

July 2010 Edition

Wine Country Flier



Next meeting: 17 August 2010, 7:30 P.M.
Veterans Memorial Bldg. (Northwest Room) Across from Fairgrounds

Get there early for your free door prize raffle ticket!

www.wcflyers.com

Promoting Model Aviation in Sonoma County

2010 Club Officers:

President:	Red	(707) 481-9504	rjensen@arcturus-uav.com
Vice President:	Phil Leech	(707) 538-8557	leechstudios@sonic.net
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Treasurer:	Jeff Penner	(707) 292-4234	sonicjeff@yahoo.com
Safety Officer:	Merle McGregor	(707) 585-1061	merle_mcgregor@yahoo.com

2010 Board Members:

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Newsletter Team: Guy Nicholas, Phil Leech
Website: Patrick O'Halloran



Prez Sez

By: Red Jensen

Pres Sez...

I hope everybody is taking advantage of the great flying weather we've been having, I know I have. Not much going on this month, but there are a couple of events I'd like to make everyone aware of. First up is a Fun Fly on September 5th. I have been contacted by NitroPlanes and they are considering sponsoring this event with some prizes. We're still working out the details, but I will let everyone know as soon as we have something concrete. There will be a flyer coming out with more information soon. Also the Neil Taylor Fly-in is scheduled for September 26th. This event is a free fly-in and BBQ for club members and their families. We also give out the "Neil Taylor Award" to a deserving club member who has well represented themselves and the club. This is always a fun and exciting event so mark your calendar and don't miss it.

We've been having a great time with the races. If you would like to come watch or better yet participate, they are held on the first Sunday of the month unless it is a holiday weekend. See the website for the exact schedule.

This month I got a nice question from a member looking for more info on li-po batteries, so see the answer elsewhere in this issue. This is exactly the type of thing I'm looking for to put in the Red's Corner monthly column, so please keep them coming!

Board Meeting Minutes

6 July 2010

Old Business.

- Board Vacancy. Patrick was formally invited to join the board. He accepted.
- Swap Meet. Adam has over 30 reservations and many promised to show up on the day.

- Robbie motioned, Adam seconded, to give \$75 to Awesome Hobbies for a gift certificate for Todd Matheson in thanks for his pylon construction. Motion passed.
- Fence is now up around the toilets. Agreement made to seal the fence \$150 allocated to do the work.
- Fun Fly July 24th will be moved to September 5th.
- Larry Frank will be moved to the 26th of September.

New Business.

- NitroPlanes.com has proposed to sponsor WCF. Agreement to look into this further.
- AMA has ruled that shooting model aircraft with paintball guns is OK. WCF will be investigate this idea for an event.
- Fun Fly (September 5th). Barbeque and Nitroplanes donations will be on hand.
- At the recent float fly at Sal Lake several non-members were present without AMA.
- All subsequent events must have "AMA Membership Required" posted on flyers in the future to avoid confusing.

Meeting adjourned at 7:05pm

General Meeting Minutes

15 June 2010

- Meeting called to order at 7:30 pm by Phil Leech, sitting in for Robert Jensen.
- 25 Members present.
- Guest Robert Dixon from an AMA club in Richmond was in attendance.
- Larry Gustafson won the gallon of fuel in the fuel raffle.
- The fence project is currently in limbo but will be finished soon.
- Treasurers Report- 83 members on roster, \$1,142 in expenses, current balance is \$7,345.
- The 2010 Christmas Party will be held at the Trentadue Winery. The deposit is being requested, and will be paid this month.

- Adam Clement the upcoming Swap Meet at the Santa Rosa Vets Building on July 10th. \$10 per table.
- Jon Stychno discussed the upcoming Wings over Wine County Air Show August 21-22. The club will be flying for 30 minutes to start the show both days. The optional shakedown/practice day will be held on August 8th. A mandatory practice will be held on August 15th. Contact Jon for more info.
- Phil Leech mentioned the upcoming Scale Masters qualifier held at the Ukiah Propbusters field in Hopland June 25-27.
- Jeff Penner talked about the Vertical Challenge Air Show being held at the San Carlos Airport on June 19th.
- A Float Fly will be taking place July 4th at Sal Lake.
- The next Pylon race on July 11th.
- Adam Clement notified members of Classic Wings and Wheels, which will be held at the Petaluma Municipal Airport July 17th. WCF will have a display, but will not be flying.
- Paul Coleman shared his KI-84 Hayate that he built from scratch with the assistance of Robert Jensen and his laser cutter.
- A video from Julio Alvarez was shown recapping the June Pylon Race. Thanks for the great work Julio!
- The raffle winners were- Bob Hixon- Hangar 9 Saratoga. Merle McGregor- Parkzone Sukhoi. Adam Clement- Hinges
- Meeting Adjourned at 8:40 pm.

Submitted by Jon Stychno for Ian Rickard.

All about Lithium Polymer Batteries

By: Red Jensen

Hi Red,

I have a question about LiPo batteries. I don't think I'm the only one either because nobody I've asked seems to know. Perhaps you could talk about how they are rated.

For example I know what 3S means (3 in series = 11.1 volts) but I don't know what 3S1P means, could you explain the basics? Thanks, Marty

Thank you very much for the great question Marty! I am sure you are not the only one either, as the electric industry as a whole is really not that well defined when it comes to explaining its various ratings and acronyms. It

can be very difficult, for instance when converting an IC (internal combustion) powered model to E power, to spec an equal performing power system. More about this later, but that should be really how you think of this type of thing, as system. (motor, ESC, battery and prop all have a great deal with the "power" your system will produce) Thankfully the battery nomenclature is pretty well defined and easy to follow once you understand the system.

On to your question! By definition all batteries are made up of individual cells, whether they are NiCad, Nickel Metal, Lipo or any other chemistry. A battery is a cluster of cells wired together either in Series and/or in Parallel. Let's take a simple 2100 maH 11.1v pack as an example and look how it is defined. The 2100 is the total capacity of energy the pack is able to deliver effectively rated in milliamp/hours. If you have a system that draws 30 amps you can expect to fly for about 7 minutes. (Provided the 30 amp draw falls under the packs "C" rating, more later!)

The 11.1v rating as you noted comes from the fact that this pack is wired in Series as the 3 individual cells are wired in such a way (pos & neg soldered together) that their individual voltages (3.7v) are added together make to the 11.1v rating.

Parallel (pos & pos/neg & neg soldered together) wiring is used when a larger capacity is required. The largest typical single cell size is around 2700 maH (there are other larger single cells, but they are rare and don't really apply in this example). Parallel wiring sums the capacities together. So if you buy a 4200 maH pack it likely is two 11.1v 2100 packs wired in Series/Parallel or 3S2P configuration. That means there are 6 individual cells wired into two 3S packs to get 11.1v, and those two 11.1v packs wired together to get in parallel to get a capacity of 4200 maH. So for any battery the first number indicates how many cells are needed to get the desired voltage and the second number is how many packs of cells at the desired voltage are added together to get the desired capacity. You can stack any number of cells together to get the desired voltage and capacity. The only rule is all cells

must be of the same starting capacity. (i.e all 2100 cells) It is not uncommon to see up to 10S4P setups in larger aircraft.

I suppose some of the confusion is that a 3S1P battery really only is referred to as a 3S battery leaving out the 1P part of the designation. By default it is a 1P battery. Which is fine as 1P batteries are all most people fly with anyway. The 2P (or 3,4,5 or more) is not really seen very much at all.

Earlier I mentioned C rating. The C refers to capacity, and the rating is used to tell how quickly the pack can safely discharge current. Using the same 2100 maH pack as an example, one might have a 15C rating while another may have a 35C rating or more. The reason it is important to pay attention to this is because it is possible to permanently damage your packs if your system exceeds the C rating of the pack. How it works is simple. You take the C rating and multiply it by the capacity to get the maximum available current the pack can deliver safely. Let's say our 2100 pack is rated at 15C, you multiply $2100 \times 15 = 31.5$ maximum amps continuous. So for our example 30 amp setup mentioned above, this battery would suffice but I would consider it a bit too close for comfort. You can see that the 35C battery with its 73+ amps continuous available is a much better solution. Most batteries also have a burst C rating, most of the time it doubles the continuous rating. The burst rating lets you know that if you have a hotter system and your battery is on the edge of being adequate, that you can exceed the normal C rating for short periods of time (i.e. take-off, hovering etc.) but you should not exceed more than 10 seconds or so at this higher current draw.

In normal operation, LiPo batteries should never be brought down below 3v per cell (9v for a 3S pack). Doing so can permanently damage the cell and can lead to poor performance and shorter run times. In extreme cases they can even swell and catch fire. Most ESC's have this 3v limit set at the factory, but it is possible to disable it on some controllers like the Castle series for instance. At any rate, flying until you hit the low voltage cut off each time is not the best way to preserve your

packs. It's best to land when you notice the power getting soft.

Balancing is always a good idea, you cannot over balance. I balance every time I charge. This will maintain your packs to the highest possible standard. I have packs that are going on 5 years old and still perform as new. Balancing becomes even more appealing when you are running multiple parallel packs together as the different performance characteristics of each individual cell will unbalance them rather quickly.

Well Marty I hope this answers your question, and thanks for sending it in.

Understanding Deans Connectors

by Phil Laperriere

From the newsletter of the Radio Control Club of Detroit, Clinton Township, Michigan

As I continue to discover more and more about the mysteries of electric flight, I'm never surprised when something that I initially think is a big problem turns out to have a simple solution once I understand the nuts and bolts about it. I'd like to share one of my latest learning's that support this truth.

I've always been very mechanical and understood mechanical things. I also have always had a great deal of confidence about using tools and getting the feel for them very quickly in order to make them work for me. That being said, I found myself getting a little rattled just using a soldering gun as I was putting together the "system" on my first electric-power project. After purchasing the motor, speed controller, and battery, I eagerly started to string things together.

I started by soldering the bullet connectors to the three wires coming off the motor. I spoke with Matt at the Prop Shop and he instructed me to fill the pocket of the bullet connector with molten solder, then plunge the wire in, holding it until the solder cooled. The first obstacle I had here was that I simply didn't have enough hands to hold the clamp while trying to melt solder into the bullet connector. I overcame this by wrapping a rubber band

around the handle of a pair of needle nose pliers. I was then able to position the bullet connector with no problem for assembly to the wire. I also quickly realized I had to slide the shrink tubing as far up the wire as possible before putting the bullet connector on. There is enough heat transmitted an inch or so up the wire to shrink the shrink tube.

Now it was time to solder the Deans-style connector onto the battery leads and the speed controller. One month ago I didn't have the foggiest idea what a Deans Connector was. Now, here I am buying them at the Prop Shop and trying to tie them into my power system.

I read the instructions on the back of the pouch that the connector set came in, and the instructions told me to tin (pre-apply solder) to the wires and connectors then touch the two together, add a little heat and you should have a good bond, ready for shrink tubing right? Wrong! By the time I was able to melt the solder on the connector, the tab had melted the outside of the connector, allowing the tab to move out of position. Also, it seemed like an extended period of time before the solder would cool enough for handling due to heat being retained in the connector body. I also found that the bond between the wire and the tab was not very strong and was easily pulled free.

After a long frustrating struggle, I was successful at getting one set of connectors soldered in place. However, when I tried to plug the two connectors together, the tabs were so far out of alignment due to the melting of the outside shell, they simply would not go together. After ruining three or four pairs of connectors, I finally stumbled upon a solution.

I found if I first plugged a set of connectors together and afterward started the tinning/soldering process. I had much better success at a well aligned connector. I also noted that the solder joint seemed to cool quickly along with the tab alignment remaining intact and showing great bond to the wire.

Having the connector plugged together also gave me enough material to hold in a vise for soldering. A couple of other observations I want to point out that seem to make sense to me after going through the process of assembly are as follows:

- Lightly sand the tab where you intend to solder, giving the material an opportunity for "tooth."
- Always assemble the female portion of the connector to the battery side. By doing this, you won't be as likely to inadvertently short out your battery because the terminals are not exposed.
- Maintain a standard for your connectors for positive versus negative. Doing this, you'll finally have flexibility for switching between batteries and speed controllers. Typically, Deans Connectors recommend the wide end be utilized as the positive side.
- Have an extra set of connectors available that are used only for the assembly process. This way you won't power up the speed controller when doing assembly. Also, if you do utilize a set only for assembly, be sure to put the shrink tube over the exposed terminals to minimize the risk of a short.
- Use shrink tube over your solder joints. Shrink tubes serve two purposes. First and foremost, it acts as an insulator, minimizing the potential for a short. Second, it adds strength to the wire just behind the solder joint reducing the opportunity for wire fatigue.

Good luck and don't let the electrics scare you. I've been finding that when I first started getting involved with electrics, the amount of confusing information was intimidating. Learning and understanding a piece at a time starts to add up quickly, making the process manageable. Hopefully I've been successful giving you a tip that will help you in your own building.

WCF 2010 EVENTS SCHEDULE

PYLON RACE	SUN AUG 1
PCAM	AUG 21-22
SID'S FLOAT FLY	MON SEP 6
PYLON RACE	SUN SEP 12
LARRY FRANK/NEIL TAYLOR DAY	SUN SEP 19
SID'S FLOAT FLY	SAT SEP 18
PYLON RACE	SUN OCT 3
PYLON RACE	SUN NOV 7
PYLON RACE	SUN DEC 5
CHRISTMAS PARTY	FRI DEC 10



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