

#### From the President...

the open house and air show.



Editor's note.... There are a couple potential club events that are in a state of flux as of the date this newsletter was published. Revisit this newsletter in about a week for an updated and more complete President's Message once everything is settled.

In the mean time....

Skymasters has just been offered the opportunity to participate in the RC activities at the <u>2017</u> <u>Pontiac Airport Open House</u>. At press time, it looks like we will be teaming up with the good folks at PMAC for a knockout static display and combined club outreach event. We will also be flying giant scale (by invitation only) in a 15 minute demo slot that afternoon. Look for Emails from the club with all details. In the mean time, make sure to <u>visit the open house web site to see all the cool events planned for the full scale part of</u>

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#### The 2017 Corn Roast and Top Gun currently conflicts with the Pontiac Airport Open House date, so we are in discussion whether to move it or to cancel it for this year. Again, look for more information shortly via club Email and on the Skymasters web site.



Parking \$5/vehicle



Bob Chapdelaine President Skymasters RC



#### Mowing the Flying Field 2017

As we all know mowing of our field is essential to keeping it beautiful and practical for flying. We want to be sure that all members are aware of the mowing schedule, and possible variations thereof.

We are planning on mowing the runway and pit area **every Monday at approximately 1-3 p.m.** It typically takes 1.5 to 2.0 hours to mow these areas. Also, during the wetter part of the flying season when the grass grows quickly, or when we have an official event the coming weekend, we will also be mowing the runway again on **Thursday night or Friday after-noon**.

Weather can have a factor on mowing days and times. If we have inclement weather on a regularly scheduled mowing day, the runway will be mowed at the next opportunity. These changes in schedule may not always be communicated to the club, therefore, plan your trips to the flying field accordingly if you think the regular mowing schedule may have altered due to weather.

#### Front Cover

The 2017 Skymasters Open house.... was a roaring success! Lots of planes, lots of visitors and at noon the Customs and Border Protection folks flew in with a full scale AS-350 turbine helicopter!

Bill Pesch photo



# LiPo Batteries For Beginners

Ordinarily this column is about model building. But this month I'm going to write about a subject that is perhaps more important to our new members who are just starting out in the hobby.

#### <u>The Care And Feeding Of LiPo</u> <u>Batteries For New Users.</u>

New to R/C flying? If you answered yes, the odds are that you are flying a trainer with an instructor and the trainer is probably electric powered. If it is electric, I'm 99.99% certain your trainer is powered by a LiPo (LIthium POlymer) battery. So, there are a few things that you <u>really</u> need to know and do to be successful and safe using your LiPo battery.

First, a LiPo battery is not just a big alkaline battery. The key thing here is the word LITHIUM. LiPo batteries have lithium in them and lithium is a <u>very highly reactive</u> metallic element. It reacts explosively when in the presence of water (even the humidity in the air can cause combustion if a cell is damaged). Lithium based batteries are used in many consumer products from flashlights to smart phones. All of those products have had well publicized instances of lithium battery fires Are you getting the idea that this <u>can</u> be some pretty dangerous stuff? It is...but like other dangerous materials if we are careful and we pay attention to what we are doing we can use our lithium polymer batteries safely.

Lets start out by talking a bit about our LiPo battery pack construction. To keep things simple we'll restrict this to the typical battery pack we would use in a trainer. The pack likely has 3 or 4 individual LiPo cells electrically connected in series. Each individual cell has its lithium along with some other metals and a flammable electrolyte sealed in an plastic pouch. The 3 or 4 cells in our example are stacked and held together by a shrink wrap. There are 2 sets of wires that exit the end of a multi-cell pack. The two relatively heavy wires are the positive and negative output power leads that run the flight motor and radio. Another set of smaller wires has a common negative connection plus an individual wire to



the positive tab on each cell. These wires go to a connector called the balance connector which plays a critical role during charging. More on this later.

So what things do we do with our LiPo battery pack? We <u>charge</u> them,

we <u>discharge</u> them (usually by flying), we <u>transport</u> them from our home to where we fly, and we <u>store</u> them when we are not doing the other things. Each of those things has some potential hazards when we do them so we must pay attention to what we are doing to keep everything safe.

#### Charging.

Buy a good charger. Your local hobby shop can help you with the selection. **Don't skimp on this.** A cheap charger can lead to expensive problems. All good LiPo chargers use a built-in computer to manage the charging process. My advice is to get the most feature rich charger you can afford and learn to use the features and understand the data it displays.

1. Read the instructions that come with the charger. I know, I know, real men don't need no stinkin' instructions...make an exception here.

2. Many chargers can charge several different kinds of batteries. When you are charging a LiPo battery <u>BE</u> <u>DOUBLE DAMN SURE YOU ARE USING THE LIPO</u> <u>PROGRAM.</u> Using the wrong program can permanently damage the battery and can also cause a fire!!

3. ALWAYS, ALWAYS, ALWAYS connect your balance connector to the charger. The chargers computer monitors the charging of each individual cell through this connector and makes sure that no cell gets over charged ( a leading cause of LiPo fires so this is very important)

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4. When setting the charge current the best practice is to set it to 1C. That means that if the battery capacity is 2.2 amp hours (2200 mAh) for example, set your charger to 2.2 amps.

5. The best practice is to never leave a charging battery unattended inside your house or car or sitting on top of your car engine at the field. If something goes wrong, your house or car can go up in smoke. If you can't be there while the battery is charging, do your charging outside away from anything you care about.

6. Never attempt to charge a damaged battery. *Never, never ever!* 

7. If the battery gets hot or even warm while charging, disconnect it from the charger and find out why.

8. It is good practice to charge your LiPo in a fire resistant container like an ammo box. Fire resistant bags are available and are probably ok for smaller capacity packs say under 2000 mAh. In my opinion the bags are not suitable for high capacity packs. (Editor's note... See photo on last page)

9. As always, if you are uncertain about anything ask questions.

10. NEVER charge your LiPo battery while it is in your plane.

#### Discharging

There are 2 ways that we typically discharge our LiPo batteries.

By flying of course. Again, we need to be careful here. If we fly too long the battery can be discharged to a voltage that is too low and the cells can be damaged permanently. So how low is too low? Not an easy answer here. Generally a battery discharged below 3.0 volts per cell has been damaged and at the very least the life of the battery is greatly reduced. At 3.0 volts you will have used all of the rated capacity (2200mah in our example). Best practice says we should not use more than about 80% of the rated capacity. Ok, so how do you know that you have used 80%? You can purchase a battery analyzer that you can plug into your balance connector. It will report the voltage of each cell and also estimate the % capacity used. They are not perfect but provide a good estimate. So, fly your plane for a few minutes and upon landing plug in the analyzer and see how much capacity you have used then adjust your flight time accordingly and set the timer on your transmitter to alert you when you are approaching that time. You can cross check this with your charger since it will tell you how many mAh it puts back in the battery (mAh in / rated mAh capacity X 100 = % capacity used).

You can also use your charger. Most chargers have a programmed discharge function. This is a fairly slow process and can do a couple of valuable things for you. First you can discharge a fully charged battery and determine the actual capacity and compare it to what is printed on the battery label. This will give you a rough estimate of the quality and/or condition of the battery. Second you can discharge the battery to a safe storage voltage. More on this later

#### **Transporting**

We need a safe way to transport our batteries from our house to the flying field. Recognize that a LiPo battery can catch fire without being connected to a charger or an airplane. You don't need to deal with an open fire in your car as you are driving. So, you need a fire resistant container to put the batteries in during transportation. Most guys use a <u>metal</u> ammo can for this purpose. Keep in mind that ammo cans are <u>sealed</u> heavy metal boxes. If a battery goes off in one the resulting pressure can cause the can to explode violently. To prevent this you can remove the lid seal or drill around six 1/4" holes in the lid to vent the pressure if something happens.



Ammo can for LiPo storage & transport Note the vent holes in the lid

Also, it is not a good idea to fill the box with a bunch of loose batteries. If one should catch fire it will likely cause a chain reaction where all of the batteries will go off. My ammo can is vented and has individual bins made of drywall material to keep the batteries separated.

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Drywall dividers in ammo can

I bought my ammo cans on Ebay for about \$15 each.

Any time I feel the need to charge a LiPo pack at home I have a steel tool chest on wheels that I roll outside of the garage. Under the lid is a space where I keep my 12 volt power supply and a spare charger. I keep batteries in storage mode in the drawers along with charger adapters, another Harbor Freight meter, a Watt meter, a battery analyzer and my bulb type discharger.



Portable charging station

#### <u>Storage</u>

Any time you are not flying, charging or transporting your batteries they are being stored (of course). Just like when transporting your batteries, they should be stored in a fire resistant container. The vented ammo box works well for this purpose. Some guys store their

batteries in the open cells in cement blocks with a patio stone cover. This is pretty straight foreword. But what about the state of charge while the battery is being stored? It turns out that LiPo batteries do not like to be stored while fully charged. They can be badly damaged if stored that way. The proper state of charge for storage is 3.8 volts per cell. Most modern chargers have a discharge function that allows you to discharge to that voltage. If you forget and store a fully charged pack for any extended period of time it is likely that the pack will be damaged. You will know that they are damaged as they will puff up. A puffed battery will feel squishy with built up gas pressure inside of the cell pouches. This is bad. A puffed battery is definitely damaged and will likely have reduced performance. It is also more likely to catch fire while charging, discharging or in storage. Many guys continue to use puffed batteries and get away with it. In my book it's not worth it. Get rid of puffed or physically damaged packs and buy a new one.



Good pack (left) vs. puffed pack (right)

If you crash your plane and see ANY physical damage DO NOT even think about using it again. So what do you do with a bad LiPo battery? Do not just throw it in the trash. It can catch fire in your trash bin, the garbage truck or land fill. The first thing you need to do is discharge it to 0 volts. Unfortunately modern LiPo chargers typically only allow you to discharge down to 3 volts per cell. There is still a lot of energy left in the pack at that point. To discharge further some guys use automotive light bulbs to continue the discharge down to 0 volts. As a newcomer you probably don't have the equip-

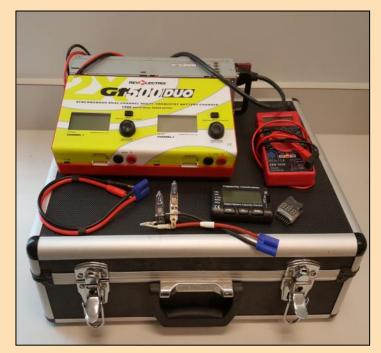
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ment to make a light bulb discharger so your next best thing is to take the pack to a battery store and give it to them to recycle. Just be sure to tell them that there is still some charge left in the pack.

#### Charging equipment

Here is a photo of the basic equipment needed to take care of your LiPo packs.



Top to bottom, left to right:

**12 volt power supply** to operate your charger at home. One like mine is available from Skymaster Gary Wells.

**Charger**...this one is a dual charger to be able to charge 2 large packs simultaneously. Your hobby shop can help you select one.

**Digital multimeter**. This one I got for free from Harbor Freight when I bought something else.

**Charging connector**. An "octopus" connector is very useful as it has many connector types and sizes all connected together. The hobby shop will have several different combinations to choose from. **Bulb type discharger**. This one is a shop made with (2) 55 watt automotive headlight bulbs connected in series. Contact Skymaster Bill Pesch for info on how to build a much fancier setup.

**Battery analyzer**. This type displays individual cell voltages as well as % capacity remaining. Your hobby shop has these.

**Small battery analyzer**. Only gives cell voltages. Tiny, fits in shirt pocket with room to spare. Your hobby shop has these.

**Carrying case**. I got mine from Harbor Freight for \$20 using a 25% off coupon.

#### **Conclusion**

LiPo batteries can be used safely if you understand and follow the few simple precautions in this article. A LiPo battery fire is a pretty rare occurrence. Just keep the possibility in mind and take steps to prevent it or minimize the damage should a pack catch fire. While I've tried to hit the key do's and don'ts there is much more that you should know as you advance up the electric RC plane learning curve. My best advice is to spend some time reading. Here is a link to an excellent, site with links to many articles on LiPo batteries as used in RC models.

https://www.rcgroups.com/forums/showpost.php? p=3066606&postcount=8

I would also suggest that you Google "RC LiPo fires" to get an idea of what can happen if you are careless with your LiPo battery packs.

That's it for this month. Next month I will be going through the build of a Sig Banshee profile control line model. This year has seen a growing interest in control line flying. These profile models are very easy to build and are relatively inexpensive to build and fly. Like my Accentor build, the Banshee will feature a radio controlled throttle. A feature I've grown to really like in my control line models.

Steve



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#### 2017 Skymasters Open House

Click anywhere in the collage to view the entire photo album on the Skymasters web



### Five Minutes on Safety Random Thoughts

#### Range check

• It is a good idea (that many of us ignore) to do a range check before each new flying session. A known good radio system can fail, and you never know when that might happen.

#### Prop safety

- ALWAYS treat the propeller on an electric aircraft like a loaded gun whenever the battery is connected.
- ALWAYS treat the propeller on a fuel powered aircraft with extreme respect when the engine is running. Take extra time to think it through when making any needle value or engine adjustments with the engine running.
- ALWAYS make sure that any cords or cable (like remote glow starters and starter power cords) are well clear before starting the engine.

#### Throttle Hold switch

- ALWAYS program, understand and USE a throttle hold switch on your transmitter if the transmitter includes that function. A THROTTLE HOLD switch is different than a THROT-TLE KILL switch and is useful on both fuel powered and electric aircraft.
- The THROTTLE HOLD switch locks the throttle channel to idle (fuel powered) or zero throttle (electric) and prevents the throttle from advancing unless the switch is placed in the "nonhold" position.

#### **Battery disconnect**

• Electric aircraft are MUCH safer if they are equipped with a master battery disconnect switch, accessible from the outside of the aircraft with all hatches closed / in place. The disconnect usually takes the form of a shorting plug that can be seen and when NOT inserted, you know for sure that the motor is disabled. This is even more important if the battery plug is not easily accessible in an emergency.

#### Taxi safely

• It is good practice when taxiing not to aim directly at an opening between flight stations. When taxiing back to the pits, I angle towards a flight station until I get close and then I taxi parallel to the flightline until I reach the opening where I am standing. While still aiming east or west (ie., NOT towards the pits) I shut the motor down and then carry or tail walk the aircraft back to the pits.

## Help Wanted

Skymasters RC Club is looking for people to fill several positions. Some long term some short term. Please see where your talents and gifts can help your club. Open positions available are:



#### Website Calendar Editor: We are looking

for someone to help keep our on-line calendar updated. We also need someone that can work with the webmaster in updating the look of the website. (CSS & HTML)

<u>Staff Photographer/Videographer</u>: work with Webmaster, Newsletter Editor and Club President to photograph/video club Events, Meetings and submit for publication and upload to the club website and archives.

<u>Staff Writer</u>: need individuals who attend the many various Skymasters events, and document the event by writing an article for the club Newsletter the Skywriter. Writers don't need to attend everything and are welcome to contribute by writing some general interest articles also.

<u>**PR/Promotions</u>**: looking for Skymasters to help on promoting our upcoming summer events in various ways, such as distributing flyers and brochures in the local and surrounding communities or writing press releases if you have the time we have the information.</u>

<u>Grill Chef/Food Service</u>: we are always looking for help to perform one of the most important tasks of our club... keeping us well fed. We are always looking to fill these key positions for some of our big events. Shift work available and you can eat for free. Your help is appreciated.

<u>Sanitation Engineer</u>: keeping our flying field looking nice involves everyone's hard work, constantly picking up around the field. We need every member to take it upon themselves to help keep the field and grounds clean and in order. Don't walk past trash or garbage on the ground. Don't assume we have a cleaning crew, because it is YOU. Our flying field is so nice because we have so many great members who care... LIKE YOU!

#### Watch for more Job Postings in the Skywriter.



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# 2017 Skymasters Annual Corm Roast & Top Gun STATUS IS TENT WITH PORT OF TRANSPORT Web

PON two visit the details appreciation & recognition recognition Top Gun eek or two up to dote of Top Gun **Top Gun Contest** 

Check back in a week or more in the detailed open flying all day except during Top Gun. Skymasters Top Gun Trophy?

> 2016 Top Gun Pilots **Champion**—Steve Schott



# **GOT FLOATS,** N W R F F 09.09-10.17



MIDWEST REGIONAL FLOAT FLY DARRELL WATTS MEMORIAL

KENT LANE, BRICHTON, MICHIGAN - SAVE THE DATE!

#### **Bigger & Better in 2017 - Celebrating 26 years of a Classic**

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seaplanesupply.com & planefunfloats.com

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#### 2017 CLUB EVENTS

SKYMASTERS RC CLUB - LAKE ORION, MI



#### April 2017

Saturday April 22 — Involvement Day – Bald Mountain, Scripps Road Field; Lake Orion

#### May 2017

Saturday May 13-Field Opening/Work Day - Scripps Road Flying Field; Lake Orion

Sunday May 21-Spring Float Fly [Chet Brady] - Bald Mountain Trout Lake; Lake Orion

Wednesday May 31 - Student Flight Training & Potluck begins - Scripps Road Flying Field; Lake Orion

#### June 2017

Wednesday June 14—Fish Fry Dinner & Member Appreciation – Scripps Road Flying Field; Lake Orion

Saturday June 17—<u>Control Line Fly In</u> – 12-5 p.m. – Scripps Road Flying Field; Lake Orion

Saturday June 24-25-Electric & Night Fly In - Scripps Road Flying Field; Lake Orion

#### July 2017

Saturday July 15 - Open House Air Show 2017 - Recreation 101 - Scripps Road Flying Field; Lake Orion

#### August 2017

Sunday August 6-Warbirds and Scale Fly In - Scripps Road Flying Field; Lake Orion

Sunday August 27-Corn Roast and Top Gun Flying - Scripps Road Flying Field; Lake Orion

#### September 2017

Sat & Sunday September 9-10-Midwest Regional Float Fly - Island Lake State Park; Brighton

Saturday September 23-Skymasters Fun Fly - Scripps Road Flying Field; Lake Orion

#### October 2017

Tuesday October 24—Indoor Flying Season Begins – Ultimate Soccer Arenas; Auburn Hills

#### November 2017

#### December 2017

Thursday December 7—<u>Christmas Party</u> – Orion Center; Lake Orion Sunday December 31—<u>Krazy Snow Fly</u> - Scripps Road Flying Field; Lake Orion



all dates subject to change - PLEASE always consult current information on website: www.skymasters.org

Skymasters - 2017

(Everyone is welcome) First and Third Monday of each month through the summer... and beyond! 9AM <u>Red Olive restaurant</u> <u>In the strip mall on Walton</u> across from Crittenton Hospital

Skymasters Breakfast

Rochester MI

#### Skymasters Student Night and Pot Luck Every Wednesday at the field. Flying & instruction any time but we eat at 6PM

#### For those participating we ask that you:

- Bring something for the grill enough to at least feed you and your guests
- Bring a dish to pass (see notes below)
- Bring your own (non-alcoholic) beverage

*We eat at 6pm - rain or shine!* The potluck is sustained by those participating, with no expense to the club.

#### Something for the grill:

The obvious choices are burgers, sausages/brats and hotdogs - but other alternatives are welcome. If you bring it - we will cook it! Already this year we have cooked pork tenderloin and chops, salmon, venison burgers and more.



Don't forget the buns if appropriate for your contribution!

We start cooking about 5:30 - having grill items available by then helps us get everything ready on time.

Dish to pass: Don't know what to bring? Each week a board will be up listing supplies needed - from plates to condiments, charcoal, etc. Pick one of the needed items to bring instead!

Not one to cook? A quick stop at local supermarket deli for a side salad, or bakery for dessert always works.

# August 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2 Addison Oaks Float Fly 9AM Student Night and Pot Luck (eat at 6PM) Scripps Field	3	4	5 Saturday Breakfast 8:30AM Iris Café
6 Warbirds and Scale 10AM Scripps field	7 Skymasters Breakfast 9AM Red Olive, Rochester Hills	8	9 Addison Oaks Float Fly 9AM Student Night and Pot Luck (eat at 6PM) Scripps Field	10	11	12 Saturday Breakfast 8:30AM Iris Café AJ Aircraft Fly-in 9AM 12000 Minx Rd, Temperance, Mi
13 AJ Aircraft Fly-in 9AM 12000 Minx Rd, Tem- perance, Mi	14	15	16 Addison Oaks Float Fly 9AM Student Night and Pot Luck (eat at 6PM) Scripps Field	17	18	19 Saturday Breakfast 8:30AM Iris Café
20	21 Skymasters Breakfast 9AM Red Olive, Rochester Hills	22	23 Addison Oaks Float Fly 9AM Student Night and Pot Luck (eat at 6PM) Scripps Field	24	25	26 Saturday Breakfast 8:30AM Iris Café PMAC Flying Circus 2PM PMAC field
27 Pontiac Airport Open House 10AM Pontiac Airport (Tentative) Corn Roast and Top Gun 10AM Scripps field	28	29	30 Addison Oaks Float Fly 9AM Student Night and Pot Luck (eat at 6PM) Scripps Field	31		

#### Skymasters Information..

The Skymasters field is located in Lake Orion, within the Bald Mountain Recreational Area on Scripps Road, between M24 and Joslyn (see map). A recreation passport or sticker is required and can be obtained from the Park Headquarters located on Greenshield Road or you can check the box on your tab renewal for a "Recreational Passport".

#### Flying hours:

CSO

EOC at large

EOC at large

EOC at large

QUIET ELECTRICS ONLY from 8AM to 10AM and 8PM to 10PM. The noise limit is 80dBa at ten feet. Regular flying is permitted between 10 AM to 8 PM. The noise limit is 94 dBa at 10 feet. These noise limits are enforced.

**Student Instruction & Pot Luck** Every Wednesday, May through September. Flying any time but we eat at 6:00 p.m. – rain or shine, literally!

For those participating we ask that

Greg Brausa

Jim Satawa

Jon Grigsby

Paul Goelz

Metamora

Lake Orion

Ortonville

**Rochester Hills** 

you bring something for the grill enough to feed (at least) you and your guests -OR- bring a dish to pass -OR- bring your own (nonalcoholic) beverage. <u>Something for</u> <u>the grill:</u> The obvious choices are burgers, sausages/brats and hotdogs - but other alternatives are welcome. If you bring it we will cook it! We've cooked pork tenderloin and chops, salmon, venison burgers, steaks and more. Don't forget the buns.

We start cooking about 5:30 p.m. having grill items by then helps us get everything ready on time.

<u>Potluck dish to pass</u>: Don't know what to bring, working late? Each week we'll let you know what is needed for the next week from plates to condiments, charcoal, etc. Pick one of the needed items to bring instead! Not one to cook? A quick stop at local supermarket deli for a side salad, or bakery for dessert always works!

From June through August, club meetings are held at the field, on the second and fourth Wednesday of the month at 8 PM. A great chance to fly and socialize. Winter meetings (September through May) are held at the Orion Center, 1335 Joslyn, in Lake Orion. Bring a model for Show and Tell, enjoy coffee and donuts and listen to the speaker of the evening.

The Skywriter newsletter is available online at the Skymasters web site and is free to all. It may also be printed from the web site if desired. All contributions are welcome. Please send photos and articles to **newslet**ter@skymasters.org If you know of anyone who may be interested in R/C Aviation, please give them a link to this newsletter or give them a copy of an AMA magazine. It may spark their interest!



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