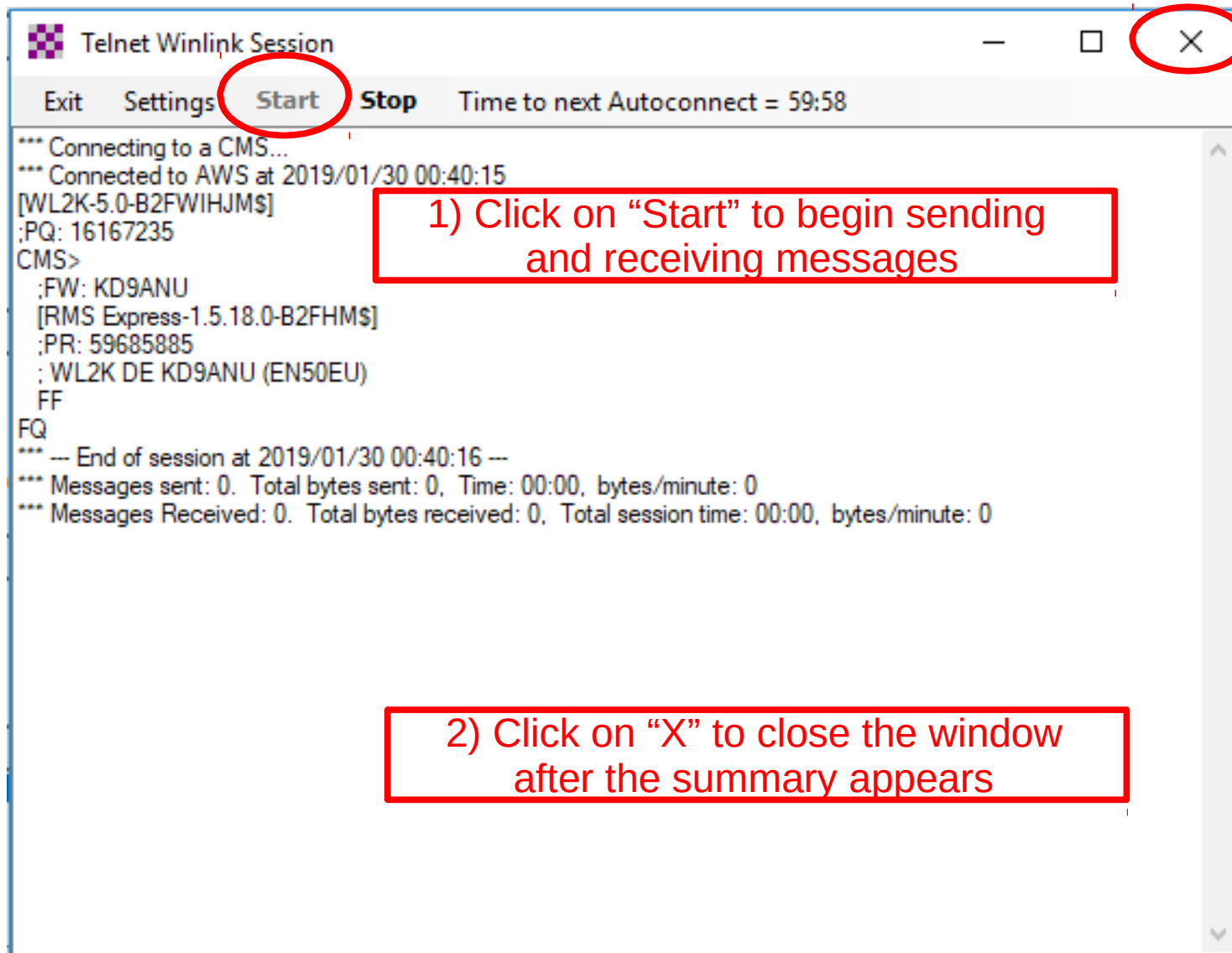
Buttons: Update, Cancel

# Compose New Message



The screenshot shows a window titled "Enter a new message" with a standard Windows title bar. The menu bar includes "Close", "Select Template", "ICS213", "HW", "NORCAL", "Attachments", "Post to Outbox", "Spell Check", and "Save in Drafts". The "Post to Outbox" button is circled in red. Below the menu bar, the "From:" field is set to "KD9ANU" and "Send as:" is set to "Winlink Message". There is a checkbox for "Request read receipt" and a "Set Defaults" button. The "To:", "Cc:", "Subject:", and "Attach:" fields are empty. The main text area contains the text: "73.", "Rich Holtman - KD9ANU", "Assistant Emergency Coordinator", "Peoria County ARES", "Home QTH - Illinois - en50eu", "cell 309-256-4272 - text me!", and "W9UVI - Peoria Area Amateur Radio Club (Illinois)".

# Telnet Session Screen - Internet



# Packet Session Screen - VHF

The screenshot shows the 'Packet Winlink Session' window. The 'Settings' button is circled in red. The session details include: Connection type: Direct, Call Sign: KD9ANU-10, Baud Rate: 1200 Baud, and Time to next Autoconnect: 24:46. The session log shows a message sent to 477DG5SBRN9V. A red callout box with the text 'Settings need to be adjusted for your radio & interface' is overlaid on the session log.

Packet Winlink Session

Exit **Settings** Switch to Peer-to-Peer Session Channel Selection 1200 Baud **Start** **Stop**

Connection type: Direct KD9ANU-10 Via ,

Connection script: Edit script Add script Remove script

Received: 125 Sent: 1537 Time to next Autoconnect = 24:46

:PQ: 97249711  
CMS via KD9ANU >  
:FW: KD9ANU  
[RMS Express-1.5.18.0-B2FHMS]  
:PR: 55107271  
: KD9ANU-10 DE KD9ANU (EN50EU)  
FC EM 477DG5SBRN9V 3787 1348 0  
F> 39  
FS Y  
\*\*\* Sending 477DG5SBRN9V.  
FF  
\*\*\* Completed send of message 477DG5SBRN9V  
\*\*\* Sent 1 message. Bytes: 1410, Time: 00:24, bytes/minute: 3490  
FQ  
\*\*\* --- End of session at 2019/01/30 00:33:30 ---  
\*\*\* Messages sent: 1. Total bytes sent: 1410, Time: 00:47, bytes/minute: 1770  
\*\*\* Messages Received: 0. Total bytes received: 0, Total session time: 00:47, bytes/minute: 0  
\*\*\* Disconnecting  
\*\*\* Disconnected at 2019/01/30 00:33:39  
\*\*\* Disconnect reported.

Settings need to be adjusted for your radio & interface

# SoundModem (Sound Card)

The screenshot shows the SoundModem software interface. The title bar reads "SoundModem by UZ7HO - Ver 1.00b - [AFSK AX.25 1200bd]". The menu bar includes "Settings", "View", "Clear monitor", "Calibration", and "About". The "Settings" menu is circled in red. Below the menu bar, the mode is set to "A: AFSK AX.25 1200bd" and the baud rate is "1700". A "DCD threshold" slider and a "Hold pointers" checkbox are also visible. The main window displays a log of radio traffic, including messages like "1:Fm KD9ANU To KD9ANU-10 <UA R F> [06:51:57T]" and "1:Fm ON To ID <UI R Pid=F0 Len=21> [06:52:44R] [+++]". Below the log is a table with columns: MyCall, DestCall, Status, Sent pkts, Sent bytes, Rcvd pkts, Rcvd bytes, Rcvd FC, and CPS TX. At the bottom, there is a spectrum display with a frequency scale from 1000 to 3000 Hz.

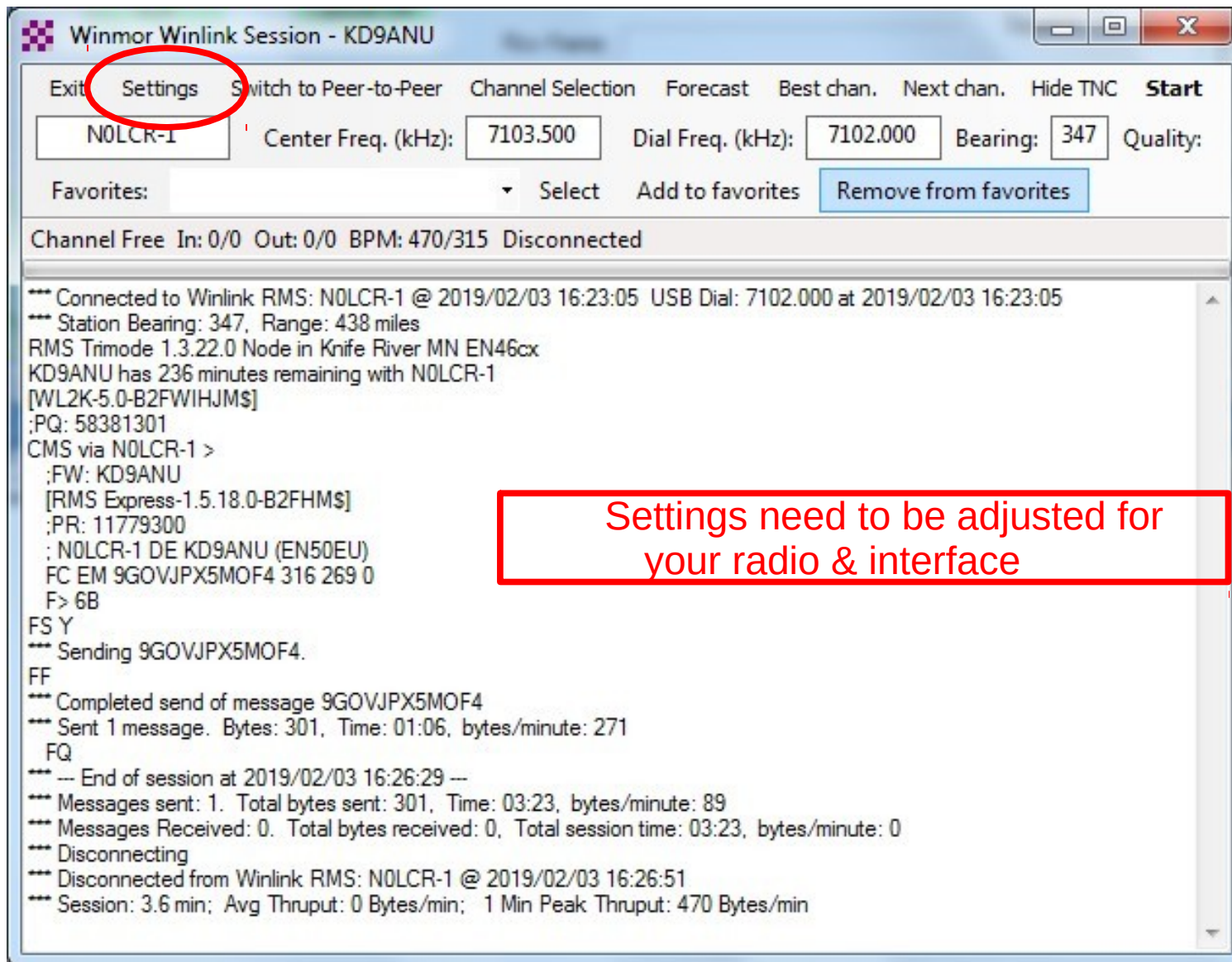
Settings need to be adjusted for your radio & interface

Soundmodem can be downloaded at: <http://uz7.ho.ua/packetradio.htm>

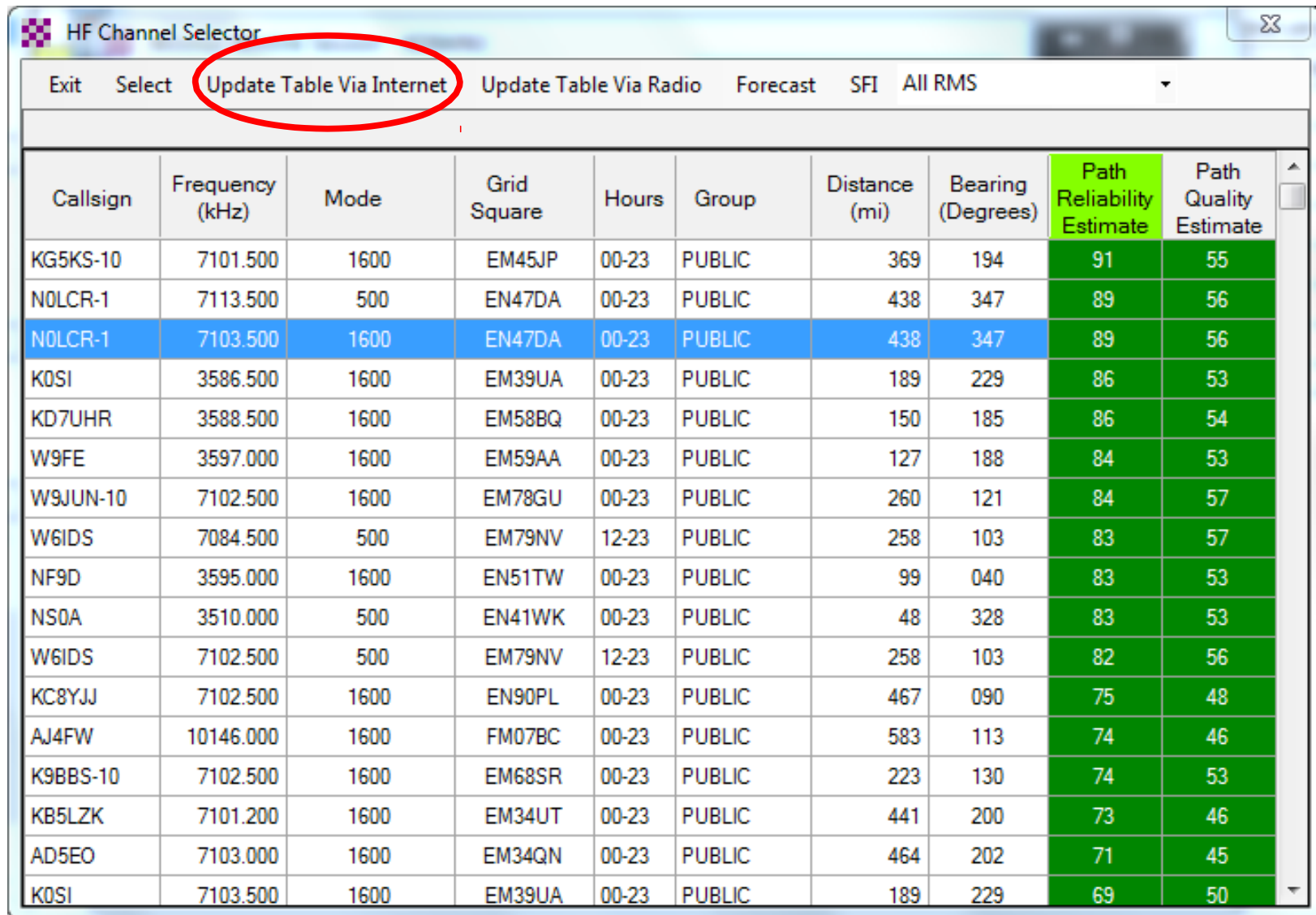
Start SoundModem before Winlink Express if using a sound card interface



# Winmor Session Screen - HF



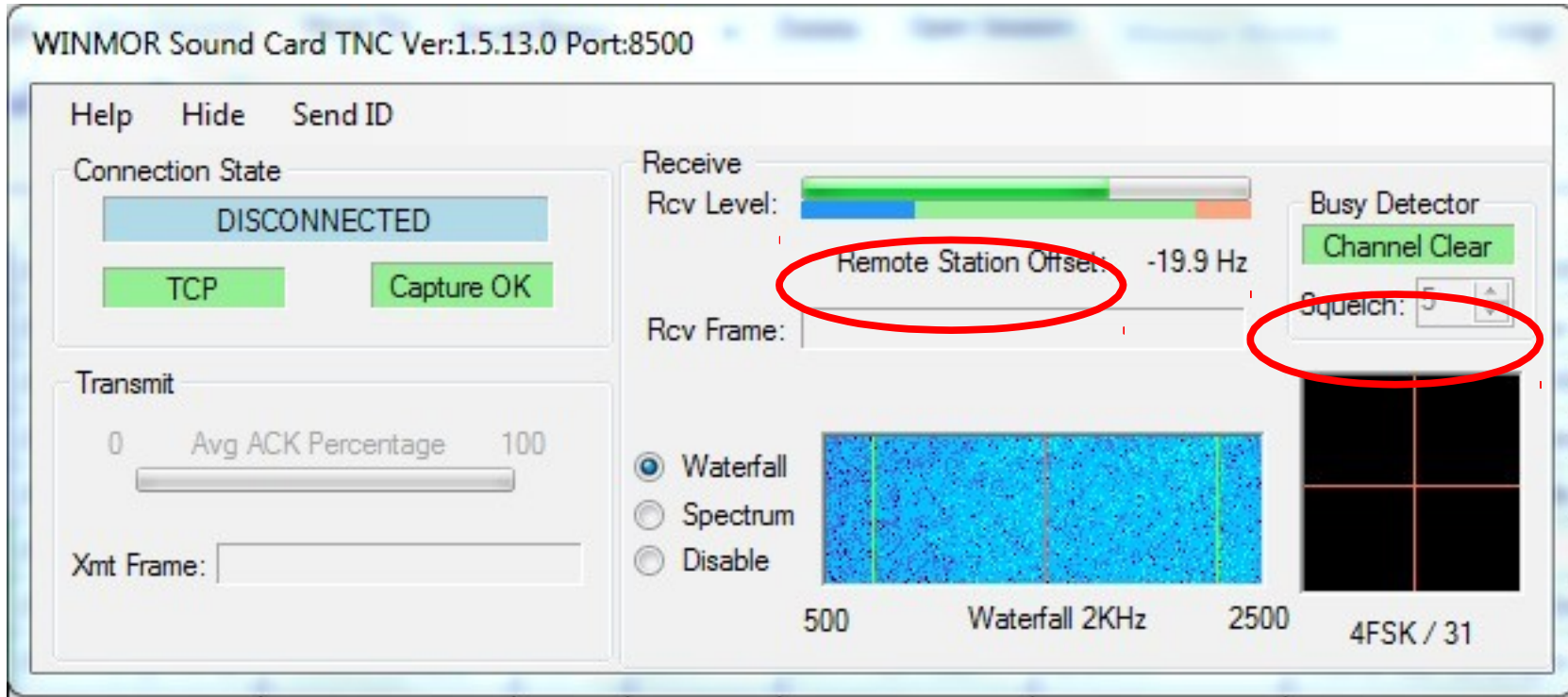
# HF Channel Selection



The screenshot shows the 'HF Channel Selector' application window. The title bar includes a small icon and the text 'HF Channel Selector'. Below the title bar is a menu bar with the following options: 'Exit', 'Select', 'Update Table Via Internet' (circled in red), 'Update Table Via Radio', 'Forecast', 'SFI', and 'All RMS'. The main area of the window contains a table with the following columns: 'Callsign', 'Frequency (kHz)', 'Mode', 'Grid Square', 'Hours', 'Group', 'Distance (mi)', 'Bearing (Degrees)', 'Path Reliability Estimate', and 'Path Quality Estimate'. The table lists various HF channels, with the row for 'N0LCR-1' at 7103.500 kHz highlighted in blue. The 'Path Reliability Estimate' and 'Path Quality Estimate' columns are highlighted in green.

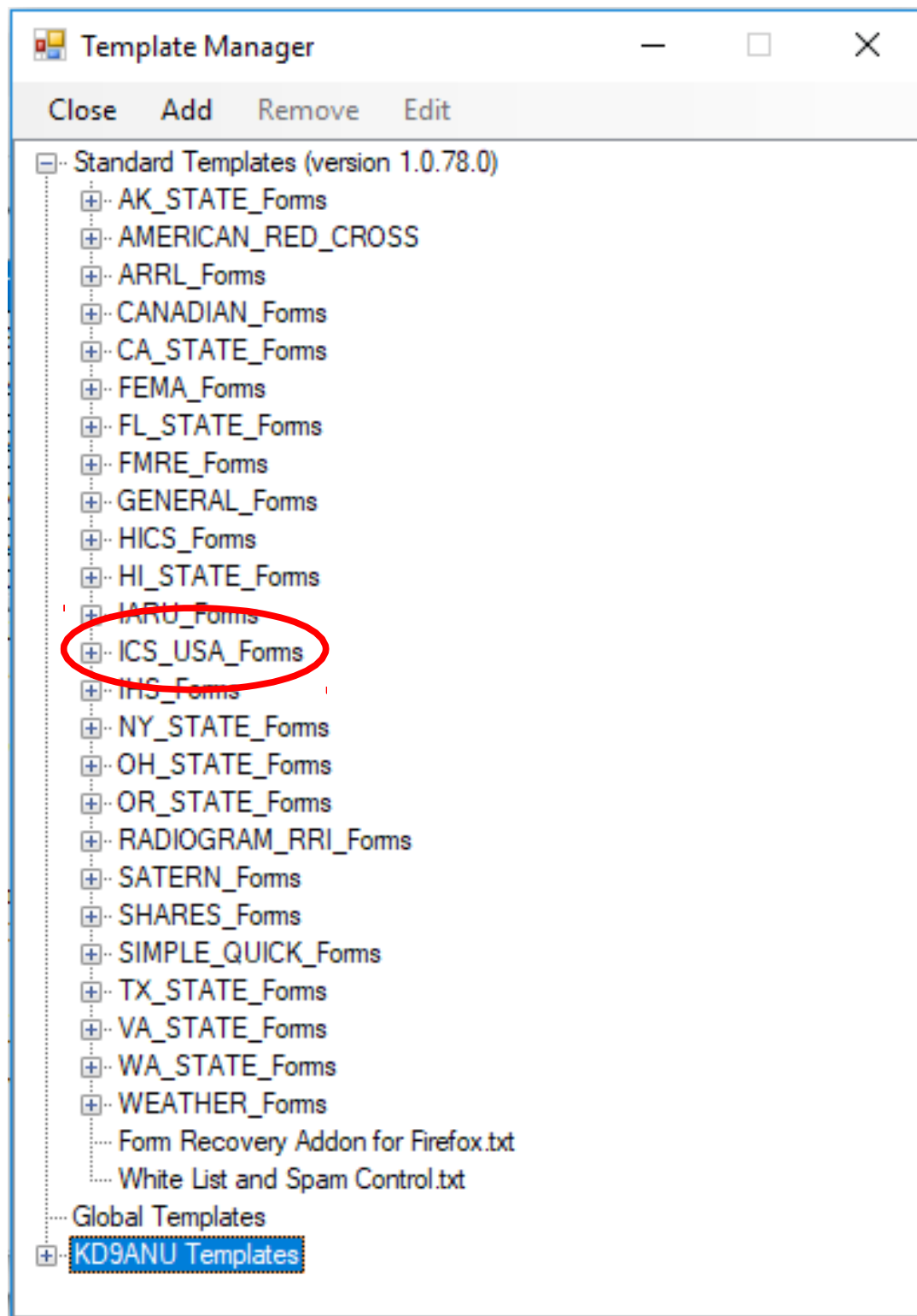
Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KG5KS-10	7101.500	1600	EM45JP	00-23	PUBLIC	369	194	91	55
N0LCR-1	7113.500	500	EN47DA	00-23	PUBLIC	438	347	89	56
N0LCR-1	7103.500	1600	EN47DA	00-23	PUBLIC	438	347	89	56
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

# Winmor Virtual TNC - HF



Look for "Channel Clear" in the Busy Detector or low signal

# Forms or Templates



# ICS213 Template (in Browser)

## General Message (ICS 213)

[Load ICS213 INITIAL Data](#)

[Form Instructions](#)

1. Incident Name:

2. To (Name/Position):

3. From (Name/Position):

4. Subject:

5. Date:

6. Time:

7. Message:

Be Brief and Concise

8. Approved by:

Position / Title:

[Save ICS213 INITIAL Data](#)

[Submit](#)

[Reset Form](#)

Senders Base Call:

Ver 36.2

# Peer-to-Peer

Send a message direct between two radios  
Packet, Winmor, Pactor are common modes  
Select desired mode in Open Session  
dropdown New Message - Send as Peer-to-  
Peer Message Coordinate P2P session via  
radio using voice Receiving station waits  
until sender transmits



# Winlink/RMS Relay

RMS Relay is an optional, supplemental program for gateway sysops that provides temporary storage of messages and local routing in the event internet access to the CMS sites is lost. Different configurations using RMS Relay are possible for different scenarios.



# WinlinkSupport

- Good indexed Help within the Winlink Express program.
- Winlink Book of Knowledge (download latest pdf file)  
[https://winlink.org/content/winlink\\_faq\\_feb\\_14\\_2019\\_revised\\_frequently\\_asked\\_questions\\_answers](https://winlink.org/content/winlink_faq_feb_14_2019_revised_frequently_asked_questions_answers)
- Winlink Forums (text-searchable)
  - Program Group
  - EmComm Group
- I'm not a fan of Winlink's online support philosophy and video-based materials provided. But such may work for you.
- 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 lingo.



# Terminology

- RMS – Radio Message Server
- RMS Gateway – A station that connects Winlink users to the Winlink servers on the Internet
- Winlink Express – Name of full-featured user software
- Digipeater or Digi – A station that receives and then immediately re-transmits digital signals (digital repeater)
- Node – A station that acts as at least both an RMS Gateway and as a Digipeater
- Virtual TNC – TNC functions provided via PC software
- Forms or Templates – structure desired data to be sent in a formatted way, yet minimize the information transmitted.

THE END