

Some Thoughts on Communications for CERT

Jim Piper / N6MED / NREMT-B
Aptos-La Selva Fire Department CERTisto
Aptos, California
Contact: n6med@k6bj.org / 831.662.2766

Need:

The importance of effective communications between team members during CERT activation and operations cannot be overstated. During either an alert or a mobilization, team members need to rapidly get in touch and stay in touch with each other. Considerations for team communications *during a team activation*¹ should include the following:

- Intra-squad communications, especially during search-and-rescue operations
- Inter-squad communications, e.g., to coordinate logistics, assistance, etc.
- Squad Leader to CERT command post
- CERT command post to civil authority incident command post (e.g., fire department or emergency operations center) and/or to cooperative agencies (e.g., Red Cross)
- Locale of operations: urban, suburban, rural

Communications Modes

The communications modes available with these are their merits and disadvantages follow:

Mode	Merits	Disadvantages ²
Pager	Can be used to alert and mobilize team. Can be used to pass text messages back and forth to individuals or entire team. Individual units relatively inexpensive (under \$100).	Service can be expensive, especially for 2-way paging/messaging. Useless for tactical communications. Useless for emergency communications.

¹ v.s. as alerting mechanisms.

² All wireless communications devices suffer the same disadvantage: they all require periodic testing to ensure they have fresh batteries.

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Mode	Merits	Disadvantages ²
Wired telephone	<p>Everyone has one. No licensing required.</p> <p>Most useful for mobilizing CERT for advanced warning of impending disaster (e.g., hurricane, tornado, etc.)</p>	<p>Team must use a "telephone tree" to contact team members. Takes time and, in an earthquake will probably be unavailable.</p>
Cellular telephone	<p>Tend to be ubiquitous (i.e., more and more people have them).</p> <p>Portable</p> <p>No license required (just a paid up phone bill!)</p> <p>If NexTel or Verizon, can be set up to operate like a portable "2-way" radio and for a "party-line" where everyone on the channel can hear what's going on (extremely important).</p>	<p>Initial and continuing cost for those who don't own one. In a major disaster, like a wired phone, wireless will be unavailable. Short battery life. Fragile. Team must use a "telephone tree" to contact team members. Takes time and, in an earthquake will most likely be unavailable (if the event itself doesn't disrupt service, the media will). Not all cellular providers give reliable service in the needed CERT coverage area. Frequently, providers have a single "back-haul" route (i.e., no redundancy) to their switching centers - a significant liability for earthquake-prone locales. Dialing 911 in California gets you the California Highway Patrol; you must dial the local 7-digit direct number to get local emergency services.</p>
"Personal Communicators" FRS (Family Radio Service) 2-way portable radios	<p>Portable. Cheap (\$50/pair). Easily available. No licensing required. Multiple channels available. "Party-line" where everyone on the channel can hear what's going on (extremely important). Can be useful for intra-squad communications in areas with low-density population.</p>	<p>Limited output power which limits range – despite 2-mile range claimed by advertising. Radios will not <i>reliably</i> cover a neighborhood – building severely interfere with FRS radio signals. Fragile. Because these radios have become ubiquitous, expect lots of interference from many others that will be using them ("selective call" feature does not reduce RF interference during receive).</p>

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Mode	Merits	Disadvantages ²
CB hand-held radio	Portable. Cheap (\$100 at Radio Shack). Easily available. "Party-line" where everyone on the channel can hear what's going on (extremely important). No licensing required. Relatively flexible with 40 channels available	Potentially, <i>lots</i> of interference because of their ubiquitous-ness (e.g., virtually every trucker on the highway has one. The frequencies on which CBs operate carry very long distances ("skips") during periods of moderate-to-high sun spot activity, contributing to their high level of noise. Requires civil authorities to have a similar capability if you are to communicate with.
Commercial or FM portable radios ("handie-talkies" like the Fire Dept. uses)	Noise-free operation (like your FM entertainment radio). Commercial equipment is typically quite robust. "Party-line" where everyone on the channel can hear what's going on (extremely important).	Equipment can be expensive compared to other modes (nominal cost: \$250/radio). Requires FCC license (\$75 <i>station</i> license) that can be onerous to get. Requires civil authorities with which CERT communicates to have a similar capability. Limited flexibility (nominally only 8 channels ³ available). Typically require commercial radio service to program/set-up equipment..
Multiple Use Radio Service (MURS) and "Dot" portable radios	Noise-free operation (like your FM entertainment radio). Commercial equipment is typically quite robust. "Party-line" where everyone on the channel can hear what's going on (extremely important). Relatively inexpensive (\$150-\$250, Maxon, Midland, Motorola). No license required. Extremely easy to use (just turn on and push-to-talk for single channel models). At 2 Watts, adequate power to provide reliable communications throughout an extended neighborhood.	Only 5 MURS channels and 9 "dot" available (require pre-programming). Communications might be limited to Inter-squad and intra-team without coordination (and cooperation) with other CERTs. [Because of the lack of any license requirement and the adequate power available, MURS can be a highly feasible solution for intra-squad, inter-squad, and squad-to-CERT Command Post communications.] Unless compatible radio equipment is installed at the public safety agency communications center, at fire stations, traffic indented for Incident Commander will need to be relayed via another means. Potential interference from others who are not

³ Refers to UHF "itinerant" channels. Note: General Mobile Radio Service (GMRS) is limited to family only use under FCC rules.

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Mode	Merits	Disadvantages ²
		CERT-related using same equipment.
Ham FM Portable Radios	<p>All as above for Commercial FM plus: hundreds of channels available (and, thus, minimal or no interference), all selectable from the keypad of the radio. Cost-effect (\$100-150 ready to go), robust equipment available. Direct link to emergency authorities and cooperating relief agencies (Red Cross Chapters and shelters are Ham equipped and, frequently, County EOCs are already "Ham" equipped.)</p> <p>If the wired telephone network still operational, one can place a phone call through the radio, so long as Ham radio repeaters in the area are "phone-patch" equipped. Radio can be used anywhere and can take advantage of a dozen radio repeaters.</p> <p>(Ham radio also offers other modes of operation that can be extremely useful for CERT. Not the least of these modes is "packet radio" where digital text messages can be transmitted.)</p>	<p>Requires <i>individual</i> FCC license (no-cost license, about \$10 for a simple no-code required test). Certain inconvenience to study for and take test (teams might face reluctance of members to take the time to study for and take a licensing exam). Some team members might put off by individual license requirements.</p>

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Integrated Approach: Ham FM & MURS

Some team members can be expected to embrace using Ham radio communications for CERT communications. Because of the difficulty of motivating a large team of volunteers, a majority of team members might be expected to be reluctant to obtain Ham radio licenses either because of the effort (albeit minimal) required to study for or simply have no interest in getting a license.

As a result, an integrated approach, properly planned, using both Ham radio and MURS radios can be made to work. A certain minimum number of those core CERT members who do get a Ham radio license could be reasonably expected to be immediately available when a disaster strikes. These members would be able to provide the liaison communications between the CERT command post and local public safety authorities. Intra-team communications could then be handled by using MURS radios. It might initially appear to be more complicated having to use multiple radio channels for CERT communications. However, multiple channels, regardless of the radio service being used, are an absolute necessity because intra-team communications need to be separate from team-to-public safety communications to maintain order.

Note: Though the following addresses Amateur Radio and MURS for team communications, other modes can, according to team requirements, locale of operations, etc., be integrated with Amateur Radio as well.

Teams should carefully plan how they will use their radio communications equipment. If radios are issued in advance, when a disaster strikes, you can fully expect that many of those team members who have radios won't be able to report to the CERT command post. If these members are Ham operators with their own equipment, their inability to help is far less an issue than those CERT members who have *team* equipment and can't help.

Application and Radio Procedures:

Each team member should have their own radio, whether purchased personally or purchased with team funds and issued to them. Radios should be as much a part of each team member as their CERT identification.

When team members assemble, they would be issued a team MURS radio. Once at the assembly point, one of the team members with a Ham license should assume the task CERT Communications. This person then assumes the tactical identifier of "____ CERT" (e.g., "Seascape CERT"). This identifier *must* be unique to distinguish it from other teams on the same frequency.

The CERT Communications person would likely monitor two radio channels. Alternatively and as required by the situation, the CERT Leader might handle all intra-team communications while the CERT Communications would handle all inter-team and team-to-public safety IC communications.

All CERT communications should follow a unified path. For example, individual squad members should not communicate directly with another team or with public safety Incident Commander or Operations Section Chief. Rather, a squad would communicate upward to the team communications person and that person would then communicate with other teams or upward to public safety IC. Thus all requests for information, status, needs, etc., would go through a central coordination point on the team.