The CERT team’s view: Basic Disaster Communications

EOC

CERT Neighborhood Command Post

FRS/GMRS Radio

CERT Team
CERT Team
CERT Team
CERT Team
Communications

- Command Post must maintain communications with all teams during an incident.
- Use whatever works: phone, cell, pen and paper, smoke signals ....
- But when all else fails radio still works.
- To be effective, we need to learn Emergency Radio Communications!
Unit Objectives

- Understand the operating characteristics of FRS/GMRS radios
- Learn to operate a radio effectively
- Use correct operational procedures
- Learn to create well formed messages
About FRS Radios

- No license required
- 14 FRS channels available
- Shares channels 1-7 with GMRS
- Channels 8-14 are FRS only
- Channels 15-22 are GMRS only (ok to listen)
- Typical 0.5 - 1 mile communication
- Very low power, 1/2 watt ERP
- Low cost
About GMRS Radios

- FCC License required, no test ($85 for 5 years)
- License covers all family members
- GMRS channels 1 - 7 are shared with FRS
- External antennas for portable radios OK *
- Can cover hundreds of square miles by repeater *
- 5 watts allowed on shared FRS channels
- Moderate to very high cost
## Field Radios

<table>
<thead>
<tr>
<th></th>
<th>Family Radio Service (FRS)</th>
<th>General Mobile Radio Service (GMRS)</th>
<th>Dual Radio Service</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Channels</strong></td>
<td>14</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td><strong>License Required</strong></td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
</tr>
<tr>
<td><strong>Power (Maximum)</strong></td>
<td>.5 Watts</td>
<td>50 Watts</td>
<td>5 Watts</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Line of Sight</td>
<td>Line of Sight</td>
<td>Line of Sight</td>
</tr>
<tr>
<td><strong>Antenna</strong></td>
<td>Fixed</td>
<td>Varies</td>
<td>Fixed</td>
</tr>
</tbody>
</table>
# Field Radios

<table>
<thead>
<tr>
<th></th>
<th>Family Radio Service (FRS)</th>
<th>General Mobile Radio Service (GMRS)</th>
<th>Dual Radio Service</th>
<th>Amateur Radio Service [HAM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>14</td>
<td>15</td>
<td>22</td>
<td>Infinite</td>
</tr>
<tr>
<td>License Required</td>
<td>No</td>
<td>Yes</td>
<td>Maybe</td>
<td>Yes</td>
</tr>
<tr>
<td>Power (Maximum)</td>
<td>.5 Watts</td>
<td>50 Watts</td>
<td>5 Watts</td>
<td>1500 Watts</td>
</tr>
<tr>
<td>Range</td>
<td>Line of Sight</td>
<td>Line of Sight</td>
<td>Line of Sight</td>
<td>The Moon</td>
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<tr>
<td>Antenna</td>
<td>Fixed</td>
<td>Varies</td>
<td>Fixed</td>
<td>Assorted</td>
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</table>

CERT Basic Training
Radio Communications

RC-7
Unit Objectives

- Understand the operating characteristics of FRS/GMRS radios
- **Learn to operate a radio effectively**
- Use correct operational procedures
- Learn to create well formed messages
Learning to use your radio

- Read the instructions for **YOUR** radio.
Radio Controls (midland)

- Off-On/Volume Control
- Antenna
- Channel
- Ear Phone Jack
- Push To Talk Switch
- Private Line (PL) Code
- Call Tone
- Monitor/Scan Key
- Menu Key
- Function Up Key
- Function Down Key
- Speaker/Microphone

CERT Basic Training
Radio Communications
Radio Controls (Motorola)

- Off-On/Volume Control
- Channel
- Push To Talk Switch
- Call Tone
- Menu Key
- Function Down Key
- Antenna
- Ear Phone Jack
- Private Line (PL) Code
- Monitor/Scan Key
- Function Up Key
- Speaker/Microphone
Batteries

CERT Basic Training
Radio Communications
Selecting & Maintaining FRS Radios

- **Radio Controls**
  - On-Off (International Symbol), Volume Control
  - Channel Selector
  - Call Rings, “Talk Confirmation” chirp and auto TURN OFF

- **Other**
  - Store radios in your car with extra batteries & instruction Manual
  - When radios are not in use, remove batteries as they may discharge accidentally
  - Use the radios frequently for fun and practice
The “Complete” FRS Kit

[Image of a walkie-talkie, earpiece, batteries, and lanyard]
<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency (MHz)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>462.5625</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>2.</td>
<td>462.5875</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>3.</td>
<td>462.6120</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>4.</td>
<td>462.6375</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>5.</td>
<td>462.6625</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>6.</td>
<td>462.6875</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>7.</td>
<td>462.7125</td>
<td>FRS/GMRS Shared</td>
</tr>
<tr>
<td>8.</td>
<td>467.5625</td>
<td>FRS Only</td>
</tr>
<tr>
<td>9.</td>
<td>467.5875</td>
<td>FRS Only</td>
</tr>
<tr>
<td>10.</td>
<td>467.6125</td>
<td>FRS Only</td>
</tr>
<tr>
<td>11.</td>
<td>467.6375</td>
<td>FRS Only</td>
</tr>
<tr>
<td>12.</td>
<td>467.6625</td>
<td>FRS Only</td>
</tr>
<tr>
<td>13.</td>
<td>467.6875</td>
<td>FRS Only</td>
</tr>
<tr>
<td>14.</td>
<td>467.7125</td>
<td>FRS Only</td>
</tr>
</tbody>
</table>

No License Required  Max ½ Watt low power
What to Expect ( or why can’t you hear me now? )

- Your are too far away from each other
- Obstructions
- Wrong channel and/or PL Code selected
- Other responders may not hear you, too weak, poor location
- Channels may be crowded causing interference or noise ( move to alternate channel if required )
- Feedback from other channels ( too close )
Learning to use your radio

- Selecting channel and PL
- Hold the microphone away from your face
- Talk across the microphone, not into it
- Speak in a normal voice
- Don’t raise your voice
- Use clear pronunciation
- If adjacent noises obscure your speech, shift your location. Don’t talk louder
Additional Radio details

- PTT = Push to talk
- Lock the channel. Don’t accidentally switch channel
- Spare batteries – You run longer
- Earphones – Listen hands free
- Do NOT use VOX
Unit Objectives

- Understand the operating characteristics of FRS/GMRS radios
- Learn to operate a radio effectively
- **Use correct operational procedures**
- Learn to create well formed messages
Best Practices

- Organize your thoughts & follow the protocol
- Pass accurate & timely information from the sender to the receiver
- Transmit only when necessary
- Limit your transmission time
- Avoid use of sensitive information over the air; personal names, addresses only when necessary
- Use plain English, no “10 or 11 codes”
Best Practices

- Speak slowly and clearly
- Avoid pauses on the air
- Know what you are going to say BEFORE you key the mike
- Check for proper channel & PL code

Note* Use PL Code “0” (none) or “Off” for emergency communications.
Best Practices

- Hold radio 2” - 3” from mouth
- Use a function or geographical identification for emergencies such as team name, tactical call, i.e. “Neighborhood Captain, Triage, Team 1”
- Acknowledge the receipt of information
- Avoid arguments over the air
- Always know the assignment of your channels
- Stay calm & courteous if chaos occurs
Best Practices

- Communicate triage results:
  - “Red Tag” (Immediate)
  - “Yellow Tag” (Delayed)
  - “Black tag” (Dead)
  - “Green Tag” (Walking Wounded)
  i.e. “We have 3 RED TAG, 12 YELLOW TAG, 6 BLACK TAG, 25 GREEN TAG”

- Avoid "stepping" on each other

- Always say, OVER when you complete your transmission

- Avoid interrupting unless they call you

- Practice frequently
What are Prowords

- Prowords are Procedural Words that were originally developed by the Military to:
  - convey maximum information with a minimum of confusion
  - keep voice transmission as short and clear as possible. Radio operators use procedure words (Prowords) to take the place of long sentences
Some Common Prowords

- **Affirmative** – “Yes” (in answer to a specific question)
- **Break** – “I have priority traffic.”
- **Break-Break** – “I have emergency traffic.”
- **Clear** – “I am finished with this communication.”
- **Copy** – “I acknowledge receipt of message.”
- **Negative** – “No”
- **Out** – see Clear
- **Over** – end of transmission, waiting for response
- **Roger** - "I have received and understand your transmission." It does not mean yes, affirmative, I agree, or I will comply.
- **Wilco** – “I will comply”
The Phonetic Alphabet

<table>
<thead>
<tr>
<th>Letter</th>
<th>Phonetic</th>
<th>Letter</th>
<th>Phonetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alpha</td>
<td>N</td>
<td>November</td>
</tr>
<tr>
<td>B</td>
<td>Bravo</td>
<td>O</td>
<td>Oscar</td>
</tr>
<tr>
<td>C</td>
<td>Charlie</td>
<td>P</td>
<td>Papa</td>
</tr>
<tr>
<td>D</td>
<td>Delta</td>
<td>Q</td>
<td>Quebec</td>
</tr>
<tr>
<td>E</td>
<td>Echo</td>
<td>R</td>
<td>Romeo</td>
</tr>
<tr>
<td>F</td>
<td>Foxtrot</td>
<td>S</td>
<td>Sierra</td>
</tr>
<tr>
<td>G</td>
<td>Golf</td>
<td>T</td>
<td>Tango</td>
</tr>
<tr>
<td>H</td>
<td>Hotel</td>
<td>U</td>
<td>Uniform</td>
</tr>
<tr>
<td>I</td>
<td>India</td>
<td>V</td>
<td>Victor</td>
</tr>
<tr>
<td>J</td>
<td>Juliet</td>
<td>W</td>
<td>Whiskey</td>
</tr>
<tr>
<td>K</td>
<td>Kilo</td>
<td>X</td>
<td>X-ray</td>
</tr>
<tr>
<td>L</td>
<td>Lima</td>
<td>Y</td>
<td>Yankee</td>
</tr>
<tr>
<td>M</td>
<td>Mike</td>
<td>Z</td>
<td>Zulu</td>
</tr>
</tbody>
</table>
Unit Objectives

- Understand the operating characteristics of FRS/GMRS radios
- Learn to operate a radio effectively
- Use correct operational procedures
- Learn to create well formed messages
Compose the message first

- Write the message on the message form
- Be brief, 20 words or less.
- DO NOT TRANSMITT UNTIL IT IS WRITTEN DOWN!
Just the Facts!

- Give your location
- In general keep the information to 20 words or less. Just the facts!
- Stick to CERT terms: Immediate, Delayed, Minor, Light, Moderate, Heavy, and so on
Message Traffic

- “ICP, Team 4: 78034 Andover Street. Heavy Damage, Over”
## ICP Activity Log Entry

### Team 4: 780034 Andover Street. Heavy Damage

<table>
<thead>
<tr>
<th>Time</th>
<th>Major Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1855</td>
<td>Team 4: 780034 Andover Street. Heavy Damage</td>
</tr>
</tbody>
</table>
The Unit Log:

- Unit information.

- Activity Log.
### UNIT LOG

<table>
<thead>
<tr>
<th>1. Incident Name</th>
<th>2. Date Prepared</th>
<th>3. Time Prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Night Sky Exercise</td>
<td>Jan 1, 2007</td>
<td>1850 hrs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Unit Name/Designators</th>
<th>5. Unit Leader (Name and Position)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division A Team 4</td>
<td>James T. Kirk</td>
</tr>
</tbody>
</table>

#### Personnel Roster Assigned

<table>
<thead>
<tr>
<th>Name</th>
<th>ICS Position</th>
<th>Home Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>James T. Kirk</td>
<td>Team leader</td>
<td></td>
</tr>
<tr>
<td>Mr Spock</td>
<td>Science Officer</td>
<td></td>
</tr>
<tr>
<td>Nyota Uhura</td>
<td>Communications</td>
<td></td>
</tr>
</tbody>
</table>
Today: 7:50 PM. Your team discovers a fire in an apartment building. There are people screaming inside. One woman is begging you to help save her baby and her mother in apartment 8. The apartment is at 7452 Iberville. The unmistakable smell of gas is in the air. Your team has discovered seven people with first degree burns.
Today: 7:50 PM. Your team discovers a fire in an apartment building. There are people screaming inside. One woman is begging you to help save her baby and her mother in apartment 8. The apartment is at 7452 Iberville. The unmistakable smell of gas is in the air. Your team has discovered seven people with first degree burns.
# Activity Log

<table>
<thead>
<tr>
<th>Time</th>
<th>Major Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1855</td>
<td>321 Main St. 4 immediate, 2 minor, Heavy damage</td>
</tr>
<tr>
<td>1940</td>
<td>7800340 Andover St. Heavy damage</td>
</tr>
<tr>
<td>1950</td>
<td>7452 Iberville. Apartment fire. Victims trapped inside. 7 Minor. Possible gas leak</td>
</tr>
</tbody>
</table>

Why a log?

- When you use the radio, you need to log all messages.
- Use the ICS-214
- “If it isn’t written down, it did not happen.”
1. Compose your message before you speak.
2. Start by listening - is the channel clear?
3. If clear, press the transmit button
4. Then speak, giving call sign of who you are calling, then your call sign.
5. Then let go of the transmit button
6. Wait for an acknowledgement.
7. Once acknowledged, wait a second then press the PTT button
8. Speak, give your call sign, then your message. Slowly.
9. Then let go of the transmit button
10. Wait for a confirmation.
11. If confirmed. Acknowledge. You are done.
12. If not confirmed. Resend message
2005 Porteous Street

USGS Photo
Example: Message Passing

- On the radio you say: “ICP, Team 4”
- You hear: “Team 4 Go Ahead.”
- You say: “Team 4. 2005 Porteous Street Heavy Damage. Team 4 Over”
Example: Message Passing

- You hear: “Copy 205 Porteous Street Heavy Damage. ICP Over”
- You say: “ICP. Negative. I repeat. Two Zero Zero Five Porteous Street Heavy Damage. Team 4 Over”
- You hear: “Team 4 Copy 2005 Porteous Street Heavy Damage ICP Over”
Example: Message Passing

- You say: “ICP. Affirmative. Team 4 Over”
  <At this point the message is passed.>
- You hear: “Team 4 proceed to...”
Speak Slowly... No, Even Slower.

- Say no more than five words without a pause.
- As you speak trace the letters on the log with your fingers.
- Use phonetics if necessary. (alpha, bravo, charlie, delta, ...)
- Your goal: Pass your message in one try.
But why speak slowly?

- Everything you say to the command post is being legibly written down.
- Records tell the story.
The most common mistakes

1. Speaking without listening first.
2. Message poorly formed, not brief.
4. Bad microphone technique.
Exercise: Team to Team

Division A

Team 1  Team 2
Team 3  Team 4

Division B

Team 1  Team 2
Team 3  Team 4
Exercise Wrap-up

- What did you encounter?
- Challenges?
Exercise: Team to Team

Division A

Team 1 → Team 2 → Team 3 → Team 4

Division B

Team 1 → Team 2 → Team 3 → Team 4
The CERT team’s view: Basic Disaster Communications

- EOC
- Ham Radio Operators
- CERT Neighborhood Command Post
- FRS/GMRS Radio
- CERT Team
- CERT Team
- CERT Team
- CERT Team
Where do we go if there is an incident?

- Ask your Neighborhood team leader for the activation plan for your neighborhood.
Questions for you

- Never leave the frequency without letting Command Post know. Why?
- Always monitor your radio, leave it turned on! Why?
- What distance will your radio cover?
- What is your neighborhood’s FRS Channel?
Unit Summary

You should know:
- The difference between FRS, GMRS, & Ham Radio
- Basic operation of your radio
- Correct Operational Procedures
- How to create and pass a message
- Why Radio communication is important

Always follow the safety rules established for CERTs – personal safety comes first!
Links

- Berkeley CERT

- FCC [http://wireless.fcc.gov/services/index.htm](http://wireless.fcc.gov/services/index.htm),
  Search for FRS, GMRS, Amateur

  Search for Family Radio Service, etc.

- NALCO [http://nalco-ares-races.org](http://nalco-ares-races.org)

- ARRL [http://www.arrl.org](http://www.arrl.org)