RMS Express – Winlink Use in EMCOMM

What Winlink offers for EMCOMM

Flexibility:

- Internet-only (Telnet) direct connections to Winlink.
- Radio link bridge to Internet e-mail.
- Radio-only store and forward messaging.
- Peer-to-peer connections between radio end-users.
- Familiar and simple e-mail client interface.

Interoperability: Connect different types of systems

- Bridge different radio capabilities (VHF/UHF/HF).
- Seamless integration with Internet e-mail.

Geographical dispersion and redundancy for reliability

What Winlink offers for EMCOMM (more)

- Standard e-mail format with many features.
  - Binary file attachments (pictures, pdf, spreadsheets).
  - Automatic message compression/decompression.
  - White listing used to prevent spam.
- Time independence.
- Ability to collect messages while unattended.
- Good operation at most power levels.
- Not limited by station-to-station propagation.
- Message logging, and ICS report generation.
- Forms and template support.
- Wide adoption by EmComm related agencies.

Winlink Connection Modes

- **Telnet** – Non-radio connection through the Internet. Good for training (no radio equipment required) and use if radio is down or network is busy.
- **VHF/UHF Packet** (local LOS propagation) –
  - **9600 baud** – Fast, reliable, range limited and requires $400 modem (Kantronics or SCS Tracker).
  - **1200 baud** – Slower, but can use inexpensive Byonics TinyTrak-4, TNC-X, or soundcard modems.
- **HF WINMOR** – "Poor man's Pactor". Not as good as Pactor, but operates with inexpensive sound card device ($100), speed between Pactor 2 and 3.
- **HF Pactor 1, 2, 3 and 4** – Fast and reliable but requires an expensive modem ($1500+).

RMS Express Main Screen

Begin connection

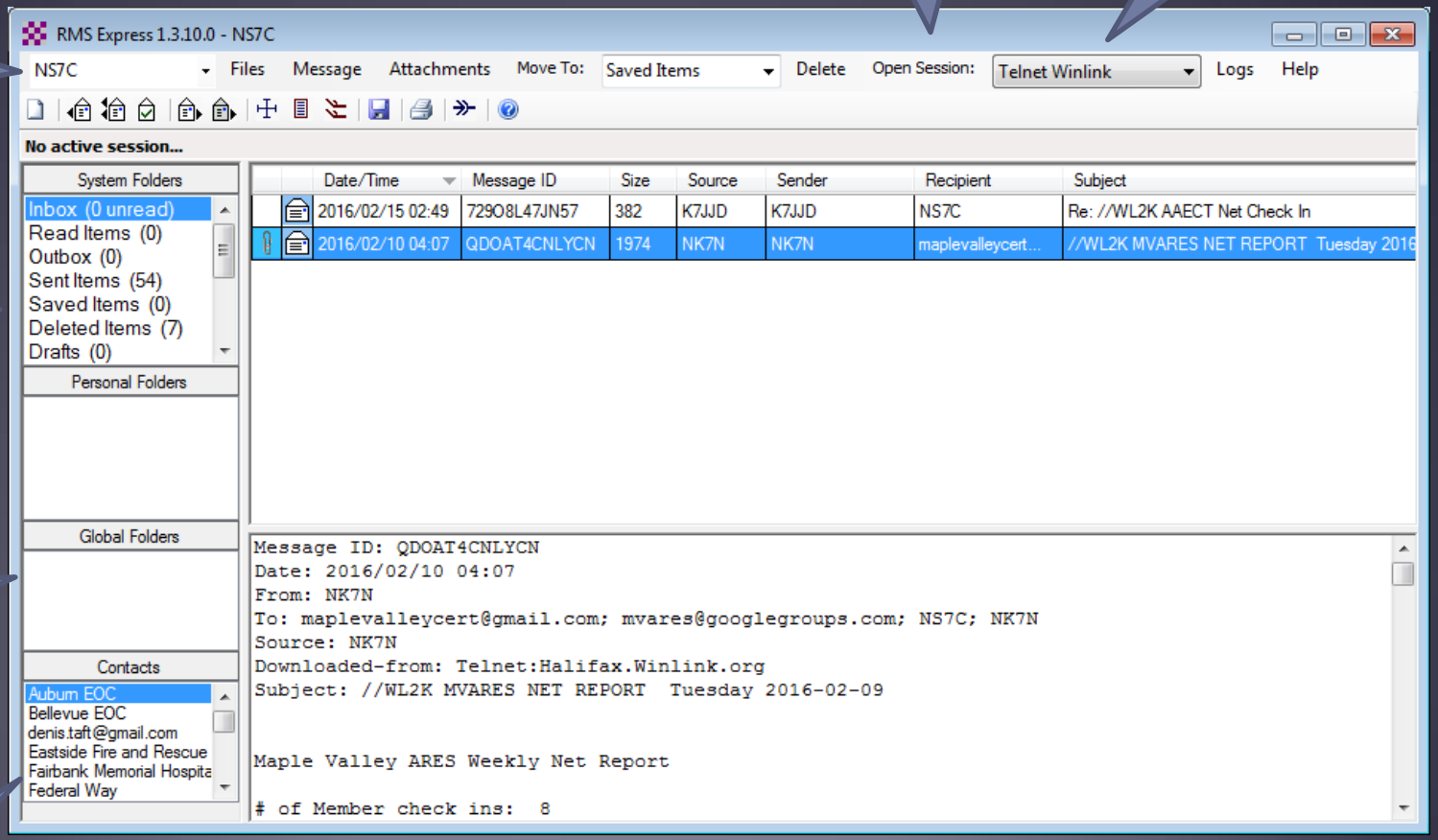
Connection Mode

Multiple call signs

Standard Folders

Personal message folders

Contacts address book



Composing A Message

New Message Button

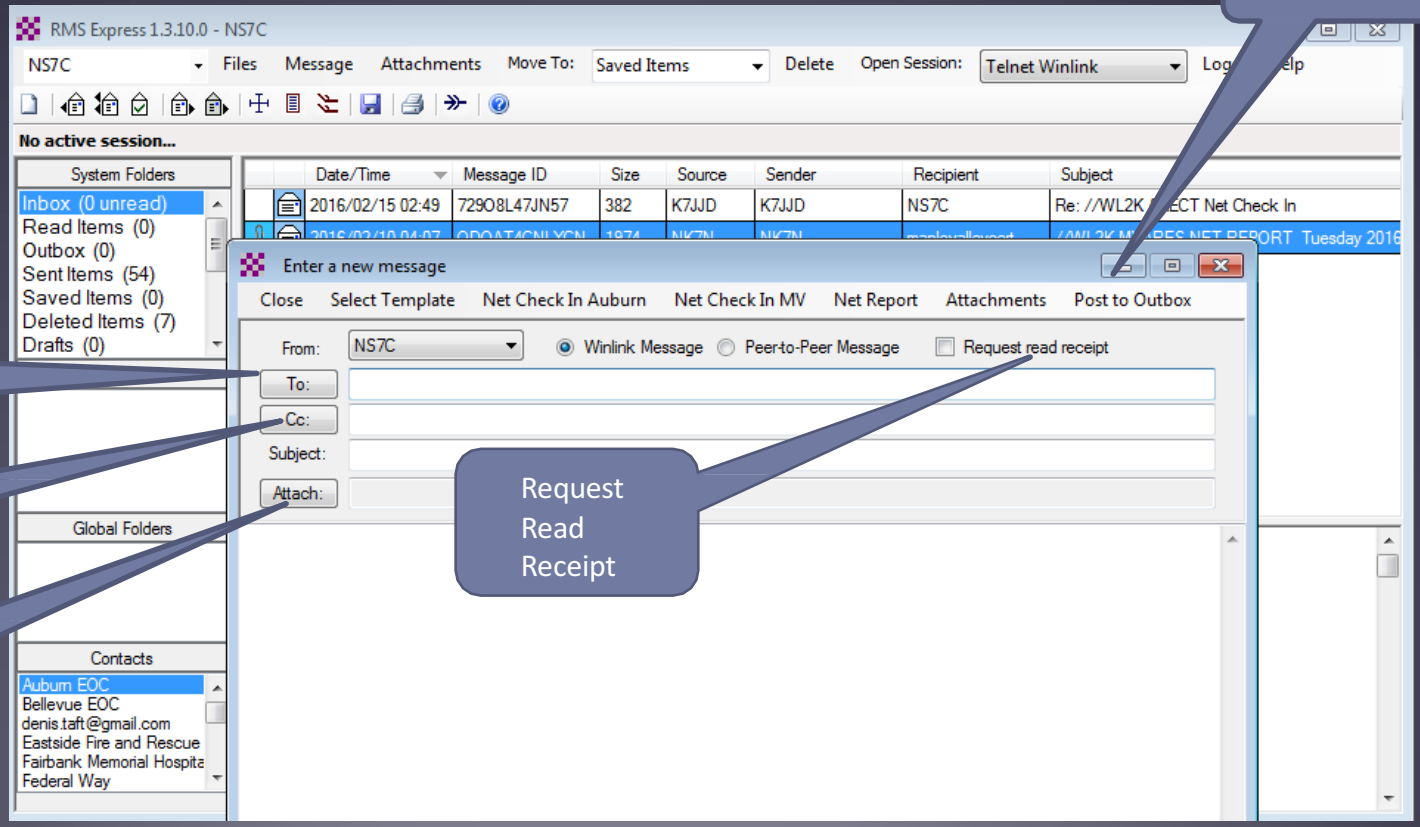
Click "To" or "CC" for contacts

Multiple recipients and CC

File attachments

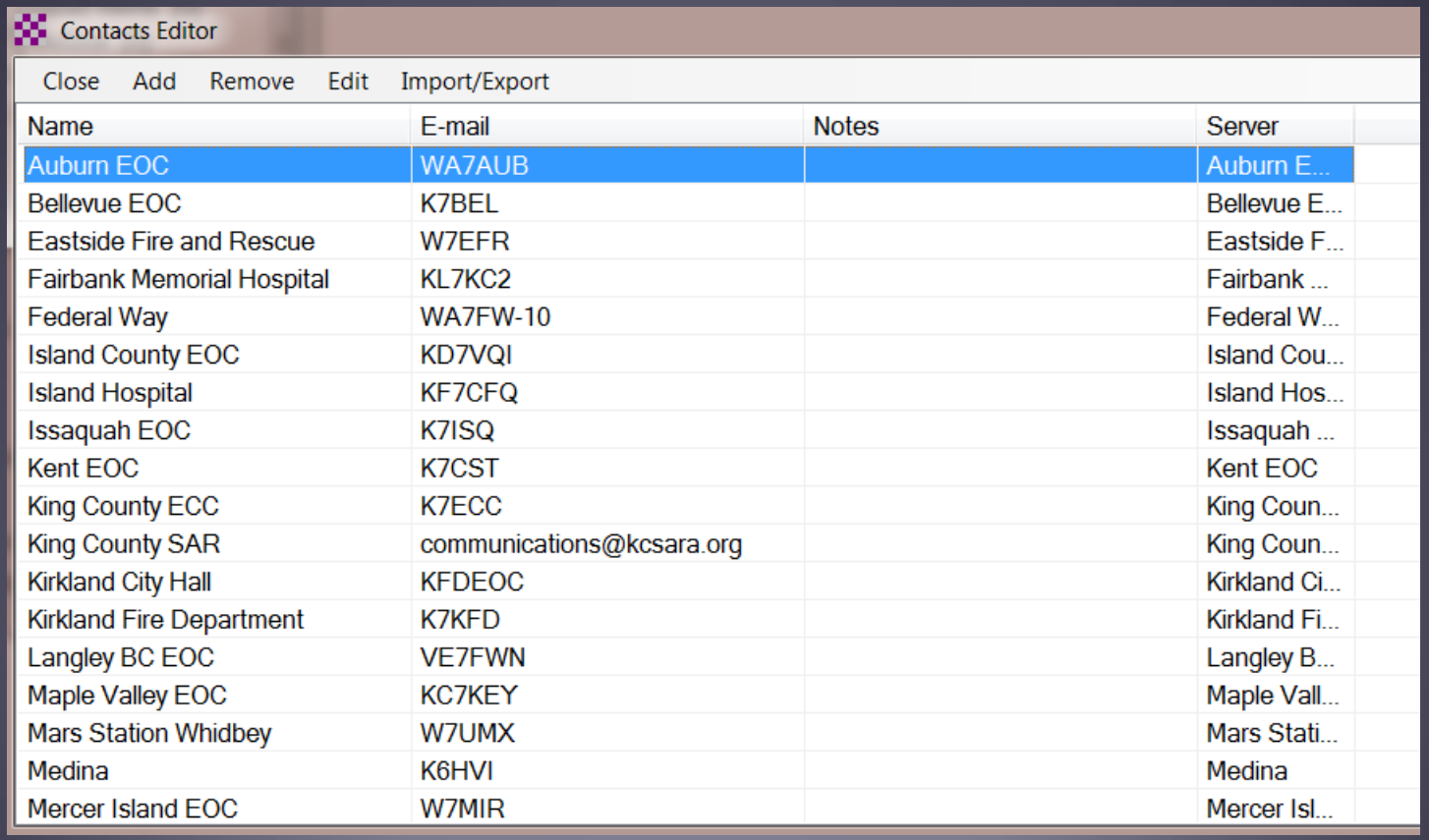
Post to Outbox

Request Read Receipt



Address Book Support

Use of Standard Addresses for EMCOMM is Encouraged

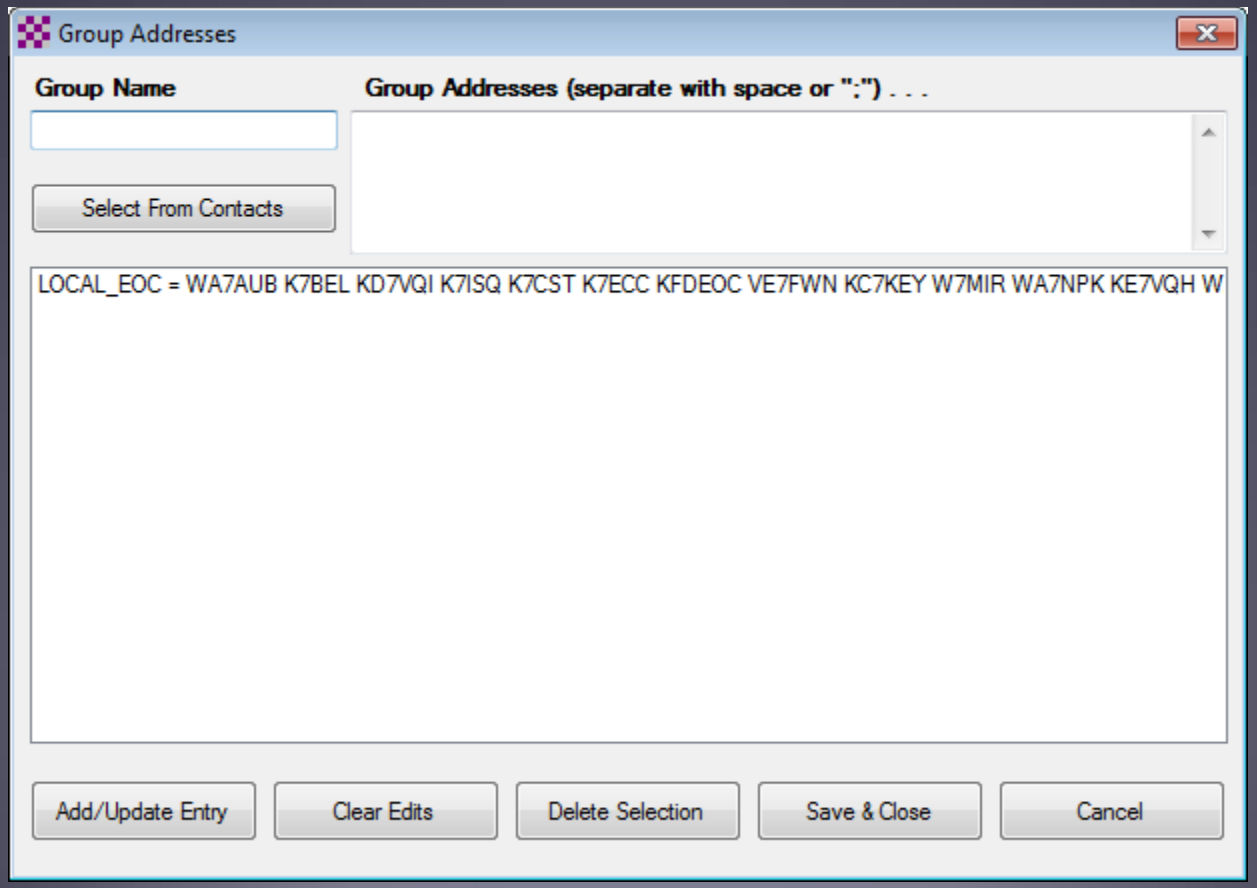


Name	E-mail	Notes	Server
Auburn EOC	WA7AUB		Auburn E...
Bellevue EOC	K7BEL		Bellevue E...
Eastside Fire and Rescue	W7EFR		Eastside F...
Fairbank Memorial Hospital	KL7KC2		Fairbank ...
Federal Way	WA7FW-10		Federal W...
Island County EOC	KD7VQI		Island Cou...
Island Hospital	KF7CFQ		Island Hos...
Issaquah EOC	K7ISQ		Issaquah ...
Kent EOC	K7CST		Kent EOC
King County ECC	K7ECC		King Coun...
King County SAR	communications@kcsara.org		King Coun...
Kirkland City Hall	KFDEOC		Kirkland Ci...
Kirkland Fire Department	K7KFD		Kirkland Fi...
Langley BC EOC	VE7FWN		Langley B...
Maple Valley EOC	KC7KEY		Maple Vall...
Mars Station Whidbey	W7UMX		Mars Stati...
Medina	K6HVI		Medina
Mercer Island EOC	W7MIR		Mercer Isl...

Using Group Addresses

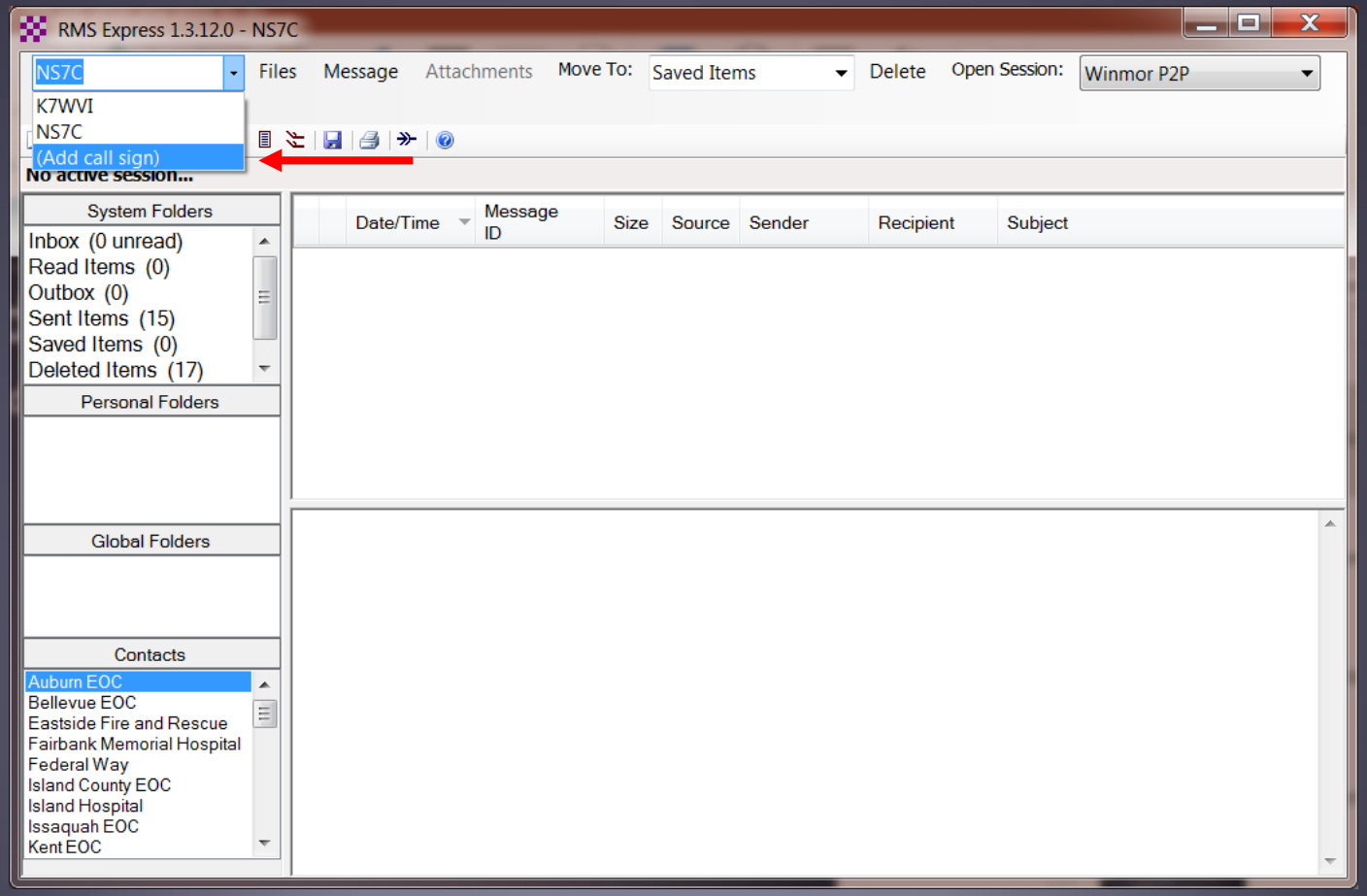
Click “Files” followed by “Group Address…”

Use a group name in the “To” or “CC” fields



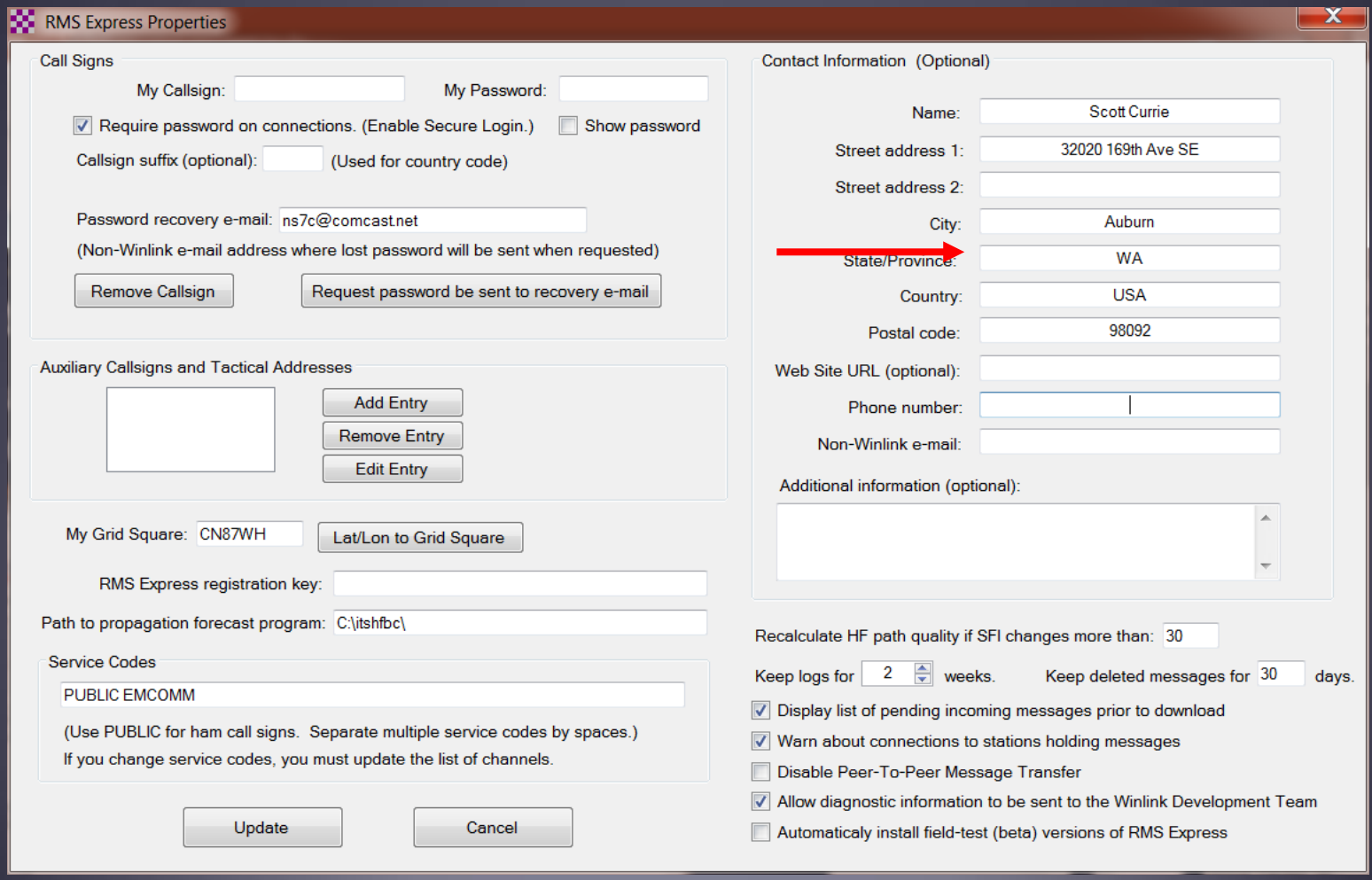
Tactical Address Support

Adding additional call signs



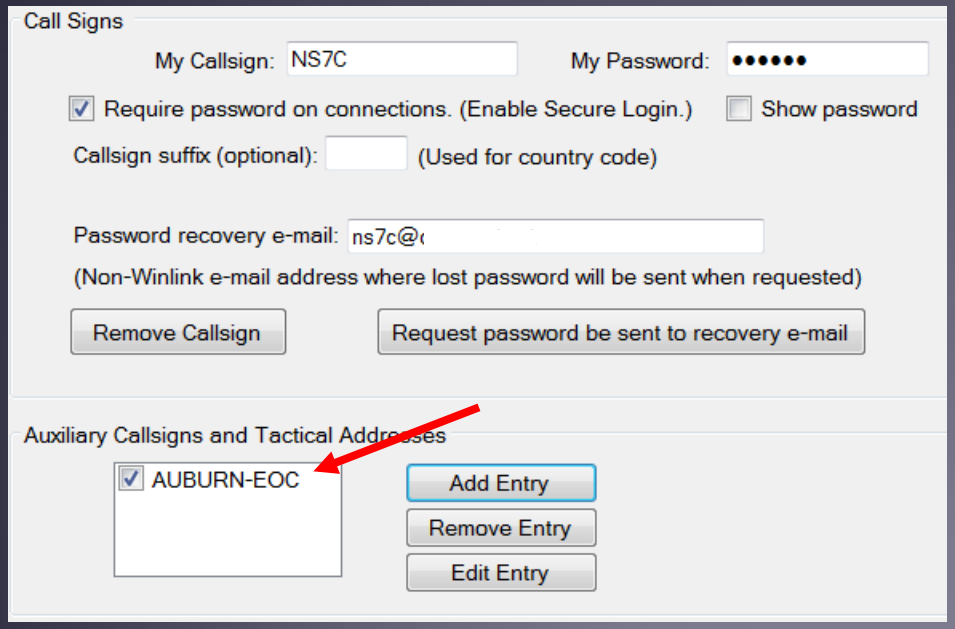
Tactical Address Support

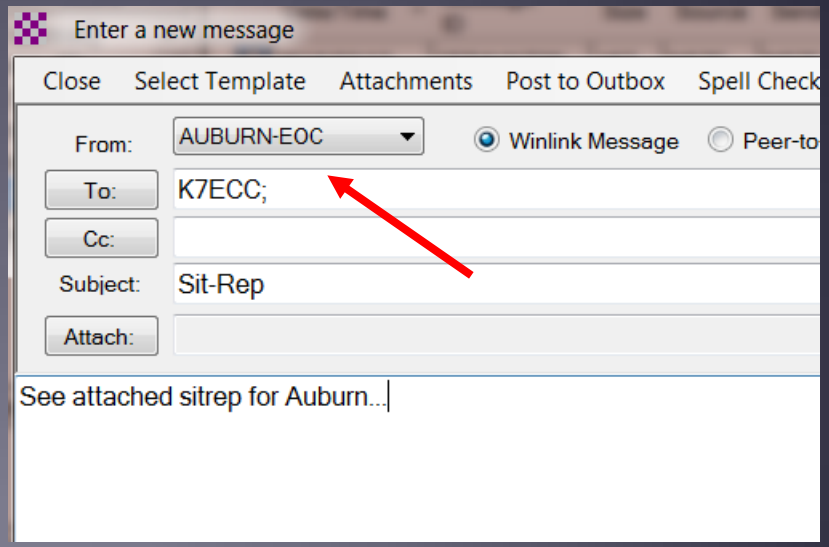
Contact info will be duplicated, update or clear these fields



Tactical Address Support

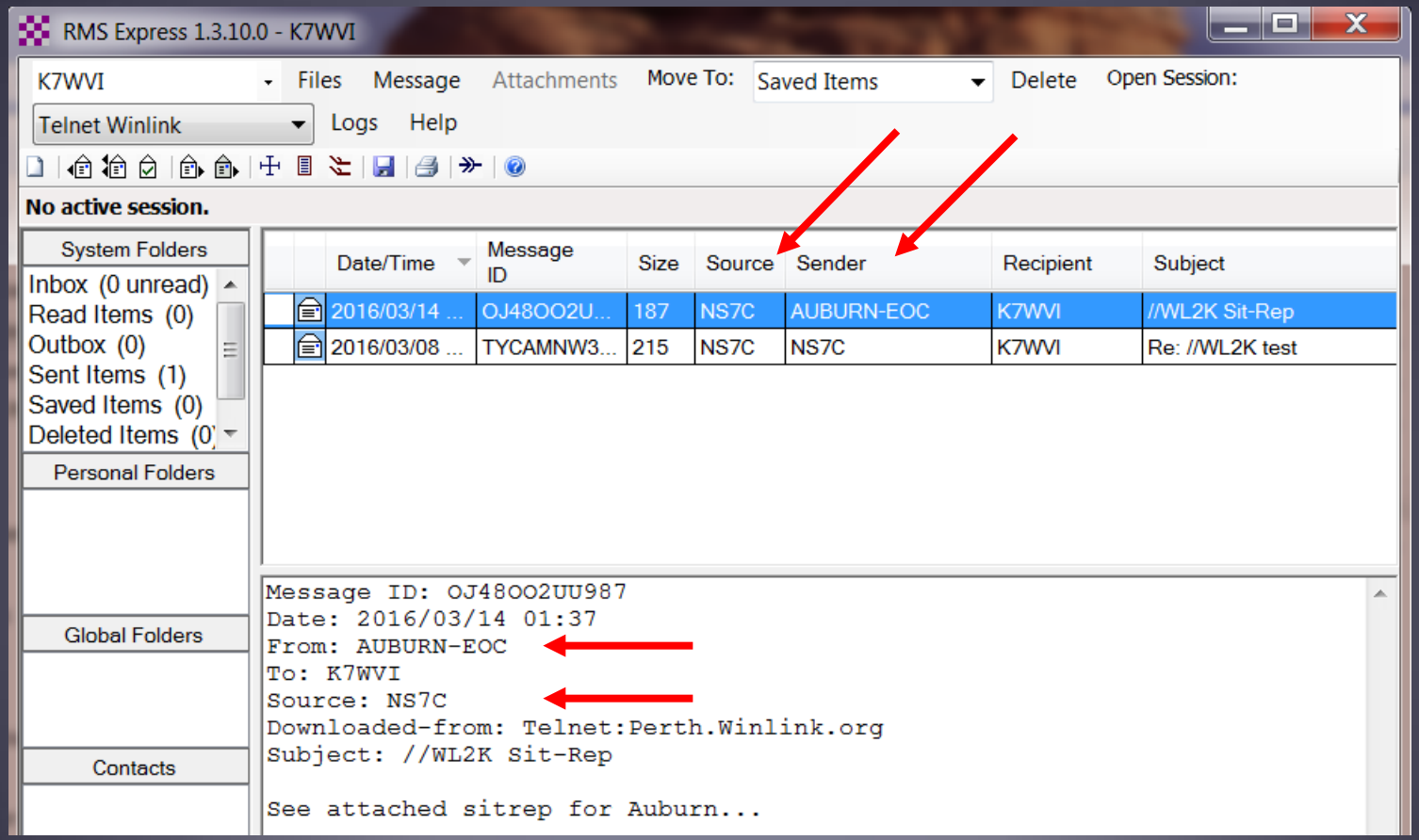
Use of Tactical Addresses for EMCOMM is Encouraged





Tactical Address Support

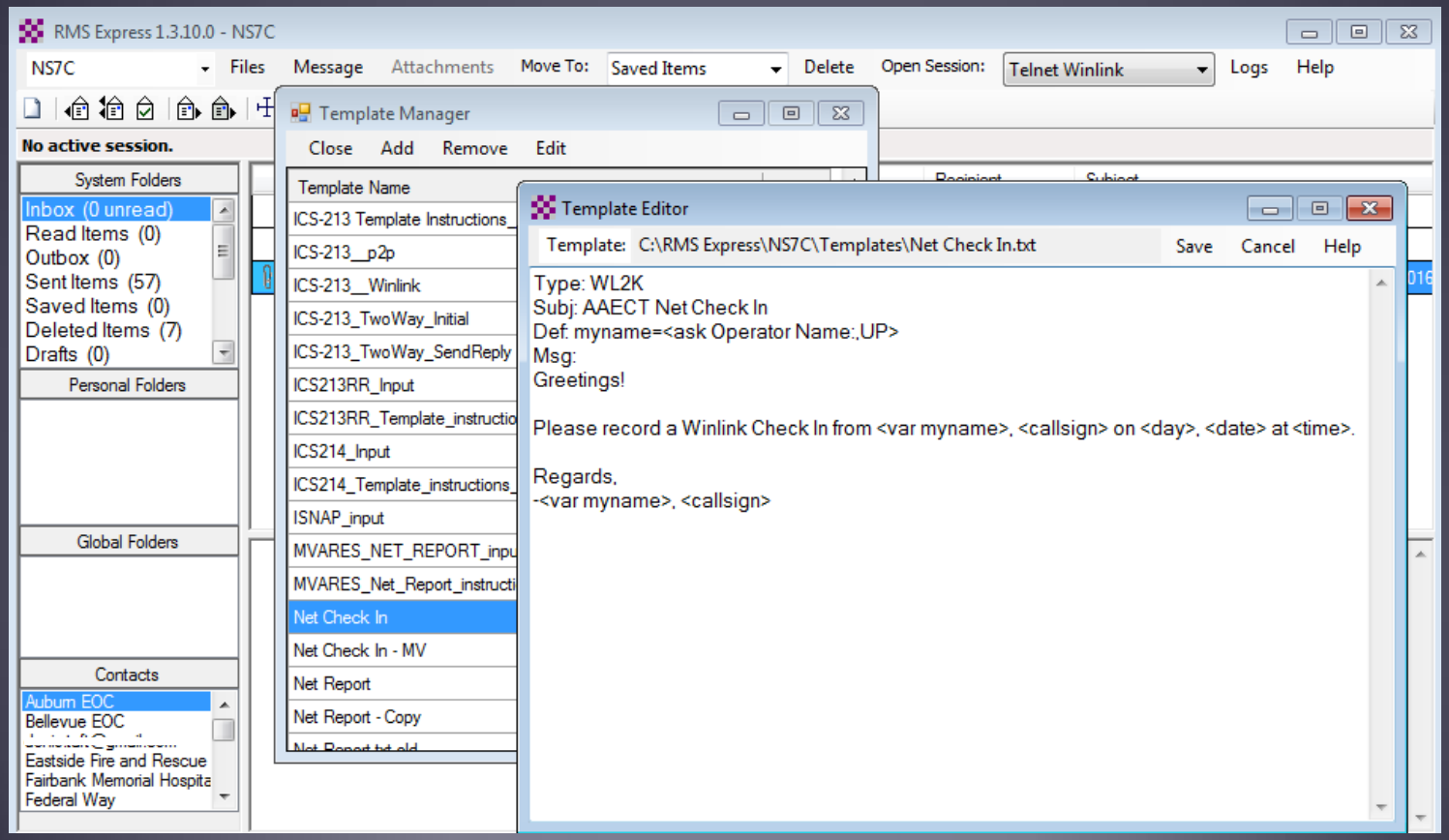
Use of Tactical Addresses for EMCOMM is Encouraged



Creating Message Templates

Fills in “boilerplate” information for messages

Click “Message” followed by “Templates…”



Using a Message Template

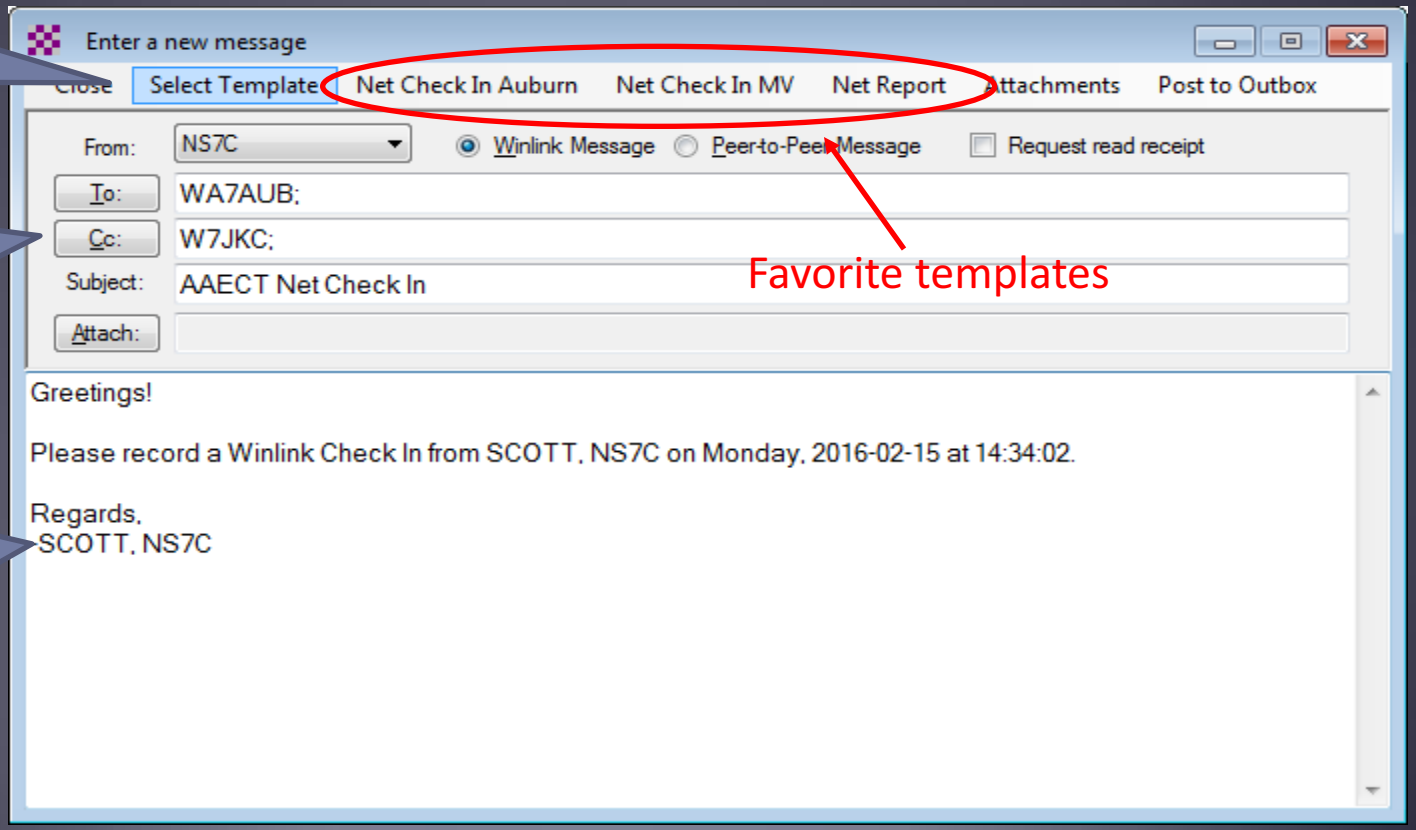
Begin composing a message

Click “Select Template” and select the template

Click to select a template

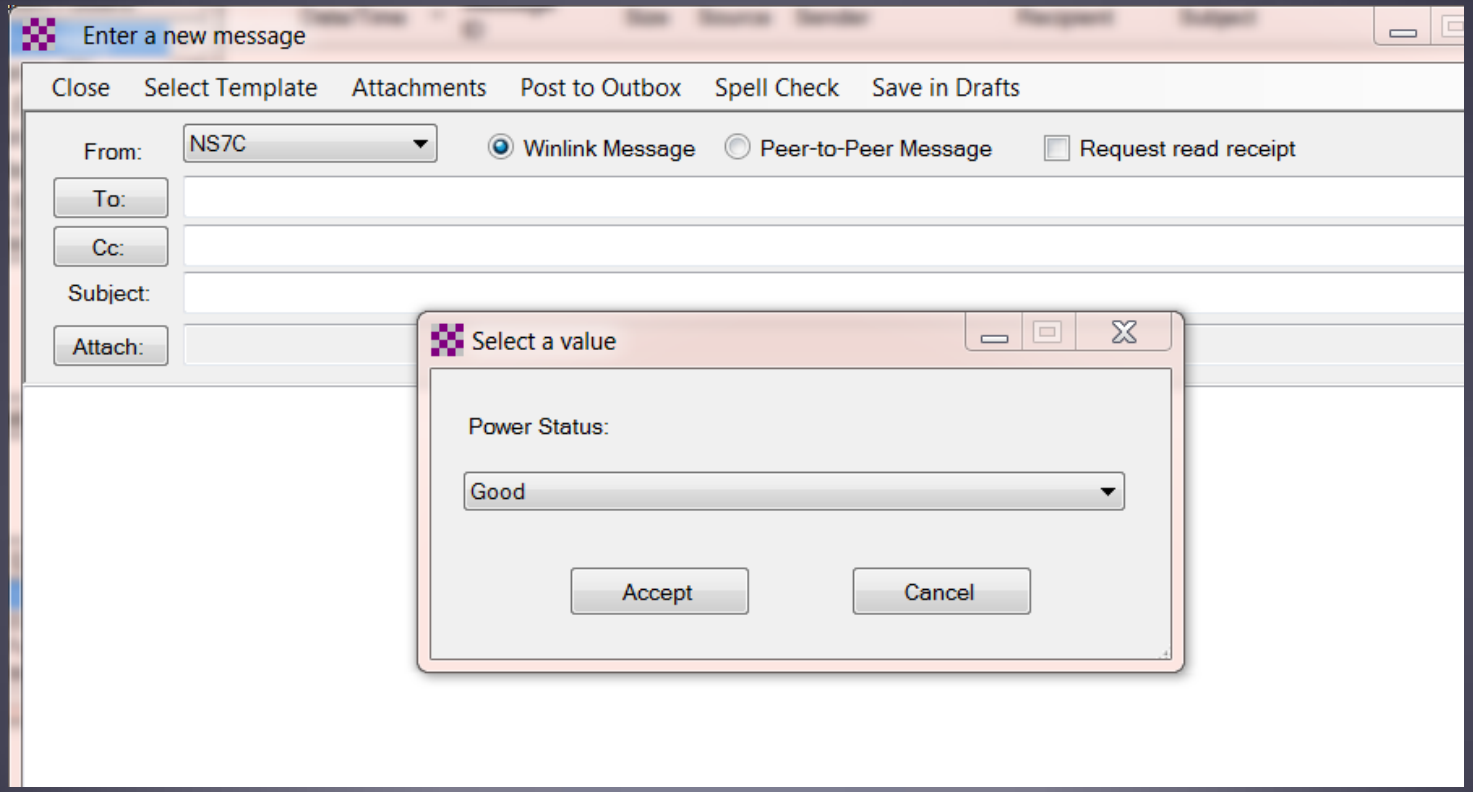
CC and subject filled in automatically

Body initialized from template



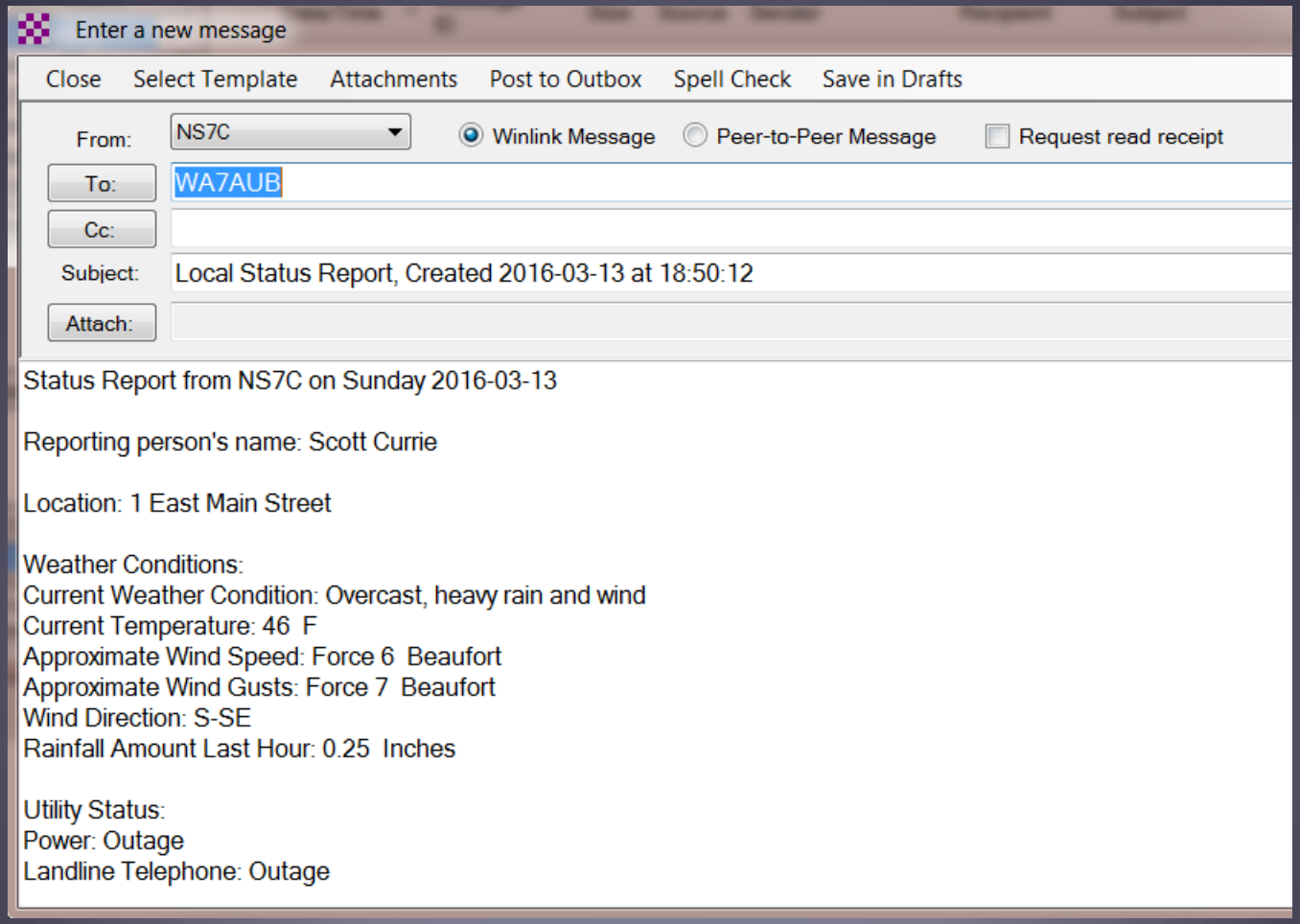
Using a Message Template

Prompting for input



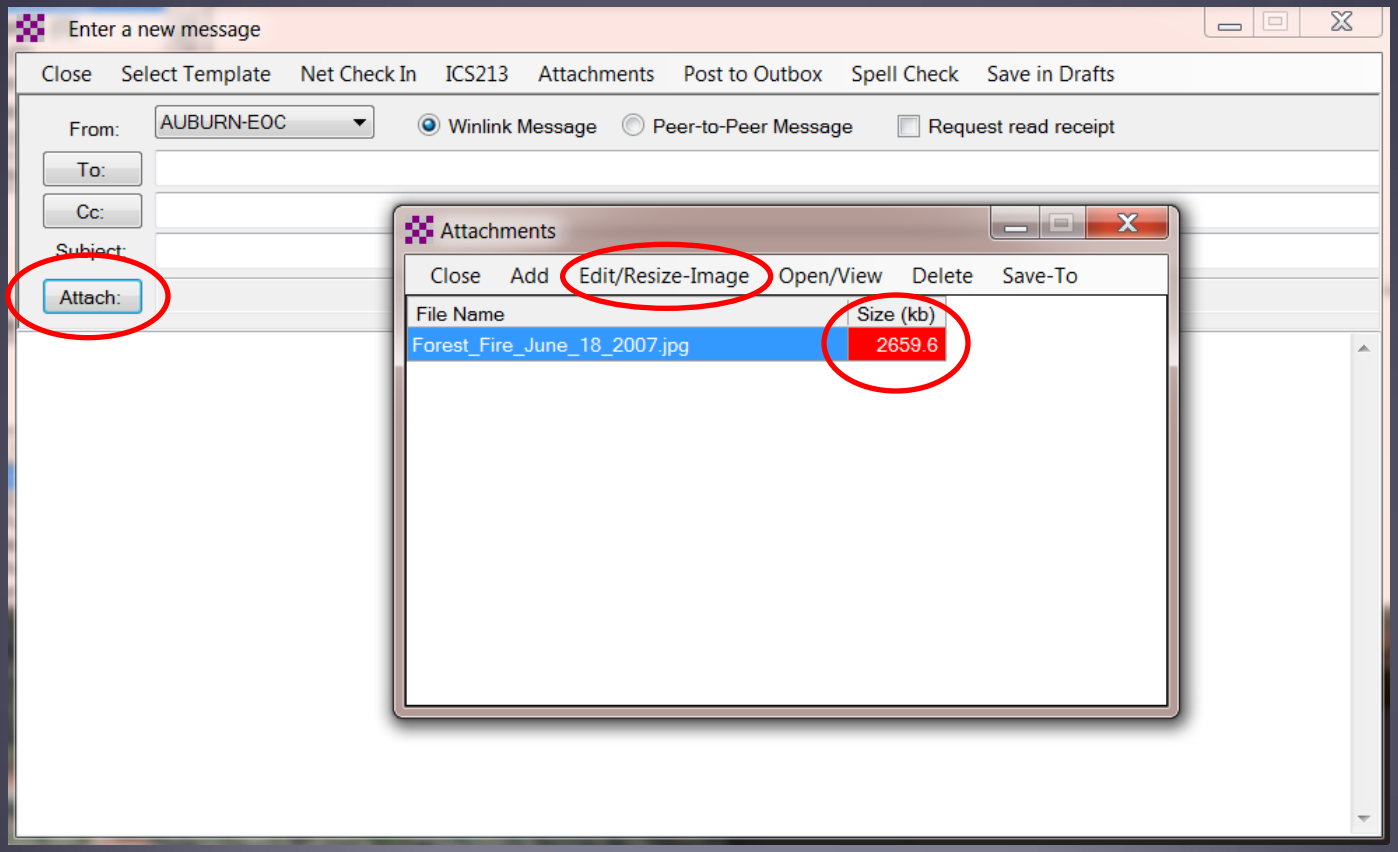
Using a Message Template

Completed message ready to send



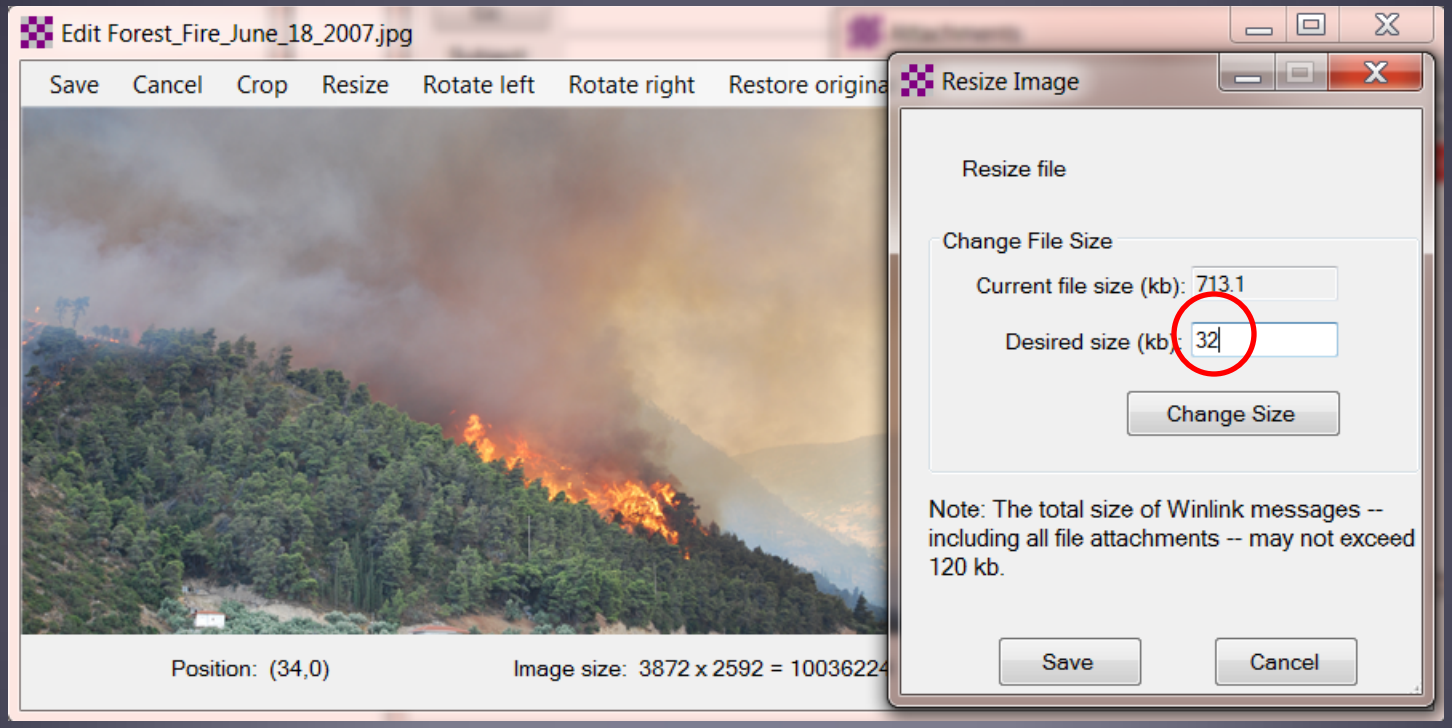
Message Attachments

File size must be managed

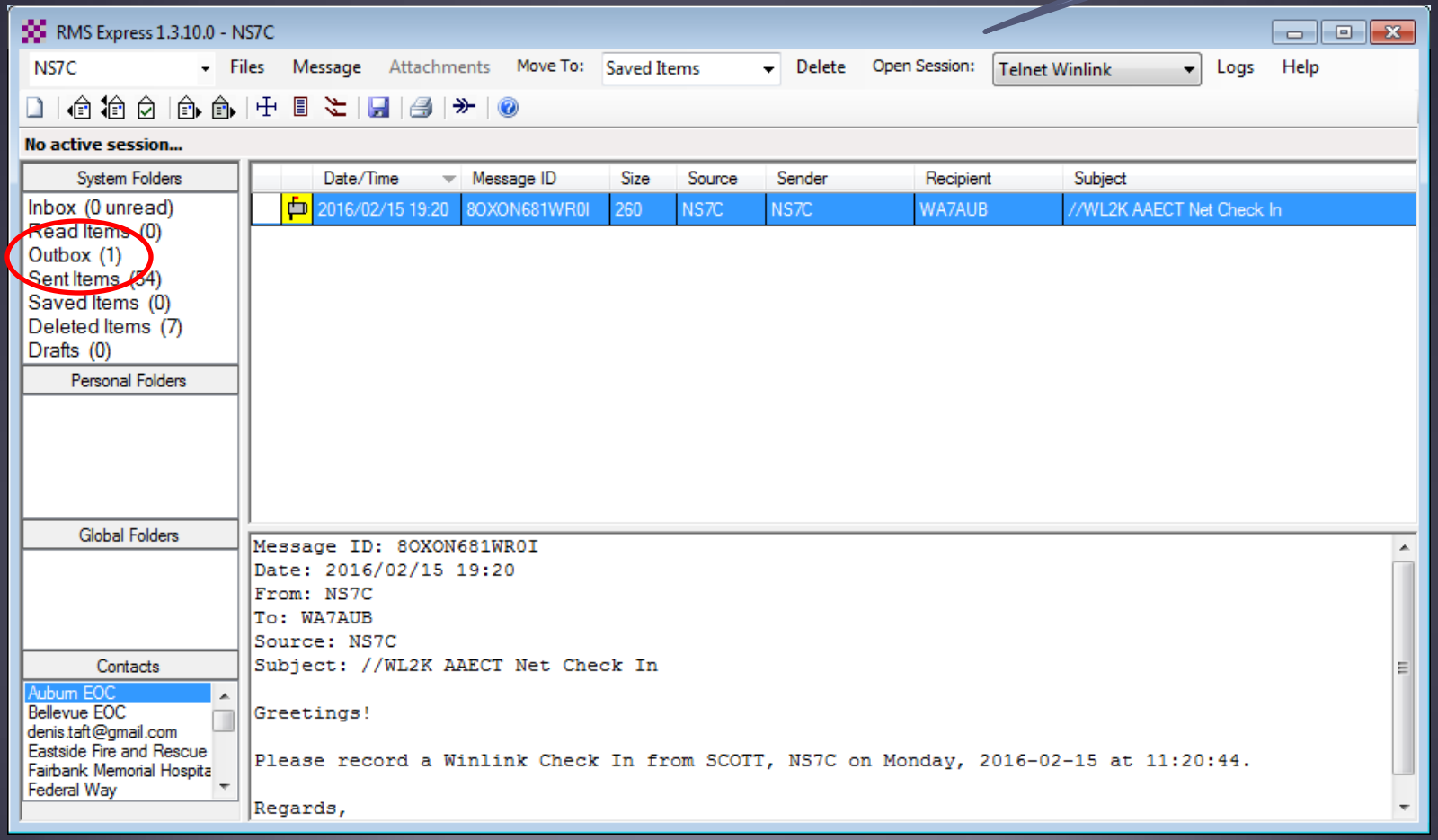


Message Attachments

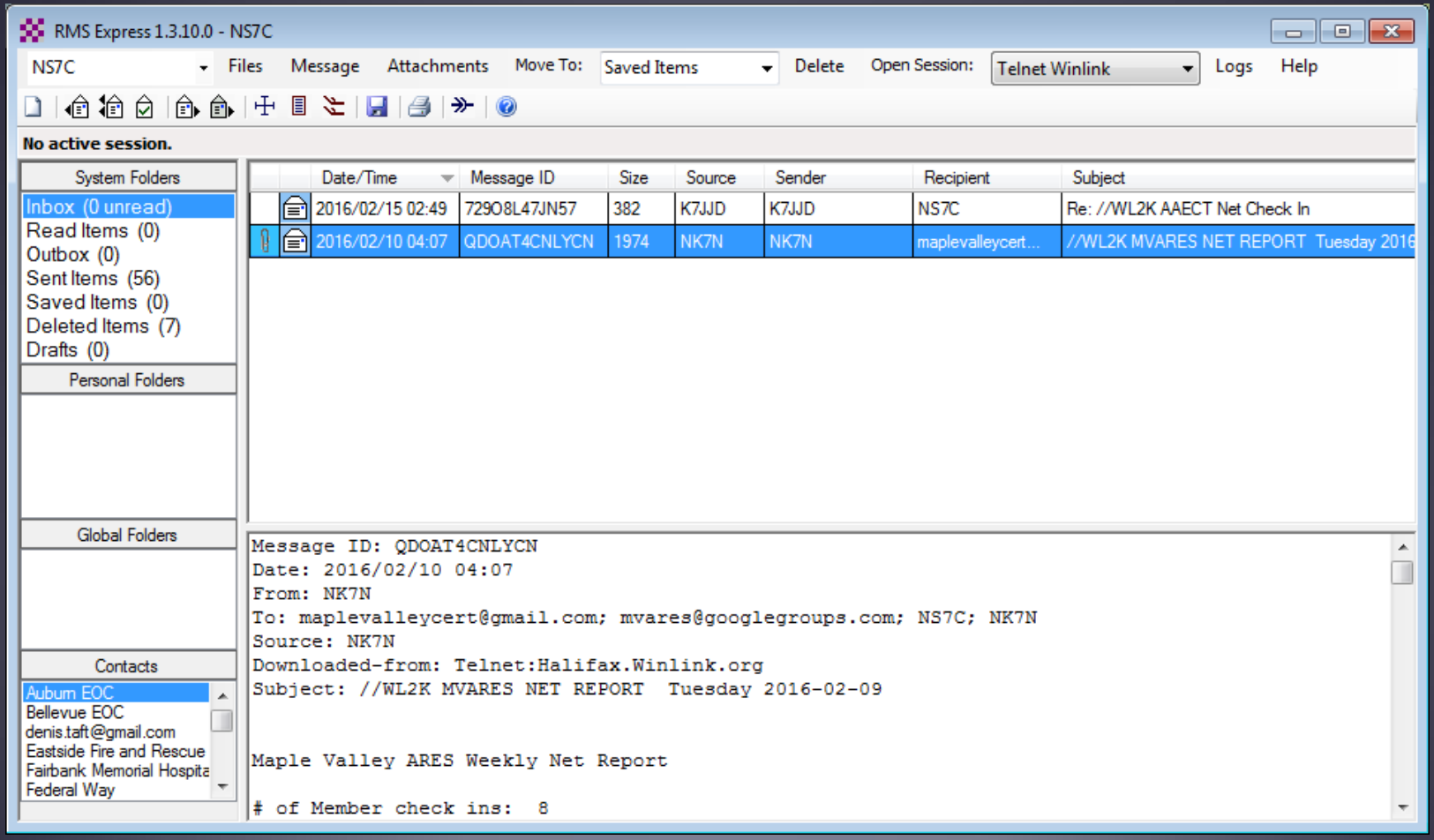
Resize and crop pictures within RMS Express



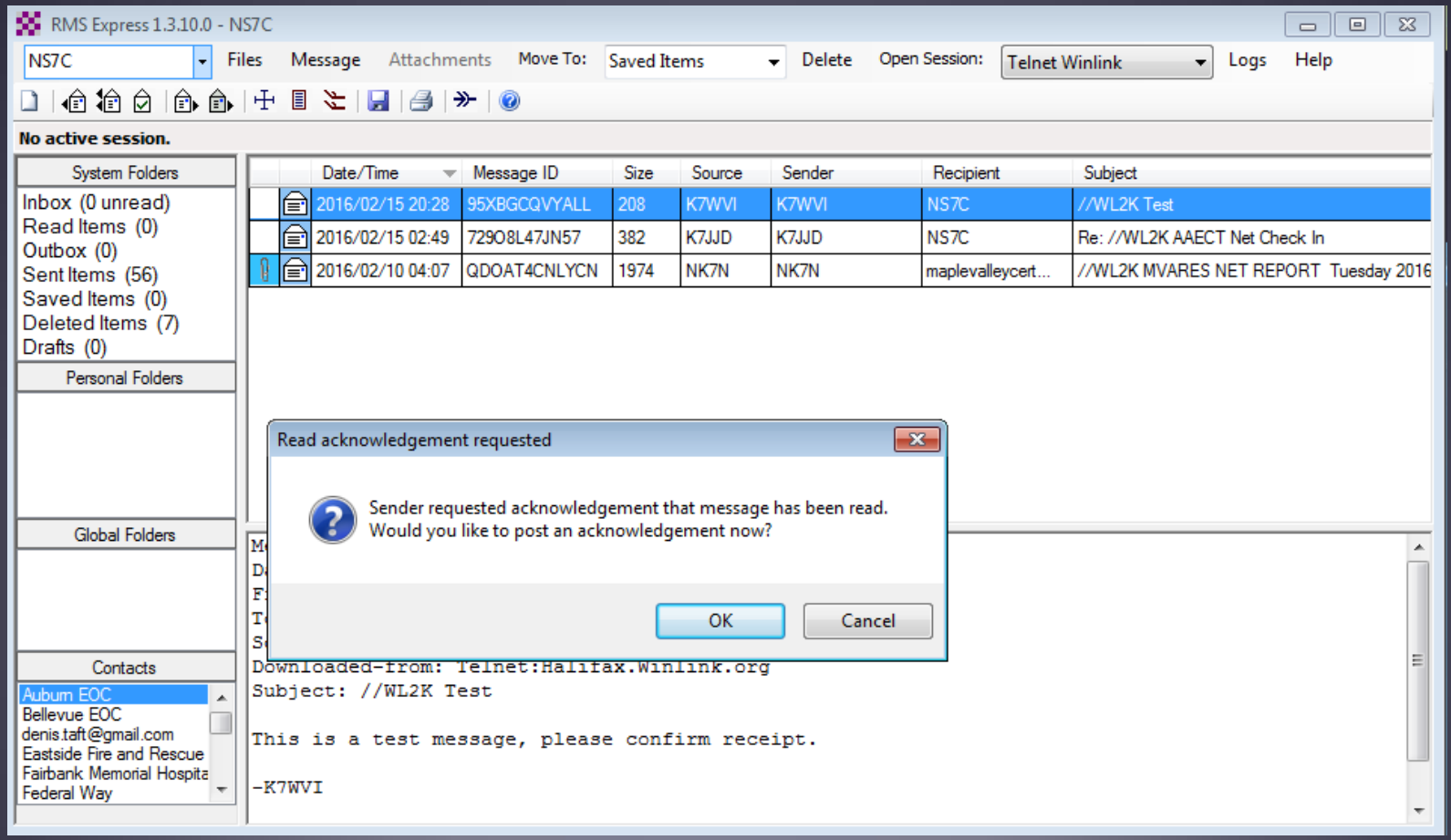
Pending Message In Outbox



Reading Incoming Messages

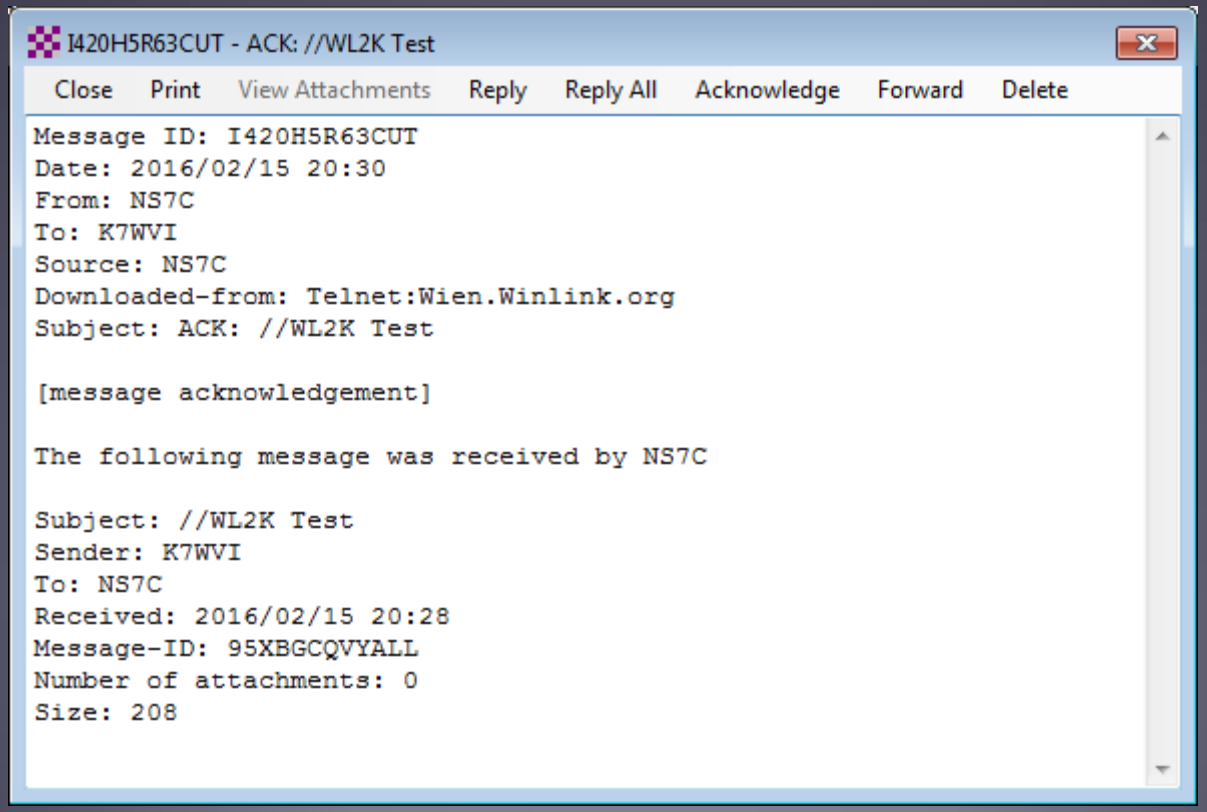


Notification of Read Acknowledgement



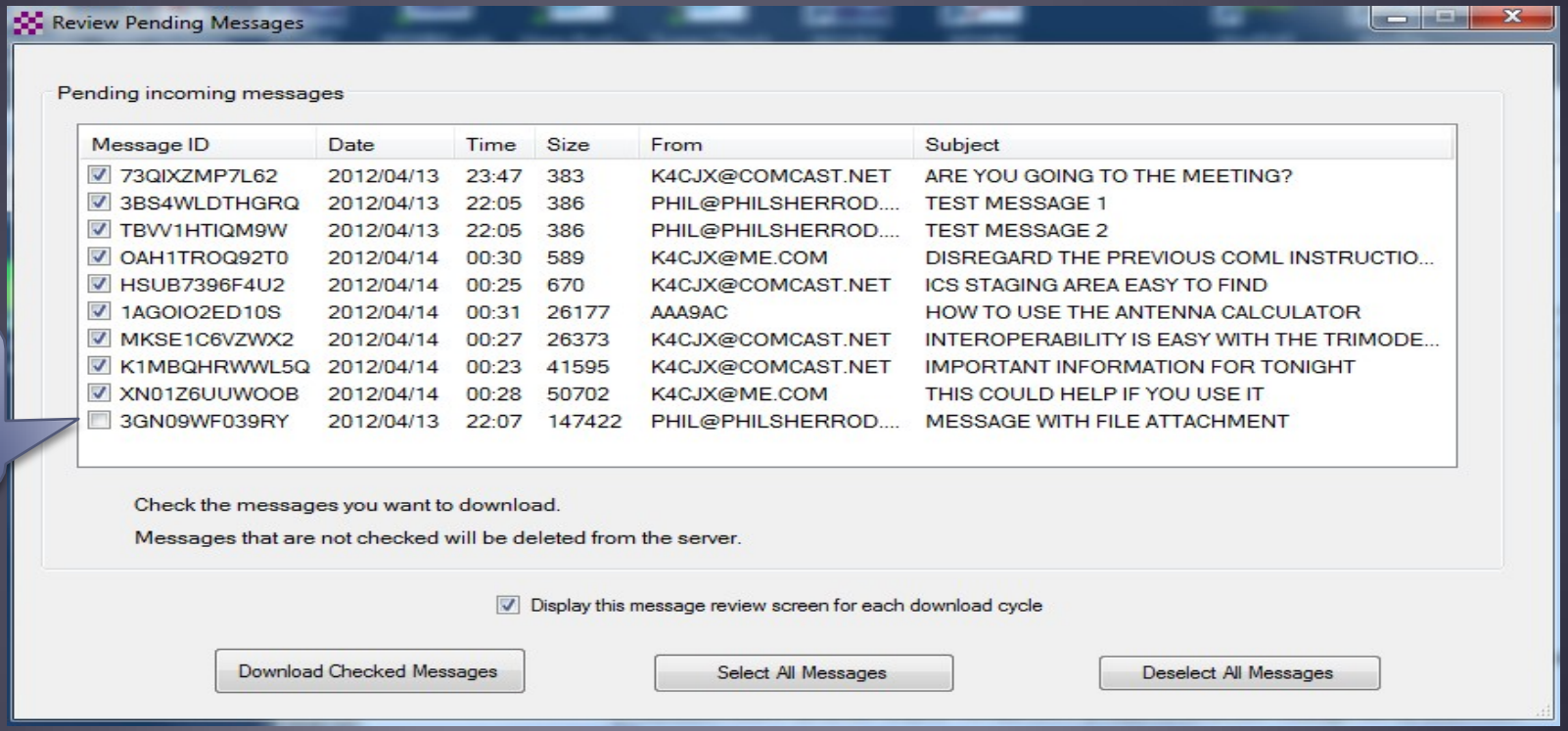
Message Receipt Acknowledgements

- Positive acknowledgment that message was received
- Information about message filled in automatically



RMS Express Message Review

- Review pending messages before downloading.
- Select which messages todownload.



Message too large & not wanted

RMS Express HTML Forms

- HTML forms are efficient and professional looking.
- Forms can be simple or very complex.
- Forms can look as good as any web site.
- Forms are easy to use.
- Attractive forms are difficult to create unless you understand HTML, cascading style sheets and JavaScript.
- The Winlink team is building a library of forms.
- Good HTML/JavaScript programmers are needed!

HTML Form and Template Set

- A full form set has three components:
  - A template that displays the form and generates the text message to be sent.
  - An input form that solicits input from the user.
  - A display form that formats and displays the information on the recipient's computer.
- Input from a form is encapsulated in a compact XML file attached to the message.
- The actual form HTML is not transmitted.
- Input and display forms may be large, but the actual data transmitted is very compact.
- Receiving station must have the display form installed.

RMS Express Forms

ICS form for data entry in browser

Tracking # 123 (Optional) **GENERAL MESSAGE** ICS213 RMSE Vers 2.36

1. Incident Name: Big Fire

2. To (Name / Position): Ops Chief, KCECC

3. From (Name / Position): Ops Chief, Auburn EOC

4. Subject: Status Update 5./6. Date / Time: 2016-03-21 08:44:43

7. Message:

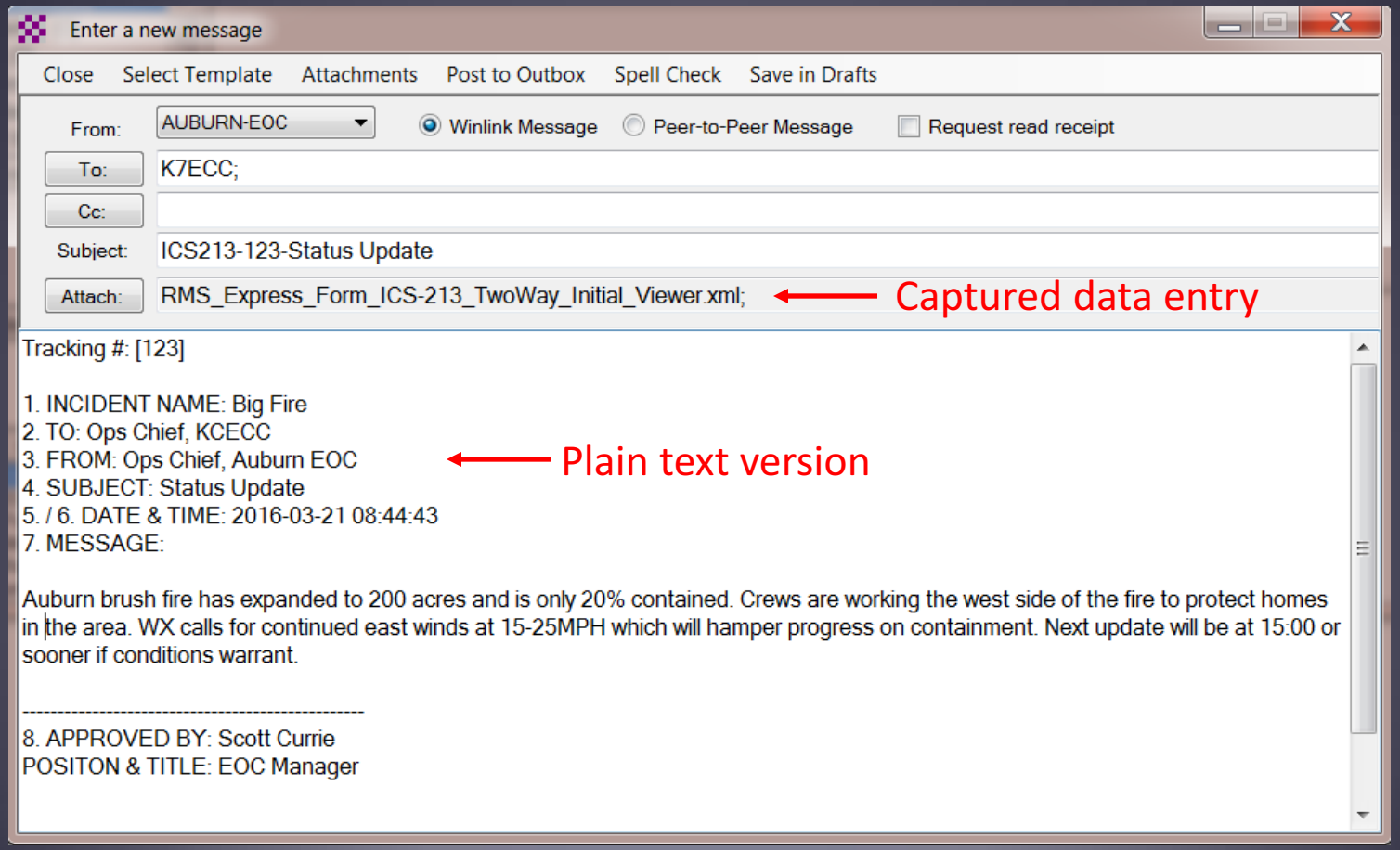
Auburn brush fire has expanded to 200 acres and is only 20% contained. Crews are working the west side of the fire to protect homes in the area. WX calls for continued east winds at 15-25MPH which will hamper progress on containment. Next update will be at 15:00 or sooner if conditions warrant.

8. Approved by: Scott Currie Position / Title: EOC Manager

Submit

RMS Express Forms

Completed form ready to send



Available RMS Express Forms (ICS)

- ICS 205 V1.26 Incident Communications Radio Plan
- ICS 205A V1.4 Communications List
- ICS 206 V2.1 Medical Plan
- ICS 213 V2.36 General Message
- ICS 213RR V1.3 Resource Request Message
- ICS 214 V2.2 Activity Log
- ICS 217A V1.6 Communications Resource Availability Worksheet
- All ICS forms are now available in one zip file: http://winlink.org/content/all_ics_forms_one_zip_file_v11

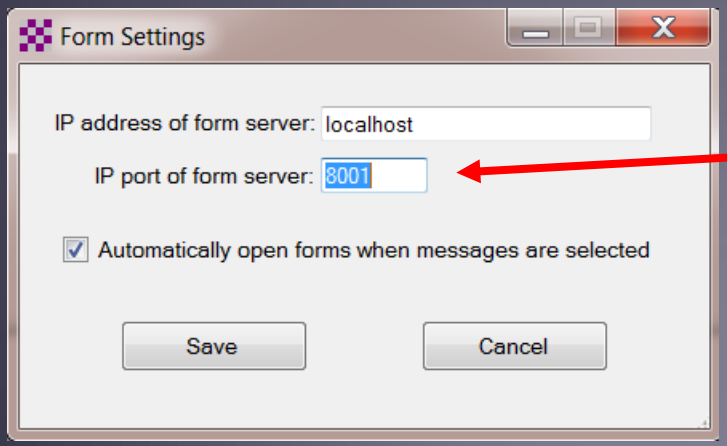
Available RMS Express Forms (general)

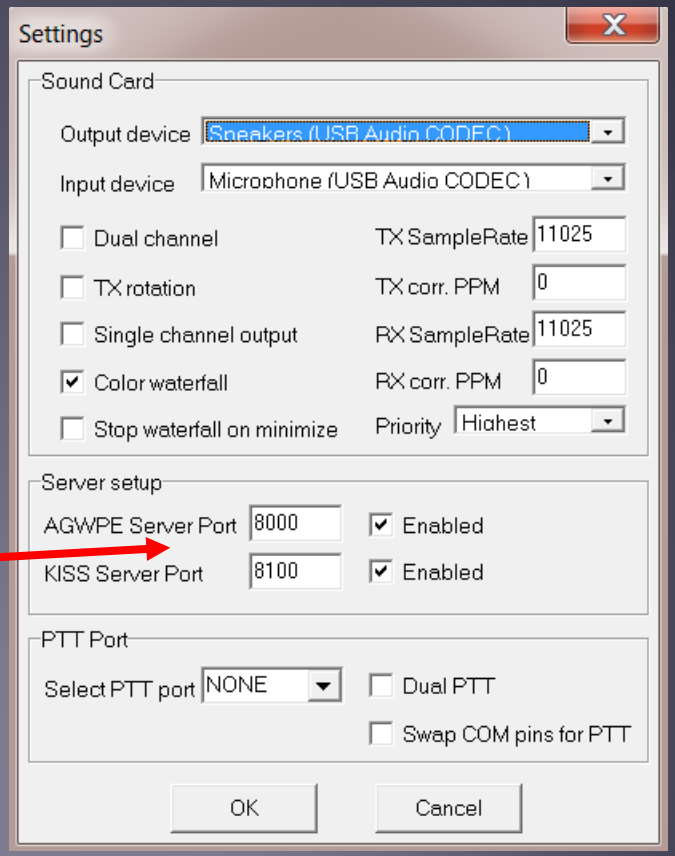
- HICS-ICS213 V2.6 General Message
- IARU V1.17 Radiogram
- ISNAP V1.0 Incident Snapshot for Counties / Tribal Nations
- RMSE V1.5 Hospital Bed Report (Marion County FL)
- RMSE V1.1 Clay County FL ICS 213
- RMSE V1.4 POD General Message Form
- RMSE V1.5 Bulletin Form
- RMSE V1.5 Simple Message
- RMSE V1.6ES Simple Message Spanish Version
- RMSE V1.8 Float Plan
- RMSE V2.0 Winlink Operator Check In

Initial Packet Setup

Sound Card Virtual TNC

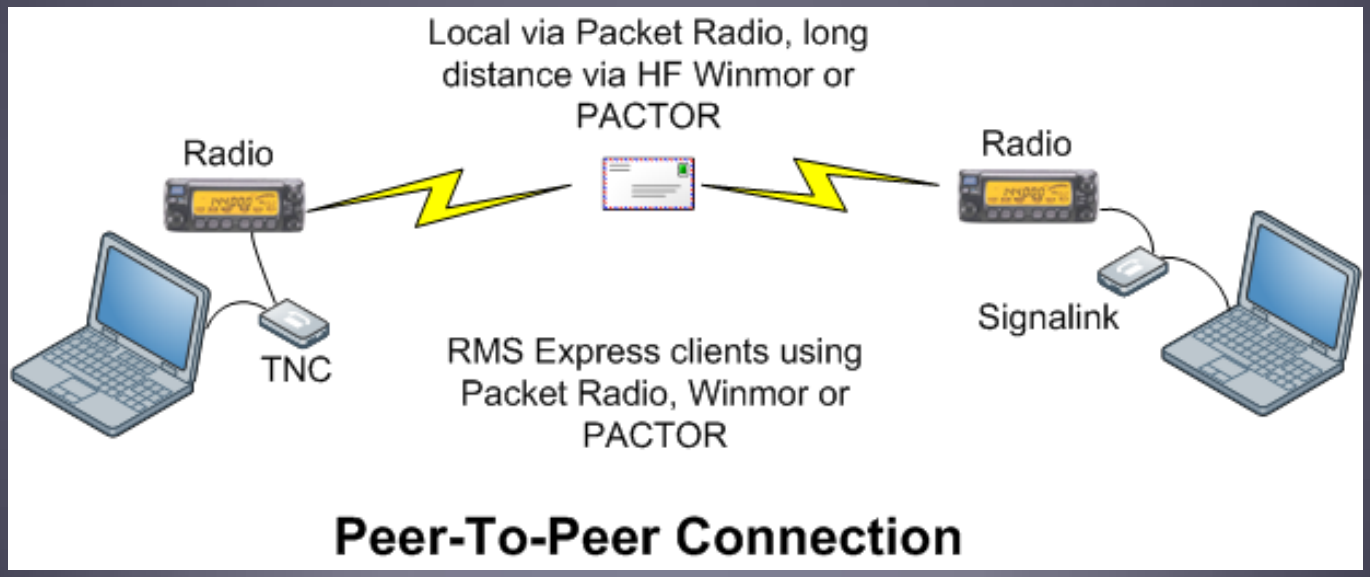
Make sure your Virtual TNC server TCP ports do not conflict with the RMS Express forms server port.





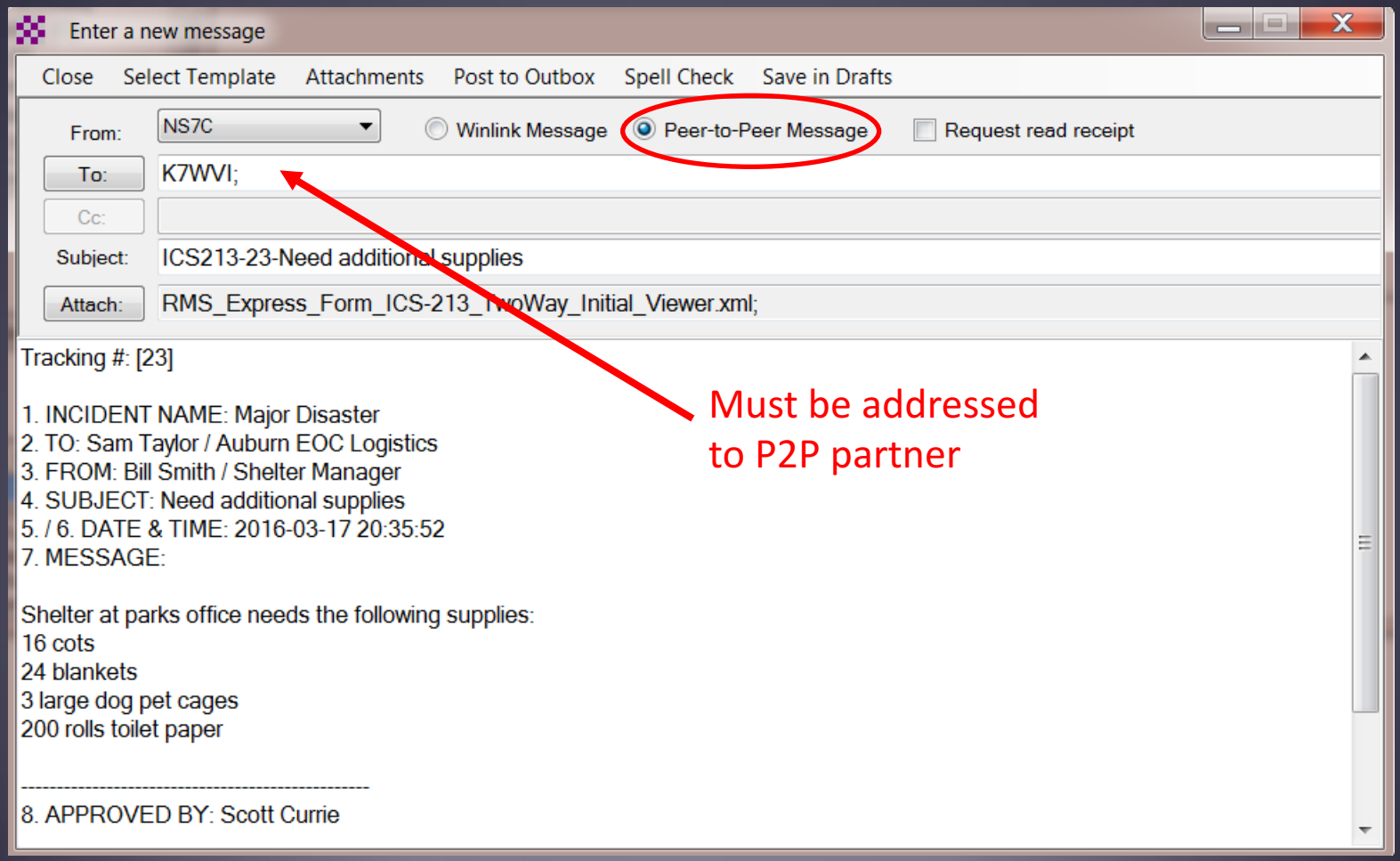
Winlink Peer-To-Peer Radio-Only Operation

- Peer-to-peer: direct radio connection betweenend-users.
- The Internet is not used, all communication by radio.
- Only the two client stations are involved.
- 100% error-free transmission and fileattachments.



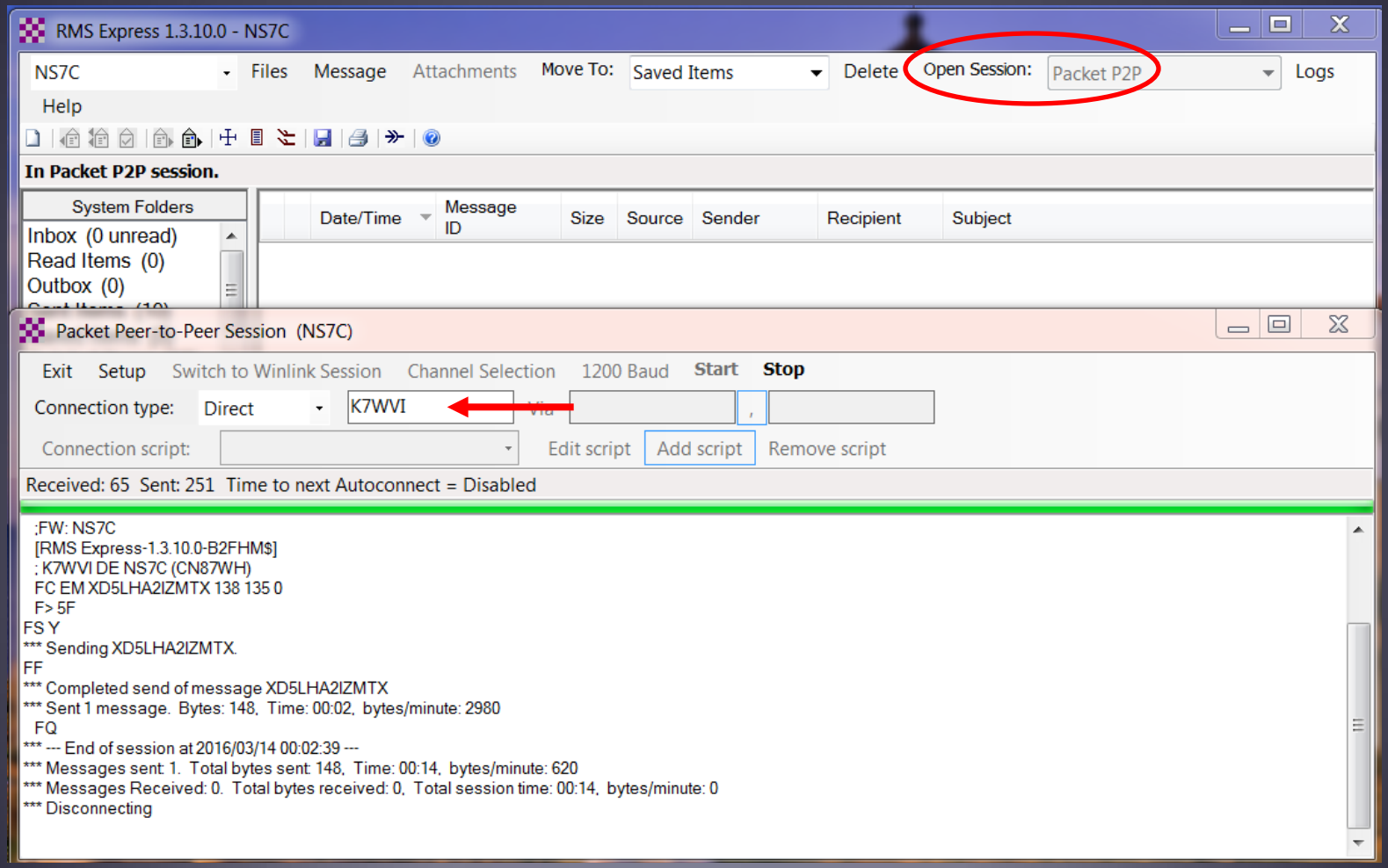
P2P Message

Set to P2P, addressed to receiving station



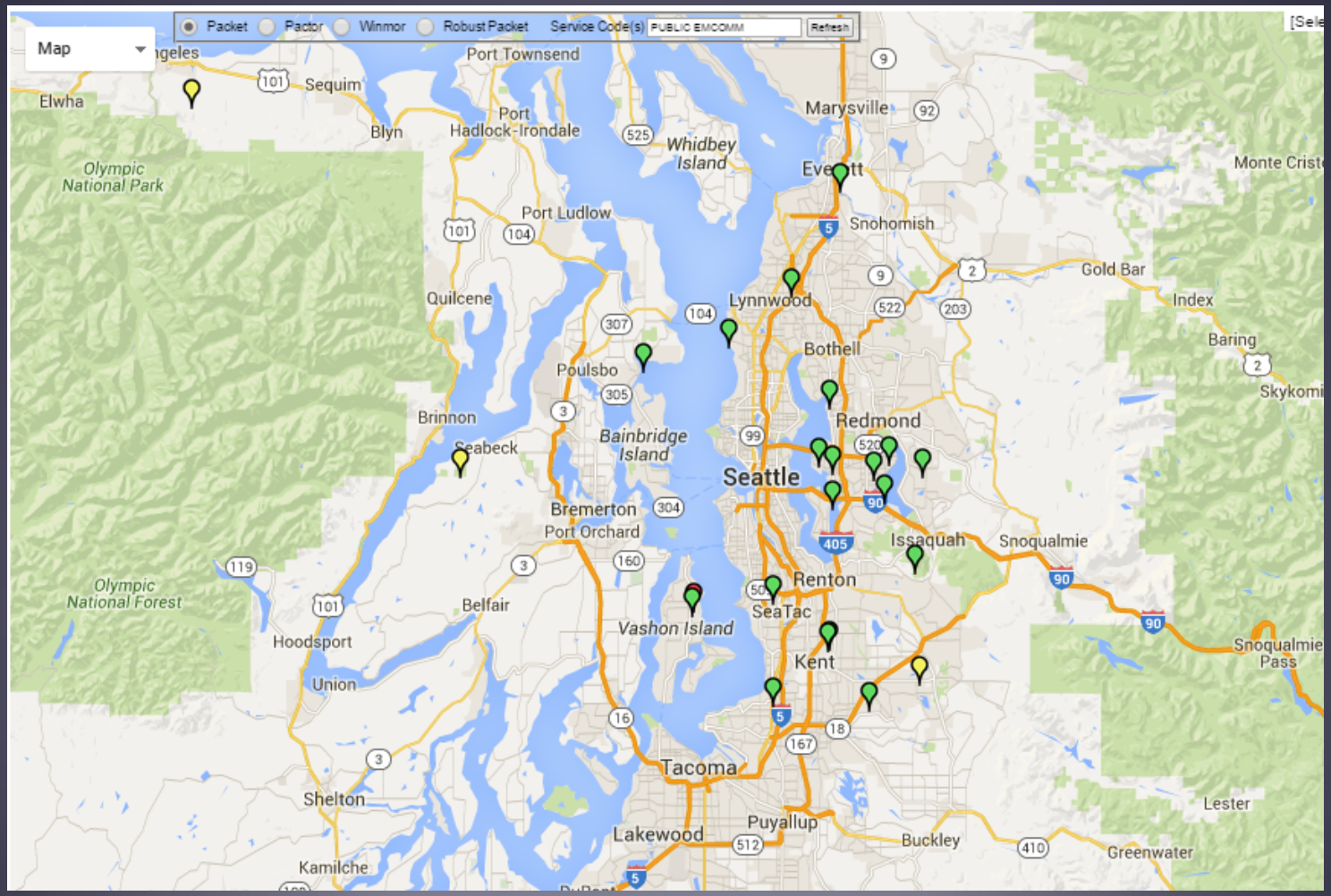
Packet P2P Session Log

Connect, login, send message, log off



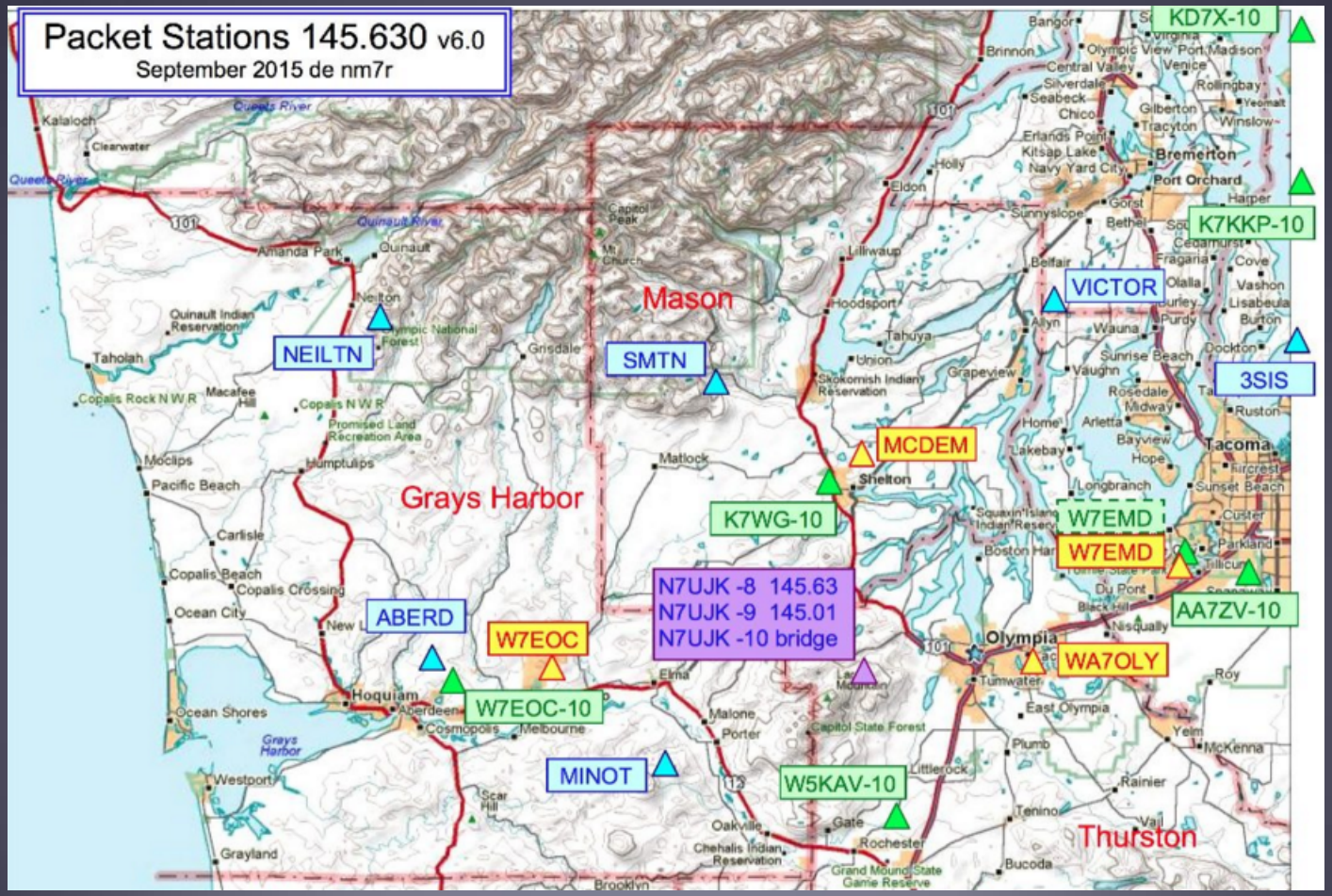
Using the Local Network

Local Packet Gateway Stations



Using the Local Network

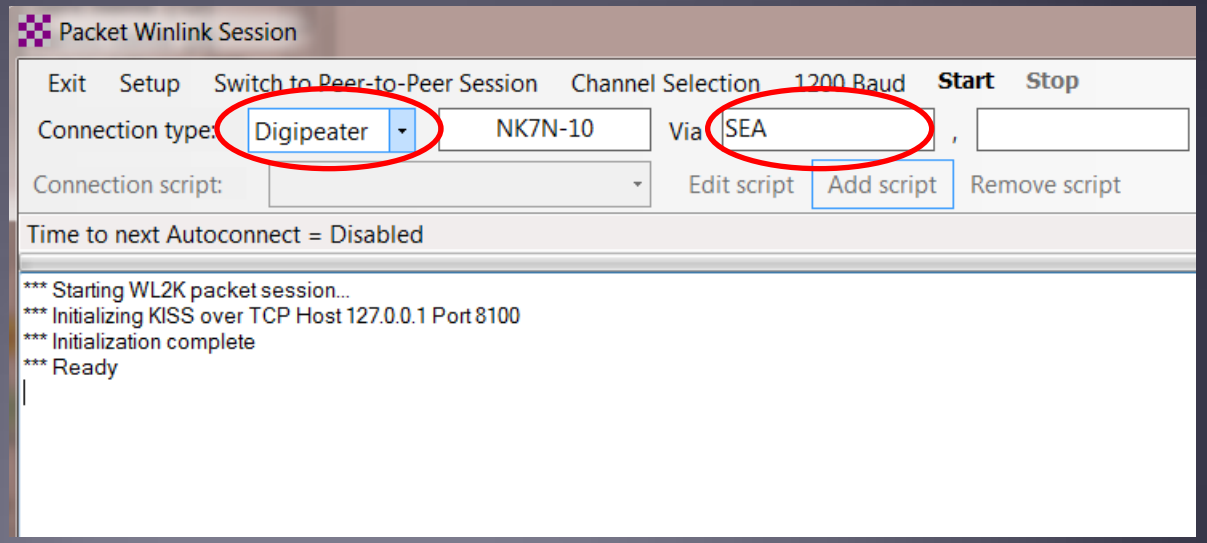
Local Packet Gateway Stations, nodes and digipeaters



Using the Local Network

Digipeaters and Nodes

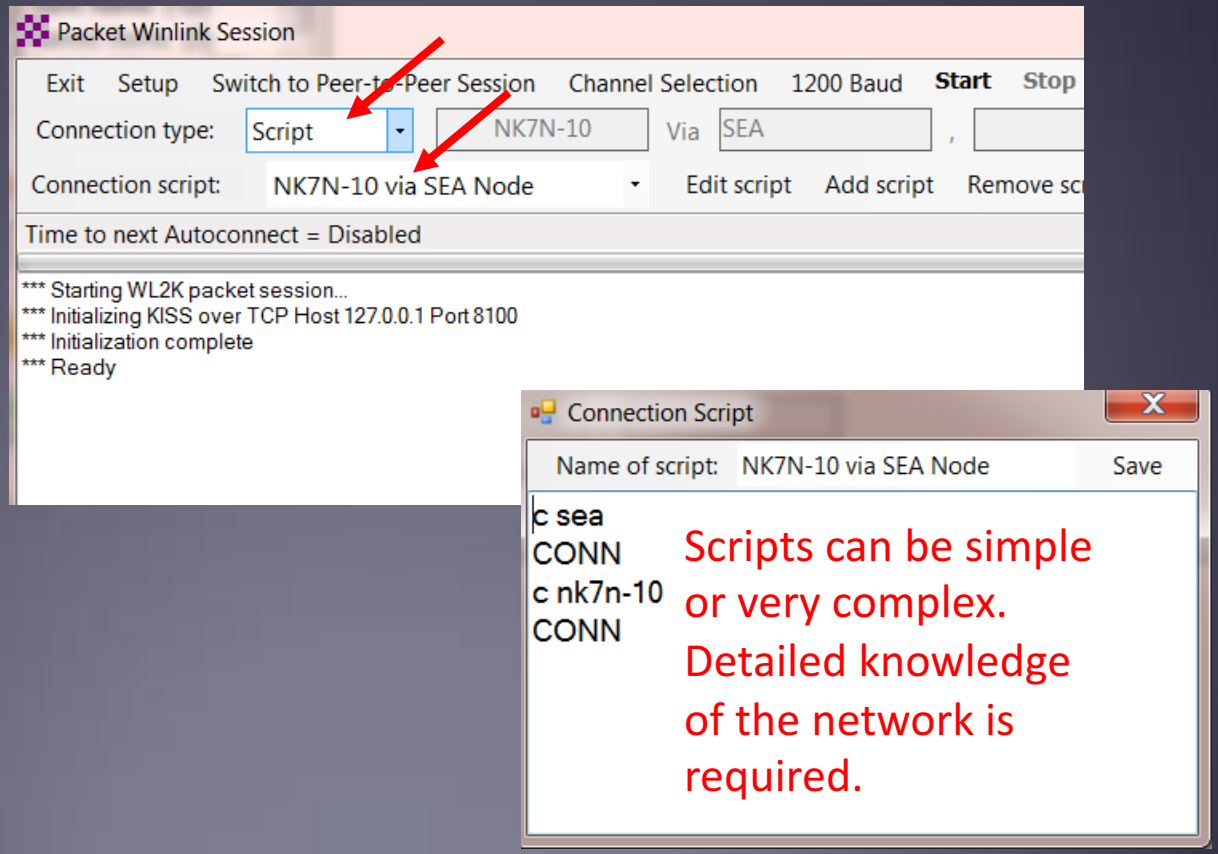
Digipeaters can be used to extend the line-of-sight path to a Gateway or P2P partner. Any station can function as a digi if properly configured. Lower level sites are actually better than mountain top sites. Each hop through a digi decreases performance, multiple hops can slow transfer speeds considerably.



Using the Local Network

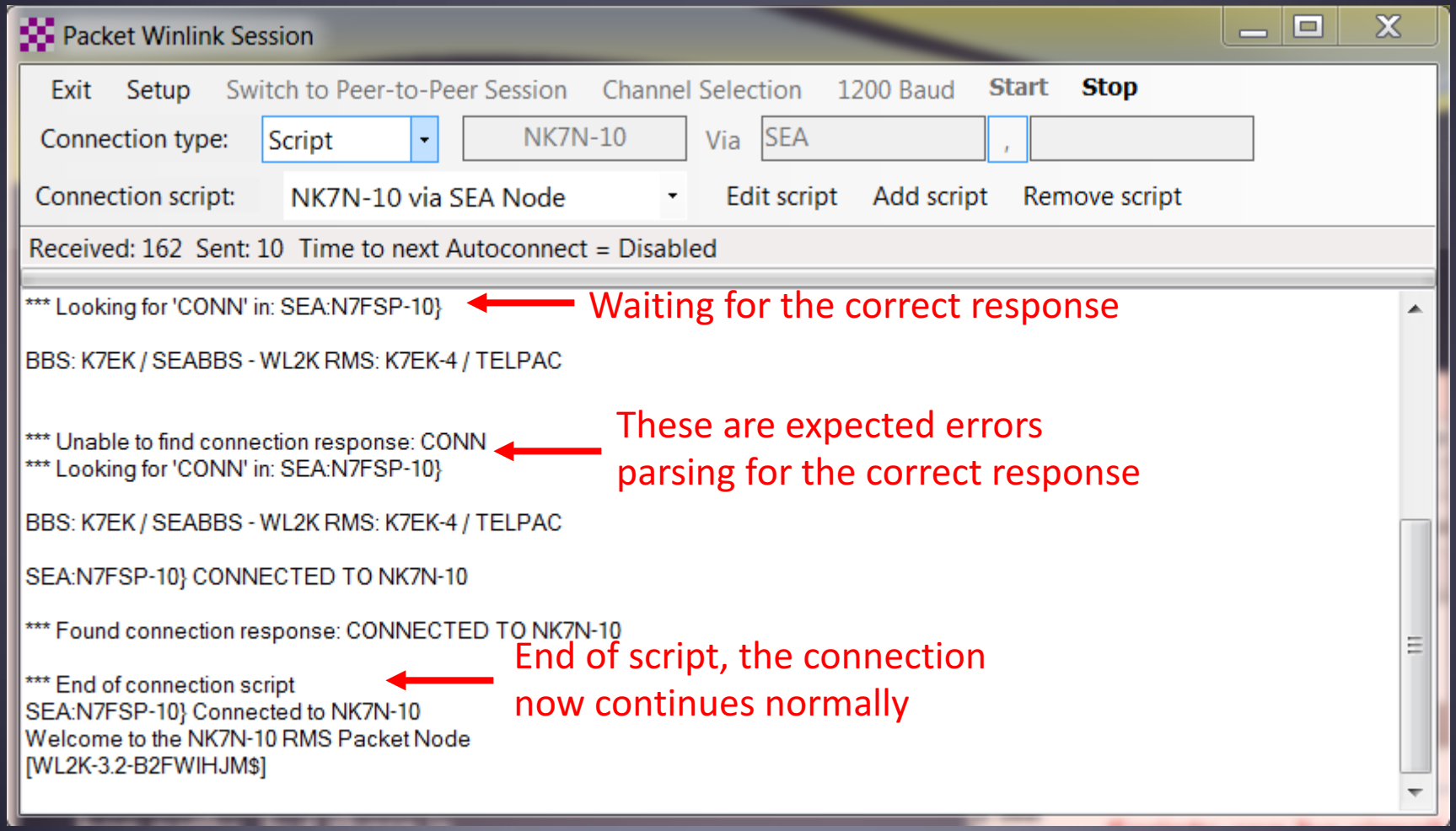
Digipeaters and Nodes

Complex connections through Nodes can be created using connection scripts. Scripts issue commands and wait for the appropriate response. Nodes provide better performance over multi-hop paths, but there is still a significant performance penalty.



Using the Local Network

Digipeaters and Nodes



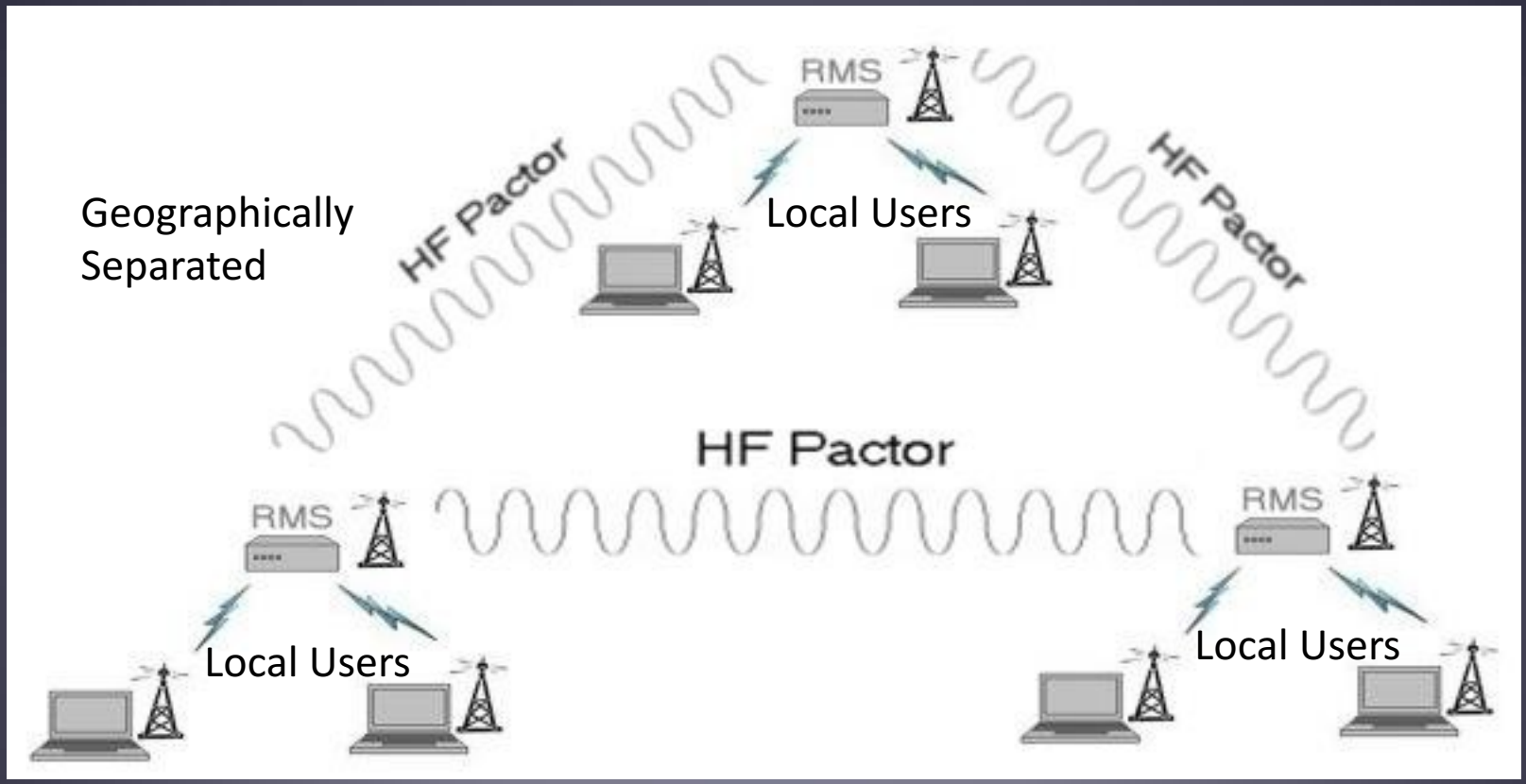
Using the Local Network

Digipeaters and Nodes

- Using nodes and digis has a significant impact on throughput
- Requires a good knowledge of available resources
- May require adjustment of packet parameters
- Be aware of the “hidden terminal” issue
- Full duplex digital repeaters are a better solution
  - There is only 1 available, in Snohomish
- You cannot run voice and data on the same band at the same time from the same location. We need to have voice and data on different bands.

Winlink Radio-Only Network

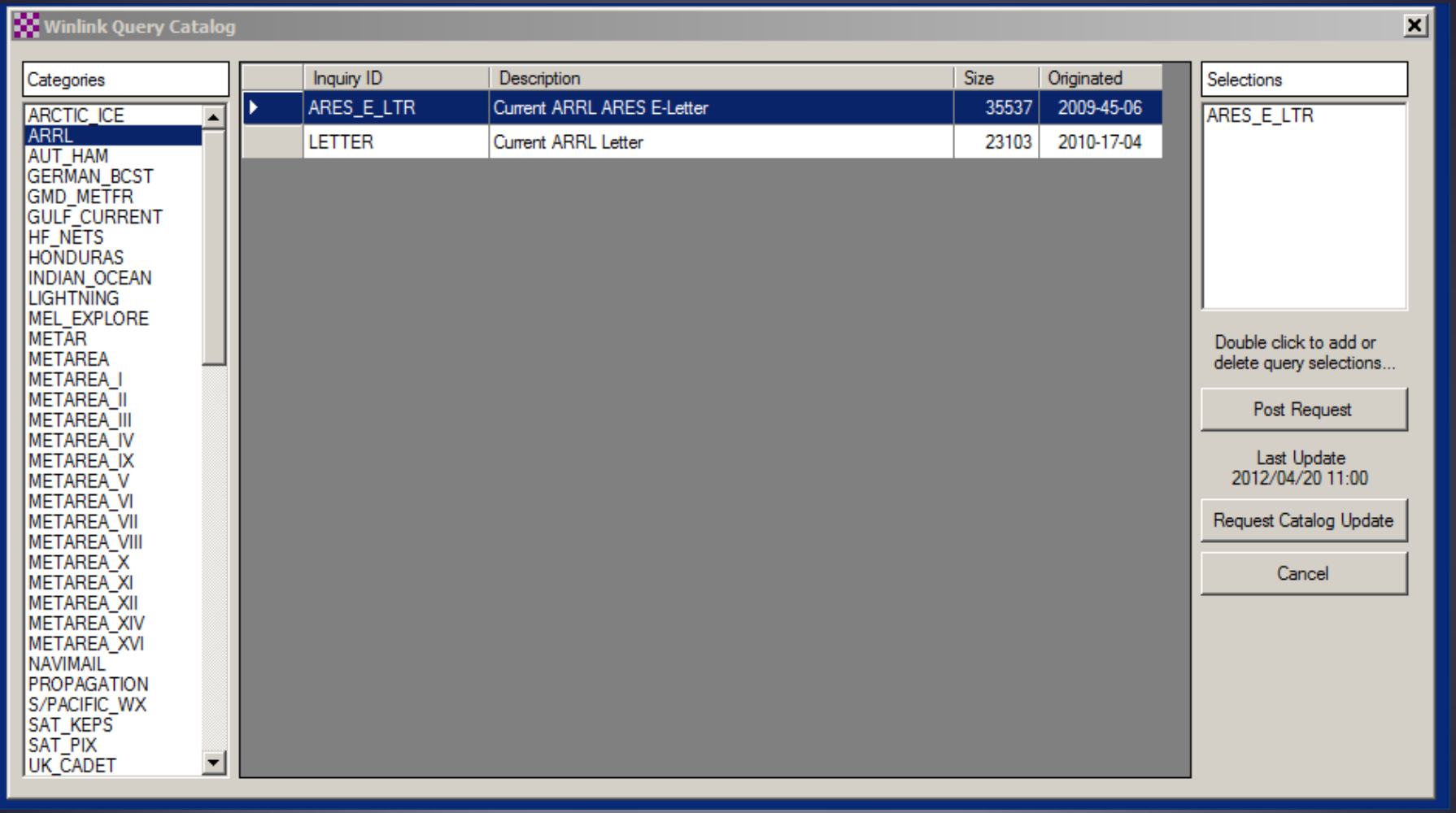
Local networks connected by HF, regional or long distance



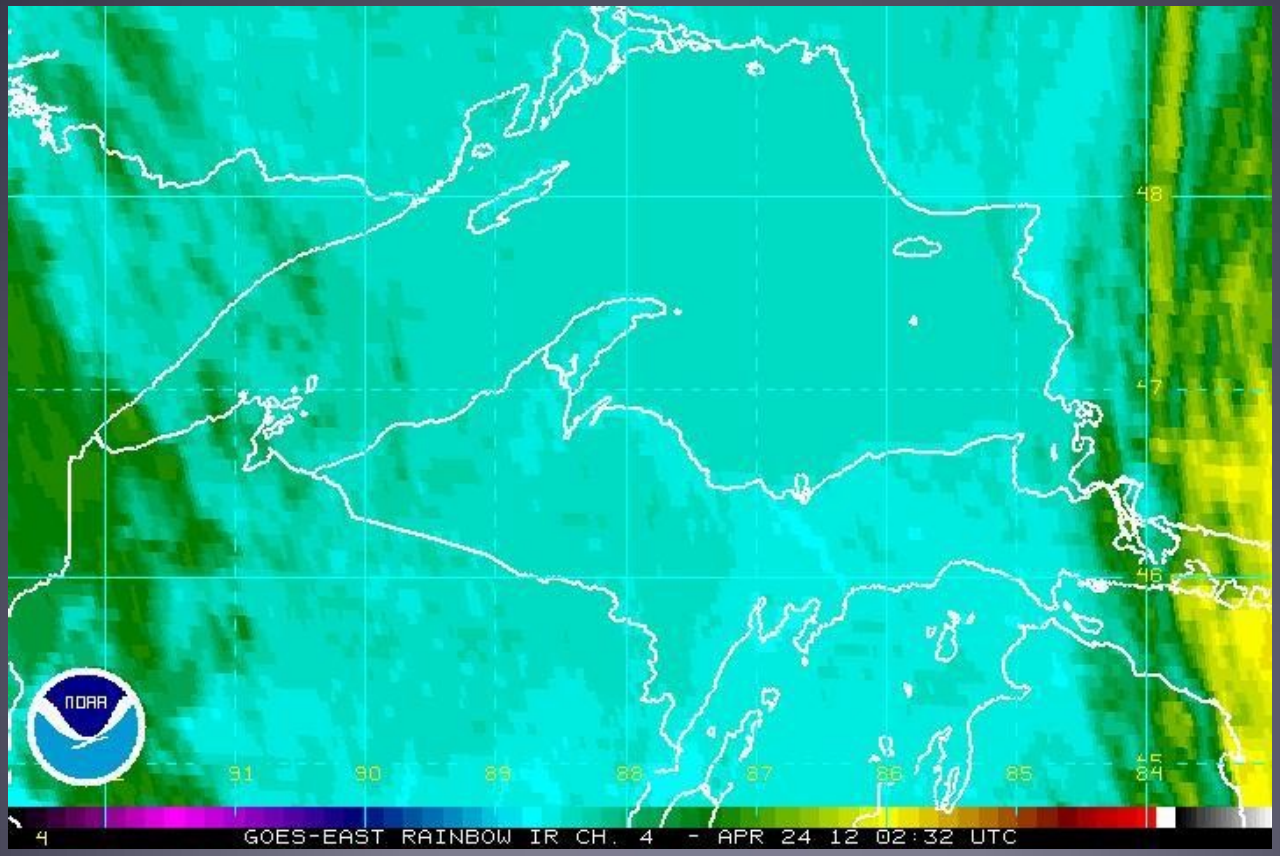
Catalog Information Requests

- Use the “Winlink Catalog Request” feature in RMS Express to request:
  - Weather maps for most areas of the world.
  - Weather forecasts.
  - Maritime HF nets and frequencies.
  - Satellite images.
  - Location of closest 30 stations.
  - ARRL Newsletter, e-letter, etc.
  - Misc. bulletins.

RMS Express Query Catalog



Weather Map Image Returned for Request



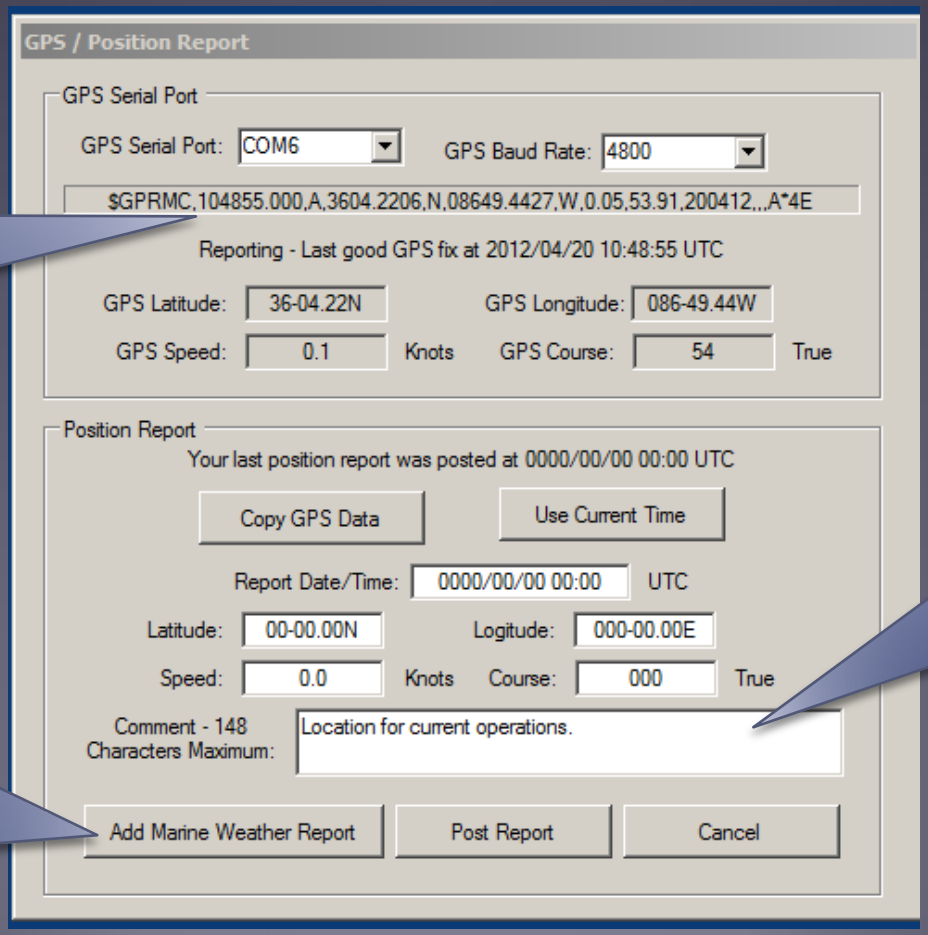
Winlink Position Reports

- You can send position reports to the Winlink system.
  - Coordinates sent via connected GPS.
  - Otherwise, your position may be entered manually.
- Position Reports are sent to:
  - Winlink system map.
  - ShipTrak maps.
  - APRS maps.
  - YotReps maps.
- Extremely valuable for pinpointing locations, especially for maritime operation.

Posting a Position Report

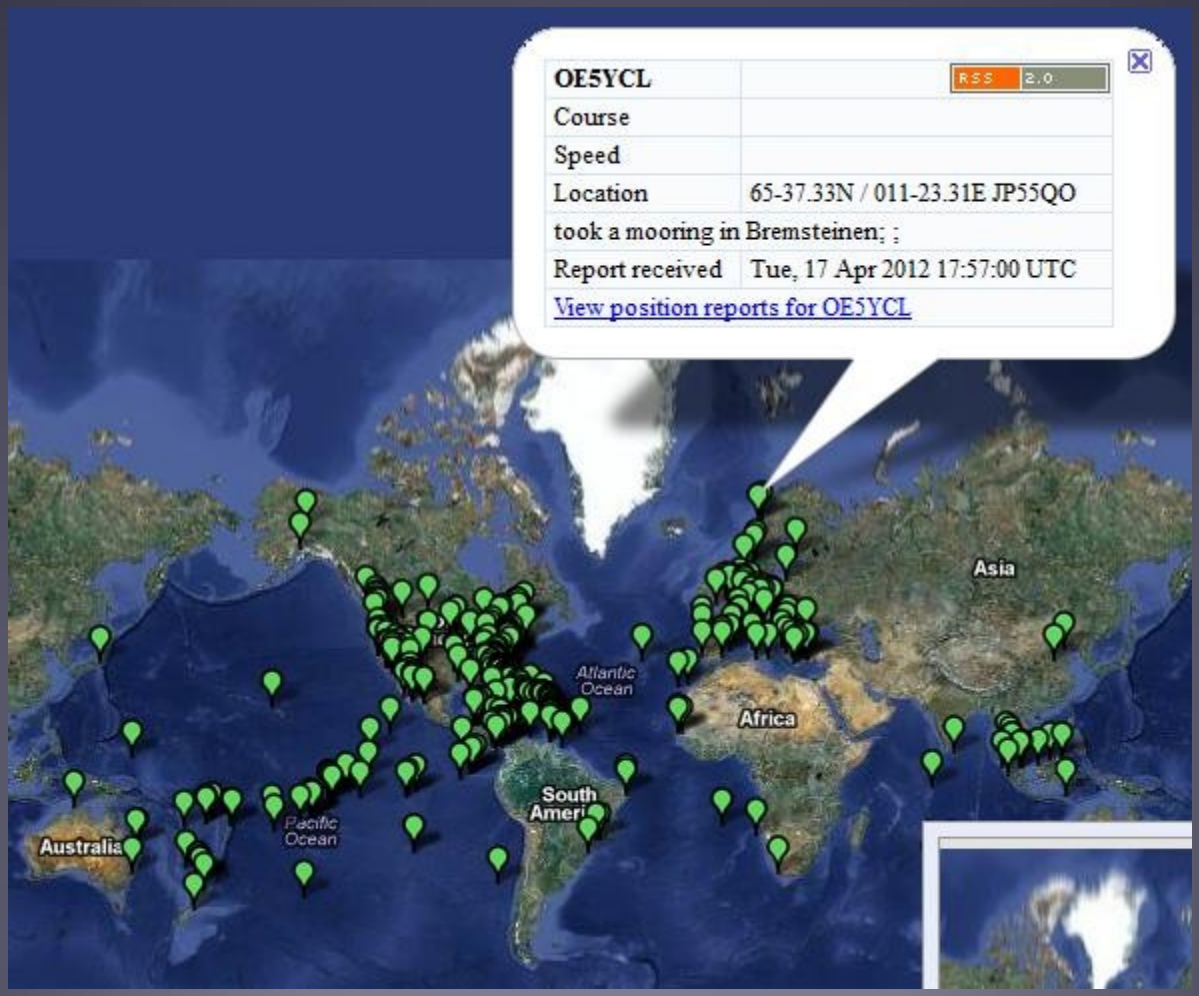
Data from a connected GPS unit.

WX assistance to the NWS Voluntary Marine Observation Program.



Useful in tracking with e-mailed disaster assessments.

Winlink.org Real-time Position Report Page



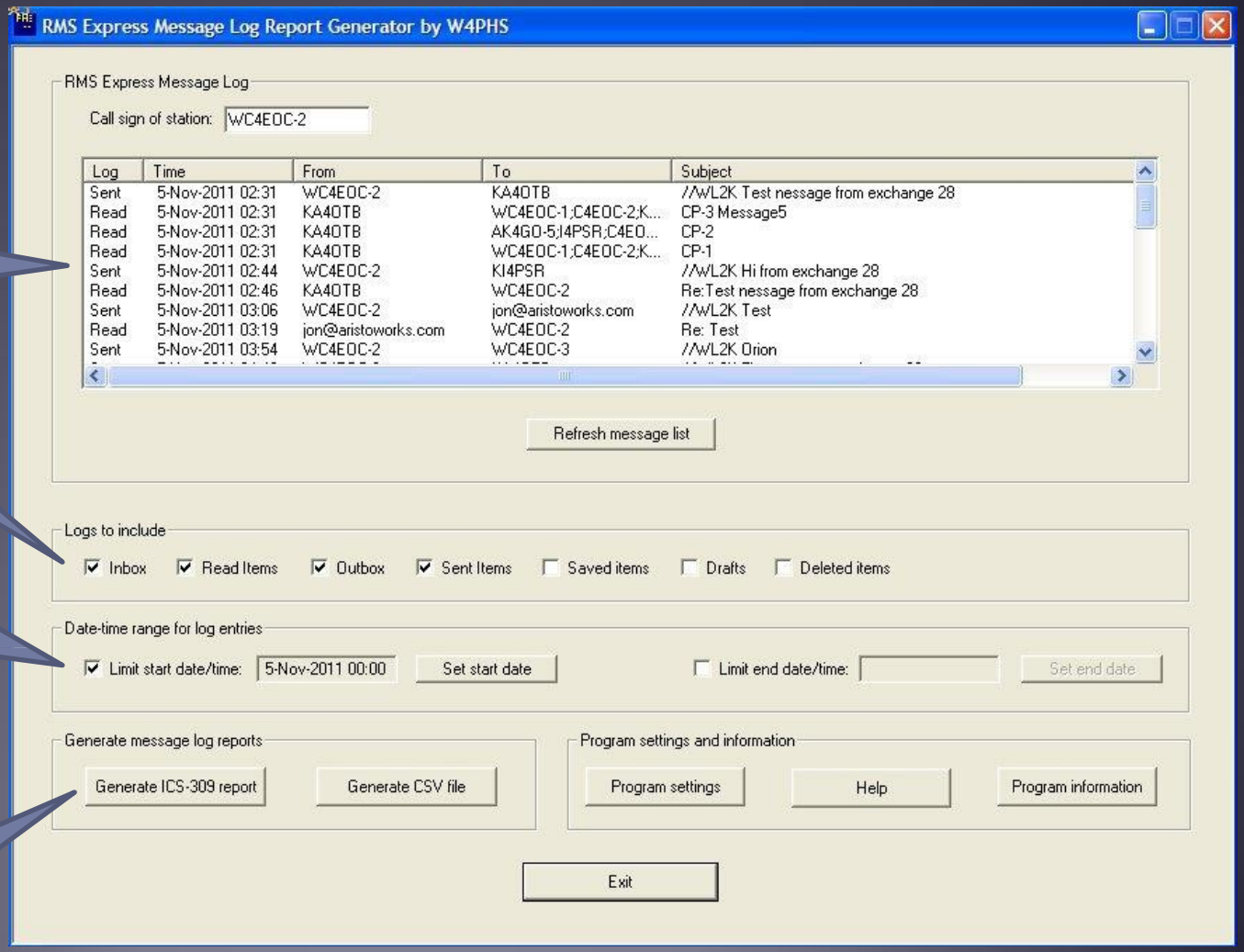
RMSMessageLog ICS-309 Generator

Messages during period

Select folders

Starting & ending report period

Generate ICS-309 pdf file



Generated ICS-309 PDF Message Log Report

COMMUNICATIONS LOG	TASK #	DATE PREPARED: 10-Sep-2011 TIME PREPARED: 15:31
OPERATIONAL PERIOD # 0800 - 1100 Sep. 10, 2011	TASK NAME: HOW-100 bike ride	
RADIO OPERATOR NAME: W4PHS		STATION I.D. Rest Stop # 3

LOG

TIME	FROM	TO	SUBJECT
10-Sep-2011 08:21	KA4OTB	AK4GO KI4PSR WC4EOC-2 WC4EOC-1	HOW-100
10-Sep-2011 08:23	WC4EOC-2	KA4OTB	//wl2k Rest Stop # 3
10-Sep-2011 08:31	WC4EOC-2	KI4PSR WC4EOC-1	//wl2k Rest Stop 3
10-Sep-2011 09:11	WC4EOC-2	KA4OTB KI4PSR	//WL2K Test from Rest Stop 3
10-Sep-2011 09:12	KA4OTB	WC4EOC-2	Re:Rest Stop # 3
10-Sep-2011 09:12	KA4OTB	WC4EOC-2	Re:Rest Stop # 3
10-Sep-2011 09:12	KI4PSR	WC4EOC-2 KI4PSR WC4EOC-1	Re:Rest Stop 3
10-Sep-2011 09:14	WC4EOC-2	KI4PSR	//WL2K Re:Rest Stop 3
10-Sep-2011 09:14	KA4OTB	WC4EOC-2	Test Message
10-Sep-2011 09:16	WC4EOC-2	KA4OTB	//WL2K Re:Test Message
10-Sep-2011 09:34	KI4PSR	KA4OTB AK4GO KI4PSR WC4EOC-2 WC4EOC-1	Re:HOW-100
10-Sep-2011 09:50	WC4EOC-2	KA4OTB	//WL2K Water received at Rest Stop 3
10-Sep-2011 10:00	WC4EOC-2	KA4OTB	//WL2K Rest Stop 3 has riders
10-Sep-2011 10:12	KA4OTB	WC4EOC-2	Re:Rest Stop 3 has riders
10-Sep-2011 10:23	WC4EOC-2	KI4PSR	//WL2K Winlink--vhf or hf
10-Sep-2011 10:51	KI4PSR	WC4EOC-2	Re:Winlink--vhf or hf
10-Sep-2011 10:53	WC4EOC-2	KI4PSR	//WL2K Re:Winlink--vhf or hf
10-Sep-2011 11:02	WC4EOC-2	KA4OTB KI4PSR	//WL2K Rest stop 3 shutting down

ICS-309 report generated by RMSMessageLog version 1.2.0 on 10-Sep-2011 15:31

Future Development
Amateur Radio Digital Open Protocol (ARDOP)

- The ARDOP project is a joint development effort among amateur radio developers that seeks to provide a specification and implementation (software or hardware) for a modern versatile open digital protocol.
- Replaces Winmor, AX.25 Packet, ???
- Soundcard based, or open hardware platform

Future Development
Amateur Radio Digital Open Protocol (ARDOP)

Target Objectives

1. **Open design:** Document and build a modern amateur radio protocol that can be used on a different common OS, computers, tablets and DSP devices and is compatible with both HF and VHF transmission. The protocol should be easily extended. Software implementations will be open sourced. A conformance specification and compatibility test insures compatibility between ARDOP implementations.
2. **Flexible implementation:** It is anticipated there will be several implementations compatible with different software and hardware platforms. These include:
    - Software implementations (virtual TNC with "sound card") on Windows, Linux, Apple and Android OS
    - Hardware implementations using low cost dedicated DSP CPU chips and integrated "sound cards"
3. **Audio bandwidth options:** The initial ARDOP protocol is intended to operate in one of four audio bandwidths, 200 Hz, 500 Hz, 1000 Hz, and 2000 Hz. The bandwidth can be forced by server, forced by client or negotiated by the server and client.
4. **Channel adaptability:** The protocol is intended to be able to operate over a wide range of data rate and robustness levels by automatically adapting to propagation and channel conditions, seeking the best modulation and bandwidth to maximize net error-free throughput.
5. **Support both FEC and ARQ operation:** ARQ (connected) operation insures error free data delivery between two connected stations. FEC (Forward Error Correction) may be used for broadcast (multicast) applications. The bandwidth, modulation mode and repeat level for FEC (multicast) operation is selectable to allow sender tradeoff of robustness and net throughput. Receiver reception requires no setup. Both FEC and ARQ transmission may be monitored by listening parties.
6. **Compliance with US FCC symbol rate rule:** The maximum symbol rate on any carrier shall be 300 baud or less for all SSB modes. The protocol shall allow modification extensions to symbol rates above 300 baud if and when the FCC rules are changed.
7. **Strong resistance to multipath propagation:** The protocol shall use modern techniques (low symbol rates, OFDM carrier cyclic prefix, 4FSK modulation, path compensation, strong FEC etc. to optimize performance under poor multipath conditions (path delay variation up to 5 ms).
8. **Minimize Interference:** The protocol shall minimize the chance of interference with other existing connections on a frequency using modern busy channel detectors and listen before transmit.
9. **Flexible operating modes and radios:** The protocol may be used on both HF (SSB mode) and VHF/UHF (SSB or FM mode). Timing parameters are adjusted automatically for ARQ modes to accommodate various transmitter keying options, SDR type radios and the use of carrier or sub tone operated VHF/UHF repeaters.
10. **Compatible with multi language usage:** Although the protocol requires ASCII compliant call signs (7 characters plus optional SSID of -1 through -Z), all data is transferred in pure binary insuring protocol compatibility with multi-language character sets like UTF-8.

Conclusion

- Winlink use continues to grow, especially for EmComm.
- The Winlink Development Team continues to enhance capabilities to adapt to changing needs.
- RMS Express is the recommended client application
  - Familiar e-mail like user interface
  - Flexible connection options
  - HTML form support
  - Used by most local teams