**Disaster Communications With FRS Radios**

This material is for the "Basic CERT Class #2, FRS"

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**WELCOME!**

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**Course Objectives**

- Quick overview of...
  - "After a major Disaster..."  
  - The role CERT plays  
  - Where do you fit in the picture?  

**The major goals for this class...**

- Learn techniques for efficient and accurate CERT communications  
- Learn to use a two way radio  
- Practice with an FRS radio

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**"After a major Disaster..."**

Limited Communications -

- Cell text messages *(maybe ?)*: No voice.  
- Messengers  
- CERT Radio (FRS & HAM) *(yes !!!)*

Limited Public Services -

- LOTS of people need help RIGHT NOW

*Walnut Creek services can’t meet demand...*

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**The role CERT Plays**

- Fire, police, medical first responders overwhelmed  
  - City needs to know extent of damage/injuries  
- In many cases CERT will be there first  
  - Locate victims in neighborhoods  
  - Provide limited First Aid  
- CERT becomes the eyes and ears for the City.  
  - Send status reports to Walnut Creek EOC (emergency operations center)

Walnut Creek is divided into Eight CERT Areas...
CERT Incident Command System Roles and Tactical Call-Signs

- Each CERT volunteer has a role.
- People in some roles need to use a radio.

**Radio Fact #1:**
Over the radio, refer to people by their role name. Your role name is your radio name or “tactical call-sign”

- Why?
  - people rotate into and out of role positions
  - at a store, when you want to complain, you say “I want to speak to your MANAGER!”
  - more useful than a person’s real name

Note: a tactical call-sign is NOT the same as a HAM call-sign!

Critical Radio Fact

**A Radio is not a cell phone!!!**

- What happens when two people talk at the same time? In this recording, you will hear...
  - One person counting 1,2,3,…,20
  - Then a second person starts to recite A,B,C,D,…,P

- Who did you hear?

**Radio Fact #2:**
Two people can’t talk at the same time. You’ll hear...
- interference (squawking or hissing)
- or only one of the people

We call this “doubling” or “stepping on each other”

Emergency Communications Demo – 1 of 2

- You are about to hear an emergency communications demo involving these people with radios:

<table>
<thead>
<tr>
<th>CERT ICS Role</th>
<th>Tactical Call-Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Center and Net Control</td>
<td>BV CONTROL</td>
</tr>
<tr>
<td>Search and Rescue Team 2</td>
<td>BV SAR 2</td>
</tr>
<tr>
<td>Transport driver</td>
<td>BV Transport</td>
</tr>
<tr>
<td>Search and Rescue Team 1</td>
<td>BV SAR 1</td>
</tr>
</tbody>
</table>

Emergency Communications Demo – 2 of 2

- During the communications demo, “ACTIVELY Listen!”

You’ll hear two messages. You’ll know they’re coming when you hear -

**BEGIN WRITTEN MESSAGE**
- The first message is “BV SAR 2 reports a house off its foundation at 371 Main St. Message number is 401.”
- Copy SECOND written message and msg number here:

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Emergency Comm Demo De-brief

Were you able to copy the second written message?

“BV SAR 1 reports a downed tree blocking all lanes at 371 Ondy Dr. Message number is 402.”
Maybe. The sender must dictate clearly, slowly, and concisely.

What did you notice in the demo?
- Short exchanges
- Special control words (over, clear, go ahead, etc.)
- Tactical call-signs (radio names for people)
- Taking turns (only one person can talk at a time)
- One person in control (“BV Control”)
- A “double” (a radio is NOT a cell phone)

We’ll show you how to communicate like this in a series of small steps!

VERBAL DRILLS

- I’ll split the room in half.
- Each half gets a tactical call-sign...
  - You folks are **Buena SAR 1**
  - You are **Buena Transport**

Circle your tactical call-sign above

1. I’ll ask one side of the room to say something.
2. Everybody in that half raises one hand to an ear.
3. Then everybody responds at the same time!
Verbal Drill #1:
Use your tactical call-sign to identify yourself

- To identify yourself on the radio, you say
  "This is Buena SAR 1, OVER." or
  "This is Buena Transport, OVER." as appropriate.
- When I point to your side of the room,
  a) raise your hand to your ear (to train a reflex),
  b) then say in unison the words to identify yourself.

Note 1: "OVER" means you are done talking, you are turning the radio frequency "over" to the other party, and you expect a response.

Note 2: Never yell into your radio. Always use a calm, clear, even voice.

Verbal Drill #2:
You want to contact "someone"

- To contact someone, e.g. Buena Ops,
  – you listen for silence,
  – then say
  "Buena Ops, Buena Ops, this is Buena SAR 1, OVER." or
  "Buena Ops, Buena Ops, this is Buena Transport, OVER."
- When I point to your side of the room, I’ll ask you to “contact Buena Ops.” You say the words. (Then I’ll ask you to contact Buena Security, Buena Medical, Buena SAR 2, etc.)

Verbal Drill #3a:
"Someone" wants to contact you

- Someone wants to contact you (you heard your tactical call).
  You must reply as quickly as possible.
- For example, you heard:
  "Buena SAR 1, Buena SAR 1, this is Buena Security, OVER"
  You reply: "Buena Security, this is Buena SAR 1, OVER"
- The projector operator will request contact with your side of the room. Say the words to answer the request.
  (e.g., he/she might be Buena Medical, Buena Ops, etc.)

* denotes that the projector operator reads this aloud.

Verbal Drill #3b:
Request and answer a contact

- When I point to your side of the room, make a contact with the other side of the room. Then the other side of the room answer the contact.
  For example, I'll point to Buena Transport. They'll say
  "Buena SAR 1, Buena SAR 1, this is Buena Transport, OVER." Buena SAR 1 will answer:
  "Buena Transport, this is Buena SAR 1, OVER."

Verbal Drill #4a:
Practice a verbal exchange (demo)

- Put it all together. In an informal situation, one side of the room contacts the other side of the room to ask very simple questions with simple answers so you can concentrate on the flow of the conversation.
- As I point to your side of the room, just read the next set of words in your "What...says" column in unison. For example,

<table>
<thead>
<tr>
<th>Buena SAR 2 action</th>
<th>What Buena SAR 2 says:</th>
<th>Buena Transport action</th>
<th>What Buena Transport says:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTACT</td>
<td>Buena Transport</td>
<td>Buena Transport</td>
<td>This is Buena SAR 1, OVER.</td>
</tr>
<tr>
<td></td>
<td>Buena Transport</td>
<td></td>
<td>This is Buena SAR 1, OVER.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You are ready to talk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buena SAR 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Now, look at the next slide which contains the full drill...
**Verbal Drill #4b: Practice a verbal exchange (full drill)**

<table>
<thead>
<tr>
<th>Buena SAR 1 says:</th>
<th>“Buena SAR 1 says:”</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Buena Transport...”</td>
<td>“Are you having fun yet? OVER.”</td>
</tr>
<tr>
<td>“Buena Control...”</td>
<td>“Buena Transport...”</td>
</tr>
</tbody>
</table>

*See “Standard Phonetics” slide and “Pro Words” slide at the end.*

**Verbal Drill #5b: Request a turn in a directed net**

This drill illustrates asking for a turn to talk in a directed net where “doubles” can occur. 
**Buena SAR 1**, you need to tell Buena Control that you’re taking a 20 minute break. 
*Buena Transport*, you need to tell Buena Control that you’re taking a 10 minute break.

<table>
<thead>
<tr>
<th>Buena Control says:</th>
<th>“Buena Control says:”</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Buena Transport...”</td>
<td>“Affirmative. Buena SAR 1, CLEAR.”</td>
</tr>
<tr>
<td>“Buena Transport...”</td>
<td>“Buena Transport, CLEAR.”</td>
</tr>
</tbody>
</table>

**Verbal Drill #5a: Directed Nets**

In the recorded CERT drill you heard earlier...

- four people shared a common radio channel.
- one person, who is ALWAYS listening.
- controlled who got to talk next.

Multiple people using a common channel with someone controlling who talks next is called a “directed net”. You must:

1. Wait until there is silence.
2. Say your call-sign to ask the “net control” person for a “turn” to talk.
3. Start talking when “Control” says “your call-sign, go ahead, OVER”.
4. Try again later if you don’t get a turn. (“Control” didn’t hear you). 
   For example, suppose:
   a) **Buena SAR 1** and **Buena Transport** want to talk to **Buena Control**.
   b) **Buena SAR 1** and **Buena Transport** simultaneously say their call-signs.
   c) **Buena Control** tries to make sense of the “double”. For example, if he/she only hears “PORT”, Buena Control announces “There was a double. PORT, go ahead, OVER.”
   d) The person with “PORT” in their call-sign now talks while the other person waits.

**Directed Net - Control asks you to “Stand By”**

When you ask for a turn on a directed net, Control may ask you to “STAND BY”.

This means that Control is busy and can’t talk to you.

Answer by saying “tactical call sign STANDING BY, OVER.”

Patiently wait until Control comes back to you and gives you a turn to talk.

If you have been patiently waiting, there is no radio activity, and you did not get a turn to talk, Control may have forgotten about you! Just ask for a turn again.

*NOTE: “STAND BY” means “Wait, I’ll be ready for you shortly.”

**What’s next**

- I’ll demonstrate how to use an FRS radio.
  
  *Note: tonight you will practice using an FRS radio (“Family Radio Service”). However, in the big Graduation drill that follows the last class #7, you will use an amateur (HAM) radio which operates in a similar fashion. You need to pass a test to use a HAM radio without supervision. You’ll hear more about the HAM Cram that is offered after the Graduation drill.*
- You’ll split you into small RADIO DRILL groups to practice using an FRS radio for 25 minutes.
- When you finish the drills, Team Instructors will collect the radios and return with you to this class room.
Radio Controls – 2 of 2
Mic, LOCK button, and symbol locations may vary...

RADIO DRILLS – Split into groups
1. Send students to four corners of the room with PRINTED HANDOUT, JACKET, and HEAD LIGHT/Flashlight.
2. The third proctor (if any, the observer/trainee) becomes Trans 1***.
3. Students write down tactical call-signs assigned by Control*.
4. At drill area, Security** distributes radios (even if student has one).

TACTICAL CALL-SIGNS for Radio Drills
a) As guided by "Control", circle your assigned CERT area and role below.
b) Write your tactical call-sign
   - (holding radios close to mouth; talking in their calm "radio" voice; etc.)
   - A listener moves around the circle
     - As directed by Security**
   - Questions (in normal volume across the microphone)
   - Don’t send sensitive information over the air
   - BREATH
   - PUSH the PTT (talk across the mike; if windy, talk directly into it).
   - Release the PTT button (a.k.a. "Release to Listen")
   - If you are getting a bad signal, you must move – several inches to hundreds of feet.

CERT Area (and FRS channel number):
   - Buena (CH8), Rossmoor (CH10), Sugar (CH12), Northgate (CH14)

CERT Roles
A) Control*  D) SAR 1  G) Logistics  J) Trans 2
B) Security**  E) Medical  H) SAR 3  K) Trans 3
C) Trans 1***  F) SAR 2  L) Plans  M) Ops Chief

Basic FRS Radio Usage "Rules" Demonstrated
1. Stand in a safe place (e.g., not in the middle of the street).
2. Only one person at a time can talk!
   - This is NOT a telephone.
3. Tune radio to assigned channel and LOCK.
4. Talking on the radio – you’ll practice this soon!
   - THINK – mentally compose or write message down
   - VERTICAL – radio works best with antenna upright
   - LISTEN to ensure no one is talking
   - PUSH the PTT (Push-To-Talk button).
   - BREATHE – you need to pause a moment for the radio to get ready to transmit; otherwise words may be cut off.
   - SPEAK – clearly, calmly, and slowly in normal volume across the microphone
     - (talk across the microphone if windy, talk directly into it)
   - RELEASE the Push-To-Talk button (a.k.a. "Release to Listen")
   - Don’t send sensitive information over the air – ANYONE may hear you!
   - If you are getting a bad signal, you must move – several inches to hundreds of feet.
   - Get higher. Face a different direction. Tilt the antenna.

RADIO Drill #1 - Identify yourself
You learn how to hold the radio, then listen and talk.
1. Students stand in a circle. Turn on the radio and adjust volume while <area> Control broadcasts "Testing".
2. Watch as <area> Control identifies himself using proper radio position and voice - "This is <area> Control, OVER."
3. Now, <area> Control points to the next person.
4. The person moves the radio to proper position, pushes the PTT key, breathes in, then says "This is <area>[tactical call-sign], OVER", then releases the PTT key.
5. <area> Control goes around the circle at least twice.

Note: <area> Security helps a student when needed – watches for proper form/usage.

Do the Mark Berch Maneuver - your arm is "frozen" with the radio next to your mouth so that if you bent over, turn around, move your head up, etc. the head (with mouth) and arm (with radio) are always in same position.

RADIO Drill #2a – Demo - calling and replying
Practice initiating a contact and answering a contact in an informal (non-Directed) net.
- Security asks question, Trans 1 via radio, Trans 1 answers.
- Security asks question, Trans 1 via radio, Trans 1 answers.

RADIO Drill #2b – Everybody – calling and replying
Now, going around the circle, <area> Control verbally asks each person to question the next person clockwise in the circle (i.e., "<caller> asks SAR 1"")
After you go all the way around, repeat going counter clockwise around the circle. <area> Security oversees proper radio usage and etiquette.

<caller> says:  <called person> says:
- "What is your favorite color? OVER"
- "I like yellow. OVER"
- "What is your favorite color? OVER"
- [some answer…]

<caller> asks:  <called person> asks:
- "What is your favorite color? OVER"
- "I like purple. OVER"
- [some answer…]
RADIO Drill #3 – Request a turn in a directed net

This drill practices talking in a directed net and how Control handles doubles.

Control points to two students. They turn around (to eliminate visual clues), then say their tactical call-sigs to request a turn. When given a turn, a student asks Control a question. To distinguish, Control points to #security and a student.

<table>
<thead>
<tr>
<th>Control</th>
<th>Call</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person A</td>
<td>Person B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Person A</th>
<th>Person B</th>
</tr>
</thead>
<tbody>
<tr>
<td>This turns away. Leave for silence, then say (Person A) or (Person B)</td>
<td></td>
</tr>
<tr>
<td>Control uses whatever (the hours and says [There was a double: partial name] go ahead, OVER.</td>
<td></td>
</tr>
<tr>
<td>Neither party knows someone else wants to talk. They may ask for a turn at the same time!</td>
<td></td>
</tr>
<tr>
<td>This is (Person x). When does class end? OVER.</td>
<td></td>
</tr>
<tr>
<td>The other person, go ahead, OVER.</td>
<td></td>
</tr>
<tr>
<td>Because their horns don’t work, OVER.</td>
<td></td>
</tr>
<tr>
<td>Control points to three people, who all ask for turns. Maybe students question other students [like drill #2], etc.</td>
<td></td>
</tr>
</tbody>
</table>

End of This Material

1. If there is still time, assign Control mix it up…
   - ask people questions directly
   - ask three students to get a turn at the same time, then identify themselves.
   - ask three students to get a turn at the same time, then ask another student a question.

2. This is the end of the radio drills. Please return the loaner radios to the proctor, then assemble in the main classroom.

If you haven’t done the Fire Control Exercise, report to Fire instructors. Otherwise, thank you and remember to sign-out!

How to Tune A CERT Cache Radio

1. (If you see “keys are locked”), press and hold for 7 seconds “CALL” button until lock symbol disappears.
2. Press MENU key (big digits flash). Press “A” as needed to change the channel.
3. Press MENU again. You want 9r oF.
4. If you see “on”, press “key.
5. Press MENU again. You want oF.
6. If you see “off”, press “key. If you see “off”, press “key.
8. To use the up or down arrows to change main channel (big digits), if you see small digits, too, repeat steps 1-6. Step 4 must be oF.

Note: press keys quickly else exits MENU.

Tuning Other Common Radios

Rotate ON/OFF to ON, set channel & no tone:
1. (If you see “keys are locked”), press and hold “MENU” until lock symbol disappears.
2. Press MENU key.
3. Press “

Changing HAM Radio Memory Channels

Once the keyboard is UNLOCKED (see previous slide), you can select pre-programmed memory channels. Always RE-LOCK your radio.

Wouxun KG-UVD1 | Yaesu F-90A
--- | ---
UNLOCK the keyboard, then use the up or down arrows to change memory channels OR press the digit number of the channel (for example, press keys 0, 1, 5) | UNLOCK the keyboard, then use the up or down arrows to change memory channels OR press the digit of the channel number (for example, press key 1, key 5) OR press the [FW] key. RE-LOCK the keyboard.

Note: if you enter only 1 or 2 digits instead of all 3, the radio may just sit there for a few seconds, and then return to the previous channel.
Directed Radio Net Etiquette, Part 2 of 2

Remember...

- One person (Control) controls (“directs”) who talks next
- Ask Control for permission to speak
- Talk ONLY after Control says “your call-sign, go ahead, OVER”
- Answer PROMPTLY
  - Monitor the radio continuously
  - Answer immediately if you are called
  - If you must leave early, or need to take a nature break, don’t just leave the “air”
  - Otherwise Control wastes time trying to call or locate you when you are “not there”
  - Get a turn, and notify Control you’ll be back in XX minutes
  - When you return, get a turn, and tell Control you are back.
- Emergency traffic (life or death, or immediate threat to property) takes precedence over all other messages

Golden Rules of Communicating

- Emergency communications always go first.
- Mostly listen! Don’t try to talk if someone is using the channel. Only one person can talk at a time – all others have to listen.
- Speak clearly, calmly, carefully in a normal voice when it is your turn.
- Even in a noisy place where it is hard for you to hear, you speak in a normal voice. Talking “louder” into the radio doesn’t help – it only comes out garbled at the other end!
- Get the message across without a lot of words.
- Use your TACTICAL CALL-SIGN to identify yourself. If you take the HAM CRAM next month, you’ll learn when to use your HAM call-sign in addition to your tactical call-sign!

Directed Radio Net Etiquette, Part 1 of 2

1. The people in your drill group worked together to share a common radio channel – this is a network of radios (or “net”). Since two people can’t talk at the same time, one person controls who talks next.
2. Suppose Person A wants to talk to Control and, at the same time, Person B also wants to talk to Control.
3. Person A and Person B request a “turn” to talk by saying just their call signs. Control sorts out the double & says “Person… go ahead, OVER.”

<table>
<thead>
<tr>
<th>Control says:</th>
<th>Someone with tactical call-sign (Person) says:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person…, go ahead, OVER.</td>
<td>Wait for silence (usually after you hear someone say “CLEAR”), then say “Person…”</td>
</tr>
<tr>
<td>Person, STAND BY, OVER, OR Person, go ahead, OVER.</td>
<td>“STAND BY” means be quiet and patiently wait. Otherwise it is your turn.</td>
</tr>
</tbody>
</table>

International Telecommunication Union (ITU) Standard Phonetics for CERT

- A - Alpha
- B - Bravo
- C - Charlie
- D - Delta
- E - Echo
- F - Foxtrot
- G - Golf
- H - Hotel
- I - India
- J - Juliet
- K - Kilo
- L - Lima
- M - Mike
- N - November
- O - Oscar
- P - Papa
- Q - Quebec
- R - Romeo
- S - Sierra
- T - Tango
- U - Uniform
- V - Victor
- W - Whiskey
- X - Xray
- Y - Yankee
- Z - Zulu

After the shaking stops, take care of your family.
- Tune your FRS radio to CHANNEL 8 (mtn) to alert Control to direct the next person to talk.

Different CERT uses, prices, features

<table>
<thead>
<tr>
<th>0.75W</th>
<th>0.50W FRS/GMRS</th>
<th>5W HAM</th>
<th>5W HAM</th>
<th>10W HAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200</td>
<td>$350 - $500</td>
<td>$500</td>
<td>$1000</td>
<td>$1500</td>
</tr>
</tbody>
</table>
Where to buy radios

- FRS: No license: Amazon, REI and others sell.
- Ignore mileage claims.
- For example, Motorola EM-1000, Midland GXT710, etc.
- NOTE: Only use ch 8-14 (you need a $65 GMRS license to use channels 1-7, 15-22).

- HAM: Pass a test to get a license.
- OR take a Salvation Army class, then take a test at MDARC.
- OR buy a study guide.
- In any case, then take the "CERT Getting on the Air" classes.

Buy a radio with the HAM Radio Group Purchase (e.g., Wouxun or Yaesu)

HAMS might also consider buying an FRS radio.

End of the FRS Presentation