ARES District 4 Net Script

__January 04, 2018 Rev 3 (net date)
Script Rev 07-03-2017

Good Evening everyone and welcome to the South Texas District 4 ARES net. This is

TOM *(name)* **K5BV** *(call)*

ARES EC for ARANSAS and SAN PATRICIO COUNTIES
(position e.g. member, AEC, etc. & County)

I will be the Net Control Station for tonight's net. First, if there are any stations with priority or emergency traffic please call

K5BV *(call)* at this time. UN-KEY

Either s*ay "**nothing heard**" or handle the traffic immediately.*

All hams in all Counties are welcome to check in to this net. You do not need to be an ARES member to participate in this net.

The purpose of ARES, the Amateur Radio Emergency Service, is to furnish emergency communications via amateur radio when regular means of communications fail or become inadequate during an emergency situation. ARES is sponsored by the ARRL, and supported by area radio clubs and individual hams. The only qualifications for ARES are that you possess an amateur radio license and you have a desire to help others. For more information or off-net questions please contact one of the following by email

Mark Dist. 4 EC - ad5ca@arrl.net
Tom EC for Aransas & San Patricio County - - - - - k5bv@arrl.net
Bob Asst EC for Aransas County - - - - - - - - - - - - - kf5cfu@arrl.net
Jim EC for Live Oak County - - - - - - - - - - - - - - - - w5im@arrl.net
Harley EC for Kleberg County - - - - - - - - - - - - - - - kg5ayd@arrl.net

The Net is scheduled monthly for the First Thursday at 8 PM. This is subject to change. We are currently using the 146.820 repeater in Corpus Christi with a (-) MINUS offset and a 107.2 Hz tone.

This net is being conducted for the purpose of providing training and information related to emergency communications; to serve as a forum for discussion; and to foster fellowship among Amateur Radio operators.

Next, are there any operators who would like to make announcement or provide information related to EmComm? This is not general check-in. Please State your call now.

Tonight after Check-In the topic will be **THOUGHTS ON BATTERIES FOR EMCOMM**.

To Check-in if the frequency has been clear a second or two key the MIC and s-l-o-w-l-y give your FCC call sign using ITU phonetics spoken clearly and slowly and UNKEY. Stating your name as well will be appreciated. Writing calls down takes a moment so allow a couple of seconds. Keep checking in and calls will be reviewed for clarifications, errors and missed calls. Please check-in with **_K5BV_**(Call) now.

(note these actions)

- *read each call back,*
- *ask for corrections*
- *ask for additional check-ins*

We will ask for questions and comments after tonight Hurricane Harvey information.

(GO TO PAGE 4)

This is K5BV

Before we go down the list for comments if there any late check-ins please provide you call now.

(again note these actions)

- *read each call back,*
- *ask for corrections*

Net Control **_K5BV_** *(your call)* will now go down the list for comments.

- *go down list of check-ins*
- *now have presenter give their comments)*

Final call for check-ins. Additional stations for the net please check-in now with **_K5BV_** *(your call).*

(again note these actions)

- *read each call back,*
- *ask for corrections*
- *ask for comments*

THIS IS NET. We had XX check-ins tonight. Thank you all for joining the ARES net tonight, and thanks to the repeater owners and mountaineers for the use of these fine repeaters. I am now closing the net and returning these repeaters back to normal amateur radio use. Stations may remain on frequency to make additional QSOs.
Net Control **_K5BV_** *(your call)* Out.

	FCC CALL	NAME	Date 01-04-2018
01			*(ENTER NET CONTROL)*
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THOUGHTS ON BATTERIES FOR EMCOMM

Note: Reliable communications require reliable electric power. When the primary source of electric power such as the utility fail backup sources must be available.

* A quality generator should to be the primary source of backup electric power.
* Battery power should only be for the standby or transition from utility to generator power and at times when a generator needs service.

Amateur radio operators work with many types of batteries. Each battery type has specific charging and safe use requirements.

The batteries used in our HTs and notebook computers are typically Lithium-Ion and are not part of tonight's topic beyond suggesting use the manufacturer's accessories and carefully follow the equipment instruction manual regarding care of batteries.

I have had hams telling me that they will be using batteries for the operation of base and portable stations to support Emergency Communications. Sometimes I am told that solar panels will keep the batteries charged.

A few times I have asked questions and came away with the feeling that the only research done was knowing that the radio needed 12 volts and deciding to buy a battery.

An example of what not to do was my being shown a $25 newly purchased 35 Amp-Hour wet cell lead-acid lawn tractor battery sitting on a garage shelf. I was told that this would be all that was needed in an emergency. I thought WHAT, an inexhaustible source of power needing no attention and ready for any emergency to power their 25 watt VHF base station radio. After a few questions I learned that the clerk at the local auto supply was the technical source guiding the purchase.

Tonight's material will hopefully provide enough guidance to know what to expect when relying on a lead-acid battery and avoid relying on the auto store clerk's EmComm guidance.

The lead-acid battery is commonly used in amateur radio emergency communication service as a source of backup power for your base station radio. So what are the different types, why use one type vs. another, and what safety procedures should be followed when using them?

Common Types of Batteries
* Alkaline
* Nickel based: Nickel-cadmium, Nickel-metal-hydride
* Lithium
* Lead-acid

From the four types above lead-acid batteries are readily available and deliver instant energy.
* Alkaline are not rechargeable and are suitable for an HT using a factory adapter.

* Nickle types are rechargeable and available in sizes suitable to operate an HT in a suitable adapter.
* Lithium, in my opinion, have safety risks and should only be used with equipment and chargers bought as a complete package.

A standard lead-acid battery is a wet or flooded lead-acid battery. One disadvantage is acid spilling casing serious injury to persons and corrosion to property. Another hazard is that hydrogen and oxygen are generated and may be ignited by a spark near the battery causing a violent explosion of the battery.

There are lead-acid battery variations that are sealed. These are identified as Gel Cell and Absorbed Glass Mat (AGM). These types are the safest to use because of less hydrogen gas evolution and exposure to sulfuric acid is unlikely.

A standard wet lead-acid batteries is designed to supply a surge of power to start a vehicle and then to be immediately recharged. Using these batteries until nearly discharged and then recharging them damages these lead-acid batteries.

A Deep Cycle lead-acid battery is designed for applications such as powering golf carts, operating marine trolling motors and suppling power in a trailer RVs until it has very low voltage. These are intended to be recharged multiple times without damage to the battery.

For use as backup power for our radios lead-acid Deep Cycle AGM batteries are a good choice with suitable accessories. These type cost significantly more than the standard wet cell but are not as prone to degradation and are safer. Deep cycle AGM batteries that are not discharged more than 60% will last several hundred cycles.

Buy the battery with the greatest reserve capacity or amp hour (AH) rating as possible. A battery rated for 50 AH should deliver 5 amps for 10 hours. However the voltage will drop immediately below 12 volts as the battery is discharged. At best expect 60% of the rating to be available.

The first step in getting a battery ready is to install fuses right at the battery terminals. Then install terminal covers or better put the battery in a plastic case with only the fused leads and insulated connectors coming out of the case.

Using the Graph on Page 8 and as an Example a 75 Amp Hour fully charged battery will have about 12.7 Volts with no load. However when this fully charged battery is connected to a radio needing 25 Amps to transmit the battery terminal voltage will typically be only 11.8 Volts.

And this gets worse. When the battery is 60% discharged and is supplying 25 Amps the terminal voltage may be 11 Volts or less. Some radios will not operate with only 11 Volts.

To boost the low voltage a battery booster such as an MFJ-4416C is needed. This device will boost an input as low as 9 Volts to 13.8 Volts and supply 25 Amps. However the booster is 90% efficient and at 9 Volts the battery will need to supply 35 Amps to the booster for an output of 25 Amps at 13.8 Volts.

A 75 Amp Hour battery discharging from 100% to 40% with a battery booster, using the Page 8 graph, expect 1.5 hours or less of transmit time.

Without the booster and knowing that a typical 12 Volt radio such as a FT-857D needs 11.7 Volts minimum at 25 Amps to transmit. It may not be possible to transmit at all without the booster.

There are a number of compact hand held battery testers available. These no longer pull a massive current from the battery. I bought an $85 model from Amazon that is for both 12 Volt and 24 Volt batteries that displays the State of Charge, Battery Health, Cranking Amps and more. These price range from $40 to $140. The more expensive have a printer.

A properly selected, used, maintained, and charged battery can be a useful source of emergency power if the limitations are understood.

There is additional information of in the Script posted on the WEB that should be reviewed.

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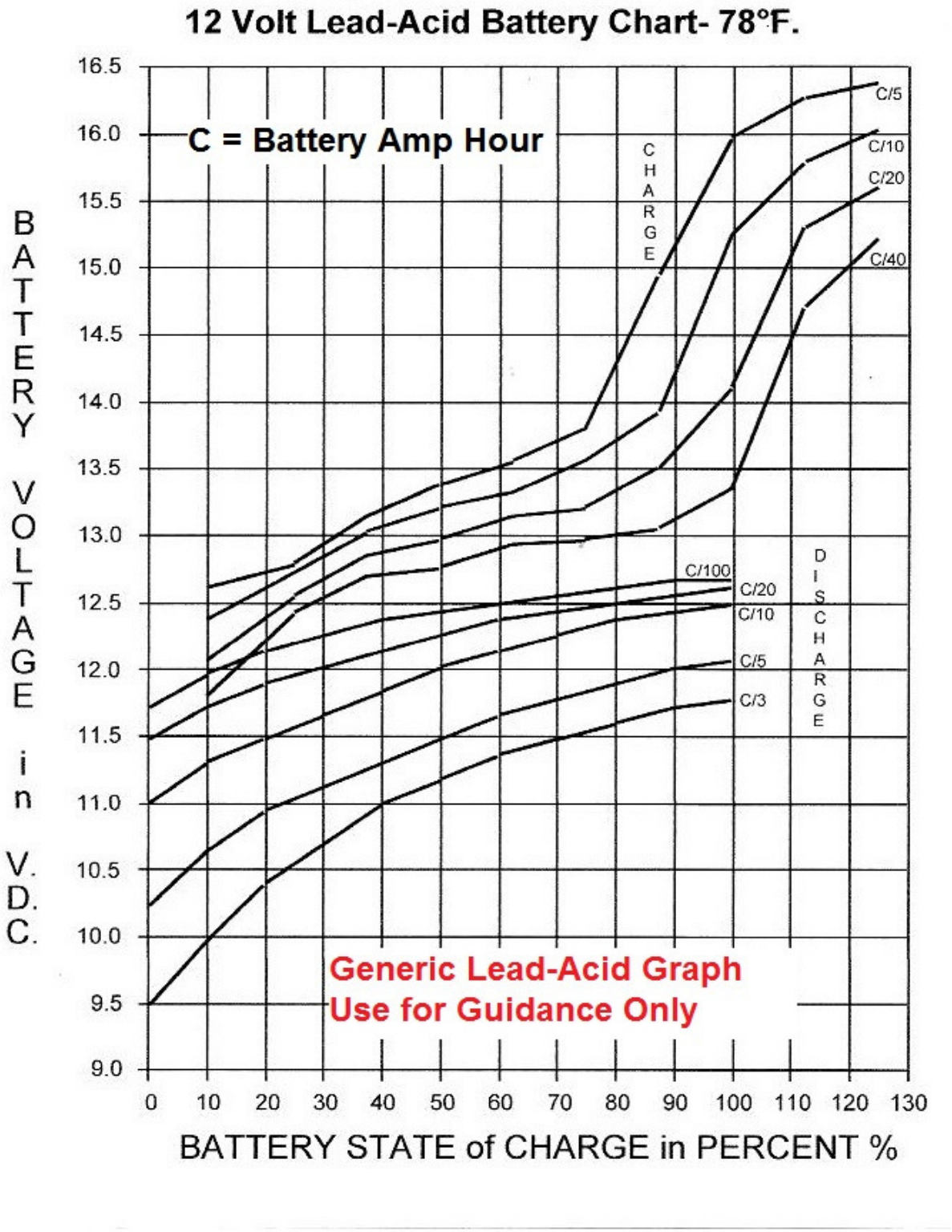
Extending Battery Life
The longer a battery sits without being re-charged, the greater amount of damage. In extreme temperatures (hot or cold) 24 hours can be too long.

Hints:
* Recharge batteries immediately after discharge.
* Keep an energy input on stored lead-acid type batteries.
* Don’t use deep cycle batteries for starting automobile engines.
* Don’t use plain lead-acid batteries for deep discharge applications.
* If you are running your radio off your automobile battery for a long period, remember to start your vehicle and charge the battery periodically so that you do not become stranded when your assignment is finished.
* Undercharging allows sulfation to occur and will damage the battery.
* Avoid temperatures greater than 100F and less than 32F.
* Use the right charger for your battery.
* Be aware of any constant power drains which discharge the battery. Many of the HT’s and GPS devices have a constant power drain even when turned off. I remove the battery from any of my devices which have this problem so the battery remains charged for a longer period.

Safety Tips
* Don’t store batteries in a bag or pocket where they can possibly short and cause a fire.
* Never put batteries in a fire. They can explode.
* Do not over charge lithium batteries, they can catch fire.

Specific Safety Tips for Lead-Acid Batteries
* Remove all jewelry when working around lead-acid batteries. These batteries can deliver up to 800 amps of instant power. Connecting one post to the other can blow the post completely off the battery. This can be equivalent to a 45 caliber bullet.
* Wear safety goggles. If acid enters the eyes, flush eyes with water for 30 minutes and see a doctor.
* Wash acid off skin.
* Keep sparks away from the battery.
* When working on vehicles, disconnect the ground cable first.
* Don’t make live connections to a battery.
* Keep children away.
* Properly ventilate the charging area.
* Store in cool, dry place.
* Lead-acid batteries are heavy so protect your back by using proper lifting techniques.
* Do not use metallic tools long enough to reach between battery terminals.
* Install fuses as close to the battery as possible. It is a good idea to fuse both positive and negative side.
* Protect the top of the battery so equipment can’t fall onto the terminals.
* Consider buying battery post covers and then keep the battery in a heavy duty plastic case designed for the battery with only fused leads protruding.
* It is best to install PowerPole connectors on the protruding fused leads.


12 Volt Lead-Acid Battery Chart- 78°F.
C = Battery Amp Hour
CHARGE
C/5
C/10
C/20
C/40
DISCHARGE
C/100
C/20
C/10
C/5
C/3
Generic Lead-Acid Graph
Use for Guidance Only
BATTERY VOLTAGE in V.D.C.
16.5
16.0
15.5
15.0
14.5
14.0
13.5
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
0 10 20 30 40 50 60 70 80 90 100 110 120 130
BATTERY STATE of CHARGE in PERCENT %