

1> We are continuing our CERT radio training with an introduction to multi-channel operations. This familiarizes you with more formal radio procedures which enable you to operate a 2-way radio more effectively during complex incidents in which there will be formal communication plans. Large incidents may involve multiple CERT teams and require a full ICS structure which places much more stringent demands upon communications. In such cases it is VERY highly recommended that CERT use a formal communication plan and a directed or controlled net structure.

2> **Objectives: *After completing this unit you will be able to:***

- **Develop a plan for CERT communications**
- **Understand why multi-channel operations are needed for complex incidents**
- **Use correct radio operating procedures**
 - **Procedural words, and standard ITU phonetics**
- **Operate your portable radio more effectively during an emergency!**

Most of your radio use in CERT up to now has involved use of the Family Radio Service, without any formal control. Using FRS on a single channel works OK when you only need to communicate with members of your own team, and when the available radio channels aren't busy. When multiple teams work together on a larger incident, it becomes necessary for many more users to share a limited number of channels. When things get busy, people may "talk over" each other unless channel allocations are coordinated and teams know their channel assignments ahead of time. Use of a directed or "controlled net" enables those managing the incident to prioritize radio use and to handle urgent situations first.

3> An alerting and mobilization is yet another part of your team communication plan. Communication methods used to alert and mobilize your team may include person-to-person contacts, landline or cellular telephone, email or text messaging. Whatever method your team decides upon, it should be efficient, organized, communicated to all team members and be made available to all team members.

4> During any response you may need to speak on the radio with other members of your team. In large incidents you may need to coordinate your actions with the incident command post, or with other teams you are working with. In order to contact them, you need to know which radio channel they will be using. This is easier when there are pre-determined channel assignments so that everyone knows ahead of time which channels will be used and for what purposes. That way everyone reads from the "same sheet of music."

5> In a fully developed ICS structure the Communications Unit Leader is in the Service Branch, of the Logistics Section. That person's job is to identify WHO needs to communicate and with whom.

FRS channels 8 through 14 are restricted by FCC regulation for low power use only. They should be used routinely for contacts between team members. FRS 8 is recommended as the primary working channel for coordination between different CERT teams. FRS channels 1 through 7 are shared with the General Mobile Radio Service. Licensed GMRS users may use higher powered radios which enable reliable communication over longer range. The “high-power” channels should be allocated for use where greater range may be required, such coordination between Team Leaders with the Command Post, or for the IC or Team Leaders to communicate with Public Safety.

6> In large incidents where there is a fully developed ICS structure, each section, Operations, Logistics, Planning, Admin, is assigned their own channel to communicate with each other and with the IC and team leaders.

7> The IC or Team Leaders may need to communicate directly with first responders. This is best done using an assigned channel which is kept clear for this purpose and not used for routine CERT operations.

8> Radio use on searches requires caution, because you don't use the radio to distract you from hazards in your environment. Designate one team member to operate the radio. Don't use the radio when busy with tasks which require your full attention. At all times maintain situational awareness. Safety first.

- STOP what you are doing, then, when in a safe place
- THINK about what needs to be communicated
- OBSERVE your situation, if it is SAFE to transmit? then...
- PLAN what you are going to say, and make your call.

9> Unit IDs are more useful than names for those listening to follow what is going on. Tactical call signs make it easier to track assignments by location and function and to know whether the people talking are moving or stationary. Use your Unit ID to establish initial contact, and again when ending your transmission. Fixed locations are identified by PLACE NAME and FUNCTION. Portable or mobile units which may change location frequently are identified by their assignment type and a unique alpha-numeric identifier.

10> “Unit ID's” is enable the person in charge to follow events by their function or location, without regard to who is operating the radio. This provides continuity when persons rotate duties and expedites accurate logging. Use your unit ID consistently, when you contact people or listen for calls directed to you.

11> The more urgent the need is to use the radio, the more important it is for there to be a command presence to prioritize and control things. That is why we want to teach CERTs basic radio discipline by demonstrating and using good radio procedure. “Controlled” nets are recommended for CERT operations when ever more than four people use the same working channel.

12> In communications between a fixed or stationary unit and a portable or mobile unit, the fixed station always acts as the “control” station.

13> If a command post or other ICS facility needs to contact more than one unit simultaneously, the unit ID's of all stations to be contacted may be listed in any convenient sequence followed by the prowords "THIS IS" followed by the tactical call sign of the facility who is calling them.

14> When public safety dispatchers assign multiple units over a repeater system, signals are strong and clear, and there is no doubt who the control station is. In our CERT radio communications we operate on "simplex" with low powered radios having limited range. Because signals may not be loud and clear to everyone on the net, we teach the ICAO calling procedure, using THIS IS, before you identify. This helps alert your brain to pay attention and listen to "who is calling me."

15> Without controlled nets during emergencies, everyone who is excited may try to speak at once, which results in complete, total and utter chaos. So stop, take a deep breath, collect your thoughts and LISTEN. A good "Control" station educate people on-air when necessary, but does so with diplomacy and tact. Being disciplined and organized enables the person in charge to prioritize and deal with the most urgent items first.

16> In a formal net you should respond only to Control and follow instructions exactly. Answer promptly when called. Do not leave the net without checking out. If you will be out of contact, hand off the radio to someone else, or check out, during a lull in activity, and explaining the situation. **"Supply 1, turning off radio to refuel vehicle, will report when back in service, over."**

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Listening the channel to avoid "talking over" a conversation in progress is required by FCC regulation and is simple courtesy. Wait a few seconds between each transmission to leave gaps to enable others with more urgent traffic to break in. It's OK to interrupt the net if you have a good reason to, but there is a correct way to do it. Wait for a break between transmissions, identify briefly and say why in plain language with as few words as possible. Then wait for Control to recognize you. **"STAIRWELL TEN, URGENT"**

18> A guiding principle of good communication is the use of plain language and common terminology. Avoid use of technical jargon unless it is operationally necessary. Keep your radio transmissions short and simple. Remember that somebody on the other end needs to write down the essential elements. Speak CLEARLY AND SLOWLY so you can be easily understood.

19>

- Before going on a mission ensure that your radio has fresh batteries.
- Replace batteries before every mission.
- Check radio function before you go out of voice contact range.
- Keep radio checks brief and simple. Call another unit, identify yourself and request a radio check.

- The radio check consists of : “<ID of Unit being called>, THIS IS <your unit ID> TESTING 1,2,3,4 HOW COPY? OVER.”

On GMRS or amateur radio you must identify by your license call sign during test transmissions. Radio checks should not last more than 10 seconds.

20> When replying to a radio check, plain language should be used:

LOUD AND CLEAR means, **Excellent** copy with no noise

GOOD READABLE means, **Good** copy, with slight noise

FAIR READABLE means, **Fair** copy, OCCASIONAL FILLS are needed

WEAK READABLE means, **Weak** copy, FREQUENT FILLS are needed

WEAK UNREADABLE means, **Unable to copy**, a RELAY is REQUIRED.

“< ID of Unit being called > THIS IS < your unit ID > “I copy...”
< plain language report > Out.”

Ham radio operators use a numeric scale to rate Readability and Signal Strength of radio transmissions, a “FIVE-NINE” signal is “full quieting” with no noise. We want you to use plain language instead. You may hear ex-military use the ITU phonetics, i.e. “I copy LIMA CHARLIE” just so you know.

21> Use the “echo” technique to confirm and read back critical information. Ask for clarification, if needed. Read back critical information EXACTLY y as you have written it down Ask the sender to CONFIRM that you have received and copied it correctly.

22> **When a contact attempt fails** on the assigned frequency, try to establish contact on another working frequency appropriate to the area of operations. Return to your previous channel and try again. **When a fixed station is unable to contact a mobile or portable unit**, they should attempt to relay the message via any other unit which has good copy.

23> The “Control” station should be someone with good people and basic radio skills, who is well organized and has a clear speaking voice with good command presence. If you are Control and someone is working with you, ask them to record the log while you talk. If you are alone you must work the radio net and log as you go. Learning how to do so is not particularly difficult, but it does require practice and knowing what to do.

24> It helps for us all to take some “time in the saddle” during exercises to appreciate what Control faces during an emergency. Everyone should take turns at this. This helps you find out who has leadership potential and makes everyone a more understanding

participant. Control leads by example, being a good radio operator. Handle the work efficiently. Stick to established procedures and write everything down to maintain a clear record.

25> When it gets busy you CAN'T remember everything in your head. There are too many stresses and distractions. How else, but with a log, can you reconstruct what happened later and learn from the experience.

26> Accurate logs provide a time line and account for assigned personnel and resources.

- **Who has a problem or information**
- **Situation update / tasks assigned**
 - **Problem identification and location**
 - **Status of building search and evacuation**
 - **Resources needed, available, assigned, out of service or in transition**
 - **Personnel safety / accountability**
- **Brief Team Leader and Incident Commander**
- **Becomes part of the incident record.**

27> Write down the names of people for whom you relay messages or information or assign tasks. This is necessary in case your relief operator gets a reply later, so they know who is supposed to get the reply. Failing to do so wastes times repeating the same requests and figuring out where they should go.

28> While you could log on anything from a piece of duct tape to a dirty napkin, it helps to have a form as an aid to your thinking. You don't have to use the ICS 309 form shown, but it may be helpful. If you may be reasonably expected to work on a command staff from a fixed location, rather than as a search team member, should carry at least a bound notebook.

29> Use the memonic ASAP as an aid to information management.

A is for ACCURATE: Precise, clear.

S is for SPEEDY: quickly copied and delivered

The second A means APPROPRIATE DISTRIBUTION

The right person gets the information

P means PERMANENTLY RECORDED: Maintain Logs as instructed.

30> Communication plans and Recommended FRS and GMRS Channel Assignments:

The low-power channels 8-14 should be used for Intra-team communications among between team members during search and rescue operations. Channel 8 is suggested as primary for communications between teams, for coordination purposes. Channels 1 through 7 can be used with higher-power radios for longer range communications between Group Leaders and the CERT Team Leader, or between Team Leaders and the Incident Command Post.

Not all FRS radios have all 14 channels, but all FRS radios have at least Channel 1. The idea is that if the power or telephones go out, neighbors would turn on their radio to Channel 1 and use it to contact Neighborhood Watch or emergency responders, including CERT. So in most cases we wouldn't use FRS1 for CERT operations, but use it to contact other neighbors.

31> A communication plan for a complex incident contains assignments not only for the Family Radio Service portables issued to CERT, but also for amateur or "ham" radio, and licensed units in the General Mobile Radio Service. GMRS and amateur radio repeaters provide reliable county-wide coverage. It is very useful to have an FCC licensed radio operator on your team equipped with a ham or GMRS radio. Then if the cellular phone network becomes overloaded or land-lines become inoperable, you aren't out there alone "in the dark" without communications.

32> Developing a "tone plan" is more complicated if not everyone uses the same make and model of radio. Different radio manufacturer instruction manuals may designate CTCSS tones either by the Electronic Industries Alliance or EIA letter code, or by a list sequence number. You need to know the actual frequency in Hertz of the chosen sub-audible tone for everyone to properly set the same exact frequency. Tone squelch is most useful in situations when there are many users and not enough radio channels, but people must be trained how to program their radios properly and understand how tone works to use it effectively. It is unnecessary for most CERT radio use.

33> We talked about prowords in Part One, Let's ll briefly review the basic four and then give you some more...

- **"THIS IS"** - Used to identify who is calling
- **"OVER"** - Means *"I have finished speaking and it's now your turn"*
- **"GO AHEAD"** - Means *"I'm ready to copy"*
- **"OUT"** - Means - *"I am finished and expect no reply"*

The station who initiates the call always TERMINATES it.

34> There are lots more pro words, but we'll go over some useful, common ones. **"Copy"** is the same as "OK," or "ROGER" and means received and understood." It doesn't acknowledge that you have copied it correctly! For that you should use the "Echo" technique to repeat and confirm critical information.

"Affirmative" or **"Negative"** are readily understood and aren't as easily lost in background noise as "yes" or "no." If you need clarification of something which you didn't understand use the prowords **"Say Again"** Don't say "repeat" because in noisy conditions because it sounds like "complete" and can be misunderstood.

35> If you make a mistake, don't get flustered, just say **"correction"** and continue again from the last correct word. The receiving unit should acknowledge the correction by echoing the information and then querying whether they received it correctly by asking **"Correct?"**

The sending unit confirms by saying "AFFIRMATIVE" or "CORRECT.," "WAIT" or "ALL UNITS WAIT" means to stop talking until you are called. This is vital to maintain control of the frequency. Otherwise things can get out of hand. All users must understand and follow instructions.

36> "I spell" is used to clarify technical words, names or words which sound alike, but which have different meanings, for example, "TO, I spell Tango Oscar."

"Figures" clarifies that numbers will follow as in "FIGURE TWO, I SPELL TANGO WHISKEY OSCAR"

"MIXED GROUP" clarifies that the following word contains both numbers and figures, such as "Room number, MIXED GROUP TWO, FIVE, FIVE CHARLIE"

Speak slowly as distinctly because someone is trying to write down what you say.

37> All numbers except whole thousands should be voiced by pronouncing each digit separately. Whole thousands are transmitted by voicing each digit in the number of thousands followed by the word 'thousand'. Numbers containing a decimal point shall be voiced with the decimal point indicated by the word 'decimal'. 121.5 MHz becomes - one two one decimal five Megahertz. Monetary denominations, sent with groups of digits, are voiced in the sequence in which they are written. \$0.75 becomes - currency, seven five cents, \$17.25 becomes - dollars, one seven decimal two five.

38> The twenty-four hour clock should be used to express time. Time should be expressed by means of four figures, The first two digits represent the hour past midnight. The last two digits represent the minutes past the hour.

12:45 a.m.	zero zero four five hours
12:00 noon	one two zero zero hours
11:45 p.m.	two three four five hours
12:00 midnight	two four zero zero hours
1:30 a.m.	zero one three zero hours

39> The standard phonetics of the International Telecommunication Union and the International Civil Aviation Organization were carefully developed to be readily understood under noisy communication conditions when pronounced by non-English speakers, and to be distinct in any language. Improvised phonetics and common "TV cop show" APCO phonetics are less effective in noisy operating environments

40> A repeater consists of a radio receiver, an amplifier, a transmitter, an isolator, and either one or two antennas. The repeater transmitter produces a radio signal on a frequency that is different from that of the received signal. This so-called frequency offset is necessary to prevent the strong transmitted signal from disabling the receiver. The isolator provides additional protection. A repeater located on a hill top, high building or tower, can greatly enhance the performance of low power portable or mobile radio

equipment by allowing communications over distances much greater than would be possible without it.

41> The expected effective range of a 500 milliwatt FRS radio on the UHF band in typical urban terrain is less than a mile, or six vertical floors. Licensed GMRS portables are authorized up to 5 watts of transmitter output, ten times the power of an FRS radio. This enables reliable communication for several miles and more than ten vertical floors. Licensed GMRS mobile radios may not exceed 5 watts transmitter power on the seven simplex channels which are shared with the FRS, but they may use more efficient external antennas. When used on designated “split” repeater frequencies, GMRS mobile radios are authorized up to 50 watts, 100 times the power of an FRS radio, enabling wide-area coverage by using established repeater networks.

42> If you are interested in learning more about 2-way radio there are many good resources on the Internet. These are only a few links.

- **Amateur Radio Relay League Emergency Communications**
<http://www.emergency-radio.org/>
- **FCC General Mobile Radio Service Licensing Information**
<http://wireless.fcc.gov/feesforms/feeguide/services/generalmobile.pdf>
- **REACT International** http://www.reactintl.org/teaminfo/usa_teams/teams-usva.htm
- **Establishing CERT Communications**
- <https://www.citizencorps.gov/cert/start-3-1g.shtm#item4>

43> **Break for Practical “Evolution” – 30 minutes approx.**

- 1) IC will call for Team Leaders to attend an Incident Briefing in an adjacent room, simulating ICP, out of hearing of the students.
- 2) Follow standard ICS format for an Incident Briefing. Communications Unit Leader in Logistics will communicate directly with Team Leaders.
- 3) A simple Communication Plan will be provided to Team Leaders as an attachment to the Incident Briefing. (*‘Simple’ meaning an ICS Form 205 which has only the information necessary to accomplish this task*).
- 4) Team leaders contact their team on their assigned channel, relay the brief to team members, ask if any team members need fills, and ask at least one team member to read-back the brief to confirm contents.
- 5) Team Members will acknowledge in turn when called by unit number that they have received, understood and copied the brief.
- 6) Team Leaders then contact Logistics Chief at Command Post on appropriate channel listed in the COMPLAN and report that briefing was communicated effectively to CERT.
- 7) Logistics Chief relays team status update to Incident Commander. Refer to the exercise brief

44> **“Hot Wash” the Exercise TIME FOR QUESTIONS**