

STATIC



May, 2006

BATTERIES

(PART III)

Presented by Bob Brunskill, KC5GMZ

Garland Radio Amateur Civil Emergency Service

Modern batteries contain calcium metal in the lead to decrease the tendency to produce hydrogen gas during charging by electrolysis of the water in the electrolyte solution. If enough calcium metal is present, the battery gassing is so well controlled that the cells can be "sealed" and their demand for replacement water greatly decreased.

Another common type of rechargeable battery is a NiCad, based on Nickel Cadmium electrochemistry. Because they are a different chemistry, they have a different voltage. Dry cells, lead/acid cells and NiCad cells will all produce a different voltage ranging from about 1.3 volts fully charged to 2.1 volts fully charged. Ni-Cads are often physically the same size as carbon/zinc "dry cells" and are made in double A, and C and other common sizes. But they will have a different voltage, a lower one. Usually this is not a problem for most electronics that are tolerant about the exact input power required. Some devices will insist that you use batteries of a certain type

All batteries or cells within a battery have an internal resistance and a capacity. The internal resistance determines how many amps the battery can reliably provide in service. The capacity is measured in amp/hours. This is simply the number of amps the battery can deliver at a reasonable discharge rate for that battery, and how many hours it is expected to deliver those amps.

Battery Math and Amp/Hours

Most batteries are rated in electrical capacity for a discharge rate of 20 hours. A 20 **amp/hour** battery should provide one amp of current for 20 hours before being fully discharged. It will still show a voltage, it will no longer be functioning correctly and if rechargeable, it will be in serious need of a recharge.

Some smaller batteries like those used on HandiTalkies are rated in **milliamp/hours**. It is the same concept, they just use milliamps instead of amps for these lighter duty batteries. A typical rating might be 1200 ma/Hr which is the same as 1.2 amp/hour. (cont. page 3)

LBARA MEETING SCHEDULE

MONTH	BOARD	REGULAR
MAY	5/16	5/18
SEPT	9/19	9/21
OCTOBER	10/17	10/19
NOVEMBER		
DECEMBER		

COMMON-MODE CHOKES

“One of life’s most economical ways to increase receiving performance”....K1VR

Your ability to hear weak MF and HF signals is limited by noise, generated mostly by solid-state electronic switches within your own house, conducted by common-mode current on the feedline. Putting common-mode chokes on your feedline, power, and other cables will substantially reduce your received noise level.

Do you wish to reduce your noise levels? Give this article a read. You’ll be surprised just how easy and inexpensive it is to lower your noise. Take a look at: www.yccc.org/Articles/articles.htm and open the article “Common-Mode Chokes”

Given the number of members who recently purchase ferrite material through Dick, W7ZR, this should be of great interest in solving common-mode problems.

Tnx Dick, W7ZR

Monday Night Net (7 PM)

System	Location	Freq	Offset	PL
MCARS	Bullhead City	145.27	-	131.8
	Kingman	146.76	-	131.8
	Kingman	448.25	-	131.8
	Lake Havasu	146.62	-	131.8
	Willow Beach	147.12	-	131.8
CRRRA	Lake Havasu City	146.96	-	162.2
	Lake Havasu City	224.24	-	156.7
	Lake Havasu City	146.64	-	156.7
	Lake Havasu City	449.95	-	141.3
BARN	Lake Havasu City	447.54	-	136.5
	Las Vegas, NV	449.95		136.5
	Onyx(Palm Springs)	449.34	-	136.5
	Orange County, CA	447.54	-	100



(Batteries, Part II, continued from page 1)

It is worth noting that a car battery has enough electric power in it to electrocute you many times over. The reason it does not is skin resistance. It takes about 48 volts to puncture the dry skin resistance of the human body and get current flowing in the conductive juices inside. Even damp skin will not breakdown easily at low voltages. This is why you can handle jumper cables hooked to a battery and usually not electrocute yourself, the voltage is too low to get the current inside the body where it can do damage. Still you should be careful about getting across any heavy duty electrical power circuit regardless of voltage.

It is quite reasonable to discharge a battery at its amp/hour rating divided by six, or four, or maybe even three. So a 45 amp/hour battery could be used to power something that demanded 10 or 12 amps. *But do not expect it to last four hours.* These higher demand currents will cause extra losses in the internal resistance of the battery to go up, and the total capacity before the battery is fully discharged will be less at these higher rates. More power is lost heating up the battery for instance.

So, if you divide a battery's amp/hour rating by the current load you are going to put on it, you can estimate how long it will last. If you divide a battery's amp/hour rating by 20, you will find out how much current it can deliver and still live up to its capacity rating. If you divide a battery's amp/hour rating by four, you can estimate the maximum current you should expect such a battery to deliver and still have a reasonable life expectancy before it is fully discharged.

Gel Cell, and Absorbed Glass Mat (AGM) batteries are handy for portable operation. A typical one would be rated at 12 amp/hours. That means it can handle half an amp easily and work for 24 hours. It should not be asked to deliver more than 3 amps maximum. Let's assume that your radio that demands 2.0 amps on key down transmit and about .5 amps on receive. A 12 amp/hour **Gel Cell, or Absorbed Glass Mat (AGM)** battery can easily keep you going for 30 hours of a given event, assuming that most of the time was receive and not key down. The battery will still be healthy, but definitely ready for a recharge afterwards.

That same battery when asked to power a rig that demands six amps, will struggle, the voltage will drop dramatically and the power output from the rig will be unacceptable. For a discharge rate of six amps, something more like a 32 amp/hour battery is appropriate. Remember, that battery will weigh about 32 pounds.

Things to Know About a Battery

The three most important things to know about a battery, regardless of whether it is for an HT, a large HF portable station or just an AA size NiCad, are its **amp/hour rating**, its **chemistry** and its **voltage**. The chemistry determines the voltage of a cell and the number of cells determines the voltage of the battery. A standard car battery is six lead/acid cells in series. A standard "battery" for a flashlight is actually a single carbon/zinc cell. A typical automatic camera battery is two specially modified carbon/zinc cells in series to produce about three volts, etc.

Recharging a battery that can be recharged is easy to understand. You need to apply an appropriate voltage and current for an appropriate time. If a battery has a 12 amp/hour rating, you should expect to charge it at 1 amp for 12 hours, amazing how that works out!

The approximately correct charging rate for a battery is the amp/hour rating divided by 10. If you charge faster you will heat up the battery. Fast charging is OK as long as it is not overdone, like at the amp/hour rating divided by ONE. The amp/hour rating divided by four is OK if the battery is monitored or if a special charging circuit that limits the current and maximum voltage is used.

The correct charging voltage is determined by the chemistry of the cells and the number of cells in the battery. A typical car battery has six lead/acid cells. Such a cell puts out about 2.1 volts when fully charged. *SURPRISE!* six of them in series causes it to be called a 12.6 volt battery! However, when really fully charged and just off the charger, such a battery can be closer to 13.8 volts. Most car battery eliminators such as the Astron regulated power supplies will crank out a fixed 13.8 volts. This is why you keep seeing this pop up like some "Magic Number". 13.8 volts has become a standard input for Ham Radio rigs for this simple reason. **(Part IV continued in the next issue)**

PRESIDENT'S CORNER

Hello Radio – Hello Havasu

I know many of you are ARRL members and probably read QST every month. If so, then you are most likely familiar with the current ARRL campaign celebrating 100 years of Voice Over Radio. Another purpose of the campaign is to make people aware of Amateur Radio. The campaign is called “Hello Radio” and if you would like to learn more about it, go to the URL <http://www.hello-radio.org/>.

Be sure to mention the web site to friends that may be interested in Amateur Radio. Visiting the web site they will learn about Amateur Radio from its beginnings to the present day, what Amateur Radio is, how we communicate and how they can become “Hams” themselves. You may even want to take a look at the web site yourself. It is rather interesting. When that friend wants more information, be sure to invite them to a LBARA monthly club meeting.

Here in Havasu I’d like to take the Hello Radio campaign one step farther. If you have friends that are Amateur Radio operators but not members of LBARA, please invite them to attend one of our club meetings or better yet, offer to pick them up and bring them to our next meeting.

Hopefully I’ll see you (along with your friends) at the next meeting.

73 de N6BRH

LBARA SPRING PICNIC



THIS IS SPRING?.....BURRRRRRRRR!

UPCOMING ACTIVITIES AND HAMFESTS

WHITE MOUNTAIN HAMFEST - Kachina Amateur Radio Club, Show Low Intermediate School, Old Linden Rd, Show Low, AZ, June 3. See: www.whitemountainhamfest.com.

ARIZONA STATE CONVENTION - ARCA, Williams Rodeo Grounds, 800 E. Rodeo Road, July 7-9, 2006. See: www.arca-az.org/ARCA

HUALAPAI ARC FALLFEST - Mohave Community College, 1971 Jagerson Ave, Kingman, AZ. September 9, 2006.

SOUTHWEST DIVISION CONVENTION - hosted by the San Diego County Amateur Radio Council, Marriot Mission Valley Hotel, Camino Del Rio North, San Diego, CA. September 22 – 24, 2006

VE TEST SESSION

Ed Gillespie, AB7EM, reports that a test session was held on 4/14/2006 with two candidates from Bullhead City and one from Lake Havasu. Two made Technician Class and the other passed his 5 wpm code test. The CSCE's are only good for 365 days, so the Technician Class should have their new licenses within a couple of weeks. John Rouse passed his 5 wpm, but must pass his element 3 for General within the next year. The candidates were:

James Knie (Lake Havasu City) - Technician (note: expect to see him join LBARA soon)

John Rouse (Bullhead City) - 5 WPM code

Thomas Tatroe (Bullhead City) - Technican

The test team was comprised of John Hunter, KK7CX; Richard Peterson, KR9P; Don Sgro, KF0YP; Rollie Ayers, KF7R; and Ed Gillispie, AB7EM.

QUESTIONS TO PONDER

- Why do you press harder on the buttons of a remote control when you know the batteries are dead?
- Why don't you ever see the headline *Psychic Wins Lottery*?
- Why doesn't Tarzan have a beard?

FOR SALE/TRADE

ALINCO DX77 MOBILE TRANSCEIVER - 100 w, 166-6m, CW filter, Removable Face Plate, Jim Varner, AE6N, 680.7259

YAESU VX-6R - 144/220/440 handheld, new in the box, \$235, Jim Gould, KF7X, 680.7705



CQ DXCQ CONTEST

By Dick W7ZR

CQ CONTEST

Here is a list of the most popular contests coming up for May:

Contest	Start Time	Date
CQ WW WPX CW	0000Z	MAY 27*

* More Details below

The contest season is drawing to a close. Still some good tests through the summer but conditions do not favor this period for any of the big contests.

CQWW WPX CW

This is the last of the majors for the season. It most often falls on Memorial Day weekend so that hurts some participation. This year we will be fighting the poor sunspot numbers also. It still could be fun the try and pick off some new CW countries. Rules at www.cqwp.com.

CONTEST SOFTWARE

No one device has affected amateur radio more than the personal computer. Some will argue that as a result of the PC potential young hams are more now attracted to the PC for a hobby or entertainment. On the other hand as a result of the PC and the internet many aspects of the hobby have been made more available than ever before.

Of course, I am partial to contesting so I will for the moment concentrate on that marriage of the PC and contesting.

The first area is the use of logging software used in contesting. 25 years ago and before when I was doing contesting and Dxpeditions we had to paper log all contacts. I can remember having sore fingers from using a pen or pencil to log 2,000 contacts in a weekend. And, that was not the end of it. When the contest was over we had to manually prepare a dupe sheet where we logged all of the contacts again to be sure we did not have duplicate entries and to be sure we did not miss any multipliers.

Today that is all different with the many available computer logging programs. There are many but I want to concentrate on introducing some of the most popular programs used primarily for contesting.

CT- (www.k1ea.com) One of the very first programs. Originally written for DOS and since ported to Windows. It is still available as a DOS based program for smaller, older computers. This program basically started it all and has had many of its features copied and improved on in other programs.

TRlog- (www.trlog.com) A DOS based program still a favorite among many cw contesters for some of its special features. They offer a free download that supports a few contests including field day. If you would prefer a DOS based program here is a chance to try one for free.

Writelog- (www.writelog.com) This program has been around for a number of years and keeps improving and adding new users. I use this one having migrated from Trlog and CT. This program has many capabilities. It supports just about every contest possible. There is a fee and an annual support fee. This program as well as most of the others also have great support through web reflectors.

N1MM- (www.n1mm.com) A relatively new comer to the contest software scene. It is free. One of its best attributes. I tried it but I guess I was too stuck in my ways. Many are using this and praise it and the price is right!

NA- (www.datom.contesting.com) A popular program with many of the features of the best programs. It does have a fee and an annual support fee. This started out to be a favorite among RTTY contesters but it is far more than just for them.

So there are some suggestions to check out. My first suggestion is try one of the free ones and see how you like it. One thing you will find out very quickly is that it really makes contesting a lot easier and more fun.

CQ DX.....CQ CONTEST (CONT.)

CQ DX

DX activity during the last month has been quite low. The solar flux dipped to the 60s. On April 5 we got to 99 but the A index was 24. To me it sounded as if someone had pulled my coax connectors. There is hope for late April and May though.

Watch for EL2PM from Liberia on 20M around 0900Z. Now that is a generally bad time for us since it is 2 AM local time but 20M has been known to have an opening over the North during the middle of the night. So if you need this one here is a chance.

A big operation will be on from Western Sahara starting April 11 through April 16. Call is SO1R. All bands all modes.

QUESTIONS TO PONDER

- * Why do people who know the least know it the loudest?
- * Why do kamikaze pilots wear helmets?
- * Why aren't there bullet-proof pants?
- * Sooner or later, doesn't everyone stop smoking?
- * How can the weather be "hot as hell" one day and "cold as hell" another?
- * If women ran the Pentagon, would missiles and submarines be shaped differently?
- * Do Lipton employees take coffee breaks?
- * Can atheists get insurance for acts of God?
- * If you ate pasta and antipasta at the same time, would you still be hungry?

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www.lbara.net

FROM THE EDITOR

If you have anything you would like to see included in these issues, please let me know. I'm always looking for articles, news items, construction articles, or anything that might be of interest to our readers. You can contact me at 928.855.7941 or email at grf@uneedspeed.net or francej@ajsinsurance.com.

L.B.A.R.A

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STATIC

ATTENTION READERS

Please note that this issue represents a “work-in-progress” and there are a number of changes to be made in subsequent issues. I would greatly appreciate your comments, both good and bad, as well as any suggestions for future issues. This issue also begins our first attempt to deliver the **STATIC** to your doorstep electronically. Please keep me abreast of any email address changes you may have and I promise to have this delivered promptly and accurately. Also, I still have a number of articles awaiting publication and will do so in the future. This is your newsletter, so keep the articles, letters, and pictures coming. I can be reached at home (855.7941), at work (855.3081) or via email at grf@uneedspeed.net .

EQUIPMENT FOR SALE

EDITOR'S NOTE: List your items for sale here. Ham radio related only, please. Include a picture if you like (please use a jpg format). Email all to me at grf@uneedspeed.net along with your name and phone number.

