RADIO BASICS: THIS IS FUN, WHAT'S NEXT?

COMMUNICATIONS ACADEMY 2019

DON MARSHALL
KE7ARH
Welcome!

Thank You for your interest in improving the safety of your community!
Introductions

- Don Marshall (KE7ARH)
  Bellevue BCS Leadership Team

- Built a Heathkit GR-81 radio when I was 11.

- (Thanks to Medical Services and Brian Daly for the Em Comm Level 1 Slides)
  [http://www.ww7mst.org/]
Agenda

- Hazards and Risks - Communications Emergency Defined
- Emergency Communications Radio Volunteers – What's Involved?
- Why Volunteer?
- Directed Radio Nets
- Which Served Agency?
- Q & A
HAZARDS AND RISKS
Simply put – ham radio works!

- Most of the time things work fine
- Despite the development of complex communications systems – or maybe because they ARE so complex – ham radio has been called into action again and again to provide communications when it really matters
Conventional communications systems

- Telephones, cell phones, Internet, trunk lines, and satellite phones all go through many vulnerable choke points.
Washington Communications
Emergencies
What is a Communication Emergency?

- **A Communication Emergency** exists when:
  - A critical communication failure puts the public at risk
  - Variety of circumstances leads to a communication emergency
  - Overload or damage to critical day-to-day systems

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Frequency</th>
<th>Expected Effects</th>
<th>Potential Effects</th>
<th>Risk</th>
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<td>3.1</td>
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<td>Conflagrations</td>
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<td>3.5</td>
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<td>Droughts/Water Shortages</td>
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<td>1.6</td>
<td>2.3</td>
<td>14.7</td>
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<tr>
<td>Air Crashes</td>
<td>2</td>
<td>1.9</td>
<td>2.7</td>
<td>10.3</td>
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<tr>
<td>Tornadoes</td>
<td>1</td>
<td>1.3</td>
<td>2.4</td>
<td>3.1</td>
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</table>
Which one of these is a communication emergency?

- 9-1-1 center telephone outage
- Cut of primary fiber optic communications line
- 2001 Nisqually earthquake
- Hanukkah Eve wind storm of 2006
- Western Washington snowfall of December 2008
- Seahawks winning the Super Bowl
BEING AN EM COMM RADIO VOLUNTEER – WHAT'S INVOLVED?
The Missions

- Varies with specific agency served

- Example: Local Emergency Management
  - Ad Hoc Interagency communications
  - Additional bandwidth
  - “Eyes and Ears” of the emergency managers
Example – Helping out with a Marathon

- Provide supplemental communications support
- Monitor Ham Radio Channels
- Run Ham Radio Net Control
- Monitor Public Safety Radios
- Monitor Commercial Event Radios
Example – Being on Standby for Windstorm

- During the Winter of 2008 snow storm a large wind storm was forecast the night of December 20th.
- With 6” of frozen snow on the roads and temperatures in the 20s, it would not be a good to lose power for a few days.
- Partial activation of Network with hourly check-ins.
- One ARES Team Leader in EOC.
Where Do You Fit In?

- Amateurs bring:
  - Equipment
  - Skills
  - Frequencies

- Create expedient emergency communications network under poor conditions
  - Flexible, expandable

- We are licensed & preauthorized for national and international communications

However….
Where Do You Fit In?

- Radios, Frequencies and Basic Radio Skills are not enough!

- Without specific emergency communication skills, you can easily become part of the problem

- Technical and Operating Skills are critical...
  - And so is your ability to function as a team player within your volunteer organization as well as the organization you are serving.
What Makes a Good Emcomm Volunteer?

- Common Attributes:
  - Desire to help others without personal gain of any kind
  - Cares about their community
  - Ability to work as a member of a team
  - Ability to take direction from others — served agency
  - Think and act quickly
  - Calm under stress and pressure of an emergency
Communicating – Job #1

- Important to remember our job is: “communicating”
- Communicating does not automatically imply amateur radios
  - If the best way is a text, cell phone or FRS – use it
  - Be prepared to use any means required
Many EmComm Modes

- VHF/UHF/HF
- FRS / CB / 800 MHz
- Winlink
- D-Star
- APRS
- Ham operated Wi-Fi Networks
- Internet / Email
- Human couriers
There are times when your family may need you as much or more than your emcomm group.

If there is ever any doubt, your decision must be to stay with your family.

You should discuss, and come to an agreement with your spouse well before any disaster, in order to avoid any last minute problems.

Alternatively, have your spouse get an Amateur Radio license and accompany you on your deployment.
So I decide to Volunteer, what happens next?

- Typically you will fill out a form that will provide permission for a background check.
- Also there may be agreements on confidentiality of communications for the served agency.
- There may be an interview to make sure your goals align with the groups goals.
- You may be asked to provide a public e-mail and phone number for other members to contact you.
- Some organizations request fingerprints.
- Background check happens...
- May need to get your picture taken for an ID badge...
- You get your ID card and your adventures begin!
Questions

1. When does a communication emergency exist?
   A. Whenever the public is at risk.
   B. When a critical communication system fails and the public is inconvenienced.
   C. When a critical communication system fails and the public is put at risk.
Questions

2. Which of the following best describes your main job as an emergency communicator?
   
   A. Dispatcher, organizing the flow of vehicles, personnel, and supplies.
   
   B. Weather spotter.
   
   C. Radio operator, using Amateur or served agency radio systems.
   
   D. Resource coordinator, organizing the assignments of disaster relief volunteers.
WHY VOLUNTEER?
Every year hams help out

- Maria Hurricane in Puerto Rico 2017
- Haiti Earthquake 2010
- Asian Tsunami 2004
- Katrina, Wilma and Rita 2005
- NE blackout 2003
- Shuttle Columbia Recovery 2003
- Charley, Frances, Ivan, and Jeanne, Isabel
- OK City bombing 1995
- Terror attacks 9/11/2001
- And many, many others
Hundreds of hams... 

- Volunteered for service to the devastated areas of the Gulf Coast after Hurricanes Katrina, Rita, and Wilma pounded 5 states and destroyed other communications systems
- Received commendations from President and Congress for their meritorious work

The Katrina Chronicles
QST (ARRL Magazine) Article
Katrina Hams

4 Minute Video Clip
Why Volunteer?

- Your work can save lives and bring comfort to those that need it.
- An opportunity to give something back to your community
- A chance to get to work with the first responders that work to keep our communities safe
- An opportunity to improve your own emergency preparedness
- An opportunity to gain leadership skills and try new things
- A chance to be mentored and later mentor
- Justifies the need to buy really cool electronic gear!
- City Council may cook you lunch during field day!
INTRODUCTION TO EMERGENCY NETS
What is an Emergency Net?

- An "emergency" net is a group of stations who provide communication to one or more served agencies, or to the general public, in a communications emergency.

- Directed (formal) Nets
  - “Net Control Station" (NCS) organizes and controls all activity
  - You will need to "check in" to a net:
    - When you have messages, questions, or information to send.
The tactical call sign allows you to contact a station without knowing the FCC call sign of the operator.

- It identifies the station's location or its purpose during an event, regardless of who is operating the station.

Net Control

State EOC

Canyon Shelter

Firebase 1

Harborview
Calling with Tactical Call Signs

Calling order is:
“Who you want to talk to”, “Tactical Call Sign”

Aid 3

“Net Control, Net Control - Aid 3”

Net Control
Aid 3: “Net Control, Net Control - Aid 3.”

Net Control Station: “Aid 3 go ahead with your traffic.”

Aid 3: “We need 25 cots and blankets“

Net Control Station: “Confirming you are requesting 25 more cots and blankets“

Aid 3: “Affirmative“ <CALL SIGN>
FCC Call Sign ID Requirements

If is not an actual disaster, you can combine tactical and your FCC call sign in a variety of ways. Whatever you do, you must:

- ID at the end of the transmission
- ID every 10 minutes. (It is unusual to be passing traffic for that long in an emergency net)

- See FCC Part 97: Sec. 97.119 Station identification
  
RADIO NET
EXERCISE
Net Exercise

Winter Wind and Snow Storm Emergency

This is a Drill!

Directions:
1. Listen for Net Control to call you tactical call station and respond with the provided message.
Local Nets

Puget Sound Repeater Group
web.PSRG.org  -  146.96 103.5 Tone

The Mike and Key group maintains a helpful list of local nets:

http://www.mikeandkey.org/nets.htm

Listen and learn!

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>Call Sign</th>
<th>Name</th>
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<tbody>
<tr>
<td>1930</td>
<td>443.725</td>
<td>WE7SCA</td>
<td>ESCA RACES (Sno-King cities)</td>
</tr>
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<td>1930</td>
<td>147.04</td>
<td>WA7FW</td>
<td>Federal Way Amateur Radio Club</td>
</tr>
<tr>
<td>1930</td>
<td>146.86</td>
<td>W7AVM</td>
<td>Island County Amateur Radio Club</td>
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<td>1930</td>
<td>145.49</td>
<td>K7LWH</td>
<td>Kirkland ARES</td>
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<tr>
<td>1930</td>
<td>145.43</td>
<td>KD7WDG</td>
<td>Kitsap County Alt. Comm. System (ACS)</td>
</tr>
<tr>
<td>1930</td>
<td>443.5</td>
<td>W7VMI</td>
<td>Vashon-Maury Island RC - ARES (except 1st Sun.)</td>
</tr>
<tr>
<td>2000</td>
<td>147.08</td>
<td>W7WWI</td>
<td>King County ARES/RACES</td>
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WHICH SERVED AGENCY?
Why is organization important to emcomm?

- Emcomm organizations:
  - Provide organization
  - Provide training
  - Pre-screen members

- When the time comes to assist the served agency, you will be as prepared as you can be.
  - Response will occur more smoothly
  - The served agency's needs will be met
Who can join?

- The Amateur Radio Emergency Service (ARES) consists of licensed amateurs who have voluntarily registered their qualifications and equipment for communications duty in the public service when disaster strikes.

- The only qualification, other than possession of an Amateur Radio license, is a sincere desire to serve.

- For more detail: [http://www.arrl.org/ares](http://www.arrl.org/ares)
Local Radio Clubs

http://www.aresofkingcounty.org/contact.php
Medical Services

- State wide group that supports the local hospitals

Western Washington Medical Services

http://www.ww7mst.org/
Your local church or employer may have a amateur radio group.

If your company has a risk management, security or safety group, that can be one place to check.
The American Red Cross saves lives. When disaster strikes, they respond with food, shelter and hope.

www.SeattleRedCross.org

www.RedCross.Org
Salvation Army volunteers

- Partner with FEMA, participate in NVOAD
  - National Voluntary Organizations Active in Disaster, and with volunteer organizations (VOADS) on state and local levels

- HF networks
  - Logistical communication between various Salvation Army offices

The Salvation Army - www.salvationarmy.org

SATERN - http://satern.org/
Washington Guard

- A great way to serve!

- Safeguard Lives
  Under the Direction of the Governor of Washington State.

- Protect Property
  Help secure and protect the property of the people of Washington State.

- Disaster Preparedness
  Minimize the impact of Emergencies and Disasters.

- All-Volunteer
  Our Staff is complete with volunteers from the great state of Washington.

http://washingtonguard.org/

https://www.facebook.com/WashingtonStateGuard
NEXT STEPS
Public Service Events

- Some of the best practice for tactical disaster communication is your local "athon"
  - Bike-athon, walk-athon, dance-athon or crawl-athon
- Large, fast moving event closely simulates the conditions experienced in disasters
Field Day

Saturday
June 22nd and Sunday 23rd

http://www.arrl.org/field-day
Find a group!

- King County ARES/RACES Team Contact Information
  http://www.aresofkingcounty.org/
- Washington State ARES/RACES Website:
  http://www.wastateares.org/
- USA National ARRL:
  http://www.arrl.org/public-service
- Canada:
  http://www.rac.ca/
Get Trained!

- ACES Emergency Communications Training
  http://www.oregonaces.org/
- ARRL Training http://www.arrl.org/emergency-communications-training
- Red Cross Adult CPR/First Aid Basics
- Red Cross Introduction to Disaster Services
- FEMA IS-100.b (Introduction to Incident Command System)
- The American Heart Association also has excellent courses available for CPR.
Conclusion

- Find a group!
- Get signed up!
- Get trained!
- Contribute and improve your community!
Thank You for your interest in improving the safety of your community!!

Questions?
ADDITIONAL RESOURCES
Example
Public Service Events

Feb
Chilly Hilly Bike Ride at Bainbridge Island

Nov
Auburn Veteran's Day Parade

Nov
Seattle Marathon

Dec
SEAFAIR Special People Cruise

http://www.mikeandkey.org/
Ice Storm Response

[Numerous reports came in from the states impacted by the horrific ice storms of late January. The following is typical of those reports received. -- ed.]

Shelby Ennis, W8WN/AAR4IJ, Hardin County, Kentucky EC, reported on February 4 that power was still out for sections of Kentucky, following the devastating ice storm affecting the region. He was finally able to turn his emergency generator off, and then slipped on the ice and broke his leg. And then he had "to put down the best dog I've ever had due to advanced arthritis." "Not a good week," said Ennis.
Training

- Amateur Radio Emergency Communications Course -- Level 1 Course Contents:
  - Introduction to Emergency Communications Amateurs as Professionals
  - The Served Agency Relationship
  - Emergency Communication Organizations & Systems
  - Served Agency Communication Systems
  - Basic Communication Skills
  - Introduction to Emergency Nets
  - Basic Message Handling
  - Net Operating Guidelines
  - Equipment Choices for Emergency Communication Operations & Logistics
  - And much more
Community Emergency Response Team

- Helps train people to be better prepared to respond to emergency situations in their communities

- CERT members can give critical support to first responders, provide immediate assistance to victims, and organize spontaneous volunteers at a disaster site

- CERT members can also help with non-emergency projects that help improve the safety of the community

http://training.fema.gov/EMIWeb/CERT/
C.E.R.T.

- Unit 1: Disaster Preparedness
- Unit 2: Fire Safety
- Unit 3: Disaster Medical Operations—Part 1
- Unit 4: Disaster Medical Operations—Part 2
- Unit 5: Light Search and Rescue Operations
- Unit 6: CERT Organization
- Unit 7: Disaster Psychology
- Unit 8: Terrorism and CERT
- Unit 9: Course Review and Disaster Simulation
Military Affiliate Radio Service (MARS)

- Department of Defense sponsored auxiliary communication program, three separately managed and operated programs
- Operate disciplined and structured nets on assigned military radio frequencies adjacent to the amateur bands
- During times of emergency, MARS provides backup communication networks to military, federal, state, and local agencies
- WA Army MARS:
  - [http://waarmymars.com/](http://waarmymars.com/)
Regularly Scheduled Nets

- Many local ARES and RACES groups hold regularly scheduled training nets
- [http://www.aresofkingcounty.org/](http://www.aresofkingcounty.org/)

- King County Weekly ARES/RACES NET
  - Time: Sundays, 8:00 PM local time
  - Repeater: W7DX 147.080

- Seattle ACS Net - [www.seattleacs.org/](http://www.seattleacs.org/)
  - Monday evening at 7:00 PM on the 146.96 (103.5) Repeater
  - Saturday 10 AM

- MST Net
  - Thursday evening at 7:30 PM
Amateur Radio Emergency Service (ARES)

- Program sponsored by the ARRL since 1935
  - Part of the League's field organization, which is composed of "Sections"
    - Most Sections are entire states, but some larger states have two or more Sections
    - Washington – 2 Sections
Washington ARES Regions

http://www.wastateares.org/
Why RACES?

- The FCC or President can suspend amateur radio operations due to a national emergency
  - But in the event that the President invokes his War Emergency Powers, amateurs involved with RACES can use certain specific frequencies.

- RACES is a radio communication service conducted by volunteer licensed amateurs, and is designed to provide emergency communications to local or state civil-preparedness agencies
  - Amateurs operating in a local RACES organization must be officially enrolled in that local civil-preparedness agency
  - This is normally the local City or County Government

- Sponsored by the Federal Emergency Management Agency (FEMA)

- For more information, see [http://www.arrl.org/ares-races-faq](http://www.arrl.org/ares-races-faq)
Increasingly, RACES-registered operators also belong to ARES, and can "switch hats".

- The RACES regulations make it simple and possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility.

- Emergency management officials like this arrangement since it provides more flexibility.

- Your local group may be ARES, RACES, or both.
Communication

Volunteer Assignments

- Staffing a Shelter
  - Handle calls for information, supplies, personnel

- “Shadowing”
  - Communication link for an official such as the Mayor

- Gathering Weather Information

- Collecting/Transmitting Damage Reports

- Pass messages outside of the disaster area

- Handle logistical needs for served agency