



EAA Chapter 100

December 2013 Newsletter

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EAA Chapter 100 is a nonprofit association involved in the promotion of aviation through adult and youth education, hands-on training, building and maintenance of experimental aircraft, and through community awareness programs.

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Reader submissions and comments are strongly encouraged.

December Hangar Flying Event

This month's hangar flying event will be hosted this Friday by Dave Griggs and will be held at his house. Come out and check out his Zenith 750 STOL project.

When: Friday, December 13th at 7:30 PM

Where: 635 Toogood Ct. SW, Rochester



Dick's 50th

Thanks to all who attended the November event and helped Dick celebrate 50 years of flying.



2014 Meeting Locations Needed

2014 is right around the corner and with it so is the need for volunteers to sign up to host the monthly hangar flying events. We'll pass a sign-up sheet around at the December event so check out your calendars ahead of time. Pick a month to show us your project – no matter what state it's in.

Keeping Batteries Going

There will be owners who say they have aircraft batteries that are five or more years



old and it still cranks just fine. Chances are they live in a warm climate, don't ever worry about having an alternator failure and have some good luck. Some use proper aviation battery chargers, but probably not. Hopefully, these owners don't fly IFR.

Our staff IA just replaced his Concord AGM in his twin and it was over five years old. While it never failed, and he knew he was pushing it, he rarely flies IFR any more. To me that is the real decision maker—do you fly IFR? If you fly with an old battery, IFR flying could be risky business. If you have solid partial-panel instrument skills, plus portable nav and comm equipment (and are proficient with them under stress, with a minimal panel backup of just vacuum instruments or less), that could make a difference on how neglectful you can be of battery age.

If you remember one thing from this article it's that battery voltage is a meaningless indicator of how long a battery will last when it is the only source of power on the airplane. That's because two-thirds of the plates in the battery could be sulfated over and the battery voltage would look normal after a charge—probably close to 13 volts. The only warning may come if you let the plane sit two to three weeks. It may not start the engine unless it fires one or two turns of the prop, in warm weather.

I was in the "don't replace what still works camp" on batteries 30 years ago, and was at the five-year point when my alternator quit and my five-year-old battery failed five minutes later, while in solid IFR conditions. It had never failed to start the engine (but I had never asked much of it beyond cranking two or three blades). I lived in southern California and flew IFR nearly every flight, often at night. Then it finally happened, and as luck would have it, I was in solid IFR conditions at night over Los Angeles. I immediately started shutting down nonessential equipment, leaving one navcomm for

communications and for flying the approach, plus the transponder. (No handheld GPS then, but the handheld radio did have a VOR and I had three small flashlights).

Getting the high current load off a battery when the alternator lets go is extremely important for keeping electric panel instruments alive as long as possible, even for a good battery.

Since I'm writing this I obviously made it, but the battery (and the panel electronics it was feeding) went out so fast because the battery was way past its "reliability" date. While I made a partial panel approach with the handheld VOR, the event scared the pants off me. I thought batteries were supposed to last 30 minutes—at a minimum. They often do if you maintain them properly and monitor them with capacity checks, at least after they are a year old.

Part 135 operators have a required schedule of capacity checks to comply with. Today, battery failure is arguably safer and you might get away with pushing your luck if you have a modern portable GPS with a flight instrument display, a handheld transceiver (preferably with an external antenna switch) and you know how to use this portable equipment without the aid of the autopilot, if it draws any power. Hopefully it won't happen at night like it did to me. I had three pilot/passengers to help with the flashlights. There were four sets of knocking knees on that Wednesday night sojourn.

Real World

Both of our last two [*Light Plane Maintenance magazine*](#) battery tests, as well as on-line surveys conducted by [*Aviation Consumer magazine*](#) of over 500 owners, show that aircraft batteries commonly last two to three years for reliable operation. The reasons for this short life are straightforward, but there are things an owner can do to optimize and lengthen useful battery life.

The first problem with aviation batteries is the marginal size and capacity for the job in order to keep battery weight down. Aviation batteries are much smaller with less capacity than an auto battery, yet it is often starting an engine with twice the displacement, with more oil that's two to three times as thick to churn through.



As a result, an aircraft battery has to discharge substantially more of its capacity to start an aviation engine than the typical automobile engine. It's a given fact that the more deeply you discharge a lead acid starting battery beyond a very minimal starting burst, the shorter its life, all other things being equal.

Next, being a chemical beast, a lead acid battery slowly self-destructs from non-use as it spontaneously self-discharges with the simple passage of time. Frequently it is not fully charged from the typical short flights of today's aircraft users, so it sits between flights in an already partially discharged state. The more time a battery spends partially discharged the faster it becomes permanently damaged and loses capacity.

It commonly takes two hours to recharge a battery during flight with a properly adjusted charging system. Charging system voltage that is either too high or too low will slowly and permanently damage a battery and shorten its useful life.

The third factor is improper care of the battery by the owner. The worst thing is to not use a battery charger when the plane is not flown at least once every few weeks. But the next worse thing is to not use the proper battery charger. That's right, using the wrong charger in some cases can be more harmful than not using a charger at all. How can this be?

First, high charge currents are bad—even the common 10-amp auto charger is too much current for a healthy charge cycle of an aviation battery. Also, any prolonged time (more than overnight) that a battery charging voltage stays above 13.2 (or 26.2) volts (in a trickle charge mode) the battery will slowly dry out. Use a

charger designed for aircraft batteries and with a trickle charger under 13.2 (or 26.4) volts, and max of 14.6 (29.2) volts.

So, mandatory or not, you should periodically test the battery per the maker's guidelines, also known as a capacity check.

A version of this article appeared in the December 2013 issue of [Light Plane Maintenance magazine](#).

Good Links

Delmar Benjamin and the Gee Bee 2. Check out the landing starting at 9:30 in the video. They would've had to force my heart back into my chest...

<http://www.youtube.com/watch?v=puZDmj2QuX8>

Everybody loves the Cub.

<http://www.sleepingdogtv.com/reel/Classic-Cub.aspx>

I received this link in an email with just one word: **Enjoy**. And **enjoy** I did.

<http://www.youtube.com/watch?v=RnMZQATbenM>

**If you have problems with the links, just copy/paste the address into your web browser.

From the November 2013 issue of EAA Experimenter "Wandering Oshkosh"



This owner uses a plastic cap to protect the point of his flying wire stabilizer, with a flag to remind him to remove it before flight.

Not so much to protect my flying wire stabilizer as to protect your eyes...