



Sticky Notes

GECO Newsletter
Vol. 4 No. 1, May 2019

www.neighborhoodlink.com/GECO

Email: gecoradio@gmail.com

Ready to Serve and Sustain Our Community

The GERC Battery Story

Glendora Emergency Response Communications (GERC) members enjoy some special mana from heaven. Depending on your point of view, it could be the free deep cycle 16 Ah and 24 Ah sealed lead acid batteries, or it could be the mild-mannered Harry KB7ULN. By day, he is a technician servicing medical equipment. But on days when medical equipment batteries must be replaced, he becomes the **GERC Battery Man**.

Harry negotiated a deal that puts into practice the idea of “mutual respect, mutual benefit.” To assure reliable medical service, even when a single battery in a bank fails to meet operating specifications, the entire bank is pulled from service. Harry convinced the hospitals and his company to donate the unserviceable batteries to the GERC HAMS. The HAMS promise to properly



Harry KB7ULN

dispose of the batteries when they are no longer useable.

The hospital saves about \$150-\$200+ per battery disposal costs. When new, the batteries cost anywhere from \$99-\$125 or more. The



16 Ah Battery



28 Ah Battery

photo on the left shows several 28 Ah batteries from a portable medical unit. Harry delivers decommissioned batteries to Jim KG6TQT at GERC for distribution.



24 Ah batteries from medical equipment.

Jim puts out the call to GERC members that batteries are available on a first-come-first served basis. For the mere cost of gas to get to the battery pick-up point (a local drive for most folks), they get free deep cycle, sealed lead acid batteries for their radio stations.

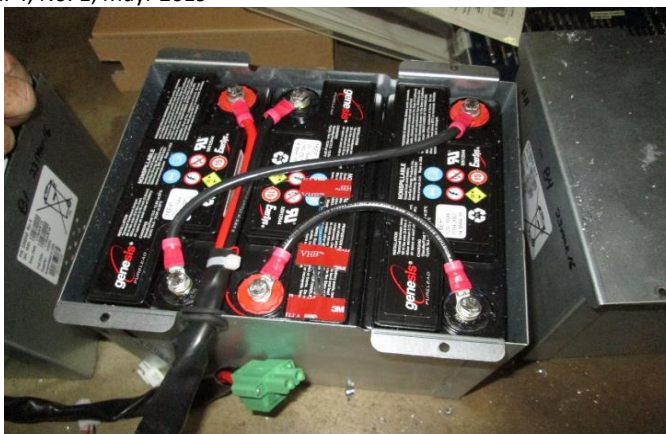
What follows are a few examples of how the GERC batteries are being used by some of the HAMS who received them. This battery bonanza can be worth hundreds to thousands of dollars. Some HAMS use them singly. Others create battery banks for their stations. 🦎

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Some battery boxes arrive with riveted covers. Once drilled open, the wiring harness is removed.

N6WZK-R

Joe N6WZK uses one of his EchoLink repeaters to support the GERC Net. Following a GERC battery distribution, Joe willingly accepts any unclaimed batteries. This is another application of “mutual respect, mutual benefit.”

He first checks the state of charge of each battery. He charges all the batteries and periodically checks the level of charge. When the batteries are fully charged, Joe removes the charger. After waiting 30 minutes, he measures each battery and records the voltage readings. Then he waits another 12 hours before taking another voltage reading.

Once he is satisfied the batteries are holding the full charge, he puts them into service in for his radios. He has separate battery banks for different repeater systems.

His goal is to run his entire station on solar power. He began experimenting with small solar panels to get familiar with panels, charge controllers, and solar energy variability to support his station needs. He’s getting closer to finalizing plans to slowly expanding to his solar capability over the next year or so. With a very limited retirement budget, the GERC batteries are a gift from heaven when it comes to



Joe N6WZK & his experimental solar array

building up his solar storage capacity. That will lower his utility costs, stretch is limited budget, and let him continue his hobby. The price he pays for the “free” batteries is to freely offer his technical expertise to GERC members who need help. Again, it comes to mutual respect, mutual benefit. 🌱

KM6EON-R Station Battery Bank

One of the many beneficiaries of the GERC battery distribution is the Wanderer's ARC. The KM6EON-R EchoLink Repeater (maintained by Joe N6WZK). The donated GERC batteries form the station battery bank. The bank is divided into two parts: the 12 VDC power system for the radios; and the 120 VAC back-up power system for the EchoLink computer and related 120 VAC equipment to keep the EchoLink station functioning. The battery bank is on float charge. If / when commercial power fails, the battery bank automatically supplies power to the EchoLink station. Emergency power is not unlimited. Power to the EchoLink station will be cut if needed for the EmComm radios. 🌱



KM6EON-R station battery bank

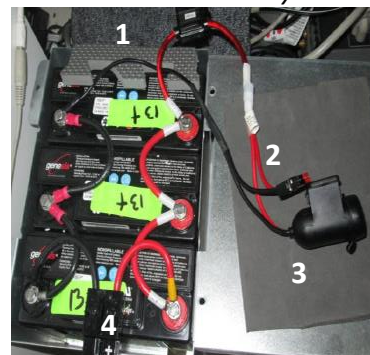
GECO Field Batteries



GECO uses the 16 Ah batteries singly or in groups of 2-3. The 3-battery box version (photo to left) has a general wiring harness for station use. The Anderson SB50 rapid connector goes to the station float charge system (left yellow

box in the photo). The Anderson P30 connector (right yellow box) fits any GECO equipment with an Anderson P30 connector. [Note: This is the standard connector for [GECO inter-operability](#).]

The photo to the right shows a typical GECO field battery box with 3 16 Ah batteries. It weighs ~ 20.7 kgs. This type of battery box is used in vehicles or field stations. The wiring harness has: 1) an inline fuse, 2) Anderson P30 connector, 3) 12 VDC accessory socket, and 4) Anderson SB50 connector. In the field, the P30 serves any GECO equipment with a P30 connector (fans, radios, LED lights, battery charger, DC/AC inverter, etc.). The 12 VDC socket primarily serves the Bao Feng HT battery eliminator. After field use, the Anderson SB50 connects to the station charging system.



A single 16 Ah battery box, weighing ~ 8 kgs supports HT pedestrian portable ops (or mobile ops at operator discretion). It uses the same field wiring harness (but without the SB50). This battery can be charged via the Anderson P30 connector. 🌱

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Mobile Battery Charging: Juan KM6DBN

Juan KM6DBN has two 16 Ah batteries from GERC to power his in vehicle mobile radio. He found a way to charge his radio batteries drawing power from the 12 VDC accessory socket. He uses a 12 VDC plug with a switch. This lets “charge, or not to charge” while driving. The two batteries live in a plastic battery box on the floor behind the center console. 🌱

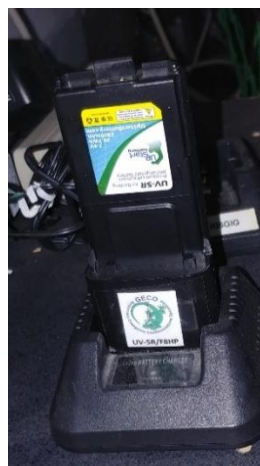


KI6GIG HT Battery Rescue

I recently finished using my HT for some systems testing. I noticed the OEM battery was down to 1 bar. I put it in the charging cradle. I decided it's a good time to do a maintenance charge on the larger spare battery.

When the batteries were charged, I put the larger spare battery on the radio to check it. The radio did not turn “on”. No power. I switched to the OEM battery. The radio came to life. What's wrong with the spare battery?

The battery was fresh off the charging cradle. I used the VOM to confirm the battery voltage.



No sense assuming, is there? As you can see, the battery was fully charged.

I got my battery cleaning kit and cleaned the battery terminals and contacts inside the radio. Cleaning done; it was time for the “acid”



test. I put the battery on the radio and powered up.

Success! We did a quick radio check with the KM6EON-R EchoLink repeater. Everything is good to go! Battery rescue completed. 🌱



New GECO HT Reports Available



Inspired by the Tech License class in Port Orchard, WA led by Mark N7YLA, we began working compiling information to help new HAMs from the class. Two new GECO reports were created and released in May 2019:

- [GECO EmComm HT Ready Pack](#)
- [HT Tips for New HAMs: Part 1](#) (of a three-part series).

For many new HAMs, their first radio is likely to be an HT. In the accelerating technological

tsunami moving away from analog radios to digital, GECO clings to its low cost / no cost, low tech / no tech approach to Emergency Preparedness and Emergency Communications. The reason is simple. Major disasters tend to have a heavier impact on impoverished people worldwide. They don't have the resources to prepare as well, if at all. Various international relief organizations believe people in SE Asia will suffer heavily in the 21st century due to natural disasters in the region.

It logically follows, local HAMs in impoverished rural areas have less access to newer digital radio technology. And, as the digital trend continues, it is possible the older analog HT radios may be relegated to dark closets and back corners of desks and drawers. Perhaps some of them will trickle to the used radio market or be given away to make room for the newer digital equipment. [Note: Anyone wishing to discard working analog HTs, please email us at gecoradio@gmail.com. We can put you in touch with folks interested in accepting donated equipment for EmComm efforts in the U.S. and overseas.]

GECO strives to find simple and effective ways to try to squeeze a bit more performance out of its HT radios. The many factors affecting RF signal quality are beyond the control of the operator. The factors under the control of the operator relate to TX power, antenna, and to some degree the operating location.

Power is limited by the HT radio (most are limited to TX 1-8 W), the number and types of batteries you have (many Li-ion batteries range from 1800 mAh to 38 mAh), and the operator's budget. To boost TX power, you can get a 20-40 W amplifier for ~ \$100. But it needs a 12 VDC power source. This adds cost and weight to the HT kit. .

Antenna: For most new HAMs the choice is to buy off-the-shelf antennas (most common) or to homebrew (a low-cost approach). So, the reality is that most EmComm HTs will be limited to 3-5 km range under ideal conditions. The GECO EmComm HT Ready Pack uses antenna height to increase the radio horizon to increase range. Many folks use the stock "rubber duck" antenna that came with the radio. We suggest they get a high gain whip antenna and make a [Tiger Tail](#). However, don't discard the OEM rubber duck. It's compact size often makes it less likely to get damaged. Using it with a coax extension to raise it higher could help extend its range as an emergency antenna.

Operating Location: Whenever possible, it is best to operate from points of high elevation and / or open areas (away from trees, buildings, and obstructions). In many cases, EmComm HAMs operate where needed. There may be little or no choice in the location. Get to know your area. Find the "dead zones" where you have poor RF signals. This information is very useful for operational planning.

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Pack Mast & whip antenna on the GECO EmComm HT Ready Pack

GECO decided to focus on the humble analog HT radio as the cornerstone of its EmComm efforts. From our limited first-hand observations of HAMs in the U.S., Thailand, Philippines, Malaysia, and India, HT radios are more commonly available and used by new HAMs.

The GECO EmComm HT Ready Pack focuses on squeezing out as much performance from an HT as possible. It is geared for pedestrian mobile and portable operations. This costs significantly more than the grassroots [non-radio EmComm](#) from the no cost and no tech efforts. But in contrast to mobile and base station radios, HTs are very economical.

The EmComm HT Ready Pack is built around a dual / mast system. A short Pack Mast raises the antenna above the pedestrian mobile operator's head. This increases the radio horizon about 1 km. The free-standing Ground Mast is used for pedestrian portable operations. It raises the antenna as much as 3 m AGL. This extends the radio horizon another 1

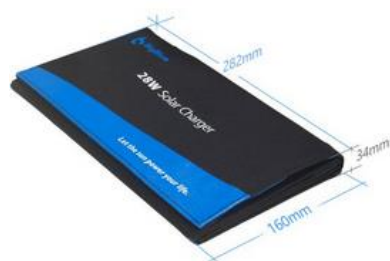
km (or 2 km over an HT held in your hand). Everything, radios, batteries, and a variety of antennas, are contained in one backpack. To learn more, you may read the [report](#). 🌱



Portable HT Charging Suggestions

When Juan KM6DBN saw the draft of the GECO EmComm HT Ready Pack, he excitedly suggested adding solar battery recharging capability. His suggestion conforms to keeping the Ready Pack light. It involves carrying the Bao Feng charging cradle, a special Bao Feng USB charging cable, and a Lithium Power pack. **[Note: We haven't yet tried this yet.** It is on our project wish list to buy and test. If you have already tried it, please send us an email and let us know your assessment.]

Juan also suggested teaming this up with a foldable solar panel such as BigBlue 5V 28W Solar Charger. It folds to a compact 28.2 cm W X 16 cm D X 34 mm thick. It easily fits into our Ready Pack. This model comes with a built-in ammeter and is



waterproof. These features make it ideal for field use.

The combined price tag for the Bao Feng cable, Power bank, and folding panel is about \$100 or so. That's not in the "low cost" category by GECO shoe-string budget criteria. And these items certainly won't be readily available in rural areas of many third world countries.

But for those who can afford it, it seems very viable. Adding this battery charging capability to the EmComm HT Ready Pack increases resilience and enables longer hours of operation.

Many consider HAM radio to be an expensive hobby. In truth, almost any hobby is expensive depending on how you approach it. GECO's low cost / no cost, low tech / no tech approach isn't done purely for economic reasons. It is motivated by the harsh reality that EmComm in third world conditions requires it. 🌱