Getting Started with Winlink



WINLINK GLOBAL RADIO EMAIL



BARC

Barnstable Amateur Radio Club
2021-04-05

Presentation Notes

- Objective is to provide enough information to get started (+)
- *This is an introduction* assuming no prior knowledge
- The presentation came from winlink.org, modified to localize/modernize
- This presentation is on the BARC website - Topics
- Let's try to avoid detailed technical discussions about how it works—there are many opportunities for further study—*this is an introduction*—a lot to cover in a short time
- Live Demo at the end – ask questions in chat, answers during setup
- We will schedule one or more on-air practice sessions (if desired)
- It's ALL Winlink: RMS Express/Winlink 2000/WL2K/Winlink Express

What Is Winlink?

- **Worldwide system for sending/receiving e-mail via radio**
- Provides e-mail from almost anywhere in the world.
- Mature, well-tested and full featured system.
- Adopted for contingency communication by many federal, state and county government agencies
- Used by the National Guard
- Used by infrastructure-critical NGOs such as International & American Red Cross, Southern Baptist Disaster Relief, DHS Tiered, AT&T Disaster Response & Recovery, FedEx, Bridgestone Emergency Response Team, etc.

Why Use Winlink?

- Widely used for EmComm
- Many served agencies use it (e.g., Red Cross)
- Commonly used by ARES nation-wide (including C&I)
- World-wide capability
- Standard forms capability, including ICS and ARC
- Many additional capabilities beyond the scope of this presentation

Primary Winlink Networks

- **Amateur Radio** - Over 10,000 (?) amateur users are registered (total users >33K, >13K active in the last month)
- Winlink is used by most **off-shore sailors**. Operates within the international amateur radio frequency space
- **SHARES** - Federal system providing HF radio contingency communication for federal agencies. SHARES operates on NTIS, federal frequencies that are not part of the amateur radio frequency space
- **MARS** - Military Auxiliary Radio Service. Provides contingency communication for U.S. military. Operates in NTIS MARS radio frequency space

Emergency Communications for American Red Cross with Amateur Radio

AKA, "Why isn't my eMail Working and What's Wrong with my Phone?"

OR

When all else fails…

PREPARE, RESPOND, RECOVER

American Red Cross

Source: ARC-EMCOMM-TRAINING@groups.io

What Winlink Offers for EmComm

- Reliability, Accuracy and Flexibility:
- Bridge different radio capabilities (VHF/UHF/HF)
- Bridge protocols: Pactor, ~~Winmor~~, Ardop, VARA, Packet
- Standard e-mail format with many features
- Binary file attachments (image, pdf, spreadsheets)—be careful
- Automatic message compression/decompression
- Encrypted attachments using the encryption program you choose. No need to convert to letter groups
- Time independence and frequency agility
- Not limited by station-to-station propagation

Winlink System Components

Client system – Radio, computer with Winlink Express software(+), interface (TNC/or sound card) and you

Radio Message Server (RMS) – Radio gateway between the client (end-user) and the Winlink system backbone

Common Message Servers (CMS) – Winlink backbone

- Multiple CMS locations
- Redundant, fault-tolerant
- Located on 3 continents
- One CMS is sufficient for normal system operation

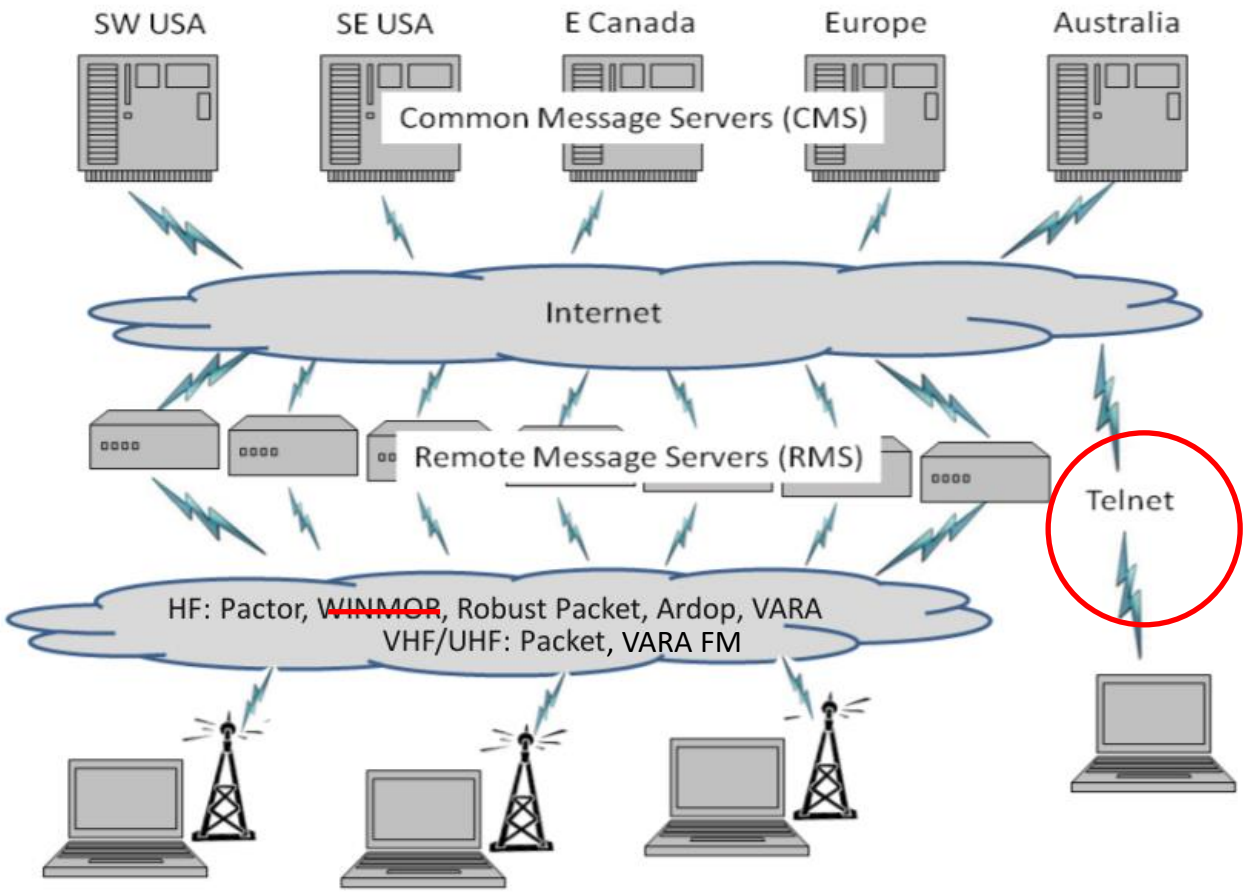
Winlink Architecture

CMS

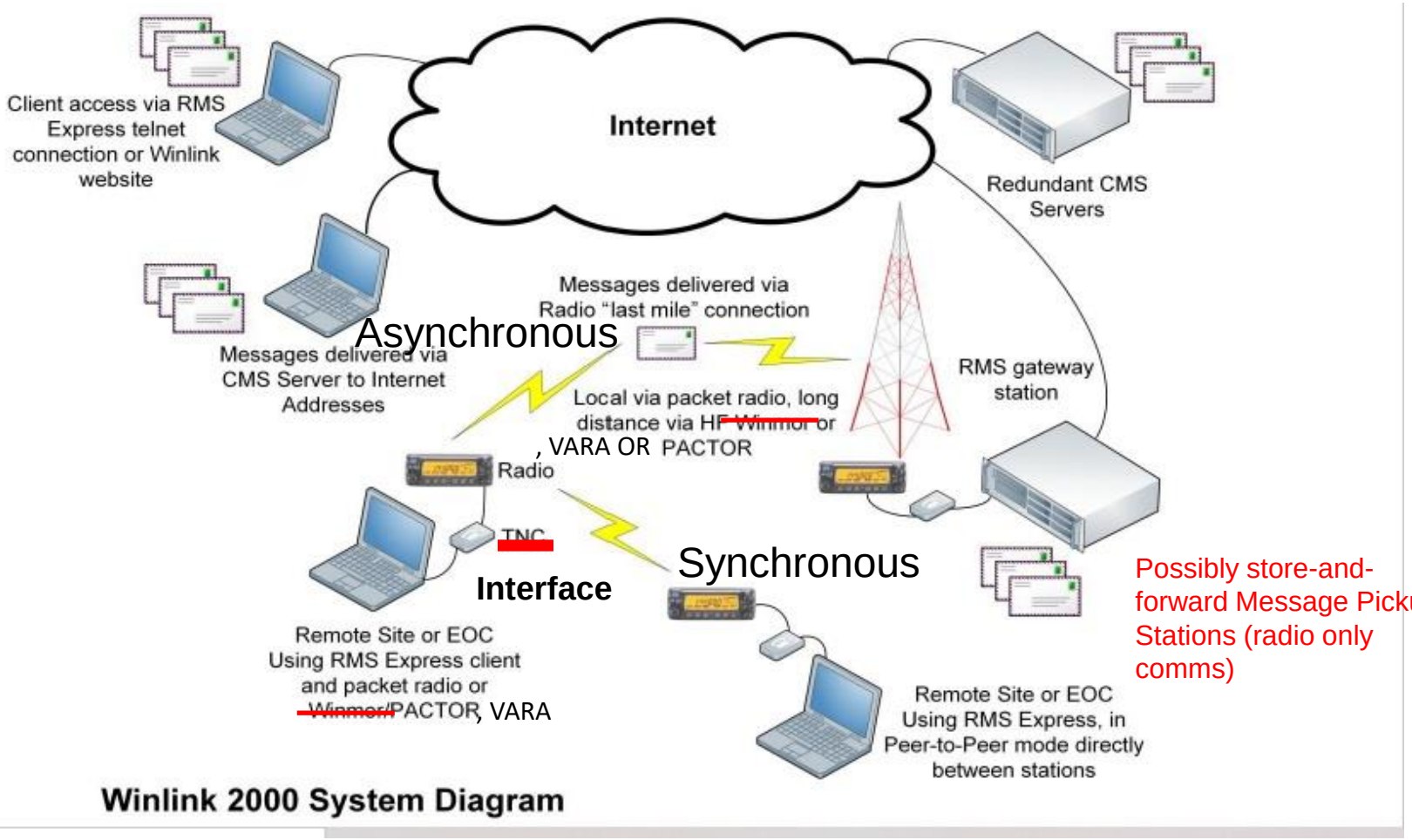
RMS (Gateway)

RMSs support specific modes

Client (You)



Winlink Architecture



Possibly store-and-forward Message Pickup Stations (radio only comms)

Source: "Beginners Guide to Winlink," W4PHS

Winlink Connection Modes

- HF Pactor – Fast but expensive - $1,500
- HF ~~WINMOR~~ – Much slower, but reliable (Sound card mode)
- Ardop and VARA – Faster replacements for ~~WINMOR~~
- VHF/UHF Packet, VARA-FM
  - May need Soundmodem software (for soundcard interface)
- Telnet – Non-radio connection through the Internet
- Iridium GO! – Satellite phone connection
- MESH network to Winlink “Post Office” (RMS Relay)
- Peer-to-peer between two Winlink Express users

Client System Requirements

NOTE: THIS IS DATED INFORMATION. YOU NEED A CURRENLTY SUPPORTED VERSION OF WINDOWS AND A COMPUTER THAT IT CAN RUN ON

Microsoft-supported 32 or 64 bit Windows OS (Windows Vista, Windows 7 or Windows 2003 Server, or later), or under Windows on Apple Mac machines using a VM engine or dual boot arrangement.

We no longer recommend Windows XP for common support and security reasons, and we will not address technical problems that arise as this OS ages without Microsoft support.

The program makes minimal CPU demands with the exception of ~~WINMOR~~ operation. The heavy DSP demands of ~~WINMOR~~ require a computer of at least **700 MHz Pentium/Celeron class and at least 512 Meg of memory**.

If multiple applications are running concurrently, we recommend a faster computer and more RAM.

Get A Winlink Account

Steps

Download, install and configure Winlink Express from winlink.org

- Soundmodem and VARA are separate downloads – get your account first

With an internet connection fill out the form presented on first startup after installation

Click “UPDATE”-- it takes a few minutes for your information to be validated and updated by the remote Winlink Server

Winlink email is yourcall@winlink.org

Use your callsign as your username and password to log in to winlink.org

Winlink accounts stay alive *only with radio use*. Accounts off-air for 400 days are automatically purged. Use it or lose it!

Winlink.org



User Programs/
Winlink Express

My Account | Tools | News | Positions | User Programs | Book of Knowledge | Download | Support

Winlink Global Radio Email...

...is a network of amateur radio and authorized government-licensed stations that provides worldwide radio email using radio pathways where the internet is not present. *The system is built, operated and administered entirely by licensed "Ham" volunteers. It supports email with attachments, position reporting, weather and information bulletins, and is well-known for its role in interoperable emergency and disaster relief communications. It is capable of operating*

2021 "Whirlwind Boom" Exercise

Gainesville, FL-- The amateur radio communications team of the Florida Baptist Disaster Relief has created a multi-site radio communications exercise designed to bring together volunteers and local authority agencies across northern Florida and beyond, for two hours in the evening of Friday March 19, 2021. Invitations to Amateur Radio Emergency Service (ARES(R)) volunteer groups, county-level emergency managers, state communications experts, and volunteers in a federal radio system have been widely disseminated, including

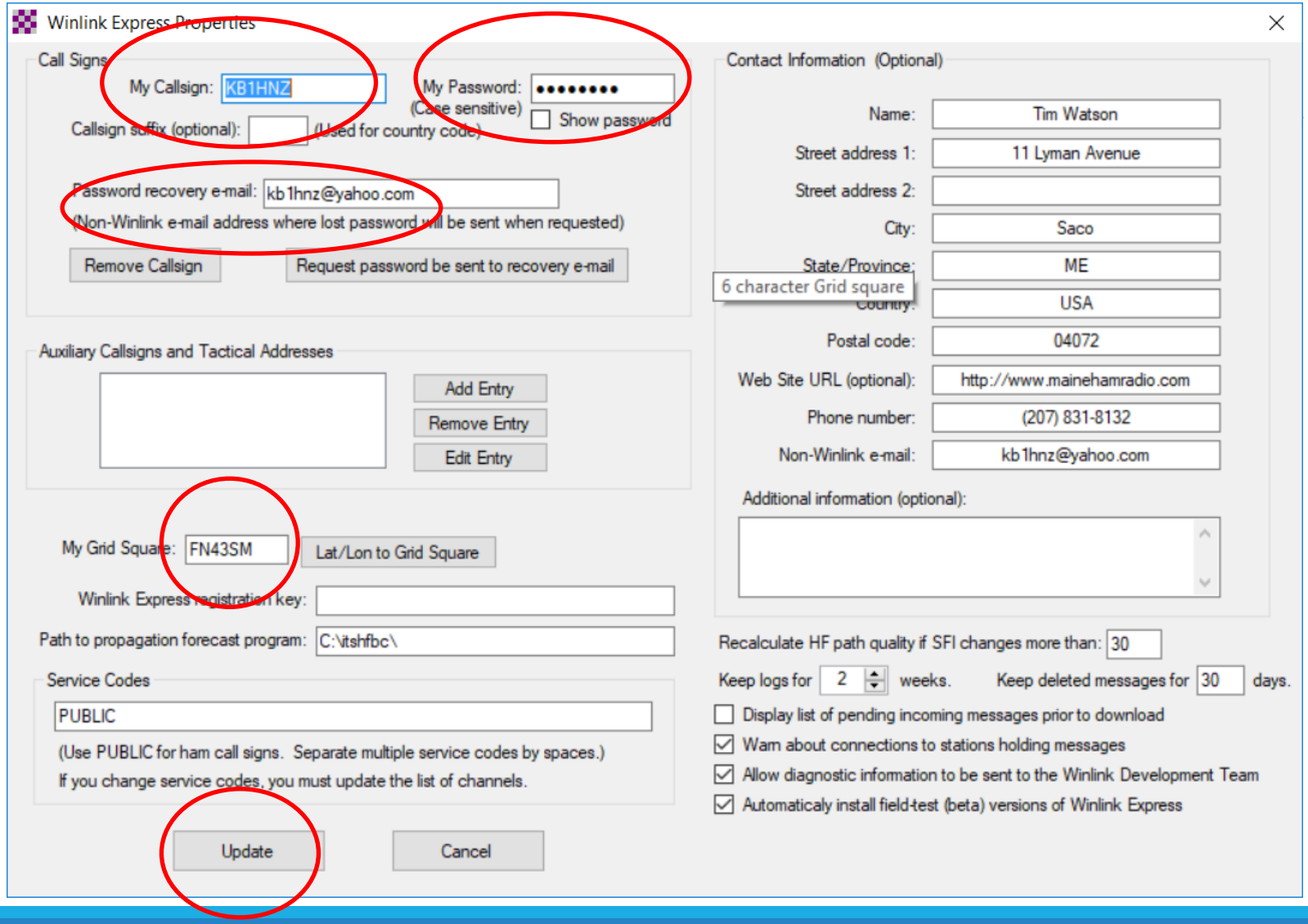
Fast Info...

- Support Winlink: Register your program
- **Lost Registration Key?** Log in. It's on your account page.
- Callsign change? What to do. How to do it.
- Which bands are open? Propagation Map
- Info about Winlink Express HTML Forms
- No internet? Winlink Hybrid Network
- Become a Winlink Gateway Sysop

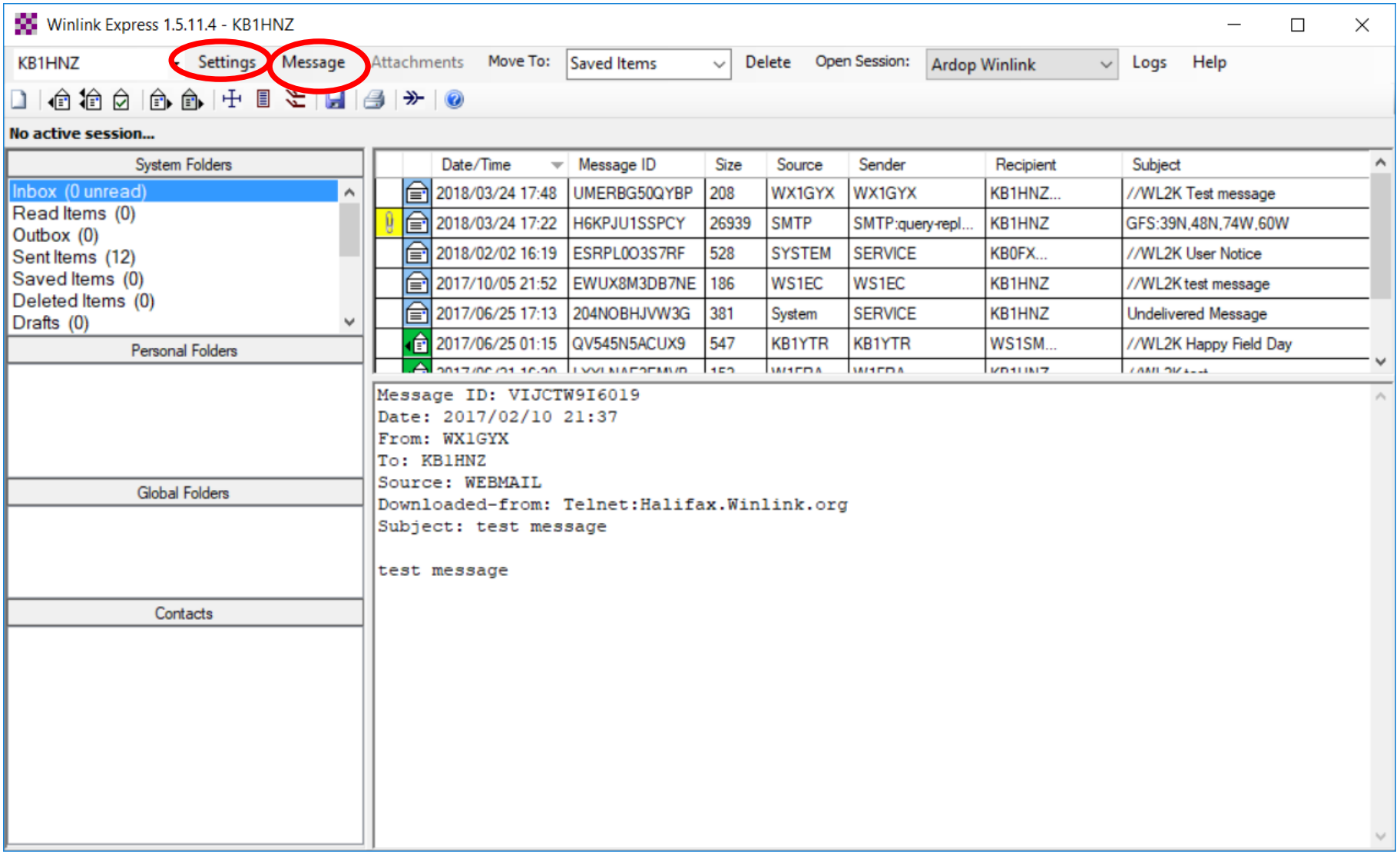
Open Message Viewer

Note: You CANNOT create a Winlink account here

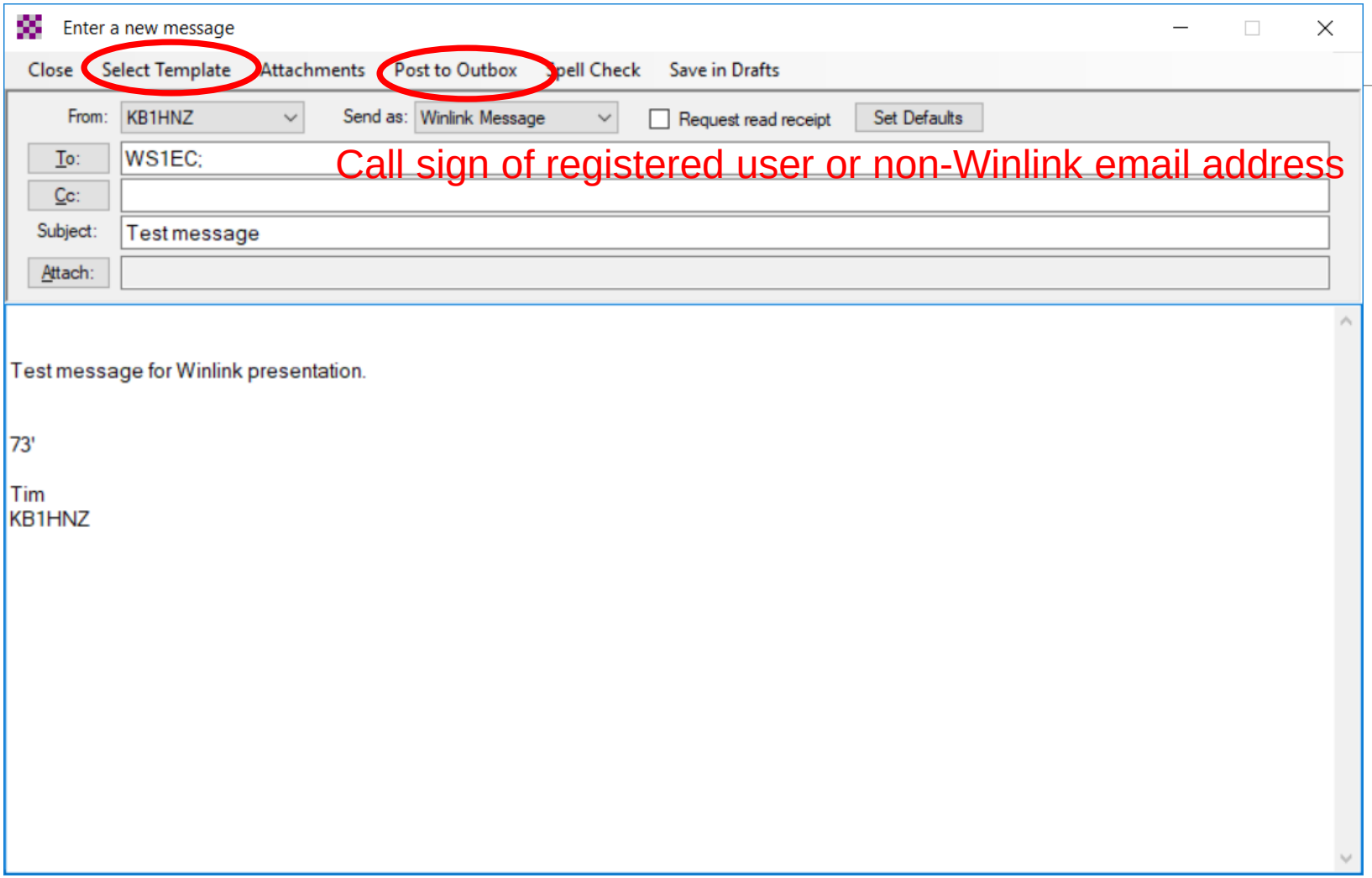
Winlink Setup



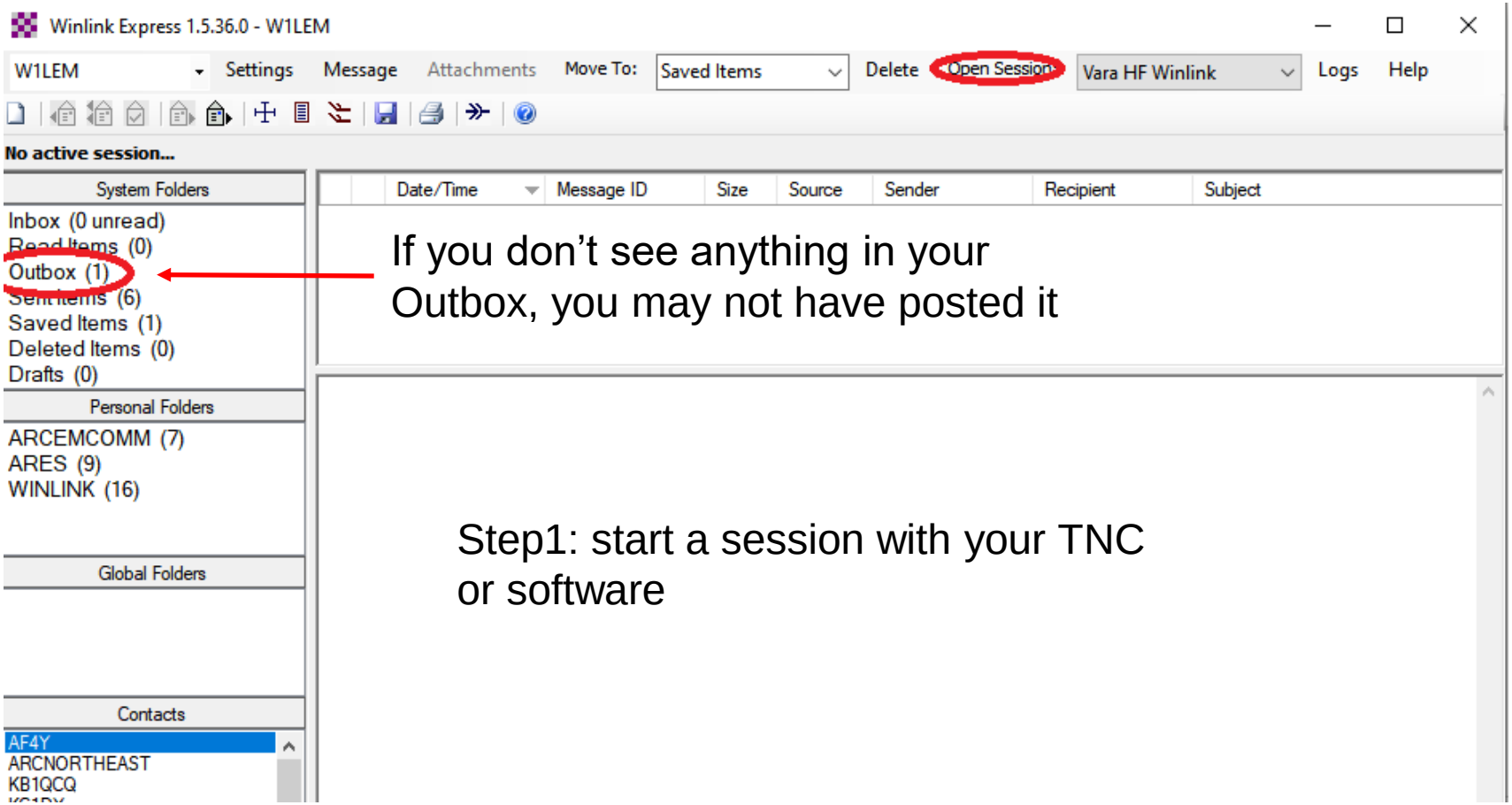
Winlink Express Mail Box



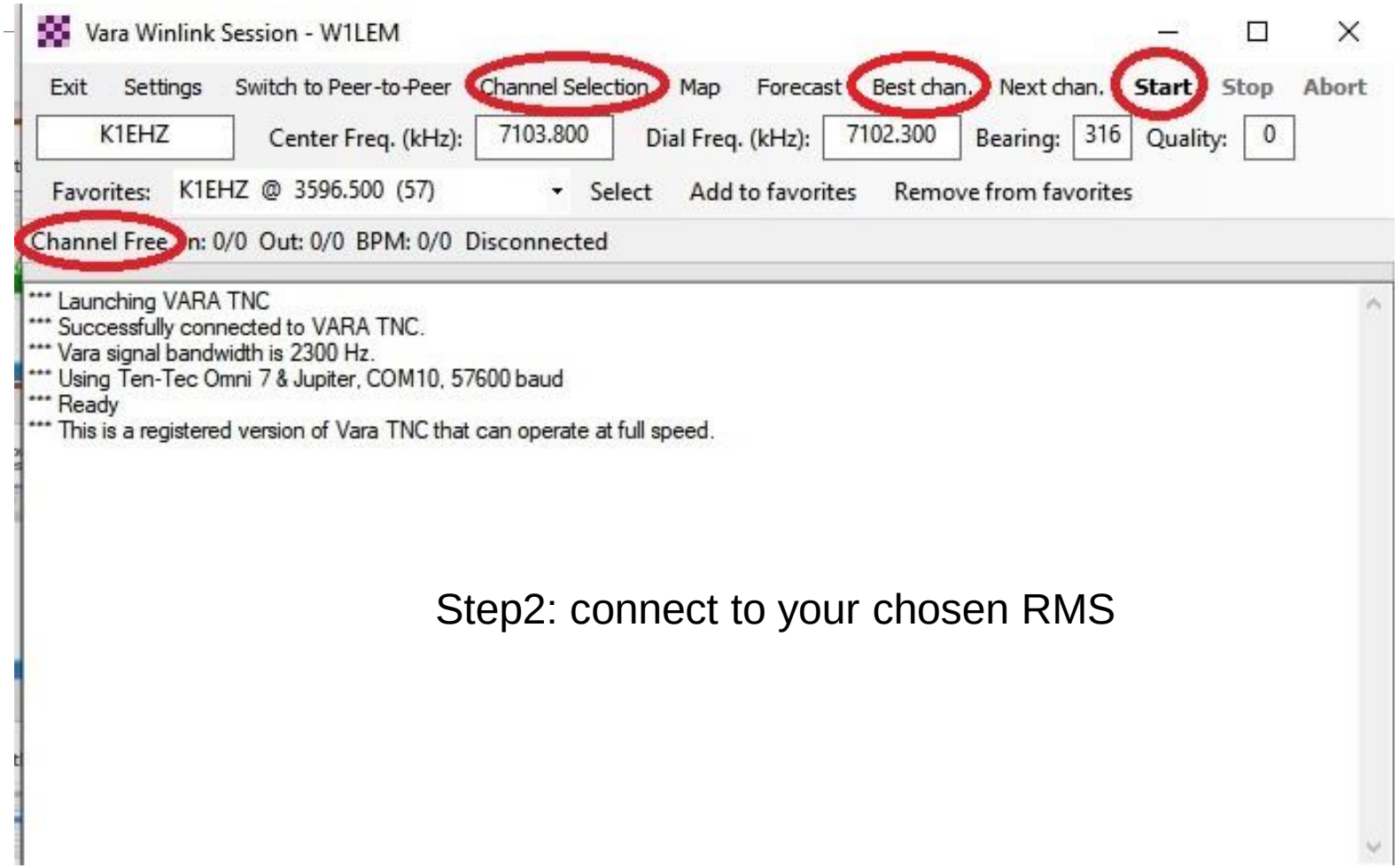
Compose Messages, Post Each to Outbox



Open A Session from Your Winlink Mail Box

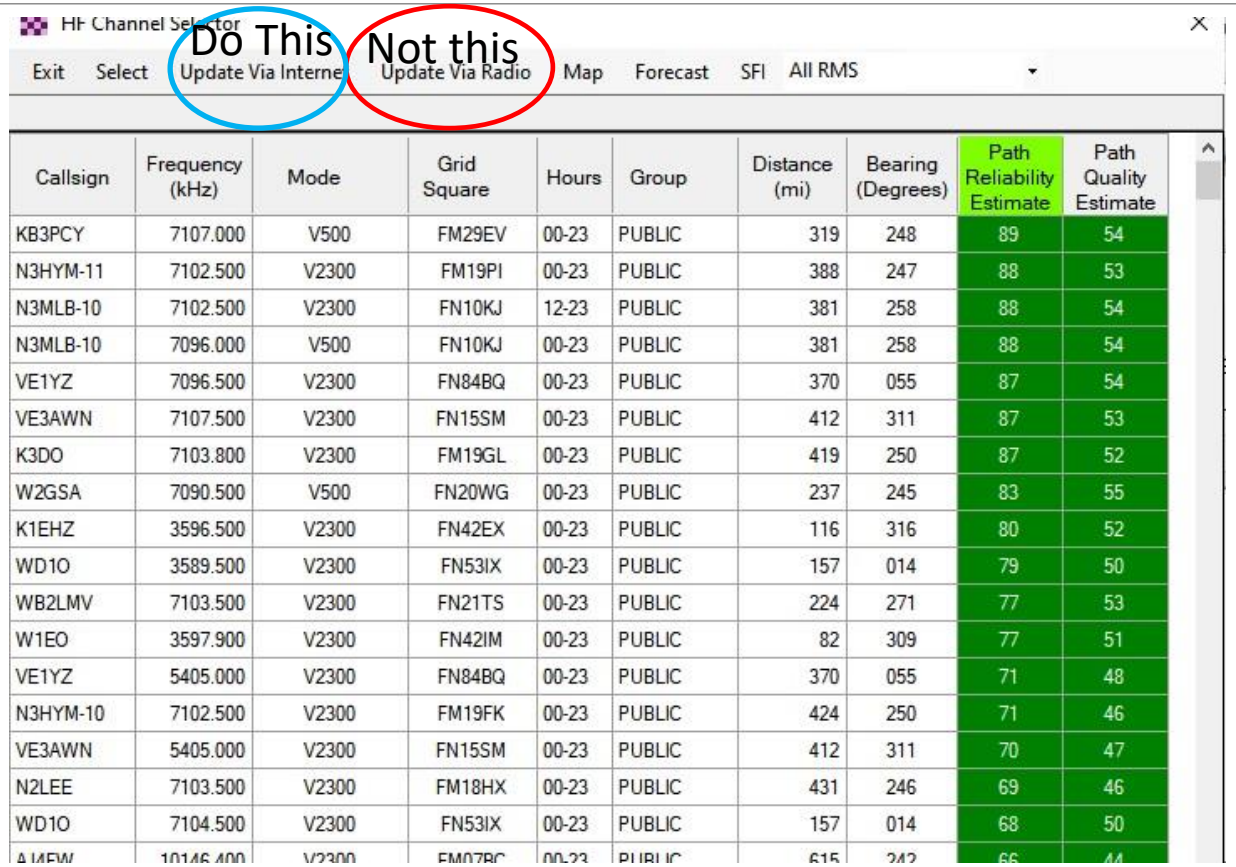


Select A Channel And Start A Connection (when it's free)



Step2: connect to your chosen RMS

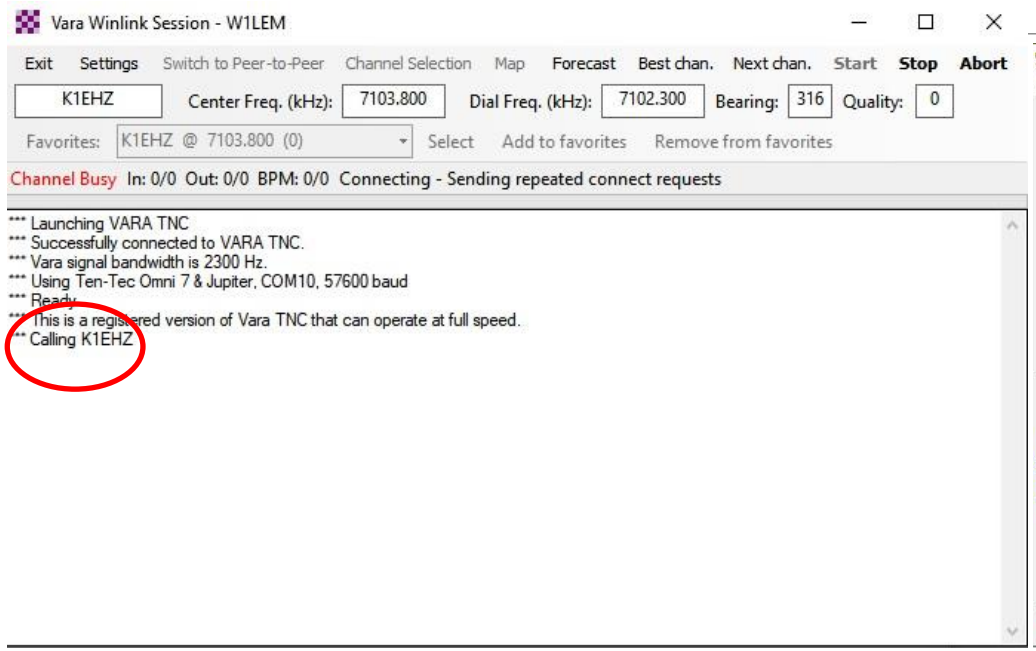
Winlink HF Channel Selector (Page 1 of 40)

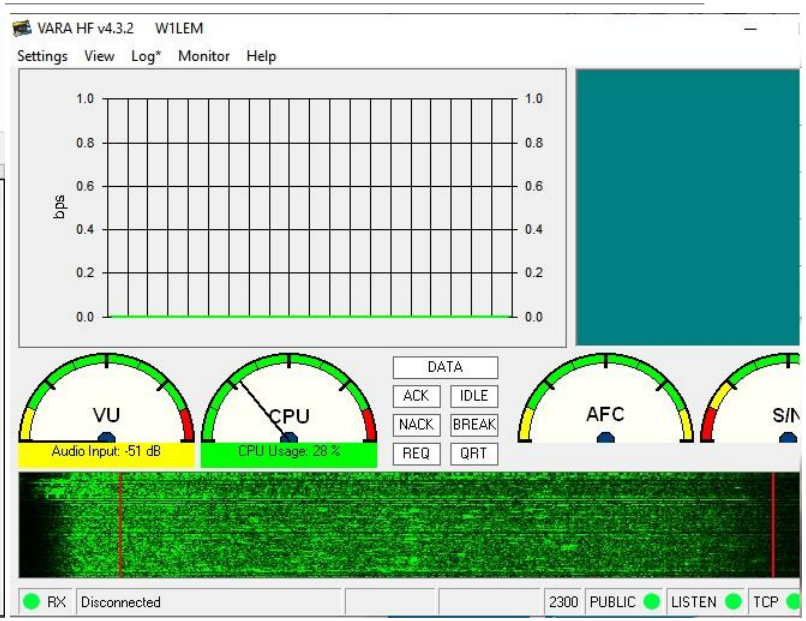


Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KB3PCY	7107.000	V500	FM29EV	00-23	PUBLIC	319	248	89	54
N3HYM-11	7102.500	V2300	FM19PI	00-23	PUBLIC	388	247	88	53
N3MLB-10	7102.500	V2300	FN10KJ	12-23	PUBLIC	381	258	88	54
N3MLB-10	7096.000	V500	FN10KJ	00-23	PUBLIC	381	258	88	54
VE1YZ	7096.500	V2300	FN84BQ	00-23	PUBLIC	370	055	87	54
VE3AWN	7107.500	V2300	FN15SM	00-23	PUBLIC	412	311	87	53
K3DO	7103.800	V2300	FM19GL	00-23	PUBLIC	419	250	87	52
W2GSA	7090.500	V500	FN20WG	00-23	PUBLIC	237	245	83	55
K1EHZ	3596.500	V2300	FN42EX	00-23	PUBLIC	116	316	80	52
WD1O	3589.500	V2300	FN53IX	00-23	PUBLIC	157	014	79	50
WB2LMV	7103.500	V2300	FN21TS	00-23	PUBLIC	224	271	77	53
W1EO	3597.900	V2300	FN42IM	00-23	PUBLIC	82	309	77	51
VE1YZ	5405.000	V2300	FN84BQ	00-23	PUBLIC	370	055	71	48
N3HYM-10	7102.500	V2300	FM19FK	00-23	PUBLIC	424	250	71	46
VE3AWN	5405.000	V2300	FN15SM	00-23	PUBLIC	412	311	70	47
N2LEE	7103.500	V2300	FM18HX	00-23	PUBLIC	431	246	69	46
WD1O	7104.500	V2300	FN53IX	00-23	PUBLIC	157	014	68	50
AJ4EW	10146.400	V2300	FM07BC	00-23	PUBLIC	615	242	66	44

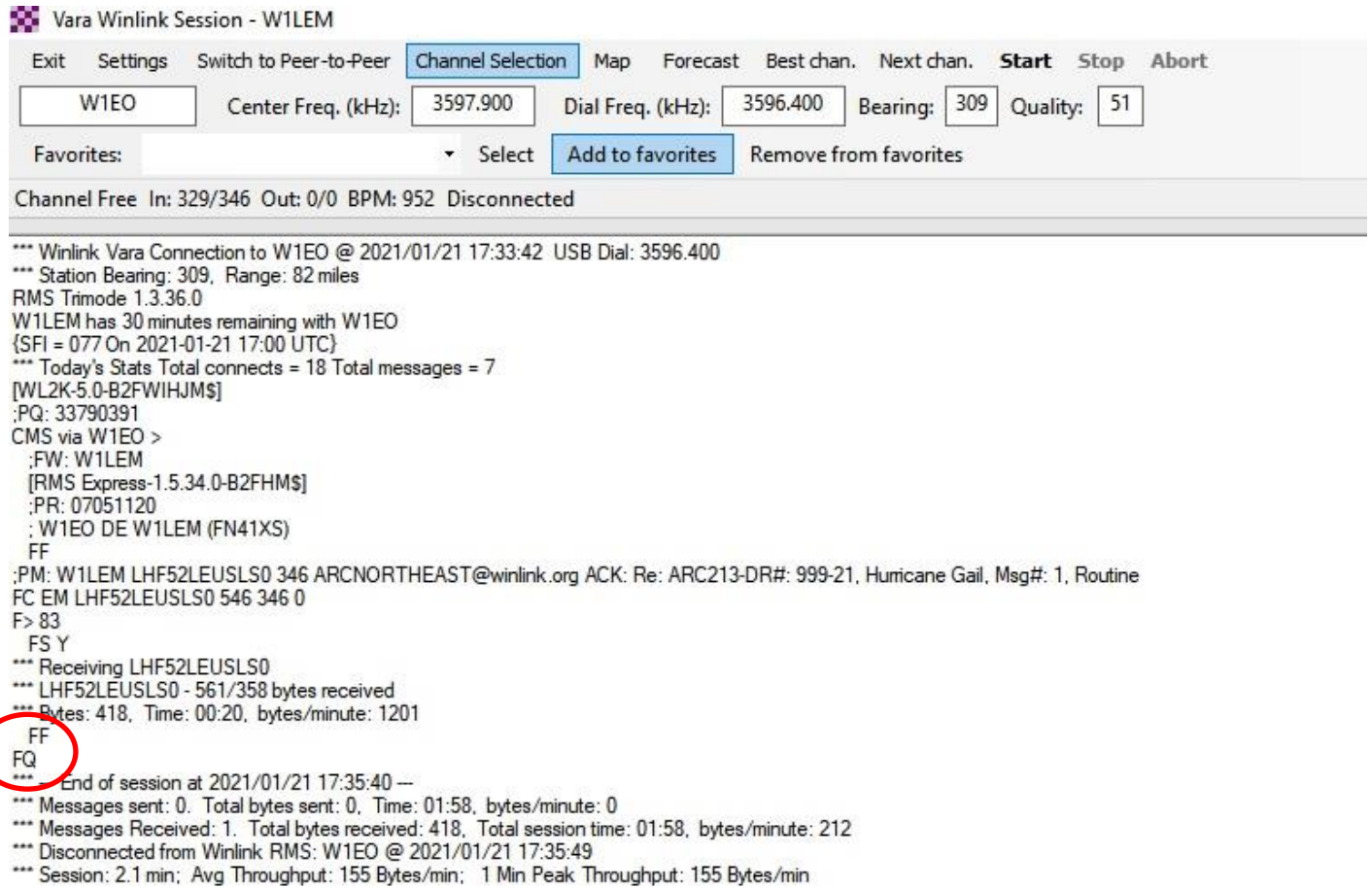
Update once/week (or so)

Winlink Will Attempt to Connect

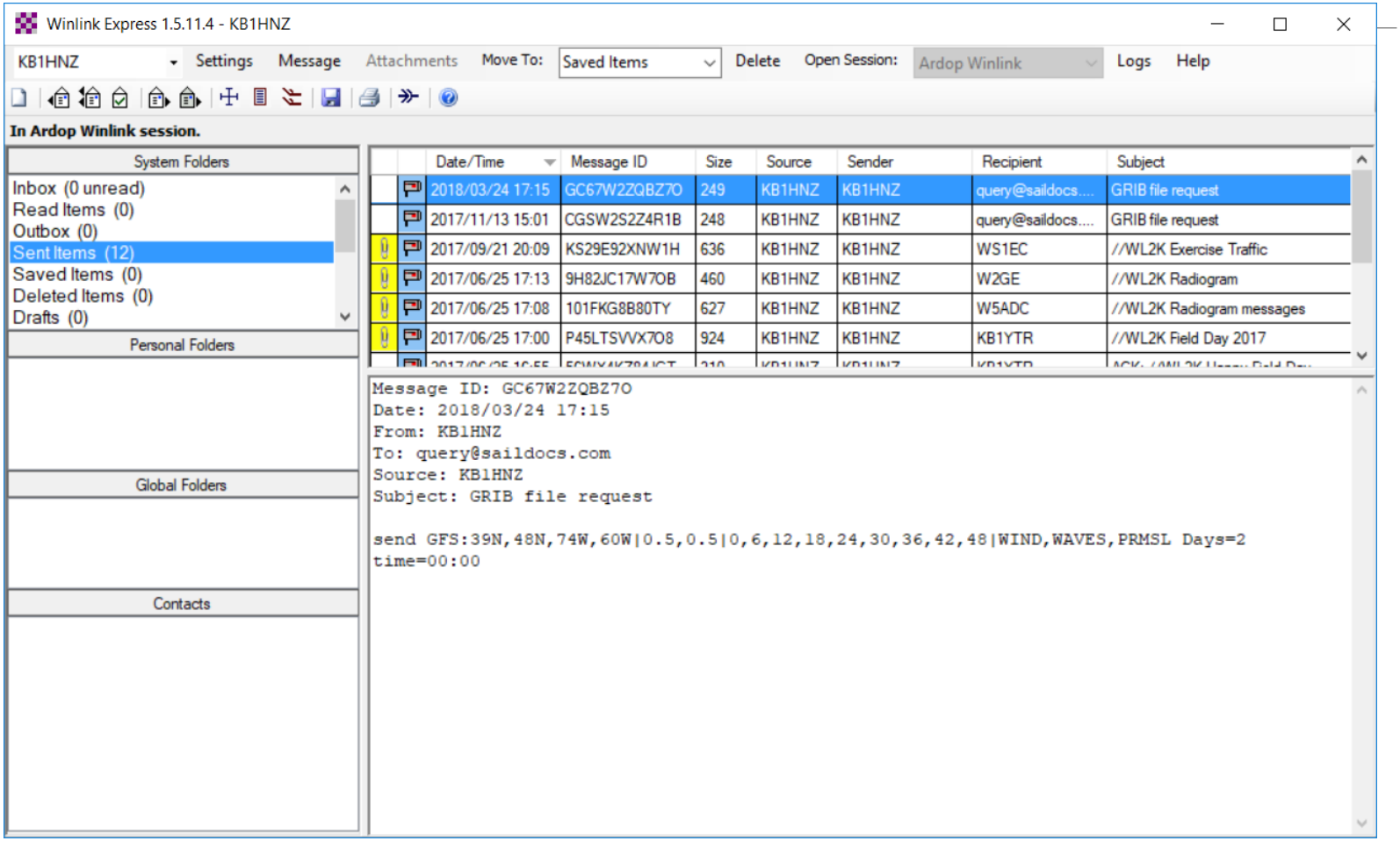




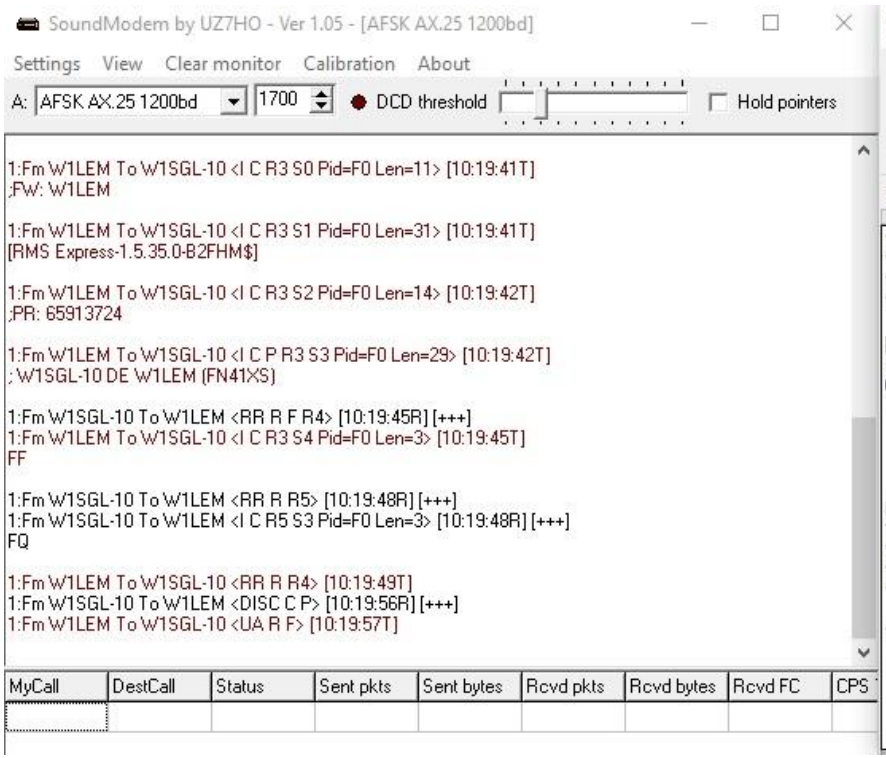
Once Connected, Winlink Will Send What's in Your Outbox and Check for Waiting Messages

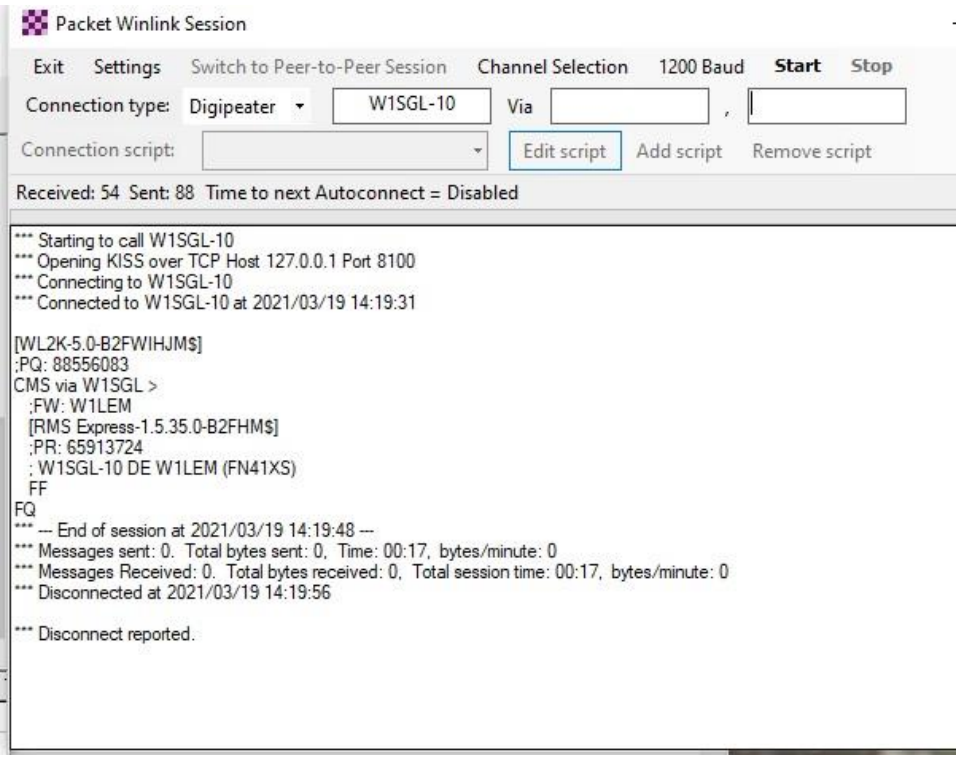


Check Sent Items, Outbox, Inbox



Packet Works Similarly (tune your radio to RMS frequency)





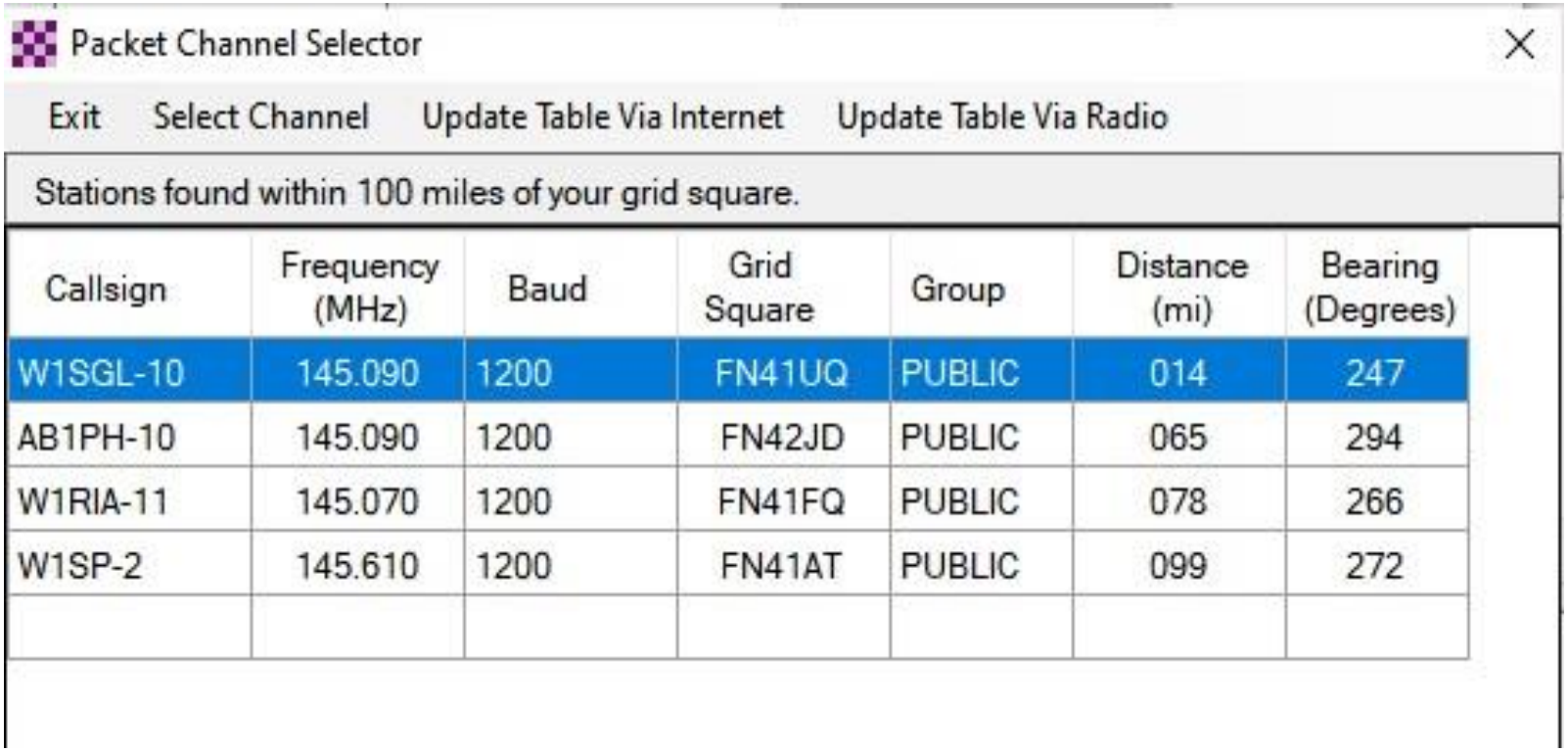
Winlink Packet Channel Selector

Barnstable

Walpole

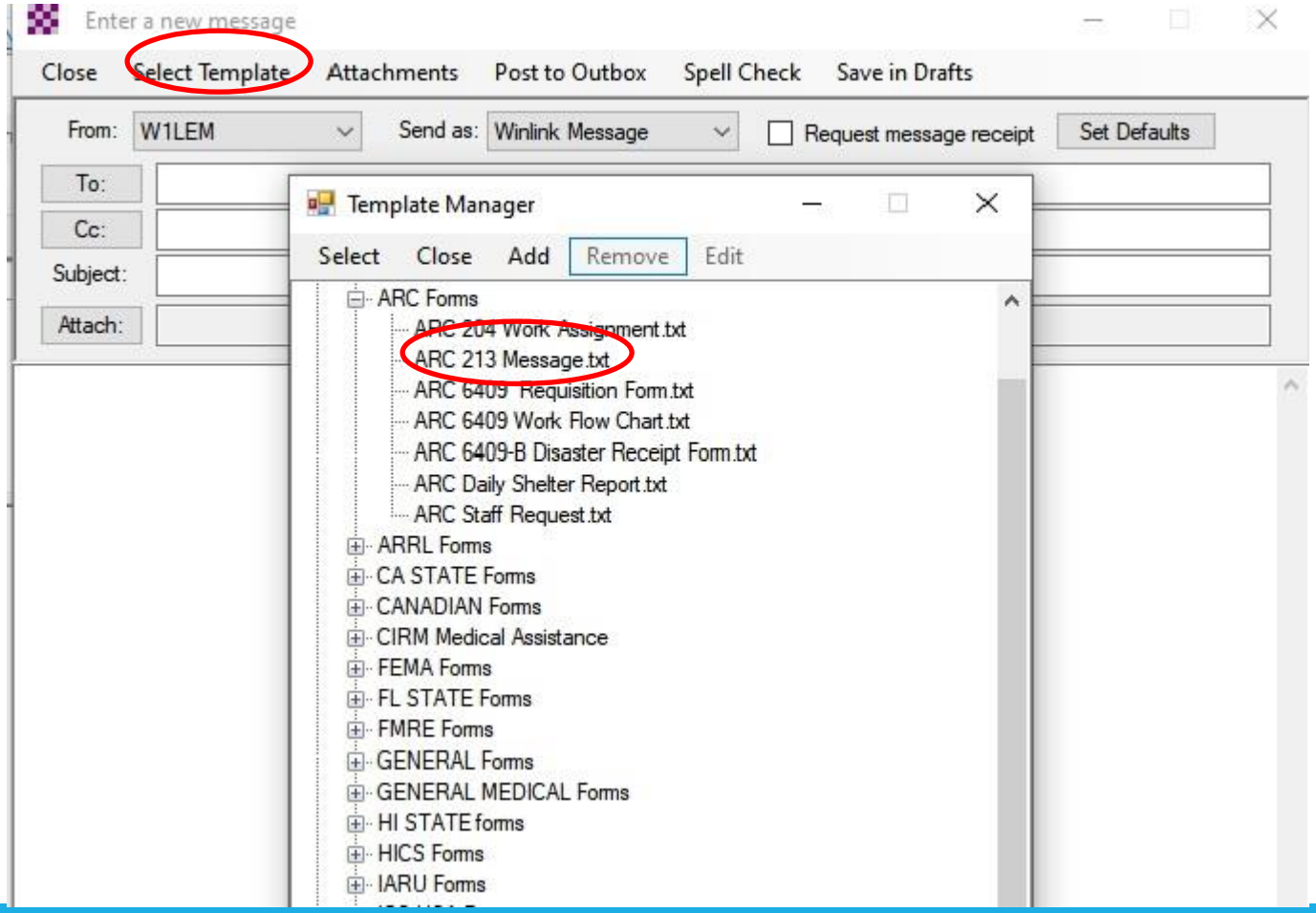
Tiverton, RI

Middletown CT

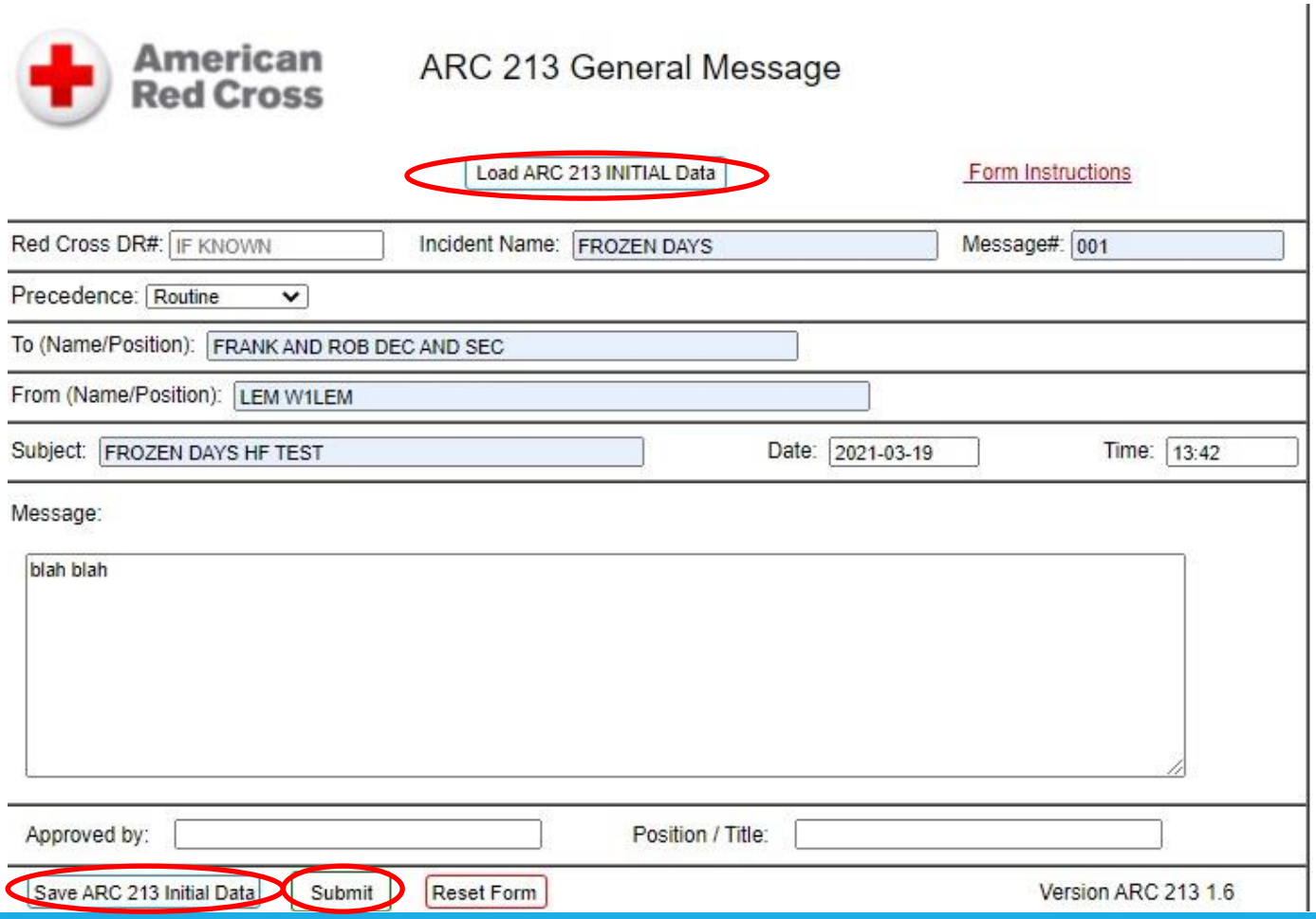


Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (mi)	Bearing (Degrees)
W1SGL-10	145.090	1200	FN41UQ	PUBLIC	014	247
AB1PH-10	145.090	1200	FN42JD	PUBLIC	065	294
W1RIA-11	145.070	1200	FN41FQ	PUBLIC	078	266
W1SP-2	145.610	1200	FN41AT	PUBLIC	099	272

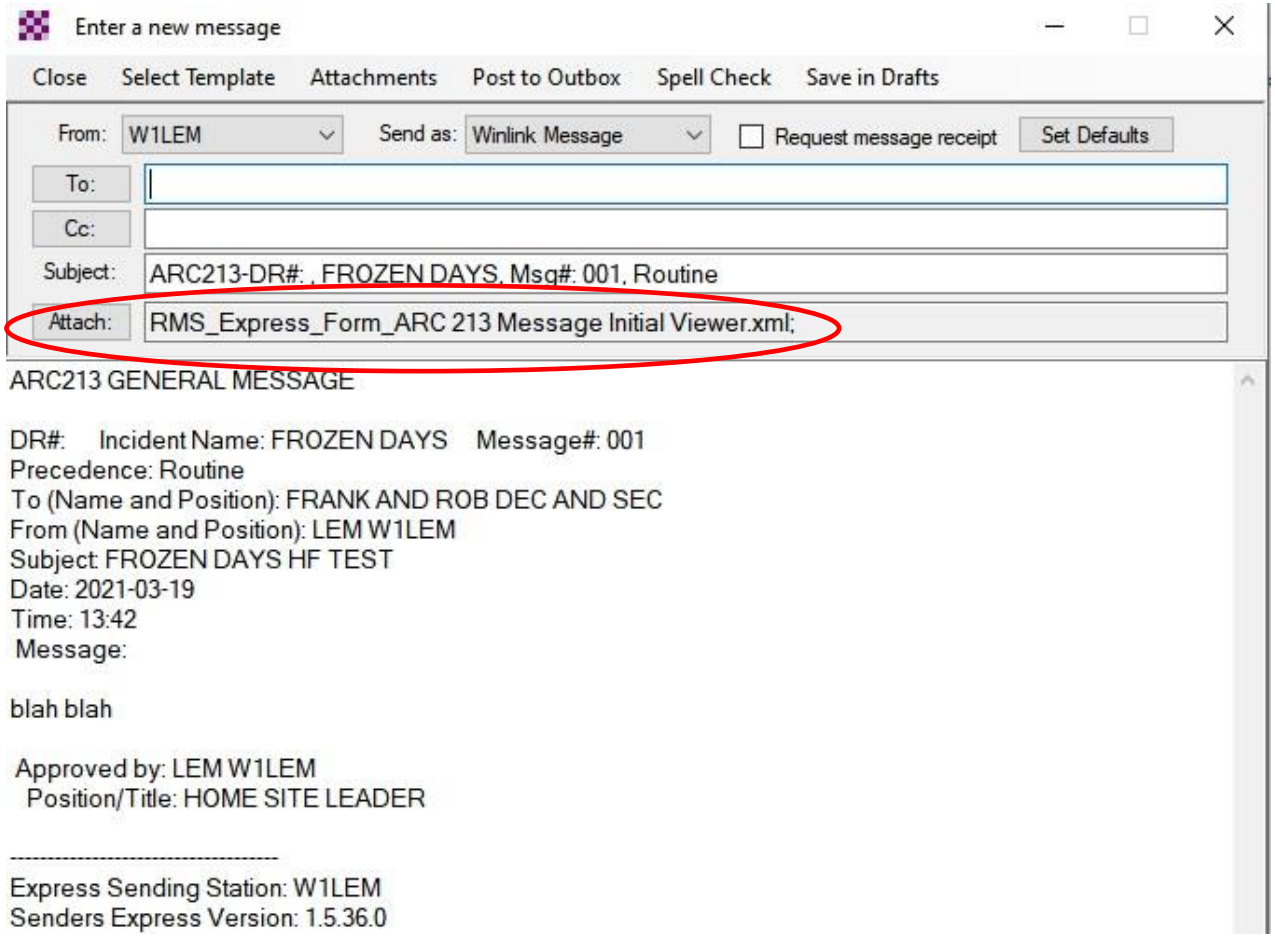
To Create A Form, “Select Template”



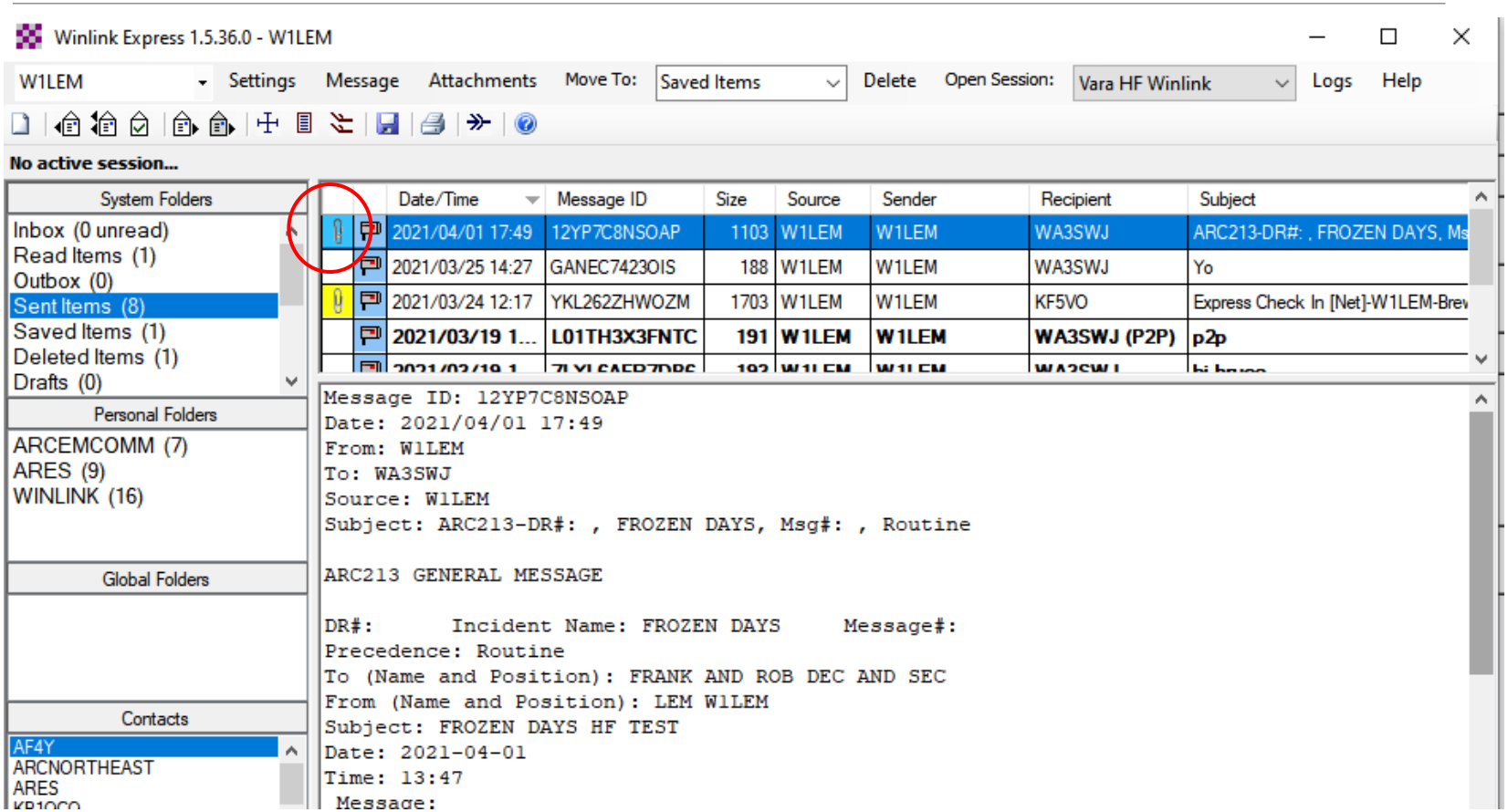
The Form Opens in A Browser



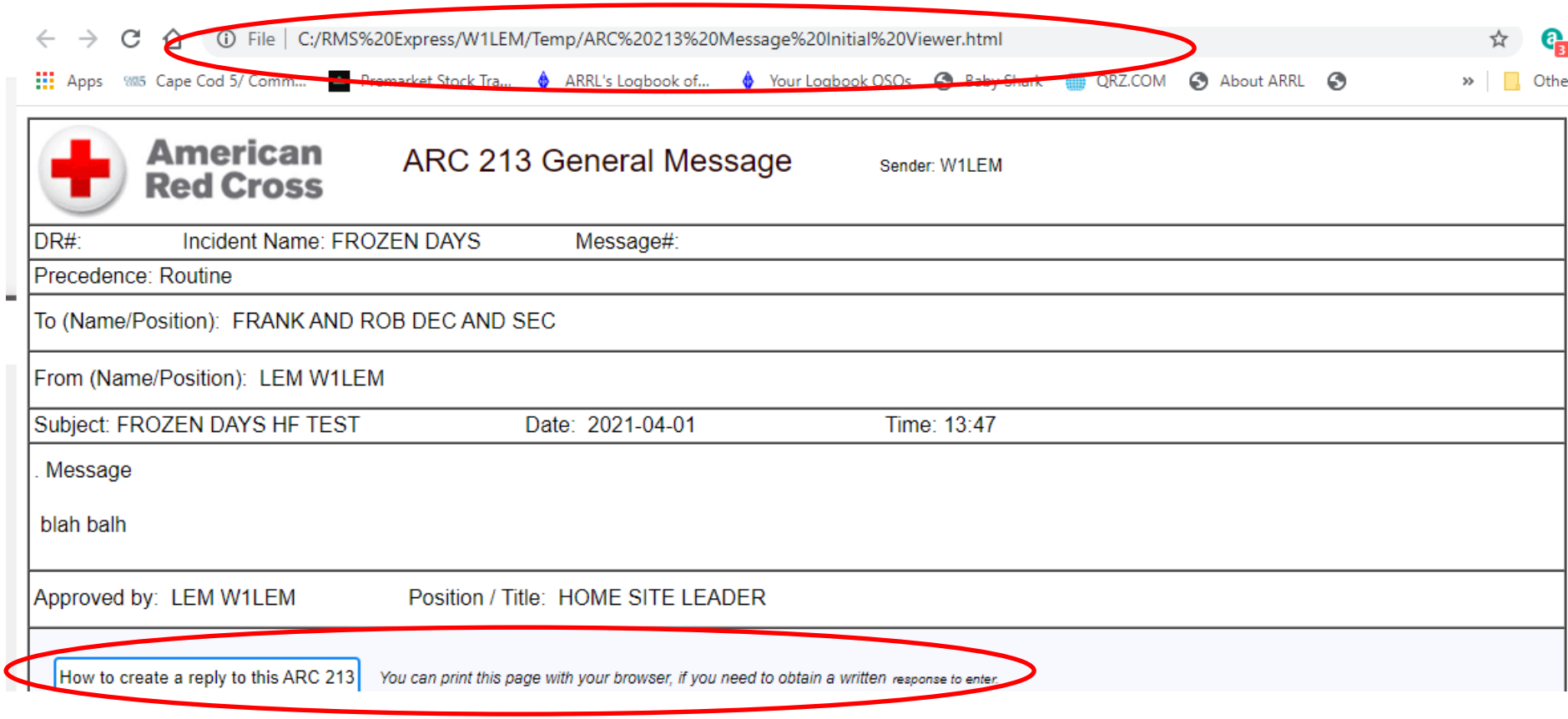
“Submit” Sends The Form (Data Only) Back to Winlink—Post to Outbox And Proceed as Usual



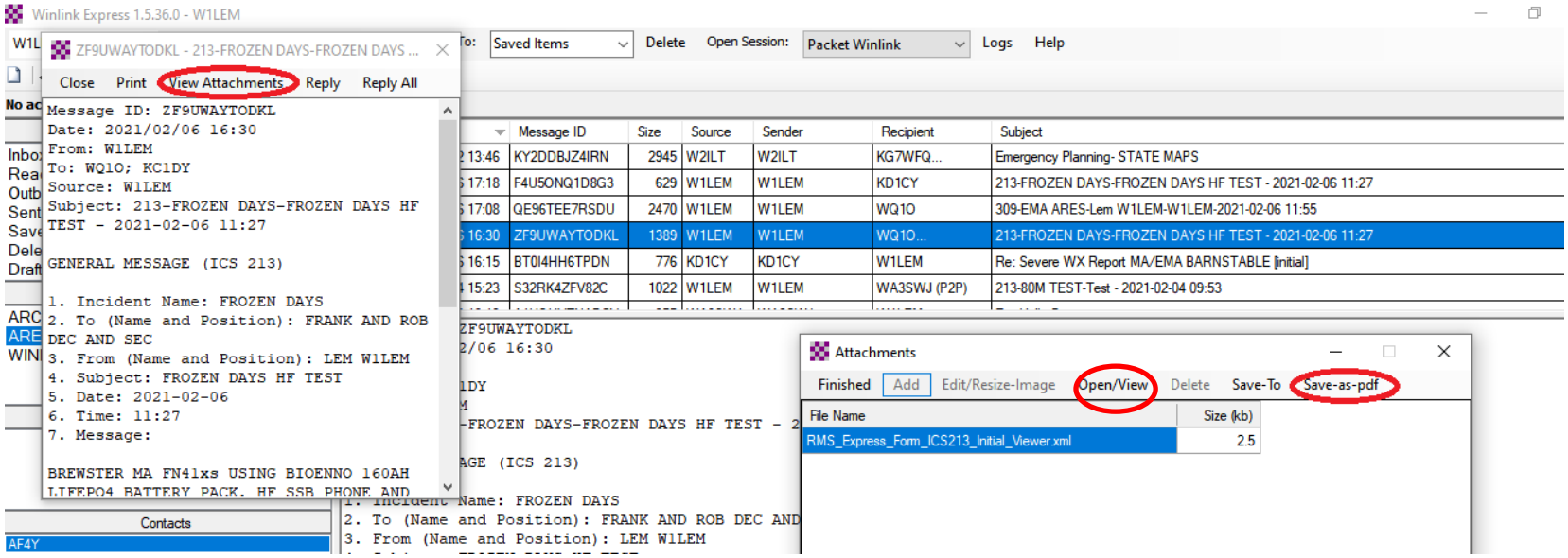
Recipient Gets The Message with An XML File Attached…



…Clicking on The Paper Clip Icon Opens The Form in A Browser Tab for Saving, Printing And/Or Replying

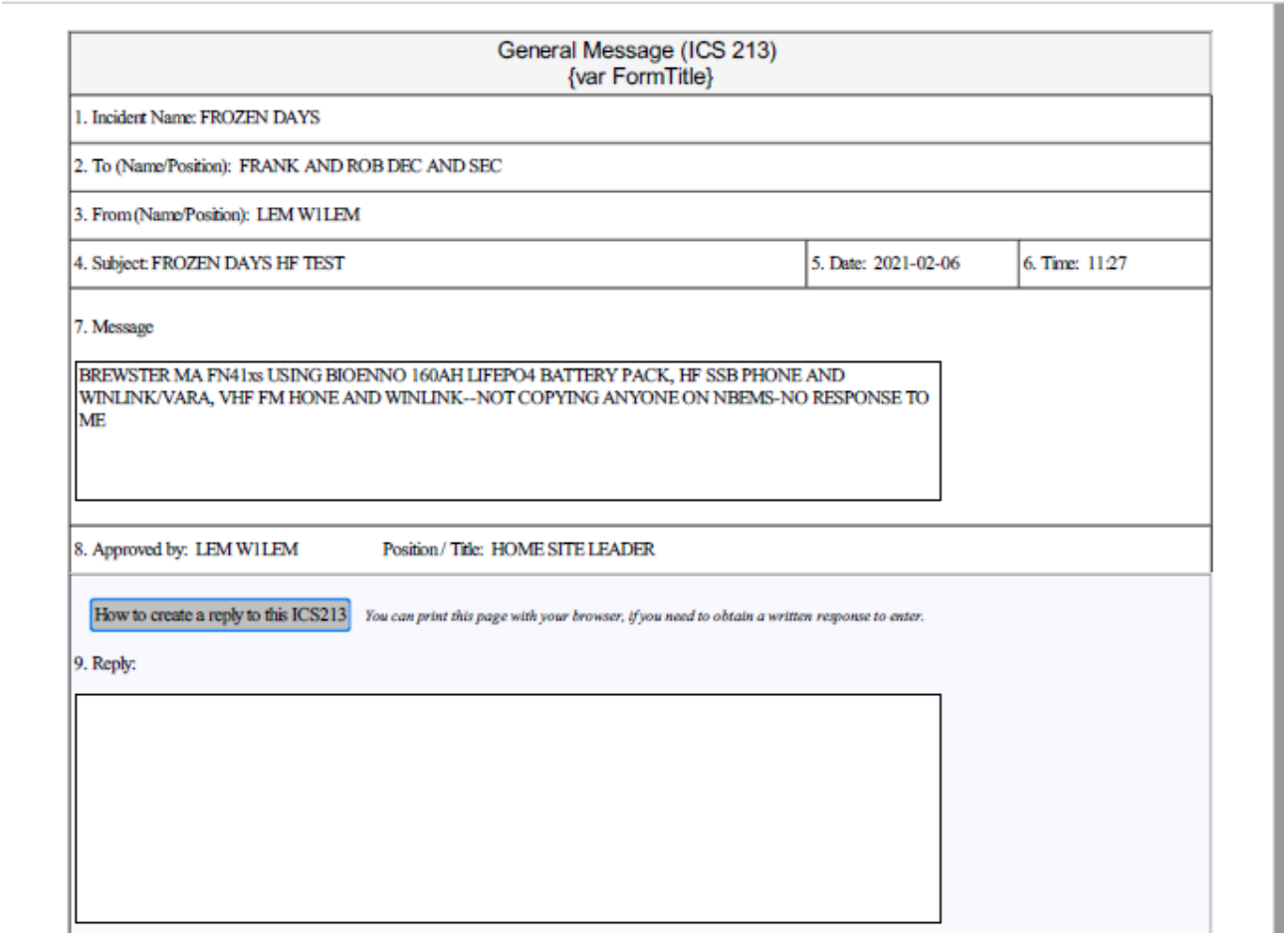


Attachments May Also Be Viewed And/Or Saved within Winlink



Note: “open/view” is not useful for .xml; will open the windows program associated with the attachment’s file type (OK for .txt or .csv)

The Recreated Form Can Be Saved as A PDF



General Message (ICS 213)
{var FormTitle}

1. Incident Name: FROZEN DAYS

2. To (Name/Position): FRANK AND ROB DEC AND SEC

3. From (Name/Position): LEM W1LEM

4. Subject: FROZEN DAYS HF TEST	5. Date: 2021-02-06	6. Time: 1127

7. Message

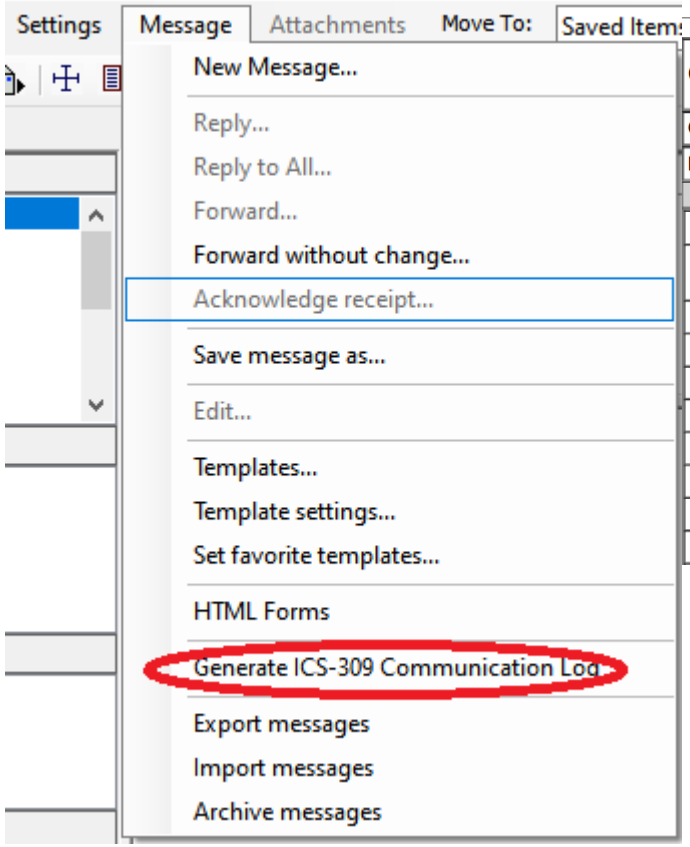
BREWSTER MA FN41xs USING BIOENNO 160AH LIFEPO4 BATTERY PACK, HF SSB PHONE AND WINLINK/VARA, VHF FM HONE AND WINLINK--NOT COPYING ANYONE ON NBEMS-NO RESPONSE TO ME

8. Approved by: LEM W1LEM Position / Title: HOME SITE LEADER

How to create a reply to this ICS213 *You can print this page with your browser, if you need to obtain a written response to enter.*

9. Reply:

Winlink Will Generate A Formatted ICS-309 Communications Log



COMMUNICATIONS LOG	TASK # 2021001	DATE PREPARED: 03/25/21 TIME PREPARED: 10:11
OPERATIONAL PERIOD # today	TASK NAME: GimmALog	
RADIO OPERATOR NAME: Lem	STATION I.D. W1LEM	

LOG

TIME	FROM	TO	SUBJECT
02/06/21 11:30	W1LEM	WQ1O KC1DY	213-FROZEN DAYS-FROZEN DAYS HF TEST - 2021-02-06 11:27
02/17/21 09:38	W1LEM	ARCNORTHEAST	Re: Attaching Files
02/24/21 09:49	W1LEM	KF5VO	Express Check In [Net]-W1LEM-Brewster, MA
03/19/21 13:49	W1LEM	WA3SWJ	Hello Bruce
03/19/21 14:03	W1LEM	WA3SWJ	hi bruce
03/19/21 14:20	W1LEM	WA3SWJ	p2p
03/24/21 08:17	W1LEM	KF5VO	Express Check In [Net]-W1LEM-Brewster, MA

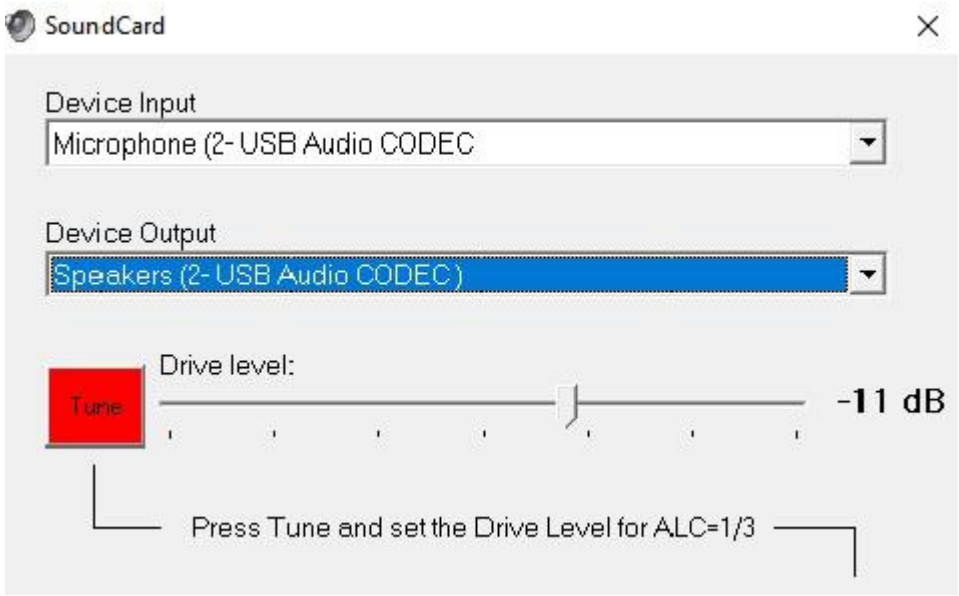
Troubleshooting Usually Points to Sound Card or TNC Settings



9:00 9:00 7:00

Initial settings,
adjust as required

- Check soundcard settings to be sure correct input and output devices are selected.
- Adjust levels as necessary



I Have 4 Winlink Setups – 4 radios, 3 computers, 2 SignaLinks+, 1 TNC

Alinco DR-135 MKII with internal TNC
- VHF
- Packet only
- No additional hardware or software (other than FTDI USB/Serial cable)

Leixen VV-898
- VHF/UHF
- Packet and VARA
- SignaLink and Soundmodem (free software), also VARA FM
- Earphone jack connected to SignaLink SPKR jack

Ten Tec Jupiter
- HF
- VARA
- SignaLink and VARA HF

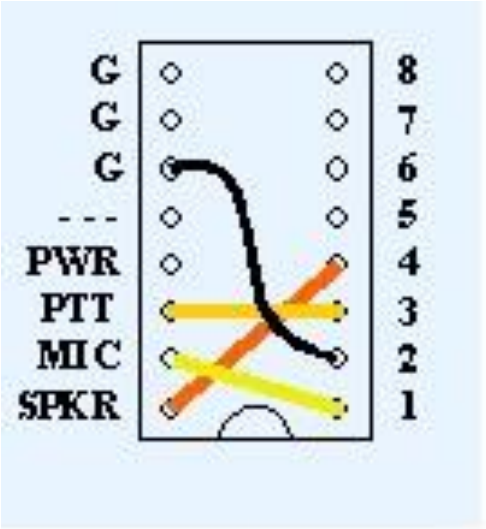
Baofeng with SignaLink and Soundmodem

Configuration Considerations

Winlink configured for each option
- Different computers or different instances

SignaLink jumpers are different for each rig
- Either rewire for each or buy jumper modules (~$10)
- Cables vary by rig

Soundmodem or VARA configured for each option
- Different computers or different instances
- Maybe multiple soundcards



Don’t try multiples until you’re comfortable with one instance

Local RMSs

Packet

- W1SGL-10, 145.09, Barnstable (others further away from Brewster)

VARA-FM

- KF1D-10, Blackstone-FN42fa, 79 mi from Brewster (I can't reach it)

VARA-HF

- Many--multiple bands, multiple locations worldwide

There Are Plenty of HF Options



Cost to Start

Initial cost is zero: download Winlink and use telnet

Total: $0-~$225 depending on current equipment, can be done in increments

If you can connect using W2CTX's PAC software or other packet capability, you're all set for packet mode (only)—still need Windows, not Linux

Otherwise (or in addition), to connect over RF you'll need:

Hardware

Rig with an internal sound card—e.g. IC-7300—may still need HW for VHF/UHF

OR, Signalink or similar ($99-$140 new, can be found used—but may need cable)

OR, TNC – Kantronics or similar ($200+ new, $100+ eBay) – Packet Only

Software

VHF/UHF - Soundmodem (free) or VARA-FM

HF - VARA HF– Free version available, but speed is very limited

- $69 for full version, group discounts available (~$50);
- One license all VARA versions

Winlink registration fee is $24—optional, but…

Winlink vs. NBEMS:
What Does Your Group and/or Served Agency Use?

NBEMS NARROW BAND EMERGENCY MESSAGING SOFTWARE	WINLINK
◦ Runs on multiple platforms	◦ Windows only
◦ Uses the flxxxx (Fast Light) suite (fldigi et al.)	◦ Essentially station to station(s), like email
◦ Can use a wide variety of modes	◦ Can operate synchronously (P2P) but station to station
◦ Contact many users simultaneously	
◦ Access to ICS and ARC forms	◦ Access to ICS and ARC forms
◦ More flexibility means more training/less operator-friendly	
◦ See groups.io/g/nbems	

References

https://www.winlink.org/

- Download software (Winlink, VARA, Soundmodem), documentation, help, and installation guides

Winlink Group on groups.io

Winlink Wednesdays and Winlink Thursdays

NE ARES Academy: https://www.youtube.com/watch?v=QzlnfNyPPGU&t=2942s

- 2hr session covering almost everything, with live demos

ARC Winlink Proficiency Goals: https://sec-ares.groups.io/g/main/attachment/993/2/Winlink%20Proficiency%20Goals.pdf

ARES Emergency Communicator Individual Task Book: http://www.arrl.org/ares

YouTube – about a billion videos (some are current, some of the current ones are accurate)

Next Steps

Download and install Winlink and additional software for your station
- Winlink.org
- If you have a TNC Winlink is all you need (if you can use PAC you can use Winlink
- VHF/UFH – SoundModem (VARA FM will work if you're in range of a VARA server)
- HF – VARA HF (different software from VARA FM, but one license gets both)

Send a telnet message to your non-Winlink email address

Configure Winlink and additional software (if any) for RF connection
- Alinco lesson

See if you can connect to a gateway to send a message over the air

Participate in Winlink Wednesdays or Thursdays

Participate in a BARC Winlink Zoom/on-air session

Read the documentation/watch the videos (but check for currency)

DEMONSTRATION