National Traffic System™ in Oklahoma (NTSOK) Documentation

This document will be updated periodically and the most recent version can be found at http://ok.arrl.org/nts/

Version 2021-10-17

Mark Kleine N5HZR – Ed Hatch AG5DV

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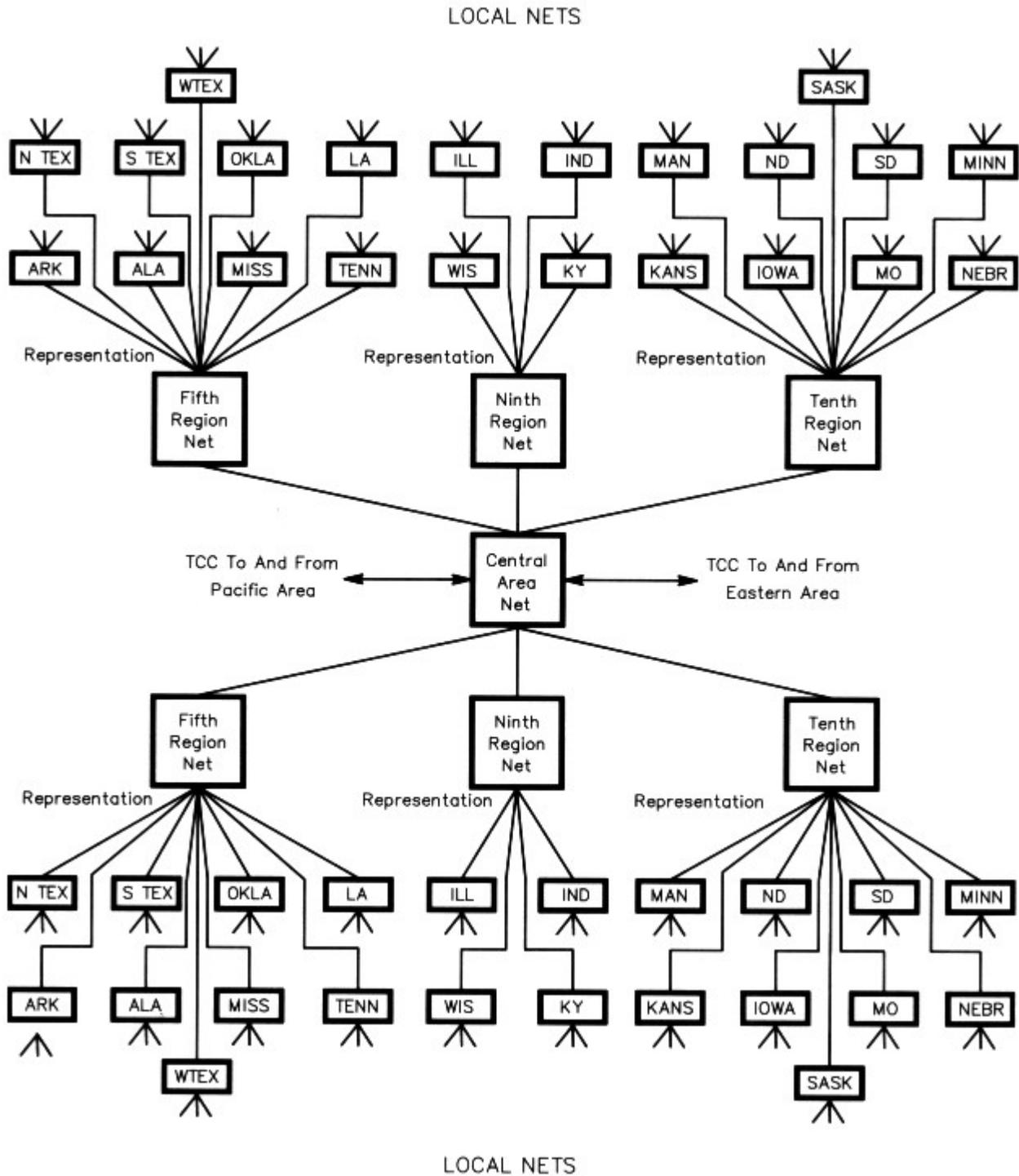# National Traffic System™ in Oklahoma (NTSOK) Documentation

National Traffic System (NTS) Overview

The National Traffic System was designed, and implemented in the 1950's to allow messages to be sent from coast to coast, via amateur radio, in under 24 hours, using amateur radio. Messages are sent during fair weather days to test the system and allow operators to practice their skills. During bad weather days, disasters or other emergencies, messages are sent to communicate information critical to saving lives or property. Additionally, health and welfare messages can be used to inquire about a disaster victim.

This document will describe the NTS system used in Oklahoma, with an emphasis on the NTSOK Winlink digital delivery method. Here we use a combination of phone/CW nets and the NTSOK digital delivery system based on the Winlink amateur radio protocol. This document will not discuss the entire process, so the following documents can be used to obtain information about the entire NTS process.

- https://blubrry.com/arrlontheair/78772205/arrls-on-the-air-episode-20/ - The ARRL On-The-Air episode 20 podcast is devoted to an introduction to Winlink.
- https://en.wikipedia.org/wiki/National_Traffic_System – Wikipedia has a great overview of the NTS which includes a sample mail delivery and audio files lets you hear a message being sent.
- http://www.arrl.org/nts – The ARRL NTS web page has links to information that can be used by hams to learn, present, and teach how the NTS works.
- http://www.arrl.org/files/file/NTS_MPG2014.pdf – This is the 484 page PDF document that can be used to answer almost any question about how the NTS functions. There are numerous examples and dialogs that can be used to answer any question you may have.
- http://radio-relay.org/ – Radio Relay International (RRI) is a group of amateur radio operators that have created and maintain a message backbone that will get messages around the world using local operators. (NTSOK uses RRI to send and receive messages outside of the state.)
- https://www.7290trafficnet.org/ – The 7290 Traffic Net is an independent, public service traffic net operating on or about 7290 kHz, and has been in continuous operation since 1953. This site explains how this national network functions and has many great training guides.
- https://kv5r.com/ham-radio/amateur-radio-traffic-handler-training/ – Harold Melton KV5R has a great website that details the entire NTS process. He has segments for the beginner, and details that can be used as a reference.
- https://www.ntstrivia.com/ – Aaron Hulett K8AMH is the North Texas Traffic Manager and he manages a weekly trivia contest that uses NTS messages to respond to his questions. Any amateur radio operator can join in on the fun.

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LOCAL NETS

The graphic shown above documents the NTS phone/CW traffic nets. Traffic from Oklahoma enters through the system as shown above to travel through the analog system.

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NTS Phone / CW Nets

To get involved with these analog nets, you'll need to set up an efficient NVIS antenna to hear the stations in the state, and to be heard you should plan on running at least an 800 watt station. Take some time to listen to these nets and feel free to check in as you are able. These nets are a great way to meet some hams in the state and you can learn how transferring messages works. A dozen or so Oklahoma hams work to move traffic in and out of the state.

Oklahoma

In Oklahoma, there are two NTS traffic nets and a training net.

- The Oklahoma Phone Emergency Net (OPEN) meets at 8 AM (CT) Sundays, with Mary Peelman KE5LTA as net control on 3.903 MHz. Usually, Sam Sitton W5CU or Jack Skinner KB5KKT are the ones that pass the traffic to the next hop on another traffic net.

- The OK ARES Net meets on 3.900 MHz at 4:30 PM (CT) on Sunday. This net rotates the net control duties among several stations. In the Tulsa area, Joe Gorkos N5TEX is very active on the ARES net.

OK Training Net
Daily @ 5:20 PM (CT) on 7.1206 MHz

National

The 7290 Traffic Net
https://www.7290trafficnet.org/
Mon-Sat 10 AM (CT) to Noon (CT)
Mon-Fri   1 PM (CT) to 2 PM (CT)

The Texas Traffic Net
http://www.daytimetexastrafficnet7285.org/
Mon-Sat 8:30 AM (CT) to 9:30 AM (CT) on 7.285 MHz
6:30 (PM) to 7:30 PM (CT) on 3.873 MHz (Alt frequency 3.877 MHz)

Texas Slow CW Net
http://www.atcweb.com/tsn/Texas_Slow_Net.htm
This is a practice CW net and it also handles NTS traffic.
Tu, Th and Fri at 7:45 PM (CT) on 3.570 MHz

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NTS Local Nets in Oklahoma

One of the ways that traffic handlers can receive or deliver NTS messages is over a local traffic net. There are over 75 active local phone (voice) nets in Oklahoma. The current list of these nets is available on the web at https://aresok.org/nets/. NTSOK District Traffic Handlers can use these nets to send or receive messages in their local areas. They can pass the traffic to an amateur radio operator that will make the final delivery in person, or by email, or telephone. Or, they may be able to deliver the message directly to an amateur that may receive a message.

These nets can also be used to generate messages that will enter the National Traffic System. Traffic Generators may check into a net to create a message that will be sent by NTS. Each local net should have at least one amateur radio operator that is capable of accepting a radiogram, and sending it to the NTS.

Tulsa Superlink Traffic Net

The Tulsa Superlink Traffic Net is dedicated to sending and receiving NTS messages using the 18 linked repeaters to the 50,000 square mile territory that the Tulsa National Weather Service manages. This net meets each Thursday on the Tulsa Superlink linked repeaters at 7:00 pm local time. The net control operators take check-ins for the net, send and receive messages, and train operators on how to send and deliver radiograms. Messages handled on this net come from liaisons to the NTS Phone nets, or from the NTSOK Winlink system.

Mark Vassoll KG5SSV (kg5ssv@arrl.net) manages this net and has posted the details regarding its activies at http://w5ias.com/events/tarc-net-superlink-traffic-net-nts/.

More information about the Tulsa Wide Area Linked system is available on the web at http://w5ias.com/tarc-wide-area-link-system/.

NTS over Winlink (NTSOK)

Since the NTS system was designed in the 1950's to be modular and allow for different organizations, modes, and message paths. To keep up with changes in amateur radio technology and trends, in 2021, NTSOK was developed using the Winlink (https://winlink.org/) system. This lets Oklahoma hams pass traffic with systems that are already in place.

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 intriguing 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. 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 shown below, are the Common Message Servers (CMS), the Remote Message Servers (RMS), and the Clients (Winlink Express).
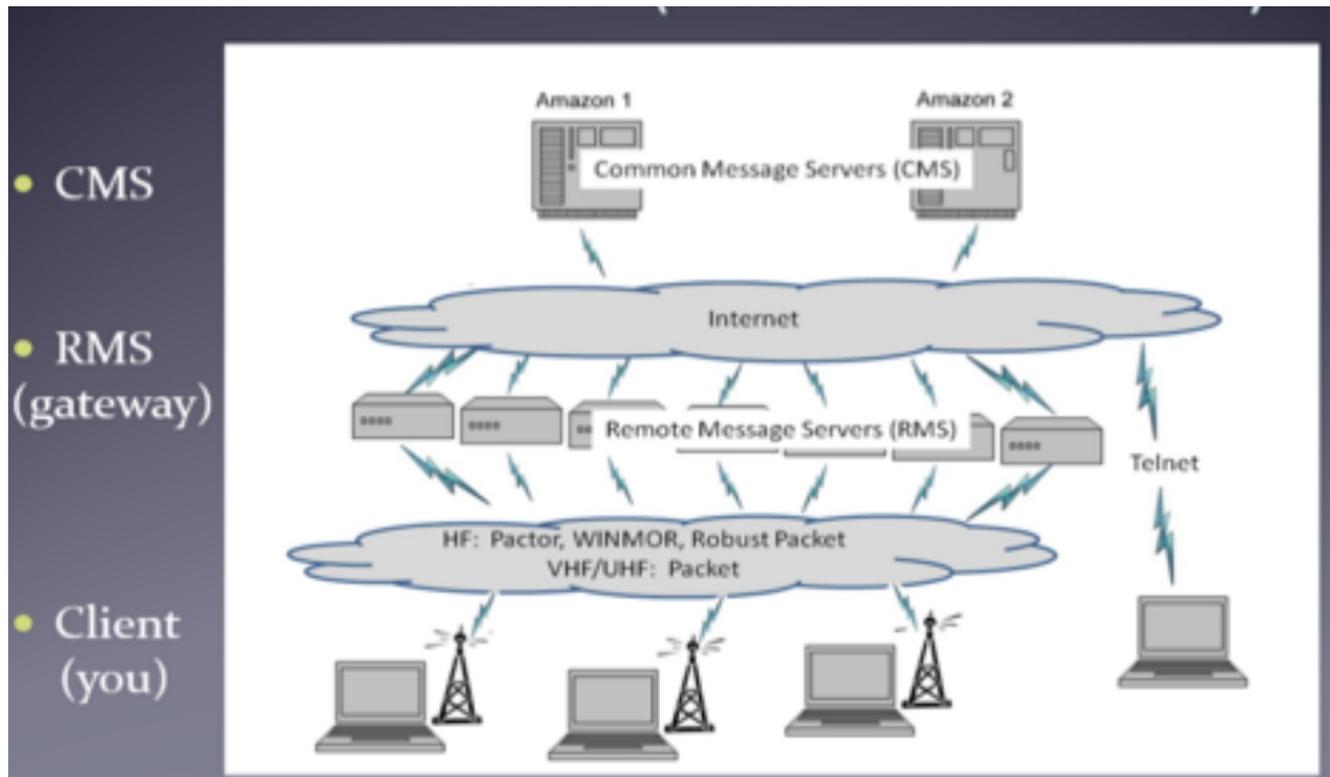
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Content Message Servers (CMS)

The CMS devices run software that receives, stores, and forwards messages that are received from RMSs. Since 2017, the multiple CMS servers run in different Amazon data centers to ensure that these devices are available 24 x 7 x 365. An independent server is kept operational that could be activated in minutes, if the entire Amazon system collapsed. These servers synchronize the data between themselves and each server maintains up-to-date copies of the message database.

Additionally, the CMS operates as a gateway to the public SMTP email system. Any messages that originate on Winlink can be directly delivered to any global email address. In times of need, messages can be sent from the field client software via VHF or HF, directly to an organization like the Red Cross or FEMA.

Remote Message Servers (RMS)

There are 677 RMS devices that operate on the VARA HF protocol used by NTSOK. These servers are the gateways between HF, VHF or UHF radios and the Internet. Hams use their Winlink Express client software to connect to the RMS, passing the traffic over one of the dozen transmission modes available. The VARA HF mode is currently the most popular for RMS connections and it provides the fastest throughput over HF radios. Jeff Scoville AE5ME operates a VARA HF RMS in Broken Arrow.

To continue operations when local Internet interruptions occur, there are two options that an RMS can use to continue. The first method is to shut down radio operations when the Internet connection is lost. This will keep clients from connecting to a 'dead-end' server. The second method is that the server would continue its operation, but it would forward the message to a neighboring server via a radio connection. The RMS operator chooses the method that is used.

Client Software (Winlink Express)

For an amateur radio operator to connect to the Winlink system over the airwaves, they need to connect their HF radio to their Windows computer using a sound card type interface. If a radio is already set up to operate on PSK-31, FT-8, FT-4, or WSPR the hardware part is complete. Winlink Express directs the radio to make the transmissions.

Hardware Requirements

With the spread of the digital technologies like PSK-31, FT-8, FT-4, and WSPR more and more hams have connected their HF radios to their computer using a sound card interface. In the Oklahoma area we consistently can pass traffic on VARA HF 40 M or 80 M using any antenna, and about 10 watts of power. Mobile operation using an Icom 705, a small loop antenna, a laptop, and a battery works well to send messages to and from the regional RMSs. VARA FM can be transmitted using standard FM radios.

NTSOK Organization

The NTSOK operation is staffed by volunteer Winlink operators from around the state. Three or more hams in each ARES OK district will serve as the entry and exit points of the network, another three hams serve as the state handlers, and the net manager monitors the activities and keeps looking for more volunteers.

NTSOK Roles and Responsibilities

There are six major roles for amateur operators in the NTSOK system. These levels are designed to provide a scaleable, systematic way to deliver messages in emergency and non-emergency modes.

Traffic Generators

The Traffic Generators (TGs) are the people that actually create the messages that we handle in the NTS. These people are typically not a part of the formal NTS. These are the people that want to get involved in NTS by creating a message to send to their Aunt Mary, across the country. Or, these are people that send messages to others so they can play a trivia game, or chess, or are NTS penpals. Traffic generators are also organizations like the Red Cross, the Salvation Army, the Civil Air Patrol, or local Emergency Management departments.

All levels of NTSOK need to find these Traffic Generators during "fair weather days", so they know where to find the local NTSOK Local Traffic Handlers during the "bad days". The traffic generators need to have a way to contact either local traffic handlers, or district traffic handlers during emergency operations.

NTSOK Local Traffic Handlers

The role of NTSOK Local Traffic Handler is the main entry or exit point for messages that travel along the Winlink NTSOK system. An outgoing message would be obtained by the local traffic handler and entered into the NTSOK system. Messages can be either entered directly into the Winlink system, or they can be transferred to the district traffic handler by phone, email, direct delivery, or some other method for the district traffic handler to enter.

Incoming messages will be routed from the district handler by Winlink, phone, email, direct delivery, or some other message. The local traffic handler will make the final delivery to the recipient by the method that the sender has indicated.

The local traffic handler role is optional, and the NTSOK District Traffic Handler may choose to deliver messages directly to the recipient, or obtain messages directly from the traffic generators.

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NTSOK District Traffic Handlers

The NTSOK District Traffic Handlers manage an ARES District tactical mailbox, namely NTSOK-DIST01 through NTSOK-DIST12. These twelve mailboxes match the ARES districts, as described earlier in this document. There should be three NTSOK District Traffic Handlers for each district and each of these roles should be held by someone in the district. These people actually deliver, or arrange for the delivery, of the messages to the recipients, and process the outgoing messages to the Winlink system.

Some specific tasks for this role are as follows:

- Monitor the assigned tactical mailbox NTSOK-DISTxx on a daily basis.
- Deliver, or arrange for delivery any in-district messages that appear in the mailbox. Messages can be delivered by phone, radio, printed message, text, courier, or a NTSOK Local Traffic Handler.
- Manage any special delivery instructions that the sender may have assigned.
- Generate RRI Radiogram.txt template messages for any out-of-district messages that appear in the mailbox.
- Maintain an Internet connected Winlink VARA HF station that is capable of connecting to at least three different RMS servers on at least two of the 20 meter, 40 meter, or 80 meter bands.
- If RMS servers can't be reached, contact a NTSOK Section Handler to locate new routes.
- If possible, one or more of the NTSOK District Handlers should be emergency power capable.
- Work to build/train/develop a network of NTSOK Local Traffic Handlers and Traffic Generators to assist in generating traffic for the system, or to help deliver the traffic locally.

The NTSOK District Traffic Handler roles are currently held by:
Name Callsign - City - email phone - District
Mark Clayton N5AZQ - Moore - hamsat2959@gmail.com 479-629-2568 - District 01
Mark Clayton N5AZQ - Moore - hamsat2959@gmail.com 479-629-2568 - District 02
Trey Traughber KG5NSU - Elgin - kg5nsu@gmail.com 580-483-7414 - District 03
Jim James KG5BIM - Blanchard - jjames5419@yahoo.com 405-818-7806 - District 04
Bob Rogers WA5EEZ - Tuttle - bobrgrs@hotmail.com 405-392-5562 - District 04
Jim James KG5BIM - Blanchard - jjames5419@yahoo.com 405-818-7806 - District 05
Bob Rogers WA5EEZ - Tuttle - bobrgrs@hotmail.com 405-392-5562 - District 05
Andy Askey KG5UIS - N OKC - andy@askewmail.com 405-820-0237 - District 05
Andy Askey KG5UIS - N OKC - andy@askewmail.com 405-820-0237 - District 06
Jeff Scoville AE5ME - Broken Arrow - ae5me@yahoo.com 918-906-4819 - District 07
Jeff Scoville AE5ME - Broken Arrow - ae5me@yahoo.com 918-906-4819 - District 08
John Brackett N9JYJ - Ponca City - jbrackett063@gmail.com - District 09
Jim Ross W5ACR - Vian - rosjames@gmail.com 918-773-7209 - District 10
Mark Kleine N5HZR - Norman - mkleine@live.com 405-410-6756 - District 11
Mark Kleine N5HZR - Norman - mkleine@live.com 405-410-6756 - District 12

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NTSOK Section Traffic Handlers

The NTSOK Section Traffic Handlers manage the main tactical mailbox, NTSOK.

Some specific tasks for this role are as follows:

- Monitor the tactical mailbox NTSOK on a daily basis.
- Forward any in-section traffic to the appropriate tactical mailbox, NTSOK-DIST01 through NTSOK-DIST12, based on the delivery location provided by the sender.
- Forward any out-of-section traffic to the appropriate tactical mailbox. Outbound routes have been defined earlier in this document.
- Maintain an Internet connected Winlink VARA HF station that is capable of connecting to at least three different RMS servers on at least two of the 20 meter, 40 meter, or 80 meter bands.
- Experiment with connecting to different RMS servers to locate additional delivery points that may change due to varying atmospheric conditions, or server operational status.
- At least one of the NTSOK Section Traffic Handlers should be capable of emergency power transmissions to keep traffic moving in a power out situation.

The NTSOK Section Traffic Handler role is currently held by Ed Hatch AG5DV.

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NTSOK Section Traffic Manager

There is one NTSOK Section Traffic Manager and the person in this role oversees the entire NTSOK traffic system. One or more of the NTSOK Section Traffic Handlers may assist this role to allow for cross training of the different tasks, or to spread the load a bit.

Some specific tasks for this role are as follows:

- Negotiate section traffic inbound and outbound routes with regional or national traffic handling organizations.
- Work with state and federal served agencies to integrate NTSOK with the emergency message requirements of organizations like the Red Cross, Salvation Army, Civil Air Patrol, FEMA, SWIC, and more.
- Oversee the delivery of messages, and monitor the message queues to make sure the traffic stays flowing.
- Work with the NTS Section Traffic Handlers to optimize the VHF/UHF/HF traffic routes for the section to use.
- Locate, train, and develop NTSOK District Traffic Handlers and NTSOK Section Traffic Handlers.
- Review Winlink logs to ensure District and Section traffic is moving over the appropriate VHF/UHF/HF routes.
- Produce/review/update this document to make sure everyone gets the training they need.
- Serve as the public face for the NTSOK system.
- Work to develop ways to increase the volume of traffic handled by the organization.
- Handle delivery issues as the occur.

The NTSOK Section Traffic Manager role is currently held by Mark Kleine N5HZR.

NTSOK Operation

The most important parts of the NTSOK operation are the people that make it happen. Each of the 'backbone' operators use their time, talent, and equipment to maintain contact with the network and each other.

Local RMS Connections

As shown in the attachments, we are currently experiencing good connections with 80 M RMS in the 0 to 300 km range. This type of connection is made using Near Vertical Incidence Skywave (NVIS) operation where the signals bounce straight up and down to reach the remote station. Jeff Scoville's AE5ME RMS in Tulsa is a good connection point for 80 M.

For 40 M operation, a range of 650 km is found to be optimal. For those of us in Oklahoma, we have had great luck connecting to RMSs in Collinsville, IL, Colorado, Iowa, Autin, and San Antonio.

As a NTSOK operator you should locate four stations that allow easy connections. In a disaster time, one or more of the RMS stations may be down, or busy, so having multiple paths will allow you to keep passing traffic.

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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.

ARES has created this Oklahoma map to break down the state into 12 district. Once the message has reached the district level, the district traffic handler will work to deliver the message to the recipient. The district traffic handler can deliver the message to a local traffic net, or contact the person directly using email, phone, or a direct contact.

Outgoing NTS Traffic

When someone creates an outgoing message, in radiogram format, meant to be delivered by NTSOK, they simply need to use the email address of NTSOK. Winlink routes those messages to the Section Traffic Handlers who will forward them to the proper route.

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Intrastate Messages

Messages that are meant for delivery within the section are forwarded to the appropriate Section District mailbox by Section Traffic Handlers. District Traffic Handlers pick up those messages and route them to the proper destination.

NTSOK Section Traffic Handlers use the 12 ARES Districts to route the intrastate traffic to the following email addresses.

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, Ottowa, 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, Le Flore, Pushmataha, Choctaw, and McCurtain counties.

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Interstate Messages

Messages that are meant for delivery outside the section will be forwarded to either the Radio Relay International regional inboxes, or to the 7290 Traffic Net inbox. NTSOK has made arrangements with both of those groups to take NTS traffic and they will distribute the messages to their final destination.

Radio Relay International

More information about Radio Relay International is available at http://radio-relay.org/

RRI uses 13 different regions to route traffic across the country. The regions are defined by state lines. Note that these regions to not match the 10 FCC callsign districts. The email boxes are shown below for each of the states listed.

RRI-Region1 – CT, MA, ME, NH, RI, VT
RRI-Region2 – NJ, NY
RRI-Region3 – DC, DE, MD, PA
RRI-Region4 – FL, GA, NC, SC, VA, PR, VI
RRI-Region5 – AL, AR, LA, MS, OK, TN, TX
RRI-Region6 – CA, NV
RRI-Region7 – AK, ID, MT, OR, WA, AB, BC
RRI-Region8 – MI, OH, WV
RRI-Region9 – IL, IN, KY, WI
RRI-Region10 – IA, KS, MN, MO, ND, NE, SD, MB, SK
RRI-Region11 – NB, NS, ON, PQ
RRI-Region12 – AZ, CO, NM, UT, WY
WH6FQE – Hawaii

7290 Traffic Net

More information about the 7290 Traffic Net can be found online at https://www.7290trafficnet.org/

NTSOK is using the 7290 Traffic Net as a secondary delivery system. This group uses phone and CW nets to transport messages once they receive them. Messages sent to Winlink mailbox **KA5AZK** will be entered into the 7290 Traffic Net system.

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Installing Software for NTSOK

Installing the software to make operate NTSOK is fairly easy, and is a five step process. If you have WSJT-X, FLDigi, or any other sound card radio system installed, you should be ready to roll. Your radio will need to provide RX audio over a Windows audio channel, and must accept TX audio over a Windows audio channel, and be able to key the transmitter Push To Talk (PTT).

The process is the same for all users of the system. Tactical Email Addresses are only needed by the District Traffic Handlers, Section Traffic Handlers, and Section Traffic Manager.

1. Install the Winlink Express client software.
2. Install the VARA HF Plugin driver software.
3. Verify the VARA HF Operation.
4. Backing Up Winlink Information.
5. Setting Up Tactical Email Addresses.

Installing Winlink Express

Installing the Winlink Express client software is fairly easy and it can be obtained at the following link https://downloads.winlink.org/User%20Programs/. Download the file that is labeled **Winlink_Express_Installation**.*.zip. There is also a **README_Software_Installation** txt file available in this folder, but the current instructions are as follows.

```
For Winlink Express:

1. Download the complete Winlink Express package. The file is called
Winlink Express Install xxxx.zip, where 'xxxx' is the current version number.

2. Unzip the contents to a directory you can find again, then go to that directory.

3. Run the .msi file to properly install the program. Follow the onscreen
directions.

4. Complete documentation is contained in the program's help menu. Refer to the
"Setup" section of the help file for detailed configuration information.
```

From the settings page of the Winlink Express client, you can either log into your existing Winlink account, or create a new account.

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Fixing Windows Font Size Issue in Winlink Express

Some installations of Winlink Express have an issue where the font size changes from a normal size to a very small size after you have sent or received messages. N6KZB has a method to fix this problem and it has worked well with those who have tried it at
https://www.winlink.org/content/work_around_windows_10_scale_issue_express

```
If a Winlink Express pop up window is too small, such as after you post to out box,
try this.
```

- ➢ Using Windows File Explorer, locate the RMS Express folder (typically "C:\RMS Express\" and open it up.
- ➢ Locate the application **RMS Express.exe**
- ➢ Right-click **RMS Express.exe** and choose Properties
- ➢ Click the **Compatibility** Tab
- ➢ Click **Change high DPI settings**
- ➢ Check the box, **Override high DPI Scaling behavior. Scaling performed by:**
- ➢ In the drop-down box below the check box, find and use, **System (Enhanced)**
- ➢ Click **OK**

The next time that you start Winlink, the change will be applied and you should not see the font size change anymore.

Installing VARA HF

Installing the VARA HF software is very simple and straightforward. The software is available from the link https://rosmodem.wordpress.com/. As of this writing, the current version is 4.4.6 and is about 4 mB in size, however you should download the most recent version of the software. In that ZIP file you will find a single executable file that you need to run as the administrator. You may get a warning that this program is unknown to the Windows system. You can ignore those warnings and continue to install the program. There are no options or details to be modified here.

W4AKH has a great document that walks through all of the functions of the VARA HF sofware and it can be found at this link https://w4akh.net/docs/7.D.pdf.

Setting up VARA HF

Once the VARA HF software has been installed, you can run the VARA HF program, as shown here.
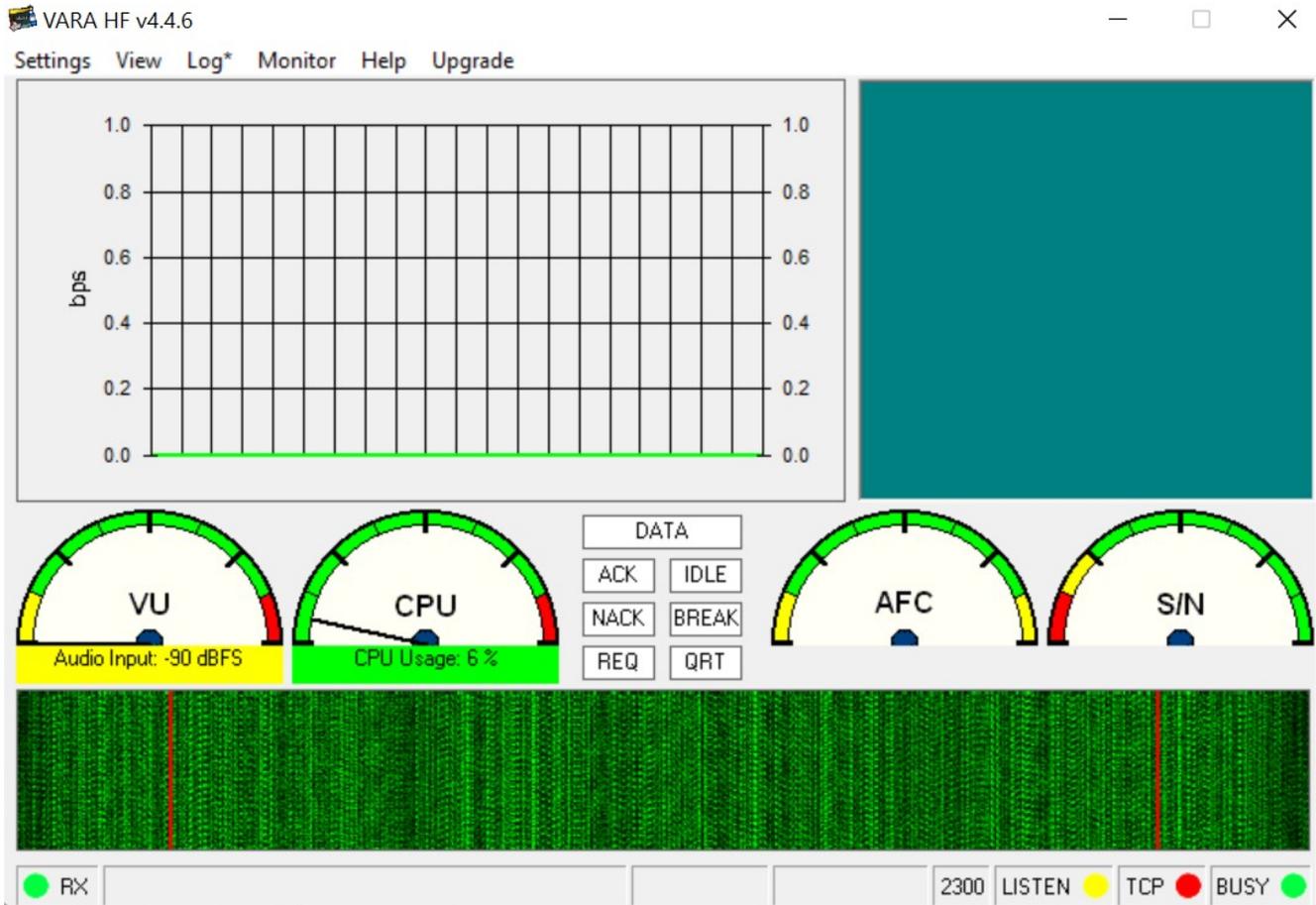
You will need to use the Settings >> Sound Card selections to properly configure your radio to the VARA HF system.

Here you can also enter the registration key if you have purchased a license for the VARA HF software. Unlicensed versions work identical to the licensed version, except that the unlicensed version is capped at 175 bps. Licensed versions can work up to the full theoretical limit of 8,490 bps. In actual operation, speeds of 300 to 3,000 are typically seen. You can support the programming effort of VARA HF and get the faster speed by sending $69 to the maker by clicking on the upgrade button on this screen. Once you have VARA HF operating, you typically don't need to run this program unless you change your operating environment. If you run Winlink Express and VARA HF at the same time you will receive a warning message, that can be ignored.

Backing Up Winlink Information

By default the Winlink Express program creates a backup daily, and it keeps the backups for 10 days. By selecting Settings and then Backup and restore databases you will see this screen and you can change any of the settings.
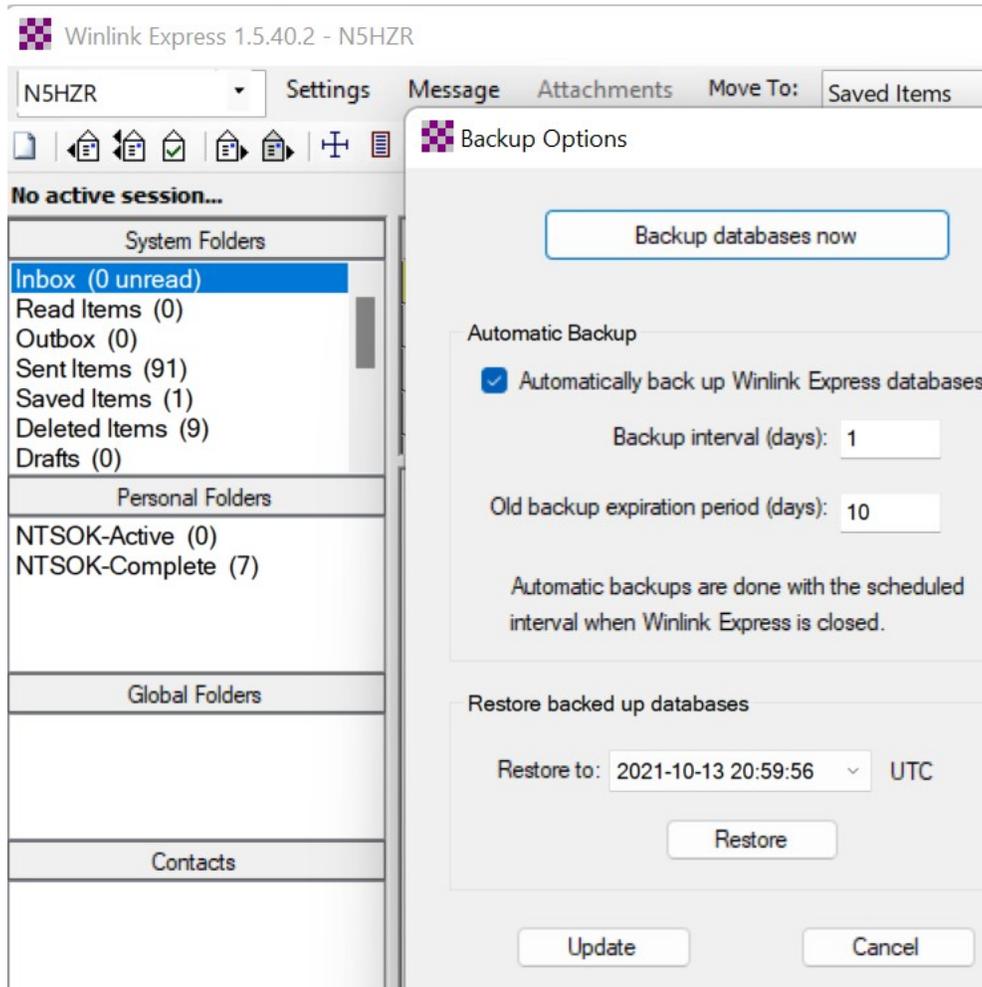
And, to be clear, this function backs up all of the system settings that are held in the Windows system registry. However, the backup files are stored in the Winlink data folder that are on the same disk. By default, this folder is C:\RMS Express. If you are working as a NTSOK traffic handler at any level, you need to make sure that this folder is copied to another system on a frequent and regular basis. Your inbound and oubound messages are stored in that folder. Copy it to a flash drive, OneDrive, DropBox, Google Drive, or some other offsystem location.

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Setting Up Tactical Email Addresses

The district and section traffic handlers need to add the tactical email addresses to their Winlink Express client. Once a mailbox has been set up on your machine, the Winlink system will check the tactical mailboxes when you check your own mailbox. **Note that if you download a message** from a tactical mailbox, it will be removed from the Winlink system mailbox. Once you download that message **you need to deliver the message** to the recipient or forward the message back into the system. If you don't know where it should go, please forward it to **NTSOK**.

When you are tasked with monitoring a tactical email address, you will receive the address and the password for this mailbox. Tactical mailboxes are managed by selecting **Settings** and then **Winlink Express Properties**. The Auxiliary Callsigns and Tactical Addresses section is shown below circled in red.
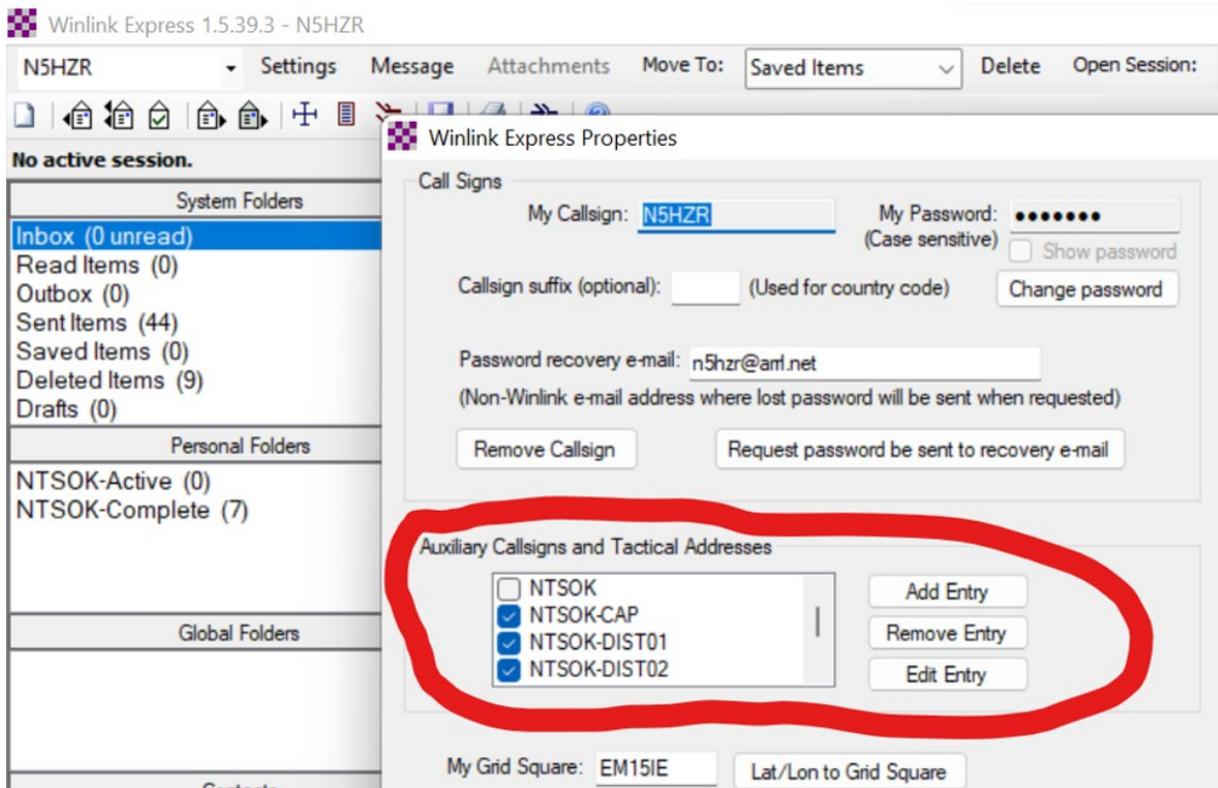
To add a mailbox click the Add Entry button and enter the appropriate mailbox and password on the popup screen. Make sure the Enabled box is selected, and you will receive those messages the next time you check for mail.

If you don't wish to receive mail for a given tactical email box, click the address, and then click the Edit Entry box. If you deselect the Enabled box and click save, your system will no longer receive email for that box.

Operating VARA HF Sessions

The current best practice is to use VARA HF protocol for radio transmissions of Winlink messages. VARA HF allows up to the theoretical speed limit of 8,490 bps. However, there's more to running VARA HF than max speed. The following list should help you operate an efficient Winlink over VARA HF station.

- By default the setup will try up to 15 times, and then send your callsign via Morse Code.

- The RMS server may be running on a radio that scans between two or more bands. If you can't raise the station, wait a few minutes and try again.

- The RMS servers may have 'busy times' of the day/week. Check the Appendix A of this document to see if your chosen server may be in a busy time.

- When selecting a server to connect to, check Appendix B through G of this document to see what distance your chose band is best suited for. 80/40 are the most reliable over time. 30 and higher tend to appear and disappear with propagation changes.

- Experiment during "good days" with the bands you have available on your system. Find four stations that you can consistently connect to on each band you operate on. During "bad days", one or more of your chosen stations may be unavailable due to system problems on their end, so multiple paths will let you be successful all the time.

- Rotate the servers in your 'good list' to make sure these servers stay available.

- Play "Winlink Limbo" as you check your messages. Turn down the power to see what you can get away with. During "bad days", the lower power will keep down interference between your station and others in the band near you.

- Watch your audio levels on both TX and RX. TX levels should not cause the ALC to kick in. RX levels should allow signals to decode reliably.

- All signals on all bands should be sent using Upper Side Band (USB).

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- Clicking on the Forecast button will provide a list of servers that should be best for your location. Selecting the stations at the top of the list would be the best chance for success in your area, as long as you have the proper bands available.

Vara HF Winlink Session - N5HZR

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

Center Freq. (kHz): 0.000   Dial Freq. (kHz):   Bearing: Quality:

Favorites: ▾ Select   Add to favorites   Remove from favorites

Channel Free In: 0/0 Out: 0/0 BPM: 0/0 Disconnected

*** Launching VARA
*** Successfully con
*** Vara signal band
*** Using Flex radios
*** Ready

HF Channel Selector   ✕

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

Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
AE5ME-13	3596.500	V2300	EM26BA	00-23	PUBLIC	98	054	88	56
KB5LZK	3598.500	V2300	EM34UT	00-23	PUBLIC	284	094	86	54
K0SI	3586.500	V2300	EM39UA	00-23	PUBLIC	382	045	85	53
KC5GOI	3598.000	V2300	EM13KG	00-23	PUBLIC	133	176	85	53
AD5EO	3584.000	V500	EM34QN	00-23	PUBLIC	267	098	84	52
AD5EO	3590.000	V2300	EM34QN	00-23	PUBLIC	267	098	84	52
K0ISP-1	3598.500	V2300	EN31DP	00-23	PUBLIC	486	022	76	50
WB5KUO	3596.000	V2300	EM12IM	00-23	PUBLIC	185	180	84	50
K9WRA	3584.400	V500	EN50JS	00-23	PUBLIC	584	046	79	50
K0ISP	3598.500	V2300	EN31DP	00-23	PUBLIC	486	022	76	50
NC9IL	3596.500	V2300	EM59ER	00-23	PUBLIC	523	051	80	50
KD0SFY	3588.500	V500	DM78OV	00-23	PUBLIC	486	304	81	50
K9BBS	7102.500	V2300	EM68SR	00-23	PUBLIC	645	065	73	50

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Creating a Radiogram

The NTSOK system routes traffic using the same radiogram format that has been in use since the start of the NTS. These radiograms allow the user to make sure the messages are transmitted exactly as the sender intended. The paper radiogram is shown here, and it correlates to the Winlink RRI Radiogram.txt template. This format allows the traffic handler to transcribe a paper radiogram to a Winlink tempate, or vice versa. Paper copies of the radiogram can be printed from the ARRL PDF file located at https://www.arrl.org/files/media/Group/Fillable%20Radiogram%20Form.pdf Preprinted radiograms in pads of 50 are available from the ARRL shop at http://www.arrl.org/shop/Message-Forms-Pad/

ARRL Numbered Radiograms (ARL Codes)

Since it is very critical to deliver each message exactly as the sender generated it, a number of shorthand codes have been created. These are to be used in the body of the message and the words are written out, as shown below, and NOT turned into a number. For example, to wish someone a "Happy Birthday", the message would be sent as **ARL FORTY SIX**.

Some ARL messages require some additional information. For example to send the message that you arrived safely at home, the message would be sent as **ARL SIXTY FOUR HOME**. The following is the list of standard ARRL numbered radiograms or commonly called **ARL Codes:**

ONE	Everyone safe here. Please don't worry.
TWO	Coming home as soon as possible.
THREE	Am in _____ hospital. Receiving excellent care and recovering fine.
FOUR	Only slight property damage here. Do not be concerned about disaster reports.
FIVE	Am moving to new location. Send no further mail. Will inform you of new address when relocated.
SIX	Will contact you ASAP.
SEVEN	Please reply by Amateur Radio through the amateur delivering this message. This is a free service.
EIGHT	Need additional _____ mobile or portable equipment for immediate emergency use.
NINE	Additional _____ radio operators needed to assist with emergency at this location.
TEN	Please contact _____. Advise to standby and provide further emergency information, instructions or assistance.
ELEVEN	Establish Amateur Radio emergency communications with _____ on _____ MHz.
TWELVE	Anxious to hear from you. No word in some time. Please contact me as soon as possible.
THIRTEEN	Medical emergency situation exists here.
FOURTEEN	Situation here becoming critical. Losses and damage from _____ increasing.
FIFTEEN	Please advise your condition and what help is needed.
SIXTEEN	Property damage very severe in this area.
SEVENTEEN	REACT communications services also available. Establish REACT communication with _____ on channel _____.
EIGHTEEN	Please contact me as soon as possible at _____.
NINETEEN	Request health and welfare report on _____ (name, address, phone).

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TWENTY	Temporarily stranded. Will need some assistance. Please contact me at _____.
TWENTY ONE	Search and Rescue assistance is needed by local authorities here. Advise availability.
TWENTY TWO	Need accurate information on the extent and type of conditions now existing at your location. Please furnish this information and reply without delay.
TWENTY THREE	Report at once the accessibility and best way to reach your location.
TWENTY FOUR	Evacuation of residents from this area urgently needed. Advise plans for help.
TWENTY FIVE	Furnish as soon as possible the weather conditions at your location.
TWENTY SIX	Help and care for evacuation of sick and injured from this location needed at once.
FORTY SIX	Greetings on your birthday and best wishes for many more to come.
FORTY SEVEN	Reference your message number _____ to _____ delivered on _____ at _____ UTC.
FIFTY	Greetings by Amateur Radio.
FIFTY ONE	Greetings by Amateur Radio. This message is sent as a free public service by ham radio operators at _____. Am having a wonderful time.
FIFTY TWO	Really enjoyed being with you. Looking forward to getting together again.
FIFTY THREE	Received your _____. It's appreciated; many thanks.
FIFTY FOUR	Many thanks for your good wishes.
FIFTY FIVE	Good news is always welcome. Very delighted to hear about yours.
FIFTY SIX	Congratulations on your _____, a most worthy and deserved achievement.
FIFTY SEVEN	Wish we could be together.
FIFTY EIGHT	Have a wonderful time. Let us know when you return.
FIFTY NINE	Congratulations on the new arrival. Hope mother and child are well.
SIXTY	Wishing you the best of everything on _____. (usually a holiday)
SIXTY ONE	Wishing you a very Merry Christmas and a Happy New Year.
SIXTY TWO	Greetings and best wishes to you for a pleasant _____ holiday season.
SIXTY THREE	Victory or defeat, our best wishes are with you. Hope you win.
SIXTY FOUR	Arrived safely at _____.
SIXTY FIVE	Arriving _____ on _____. Please arrange to meet me there.
SIXTY SIX	DX QSLs are on hand for you at the _____ QSL Bureau. Send _____ self addressed envelopes.
SIXTY SEVEN	Your message number _____ undeliverable because of _____. Please advise.
SIXTY EIGHT	Sorry to hear you are ill. Best wishes for a speedy recovery.
SIXTY NINE	Welcome to the _____. We are glad to have you with us and hope you will enjoy the fun and fellowship of the organization.

Appendix A – RMS Server Utilization

Appendix B – 160 M RMS Utilization

Appendix C – 80 M RMS Utilization

Appendix D – 40 M RMS Utilization

Appendix E – 30 M RMS Utilization

Appendix F – 20 M RMS Utilization

Appendix G – 15 M RMS Utilization