



Grassroots Emergency Communications Operations

Amateur Radio Nets

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www.neighborhoodlink.com/GECO

gecoradio@gmail.com

Ready to Serve and Sustain Our Community

An amateur radio net is a way for hams to meet via radio. The net may be informal or formal. An informal net might occur by chance. Two hams (A and B) make contact and begin talking about various topics. They might be joined by other hams (C and others). The conversation grows as more hams join in.

A formal net is often based on a common purpose. For example, a radio club might have a weekly “on air” meeting of its members. The illustration on the right is an example of a formal radio net for GERC (Glendora Emergency Response Communications).

Most amateur radio communication is simplex; One person speaks while the others listen. This is quite



The Glendora Emergency Response Communications Net and Roundtable meets Tuesdays at 8:30 pm local time at 144.435 MHz simplex. All licensed ham operators are invited to check-in.

different than have some friends over for dinner and conversing. In a typical dinner conversations, many people can be speaking at the same time. This is more like a conference telephone call. In fact, numerous conversations can take place simultaneously. It's a situation of freedom to speak to/with whomever is will to engage in conversation with you.

Keeping order on a radio net can be either informal or formal. In an informal net, usually one of the hams who started the contact takes responsibility. A very common way to do this is to create a rotation order for speaking based on when a ham joined the group. They typically end their part of the conversation with “Over” and pass the mic back and forth. When ham C joins A and B, either ham A or B will acknowledge ham C and invite them to join

the conversation. The mic will be passed to ham C. When ham C stops talking, the mic goes back to either A or B. That will be the rotation until another ham joins the conversation. Nothing is perfect. In an informal rotation, sometime someone is skipped. If everyone is flexible, they let the skipped ham back into the line-up, even it is out of order. Or they wait until they can get back into sequence.

The formal net is more common in emergency communications. The Net Control Station (NCS) is staffed by the Net Control Operator. Stations



Mark (N7YLA) as GERC Net Control

wanting to join the net must call for Net Control and wait to be recognized. For a weekly club net, Net Control will get on the air in advance of the start of the net. This announcement

alerts hams that the frequency will be used for the net. The net often begins with general club announcements. This is followed by a roll call. Each member “checks in” by responding with their call sign, and returning the mic to Net Control. After the roll call, many clubs have a “roundtable” for members to speak up. This can take various forms. It depends on the club. Some clubs announce a topic to be discussed. Others ask for members to volunteer to speak or offer equipment for sale; members can ask for help or advice on technical or non-technical topics.

In an emergency, simple organization and flexibility are critical to success. GECCO feels that every member of an Emergency Communications (EmComm) group must be willing, ready, and able to serve as Net Control. This takes practice. So, it is a good idea to have a regularly scheduled controlled net.

This serves many purposes:

- Training for the Net Control operator;
- Training for group members for the discipline of operating in a controlled net environment;
- Operators get more familiar with their equipment and maintain the state of battery charge, etc.
- All stations can get data about the signal quality to and from other stations. This helps everyone to know who can be reached by whom. And who might be able to relay messages to/from other stations.



Photo from <https://altadenaradio.com/net-script/https://altadenaradio.com/>; Altadena Local Emergency Team

Elsa-K1EAS, net control with Nasrat-K1NAR as back up net control.

Even when an organization has designated Net Control duties to specific hams, every EmComm team member must be prepared to be Net Control. The reason is simple. Disasters often make all emergency plans useless. When a disaster strikes, ideally all EmComm team members follow some simple guidelines.

- **Be Sure of Your Personal Safety and Well-Being:** You are not going to be very useful to the team if you are not safe and secure. This extends to your family. It will be hard to focus all of your attention on your EmComm duties and responsibilities if your family’s safety is unknown.
- **Get on the Air and Monitor:** Gordon "Gordo" West (WB6NOA) a well-known US ham and amateur radio educator, suggests this simple test: Strive to up your equipment and get on the air in 60 minutes after a disaster strikes.

If you cannot find the designated Net Control on the air, you have two basic choices: sit and wait or start the Net. If and when the designated Net Control gets on the air, you simply turn the net over to them. The most important thing is that your EmComm group is there and ready to serve.

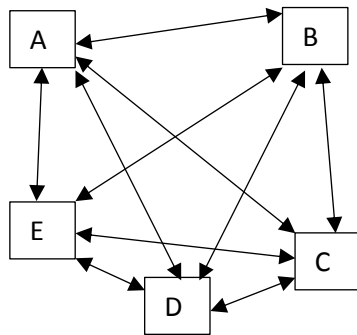
Being involved in amateur radio EmComm is not about being a hero. It is about being on a team providing vital communications in difficult times. As a team member, no one person is more or less important than another. Everyone is needed and every function helps the group to perform.

Informal Nets

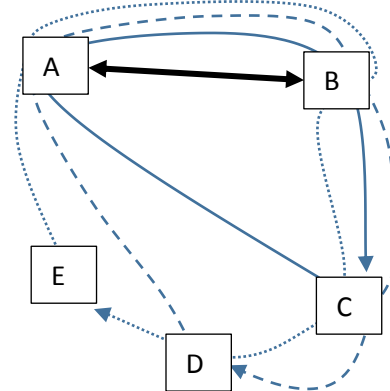
Hams A and B make contact and begin talking. As time passes, hams C, D, and E join the group. In a very loose informal gathering (left diagram below), anyone can speak when some stops talking. There is no order. The people quick to key the mic get to talk. In simplex, if more than one ham is transmitting, “doubling takes place” and no one hears, or the stronger transmitter gets through to some of the receivers.

Rotation order is more organized. Hams A and B make contact and begin talking. When ham C calls, either A or B acknowledges C, and passes the mic to C. When C is done, he passes the mic to either A or B. If A gets the mic, they speak, then pass the mic to B. As other hams join, the pattern is repeated. The actual sequence can be whatever the hams make it to be. And if someone is skipped or misses a turn, be flexible and let the missed ham back in the rotation.

Loose or Free For All; No Order



Rotation Order

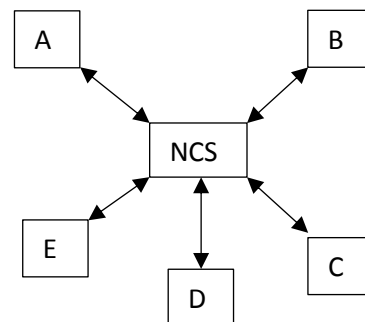


In a controlled or directed net, all communication is directed by the Net Control Station (NCS) or Net Control. Stations want to contact Net Control would call and wait to be acknowledged. You can imagine how busy it can get with many hams trying to call Net Control. Hams transmit only when allowed to by Net Control. When a ham ends a transmission, they return the mic to Net Control. In some cases, Net Control can direct hams to change to another frequency to contact another station. However, once the side communication ends, the hams involved need to notify Net Control the alternate frequency is clear. In any case hams, do not talk directly to each other UNLESS allowed to by Net Control

EmComm hams must learn to set a priority on their radio traffic. The American Radio Relay League (ARRL) uses these priority designations (excerpted from: <http://www.arrl.org/chapter-six-arrl-precedences-and-handling-instructions>)

- **Emergency:** Any message having life and death urgency to any person or group of persons, which is transmitted by Amateur Radio in the absence of regular commercial facilities.

Directed or Controlled Net



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- **Priority:** This classification is for important messages having a specific time limit, official messages not covered in the emergency category, press dispatches and emergency-related traffic not of the utmost urgency.
- **Welfare:** This type of message an inquiry as to the health and welfare of an individual in the disaster area or an advisory from the disaster area that indicates all is well. Welfare traffic is handled only after all emergency and priority traffic is cleared.

If your group operates outside the US, it isn't important if your group follows the ARRL categories. Some EmComm groups use simple color codes of Red, Yellow, and Green. These colors are familiar as traffic signals. So many people readily associate Red as top priority or urgent, Yellow as a lower urgency, and Green as OK or not urgent. Whatever the system you adopt for setting priorities, everyone in your group must learn and use them appropriately.



aid to practice directed or controlled nets. In situations where newly licensed hams cannot afford radios, Echolink provides an alternative for "getting on the air" and practicing amateur radio communication protocols. Without a radio, they can make DX contacts in foreign countries. It also gives non-native English-speaking hams the chance to have voice contact with other native and non-native English speakers. We mention English because it is a widely spoken language of international business, communications, science and technology, and for international disaster relief.

If you are not active in any radio net, we urge you to join or from one. This is a chance to gain practical operating skills. Any ham should be able to assume the role of Net Control in an emergency. Disasters have a way of reduce the best plans to waste paper. Anything can happen in a disaster. Who will take over if the Emergency Operations Center (EOC) is



damaged or destroyed by an avalanche, mudflow, earthquake or tsunami?

If you are the last ham standing, other survivors are depending on you. Are you ready? 🌱

Guidelines for Starting an Amateur Radio Net

These statements come from the ARRL National Traffic Standards. If your club is operating outside of the US, you should consider adapting these guidelines to suit your circumstances.

- Select a name for the net
- Define the purpose for holding the net
- Find a time for the net. It should be the same day and hour of the week. It is common to have a weekly net. This gives members more chance to practice.
- Find an available frequency. If using a repeater, be sure to get approval of the repeater owner to hold your net. Then be sure everyone knows the frequency, offset, and PL code.

The following procedures are recommended as NTS standards. Deviations from these procedures are made at the discretion of the net manager in cognizance of either necessity or desirability arising out of extraordinary circumstances, but always as a temporary expedient until standard procedure can be resumed.

The following procedures apply to all NTS nets:

1. The net control station (NCS) transmits a net call up promptly at the pre-established net meeting time.
2. Stations reporting in indicate their function or the destination(s) for which they can take traffic, followed by the list of traffic on their hook, if any.
3. Time-consuming pleasantries and other superfluous matters are not to be a part of the procedure while the net is in session.
4. Net stations follow the direction of the NCS without question or comment if such directions are understood.
5. Explanations of any kind are not transmitted unless they are essential to the net's conduct.
6. Stations reporting into a net are held for 15 minutes, after which they are excused if there is no further traffic for them at that time. Stations in the net do not leave the net without being excused and do not ask to be excused unless necessary.

Source: <http://www.arrl.org/chapter-five-nts-standard-net-procedures>

Sample Net Control Script

QST QST QST

All stations, this is [Your Call Sign], net control for [Your organization name] Net. My name is [state your name]. I am located at [give your location]. Our net meets [give date, time—and UTC time zone, and how often] at [give frequency].

This is a directed net. Please don't transmit unless called by Net Control.

The purpose of this net is to give [Your organization name] members a chance to train for emergency communications, share knowledge, and improve their radio operating skills.

Visitors are welcome.

Stations with emergency traffic may break in at any time. Are there any stations with emergency traffic? [If there is emergency traffic, allow it to finish before holding the net. If

there is none, “Hearing none, we will begin the member roll call. Visitors may check in after the member roll call.”

When you check in, please remain on frequency until roll call is completed and all traffic is passed. When I state your call sign, please reply with your call sign, name, and location. After all stations have checked in, there will be a roundtable. (A roundtable is optional. Some clubs end the net after the check in.)

Note: The order of the member roster can be done in a variety of ways. You are free to decide. For example,

- Alphabetical by name
- Alphabetical by call sign
- Geographically by region or district

Once you have gone through the member roster, you can call for “any late members, please check in now”. Then you must listen for members calling in and take them in order. Some confusion may occur when late check ins “double” on the air. Some may not be heard. If you hear another member, but Net Control did not, they should call Net Control and report what they heard. Net Control would then call for that member. If you cannot hear the response, you (as Net Control) can ask if any member can act as a relay for you.

After the members, have had a chance to check in, you can ask “Are there any visitors to the net? Please call now.

After the check in are completed you can either end the net or hold a roundtable. If you end the net, skip the rest of this part and go to the conclusion. If you have a roundtable, use the check in roster to organize the session. This gives all net participants a chance to speak. But remember, this is a directed net, so Net Control is in charge.

This concludes the [name of the organization] Net. I want to thank the members and visitors for checking in. This is [Your Call Sign] returning the frequency to normal use.