Communications Plan

FIELD GUIDE

Beaverton CERT Radio Group
2/27/2013

Revision 1.0
This FIELD GUIDE component of the Beaverton CERT Communications Plan contains essential preparation and operational information for amateur radio operators assisting CERT teams during an emergency.

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February 2013—Revision 1.0
This FIELD GUIDE is part of the Beaverton Community Emergency Response Team (CERT) Communications Plan. It describes preparation and operational activities for amateur radio operators in the field who are deployed with CERT teams or assisting them with communications.

Other components of the Communications Plan are the OPERATIONS GUIDE and REFERENCE ADDENDUM.

CERT BACKGROUND

The Community Emergency Response Team (CERT) concept was developed and implemented by the Los Angeles City Fire Department in 1985. The Whittier Narrows earthquake in 1987 underscored the area-wide threat of a major disaster in California. Further, it confirmed the need for training civilians to meet their immediate needs. As a result, the LAFD created the Disaster Preparedness Division with the purpose of training citizens and private and government employees.

The training program that LAFD initiated makes good sense and furthers the process of citizens understanding their responsibility in preparing for disaster. It also increases their ability to safely help themselves, their family and their neighbors. The Federal Emergency Management Agency (FEMA) recognizes the importance of preparing citizens. The Emergency Management Institute (EMI) and the National Fire Academy adopted and expanded the CERT materials believing them applicable to all hazards.

The CERT course will benefit any citizen who takes it. This individual will be better prepared to respond to and cope with the aftermath of a disaster. Additionally, if a community wants to supplement its response capability after a disaster, civilians can be recruited and trained as neighborhood, business, and government teams that, in essence, will be auxiliary responders. These groups can provide immediate assistance to victims in their area, organize spontaneous volunteers who have not had the training, and collect disaster intelligence that will assist professional responders with prioritization and allocation of resources following a disaster. Since 1993 when this training was made available nationally by FEMA, communities in 28 States and Puerto Rico have conducted CERT training.¹

¹ Citizen Corps web site, URL http://www.citizencorps.gov/cert/about.shtm
CERT teams in Beaverton are organized by area and named by color: Orange, Green, Blue, Yellow, Teal, Red and Gray.
EMERGENCY COMMUNICATIONS

During a disaster or emergency, normal channels of communication (landline and cell phones) will likely be disrupted due to failure or overload. CERT’s need for communication is in coordinating local team activities,
communicating with the Beaverton Emergency Operations Center (EOC) including casualty repeaters, damage and situation reports, logistics and resource requests.

**FRS / GMRS RADIO**

CERT teams will use FRS/GMRS radios for communicating within their team. Each team is assigned an FRS/GMRS channel. If CERT team leads or members have GMRS radios capable of higher power, they may be able to use GMRS capabilities to reach other (nearby) teams for assistance or team-to-team coordination. See Beaverton CERT Team FRS/GMRS Channels table on page 12.

**AMATEUR RADIO**

CERT teams will use amateur radio for communicating with the EOC and other teams (when necessary). Area repeaters, simplex frequencies and secondary frequencies have been selected for use in an emergency. See Beaverton CERT Amateur Radio Frequencies table on page 11.
COMMUNICATION ROLES

Four roles are defined for amateur radio operators working with Beaverton CERT during an event, team communicator, EOC communicator, net control station and available station.

When CERT is activated, it is essential that:

- Each CERT team activated should have at least one team communicator as soon as possible
- An EOC communicator is available at the Beaverton EOC
- A station is acting as Net Control and starts building a list of available stations

CERT uses the Incident Command System\(^2\) (ICS) model for a flexible and expandable way to organize the response to an event. Based on conditions and the size of the event, additional team communicators and EOC communicators may be required to assist with individual groups within a CERT team and form a rotation of personnel for longer duration events. Similarly, additional net control stations may be required to manage subnets, fulfill other specialized roles or form a rotation of personnel as required by the response.

TEAM COMMUNICATOR

The team communicator is assigned to a CERT team to facilitate communications between the team leader and the Beaverton Emergency Operations Center (EOC), other CERT teams and related resources as necessary. FRS / GMRS radios are used for team communications (all members of the team) and amateur radio is the link to other team communicators and the EOC. The team communicator role leads communications for the team both on the amateur radio side and the FRS / GMRS side.

Team communicators are typically physically located with the CERT team leader and use handheld or easily portable radios for amateur radio communications.

EOC COMMUNICATOR

The EOC communicator is stationed at the Beaverton EOC and interfaces between stations on the net and the Incident Commander and other emergency management personnel at the EOC.

The EOC communicator will use amateur radio equipment located at the EOC.

NET CONTROL STATION

The first and primary net that is established is the tactical net. The net control station (NCS) organizes and controls on-air activities for amateur radio operators to provide orderly communication between the CERT teams and the EOC for tactical traffic.

The NCS typically uses a portable or base station with emergency power capability and a strong signal. Under simplex operation, the net control station can be located anywhere around the Beaverton area where there is good propagation to all areas that CERT teams are operating in and the EOC.

\(^2\) See FEMA / NIMS URL http://www.fema.gov/emergency/nims/IncidentCommandSystem.shtm
**AVAILABLE STATION**

Available stations are those that are not currently assigned to team communicator, EOC communicator or NCS roles. They can be using any type of equipment and be either at a fixed location or mobile. Available stations are tracked and form a pool of resources that can be assigned various assist roles as needed. If appropriately located, they may be brought in as backup or additional CERT team communicators or EOC communicators. They may also function as backup or additional NCS operators for the main tactical net or subnets.

Other tasks that available stations may fulfill are resource, logging, liaison, spotting and relay. A station may be asked to be an NCS for a resource net to handle check-ins of available stations or handle other resource and logistic traffic so that traffic is removed from the tactical net. A station may assist any NCS with message logging if the volume of traffic is high or there is a need to “shadow” another station to record their traffic. Liaison stations may be asked to monitor other frequencies or nets and act as a “gateway” to filter traffic as needed. Spotters may be needed to be physically present at a particular location to have “eyes on the ground” and give real-time tactical information. Relay stations may be needed to assist communications in areas with poor propagation or over wider distances.
BE READY

There is no substitute for preparation before an emergency. There are choices to be made in the areas of equipment and “go kit” contents, and working on your operator skills.

EQUIPMENT RECOMMENDATIONS

**Team communicators** and those who will be with a CERT team or deployed in the field will be well served with a dual-band (2m/70cm) handheld transceiver (HT). While several of the newer model HTs will also do other bands (6m, 1.2m, 23cm) these other bands are not currently in the Beaverton CERT communications scheme and so you might consider saving by purchasing an HT that only has the 2m and 70cm bands. A high-gain antenna for your HT is also a nice to have for better reception and transmission and also lets you keep your normal antenna as a backup in case of failure or damage. Additional batteries and an alternate power source are good things to have on hand. Team communicators may also want to consider a portable or mobile station, either in their vehicle or an easily carried portable setup that can act as a backup to their HT.

**Net control stations** will ideally be using a portable or base station with a good deal of available emergency power and the capability of putting out a strong and clear signal in the event of simplex operation. Base and portable stations usually have a large heat sink and this is a good thing given the amount of time an NCS spends in heavy activity. A good high-gain antenna with the capability of reaching out to all areas of Beaverton that are covered by CERT teams and listening to weak stations is a requirement. A good location has a lot to do with ability to reach all of Beaverton (not being in a “pocket” or having a “shadow” such as a large hill, having some elevation).

“GO KITS”

In addition to planning on being self sufficient for 72 hours by having appropriate personal care and food ready, here are a set of items to think about including in your “go kit” for radio operators.

- 2m / 70cm handheld transceiver
- High gain antenna in addition to your radio’s normal antenna
- Headphones / earphone (so you can listen to your HT without disturbing others)
- Extra HT batteries, charger
- Power adapters for auxiliary power options (12Vdc plug adapter, alligator clips, etc.)
- Pencil/pen and paper for logging activity and messages
- Street map of Beaverton and surrounding area

PARTICIPATE IN NETS

A good way to work on your operator skills is to participate in regular nets that are hosted by various organizations in our area. Most of these nets allow anyone to participate and generally involve “checking in” or practicing formal message passing. While most of Beaverton CERT’s traffic will be tactical, formal message handling is a good skill to have and makes you more flexible and adaptable as an amateur radio operator.

One net in particular to be involved with is the regular weekly **Beaverton CERT Net**. This net meets every Monday evening at 8:00pm on the 147.38 (+) 100.0 repeater for the express purpose of preparation for working with Beaverton CERT. The net holds regular exercise, drills and discussions related to emergency preparedness and all
stations are encouraged to participate. See the Beaverton CERT Radio Group’s web site at www.beavertoncertradio.org.

EXERCISES AND DRILLS

ARRL’s Field Day is a good opportunity to practice skills, especially portable operation and emergency / alternate power. As mentioned above, the Beaverton CERT Net holds regular exercises emphasizing various aspects of emergency operation.

Beaverton CERT members volunteer at area events to assist with logistics and crowd control and radio operators are sometimes needed. Annually the Northwest Emergency Team Rodeo is held in the fall which places amateur radio operators who are also CERT trained with teams during a full day of training and drills and is an excellent training opportunity.

Additionally, Beaverton CERT participates in larger area drills and emergency simulations coordinating with the City of Beaverton. These will be announced on the Beaverton Cert Net and www.beavertoncertradio.org.
ACTIVATION

Beaverton CERT can be activated by the EOC (through the CERT team leaders) or is self-activated. As an amateur radio operator assisting Beaverton CERT, follow these guidelines for activation.

ACTIVATION METHODS

1. CERT
   Your local CERT team leader may reach out to you directly if you are a part of a CERT team.

2. City of Beaverton / EOC
   In the event of an emergency or disaster, the City of Beaverton has an emergency radio station on the broadcast frequency 1610 kHz AM. Monitor this station for information and instructions.

3. Self activation
   In the event of a widespread or major incident, contact your local CERT team leaders and get on the air to contact other CERT radio operators.

CERT CONTACT INFORMATION

If you will be acting as a team communicator it is a good idea to have contact information of your local CERT team.

Team color ____________________________________________________________
Leader name _________________________________________________________
Street address _______________________________________________________
Phone number _______________________________________________________

Other name _______________________________________________________
Street address ______________________________________________________
Phone number _______________________________________________________

RESPONSE

When activated, here are considerations and instructions for response.

IMMEDIATE ACTIONS TO TAKE

1. Yourself, your family and your property.
   Check that your family and property are safe and secure first and are likely to remain so before proceeding to join the response effort in assisting CERT and the City of Beaverton.

2. Assess
   Prepare a brief summary of the situation in your neighborhood or on your street. Use numbers where possible to quantify the description (“10 houses moderately damaged on Main Street”, etc.)
3. **Reach out**
   Contact your CERT team leader(s) and reach out on the air to contact other CERT radio operators. If you are not a part of a CERT team, contact your neighbors and do some “ad hoc” organizing.

4. **Check in and Listen**
   Check in to the tactical net by giving your call sign, then LISTEN for instructions. See the section below on which frequencies to use.

5. **Take charge if necessary**
   If you are *first on the air*, acting as a **team communicator**, **EOC communicator** or **available station** go ahead and assume the **net control station** role until other stations are available.

### FREQUENCY PLAN

For **amateur radio**, use the following table for assigned frequencies. If a repeater is available either on 2m or 70cm, we will use it so check the repeaters first. Monitor the repeater frequency to see if a net is in progress. If you hear nothing, try transmitting with your call sign (only) and see if an NCS acknowledges you. If not, check to see if you can hear the repeater “courtesy tone” (a beep after you are done transmitting) or the repeater “tail” (a brief period where the repeater is still transmitting after you have released your PTT). If you don’t hear a courtesy tone or tail, the repeater may not be available. Proceed down the list of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and so on to check for a net in progress.

**Table 1. Beaverton CERT Amateur Radio Frequencies**

<table>
<thead>
<tr>
<th>Priority upon activation</th>
<th>Frequency</th>
<th>Use</th>
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<tr>
<td>Check this 1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>147.38 (+) 100.0</td>
<td>Primary 2m repeater</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>442.225 (+) 100.0</td>
<td>Primary 70cm repeater</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>444.75 (+) 123.0</td>
<td>Secondary 70cm repeater</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt;</td>
<td>147.48</td>
<td>Primary 2m simplex</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>146.50</td>
<td>Secondary 2m simplex</td>
</tr>
<tr>
<td></td>
<td>446.05</td>
<td>Primary 70cm simplex</td>
</tr>
<tr>
<td></td>
<td>441.575</td>
<td>Secondary 70cm simplex</td>
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For **FRS/GMRS radio**, use the following table for contacting CERT teams. **Table 2.**

**Beaverton CERT Team FRS/GMRS Channels**

<table>
<thead>
<tr>
<th>Team color</th>
<th>FRS/GMRS Channel</th>
<th>Frequency (MHz)</th>
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<tbody>
<tr>
<td>Orange</td>
<td>1</td>
<td>462.5625</td>
</tr>
<tr>
<td>Green</td>
<td>2</td>
<td>462.5875</td>
</tr>
<tr>
<td>Blue</td>
<td>3</td>
<td>462.6125</td>
</tr>
<tr>
<td>Red</td>
<td>4</td>
<td>462.6375</td>
</tr>
<tr>
<td>Yellow</td>
<td>5</td>
<td>462.6625</td>
</tr>
<tr>
<td>Teal</td>
<td>6</td>
<td>462.6875</td>
</tr>
<tr>
<td>Grey</td>
<td>7</td>
<td>462.7125</td>
</tr>
</tbody>
</table>
AMATEUR RADIO COMMUNICATIONS

Following are some details regarding amateur radio communications. Following this section are two diagrams that illustrate these options under repeater operations and simplex operations.

PREFERRED OPERATING MODES

The first preference for establishing a tactical net is utilizing the primary or secondary repeaters for Beaverton CERT due to more power, higher sensitivity and better range of the repeater. If the primary 2m repeater is unavailable then the secondary 70cm repeater should be used. If neither repeater is available then simplex will have to be utilized. It is preferred to use 2m simplex over 70cm due to better propagation with 2m.

BEAVERTON EOC STATION N

The Beaverton EOC is a “special case” station in that due to the presence of many other 2m antennas & modes at the EOC building, in order to avoid interference with these other services it is necessary for the Beaverton EOC to transmit and receive on 70cm only for CERT communications. This means that either the tactical net needs to be running on 70cm repeater mode or 70cm simplex mode (in which case the EOC station may access it directly) or a cross-band repeater must be active and available to the EOC to translate the 70cm transmissions of the EOC to a 2m repeater or 2m simplex frequency and vice versa. It is envisioned that a cross-band repeater available at the EOC would be set up near the EOC to handle 70cm to 2m translation but the cross-band repeater could also be set up anywhere in the area that the EOC’s 70cm station could hit reliably.

CROSS-BAND REPEATERS

It is also envisioned that at any location in the city that is having trouble receiving the tactical net could establish a local cross-band repeater. One side of the cross-band repeater would tap into the tactical net running on 2m or 70cm, repeater or simplex, and the other side of the cross-band repeater would use a “private” 2m or 70cm frequency (assigned by NCS).
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March 21, 2010 – Revision 0.3

Option 1. Use 147.38 repeater. Note EOC must deploy a local cross-band repeater in order to utilize the 147.38 repeater.

LOCAL Option. Anyone may deploy a cross-band repeater and utilize an available simplex frequency for their local area.

Option 2. Use 442.225 repeater.

Roles
- CERT Command Staff
- CERT Team Leader
- Amateur Radio Operator
- CERT Team Member

Communications
- Voice
- FRS / GMRS Radio
- Amateur Radio 2m Duplex
- Amateur Radio 2m Simplex
- 70cm Duplex
- 70cm Simplex
Figure 2. Beaverton CERT Amateur Radio Simplex Operations
TEAM COMMUNICATOR

As team communicator your primary role is being the facilitator of communications between your CERT team and the EOC, and perhaps other CERT teams and resources.

RESPONSIBILITIES

• **Make contact with CERT team leader**
  Determine logistics... should you be with the team leader or can you be remote? Are there other team communicators for the team?

• **Make contact with NCS**
  Check into the tactical net with your call sign, name, equipment details (radio type, power source), initial status, location and an estimate of length of availability.

• **Monitor the tactical net**
  After checking in to the tactical net, you must not leave without checking out and must be able to monitor the tactical net at all times.

• **Organize your team’s FRS/GMRS radio operators**
  Act as a “mini NCS” on your team’s FRS/GMRS channel. Take check-ins from team members with radios and monitor the channel for traffic directed to you. Establish tactical callsigns as needed for team members and locations.

• **Keep a log**
  Make sure to keep a basic log of your activities

BEST PRACTICES

• **Listen**
  Tune out distractions and avoid unnecessary transmissions.

• **Transmit clearly**
  Press the PTT button and pause for a moment before you start talking so transmissions are not cut off. Speak “across” the microphone in a normal voice (not into the mic). Speak clearly and distinctly.

• **Use low power**
  Use the lowest power setting possible to complete the contact. This is always true but never more important than under emergency conditions. Recharging batteries is not always possible. Remember many “blister pack” FRS/GMRS radios also have low and high power settings so conserve their batteries as well.

• **Be brief and clear**
  Time on the air is a precious shared resource, use only essential words to communicate the message and leave everything else out. Be sure to say exactly what you mean. Do not use jargon, just plain English. Use ITU phonetics if you are not being understood when saying proper nouns (street names, locations).

• **Use tactical call signs**
  You may be assigned a tactical call sign by NCS, make sure to respond to it if heard and to use it yourself (and other station’s tactical call signs). Remember to ID your call sign every 10 minutes and at the end of every exchange.
EOC COMMUNICATOR

As EOC communicator your primary role is handling tactical traffic between the CERT teams from their team communicators and personnel at the EOC. See Team communicator section above for best practices.

RESPONSIBILITIES

- **Setup EOC station if necessary**
  If you are first in the EOC, setup the EOC CERT amateur radio station.

- **Make contact with NCS**
  Check into the tactical net with your call sign, name, equipment details (radio type, power source), initial status, location and an estimate of length of availability.

- **Monitor the tactical net**
  After checking in to the tactical net, you must not leave without checking out and must be able to monitor the tactical net at all times.

- **Keep a log**
  Keep a log of activities and messages. This log should record date and time, call sign / tactical call sign of the station originating the traffic, subject & message and disposition. The EOC may employ additional forms and logs for your use.

NET CONTROL STATION

As net control station your primary role is controlling and organizing the on-air activities of the amateur radio traffic and stations for Beaverton CERT.

RESPONSIBILITIES

- **Assess repeaters, begin net on appropriate frequency**
  If either repeater is available, use it otherwise begin the tactical net on 2m simplex.

- **Keep track of stations on the net**
  Keep a written record of all checked-in stations and record when stations have checked out. Be able to know at any time who is on the net.

- **Assign and use tactical call signs**
  Use team color designators as tactical call signs. ID yourself every 10 minutes.

- **Accumulate a list of available stations**
  Stations checking in that do not have an immediate assignment should go on the available stations list for subsequent assignment or dispatch.

BEST PRACTICES

- **Ask specific questions, give specific instructions**
  This helps to reduce retransmissions and slowing down the net.

- **Call for reinforcements**
  Make note of stations able to serve as backup NCS and form a rotation of the NCS role as the event
develops. Assign tasks such as logging events or messages, preferably to someone who can assist the NCS where they are located.

- **Divide and conquer when traffic is too high**  
  Form subnets (resource, command, information, others as need arises) and assign NCS resources from the available station pool to manage them to get the volume of traffic down to a manageable level. Assign liaison stations to be the gateways between the tactical net and the subnet.

- **Prioritize traffic when amount of messages are high**  
  Call for emergency traffic first, then priority traffic. Clear all this traffic first before moving on to routine messages and contacts.

- **Be calm, speak authoritatively and confidently**

- **Use regular announcements to enforce net discipline**  
  Take note of stations not following protocol and instead of confronting them directly on the air, save up the “no nos” in the form of a reminder during an informational announcement (“Net control wishes to remind the net...”) along with other current status information such as subnets formed, frequencies in use, etc.