GOAT NOTES

AUGUST 2020

August is Here and so are we

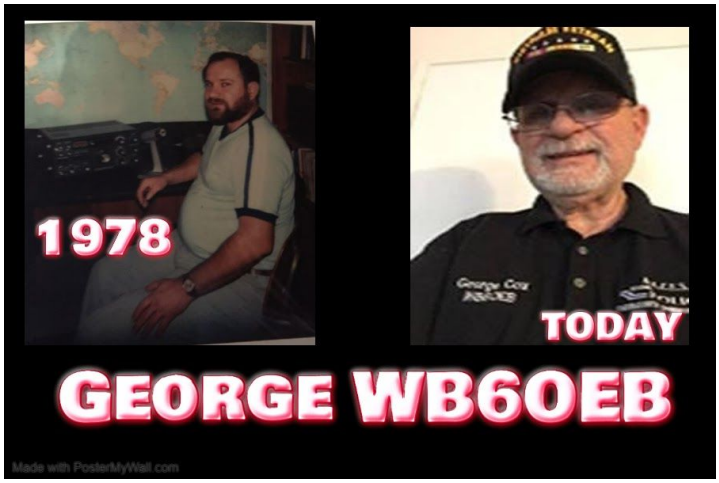
Greetings Goats, yes August is looking like these past few months, challenging to say the least. The good news is we are still here, hanging in there together, and even pulled off a successful Field Day 2020. In these times that's quite a list of accomplishments in any book.

This month's newsletter we have George Cox WB60EB as our SPOTLIGHT. George is a long time Ham and Elmer and we are glad to have him this month.

This month we have tried to continue with our outdoor activities, I guess only time and the Governor will see how that continues. We are doing these activities in a safe and intelligent way by the way, in case he is reading this newsletter.

We have some other informative articles by Dave K6EV and an intro into batteries to be used for "off grid" operations and just food for thought. OK Goats let's get to it.

SPOTLIGHT



This month we are proud to SPOTLIGHT George Cox in is his own words
Hello my name is George Cox my call is WB60EB. I was born in a small town in Nevada called Winnemucca and when I was five I moved to California. I got interested in ham radio when I was in high school taking an electronics class. I got my novice license in 1963 and my general in 1964. In 1964 I handled emergency traffic for the Alaskan earthquake as a ham radio operator Out of high school I got drafted into the army and became a Mars radio operator for one year in Pleiku Vietnam. We ran phone calls to guys' parents and loved ones at home. When I returned from Vietnam July 4, 1968 we were getting off of the plane in Oakland California and some lady was trying to shoot at us. We commented if going to get shot at might as well go back to Vietnam. I enjoy making antennas and dealing with emergencies. I am a member of Azusa and Glendora PD emergency communications also CERT. When we had the Kobe fire up on the hill four blocks from our home I was out waking up at 6 AM in the morning that didn't even know we had a fire. I have been married 44 years to a lovely lady that puts up with my crap. I have four kids, two grandkids and two great grandsons that are twins. How many guys have a wife that would let them buy a flex radio 6400 M. I am a very lucky person. I recently joined Gotahams and it is a very exciting and wonderful club. I even worked my way up to sponsor. I enjoy CW and at the moment I am trying to help a good friend because he likes code.

Thanks George not only for your loyal service to our country and your community, but to our club. You were the first “sponsor” level contributor and have proved to be an invaluable member. If there is any question that George doesn't know he is more than happy to find out and get it out there. BTW did you ever get your steak dinner when you returned from Viet Nam?

OFF THE GRID OPERATIONS

So we have been talking a lot of “Off The Grid”communications and have using this technology for some time thanks to power supplied via solar panels, to go boxes and other types of mobile power.

Speaking of mobile power here is a starting point on how to install a mobile radio in your vehicle. Remember this is a starting point on the operation and some basic knowledge to get the mental juices flowing. Points to ponder and even points of discussion. Read through this article, write down any suggestions, corrections or even opposing views for future articles and “net” conversation.

Safety Note: Vehicles continue to evolve. Consult your car’s documents or the manufacturer if in doubt as there will no doubt be new configurations that place different constraints on wiring in order to protect the vehicle, the battery, the radio and yourself. And just because it’s only 13.8V, NEVER underestimate the ability of your car’s electrical system to cause harm. A short circuit on the battery can cause an explosion flinging battery acid into the air. A battery shorting through your wristwatch or wedding ring can result in amputation or severe injury. If in doubt, let professionals do the wiring for you. And remember that in Hybrid and Electric drive trains, the propulsion batteries produce HUNDREDS of volts and can be immediately lethal. This should not be construed as a complete do-it-yourself guide.

For many years, a common practice for connecting power to a mobile transceiver (other than a low power unit such as an HT) mounted in a vehicle was to route the

positive and negative leads from the transceiver directly to the battery terminals. However, an important feature in a great number of modern cars suggests a modification to this approach.

The electrical systems in today's vehicles are more elaborate and, in many cases, draw considerably more electrical power than was the case years ago. Too many gizmos. Also, the pursuit of energy efficiency extends to the battery and charging system and that has brought about changes. Lastly, an efficient and intelligent charging scheme helps to preserve the life of batteries. Thus, in late model vehicles the embedded computing power in the car has become a participant in monitoring and regulating battery charging activity in response to real time changes in the electrical load. In order for these systems to operate efficiently the computer(s) need to be aware of the various loads on the battery as things are turned on and off. When you add a transceiver to the car with a powerful high-current transmitter, that needs to be included too. It is not a small load. (As a note, DO NOT connect a powerful mobile transceiver to the cigarette lighter. Most are NOT rated to carry the 12-14 Amp load that many transceivers can present).

From the positive terminal of the battery it is common that one heavy lead goes to the starter motor (actually to its solenoid switch) and another to a man fuse box. At the fuse box, after fusing, that portion of the positive bus fans out to many loads throughout the car. In some cases, multiple different fuse boxes or other loads may be tied directly to the battery plus terminal. So, the current flow from the positive terminal is immediately headed in several different directions on different wires and would be complex to measure and monitor.

The situation on the negative terminal was generally a little simpler, sometimes as straightforward as a single heavy wire from the battery negative terminal to the car chassis. Thus, the entire body and frame of the car become the current carrier for the negative terminal. This means that the ENTIRE batter current (whether discharging or charging at a given moment) is flowing through that single heavy black wire to the chassis – typically to a spot very near the battery location.

When carmakers wanted to begin to monitor the current flow in and out of the battery with good accuracy and in real time, they realized that this 'choke point' in the heavy black lead from the battery negative terminal to the car chassis was the simplest place to put a single sensor that would capture 100% of the flow into or out of the battery.

Some sensors use a very low-resistance resistor in series with that lead. This might be as little as 100 micro-ohms or 0.0001 ohm. At a starter current of 350 amps we would see about 0.035 volts of loss. (And a short-term power loss of roughly 0.035*350=12 watts. That is a tiny fraction of the 4KW or so of power that is flowing to the starter. In normal operation with perhaps a 10 to 100 Amp operating load the voltage drop is only 1mV to 10mV and is probably a good deal less than the voltage drops in the wire and cable to the various loads. A second version of sensor uses a Hall-Effect device that makes no actually contact to the battery negative terminal but is wrapped around it and measures the current flow by sensing the magnetic field produced by that current. Both types are in use. Many battery management systems (BMS) also monitor battery voltage and temperature. You can often spot the current sensing resistor or hall effect sensor by identifying a large 'lump' connected to the negative battery terminal with some small data cable coming out of it (for the resistor voltage drop data) or perhaps a large 'lump' surrounding the cable exiting the negative battery terminal as it heads for the chassis of the car.

If we use the old method of connecting the radios negative power lead directly to the battery terminal, we will have bypassed the current sensor of the BMS and denied the car's computer information as to the (sometimes substantial) current load that we are drawing – particularly when we transmit. That may result in less efficient or incomplete charging of the battery.

An alternative method of connecting power to the radio in modern vehicles is as follows.

1. Follow all of the older best practices especially as regards using very heavy wire adequate to the load you are powering and the distance it must travel through the car. Aside from using wire heavy enough to not fail from heating, your even tighter limit is probably to use wire heavy enough to minimize the round-trip voltage drop in your plus and minus wires to ensure that your transmitter gets sufficient operating voltage under high current conditions.

2. Always include fuses in BOTH the positive and negative wires – and these should be placed near the battery end of your cable run not near the radio end. And remember that the fuses themselves can add some voltage drop. Your radio manufacturer will have provided a power cable with recommended fuse sizes and these may be a good guideline. HOWEVER, the supplied power cable may very well be of somewhat thinner wire than you really ought to use for a long cable run. There are calculators on the internet that will assist you in calculating voltage drop at various currents for different gauges of wire. Make sure the wire has insulation suitable to the temperature that it will encounter near the engine and protect it from sharp edges with grommets as required. Whatever the wire, it should not be in contact with the engine block, exhaust manifolds/pipes or other very hot areas or moving parts.

3. Attach the fuse-end of your power cable's positive wire directly at the positive terminal of the battery as per long-standing practice.

4. Connect the fuse-end of your power cables negative wire to the car's chassis, either at the same point the battery connects to the chassis or at a place as nearby as possible. This assures that the 'return' current from your radio flows first to the chassis, and then up THROUGH the current sensing device of the BMS to the battery's negative terminal. Were you to tie your radio power cable directly to the minus terminal you are bypassing the BMS.

By the way, something else to consider is that all of the car's computer systems may not be too happy with a ton of RF energy being released nearby by your transmitter. Most carmakers advise that you do NOT route your antenna cable alongside other auto electrical cables (hard to tell these days which ones are

carrying data as well as energy) and instead try to cross these at right angles. This precaution largely applies to the coaxial cable from your transmitter (and receiver) to your antenna. Try to keep it away from other auto wires.

Another thing you might optionally consider is whether it is more important to you to be able to operate for an extended period with your engine turned off or whether you'd rather protect yourself from accidentally disabling your car by discharging the battery if you forget to turn off your radio. In my case, I was pretty sure that I would not often want to sit around in my car on the radio when I wasn't going somewhere and, being a bit older, really don't want to deal with dead batteries. So, I added a heavy-duty relay to my power supply scheme. It is a waterproof, high temperature automotive type relay with very heavy contact ratings. I connected the coil of the relay to the 'Accessory' power in my car. The relay's coil is energized whenever the engine is on or the ignition is placed in the Accessory ON mode/position. My positive wire goes from the battery positive terminal, through a heavy inline fuse holder right away, and then to the relay contacts. If the relay is energized, the connection continues for the rest of the run to the transceiver chassis. If I forget to turn my radio off – the car does it for me! There is no heavy load on the car's Accessory wiring because the relay coil only draws milliamps of current.

Example: I chose a vhf/uhf radio with a detachable control panel. I chose to mount the radio chassis in the trunk so the antenna lead is short and goes directly to my trunk lid mounted antenna. There is no reason it goes anywhere near any other wiring and the loss in the coax cable is minimized. I used heavy wire to bring power back from the front of the car (where the battery and my new relay are located) to the trunk area, as described. I had a car stereo installer route that for me through the channels beneath the door sills – they know how those come apart and go together in lots of different kinds of cars. He got it apart and put it together without breaking anything and it is all hidden. I also had him route the extension cables from the radio to the control head, speaker and microphone, using the same door sills up to the center console area of the cabin.

I also let him make the connections to the battery/chassis and mount the relay as they do that sort of thing all the time too. I purchased and provided ALL of the wire.

Having an installer do it was far from free (cost nearly what the radio did) but he did a nice job and I didn't break the car, explode the battery or cut my fingers. And I still got it wired the way I wanted it. I did the actual mounting of the radio chassis, antenna, antenna cable, speaker, control panel and microphone/holder to suit myself as he was a bit non-plussed by the radio side of things. I've taken this road twice - Once a late model Chevrolet Impala for myself and again in a late model Toyota Camry for my spouse K6LRY. Both have worked out great with zero problems over the past 30-36 months. Both radios are held an inch or two away from floors or panels to assure air flow. I usually use no more than medium power but have no problems at 50 watts full power. While a roof mounted antenna might sometimes be better, in our area I'm much more likely to be blocked by a mountain than by my car's rear window. The 37-inch antennas clear my garage door too!

Coming next month: Part One of a series on Emergency Power for Amateur Radio covering: How much you need for what circumstance, radio power, mode, etc. Battery sizing, key specs, types/chemistries, safety, etc. Basic solar panels and controllers. Portable generators and inverters. Will include a tutorial appendix on Amps vs Amp-Hours, Volts, Watts and Watt-Hours. Will include a spreadsheet calculator to help simplify calculations for your circumstances.

Thanks Dave K6EV fot that all inclusive "How To Do" Modern cars demand modern solutions- That's why I have a 1967 Scout - LOL.

THOUGHTS ON COPING WITH THE "LOCK DOWN"

A while back I was talking with Grace KM6LJL. The subject turned to the current lockdown/sequestration of the moment. I told her how this was something I had not experienced other than being in the service. She gave me some tips on coping and adjusting to this ever evolving situation. I thought that I would pass on her sage advice.

PHYSICAL:Take a shower and pay attention to your cleanliness of your person

MEDS: If you need them, take them, keep to your schedule.

EAT HEALTHY/DRINK WATER: Although it's tough try and eat right and stay away (as much as possible) from fast food and overly sugary drinks, drink water to flush toxins and stay hydrated.

WASH YOUR HANDS: Be aware of where you are and what you're touching, wash your hands thoroughly it's good practice.

KEEP YOUR ENVIRONMENT CLEAN: If you do a small section around you the task is easier.

TEND SOMETHING LIVING OR GROWING: A plant , a vegetable garden, potted plants or a pet. Caring and watching these things flourish by your efforts is satisfying to your mind, body and soul.

THINK: Use your most powerful muscle- your brain. Listen, to a song, to a spoken word to a thought. Create within yourself a "spiritual" place that is calm and serene. See the goodness around you (sometimes it's tougher than it sounds).

Never forget to reach out to another human being outside your home. Exercise, bike, walk or something to get that heart rate up at least once a day. Do one thing everyday that you want to do just because you want to do it, for in doing that thing you'll be glad later that you did. Get in at least one good laugh.

Reward yourself for all your efforts and try to keep a positive attitude It's tougher some days than others, but with practice all things are possible.

FIELD DAY 2020

Field day 2020 will probably go down as one of the most challenging in our lifetime. While some clubs in the are were not able to participate, the Goats under the Leadership of our President Ken KC6WOK, Vice President Mark KM6AHY, Secretary Kathi KM6CAF and our Hospitality Director Vilma, excelled. Several of our other members were able to fly under the radar and help with the effort. Here is the story as told by Kathi.

Friday Afternoon and early Saturday morning, antennas erected,

canopies up and radios connected for Field Day 2020

Antenna going up L-R Tim, N6DLC; George, WB6OEB, Mark, KM6AHY;

Chris, KM6S and Ken, KC6WOK

GotaHams Command Center. Three stations were all operated off solar power.

The Digital station in action L-R Ken, KC6WOK; Jim, KE6FVN; Tim, N6DLC; David, KE6OPK & Bruce, KM6WBI

ARRL SW Division Director, Dick Norton, N6AA visits Field Day 2020 speaks with Chris, KM6S

Shaun, K6CT with wife Jennifer & children, Abigail & Adelyn pitch a tent for an overnight stay at FD 2020, good looking bunch.

Our own Vilma, Hospitality Director makes coffee I believe even with the mask we can see that wonderful smile.

The Goats in the wild- Field Day 2020 is in the books, thanks to these folks. A huge salute to them that attended in person and those operating at home.

Several of the Goats were able to conduct Field Day activities from their home like Dave and Jack KM6UNQ and their efforts were added to our eventual overall score, as well as those of us who were there in spirit. Next year's event is already in the planning stages and we hope for even greater representation. Foa an event that was on a go/no go basis and was not even slated to be open, thanks to the current emergency, Congratulations Goats you did good.

LIONEL RETURNS

Lionel Lizard lives in the foothills among the evergreen trees and silver-tasseled scrub bushes.

He sits outside in the sunshine with his friends Buttercup Butterfly and Seemore BlueJay.

He lives in an abandoned telegraph shack where he taps out a daily message in Morse code with his long lizard snout. CQ, CQ, CQ, This is L6ZRD, QSL?

As he continues to tap out his message, he looks at his calendar. It says Field Day, June 27.

Lionel Lizard and Sally Salamander decide to ride to Field Day on the ornamental railroad car. Just then they heard a noise. Wiggle, wiggle, wiggle…wiggle, wiggle, wiggle, wiggle. It was Luna Western Fence Lizard, a neighbor from down the road. Luna was hoping to join them on their Field Day adventure.

Getting out with radio friends contacting people from all over the country, eating good food and tapping out Morse Code in the middle of the night was exciting for the three friends.

When they returned home Lionel Lizard tapped out his message telling the world about the fun time he had at Field Day 2020. CQ, CQ, CQ, This is Lionel L6ZRD, QSL?

Thanks Kathi-

CLOSING:

Man even Lionel made it to field day, well there's always next year. The Video Monthly meeting was a hit and we had pretty good participation. Next month we will have an article on the status of our Nightly Video lounge and our nightly net. If you have any ideas for this newsletter please contact either me or Kathi and we will get to work on those ideas. Well we will see how next mont's activities will shake out, and unfortunately it's in the hands of others at this point, but we will continue as best as we can, so keep an eye on the club website (WWW.GOTAHAMS.COM) for up to date information.

Remember that every storm runs out of rain at some time, and we all have weathered storms that seemed not to have an end, and just like that, the sun broke through again. Sotoo this storm will cease to be only a bad dream and a reminder of how things can get. Stay Frosty, Stay Healthy, and always Stay Radio Active. This is KM6RWB, Vic in Covina - 73 till next month.