Grassroots Emergency Communications Operations

Sticky Notes

GECO Newsletter
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Ready to Serve and Sustain Our Community

Happy Chinese New Year!

You May Become an Accidental First Responder

Click here to read the article starting on page 5.

GECO takes Chinese New Year as a second chance for backup New Year resolutions. This year, we renew our efforts to spread the message of grassroots emergency preparations (EmPrep) and emergency communications (EmComm). The emphasis is to make people keenly aware that they may become accidental emergency first responders. This can be as simple as a kitchen fire at home. If you are at home alone, you will be the first person to be aware there is an emergency. You may respond by putting out the fire, calling for help (in which case you become an accidental EmComm operator), or you can just run away and let the fire burn.

When it comes to safety and emergencies, everyone has a vested interest to be their own first responder. In the case of a kitchen fire at home, you are on the scene and it will take the fire department time to get to you. During that time, you can easily put out a small grease fire (if you are prepared). If you don't put it out or try to, that small fire can grow quickly and destroy your entire house before the fire department arrives. The choice is yours.

On a larger scale, governments can make and have the best emergency plans. But if the plans are not put into action on the ground, no one will know for sure if the plan works. For major disasters, small communities far from larger cities can expect to wait longer for emergency relief. Governments try to serve the greatest number as quickly as possible. Emergency preparedness and response don't have to be limited to just you and your family. Groups in a community can collaborate to help build resilience for the whole community and involve everyone in the effort.

In This Issue

EchoLink Eruditions

Here's an assortment of EchoLink tidbits that may help enlighten those who are new to EchoLink. First and foremost, EchoLink is free to licensed amateur radio operators. Second, technology has eclipsed the times of the original EchoLink program and taken off in unknown and unimaginable directions from then. So, EchoLink may not function seamlessly everywhere. Besides, no communication system is 100% bulletproof or is totally reliable.

Possible Devices: The table at the right shows the possible connections between the different EchoLink-enabled devices (e.g., desktop computers, laptop computers, smartphones, and tablets). Notice that EchoLink installed on computers can be used to connect to other computers, but NOT to EchoLink on smartphones or tablets. However, EchoLink users on smartphones and tablets can connect to EchoLink-enabled computers but NOT to other smartphones and tablets.

EchoLink Single User Connections		
Wants to Connect to	**EchoLink Stations That Are Online**	
Computer (Single User or SysOp) 	Computer (Single User or SysOp) 	Single User on Computer
		SysOp Link (computer & simplex transceiver)
		SysOp Repeater (computer & a repeater)
	Smartphone or Tablet 	Computers with EchoLink cannot contact EchoLink Smartphones or Tablets
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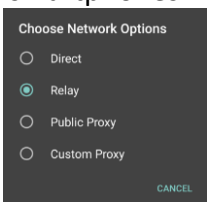


Network Options: The EchoLink-enabled unit can connect to the Internet in four ways: Direct, Relay, Public Proxy, or Custom Proxy (in the EchoLink settings section). Each has pluses and minuses. We've found the "relay" option to be the easiest to use. A "Direct" connection is best when operating at home with high-speed Internet access. But it involves making router setting adjustments that are complex and hardware dependent making it too challenging for me.). The proxy settings can work, but you may get disconnected or timed out from the proxy as each has its methods and limits for the duration of use.

Unable to Connect: This can happen for several reasons which may or may not be knowable. This is what we call "poor band conditions on EchoLink," LOL. Some of the reasons might be:

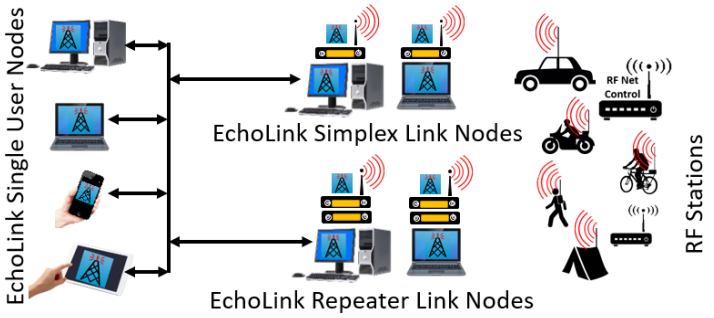
- The receiving station cannot handle the number of stations trying to connect (controlled in "settings"
- Low bandwidth of the Internet service provider at either end of the call.
- Internet disruptions at either end of the call and points in between.

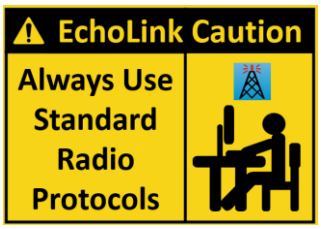
[**Note**: There are times we have tried to connect to a station and got a message saying "timed out," "no route available," or some other indicator that the connection failed. We immediately tried again and got connected. Sometimes it took three tries before getting connected. And other times, we couldn't connect. Trying again several hours later or the next day and we got connected. We guessed it was just "poor EchoLink band conditions."]

Practice Amateur Radio Protocol: Whenever using EchoLink, be sure to practice good amateur radio protocol. Ignore the comments about EchoLink "not being REAL HAM radio." It's a moot point. Jonathan K1RFD developed EchoLink to extend the RF range of amateur transceivers using VOIP technology. Clearly, EchoLink SysOp stations are using "REAL HAM" amateur transceivers.

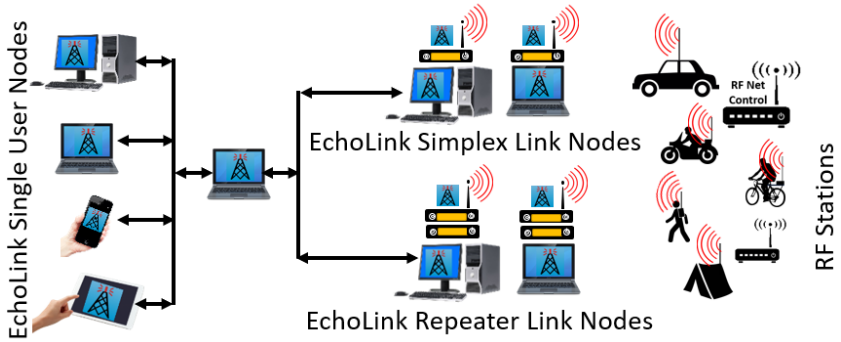
connecting a computer to an amateur transceiver doesn't change the transceiver, no more than attaching an auxiliary speaker to a transceiver doesn't change it into anything else.

Amateurs using EchoLink can connect to other amateurs in a variety of ways (see the generalized summary chart on the right, *but be mindful of the connectivity limits shown in the table at the start of this article*). Going from the left column, all EchoLink single users can connect to EchoLink Simplex or Repeater nodes. The QSO is by VOIP; at first glance, no RF is involved. However, when RF stations (in the right column) call into the RF-enabled EchoLink simplex or repeater nodes, the RF input to those nodes goes from analog RF to digital VOIP to the EchoLink Single Users in the left column. Since they are connected to a computer SysOp node, they can be talking with RF and non-RF amateurs. On Single User devices, it is difficult to tell the difference. That's why all operators using EchoLink must practice standard radio protocols.





The diagram on the right shows EchoLink Single Users (on the left) connecting to another Single User, who is connected to an RF-enabled EchoLink station. The Users in the left column have no way to know the EchoLink SysOp nodes are involved in the QSO, and the RF users have no idea they are talking with others who are using RF. The EchoLink users in the left column may not know they are talking to amateurs who are going RF into EchoLink Sysop nodes through the intermediary EchoLink Single User.



Key Points:

- Amateur radio is a hobby that starts with certain technology. Over time the technology has changed, but the spirit of amateur radio (technical development, international friendship, and public service) has remained constant. So long as radio amateurs use their hobby to grow and sustain the spirit of amateur radio, we at GECO radio won't quibble over what is real radio.
- During an emergency, any means of communication should be used to save lives and help communities in need. There is no guarantee that any particular communications system will or will not be working. It is best to keep all options open. The West Bengal Radio Club (WBRC) used the KM6EON-L in the Telinipara Ghat disaster, and the Internet was functioning during Hurricanes Harvey and Irma. And as any experienced DX amateur operator can tell you, the HF bands are not always open and available.
- GECO is in favor of using any means possible, RF or VOIP that enable amateurs to stay in touch, share information, make and maintain friendships and develop understanding across the barriers of time and space. Communication is the name of the game and amateur radio by RF or VOIP is the same.

New Year Station Tune-Up

The New Year is a good time to do an annual checkup for your station (or at least parts of it especially if you experience weather extremes). Every amateur has their ideas of equipment maintenance, so there probably isn't any standard way to carry out an annual station tune-up or spring cleaning as it were. GECO puts a priority on single-handed accidental EmComm operating in remote or rural areas. Our preference for equipment is compact, lightweight, and portable. So, here are our suggestions (in no particular order).

Batteries: This includes batteries for HTs, mobile units, station battery banks, flashlights, and portable field equipment (e.g., VOM, phones, GPS, cameras, lithium battery packs, etc.).

General Procedures:

☐ Clean battery terminals (slide 15)	
☐ Test voltage (slides 20-24)	☐ Clean cables & adapters
☐ Charge as needed; test	☐ Keep sets together

[**Note**: GECO interoperability requires all batteries to be readily useable by any GECO transceiver.]

Battery Charging: Guidelines for EmComm operations suggest being able to operate for 72 hours before being re-supplied. Radio operators should plan for ample battery power or have battery charging capacity to support operating for 72-hours. Whatever battery charging options you decide to use, be sure to consider a backup. For example, solar panels are a good option, but some disasters are associated with obscured sky conditions (e.g., cloud cover, smoke, volcanic ash, etc.). Manually powered generators (e.g., peddle power, hand-crank, etc.) need to be balanced out with food/water supply considerations to maintain physical strength to make electricity. Gas-powered generators require sufficient fuel stocks.

General Procedures:

☐ Clean battery terminals (slides 12-13)	
☐ Clean battery contacts in the HT charging cradle	
☐ Clean charging cables	☐ Optional battery cables
☐ Keep sets together	☐ Tools to scavenge batteries

Transceivers: GECO interoperability (1, 2) includes regular cleaning and inspection, so all cords and accessories are in good condition and readily accessible. Check all frequencies set in the unit's memory and update them as needed. Keep an equipment log of any changes, modifications, and repairs. Do any necessary RF safety exposure measurements as needed and complete the required forms and keep them on file. [**Note**: Have copies of your valid amateur license.]

General Procedures:

☐ Clean connectors (power, mic, antenna)
☐ Inspect power cord & connectors
☐ Inspect the microphone, cord, and connectors
☐ Check and inspect all adapter cords and jumpers
☐ Check, inspect, and clean all antenna connectors and adapters

Antennas: General inspection and cleaning. Check and waterproof all outdoor antenna coax connections. Check and record SWR measurements at least annually or at any time changes are made in coax, transceiver, etc. Plan for replacement or backup antennas, connectors, and adapters. [**Note**: GECO interoperability requires all antennas to be capable of being used with any transceiver. This means having the necessary hardware connectors for using HT antennas with mobile/base station transceivers and vice versa. This flexibility improves the resilience of EmComm.

General Procedures:

☐ Clean antenna connectors	☐ Clean adapters
☐ Inspect antenna cables	☐ Clean cables
☐ Test the coax for shorts	☐ Keep sets together

You should review your current station and situation, potential hazards/disasters, and plan accordingly. In past disasters, the number one reason for EmComm's failures is the unexpected.

Thoughts for EmComm Operations

The most common reason for EmComm failures is the occurrence of unexpected events. The challenge is how to prepare for the unexpected (i.e., unknown, or possibly unimaginable). This is sort of a mission impossible, especially in an era of rapidly expanding dependence on technology.

The GECO approach follows K.I.S.S. (Keep It Simple, Stupid) model. GECO began as part of the EmComm program in the Rural Training Center-Thailand (RTC-TH). With few licensed amateurs in the area, the focus was on a lone operator in an impoverished rural area with little to no formal EmComm training or EmComm groups. This meant minimal procedures and equipment for a no-cost/low-cost, no-tech/low-tech approach to making it easier to replicate. In 2014, the RTC-TH ceased operations. So, the RTC-TH granted the rights to all of its EmComm materials and GECO emerged as a stand-alone program in 2016.

2008-2014 2016-date

GECO continues the original grassroots approach geared to the "accidental" EmComm operator. This person is an amateur radio hobbyist who may happen to be affected by a disaster. They either step up to the plate and volunteer to do EmComm or they don't. Most volunteers have other obligations and commitments. They are not paid and don't train repeatedly to perform EmComm. GECO does not spend time training volunteers to perform EmComm like FEMA, and other organizations. This is why we try to keep things barebones and simple. This helps when the operators have to work in high stress.

GECO simplifies things to make it easier for volunteers to get into action and not get bogged down in the bureaucracy in a chaotic disaster site. Here are some ideas to help simplify EmComm operations:

Base Five to Simplify: Sun Tzu, an ancient Chinese military strategist, said there was no difference in commanding an army of 5,000 or 100,000 men. The general only talks to five men, that each talk to five men, that each talk to five men, etc. Most business managers can only effectively supervise a maximum of ten people.


Sun Tzu (771 to 256 BCE)

GECO EmComm plans on people working in pairs (for safety) with an EmComm field team of two to ten people (see diagram, below, right). A team of ten people is two groups of five and conforms to Sun Tzu's idea of a command structure.

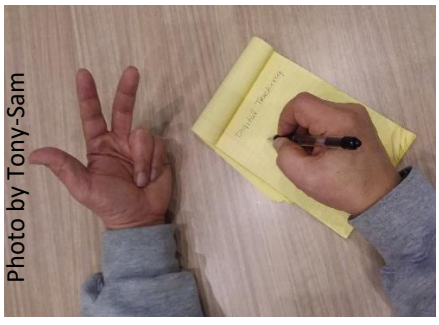
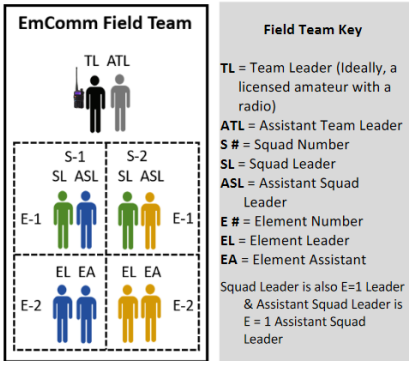


Photo by Tony-Sam

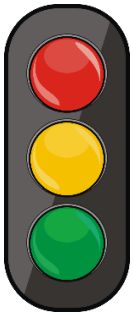


- **Digital Tracking:** We advocate organizing notes and training topics to a maximum of 5 key points. This helps set priorities to filter through large amounts of information. This may not be the solution to everything.

GECO uses this method for EmComm training as it reduces the volume of materials, and might help

accidental EmComm amateurs to recall important information when under stress. Sometimes, physically counting on fingers help people recall information. It may not work for everyone but try it. If it works for you, great. If not, try to find a method that does work for you.

Base Three May Help Thee: GECO makes use of the number three (which is less than five so is easily accommodated by the digital tracking method above). We recall this number and pattern concept from the story of Goldilocks. Here are examples of how GECO uses Base three numbering in EmComm.



- **Red, Yellow, Green (Traffic Lights)**: All EmComm groups have a method to rank messages in some order of importance. GECO uses a three-color system used for traffic lights. Color-code all messages (received or transmitted) using these colors. Mark the date and time the message was handled and the final action that was taken.
  Red is for "Top priority." Start the message with "Mayday, Mayday, Mayday." Use this when there is an immediate impact on life (death or serious injuries) and property. This is emergency traffic and must be handled immediately.
  Yellow: Start the message with "Pan Pan, Pan Pan, Pan Pan." Use this when there is a danger or hazard to life and property, but the situation is NOT life-threatening. [**Note**: GECO uses Mayday and Pan Pan as they are established international phrases.]
  Green: Start the message as you would for a normal QSO. Use this for regular messages and other traffic that does not fit the other categories.
- **Ranking GECO Lessons/Training:** All GECO EmComm lessons and training are rated in three tiers; Basic, Intermediate, and Advanced. Each higher level indicates mastery of the previous lower level but implies the ability to use prior-level data collection methods as a backup if needed. All GECO volunteers are expected to be flexible and do whatever task is necessary according to the circumstances.

Description	Ability	Data Collection
Basic: Core foundation knowledge, and skills. Must gain practical experience to go on for more training.	• Qualifies to be a team member to gain practical experience. • Teach back Basic lessons	Subjective observations standardized to reference charts.
Intermediate: Additional knowledge and skills above basic level. Must gain practical experience as a team member or Asst. Team Leader to go on for more training.	• Teach back Basic and Intermediate lessons. • Experienced as a team member and can mentor new team members. • Experienced team member mentor can qualify as Asst. Team Leader.	Uses analog devices to make measurements.
Advanced: Can teach back all lessons; gets more knowledge, skills, and experience as Asst. or Team Leader go on for more Net Control training and other GECO leadership roles.	• Teach back all lessons. • If experienced as an Asst. or Team Leader and can mentor new all team members. • If experienced as a team mentor can qualify for Net Control training or other GECO leadership roles.	Use digital devices to make measurements.
Note: *All GECO volunteers are expected to periodically refresh and teach back all low-tech methods of data collection to build redundancy and resilience in EmComm data collection functions.*		

GECO adheres to its no-cost/low-cost, no-tech/low-tech approach because 1) it is easier for poor communities to try to replicate our efforts, and 2) the worst-case scenario is that a well-prepared, well-equipped station can be severely damaged or destroyed. In remote areas, high-tech equipment is hard to repair or replace. A resilient EmComm operator will make do with whatever is on hand to try to establish communications.