



RMS Express – Winlink Global Radio E-Mail System



What is Winlink

- Worldwide system for sending e-mail via radio.
- Provides e-mail from almost anywhere in the world.
- Entirely supported and operated by amateur radio volunteers (Amateur Radio Safety Foundation, Inc.).
- Started as “SailMail” providing support for sailors.
- Adopted for contingency communication by many government agencies.
- Used by infrastructure-critical NGOs such as International & American Red Cross, Southern Baptist Disaster Relief, DHS Tiered AT&T Disaster Response & Recovery, FedEx, Bridgestone Emergency Response Team, etc.

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 System Architecture

Hierarchical levels of the Winlink system:

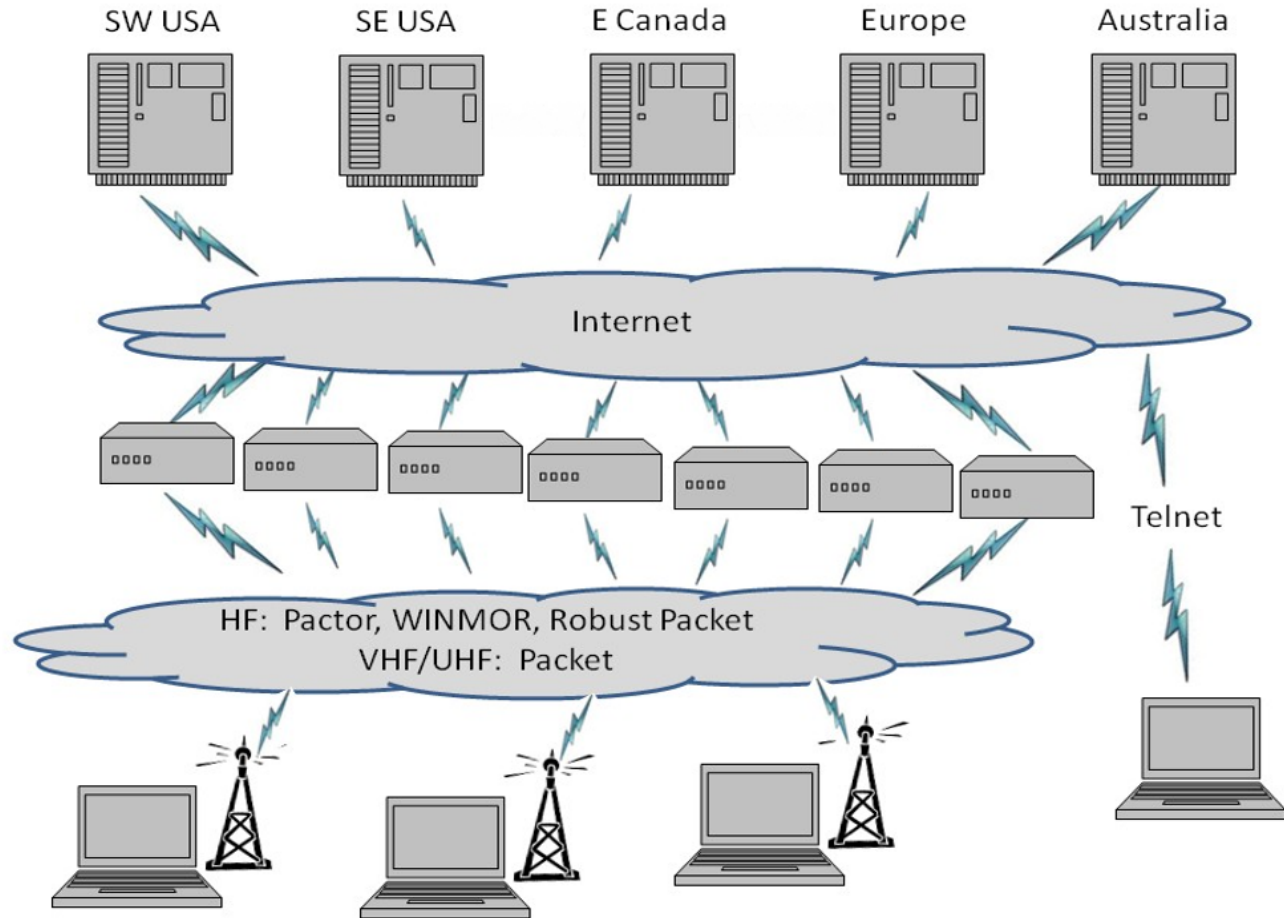
- 1. *Client system*** – Radio, computer with Winlink software (RMS Express), TNC (or sound card) and you, the end-user!
- 2. *Radio Message Server (RMS)*** – Radio gateway between the client (end-user) and the Winlink system backbone.
- 3. *Common Message Servers (CMS)*** – Winlink backbone.
 - 5 CMS locations,
 - redundant, fault-tolerant
 - located on 3 continents
 - One CMS sufficient for operation

Winlink Normal Network Operation

CMS

RMS
(gateways)

Client
(you)

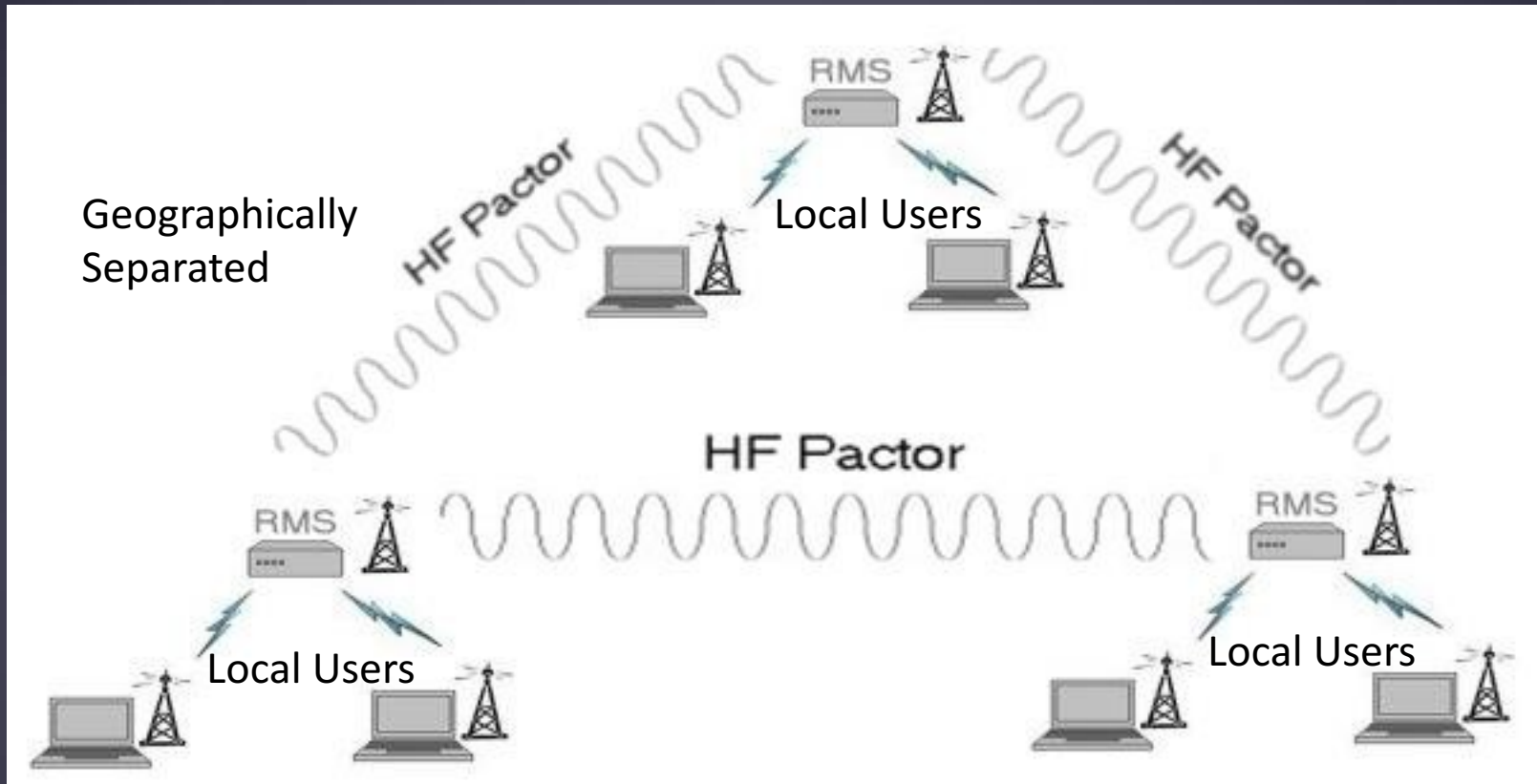


Winlink System Architecture

- Client users connect to gateway stations over RF (local or long distance).
- Gateway stations then connect to the CMS via the Internet.
- Local RF connections can be direct to the gateway, or use digital repeaters and/or network nodes to extend LOS range.
- Radio-Only “mesh” networks can be built where the gateway stations operate as message servers and do not use the internet. This creates a “local LAN” which can then be connected to other LANs via HF forwarding, regional or long distance.
- Direct peer-to-peer connections between clients are also supported, both local and long distance.

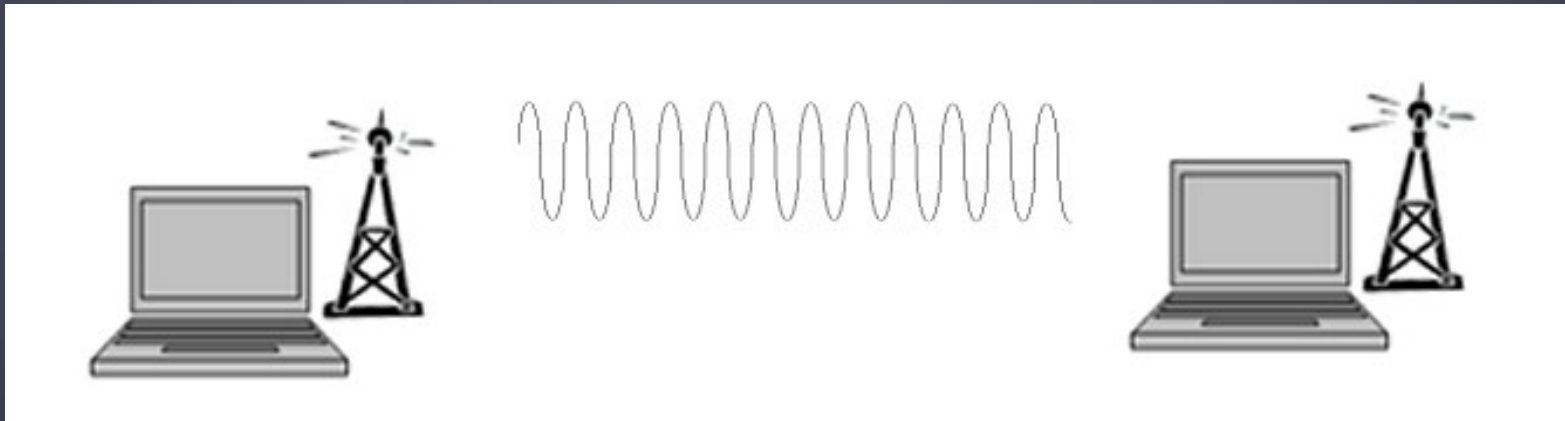
Winlink Radio-Only Network

Local networks connected by HF, regional or long distance



Winlink Peer-To-Peer Radio-Only Operation

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



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 SCSTracker).
 - **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+).

Levels of Message Validation & Correction

- **No validation or correction** –RTTY, BPSK-31.
- **Forward Error Correction (FEC)** – Redundant information transmitted so minor errors can be corrected: MT63, Olivia, QPSK-31.
- **Automatic Repeat Request (ARQ)** – Positive or negative packet acknowledgements from receiving station: Pactor, Winmor, Packet, TCP/IP.
- Pactor and Winmor use both FEC and ARQ.
- Only ARQ provides 100% accurate message delivery.
- Accuracy is essential for EmComm.

Resources Needed for RMS Express

VHF/UHF Packet Radio

- Computer running Windows XP through Windows 10.
- .NET 3.5 framework.
- RMS Express program.
- V/UHF radio with data port (1200/9600) or speaker/mic connection (1200 only).
- Signalink or similar USB soundcard interface, or Packet TNC (Kantronics, TNC-X, MFJ, etc.). Might require a USB to Serial dongle.
- Note: Some new radios have built-in soundcards/TNC's.
- Software downloads:
 - <ftp://autoupdate.winlink.org/User%20Programs/>
- All software is free, donation is suggested.

Signalink Soundcard Interface

- Simple device powered by USB connection.
- Cost is about \$100 including radio-specific cable.
- Radio needs to have a data (sound) port, or use microphone and speaker connections.
- Need to run “Software TNC” application (Direwolf, UZ7HO soundmodem).



Packet TNC

- Can be simple KISS mode, or full function.
- Cost from about \$100 to \$1500.
- Radio needs to have a data port (1200/9600), or use microphone and speaker connections (1200 only).
- Some radios include a built-in TNC or sound card.



Installing RMS Express

- Download zip file:
 - <ftp://autoupdate.winlink.org/User%20Programs/>
- Extract the .msi installer from the zip file and run it.
- Complete the setup screens (call sign, location, etc.).
- Browse C:\RMS Express\, right click on.
 - RMS Express.exe and select option to create a shortcut.
- Note: Winmor will be installed automatically.
- Download propagation prediction program (for HF only) zip file, extract .exe installer file from zip file and run it.

RMS Express Main Screen

Begin connection

Connection Mode

Multiple call signs

Standard Folders

Personal message folders

Contacts address book

No active session...

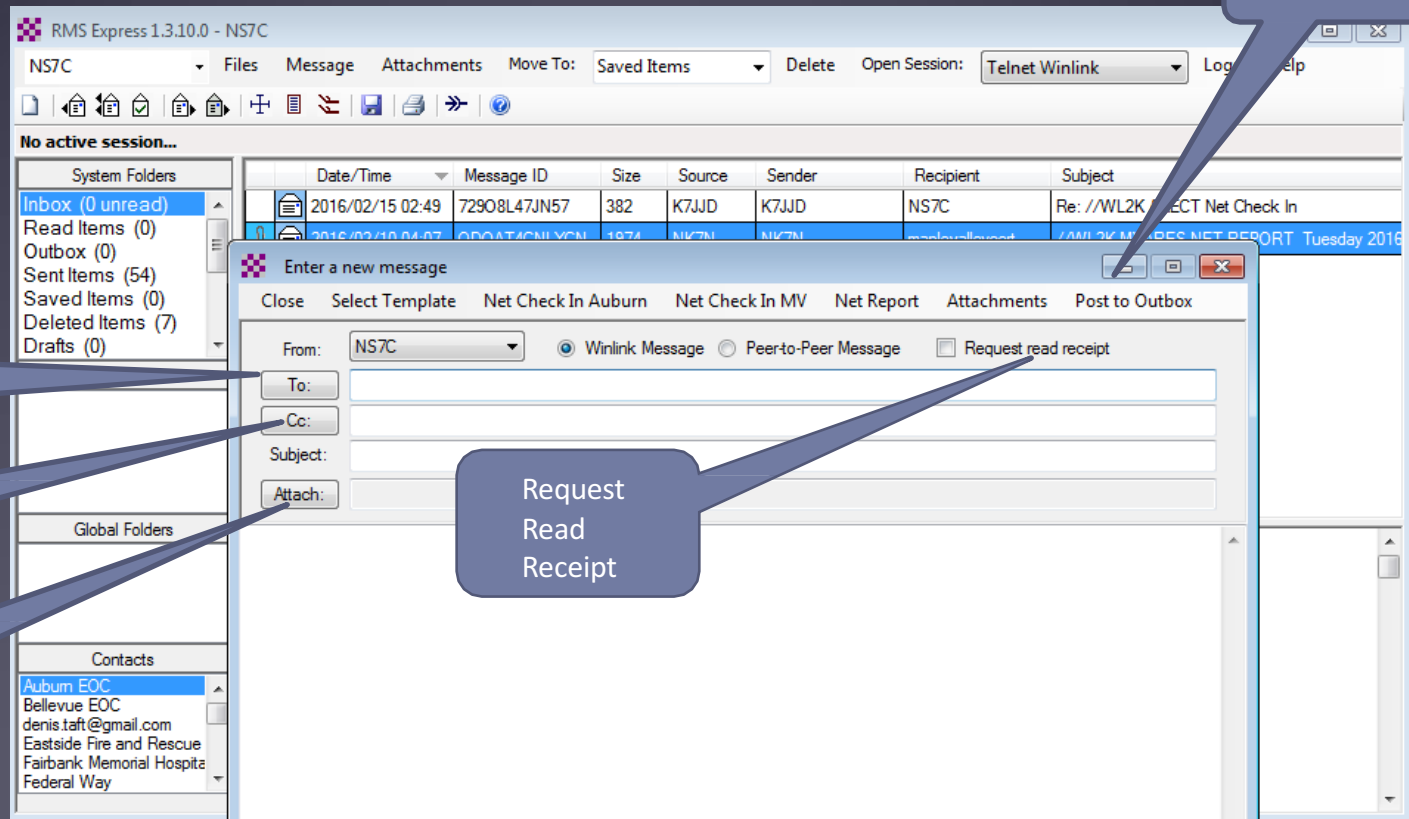
	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
	2016/02/15 02:49	72908L47JN57	382	K7JJD	K7JJD	NS7C	Re: //WL2K AAECT Net Check In
	2016/02/10 04:07	QDOAT4CNLYCN	1974	NK7N	NK7N	maplevalleycert...	//WL2K MVARES NET REPORT Tuesday 2016

Message ID: QDOAT4CNLYCN
Date: 2016/02/10 04:07
From: NK7N
To: maplevalleycert@gmail.com; mvares@googlegroups.com; NS7C; NK7N
Source: NK7N
Downloaded-from: Telnet:Halifax.Winlink.org
Subject: //WL2K MVARES NET REPORT Tuesday 2016-02-09

Maple Valley ARES Weekly Net Report

of Member check ins: 8

Composing A Message



New Message Button

Click "To" or "CC" for contacts

Multiple recipients and CC

File attachments

Request Read Receipt

Post to Outbox

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

Enter a new message

Close Select Template Net Check In Auburn Net Check In MV Net Report Attachments Post to Outbox

From: NS7C Winlink Message Peer-to-Peer Message Request read receipt

To: WA7AUB;

Cc: W7JKC;

Subject: AAECT Net Check In

Attach:

Greetings!

Please record a Winlink Check In from SCOTT, NS7C on Monday, 2016-02-15 at 14:34:02.

Regards,
SCOTT, NS7C

Pending Message In Outbox

Open Session

The screenshot shows the RMS Express 1.3.10.0 - NS7C interface. The window title is "RMS Express 1.3.10.0 - NS7C". The menu bar includes "NS7C", "Files", "Message", "Attachments", "Move To: Saved Items", "Delete", "Open Session: Telnet Winlink", "Logs", and "Help". The toolbar contains various icons for file operations. The left sidebar shows "System Folders" (Inbox (0 unread), Read Items (0), Outbox (1), Sent Items (54), Saved Items (0), Deleted Items (7), Drafts (0)), "Personal Folders", "Global Folders", and "Contacts" (Auburn EOC, Bellevue EOC, denis.taft@gmail.com, Eastside Fire and Rescue, Fairbank Memorial Hospita, Federal Way). The main area displays a table of messages with the following data:

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2016/02/15 19:20	80XON681WR0I	260	NS7C	NS7C	WA7AUB	//WL2K AAECT Net Check In

Below the table, the message details are displayed:

Message ID: 80XON681WR0I
Date: 2016/02/15 19:20
From: NS7C
To: WA7AUB
Source: NS7C
Subject: //WL2K AAECT Net Check In

Greetings!

Please record a Winlink Check In from SCOTT, NS7C on Monday, 2016-02-15 at 11:20:44.

Regards,

Once a message has been posted to the outbox, it remains there until a transfer session has been opened and started. Kind of like the old dial-up days.

Resources Needed for RMS Express

HF Winmor

- Same computer and software requirements as V/UHF connections.
- ITSHF propagation prediction program.
- HF radio with data (sound) port and optionally computer control (CI/V, CAT, etc. for rig control).
- Signalink or similar USB soundcard interface.
- Note: Some new radios have built-in soundcards.
- All software is free, donation is suggested.

Active Winmor Connection

WINMOR Sound Card TNC Ver:1.5.8.0 Port:8500 NS7C / VA7DEP

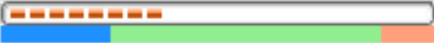
Help Hide Send ID

Connection State

IRS

TCP Capture OK

Receive


Rcv Level: 

Remote Station Offset: -23.7 Hz

Rcv Frame: 2 Car 4FSK FEC Data

Transmit

0 Avg ACK Percentage 100

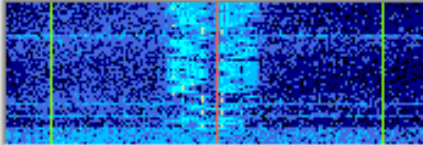


Xmt Frame:

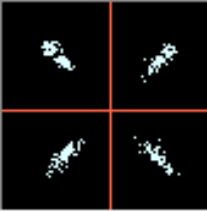
Busy Detector

Squelch: 5

Waterfall Spectrum Disable



500 Waterfall 2KHz 2500



4FSK / 74

Similar modem interface as other HF digital modes.

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.
- We need good HTML/JavaScript programmers.

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.
- The form itself is not transmitted, only the data entered on the form.
- Forms may be very complex and feature rich, but the actual data transmitted is very compact.
- Receiving station must have the display form installed for proper display, but they will still receive a text-only version.

RMS Express Forms

ICS form for data entry in browser

Tracking # <input type="text" value="123"/> (Optional)		GENERAL MESSAGE	ICS213 RMSE Vers 2.36
1. Incident Name: <input type="text" value="Big Fire"/>			
2. To (Name / Position): <input type="text" value="Ops Chief, KCECC"/>			
3. From (Name / Position): <input type="text" value="Ops Chief, Auburn EOC"/>			
4. Subject: <input type="text" value="Status Update"/>		5./6. Date / Time: <input type="text" value="2016-03-21 08:44:43"/>	
7. Message: <input type="text" value="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: <input type="text" value="Scott Currie"/>		Position / Title: <input type="text" value="EOC Manager"/>	
<input type="button" value="Submit"/>			

RMS Express Forms

Completed form ready to send

Enter a new message

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

From: AUBURN-EOC Winlink Message Peer-to-Peer Message Request read receipt

To: K7ECC;

Cc:

Subject: ICS213-123-Status Update

Attach: RMS_Express_Form_ICs-213_TwoWay_Initial_Viewer.xml; ← Captured data entry

Tracking #: [123]

1. INCIDENT NAME: Big Fire
2. TO: Ops Chief, KCECC
3. FROM: Ops Chief, Auburn EOC ← Plain text version
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

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

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

Conclusion

- Winlink use continues to grow, especially for EmComm.
- The Winlink Development Team continues to enhance capabilities to adapt to changing needs.
- Winlink has three modes of operation to send and receive messages, even if the Internet is down:
 - RF connection through a gateway to a CMS Internet server.
 - Radio-only “MESH” network with HF relaying.
 - RF Peer-to-Peer connections between client stations.
- Steady improvements are being implemented.

Follow on sessions

- Session 2 this afternoon will focus on the technical details of installing and configuring RMS Express for V/UHF packet and HF Winmor operation using TNC's and sound card modems.
- Session 3 on Sunday afternoon will focus on the operation of RMS Express in the EMCOMM environment, and possible future developments.

Questions?