

Our New Base in Arizona

We made a move from Los Angeles, CA to Scottsdale, AZ to continue supporting a dear friend who is battling cancer alone. We won't go into the details except to say, no one should have to walk this path alone. True friends are there even when family fails.

The move is a big relief for me. Earthquake country is not my cup of tea. After Hurricane Katrina, LA officials asked FEMA what plans they had for LA when the killer quake hit. FEMA's

response was "none." To say chaos would ensue is a gross understatement. Evacuation is next to impossible. Relief will be a monstrous Gorgon Knot. In contrast, Scottsdale as a significantly lower risk for earthquakes. [Scottsdale geo-hazards](#) (ranked by high to low risk): severe weather (tornadoes, high winds, hail, floods, heat waves, drought).

The place we are renting is in an HOA. We are still waiting information regarding antennas, flag poles, and masts for weather stations. The fallback position is portable radio operations in the backyard or local parks.

We also upgraded some of our graphics to match the move. The Arizona radio diamond for KI6GIG and announcement card for the new QTH are shown on the right. Scottsdale is in Maricopa County, AZ.

Unpacking is in progress. The radio gear is a lower priority.



We moved next door, heading East (from the Golden State to the Grand Canyon State). We changed deserts (from the Mohave to the Sonoran), climate region (Mediterranean to Arid, winter rain to summer rain), and Time Zones (UTC-8 to UTC-7). However, we will retain our HAM call signs for continuity in our EmPrep and EmComm lessons. We hope we can set up antennas at the new QTH. But we are prepared to operate "Portable" in needed. Best Wishes to All. '73 de KI6GIG/KM6EON




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HAM radio for international friendship and understanding.

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For setting moving into the house. So many hoops and hurdles:

- 1) Basic infrastructure start-ups for basic utilities, internet, and cell service. Luckily, we were able to terminate old utilities and starting new ones online. We thought we had the internet lined up online. But Mr. Murphy's Arizona cousin got in the way. Apparently, the painters damaged the fiber optic connection and put the fiber optic modem on a closet shelf in a different room. That slowed down getting the Internet up and running.
- 2) T-Mobile cell service was 1 bar or less everywhere in the house and in the yards. As a tease, one south-facing window might occasionally flash 3 bars for a few seconds. A call to T-Mobile revealed the ugly truth: we were in an area and the closest 4 towers were older 2G. However, once we were able to the Internet/Wi-Fi in the house, T-Mobile very quickly instructed us to reset and reboot our phones so they could conduct some tests. Once they had the results, they provided us with a "CellSpot" (signal booster, at no cost) to connect to our modem/router. We now get 4 bars anywhere in the house.

We will get a station up and running to continue our efforts in HAM radio, EmPrep, and EmComm. Planning a station with HOA antenna restrictions is done in a phased approach:

- 1) Submit drawings and plans to the landlord for review and approval for 1-2 masts 10-12 ft AGL for VHF/UHF operations.
- 2) Plan B is stealth antennas either ground level, indoors, and as a remote possibility, in the attic. Performance may not be as good as outdoor antennas at 20-30 ft AGL. Hopefully, it will be functional to hit the nearest repeaters in the area (~25 mi away).
- 3) Plan C is to shift to VOIP modes (EchoLink, CQ 100, Peanut, etc.)
This way we maintain our DX contacts.
- 4) Plan D is to fall back on our portable field VHF/UHF sets. We can temporarily set up and operate in the backyard or nearby parks.

The reality will probably be a combination of bits and pieces of all options. The worst case is not having any permanently installed outdoor antennas. Whatever the outcome, we are confident nothing will prevent us from continuing to find a way to participate in HAM radio. 🌴



Torpedo Level Modification

In anticipation of setting up new antenna masts, we began making additions to our field tool kit for setting up antenna masts. The GECO field antenna guidelines are based on our experiences in rural Thailand. The parameters for our field radio kits were rudimentary:

- 1) Single-handed operation. We assumed a lone HAM in a remote area.
- 2) Equipment must be light-weight, portable, compact, and fit into a backpack. (Remember, the HAM must also be able to carry supplies to hold out 72-hours before resupply.)
- 3) Multipurpose/multifunction items are preferred (to reduce weight and bulk).

We found an inexpensive combination magnetic torpedo level/clinometer at Harbor Freight Tools. This torpedo level is compact and easier to stow and carry in a backpack than the current post setting dual level we use. This torpedo level also includes a clinometer. We can also use it to measure topographic slope angles, a key measurement in geo-hazard



assessment for emergency preparedness.

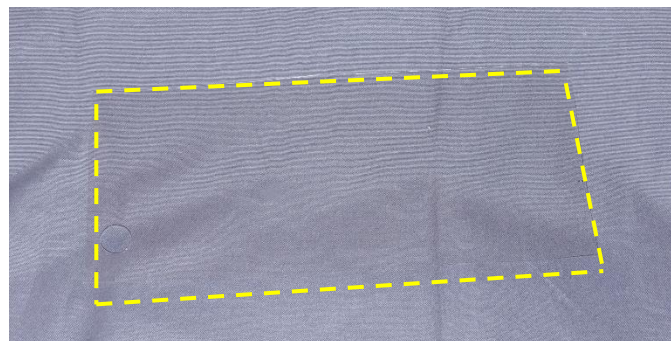
We considered the bubble vials on the torpedo level a potential weak spot. We added a layer of protection by covering them with clear plastic salvaged from a blister packed product. We often “recycle” the plastic from blister packaging. We trim and save any clear flat pieces for future projects.



We cut and save flat portions of blister packaging.

We felt the added level of protection is useful when carrying the torpedo level in our backpack. Things tend to get jumbled and tangled in a backpack regardless of how neat you try to keep things. With the plastic shields in place, nothing can accidentally get entangled with the bubble vial.

GECO’s approach to the lone EmComm HAM embraces the idea HAMs making geo-hazard assessments enhance their value as EmComm operators. This is the same reason we created MEWS (Mobile Emergency Weather Station) training for HAMs several years ago when we were in Thailand. 🌿



We made plastic guards for the bubble vials.



The added protection may prevent damage in the pack.

GECO EmComm Field Organization

Much of my EmComm (Emergency Communications) ideas are shaped by my experiences in a rural operating environment as a lone HAM. In many parts of the world, rural HAMs are few and far between. They have little access to formal EmComm training or EmComm groups. If others in their area get interested in HAM radio, poverty and remoteness limit their ability to buy radios.

The lack of radios does not preclude your ability to do EmComm. After all, EmComm is not exclusive to radios. The table on the right lists some of the common Non-Radio EmComm gear. Many of these items are readily available off the shelf locally. Some of them can be made with common materials. Others can be scavenged or salvaged from disaster debris. To learn more, read the [2017 June issue of Sticky Notes](#). Many of these methods can be taught to students. This gives youth exposure to EmComm. This can lead to building local community EmComm capacity and disaster

Non-Radio Communications Gear		
Audio		☐ Whistles
		☐ Sirens
		☐ Loud speakers
		☐ Gongs, Bells, Chimes
		☐ Gunshots
Visual	Day	☐ Mirror Flashes
		☐ Smoke / Flares
		☐ Flags
	Night	☐ Lights/Flashlights
		☐ Flares
		☐ Fires

resilience. It also plants seeds for the next generation of EmComm operators.

In my travels in Asia and the Pacific (from the mid-1980s to 2017), cell phones became increasingly present, even in rural areas. The growth of the Internet and cell phone service gives people in rural areas greater access to the world. It seems many newly licensed HAMs cannot afford a radio. But they may already have cell phones. And the world market for smartphones is rising rapidly.

There are many VOIP (Voice Over Internet Protocol) applications for cell phones. We've used three in particular: EchoLink, Zello, and WhatsApp. EchoLink requires a HAM license. But Zello and WhatsApp do not.

Zello is a walkie-talkie program. You need to push a button to talk, much like a HAM radio PTT (Push-to-Talk) switch. WhatsApp works more like a phone call. These VOIP apps let you create a "private channel" or group, sent text messages, and photos. These work with smartphones. [Learn more about this EmComm idea on page 6 of this newsletter.] Yes, the operational limit is

the need to have Internet and cell service in the disaster zone. You cannot assume these will NOT exist. No more than you can expect the RF (Radio Frequency) bands to always be clear and available.



Joe N6WZK successfully integrated HAM radio with EchoLink and Zello (both VOIP technologies). While this is possible, it may not fit well with EmComm HAM radio operations. With this set up, non-HAMs on Zello are part of the EchoLink and RF traffic. There is no effective way to separate the HAM and non-HAM traffic. This violates amateur radio license rules. This is why GECO proposes the separation of RF and non-HAM VOIP EmComm users.

One way is to set up two separate systems; one for HAMs using combined EchoLink/RF equipment. The second system would use only non-HAM VOIP with a HAM team leader who would gather reports from non-HAM VOIP team members and relay the information by RF (or if EchoLink is available, via smartphone).

In most disasters, there will be more people with cell phones than there will be licensed HAMs with radios. We propose to train and organize community HAM/VOIP EmComm groups by:

1. Using non-HAMs with VOIP smartphones in EmComm. In an emergency, any and all forms of communication should be used to help save lives and property.
2. Using VOIP to train people in EmComm operating protocols. The Zello PTT function gets them used to operating HAM radios (if they decide to get a license, or if they are a HAM with no radio).

GECO is grassroots, so let's start small. The table on the right shows a HAM/VOIP EmComm Squad of four members (to a maximum of 6 members). For safety, EmComm operators work in pairs.



The Example of Bangladesh

Of the 500 licensed HAMS, only 85 (17%) are active (reported by S21ED). In contrast, there are a total of 161,506 million [legal mobile subscribers](#) in Bangladesh. Among these, more than 110,000 million would be the smartphone users in [Bangladesh](#). If even 0.01% of them volunteered for non-HAM VOIP EmComm training, this is 11,000 potential recruits. This is 129 times more people than there are active licensed HAMs.

Note: VOIP

applications come in two basic types: 1) Some are available only to licensed HAMs (e.g. EchoLink, CQ-100); 2) those available to the public. For this paper, non-HAMs would not be using VOIP apps restricted to HAMs.

HAM-VOIP EmComm Squad	Four members arranged in pairs, with 1 radio and 3 private group VOIP enabled cell phones.
Squad Leader – Radio	Element 1, 2 members, private group VOIP phones
Asst Leader -VOIP phone	

- Element operators report to the Assistant Squad Leader by VOIP using a pre-set private group.
- Squad Leader reports to EmComm Net Control by radio (if available, or by VOIP).

GECO uses a competency-based education model. People learn hands-on to develop EmComm operating knowledge and skills. The normal path for a non-HAM is to start as a member of an Element using VOIP. They are encouraged to study and get a HAM license. They don't HAVE to do so, unless they want to be an Assistant Squad Leader. Squad Leaders and Assistants must be radio operators. [Note: We limit Teams to a maximum of 5 squads for optimal management.]

The table on the right shows the composition of a GECO EmComm Team. Each Squad on Team 1 is numbered 1-5. A squad has a Squad Leader, Assistant Squad Leader, and at most, 2 elements (A and B). Each element has 2 members. For example, the yellow highlighted operator reports as A-2, Squad 1, Team 1. They only report to their Asst. Squad Leader. The Asst. Leader monitors all

squad members and reports to Squad 1 Leader. All Squad Leaders report to the Assistant Team Leader. The Team Leader is in RF communication with Net Control. If more radios are available, they should be allocated down the command structure to Assistant Team Leader and Squad Leaders. If cell service is disrupted, written messages should be carried by runner from Squads to their Team Leaders.

These ideas are meant to open discussions about building EmComm capacity in communities with few resources and few licensed HAMs. Of course, amateur radio regulations are different for each country. HAMs should feel free to modify and adapt these ideas to their situation. In many poor communities, using non-HAMs and cell phones to bolster HAM EmComm teams could be a viable way to build EmComm capacity AND cultivate a group of new recruits. Start to build EmComm capacity and disaster resilience now, BEFORE the disaster happens! 🍌

GECO Field EmComm Team Organization				
	EmComm Net Net Control Call Logger		Net Control (assisted by Call Logger) oversees EmComm Teams. Plan for staffing 3 shifts 8 hrs. / day. At all levels, advancement is	
Alt Net Control 1 Alt Call Logger 1	possible to next higher level based on competency and necessary HAM license. A Team has 4-6 people. A Squad has 2-6 people. An Element has 2 people.			
Alt Net Control 2 Alt Call Logger 2				
Team 1 Team Leader (TL) Asst Leader (ATL, log calls from squads)	Team 1-2	Team 1-3	Team 1-4	Team 1-5
	A team has at least 1-2 radios (TL and ATL). Additional radios go to Squad Leaders (SL). If no other radios available, use VOIP on cell phones (if possible) SL to ATL. No cell service, SL to use runners carrying written messages to ATL.			
Squad 1	Squad Leader		Element A-1	Element B-1
Squad 2	Each squad uses	Radio	VOIP	VOIP
Squad 3		Asst Leader	Element A-2	Element B-2
Squad 4		VOIP	VOIP	VOIP
Squad 5		cell phones with same VOIP private group. Squads follow the same composition of 4-6 members. Element members report to Asst Squad Leader by VOIP. Squad Leader reports to Asst. Team Leader by radio or VOIP (if no radio). Team Leader reports to Net Control by radio.		

[Note: In 2013, I read an article where Basappa VU2NXM reported people could use CB radios in India without a license. He advocated for village leaders to get and use CB radios for EmComm. Although CB radios have a shorter range than HAM radios, in an emergency, any and all means of communication should be used. We collaborated on a [presentation](#) at HamFest India 2013 for a 3-tiered training program to create the NextGen EmComm operators in India.]

Non-HAM EmComm Using VOIP

We have talked about recruiting non-HAMs as EmComm team members over the past several years in our “NextGen EmComm” discussions. In the previous article, we used the example of Bangladesh.

Syed S21ED reported the government has issued about 500 HAM licenses. Only 85 HAMs are active (70 on VHF/UHF, 15 on HF). License fees increased ten-fold from \$1.25 annually to \$13. This is exorbitant for Bangladesh HAMs, so many have not been able to afford renewing their licenses.

Each year, Bangladesh faces a double whammy disaster scenario with the summer monsoons. Flood waters descend from the North converging with storm surges from the South. About 75% of the population live in flood prone areas. A glance at the map shows those areas. Even if all 85 active HAMs mobilized for EmComm service, they are hard pressed to cover the disaster area.

We suggest recruiting and training cell phone users may help the EmComm effort. It is estimated there are 110,000 smart phone users. If only 0.01% volunteered for training, this expands the potential EmComm group to 11,000. Using the private group function of the VOIP (Voice Over Internet Protocol), EmComm Teams can effectively network to do their work. Yes, VOIP needs cell phones to work. During disasters, cell service may be disrupted. But there could be some service in some areas. When available, it should be used. It’s consistent with the EmComm mantra “In an emergency, any and all means of communication should be used.”



Disaster prone areas due to cyclones and flooding.

Here is a general overview of a suggested training program. 🌱

Level	Topics	Some Specifics
Level 1: Basic Non-HAM	Personal Safety	Make/maintain Personal EmPrep Kit; learn basic safety practices.
	Non-Radio EmComm 1	Learn to make/use the GECO Non-Radio EmComm methods.
Level 2: Intermediate Non-HAM	Team Safety	Learn to work in teams safely
	Non-Radio EmComm 2	Make/use a heliograph ; learn/use Morse code
Level 3: Advanced Non-HAM	Cell Phone VOIP Observer	Learn to use VOIP in a private group; Learn to use a CB radio; join an EmComm Team
	Mobile Emergency Weather Station	Learn Basic MEWS observation/reporting
Level 4: Basic HAM	Entry level HAM license	Get a HAM license
		Learn/use EchoLink & VHF/UHF radios
Level 5: Intermediate HAM	Intermediate Level HAM license	Practice being Net Control
	Make a station	If possible, set up a station (RF or EchoLink) or help set one up.
Level 6: Advanced HAM	Advanced Level HAM license	Learn/use an HF radio
Note: There are other training topics for the various levels. Watch for future articles describing each level in more detail.		

Meeting with Greg Lee in S21-land Pilot Planned

Deepta S21HK is friends with Syed S21ED (who met Greg KI6GIG in HamFest India 2017). Greg and Syed had email exchanges discussing ideas to help improve training for HAMs in S21-land (Bangladesh). Deepta joined in an EchoLink Net on linked stations VU2WB-R (West Bengal Radio Club) and KM6EON-R (Wanderers Amateur Radio Club). When COVID-19 took the world by storm, Deepta and Greg began exchanges of information relevant for medical workers in Bangladesh. Once again, HAM radio created opportunities for international friendship and understanding.

In recent text chats, Deepta fielded a suggestion/invitation for Greg to meet folks in Bangladesh via video conference. He thought it would be a good opportunity for them to meet Greg in “virtual” person. Talk about social distancing (about 13,246 km)! Deepta’s request was two-pronged: a group of S21 HAMs aimed at EmComm and other HAM topics; a group of medical workers on various topics.

For the moment, the plan is for Deepta to host a Google Group for S21 HAMs to meet Greg on 30 July 2100 hrs. BST (UTC-6) / 0800 hrs. MST (UTC-7 no DST). To join the group, S21-land HAMs please contact Deepta S21HK.

Topics for the program will vary according to the interest of the groups and Greg’s capability. For the first group meeting, Greg will introduce himself and present an overview of his past work. Since Greg can only present in English, advance notes will be provided to Deepta for distribution. This way participants can get a glimpse of the presentation and prepare notes and questions. This should facilitate discussions.

The general format is a presentation followed by a Question/Answer/Discussion period.

Nothing is set in stone, but the thought is for a 30-45-minute presentation followed 15-20-minute Q/A period. Flexibility will prevail and the format can be adjusted as needed. Deepta plans to record the sessions so those unable to participate can view it later. He also plans a discussion board for additional comments and questions. Greg will directly respond to these.

To get a glimpse at some of Greg’s areas of interest, please visit the following websites:

- [Applied Geography for Sustainable Living](#). This site contains newsletters about a sustainable agriculture demonstration farm in rural northern Thailand, education, and early EmComm articles.
- [Applied Geography 2](#). This is the archive of a wide variety of topics and lessons (e.g. education, international projects, applied geography, emergency preparedness, emergency communications, HAM radio, weather observing, conference presentations, etc.)
- [Grassroots Emergency Communications Operations](#). Greg’s activities after return to the US from Thailand about 2014 to present: Topics include Emergency preparedness, emergency communications, EchoLink, the Wanderers ARC newsletters, etc. 🌿

