

SHArEd RESources High Frequency (HF) Radio Program (SHARES)

Overview for Maine



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Agenda

- Overview of SHARES program
- Benefit to Maine Agencies from membership
- Station Equipment
- Joining SHARES
- Supplemental Material

SHARES Overview

- Established in 1988, now part of DHS under CISA
- SHARES provides a single, inter-agency emergency message handling system for the transmission of National Security/Emergency Preparedness (NS/EP) information.
- SHARES is restricted to the USA and its possessions
- SHARES is agency driven with approximately 2500 participants and over 500 member entities.

Conditions for Use

- During an emergency, conditions for the use of SHARES include:
 - The information must support National Security or Emergency Preparedness.
 - The information must be of critical importance to the entity's mission or involve the preservation of life or property.
 - The primary means of communications must be inoperative or unavailable for use.
 - The processing of a SHARES message must not interfere with the primary mission of the participating stations.

General Benefits

- Proven components: HF SSB (voice & data), Winlink radio email, ALE, HF Alerting System
- Provides multiple HF channels, applicable for any distance (statewide. regional, national).
- True emergency service that promotes volunteer participation.
- Requires no external infrastructure
- Interoperable among civil authorities and their NGO partners
- “The SHARES mission is to support to your mission by providing various transport layers over dedicated HF Channels.”

Membership Categories

- Critical Infrastructure / Key Resources such as American Red Cross, AT&T, Verizon and Winlink
- Federal agencies and their volunteer auxiliary programs (e.g. USCG Auxiliary, MARS and CAP)
- State and County Emergency Management Agencies

Communications Components

- The network has been based on Coordination Nets with Net Control Stations
- Includes a dedicated Winlink radio-email system
- SHARES ALE (Automatic Link Establishment) is always active and available for use
- HF Alerting System continuously provides status updates and net information (region, channel, time)

Exercises & Readiness

- There are weekly national and regional nets
- Exercises may be initiated by member agencies.
SHARES HQ will assign frequencies based on exercise requirements and objectives.
- Winlink system practice and exercises as desired
- ALE system may be exercised at any time

Operating Guidelines

- Call signs, member details and frequencies are not public info.
- Call signs are agency/station specific. A single EMA may have multiple call signs based on the number of fixed and portable stations.
- Radio operators are designated by the agencies. There is no specific requirement for an operator to have an amateur radio license, but amateurs are one of the key groups that understand HF radio.
- The voice messaging guidelines follow the USCG Radiotelephone Handbook. There are no SHARES mandated message formats.
- Data may be mixed with voice on the voice channels.
- Encryption is permitted. An off-line encryption tool is available.
- Identification on the air is restricted to SHARES call sign, agency and general location.

Interoperability with the Amateur Radio Service

Stations participating in SHARES may communicate with amateurs as follows:

- With RACES (Radio Amateur Civil Emergency Service) operators
- With amateur radio stations engaged in emergency communications on the 5 amateur radio secondary channels at 5 MHz
- Via Winlink

Why SHARES for Maine?

Relying on normal VHF Public Safety radio communications systems requiring a local infrastructure can lead to issues in certain situations, especially for complex messages.

- If local repeaters are out, HF radios are the only way to communicate across the state. NVIS frequencies are very reliable for statewide and regional communications.
- SHARES is the only HF capability, outside of Amateur Radio, that can be used by EMAs.
- No radio license is required. Ham HF skills are directly transferable to SHARES. Hams can also train EMAs to use.
- Unlike Ham, there are no FCC restrictions and no competition from other national & international activities such as contesting, DX, etc.

Why SHARES for Maine?

Multiple ways of transmitting information.

- Voice messages
 - Throughout the state without repeaters using regional (NVIS) channels. This can be supplemented using NBEMS on the same channel for data transfer. (Standard procedure for Ham VHF but not permitted on HF.)
- Winlink Email
 - Able to send radio-email using a laptop connected to a HF radio on the SHARES frequencies.
 - Beneficial if local internet or commercial email systems are nonfunctional
- NBEMS digital forms
 - Able to send data in common ICS and EOC formats
 - Compatible with Winlink and other transport modes
- Voice, NBEMS and Winlink are well established in Maine on the ham bands.

Typical Hardware Configuration

**Voice, Winlink, NBEMS:
SHARES & Ham!**



Most of our EMAs have many of the above components. The radio will have to be “opened” for continuous coverage. The SCS Pactor modem is the one significant addition. The external tuner may or may not be required depending upon the antenna.

Registered Maine SHARES Stations

County	EOC	Other	Comments
Hancock	1	1	Winlink HF capable (Jan 2021)
Knox	1	3	Winlink HF capable (4), Regional primary beacon/ALE (1)
Lincoln	1	2	Winlink (2 Telnet), active SSB & CW net participation (1)
Piscataquis	1		Inactive at present
Waldo	1		Winlink HF capable
York	1	1	Inactive at present
MEMA	1		FNARS ALE
Augusta NG JOC	1		Winlink Telnet capable

SHARES Activity in Maine

- Weekly SHARES Winlink Check In Exercise
 - Message sent every Sunday to all Maine Winlink capable stations plus one EOC in NH. This includes the Augusta NG JOC. Replies may be sent by Telnet or Pactor HF.
- In the planning stages for a periodic Maine SSB net (voice and NBEMS)

Signing Up

**FOR OFFICIAL USE ONLY
(WHEN FILLED IN)**

SHARES HF RADIO PROGRAM STATION DATA FORM SECURITY PROCEDURES AND PRIVACY ACT	
ACTION: Add New Station ☒ Delete Station ☐ Update Station/ERP Data ☐ Add ERP ☐	
PART I: NCSH 3-3-1 STATION DATA	
1. ENTITY: <u>Your EMA</u>	2. STATION LOCATION: City _____ State _____
3. VOICE CALL SIGN: <u>TBD</u>	
4. BBS CALL SIGN: _____	
5. STAR CALL SIGN: <u>TBD if Portable</u>	6. STATION TELEPHONE: Commercial <u>207-</u> DSN _____
7. ALE ADDRESS CODE: _____	
8. VOICE FREQUENCIES:	9. ALE FREQUENCIES:
1. _____ Primary (*) ☐ LSB (V) ☐	1. _____
2. _____ ☐ ☐	2. _____
3. _____ ☐ ☐	3. _____
4. _____ ☐ ☐	4. _____
10. STATION HOURS OF OPERATION: 1 - 24 Hours ☐ 2 - Part Time/Duty Hours ☐ 3 - On Call/Emergency ☐	
11. STATION CAPABILITIES: (Check All That Apply)	
SSB Voice ☐	HF E-mail ☐ GTOR ☐ HF Packet ☐
ALE (141b/1045b) ☐	Phone Patch ☐ AMTOR ☐ CLOVER ☐
FACTOR/FACTOR II ☐	MODEM (1052) ☐ CLOVER 2000 ☐ STI ☐
STAR ☐	MODEM (110b) ☐ PSK31 ☐ MT63 ☐
PART II: SECURITY PROCEDURES AND PRIVACY ACT	
Information contained in NCSH 3-3-1, SHARES Directory, carries a FOR OFFICIAL USE ONLY (FOUO) designation due to the compilation of station data. To participate in SHARES, a member must comply with the following security procedures for handling FOUO material as specified in NCSH 3-3-1, Chapter 1, para 1.9: (1) The information shall not be released in any manner to the public or other personnel who do not have a valid need-to-know; (2) the information shall not be photocopied or electronically reproduced; (3) when unattended, the information shall be stored in a locked container or in a room with sufficient physical access control measures to afford adequate protection to prevent unauthorized access; (4) when stored on a computer, the information shall be password protected; (5) the information shall be disposed of in such a manner as to ensure destruction beyond recognition and reconstruction; (6) upon leaving the SHARES program, the Project Office shall be notified of the date NCSH 3-3-1 is destroyed; and (7) the loss, compromise, suspected compromise, or unauthorized disclosure of the information shall be reported to the SHARES Project Office. Failure to comply with these security procedures to protect NCSH 3-3-1 information from unauthorized personnel shall result in removal from the SHARES program. Authority: Executive Order No. 12472, The Assignment of National Security and Emergency Preparedness Telecommunications Functions, authorizes the collection of this information. Purpose: The National Communications System (NCS) / Shared Resources (SHARES) Program uses the members' contact information to contact SHARES members. Further, the members' contact information is compiled in a directory that is distributed to all program members. Routine Uses: SHARES Program members can use this information to identify and communicate with one another by referencing the directory. Information contained in Part I of this Form is included in NCS Manual (NCSM) 3-3-1, SHARES Directory, and distributed to SHARES members as official use only (FOUO) information that may only be used for program purposes. Disclosure: Provision of this information is voluntary. However, failure to provide the information requested on the FORM 1 may result in exclusion from the SHARES program or not appearing in the SHARES directory.	
PART III: ADMINISTRATIVE DATA	
STATION POINT OF CONTACT OR ERP: Name: _____ Address: _____ Phone: _____ E-mail: _____	ENTITY POINT OF CONTACT: Name: _____ Entity: _____
STATION POINT OF CONTACT OR ERP: I have read and understand the procedures contained in Part II of this Form 1. Signature _____ Date _____	ENTITY POINT OF CONTACT: I approve the Form 1 request. Signature _____ Date _____

**FOR OFFICIAL USE ONLY
(WHEN FILLED IN)**

SHARES FORM 1

- Download a copy of the SHARES Form 1
- Fill it out and sign for the Station POC and Entity POC
- Feel free to contact me for assistance with filling out and submitting
- Instructions are on the backside of the Form
- Some hints follow

Form 1 Top

PART I: NCSH 3-3-1 STATION DATA			
1. ENTITY: <u>Your EMA</u>		2. STATION LOCATION:	
3. VOICE CALL SIGN: <u>TBD</u>		City <u> </u>	
4. BBS CALL SIGN: <u> </u>		State <u> </u>	
5. STAR CALL SIGN: <u>TBD if Portable</u>		6. STATION TELEPHONE:	
7. ALE ADDRESS CODE: <u> </u>		Commercial <u>207-</u> DSN <u> </u>	
8. VOICE FREQUENCIES:		9. ALE FREQUENCIES:	
	Primary (*)	LSB (+)	
1. <u> </u>	☐	☐	1. <u> </u>
2. <u> </u>	☐	☐	2. <u> </u>
3. <u> </u>	☐	☐	3. <u> </u>
4. <u> </u>	☐	☐	4. <u> </u>
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11. STATION CAPABILITIES: (Check All That Apply)			
SSB Voice	☒	HF E-mail	☒
ALE (141b/1045b)	☐	Phone Patch	☐
PACTOR/PACTOR II	☐	MODEM (1052)	☐
STAR	☐	MODEM (110b)	☐
		GTOR	☐
		AMTOR	☐
		CLOVER 2000	☐
		PSK31	☐
		HF Packet	☐
		CLOVER	☐
		STI	☐
		MT63	☐

- Put TBD for the call sign. SHARES will assign. If you want separate call signs for voice and data or have more than one station, put in the number of calls requested.
- STAR is only for portable stations (e.g. drop kits).
- Be accurate in the hours of operation.
- For SSB voice, NBEMS and Winlink just check the SSB and HF Email boxes.

Form 1 Bottom

STATION POINT OF CONTACT OR ERP: Name: _____ Address: _____ Phone: _____ E-mail: _____	ENTITY POINT OF CONTACT: Name: _____ Entity: _____
STATION POINT OF CONTACT OR ERP: I have read and understand the procedures contained in Part II of this Form 1. Signature _____ Date _____	ENTITY POINT OF CONTACT: I approve the Form 1 request. Signature _____ Date _____

- The Station POC is the person responsible for the station. It will generally be the same as for the Entity POC.
- If the Entity (e.g. EMA Director) authorizes a person to operate a remote station, that person would be the Station POC.

Things to Remember

- The agency director can authorize any qualified person (employee or volunteer) to operate a SHARES station. They need to understand the items in Part 2 of Form 1 and understand the rules and procedures for station operation.
- If a person is involved in SHARES on an ongoing basis and would benefit from SHARES membership, then a Form 1 would be filled out by the agency for that person. An example would be a person operating a fixed station that is remote from the EOC.

SHARES Working Groups and HSIN

- Members are welcome to join the Working Group sessions. The most beneficial is the Interoperability Working Group (IWG). This generally meets on the last Friday of the month (10:00 to 11:30 AM) via teleconference. Each meeting has a presentation on some aspect of SHARES HF operations – radios, propagation, ongoing projects, etc.
- Members should have an account on HSIN. Documents (directories, net channels and times, etc.) are no longer emailed after the initial welcome email.

Questions?

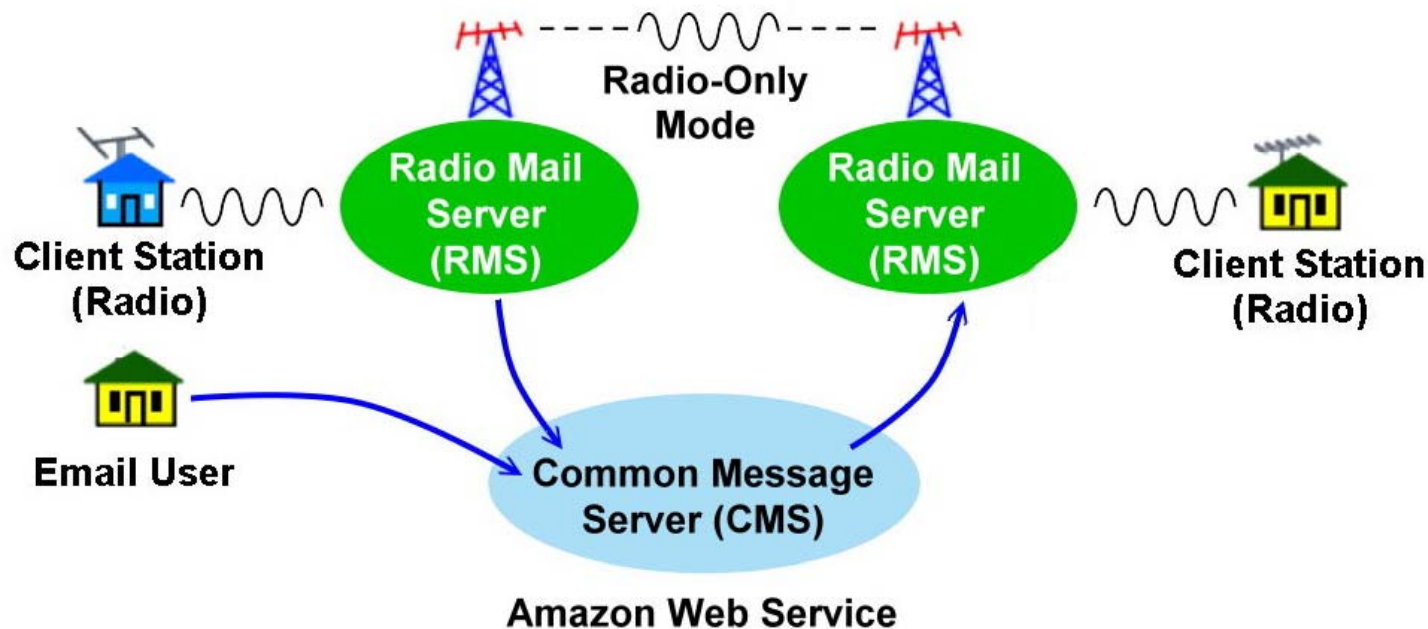
Supplemental Information

- Winlink Overview
- The HF Alerting Program
- Automatic Link Establishment (ALE)

Winlink Overview

- Winlink provides a very powerful system for data communications. SHARES and the Winlink Development Team have put a major focus on expanding the SHARES Winlink system in the USA.
- The Winlink system uses the Winlink Express client program. It looks much like an email program. It has many helps and built in features to assist with finding and connecting to a suitable gateway (RMS) station.
- Winlink messages are fully error corrected – 100% accurate.
- Ham and SHARES Winlink are parallel/separate services. In the “normal” mode, they can interoperate with each other.

SHARES Winlink



- Two modes of system operation:
 - Through the CMS (connect to a RMS anywhere that an internet connection exists).
 - Radio only (HF mesh network – use if there is an extremely widespread internet outage).
 - Stations may also connect directly with each other through the Peer to Peer mode of operation using any data mode available with Winlink Express.

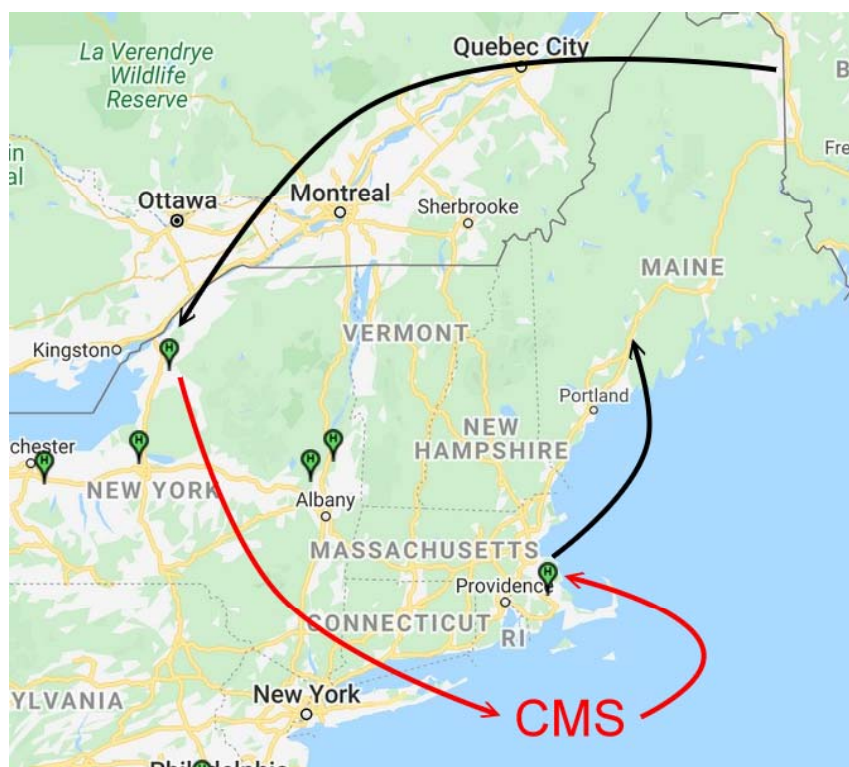
SHARES Winlink Gateways



All gateways are capable of radio-only operation

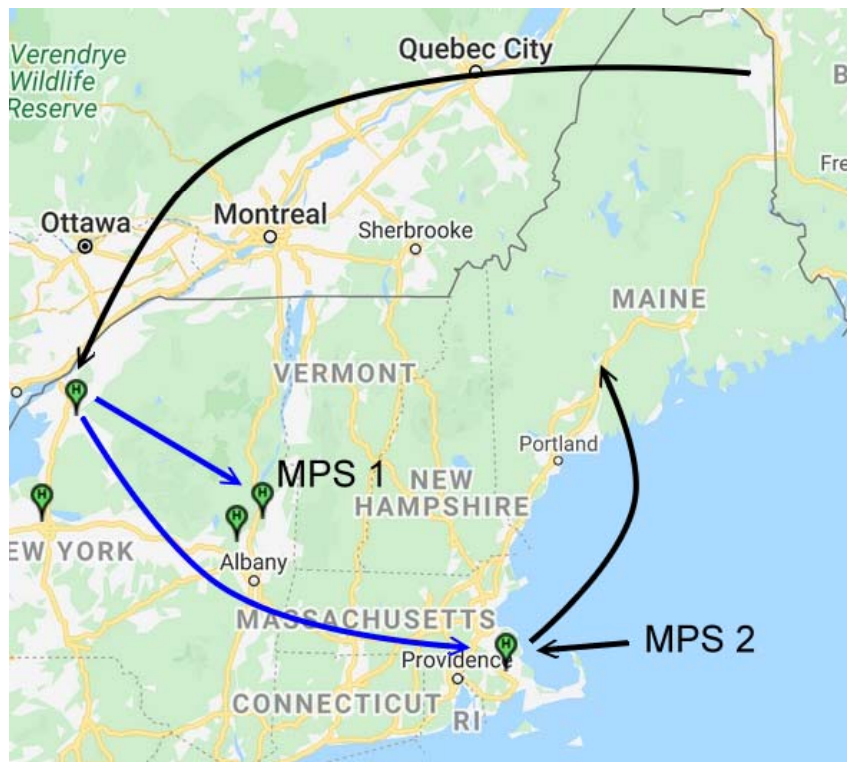
Message Routing via CMS

(Caribou to Augusta)



- Sending station connects by HF to any RMS with an internet connection.
- Message is transferred from the RMS to the CMS by internet.
- Receiving station connects to any RMS. RMS retrieves waiting message from the CMS and transfers to receiving station by HF.

Message Routing Radio-Only



- Sending station connects by HF to any RMS using radio-only mode.
- Message is transferred by HF to the addressee's Message Pick Up Stations by HF. This could involve one or more hops to each MPS.
- Receiving station connects to one of its selected MPS and retrieves the waiting message.
- Stations using the system have to pre-select 2 or 3 MPS before being able to use the system.

SHARES HF Alerting

The SHARES HF Alerting Program provides member agencies with a simple, passive mechanism for the reception of important messages.

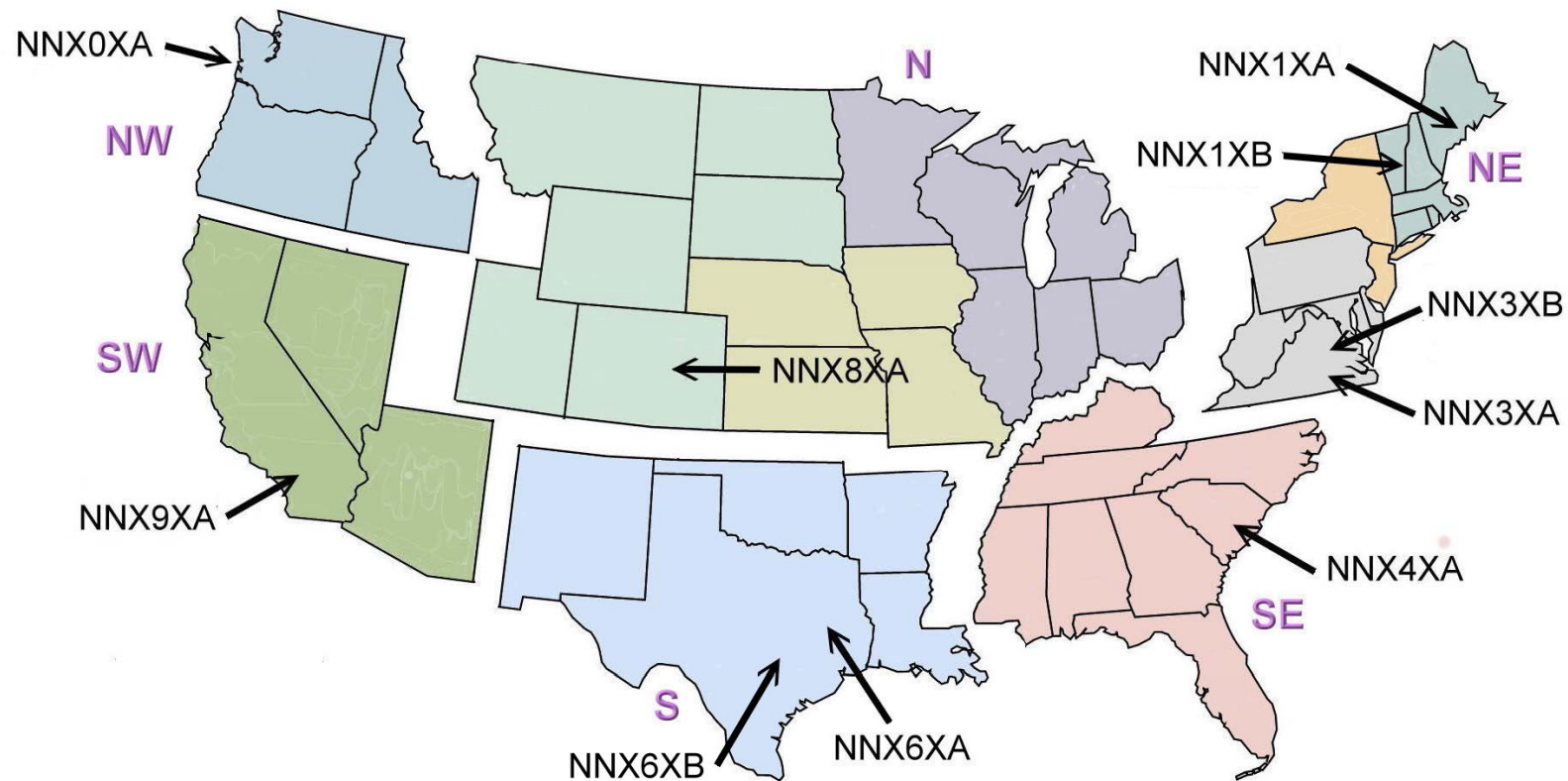
Content includes Alert level, Net activations, Net Channels and times.

Nationwide coverage by multiple time-sequenced beacons on two dedicated frequencies (regional NVIS and long range).

There is a complementary LF (~200 kHz) program in development.

SHARES HF Alerting Beacons

(as of January 2021)

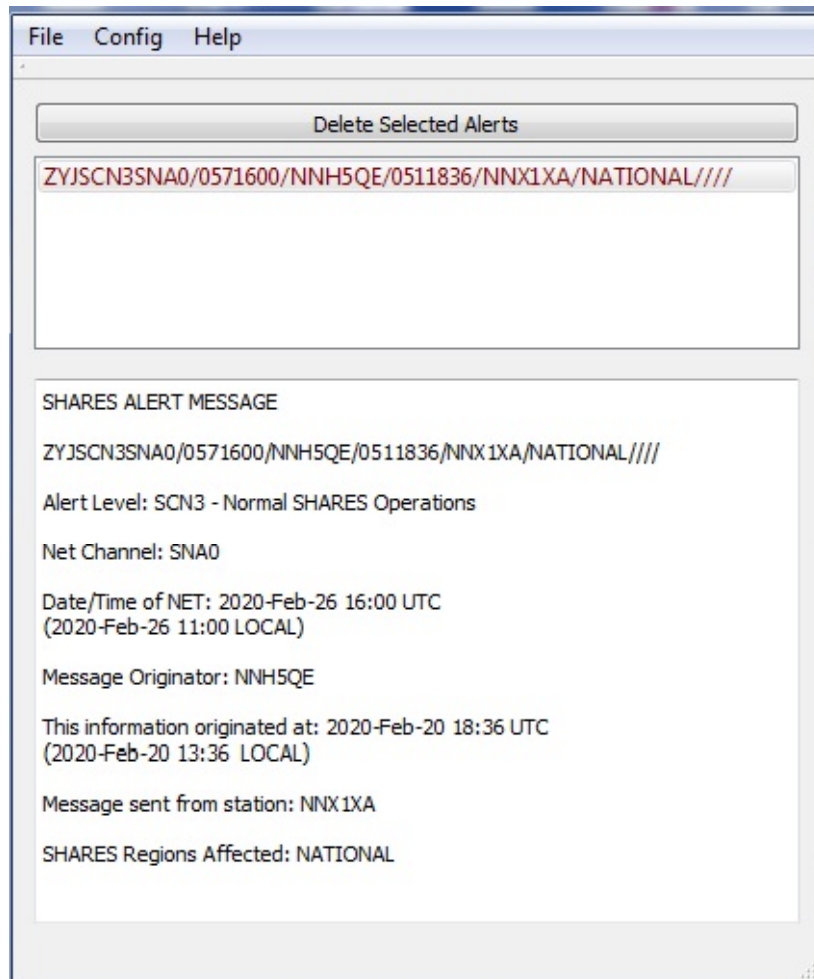


Each station beacons twice per hour during assigned 3 minute time slots. For example, NNX6XA at the top of the hour (~14 MHz long distance) and bottom of the hour (~5 MHz regional NVIS).

SHARES Alert Example

- ZYJSCN3SNA0/1411500/KGD34/1341805/NNX1XA/NATIONAL////
 - ZYJ – Agency code (to SHARES stations)
 - SCN3 - Normal SHARES operations
 - SNA0 – Net channel
 - 1411500 – Effective day of year and time: 2020 May 20 1500Z
 - KGD34 – Originating station
 - 1341805 – Message reception day/time: 2020 May 13 1805Z
 - NNX1XA – Beacon station transmitting message
 - NATIONAL - SHARES Region affected by the alert message

Alert Center Software



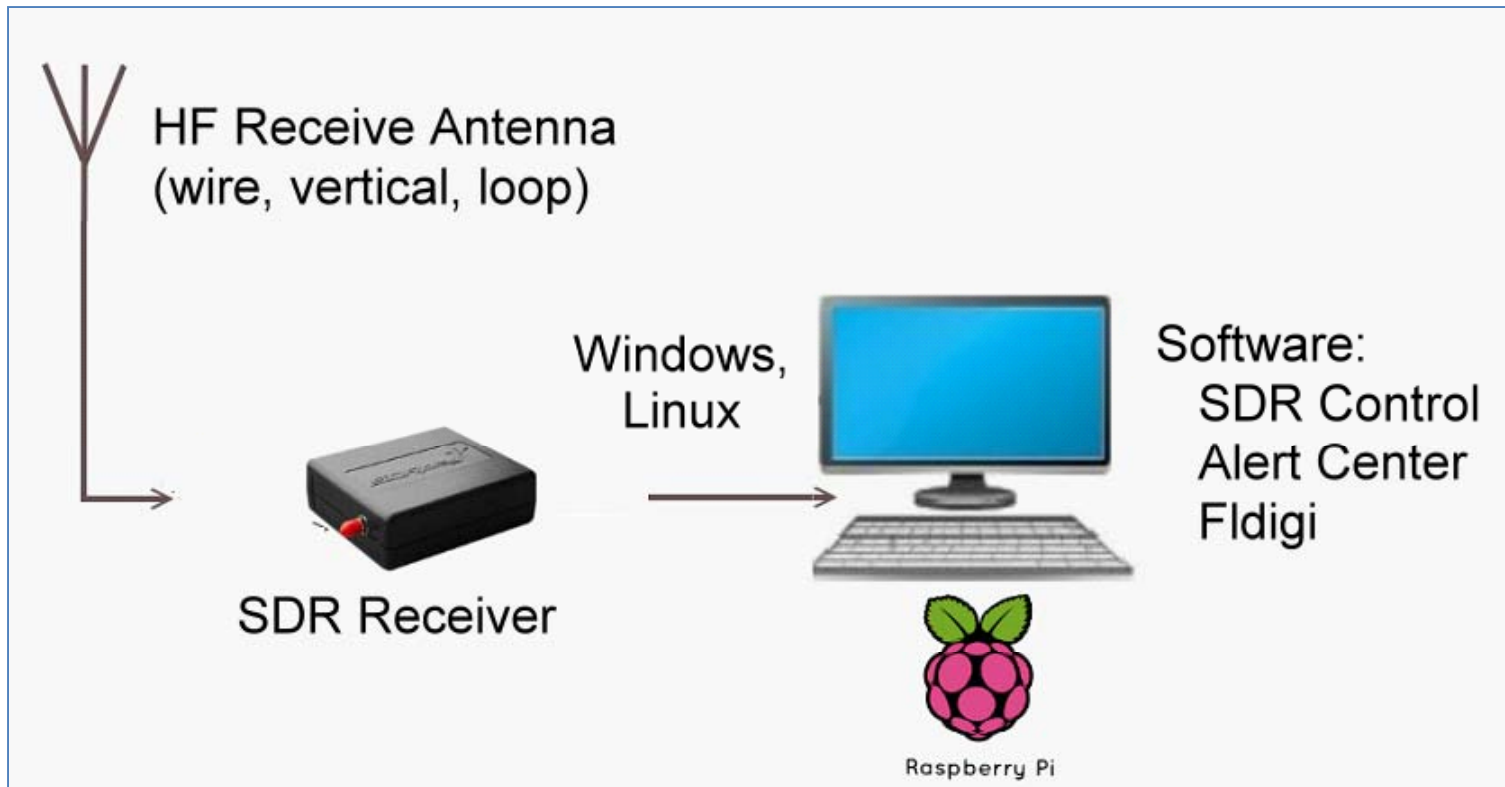
Raw Alert text is displayed in the upper window.

Decoded text is displayed in the lower window.

Windows at present, will offer Linux/Raspberry Pi

Free download

HF Alert Reception Station



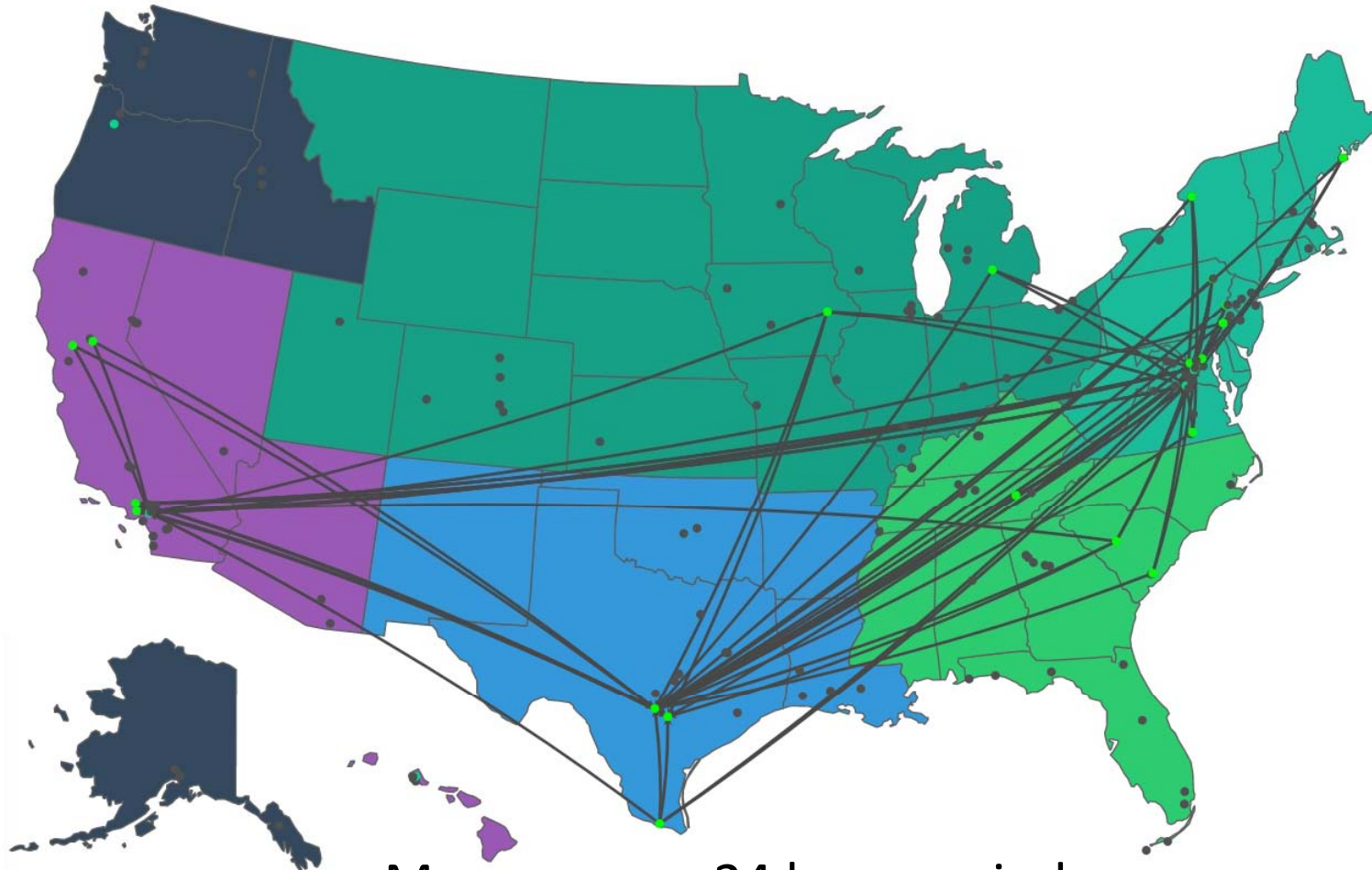
SHARES Automatic Link Establishment (ALE)

- ALE is a well established means for HF communications. Properly implemented, it makes HF communications similar to using a telephone.
- Agencies with hardware or software driven ALE capable radios are welcome to apply for ALE call signs and use the dedicated ALE channels.
- ALE radios sound (beacon) on multiple frequencies to announce their presence. The radios are also listening for the soundings from other stations.
- The beaconing process takes the guesswork out of connecting to one or more stations by HF. If it is desired to contact a station, the radio will pick the best channel for operation.
- ALE allows for directed calling, group calling, or calling everyone.

SHARES ALE Status

- SHARES ALE Best Practices document published
- Emphasis is on short to medium range (NVIS) communications (regional communications)
- New developments in software implementations for ALE to permit the use of non-ALE radios:
 - Maxwell-2G is optimized for SHARES.
 - Work is ongoing to add ALE to fldigi, the popular ham program and core of the NBEMS software suite.

Live ALE Map



Map covers a 24 hour period

Additional monitoring stations are being added