

# Jeff Scoville, AE5ME

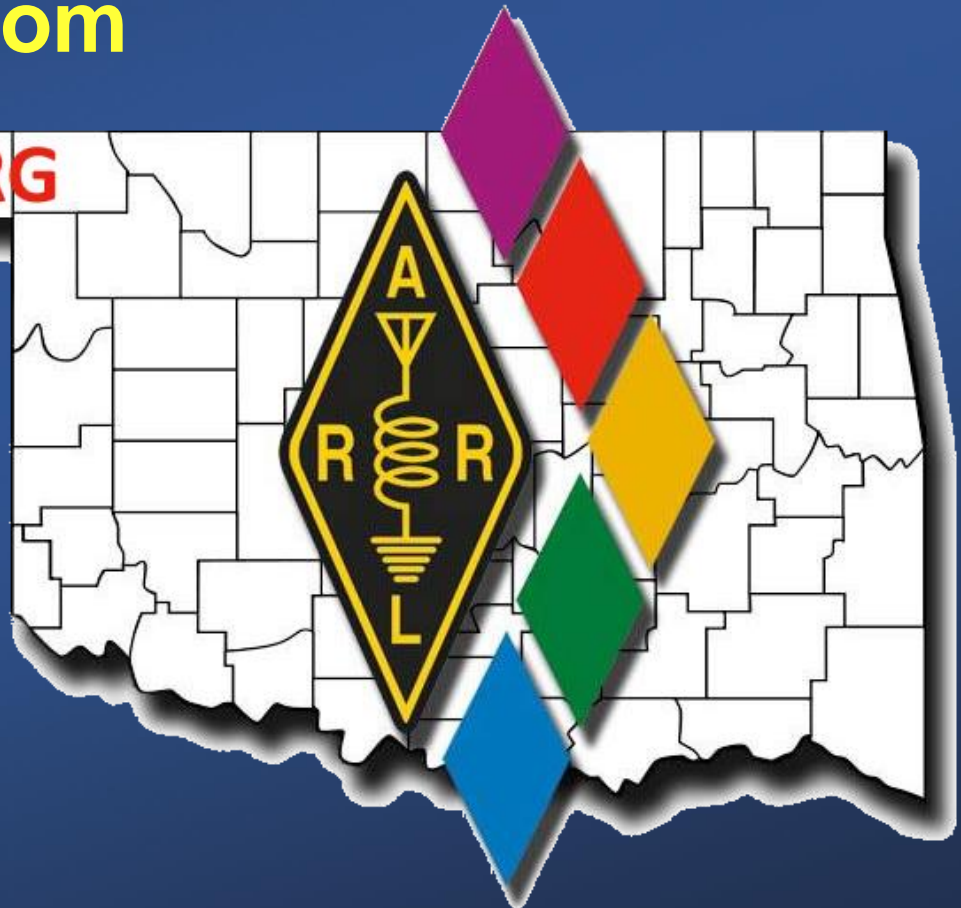
- 918-906-4819
- ae5me@yahoo.com

**OK.ARRL.ORG**

Presentation based  
upon Mark Kleine  
N5HZR presentation  
to SCARS on 2-12-  
2022.



**ARRL** The national association for  
AMATEUR RADIO



# The Five OK Action Groups

**ARES**

**NTS**

**Clubs**

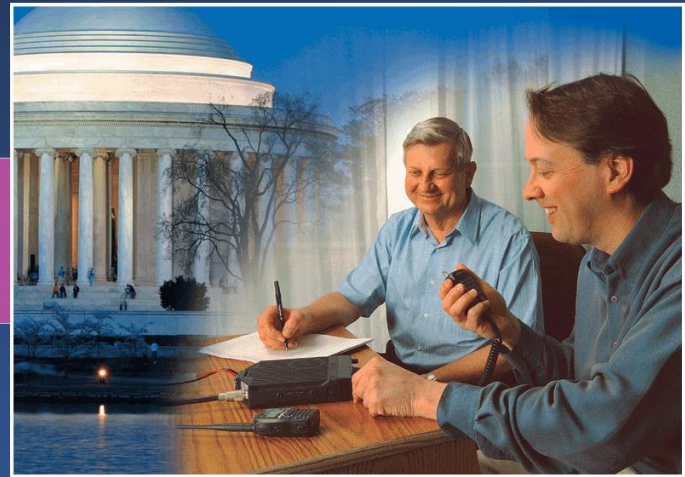
**Communication**

**Outreach**



**ARRL** The national association for  
AMATEUR RADIO

# NTS



- - HF Phone Nets
    - Sunday 3900 08:00 local / 3900 16:30 local
    - Daily 7290 AM/PM
  - Statewide VOIP Net
    - Monday 7:15 pm
  - NTSOK Winlink
    - Winlink message to NTSOK



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AMATEUR RADIO

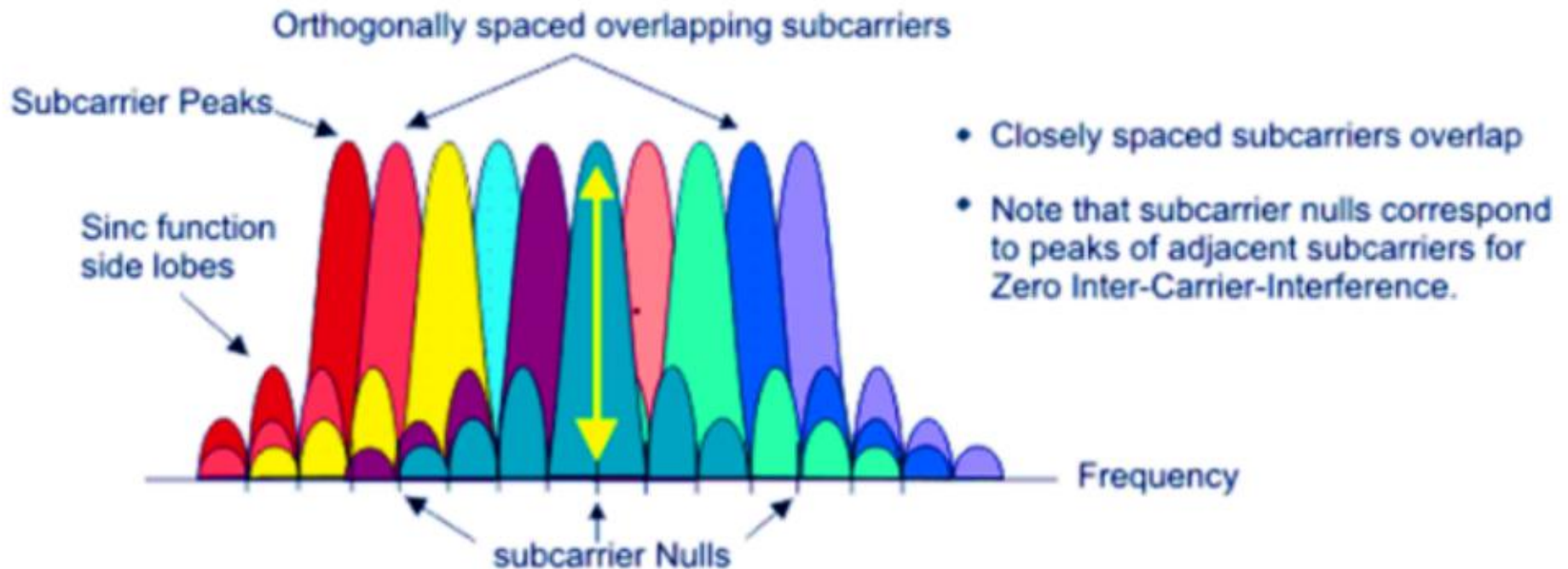
# Winlink Overview

- The Winlink email system uses a hybrid approach to sending and receiving messages that was designed and is managed by hams, for hams.
- The best part of this system is that the message storage has been separated from the message delivery mode.
- All of the 'back-end' storage is managed on the public internet, far away from a disaster location.

# Installing Winlink Software

- All Installation Details are at **[ok.arrl.org/ntsoksoftware](http://ok.arrl.org/ntsoksoftware)**
- Install Winlink Express
- Installing VARA HF
- Installing VARA FM

# VARA Encoding



# Winlink Registration Key

- Registration is voluntary and not required.
- Registration requires that you purchase a digital key to be applied to your program.
- Registration supports the ongoing operations of the Winlink system.
- Registration keys are unique to callsigns.
- Registration keys never expire.
- The registration fee is \$24 per callsign.

# VARA License

- NOT required...
- License is \$69
- License will let you use full speed
- Unlicensed VARA HF is limited to 175 bps vs max of 8,490 bps
- Unlicensed VARA FM is limited to 300 bps vs max of 25,210 bps



# Initial Account Creation

Winlink Express 1.6.1.0 - N5HZR

N5HZR Settings Message Attachments Move To: Saved Items Delete Open Session: Telnet Winlink Logs Help

No active session.

System Folders

- Inbox (12 unread)
- Read Items (0)
- Outbox (0)
- Sent Items (163)
- Saved Items (1)
- Deleted Items (10)
- Drafts (0)

Personal Folders

- NTSOK-Active (0)
- NTSOK-Complete (7)

Global Folders

Contacts

Winlink Express Properties

Call Signs

My Callsign: N5HZR My Password: .....  
(Case sensitive)

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

Password recovery e-mail: n5hzz@arrl.net  
(Non-Winlink e-mail address where lost password will be sent when requested)

Remove Callsign Request password be sent to recovery e-mail

Auxiliary Callsigns and Tactical Addresses

- ☐ NTSOK
- ☒ NTSOK-CAP
- ☐ NTSOK-DIST01
- ☐ NTSOK-DIST02

Add Entry Remove Entry Edit Entry

My Grid Square: EM15IE Lat/Lon to Grid Square

Winlink Express registration key: FC8 [REDACTED]

Contact Information (Optional)

Name: Kleine, Mark

Street address 1: 2651 84th Ave SE

Street address 2:

City: Norman

State/Province: OK

Country: United States

Postal code: 73026-5750

Web Site URL (optional): https://w5nor.org

Phone number: 405-410-6756

Non-Winlink e-mail: n5hzz@arrl.net

Additional information (optional):

# Winlink Display

Winlink Express 1.6.1.0 - N5HZR

N5HZR Settings Message Attachments Move To: Saved Items Delete Open Session: Telnet Winlink Logs Help

No active session...

System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (12 unread)	2022/02/09 18:36	0RHRKUI4GX4G	2003	KB4KY	KB4KY	AB4WS...	NET REPORT FOR THE AM
Read Items (0)	2022/02/07 16:06	LFJXWQGYPFYG	2732	KB4KY	KB4KY	AB4WS...	REMINDER AMLEG Post 42 V
Outbox (0)	2022/02/06 03:29	13ZBAUH1W9X3	316	WB5ANX	WB5ANX	N5HZR	Test message
Sent Items (163)	2022/02/03 02:23	FUKV5B0DK1SN	954	N5AZQ	N5AZQ	N5HZR	FW: Re:Vara FM Gateway / Di
Saved Items (1)	2022/02/01 19:40	41F408IYH9WV	1950	KB4KY	KB4KY	AB4WS...	NET REPORT FOR THE AM
Deleted Items (10)	2022/01/31 19:46	WQ214C282P2Q	2857	KB4KY	KB4KY	AB4WS...	REMINDER AMLEG Post 42
Drafts (0)							
Personal Folders							
NTSOK-Active (0)							
NTSOK-Complete (7)							
Global Folders							
Contacts							

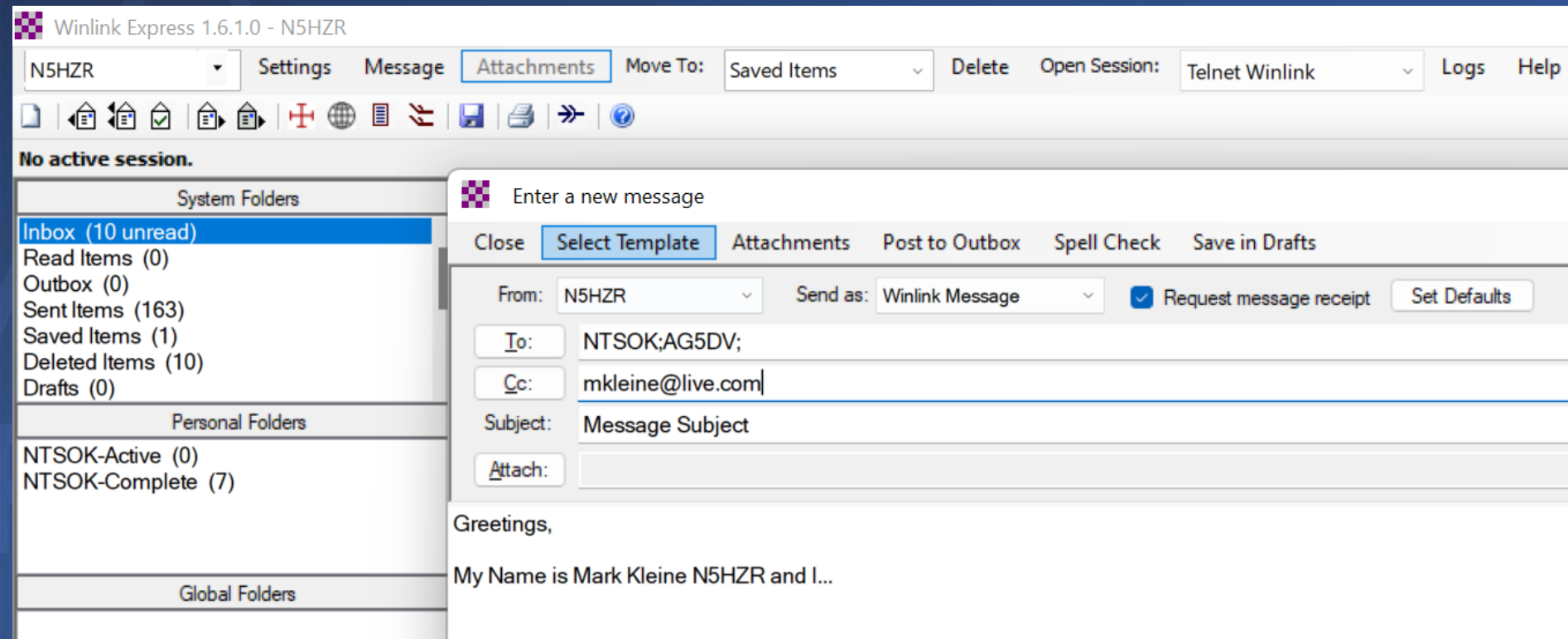
Message ID: H6EJZPJV4G3J  
 Date: 2021/08/31 03:32  
 From: AE5ME  
 To: AG5DV; N5HZR  
 Source: AE5ME  
 Downloaded-from: Telnet:CMS-SSL  
 Subject: MS NBEMS

I will be following both of you some of the Winlink messages that the MS ARES is sharing of their NBEMS nets and SET exercises. They are doing an outstanding job for the hurri

--Jeff AE5ME

[Message receipt requested]

# Sending an Email



# Using An Email Template

Winlink Express 1.6.1.0 - N5HZR

N5HZR Settings Message Attachments Move To: Saved Items Delete Open Session: Telnet Winlink Logs Help

No active session.

System Folders

- Inbox (10 unread)
- Read Items (0)
- Outbox (0)
- Sent Items (163)
- Saved Items (1)
- Deleted Items (10)
- Drafts (0)

Personal Folders

- NTSOK-Active (0)
- NTSOK-Complete (7)

Global Folders

Contacts

Enter a new message

Close Select Template Attachments Post to Outbox Spell Check Save in Drafts

From: N5HZR

To: NTSOK;AG

Cc: mkleine@li

Subject: Message S

Attach:

Greetings,

My Name is Mark Kleine

Template Manager

Select Close Add Remove Edit

Standard Templates (version 1.0.180.0)

- ARC Forms
- CA STATE Forms
- CANADIAN Forms
- CIRM Medical Assistance
- FEMA Forms
- FMRE Forms
- GENERAL Forms
- GENERAL MEDICAL Forms
- HI STATE forms
- HICS Forms
- IARU Forms
- ICS USA Forms
- MAPPING-GIS FORMS
- OR STATE Forms
- RADIOGRAM & RRI Forms
  - Multi Client Work Sheet.txt
  - Radiogram.txt
  - RRI ICS213 Radiogram.txt

# Entering An Email Template

Radiogram Template

File | C:/RMS%20Express/N5HZR/Temp/Radiogram.html

## Amateur Radio RADIOGRAM Text Creator [Read Help and Instructions!](#)

Number	Precedence	Handling Instructions	Station Of Origin	Check	Place of Origin	Time	Date
60	R EMERGENCY P W <small>Emergency not in use at this time.</small>	NONE HXA HXB <a href="#">HX Help</a> ADD MORE HX INFO	N5HZR <small>Change if not you.</small>	8	NORMAN OK	0443Z	FEB 11
						<input checked="" type="radio"/> Current UTC Time <input type="radio"/> Current Local Time <input type="radio"/> No Time	

☐ SVC (Handler use)

**TO:**

Name:  Call Sign:

Address:

City / Town:  State or Province:  [2 Letter Codes](#) Zip:

Country:

Phone:  Extension:  E-mail:

Op Note about this Radiogram:

**MESSAGE TEXT** Check:  [ARL Message Numbering Help.](#)

GREETINGS AARON X CONGRATS ON  
YOUR NEW HOUSE

[Click here to preview for accuracy BEFORE you SUBMIT](#)

Signature (name) of person for whom message originated:

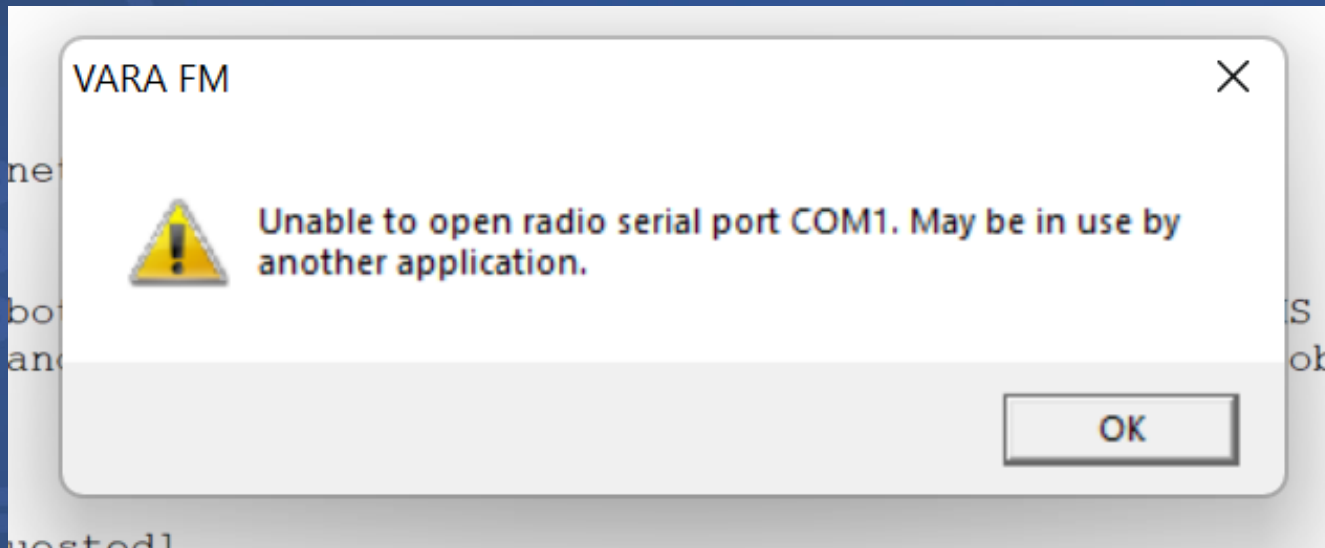
Operator Note:

**>>> NOW CLICK HERE and select a Liaison Station <<<**

Contact KB1TCE about this form: Ver 10.5

# VARA Error Message

- When you run VARA HF or FM while Winlink is running, this message will pop up. It's just a warning...



# VARA HF or FM License

The screenshot shows the VARA FM v4.1.0 Setup window. On the left is a 'Settings' panel with a 'View' tab and a VU meter. The 'TCP Ports' section has 'Command' set to 8300 and 'Data' set to 8301. The 'FM System' is set to 'NARROW'. The 'Digipeater' and 'Retries' (set to 2) fields are empty. A checkbox 'Allow VARA check for updates' is checked. On the right is the 'VARA Licenses' section with four rows of 'Callsign' and 'Registration Key' fields. Below the setup window is a wiring diagram for the rear panel. A blue box labeled 'Compatible with Signalink USB' points to the 'DATA' pin. The diagram shows connections for 'SQL', 'DATA OUT 9600bps', 'GND', 'DATA OUT 1200bps', 'PTT', and 'DATA IN'. Two BNC connectors are shown: one labeled 'to PC input' connected to 'DATA OUT 1200bps' and 'PTT', and another labeled 'from PC output' connected to 'DATA IN' and 'PTT'.

VARA FM v4.1.0 VARA Setup

Settings View

bps

1.0  
0.8  
0.6  
0.4  
0.2  
0.0

VU

Audio Input: -1

RX Disconn

Pe

NTSOK-Active (0)  
NTSOK-Complete

G

TCP Ports:

Command  
8300

Data  
8301

FM System:  
NARROW

Digipeater:

Retries:  
2

☒ Allow VARA check for updates

VARA Licenses:

Callsign: Registration Key:

Callsign: Registration Key:

Callsign: Registration Key:

Callsign: Registration Key:

Compatible with Signalink USB

SQL

DATA OUT 9600bps

GND

DATA

DATA OUT 1200bps

PTT

DATA IN

to PC input

from PC output

\* 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)...

# VARA HF/FM Program

The screenshot displays the VARA FM v4.1.4 software interface. A "SoundCard" dialog box is open, showing the following settings:

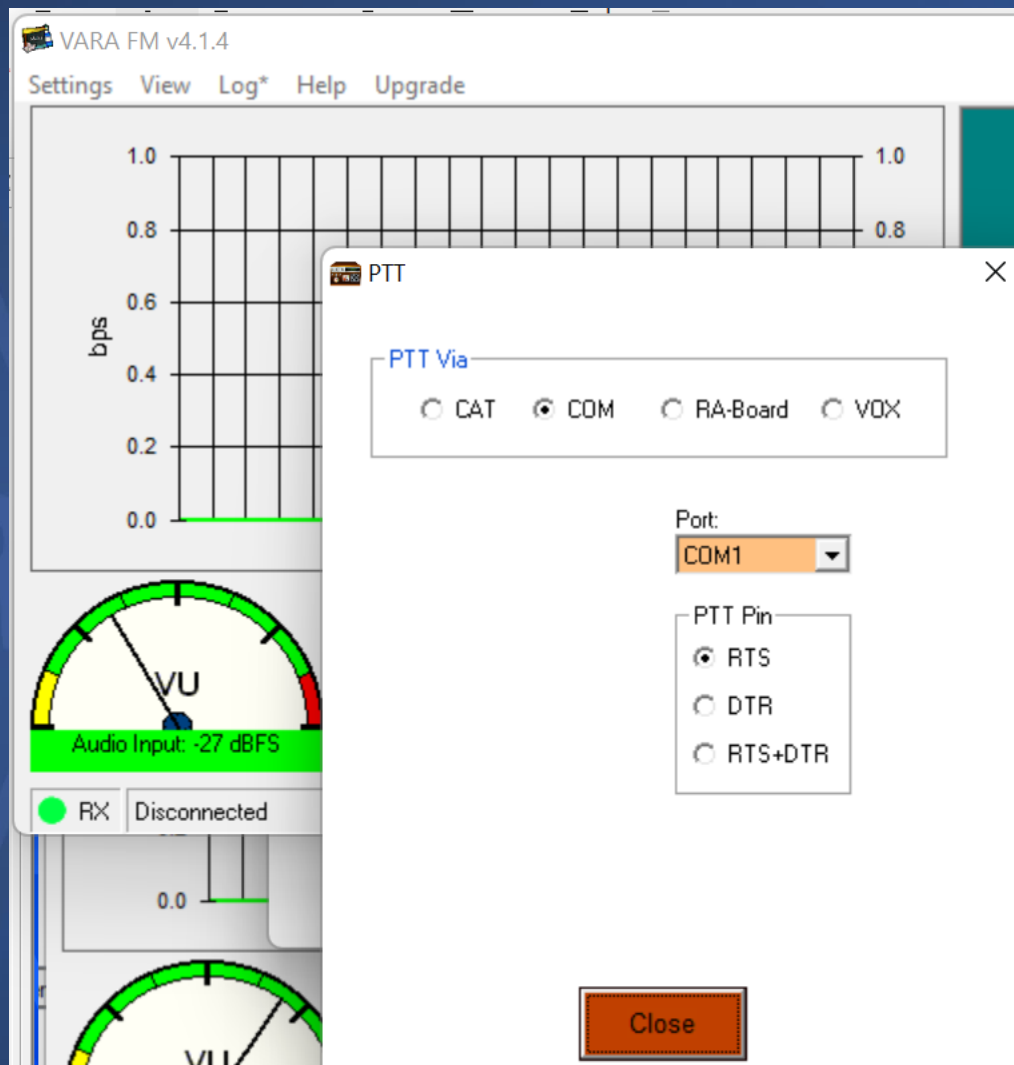
- Device Input:** Microphone (Realtek(R) Audio)
- Device Output:** Speakers (Realtek(R) Audio)
- Drive level:** -5 dB
- Buttons:** Tune, Auto Tune, Ping, Close

In the background, the main interface includes a "Message" window, a "Settings" window, and a "Logs" window. The main interface also features several gauges and status indicators:

- VU Gauge:** Audio Input: -13 dBFS
- CPU Gauge:** CPU Usage: 7 %
- TX Delay Gauge:**
- S/N Gauge:**
- DATA Section:** ACK, IDLE, NACK, BREAK, REQ, QRT
- Status Indicators:** RX (Green), Disconnected, NARROW, TCP (Red), BUSY (Yellow)



# VARA HF or FM PTT Control



# Define Your Session

Winlink Express 1.6.1.0 - N5HZR

N5HZR Settings Message Attachments Move To: Saved Items Delete Open Session:

No active session.

System Folders	Date/Time	Message ID	Size	Source	Sender
Inbox (12 unread)	2022/02/09 18:36	0RHRKUI4GX4G	2003	KB4KY	KB4KY
Read Items (0)	2022/02/07 16:06	LFJXWQGYPFXXG	2732	KB4KY	KB4KY
Outbox (0)	2022/02/06 03:29	13ZBAUH1W9X3	316	WB5ANX	WB5ANX
Sent Items (163)	2022/02/03 02:23	FUKV5B0DK1SN	954	N5AZQ	N5AZQ
Saved Items (1)	2022/02/01 19:40	41F408IYH9WV	1950	KB4KY	KB4KY
Deleted Items (10)	2022/01/31 19:46	WQ214C282P2Q	2857	KB4KY	KB4KY
Drafts (0)					

Personal Folders

NTSOK-Active (0)  
NTSOK-Complete (7)

Global Folders

Message ID: H6EJZPJV4G3J  
Date: 2021/08/31 03:32  
From: AE5ME  
To: AG5DV; N5HZR  
Source: AE5ME  
Downloaded-from: Telnet:CMS-SSL  
Subject: MS-NDPMS

Telnet Winlink  
Telnet Winlink  
Packet Winlink  
Pactor Winlink  
Robust Packet Winlink  
Ardop Winlink  
Vara HF Winlink  
Vara FM Winlink  
Iridium GO Winlink  
-----  
Packet P2P  
Pactor P2P  
Robust Packet P2P  
Ardop P2P  
Vara HF P2P  
Vara FM P2P  
Telnet P2P  
-----  
Pactor Radio-only  
Vara HF Radio-only

# Telnet (Internet) Session



Telnet Winlink Session

Exit Settings **Start** Stop Time to next Autoconnect = 29:50

\*\*\* Connecting to a CMS...

\*\*\* Connected to CMS-SSL at 2022/02/10 04:46:11

[WL2K-5.0-B2FWIHJM\$]

;PQ: 59120839

CMS>

;FW: N5HZR NTSOK-CAP|28212672 NTSOK-DIST11|52138181 NTSOK-DIST12|82088310

[RMS Express-1.6.1.0-B2FHM\$]

;PR: 27989473

; WL2K DE N5HZR (EM15IE)

FF

FQ

\*\*\* — End of session at 2022/02/10 04:46:12 —

\*\*\* Messages sent: 0. Total bytes sent: 0, Time: 00:00, bytes/minute: 0


\*\*\* Messages Received: 0. Total bytes received: 0, Total session time: 00:00, bytes/minute: 0

\*\*\* Disconnected at 2022/02/10 04:46:17

# VARA HF Session

Exit Settings Switch to Peer-to-Peer Channel Selection Map Forecast Best chan. Next chan. **Start** Stop Abort

Quality:	36
----------	----

 HF Channel Selector

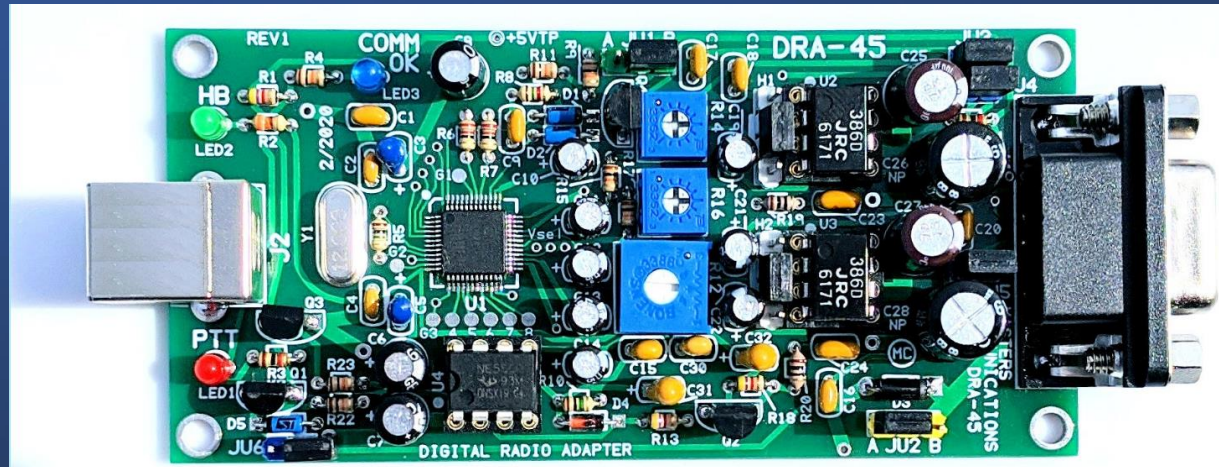
Exit   Select   Update Via Internet   Update Via Radio   Map   Forecast   SFI   All RMS

STANDBY - Updating RMS channels propagation indices for XE1VP

Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KD5EOC	3589.000	V2300	EM13KF	00-23	PUBLIC	135	176	92	56
AD5EO	3590.000	V2300	EM34QN	00-23	PUBLIC	267	098	91	55
AD5EO	3584.000	V500	EM34QN	00-23	PUBLIC	267	098	91	55
WB5KUO	3596.000	V2300	EM12IM	00-23	PUBLIC	185	180	91	54
AE5ME-13	3596.500	V2300	EM26BA	00-23	PUBLIC	98	054	91	58
KB5LZK	3598.500	V2300	EM34UT	00-23	PUBLIC	284	094	90	56
KD0SFY	3588.500	V500	DM78OV	00-23	PUBLIC	486	304	90	53
K0SI	3586.500	V2300	EM39UA	00-23	PUBLIC	382	045	89	54
W9FE	3592.500	V2300	EM59AA	00-23	PUBLIC	482	055	86	52
W9FE	3596.500	V2300	EM59AA	00-23	PUBLIC	482	055	86	52
K0ISP-1	3598.500	V2300	EN31DP	00-23	PUBLIC	486	022	86	53
NC9IL	3596.500	V2300	EM59ER	00-23	PUBLIC	523	051	85	52
N5TAN	3598.000	V2300	EM12QJ	00-23	PUBLIC	222	125	85	49


# VARA HF Setup

- Direct USB connection to Your Radio
- Setup Similar to Digital Connection
- Signal-Link
- Options available at <https://w5nor.org/digital/>





# VARA FM Session

 Vara FM Winlink Session - N5HZR

Exit

Settings

Switch to Peer-to-Peer

Channel Selection

Start

Stop

Abort

Connection:

Digipeater

W5LHG

via

Freq.:

145.030

Range:

24

Bearing:

263

Favorites:

W5LHG @ 145.030

Select

Add to favorites


Remove from favorites

In: 0/0 Out: 0/0 BPM: 0/0 Disconnected Time to next Autoconnect = Disabled

\*\*\* Launching VARA FM TNC: C:\VARA FM\VaraFM.exe

\*\*\* Successfully connected to VARA FM TNC.

\*\*\* Ready

 Vara FM Channel Selector

Exit

Select Channel

Update Table Via Internet

Update Table Via Radio

Stations found within 185 miles of your grid square.

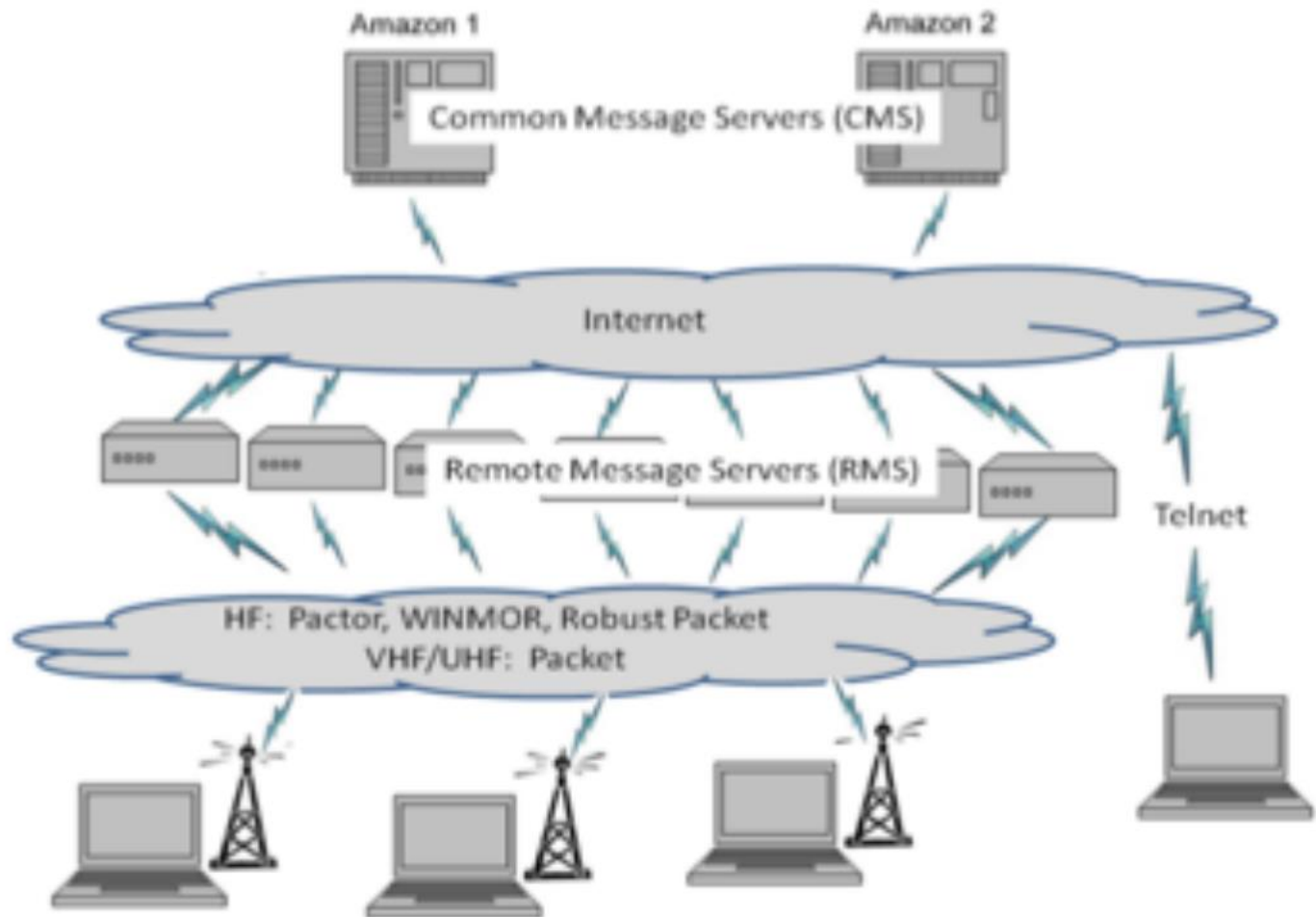
Callsign	Frequency (MHz)	Channel Width	Grid Square	Group	Distance (mi)	Bearing (Degrees)
W5LHG	145.030	Narrow	EM15DD	PUBLIC	024	263
W5LHG	145.030	Wide	EM15DD	PUBLIC	024	263
KC5TSU-10	144.990	Narrow	EM13LD	PUBLIC	142	174
KN6Q	145.050	Wide	EM12FX	PUBLIC	153	185
W6JDG-10	145.630	Narrow	EM12RX	PUBLIC	158	164
N5REG-9	446.150	Narrow	EM12RW	PUBLIC	161	164
K5COW-10	145.030	Wide	EM12HS	PUBLIC	167	182
N0CWR-10	145.050	Wide	EM27IH	PUBLIC	184	037
WB5KUO-10	144.930	Narrow	EM12IM	PUBLIC	185	180

# Winlink Operation

- The remote servers can connect to the clients in a dozen different ways. We tend to use three of those paths, ethernet, VARA HF, and VARA FM.
- The three layers of this system are the Common Message Servers (CMS), the Remote Message Servers (RMS), and the Clients (Winlink Express).

# Winlink Network Design

- CMS
- RMS (gateway)
- Client (you)





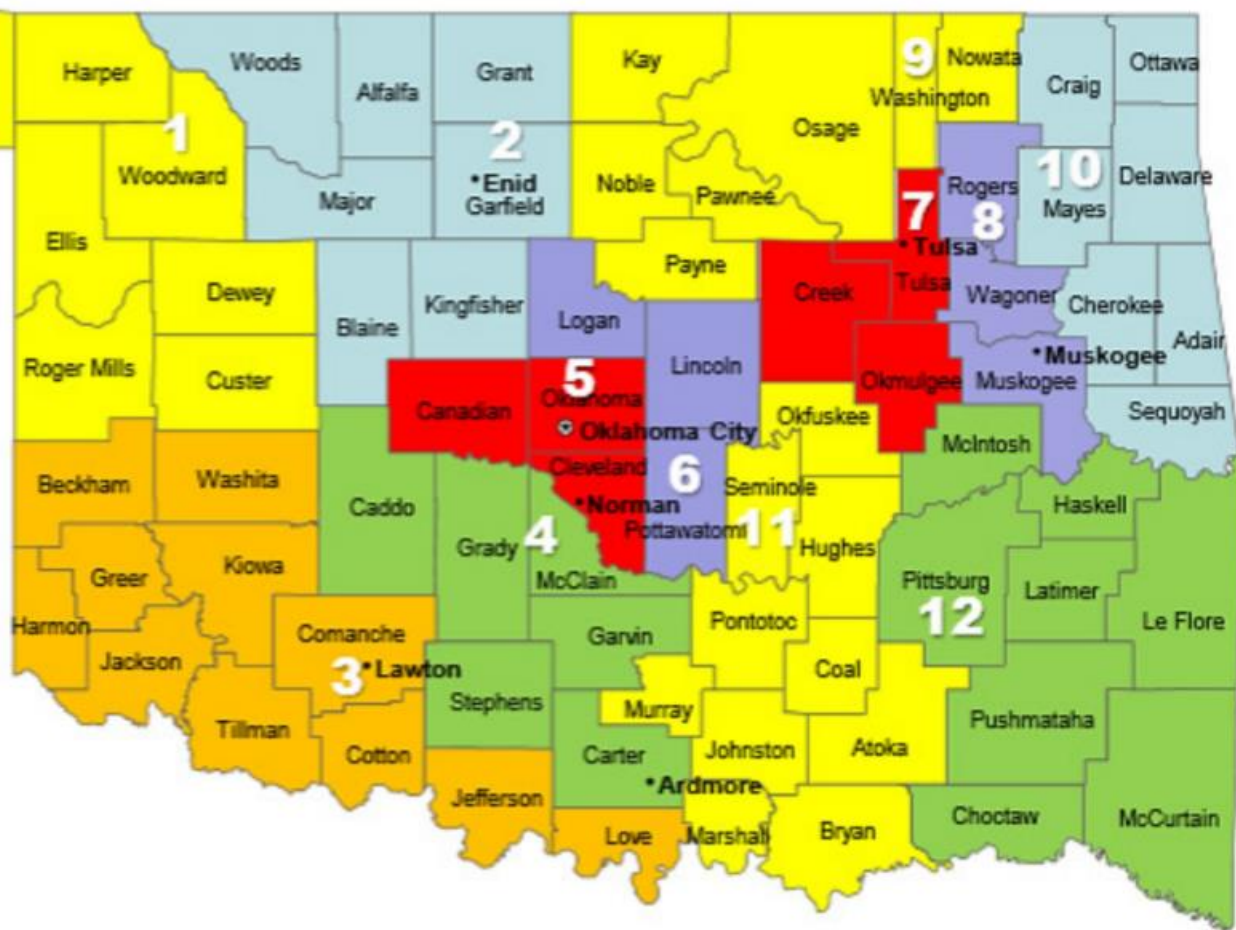
# VARA FM Oklahoma Network

- AE5ME-13 is a Winlink VHF gateway in **Broken Arrow, OK**. 145.03 MHz
- AE5ME-14 is a Winlink VHF gateway in **Ft. Gibson/Muskogee, OK** (should have good coverage in the Tulsa area with a 25 watt base radio, or a 50 watt mobile radio). 145.03 MHz
- AE5ME-7 is a VARA FM digipeater in **Ft. Gibson/Muskogee, OK**. (used to digipeat, if the Internet is down at the tower) 145.03 MHz
- W5LHG is a Winlink VHF gateway in **Blanchard, OK** on 145.03 MHz. This should have good coverage in the Norman, South OKC area. Reports in the Norman area are that 3 watts with a magnetic mount antenna works well from the Norman Airport.
- N0LOZ-10 is the Winlink VHF gateway in **Prague, OK** on 145.03 MHz.

# Future VARA FM Oklahoma

- Others that are known to be working on gateways:
- Vian
- Guthrie
- East Norman
- NE OKC
- Many thanks to all who have put up gateways, or who are working on gateways in the area.

# NTSOK Regions



# Intrastate Messages

- NTSOK-DIST01 – Cimarron, Texas, Beaver, Harper, Woodward, Ellis, Dewey, Roger Mills, and Custer counties.
- NTSOK-DIST02 – Woods, Alfalfa, Grant, Major, Garfield, Blaine, and Kingfisher counties.
- NTSOK-DIST03 – Beckham, Washita, Harmon, Greer, Kiowa, Jackson, Tillman, Comanche, Cotton, Jefferson, and Love counties.
- NTSOK-DIST04 – Caddo, Grady, McClain, Stephens, Garvin, and Carter counties.
- NTSOK-DIST05 – Canadian, Oklahoma, and Cleveland counties.
- NTSOK-DIST06 – Logan, Lincoln, and Pottowatomi counties.
- NTSOK-DIST07 – Tulsa, Creek, and Okmulgee counties.
- NTS-DIST08 – Rogers, Wagoner, and Muskogee counties.
- NTS-DIST09 – Kay, Osage, Washington, Nowata, Noble, Pawnee, and Payne counties.
- NTS-DIST10 – Craig, Ottawa, Mayes, Delaware, Cherokee, Adair, and Sequoyah counties.
- NTS-DIST11 – Okfuskee, Seminole, Hughes, Pontotoc, Coal, Murray, Johnston, Atoka, Marshall, and Bryan counties.

NTS-DIST12 – McIntosh, Haskell, Pittsburg, Latimer, LeFlore, Rushmore, Cheateau, and

# Incoming NTS Traffic

- NTSOK has made arrangements with Radio Relay International and the 7290 Traffic Net to receive inbound messages to the network. The state traffic handler forwards these messages to the proper ARESOK district for local delivery.



**Radio Relay  
International**

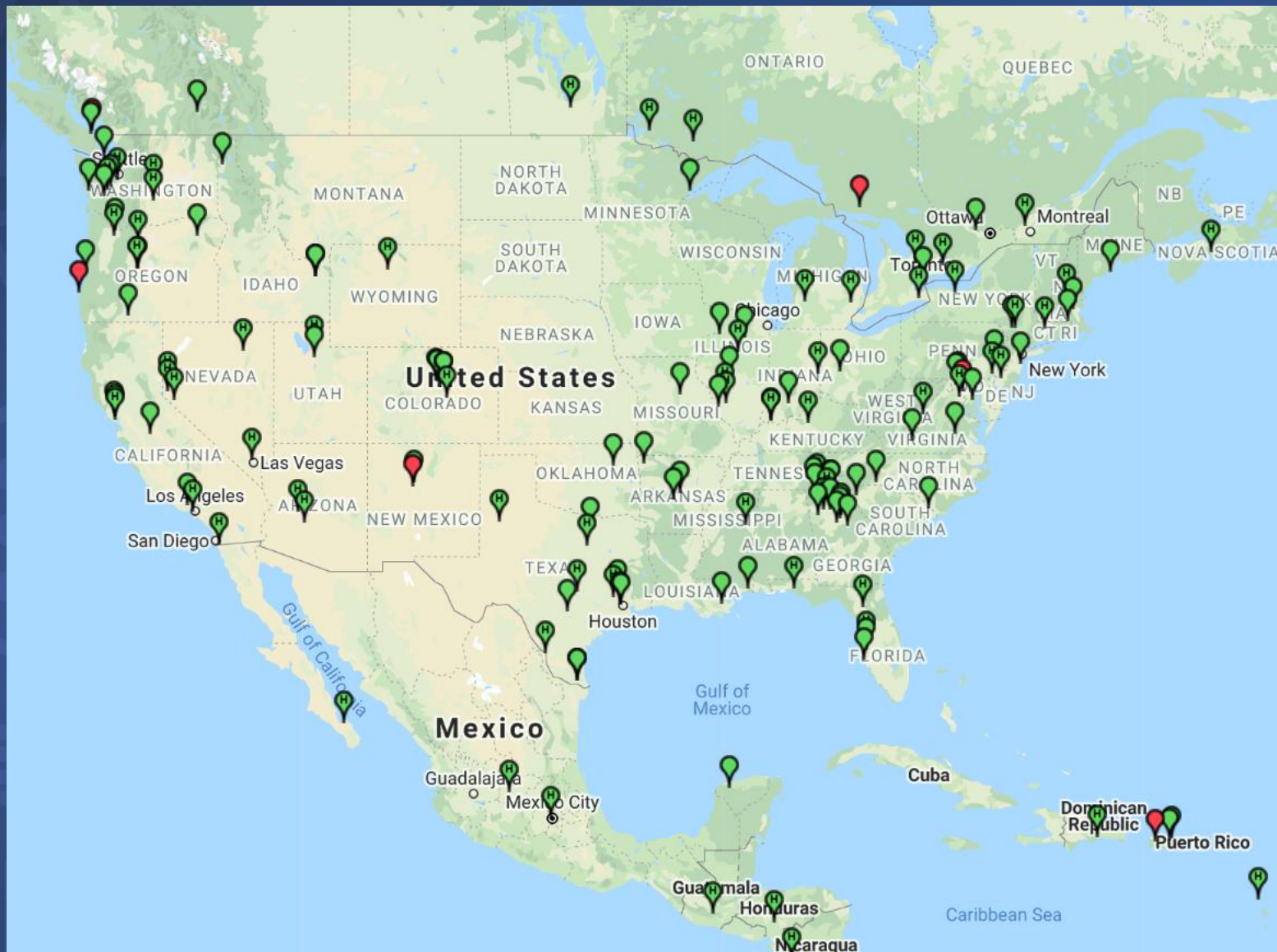


# Interstate Messages

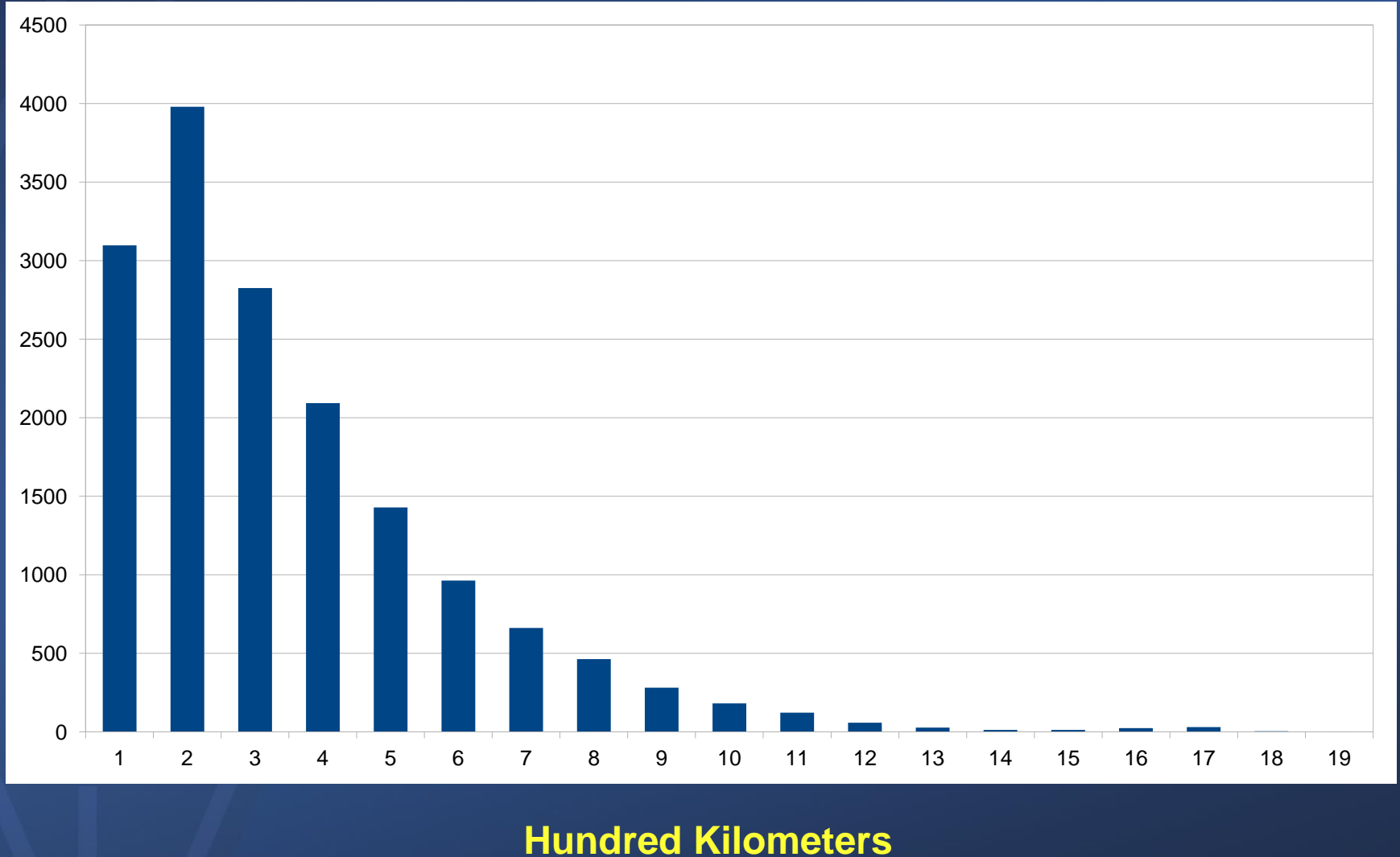
- Outbound messages should be sent to NTSOK.
- We have made arrangements with 7290 and Radio Relay International to take NTS traffic and they will distribute the messages to their final destination.



# VARA HF Gateways

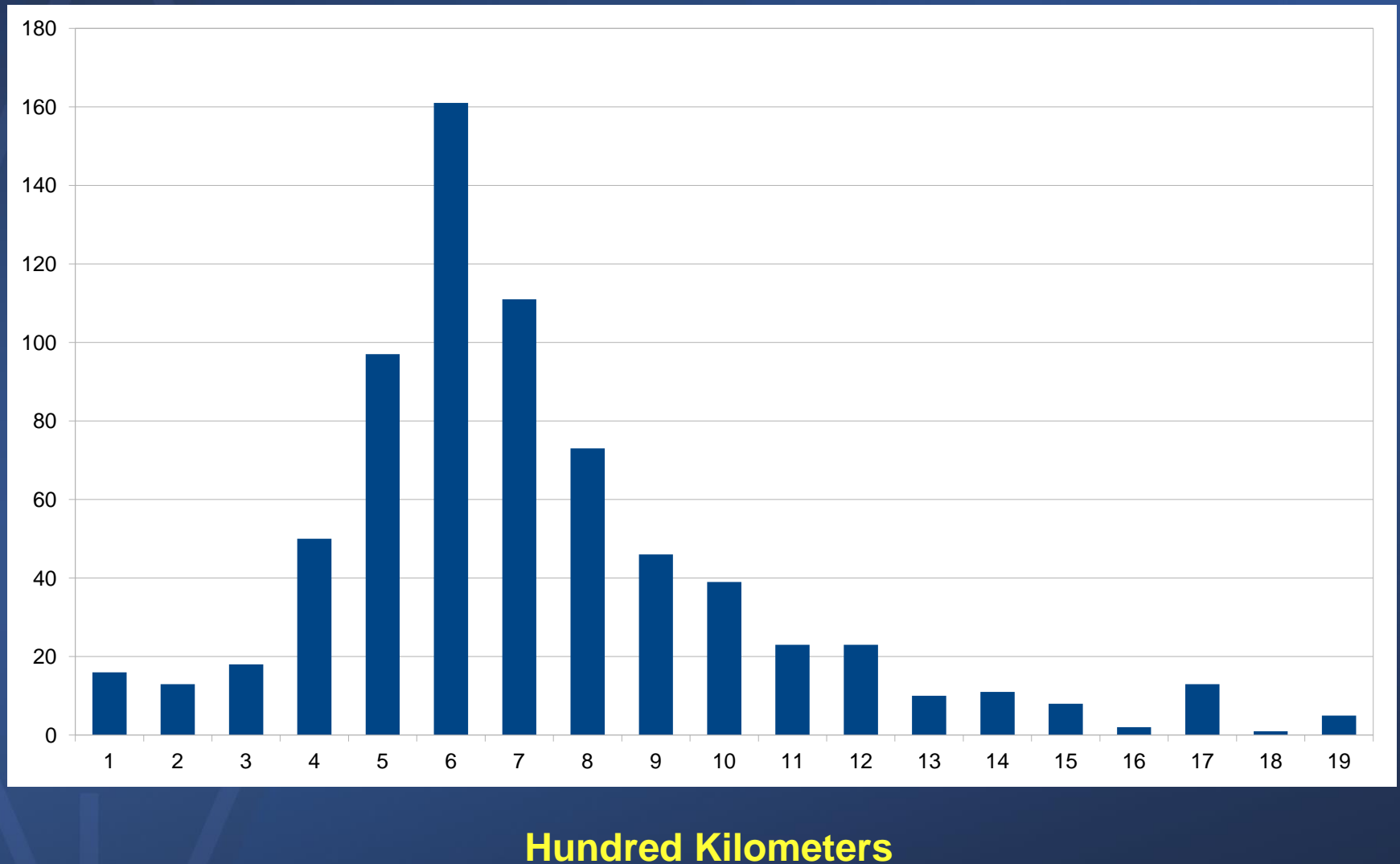


# 80 Meters Winlink Transactions

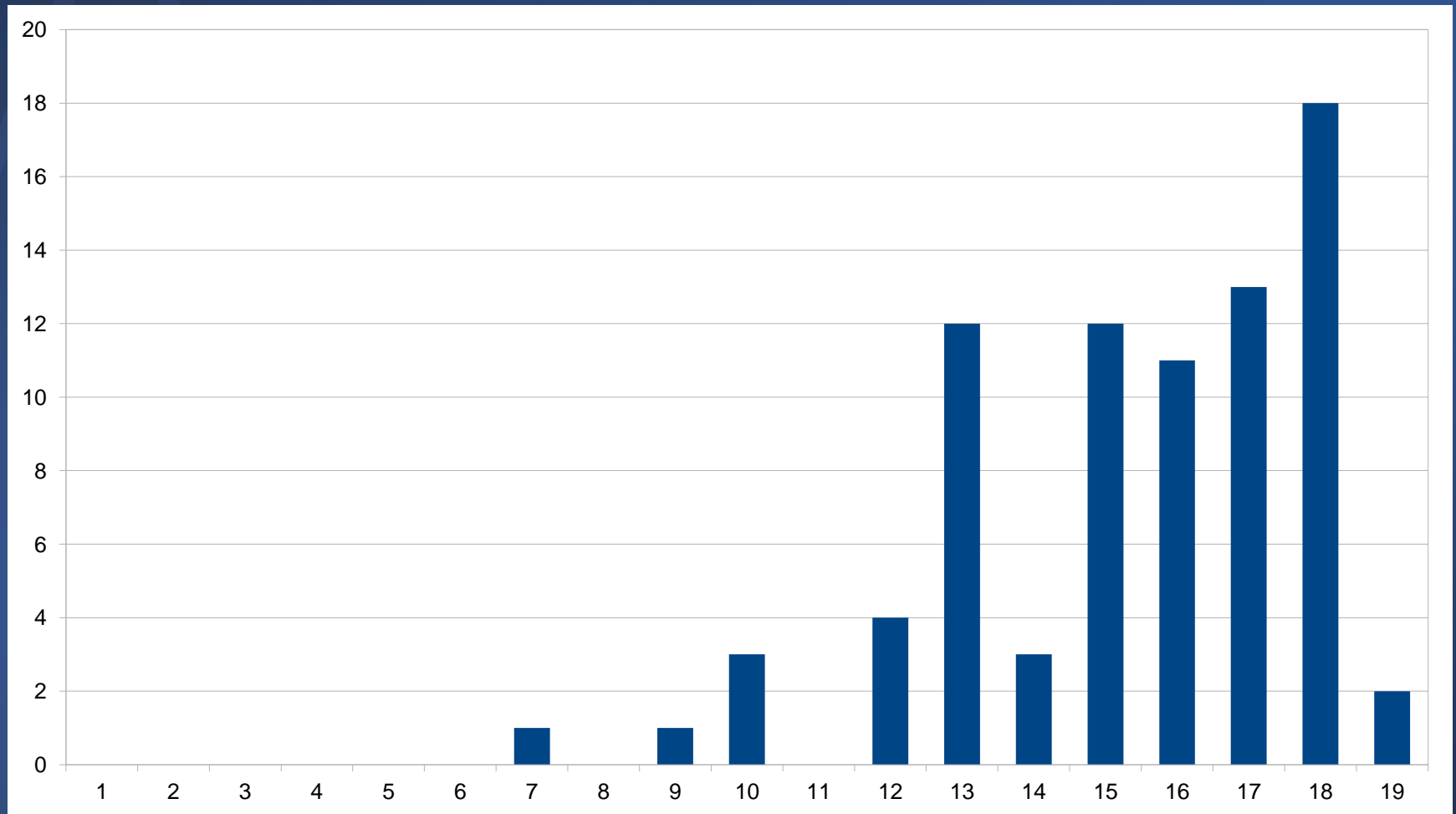




# 40 Meters Winlink Transactions



# 20 Meters Winlink Transactions



Hundred Kilometers

# Demo Time

