

National Traffic System (NTS)

An Introduction

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National Traffic System (NTS) Messaging Basics

Outline

- What is the National Traffic System?
- Advantages of NTS Messaging
- NTS Hierarchy and modes
- The ARRL Radiogram Form
- ARL Abbreviated Texts
- How to Deliver an NTS Message
- NTS Digital
- VHF Digital BBS demo
- Local NTS Contacts & Nets
- Additional Resources



What is the National Traffic System (NTS)?

- The "RELAY" in American Radio Relay League (ARRL)
- Started in 1915 as the formal ARRL system to relay messages around the country
- Transmit & Receive Modes: Voice, CW, Digital
- NTS and Amateur Radio Emergency Services (ARES)
- Requirements to join: Any level Ham license & interest
- ARRL Field Organization Appointments: Official Relay Station (ORS), Digital Relay Station (DRS) & Section Traffic Manager (STM).



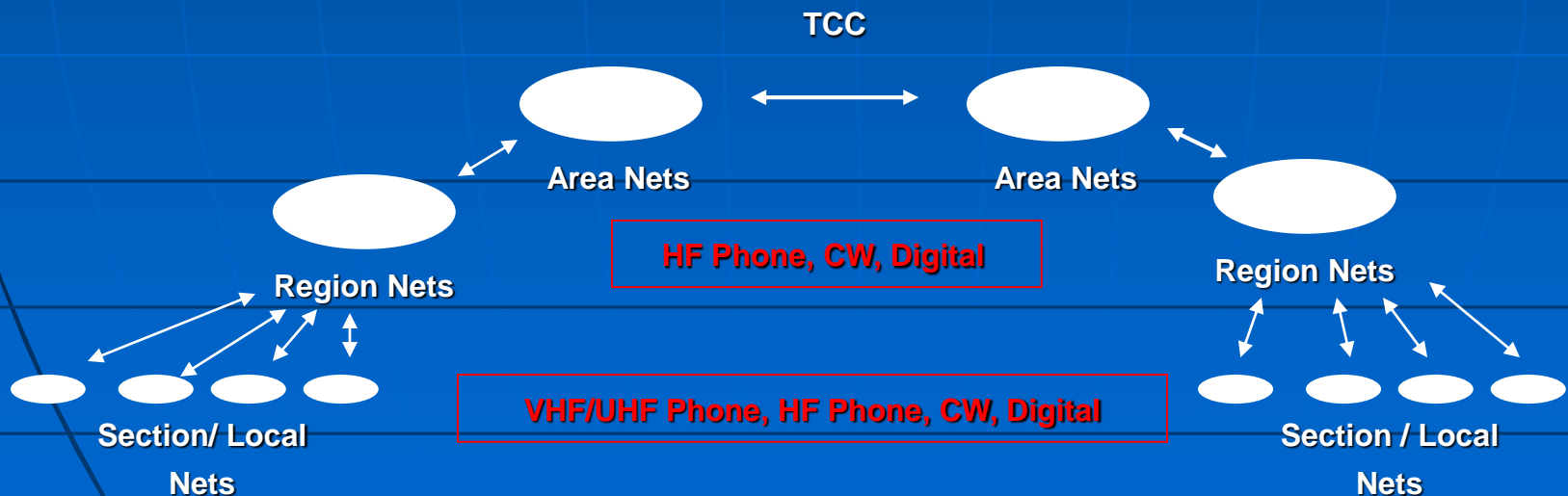
Advantages of NTS Messaging

- Wireless! Send them from anywhere.
- Use a little HT or a big base station
- Standard Format
- Accountability
- NTS Nets meet daily
- Speed (digipeater vs. email)
- *When all else fails...*
- Fun, good practice & helpful!



NTS Hierarchy and Modes

- US and Canada organized into Area, Region, and Local Nets
 - 3 Areas
 - 12 Regions
- Traffic Flow:



NTS Areas



States/Provinces, Regions and Areas

State	Region	Area
CT, ME, MA, NH, RI, VE	1RN	EAN
NJ, NY	2RN	EAN
DE, DC, MD, PA	3RN	EAN
FL, GA, NC, PR, SC, VI, VA	4RN	EAN
MI, OH, WV	8RN	EAN
LB, NB, NF, NS, ON, PE, PQ	2RN	EAN



2RN Sections and Divisions

State

Division

Sections

New Jersey

Hudson

NNJ

New Jersey

Atlantic

SNJ

New York

Hudson

ENY, NYCLI (NLI)

New York

Atlantic

NNY, WNY



Message Format

The ARRL Radiogram



The American Radio Relay League
RADIOGRAM
 Via Amateur Radio

Number 704	Precedence R	HX C	Station of Origin N2GS	Check 14	Place of Origin CHESTER NJ	Time Filed 1830	Date JUL 2
----------------------	------------------------	----------------	----------------------------------	--------------------	--------------------------------------	---------------------------	----------------------

To:

JOE SMITH KC2XXY
1234 SECOND ST
SUMMIT NJ 07901

This Radio Message was received at:

Amateur Station _____ Date _____
 Name _____
 Street Address _____
 City, State, Zip _____

Telephone Number: **650-123-4567**

THIS	IS	THE	ARRL	RADIOGRAM
FORM	XRAY	DETAIL	TO	FOLLOW
XRAY	HAVE	FUN	73	
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

GREG SZPUNAR N2GS

REC'D	From	Date	Time	SENT	To	Date	Time
					Austin AK2US	7/2/03	2112 EDT


A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating, a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225, Main Street, Newington, CT 06111.

The American Radio Relay League, Inc. is the National Membership Society of licensed radio amateurs and the publisher of QST Magazine. One of its functions is promotion of public service communication among Amateur Operators. To that end, The League has organized the National Traffic System for daily nationwide message handling.



ARRL Radiogram Form

- Preamble:** Message number, precedence, HX (optional handling code), station of origin, check (text word count), place of origin, time filed (optional), and date.
- Addressee:** Name, call sign (if a ham), full street address, city, 2-letter state abbreviation, zip code (very important) & telephone (be sure to include area code).
- This Radio Message was received at:** Station identification and location.
- Text:** 25 words maximum, 5 per line; Use the word "xray" for a period (.) and "query" for a question mark (?). Last word in salutation (e.g., "73", "Love", etc.)
- Signature:** (Write-in above REC'D block) Name & call sign of person who wrote the message – include full phone number if not a Ham or if new to NTS.



The American Radio Relay League
RADIOGRAM
Via Amateur Radio

Number 704	Precedence R	HX C	Station of Origin N2GS	Check 14	Place of Origin CHESTER NJ	Time Filed 1830	Date JUL 2
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To:

**JOE SMITH KC2XXY
1234 SECOND ST
SUMMIT, NJ 07901**

Telephone Number: **650-123-4567**

This Radio Message was received at:

Amateur Station _____ Date _____

Name _____

Street Address _____

City, State, Zip _____

THIS	IS	THE	ARRL	RADIOGRAM
FORM	XRAY	DETAIL	TO	FOLLOW
XRAY	HAVE	FUN	73	_____

GREG SZPUNAR N2GS

REC'D	From	Date	Time	SENT	To	Date	Time
					Austin AK2US	7/2/03	2112 EDT

A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating, a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225, Main Street, Newington, CT 06111.

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- REC'D & SENT:** Record the names and call sign of the person you rec'd the message from and/or sent/forwarded the message to, along with the date & time (EST/EDT or Z).



Radiogram Form Detail (1 of 6)



The American Radio Relay League
RADIOGRAM
Via Amateur Radio

Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
704	R	C	N2GS	14	CHESTER NJ	1830	JUL 2

Number

- Assigned by the message originator
- No standard way of numbering messages
- Consecutive (1, 2, 3..., starting over at the new year or monthly)
- Order by month & number (507 = 7th you originated in May; 11244 = 244th message you originated in November)

Precedence (Emergency, P, W, or R)

- Emergency (life or death urgency in a declared emergency) always spelled out
- P = Priority (official traffic in a declared emergency)
- W = Health & Welfare (used only in a declared emergency)
- R = Routine (everything else – most frequently used)



Radiogram Form Detail (2 of 6)



The American Radio Relay League
RADIOGRAM
Via Amateur Radio

Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
704	R	C	N2GS	14	CHESTER NJ	1830	JUL 2

1. (Optional) HX or Handling Code – A, B, C, D, E, F or G

- Collect landline delivery authorized within ___ miles of addressee or unlimited if blank (A150 = collect call authorized w/in 150 miles; A = collect call authorized regardless of miles)
- Cancel message if not delivered within ___ hours of filing time & service originating station (B72 = cancel if not delivered within 72 hrs and send message to originator to notify them)
- Confirmation of delivery requested by originating station ("TOD YOUR 1014 JULY 4 1330 PST XRAY 73" or if issues "ARRL SIXTY SEVEN 1014 PHONE 650 555 1212 INCORRECT NO REPLACEMENT FOUND SENT RADIOGRAM INSTEAD XRAY 73")
- Report your identity & time/date rec'd message plus time/date delivered or sent to another
- Delivering station to get reply from addressee and send to originator as a new message
- Hold delivery until ___ (numbered day of month) – great for birthday or anniversary messages (F14 = deliver on 14th of the month; F1 = deliver on the 1st of month after date filed)
- Delivery by mail or toll call not required, service originating station (often ignored).



Radiogram Form Detail (3 of 6)



The American Radio Relay League
RADIOGRAM
Via Amateur Radio

Number	Precedence	HX	Station of Origin	Check	Place of Origin	Time Filed	Date
704	R	C	N2GS	14	CHESTER NJ	1830	JUL 2

1. **Station of Origin:** Call sign of station who put the message into NTS format; If N2GS prepares message 1207 for a fellow ham, then puts it onto an NTS packet BBS for relay to Vermont, the originator is... N2GS. If WB2W prepares message 23 for his non-ham neighbor then gives it to N2GS to relay to any NTS net, the originator is... WB2W.
2. **Check:** The word count in body text only (do not count the address or signature); precede with "ARL" if any of the ARL numbered texts are used (e.g., ARL 7).
3. **Place of Origin:** The city & state where the message was written.
4. **(Optional) Time Filed:** This is not used much... 24-hr format & time zone
5. **Date:** Month (non-numeric – abbreviated) & day number message was created e.g., Sep 21)



Radiogram Form Detail (4 of 6)

To: JOE SMITH KC2XXY 1234 SECOND ST SUMMIT NJ 07901	This Radio Message was received at: Amateur Station _____ Date _____ Name _____ Street Address _____ City, State, Zip _____
Telephone Number: 650-123-4567	

To:

Name, call sign (if going to a ham), street address or P.O. Box, city, state (abbreviated) & zip code. Note: Digital and packet NTS messages are routed via zip code.

Telephone Number:

Be sure to include the area code and double-check the number!!!

This Radio Message was received at:

Your station identification, date received, and your location. More received-from detail will go in the "REC'D" block after body text and signature.



Radiogram Form Detail (5 of 6)

THIS	IS	THE	ARRL	RADIOGRAM	
FORM	XRAY	DETAIL	TO	FOLLOW	
XRAY	HAVE	FUN	73		
GREG SZPUNAR N2GS					
From	Date	Time	To	Date	Time

Text: 25 words maximum, 5 per line; Use "xray" for a period (.) and "query" for a question mark (?).

Signature: There is no "Signature" field, just write-in below text; Name & call sign of author – include phone number if not a ham or if not known on an NTS net.



Radiogram Form Detail (6 of 6)

REC'D	From	Date	Time	SENT	To	Date	Time
					Austin AK2US	7/2/03	2112 EDT
A licensed Amateur Radio Operator, whose address is shown above, handled this message free of charge. As such messages are handled solely for the pleasure of operating, a "Ham" Operator can accept no compensation. A return message may be filed with the "Ham" delivering this message to you. Further information on Amateur Radio may be obtained from ARRL Headquarters, 225, Main Street, Newington, CT 06111.				The American Radio Relay League, Inc. is the National Membership Society of licensed radio amateurs and the publisher of QST Magazine. One of its functions is promotion of public service communication among Amateur Operators. To that end, The League has organized the National Traffic System for daily nationwide message handling.			

REC'D: Call sign from whom you received the message and date & time of receipt. Time may be either your local time (EST/EDT) or Zulu time. Make sure date agrees with time (Zulu is 5 hours ahead of EST – can cause date to roll forward).

SENT: Call sign you sent or passed the message to, or to whom you delivered it, with date & time. Also good to note delivery method for your own reference (i.e., via phone or left on Tom's voicemail). Always leave your call back number if message was left on voicemail!



ARL Numbered Texts

Purpose & How Counted

- ARL Numbered Texts replace common phrases in message body text (i.e., Happy Birthday, Greetings by amateur radio, etc.)
- Use of ARL texts reduce total message word count – faster and more consistent transmission of text
- Translated before delivery of message to addressee
- ARL text numbers are always spelled-out in words (i.e., ARL SEVEN or ARL FORTY SIX)
- Message word count (check) is written as “ARL #” (e.g., ARL 4 or ARL 15) to alert operators that message includes at least one ARL numbered text.



ARL Numbered Texts (Examples)

- ARL FORTY SIX = Greetings on your birthday and best wishes for many more to come.
- ARL FORTY SEVEN = Your message _____ to _____ delivered _____ UTC
- ARL FIFTY = Greetings by amateur radio.
- ARL 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.
- ARL SIXTY SEVEN = Your message number _____ undeliverable because of _____. Please advise.



How to Deliver an NTS Message

- Preferred delivery is via telephone.
- Okay to leave on voicemail or answering machine IF you are comfortable you reached the right person.
- Radiogram postcard if cannot reach by phone.
- Service originating station to inform if cannot deliver or if they requested confirmation.



Record Keeping & Reporting (PSHR)

- Use a log sheet to keep track of your messages
- Use a PSHR log sheet to tally monthly points for Public Service Honor Roll
- Report message count (originated, sent, received & delivered) to STM monthly
- Report PSHR totals to STM STM =
Dave Struebel WB2FTX wb2ftx@arri.net



NTS Digital

Dave Struebel WB2FTX
Eastern Area Digital Coordinator-
NTSD
Section Traffic Manager- NNJ

Advantages of NTS Digital

- Available 24/7, 365 days a year
- Error Free
- Frequency, Time, Propagation Agile
- Faster
- Able to respond and adapt quicker to urgent needs like disaster messages
- Multiple redundant routing paths
- NTSD exists at and incorporates all levels of traditional NTS from TCC, through Area, Region, Section and Local .



Not to Replace Traditional NTS

- Complementary system
- Trained operators always needed for origination and delivery of messages



Digital Mode History

- RTTY- After WWII, 5 level Baudot code, mechanical teletypewriters, paper tape storage.
- Noisy
- Signals subject to selective fading and drop out errors.
- Equipment relatively available via surplus route
- Some units as big as a sub-compact car
- AMTOR- Still 5 bit code, but with limited error correction.
- Burst mode-requires fast transmit/receive switching



FCC Authorizes ASCII- late 70's 7 bit code- with some error detection

- HF Packet- 300 baud, Long bursts, error correcting but needing large signal to noise ratio to properly decode
- Net result- Many retries, slows down transfer rate



First integrated system- APLINK (Amtor/Packet Link)

- Bulletin Board System incorporating Amtor on HF with transfer of data to VHF Packet
- Highly successful but suffers from selective fading
- With 5 bit encoding- only capital letters.
- No compression
- No file transfer



Classic Winlink- Win 3.11/Win 95 Win 98, 2000, XP

- Modules for AMTOR, CLOVER, PACTOR 1,2, and 3
- Along with VHF Packet
- Scanner function allowing multiple auto calls varying in time, frequency, mode, based upon propagation.
- Multiple forwarding paths
- With SCS proprietary modem for Pactor 2 and 3 allows automatic frequency control, automatic power level control
- Compressed and binary transfer of data



Winlink 2000 (aka WL2K)

- Developed by Winlink Classic Programmers in late 1990's
- Uses Pactor 1, 2, and 3, VHF/UHF Packet Sound Care Winmor module, Telnet
- Forwarding via Internet; Radio all the way via NTSD if infrastructure fails
- Radio-email and Integration of NTS NTSD and ARES
- Chapter 6 Methods and Practices Guideline (MPG)

http://wx4j.com/MPG6_NTSD_RADIOEMAIL.htm



Autocall

Autocall

List of AutoCall Stations

00:13	KW1U	03594.00	PctSCS:HF
00:13	N2LTC	03594.00	PctSCS:HF
00:13	W1WCG	03594.00	PctSCS:HF
00:13	W4ZJY	03594.00	PctSCS:HF
00:23	W8UL	03594.00	PctSCS:HF
00:33	W8UL	03594.00	PctSCS:HF
01:13	N2LTC	03594.00	PctSCS:HF
01:13	WA4ZXV	03594.00	PctSCS:HF
02:13	W1WCG	03594.00	PctSCS:HF
02:13	W4ZJY	03594.00	PctSCS:HF
02:13	WA4ZXV	03594.00	PctSCS:HF
02:23	W8UL	03594.00	PctSCS:HF

Display List by...
Call Sign StartTime SORT - +

AutoCall Time and Weekday

Auto-call Time: **00:13**

Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday
 Sunday

Current Time: **09:40:05** Display Log

Autocall Parameters

Station: N2LTC, N2LTC, W1WCG, W1WCG, **KW1U**, KW1U
QRG:
Port: PctSCS: <UNNAMED>

Call this station:
 Always
 w/Msg QTC
 w/Bull QTC

Band Plan: US WW

Mode: LSB Filter: 2.4 KHz Long Path / Robust: Norm Long/Rbst

? Help
X Cancel
✓ OK

NTSD and Pactor

- HF NTSD Operates almost exclusively in the automatic control sub-bands
 - 3.585 - 3.600 MHz
 - 7.100 - 7.105 MHz
 - 10.140 - 10.150 MHz
 - 14.095 - 14.0995 MHz
 - 14.1005 - 14.1120 MHz
- Using Pactor 1, 2, and Pactor 3.
 - *Pactor 2 and 3 are proprietary modes.*
- All pactor connects start out at Pactor 1 and then shift up to higher speed if the equipment at both ends is compatible.
- Bandwidth for Pactor 1 and 2 is 500 Hz. pactor 3 will expand its bandwidth up to 2.4 KHz at highest speeds.



Eastern Area MBOs

- KW1U 1RN Edgartown, MA
- W1WCG 1RN North Haven, CT
- W2SFD 2RN Glenville, NY
- WB2FTX 2RN Butler, NJ EADC
- W3JY 3RN Malvern, PA
- WX4J 4RN Switzerland, FL
- WA4ZXV 4RN Norcross, GA
- W4DNA 4RN Goldsboro, NC
- W8UL 8RN Reynoldsburg, OH
- VE3GT ECN Renfrew, ON
- VA3PM ECN Brampton, ON



Central and Pacific Area Hubs

- KB00FD Missouri
- W5KAV Washington



Winlink 3.0 Components

- Message Manager - Forwarding file
- User Manager
- Event Log
- PCTSCS - HF Pactor module
- PKT VHF- VHF Packet Module
- Scanner- scanning, busy detector, event scheduling and rescheduling



Typical Forwarding File

- NTSAK K4WWV W8UL KW1U
- NTSAL W5KAV K4WWV W8UL KW1U W1WCG
- NTSAB W5KAV K4WWV W8UL KW1U W1WCG
- NTSAZ W5KAV K4WWV W8UL KW1U W1WCG
- NTSAR W5KAV K4WWV W8UL KW1U
- NTSB* W5KAV K4WWV W8UL KW1U
- NTSCA W5KAV K4WWV W8UL
- NTSCO W5KAV K4WWV W8UL



WB2FTX NTSD Station

HF

- Kenwood TS-450S
- SCS PTC-IIUSB Modem
- MFJ 9913 Autotuner
- B&W Folded Dipole
- Computer- old Pentium 150 Mhz- Win 98 SE
- Classic Winlink 3.0
- Kantronics KPC-3 plus for packet port

VHF

FBB 7.00i BBS Software
Pentium 100 Mhz
running DOS 6.22
1 Paccomm Tiny 2 TNC
Flexnet
Icom IC-38A, 25 watts
4 el 220 Mhz beam
pointed at WA2SNA





NTS Digital Demonstration

Local Digital Traffic

- Receipt and Origination via WB2FTX-4 PBBS
- WB2FTX-4 accessible via WA2SNA (Ramapo Mtn), via NJ Flexnet System
- SNJ partially served by NJ2AR-4 and KC2QVT-4

Node Name	Location	Frequency (MHz)
WA2SNA	Ramapo Mountain, Oakland, NJ	145.01
WB2SNN	Sayreville, NJ	145.51
N2QAE	Schooley's Mountain, W Morris CO	145.51

Local NTS Digital

- Basic equipment requirements
 - 2M rig
 - TNC capable of 1200 baud VHF Packet
 - Terminal Program

OR

- Soundcard interface and software capable of emulating Packet
- Computer



Outpost Packet Message Manager

- Outpost is a Windows-based packet message client that lets you send and receive packet messages with almost any Amateur Radio Bulletin Board System (BBS) or TNC Personal Mail Box.
- Hides the complexity of the native packet environment and shorten the learning curve
- Provide an MS Windows-based packet messaging client
- Automate the packet message handling environment
- Create a program that behaves like your email client that you have at work or home...
...create, send, receive, read, delete, reply to, or forward messages
- Automates the origination and formatting of NTS messages.
- *Focus on the message not the medium*
- **Freeware: <http://www.outpostpm.org/>**



2RN Nets

- Open to all HAMs
- Liaisons to/from NJ and NY
- Liaisons to EAN

Frequency (MHz)	Time	Mode
3.925	1:45 PM	SSB
3.925	4:35 PM	SSB
3.925	6:30 PM	SSB

NNJ/SNJ Section Nets

- Open to all HAMs

Frequency (MHz)	Time	Name	Mode
3.544	10:00 AM	NJ Morning (WE)	CW
3.950	6:00 PM, 9AM (SU)	NJPN	SSB
3.547	6:30 PM	NJ Slow Net	CW
3.544	7:00 PM	NJ Net/Early	CW

NNJ Local Nets

- Open to all Hams with or without traffic handling experience.
- A great place to start and to learn first hand.

Name	Time	Frequency (MHz)	Repeater	Comment
NJVN/E	7:30 PM	146.895 (PL 151.4)	WS20/ WB2FTX	Echolink via WB2FTX-R
CJTN	8:00 PM	146.760 (PL 156.7) 443.200 (PL 141.3)	K2GE	Echolink via K2GE-R
UCTN	10:00 PM	Various 147.255 (PL 141.3)	W2NJR/ WA2IWR/	Echolink via W2NJR-R and



Additional Resources

- [ARRL Net Directory](#) – Excellent NTS reference with net listings by state (\$5 from ARRL). Online version is accessible free at the ARRL web site (www.arrl.org).
- [Public Service Communication Manual](#) – Detailed reference on NTS message handling (\$1 from ARRL), also available on ARRL web site.
- [Morris County NJ Amateur Radio Volunteers](#) website – see NTS section:
 - <http://www.qsl.net/mcarv/nts.htm>
- [K2UL website](#) – Dan was the Section Traffic Manager for SNJ and has a great website.

<http://www.qsl.net/k2ul/resource.htm>



Acknowledgements

- **Pinkney Foster, KG6ILA**, Section Traffic Manager ARRL Santa Clara Valley Section kg6ila@arrl.net whose presentation "*National Traffic System (NTS) Messaging Basics*" inspired the message handling components of this presentation.
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Questions?