

Knox County Neighborhood HamWatch

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Getting Close to the Cell Tower Doesn't Help When It's Broken



Puerto Rico 2017

Agenda

- Program goals
- Background, status and strategy
- FRS – GMRS and Amateur Radio integration
- National level context
- Pilot project specifics: Owl's Head to Port Clyde
- Storm/outage protocols
- Roles for non-hams in exercises and for weather spotting
- Summary: Plans and Challenges
- Hands on – various FRS and GMRS radios

Program Goals

Provide direct access to amateur radio emergency communications services by facilitating linkages with users of Personal Radio Service devices (Family Radio Service and General Mobile Radio Service).

Provide roles for non-hams in activities such as weather spotting and exercises.

Pilot the program in southeastern Knox County.

Background

- After the November 2014 ice storm, Knox County ARES/RACES-CERT and the Pen Bay Amateur Radio Club established a community support program.
- We put in place a community web site for information at <http://ballyhac.com>.
- An hourly Amateur Radio Storm Net was established.
- We offered services for individuals to communicate with family & friends elsewhere.

Results

- The amateur radio storm net (top of every hour) has generally worked out well with participants from around the county. We have gathered SITREPS and weather info for relay to the Knox EMA and to Gray NWS.
- The EMA has provided SITREPS to the net (e.g. road closures, accidents) which are announced on the net.
- Waldo & Lincoln counties (and several others) are now running similar nets.
- There was no visible community involvement or feedback although it is certainly likely we have had people monitoring via their scanners.

Areas to Address

- We need more ham volunteers to improve coverage around the county.
- Outreach to the community was simply “some hams monitor FRS Channel 1” mentioned in a flyer. This was entirely inadequate and needed to be formalized and supported.
- We need hams who can also support non-ham communications i.e FRS and GMRS.
- Providing a messaging service is not a big draw given that communications outages in this area tend to be brief and cell services generally have survived. (That doesn't preclude a major outage in the future. Be prepared.)

Strategy: Beyond Ham Radio

- In late fall 2017 we began an effort to revise the program and pilot test in a limited area (the peninsula south of Rockland). Specific goals included:
 - Formalize a system of non-ham communications using the Personal Radio Service* (FRS and GMRS) and linking those to ham operators with a standard protocol.
 - Involve the community in providing SITREPs and weather information as well as offering relay services for personal messages.
 - Be able to communicate priority messages to the county EMA.

*The Personal Radio Service also includes Multi Use Radio Service (MURS) and CB.

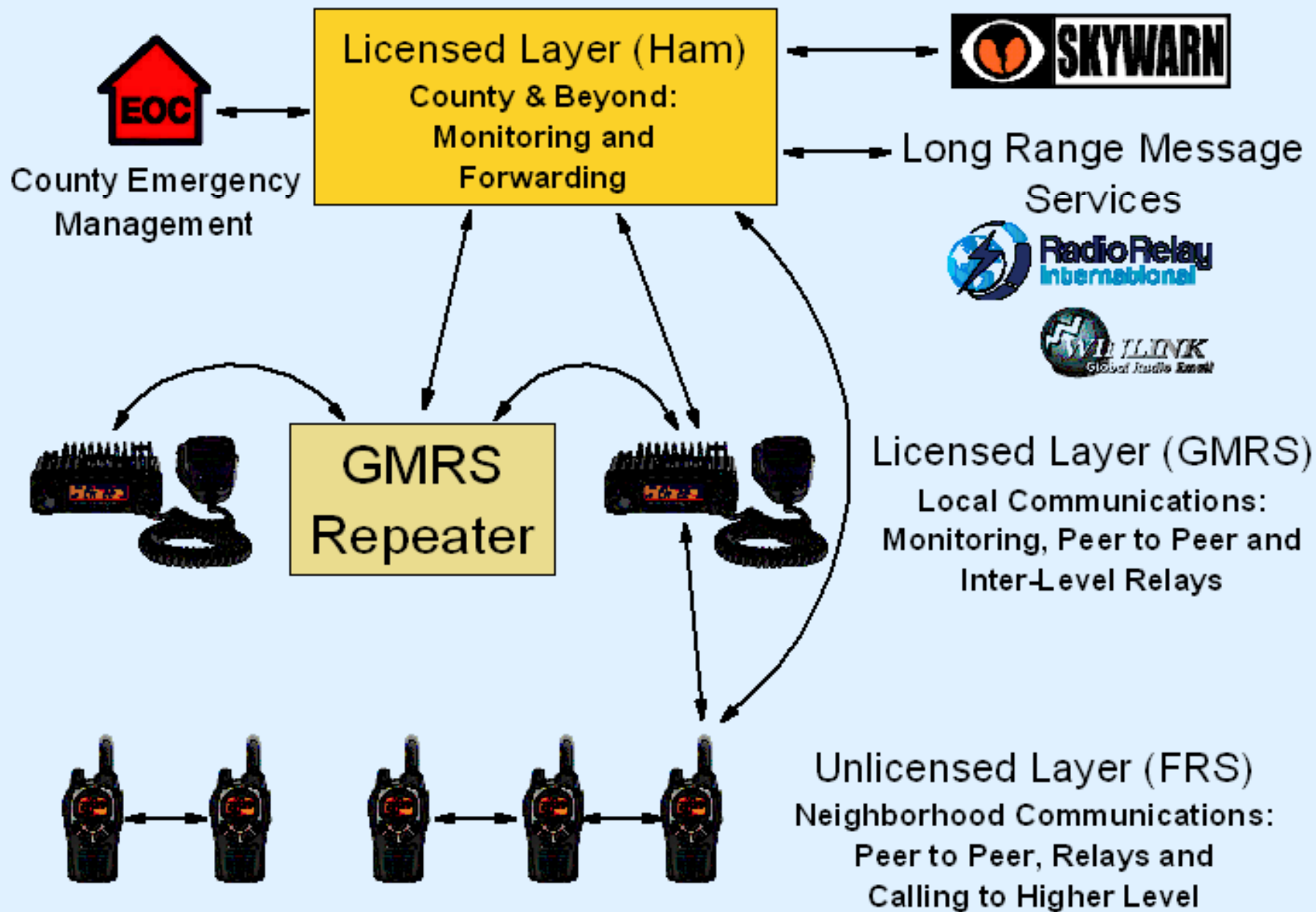
The Personal Radio Service (PRS)

Many people use inexpensive radios such as this one in conjunction with various outdoor activities.

While usually viewed as convenience items, FRS & GMRS radios have the potential to be very useful tools when normal communications are disrupted.

- FRS (Family Radio Service): unlicensed, 2 watts max on many channels. Integrated antennas only.
- GMRS (General Mobile Radio Service): license required (\$70/10 years, covers family members).
- Many GMRS channels are shared with FRS, 5 or 50 watts max.





National Level Context

Related national level programs include:

- National SOS Radio Network (NSRN). Formed after Katrina and includes calling & monitoring procedures for use with FRS radios, primarily at the neighborhood level.
- Neighborhood HamWatch. Closest to our program with scheduled nets, links to town or county EOCs & NGOs, messaging services.
- Both of the programs have been used during various disasters including hurricanes & floods.
- REACT International sponsors similar efforts.

Radio Relay International (RRI)

- The two programs lacked a national-level infrastructure and standardized procedures.
- In early 2017 Radio Relay International adopted the programs as part of its National Communications Strategy.
- A local programs committee was formed in July. Membership consists of hams in diverse parts of the country who are committed to emergency communications & formal message handling.

RRI National Communication Strategy

- Information is structured by the radiogram format for accurate, accountable, intermodal messaging.
- Amateur radio clubs publicize, train and manage the plan for their communities.
- Civic groups include neighborhood watch, CERT, scout troops, churches, etc.
- NCERT is the RRI National Communications Emergency Response Team concept.

**SIMPLE
SCALABLE
INTEROPERABLE**

Global

Regions

Multimode
HF Nets



Radio
Clubs

Towns



Civic
Groups

Neighborhoods

**National SOSSM
Radio Network**

www.NationalSOS.com

Amateur Radio Service
Radiotelegraphy, radiotelephony, data
Pactor, AX.25, 802.11

Information

Families

and

Individuals

Personal Radio Services
Radiotelephony
FRS, GMRS, CB, MURS



**RadioRelay
International**

RRI NATCOMSTRAT 2017

Approved for General Distribution

www.radio-relay.org/natcomstrat


Personal Radio Service Overview

FRS & GMRS Rules Overview and
Typical Equipment

New FCC PRS Rules

- Effective September 2017.
- FRS went from ½ to 2 watts maximum.
- Additional shared channels were made available.
- Gradual phase out of combined FRS/GMRS radios. Any “bubble pack” radio that exceeds 2 watts on any frequency will only be able to be operated legally by a user with a GMRS license.
- Any radio that is repeater capable, regardless of power level, requires a GMRS license.
- Brief data bursts ok on GMRS and FRS (1 second max every 30 seconds) for texting and positional information (e.g. Garmin devices).

FRS/GMRS Shared Channels

Channels	Function	FRS Power	GMRS Power
Old Rules			
1-7	Shared simplex	½ watt	5 watts
15-22	GMRS simplex; repeater output	Not permitted	50 watts
New Rules			
1-7	Shared simplex	2 watts	5 watts
 15-22	FRS/GMRS simplex; repeater output	2 watts	50 watts

References:

http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0427/DOC-344617A1.pdf

https://wiki.radioreference.com/index.php/FRS/GMRS_combined_channel_chart

FRS & GMRS “Bubble Pack” Radios

- What you usually find at Walmart, Cabelas, etc.
- Usually sold in pairs.
- Combo radios are being phased out.
- Don't believe the range claims on the packaging.
- Read the fine print on licensing!
Many users are operating illegally.
- Simplex only, generally not repeater capable.



How do I Know if a Particular PRS Radio Requires a License?

- It's very confusing as manufacturers don't state power levels, just mythical (overstated) ranges.
- The FCC test data has power information (tedious to obtain).
- BuyTwoWayRadios.com has this sorted out.
- Motorola and Uniden have license-free FRS radios that are compliant and are close to the new legal limit.

GMRS Radios

- Affordable handheld and mobile GMRS radios have been hard to come by until very recently (2017).
- Consumer GMRS radios are now available from BTECH, Tera, Powerwerx and Midland.
- A GMRS license may be obtained on line. No test. A single license covers the licensee's spouse, children, step children, grandchildren, parents, grandparents, step parents, brothers, sisters, in-laws, uncles, nieces, nephews. Cousins are out of luck.



Midland 40 watt
Mobile GMRS radio



BTECH GMRS Handheld

GMRS Repeaters

- Many are operated by hams.
- Frequently affiliated with emergency groups e.g. REACT, VOAD, neighborhood watch groups, etc.
- Access is generally restricted i.e. permission required or by membership in a community group.
- FRS radios are not repeater capable.

Pilot Program Specifics

Owls Head, So. Thomaston, Spruce Head, St. George,
Tenants Harbor, Port Clyde

Why this Peninsula?

- Base of committed ham volunteers who are familiar with formal message relay procedures and are equipped with FRS or GMRS radios.
- Some key amateur radio infrastructure:
 - Winlink radio-email gateway in Tenants Harbor
 - RRI Digital Hub in Owls Head
- Communications here tend to have a variety of issues during storms. Some areas have poor coverage even in normal conditions.

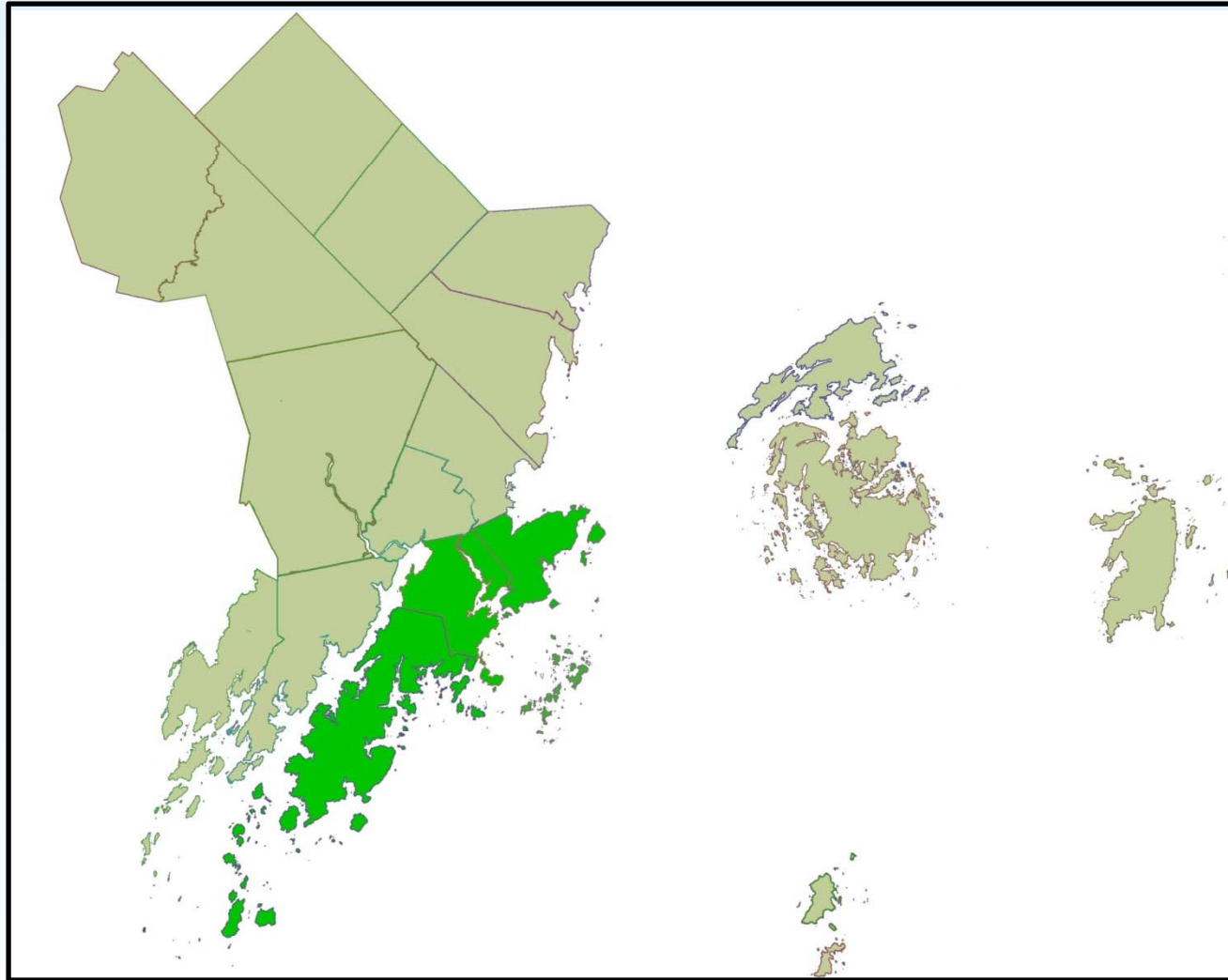
Who's Involved

- KB1TCE/WQQB941 in Owl's Head
RRI Digital Traffic Station for Maine; FRS & GMRS monitoring; traffic relay.
- WD10/WQZI552 in Tenants Harbor
Winlink gateway, Knox County Packet Network; FRS & GMRS monitoring; traffic relay. Manages FRS/GMRS station at St. George fire house.
- KB1ZUN in Spruce Head
Host site for the Spruce Head 675 GMRS repeater; FRS & GMRS monitoring; traffic relay.

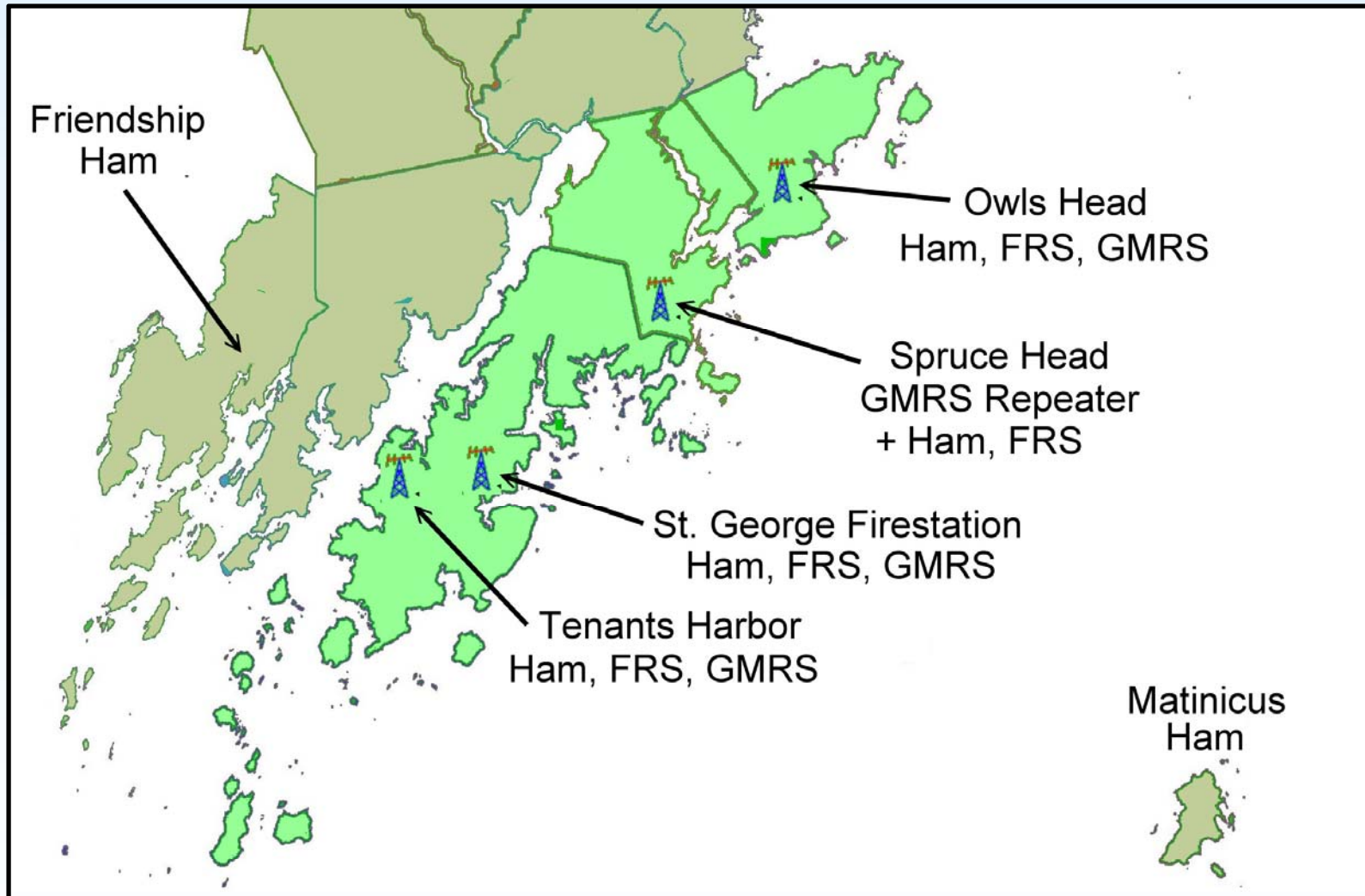
Also

- NY1B in Friendship
Primary Storm Net net control operator
- K1EMM on Matinicus Island

Knox County



Pilot Area & Capabilities



Schedule

- Owl's Head GMRS station has been in place since late fall 2017.
- Tenants Harbor GMRS station is in place.
- St. George GMRS station will be fully installed this spring.
- Spruce Head repeater is planned for early summer installation.

Storm/Outage Protocols

- Amateur Radio Storm Net is on the hour during severe weather events.
- FRS and GMRS stations will be attended from 15 minutes before the hour to the top of the hour.
- Messages may be left at stations with voice recorders.

FRS/GMRS Channel Usage

Channel Usage Guidelines	
Channel	Use
1	High priority/emergency calling between FRS radios or with GMRS radios in the same neighborhood. Use highest FRS power available. This is consistent with National SOS Radio Network practice
2-7	General use between FRS and/or GMRS radios within a neighborhood.
8-14	General communications between closely positioned radios. Limited to ½ watt maximum.
19	For communications with a full power GMRS hub station
20	Spruce Head 675 GMRS repeater

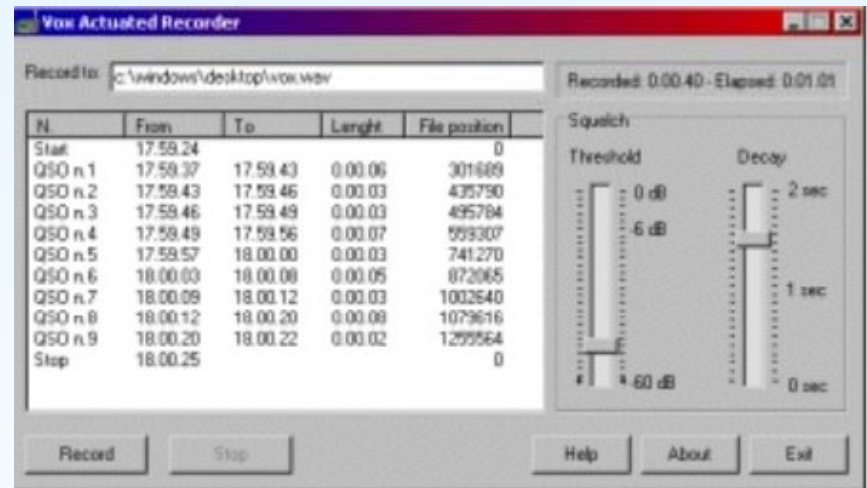
Unattended Monitoring



Audio to Radio

Voice/CW ID
15 Minute
Intervals

Audio from
Radio



PC Running Voice Actuated
Audio Capture Software

Pulling it Together
And
Next Steps

For Non-Hams: Why Wait for an Emergency?

- Add roles for non-hams in our exercises. Equip them with FRS radios if they don't have them. Examples:
 - Provide weather information
 - Provide a SITREP
 - Initiate a formal message to a friend or family member out of state
- Train in the use of proper radio communications protocols and message formatting.
- Promote the use of GMRS.
- Encourage them to get their ham ticket.

Non-Hams and SKYWARN

- Any resident can register with Gray or Caribou NWS and become a weather spotter. The NWS has regular training sessions around the state as well as written training & reference materials.
- Weather spotters provide a valuable service for reporting various meteorological events that are difficult or impossible to measure remotely. Examples include snowfall amounts, hail, localized high winds, weather induced damage, flooding, ice, etc.
- If conventional communications are impaired, hams will report conditions via radio.
- For the non-ham, the type of program we are proposing would enable them to submit reports by a Personal Radio Service radio to a ham who can then relay the information.

Telephone & Internet Fail

Telephones & the internet represent a primary means of weather reporting. However, these often fall victim to severe storms:

“One thing we noticed during the windstorm on Oct 29th (2017) is that as soon as power and communications go down the observations cease as well. I immediately thought of (your program) as this is exactly the scenario you are working to improve in your community. “

Margaret Curtis, Meteorologist, NWS Gray

Summary: Current Status and Plans

Immediate Plans

- Finish all equipment installations
- Refine protocols and complete coverage maps

Enhancements

- Find roles for non-ham communicators in our ARES/RACES exercises
- Enroll some weather spotters

Challenges

- Get community interest and involvement
- Convince more hams to invest in GMRS equipment
- We need constructive input

More Information

Program Website: <http://ballyhac.com>

Lots of information and links

This Presentation: <http://ballyhac.com/files>

Questions

Hands-On