



SAM Says

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November 2014

Volume 39 Issue 11

Special points of interest:

- The Prez Sez
- LiPo Safety from NPS
- Crazy Ivan
- Lake McSwain
- Club Meeting Minutes

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THE PREZ SEZ

On October the 11th we held an auction at the field to sell off the lifetime modeling collection of Dennis King (a long time member that only the older guy's would know) along with several items from the estate of Merrill O'Grady. In addition Ed Pare had donated a 40 size receiver ready trainer. Then Wayne Sweet put into the mix an almost new great planes sport trainer with an O.S. 46 engine, needing only a receiver to be complete. That airplane was too *sweet* (no pun intended) to auction away and is now, with the addition of a receiver, flying as our new gas club gas trainer on 2.4 gigs.

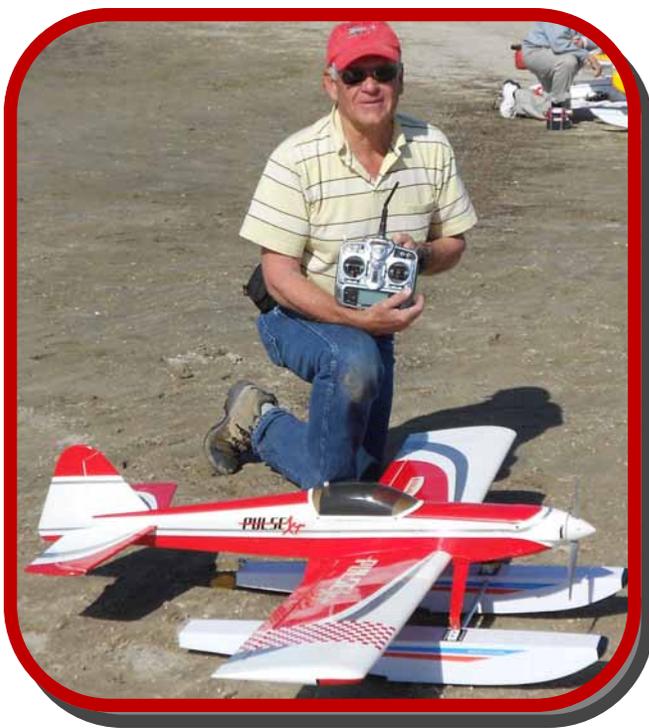
There was quite a variety of stuff that went quickly and many a good deal and good time was had by the members present.

Thanks to Greta and Triston Williams for lending a hand, And, also to Augie for helping collect buyers monies and for spending some of his own in buying up lots of the small stuff. If you're in need of small hardware he's the man to see.

After all was said and done about \$1400.00 dollars went into the club coffers from the auctioned items. Not too bad for a day's work.

The last RudderGate and the last club meeting at the field for the season will be this Saturday the 25th. So, come on out and enjoy BBQ hamburgers by our award winning chief Howard Power. (Not sure of the award, he's looking that up) And, don't forget to bring along some side dishes to share. Be there, or be square.

The Prez



Let's Get Radical (1)

By Crazy Ivan

Mixing? Could be a book! I'll touch it... in a "Crazzy" Ivan sort of way; Purrowr.

When you mix flaps in with elevator (Flapavator) Magical things happen, your craft, however good it was before is now "double" good; you particularly notice that inverted performance is now "amazing". I use it in small amounts so drag isn't increased by a pilot determinable amount. In non-3D but "fully aerobatic" rates, I set full up (about 40 Degrees) to add about 10 degrees of "effectively" flaps, this seemingly soft set-up really isn't that soft, It'll do incredible things to maneuverability's; you may want less or you may want more. Be careful with that more thing if you've got ailerons acting as flaps; you may be inviting tip stall problems. **For 3D?** I would imagine yes if the prop blast is on them! For classic turnaround pattern & hucking down low it's awesome; the prop blast action does increase control within the "pitch axis" while you're hanging on the prop! (Next 3 are the variants).

Flapavator is in coupling your flaps to your elevator so when you pull up elevator the flaps move downward and vice versa as in, when you push down elevator the flaps move upward. Flapavator suggests that you've got "inboard flaps" and separate "outboard ailerons"; this is the best of the three by far in that it doesn't invite tip stall; if had, I never turn this off. (Elevator @ 40 degrees mixes in 10 degrees of flaps); start here.

Flaperons suggests that you're mixing in flaps to full spanning ailerons (or to "only" ailerons however long). This mix is usually set up to operate from a separate "knob" or switch and doesn't offer mixing in the flaps to the elevator.

Flaperonavator (That's hilarious) would be in mixing in an elevator caused flap action too "flaperons" There may be a mix for this but I did it by slaving or mixing my flaperons from elevator commands. It's also toggled on-off. I'd never turn it off except maybe for landings, tip stall characteristics of the craft being the determinate. On is awesome!!!

"**Ailevator**" mixing, centers the crafts "actual roll axis" nearer to the aircrafts' "actual mass centerline"; it simply rolls "truer". There is no downfall to this, only advantage! What is Ailevator? When aileron is applied, the elevators also move "a-bit" in the same direction (mimics the ailerons, one up & one down; just a bit) but still work primarily as elevators. When you do a roll, your tail surfaces don't want too roll... they resist! Example; your main wing resists being rotated (called roll stability yes?) so... so does your tail in defying your command "roll over". Bad dog!!! But it can be trained Call Dr. "Ailevator"; Not Elevons, not Vee tail. How safe is this, is it for beginners... It's absolutely safe and absolutely "better" in every way. If I've got independent servos for elevator control I make sure to be using the Ailevator mix on the Maiden Voyage; Advantage only, might even save it! How much throw? Hmm 45 degrees aileron to 3 - 5 degrees of mixed in elevator action; a little dab goes a-long way for my intentions. For 3D though it may be hugely advantageous in-by using a-lot of this mix for Rotational control whilst hanging on the prop; toggle switch? The final tuning (besides throws) is; the ailerons are trimmed to fly level when the elevators are exactly even. Re; when you roll trim the ailerons you may also via mix, roll trim the elevators, I undo this at the clevis until the ailerons are trimmed for flight and the elevators are flat to each other in the roll axis. It's a moderate advantage yes but, it's a "very easy" turn it "on", dial some in program and it makes your aircraft roll truer. Sold; every time!!! **3D huckers see the very last paragraph but come back**, Aerodynamicists... Keep Out ha.

Aileron Differential; the up going aileron moves "up" more than the downward aileron moves "down". Differential "reduces" adverse yaw; it's not a cure.

Adverse Yaw = the nose gets dragged right during a left aileron roll input and vice versa, as caused by increasing the lift and therefore adding drag to the outboard wing. It "yaws" the craft the wrong way via, aileron inputs! Differential (as above) "helps".

(Continued on Page 3)

Let's Get Radical (1) (Continued from Page 2)

Inverted? Nope this “correction” will be exactly wrong for inverted flight. I do utilize differential ailerons though; they're the correct right side up “advantages”; tip stall is reduced + recovery is sooner right side up (just a bit); comes in handy when you get jolted by turbulence just before touchdown. The inverted snap and stall is “slightly” heightened; Hell... that's an attribute “sold” ha. You Pattern flyers though may want to be rid of it! My view is that; when inverted the thrust line is up and left (exactly wrong (x2)), the rudder trim is left (exactly wrong) so... the little bit that you add to what's already wrong is an “undeterminable loss” inverted for a 2% gain right side up; Sold!

Note; I build in differential via mounting my (bottom side mounted) aileron control horns slightly more rearward or towards the trailing edge by 1/8” or so from the usual (horn holes “over” the hinge line) horn position; Where are your horns? It matters!

Aileron rudder mixing; this is to “eliminate” adverse yaw with or without the fore scripted Aileron Differential. This mix automatically adds right rudder to right aileron inputs and vice versa for left aileron inputs. This is the “cure” for adverse yaw whereas “Differential” **is** a worthwhile boost to this mix. **Inverted?** Nope, it'll be exactly wrong... **and strong!** It's often toggled on- off; off for “anything” inverted!

Rudder, Elevator mixing; when rudder is applied from a knife edge position a craft will typically “pitch” or “tuck” in the pitch axis. Position your craft in knife edge and add rudder... if it pitched up (or down) here's the mix to fix it. The goal; Rudder is mixed to cause up or down elevator actions as needed to make the craft “track straight” when you kick rudder; Knife edge becomes “simple” if all you have to do is hold rudder is the idea. This mix “usually” **doesn't harm inverted flight**; it simply counters the rudders' caused pitch in the pitch axis. Landings and slow flight are unharmed and I think bettered, the correct setting simply prevents the rudder from pitching the craft. This usually helps from all aircraft positions. AKA if the rudder kicks the nose down in knife edge it likely will also kick the nose down in level flight; fix one... fixes both! It will require differing mix percentages for both right and left rudder inputs; a very worthwhile mix that never needs be off; a bit tenacious to set up & chase out but, it's “always” a **huge** advantage!

Crazy Ivan

Hey 3D Huckers! Ailevator is particularly for 3D aircraft, here's why: God Help Me!

To explain; flaps cause an aircraft to pitch up... the why is because they literally cause air to be blown down on the horizontal tail surfaces which in turn acts alike adding up elevator. OK so... your ailerons are full spanned (and huge) meaning that they “span” near to the fuselage; within the would be flaps area. OK so... right roll = left aileron down (alike flaps)... this blows air down on the left horizontal stabilizer... Oops... the tail not only resists rolling with the ailerons via it's own roll stability but, due to the “spanning” aileron being in front of the horizontal stabilizer it's inducing the tail to roll in the opposite direction; the tail resists roll, double. The opposing side does opposite “bad” in either of two ways that I'll not disclose; “pgs.” I humorously call this “adverse roll”; Ailevator fixes it; it don't take but a dab; No Fears! (Skip back to **Aileron**

NOTE:

To view Robert Shaver's You Tube videos of his Windfree and Le Fish (pictured right) titled **3D Storm** and **Windfree Hard Core Sloping**, go to You Tube and search “Robert Shaver” The videos help back up Crazy Ivan's articles.



PLEASE NOTE: The following is an excerpt from a Navy Postgraduate School publication entitled *“Safety & Usage Procedures for Lithium Polymer Batteries.”* The section on Maintenance and Storage was published last month. This month I am publishing the section entitled *Lithium Polymer (LiPo) Information* (Section 1). Refer to last month's newsletter for the section on Maintenance and Charging. Thanks once again to Kevin Jones for providing this valuable information. *The Editor*

“Safety & Usage Procedures for Lithium Polymer Batteries.”

1. Lithium Polymer (LiPo) Information

Scope

This SOP provides guidance for the safe handling of Lithium Polymer (LiPo) batteries at NPS, in compliance with NAVSEA S9310-AQ-SAF-010 (Tech Manual), “Navy Lithium Battery Safety Program: Responsibilities and Procedures”, which has a mandate to “establish safety guidelines for the selection, design, testing, evaluation, use, packaging, storage, transportation and disposal of Lithium batteries”. The Tech Manual applies to all Navy and Marine Corps activities and all Lithium battery powered devices intended for use or transportation on Navy facilities, submarines, ships, vessels and aircraft. Exceptions to these requirements include very small, commercial-off-the-shelf batteries, such as laptop batteries, as defined in Appendix F. Purchase approval and reporting requirements may apply.

1.2 Properties

Lithium Polymer (LiPo) batteries are comprised of Lithium-based chemistry suspended in a solid polymer matrix. The cells are assembled in stacked architecture of cathode, anode, and current collector grids and wrapped in a plastic-aluminum laminate. Most packs are not hardened beyond thin plastic heat-shrink tubing and therefore care must be taken to prevent mechanical damage or puncture.

Cell chemistry produces a nominal voltage of 3.7 Volts per cell and operating voltages between 3.2 and 4.2 V. It is critical that the cell voltage does not drop below the 3.2 V minimum as this can damage the cells, reducing performance or even rendering the battery useless. To accommodate this requirement, equipment should be used that is designed for use with Lithium Polymers, namely ESC's (electronic speed control) that have a low voltage cut-off setting that will reduce power to the motor when pack voltage approaches 3.2 V per cell. Even more important, the cells must not exceed a safe maximum voltage, typically 4.205 V, as this can start a runaway reaction resulting in fire. To meet this requirement, chargers designed for Lithium chemistry batteries must be used, and for packs with multiple cells in series, either active cell balancing or individual cell under/over-voltage protection circuitry must be used during charge. The exception is some devices with built-in LiPo packs with two cells in series, where cell balancing is typically not provided.

Cell capacity is determined by cell dimensions, and cells are wired in series and parallel configurations to construct battery packs of desired voltages and capacities. LiPo discharge ratings vary widely as a function of construction and chemistry. Batteries are commercially available to RC modelers with ratings as high as 70C continuous and 140C burst, where 1C nominally equates to a one hour discharge time (e.g., for a 4 Ahr pack this would be a 4 A load). Energy densities typically run between about 120 and 190Whr/kg. Typically energy density is higher for cells with a lower C-rating, but users should avoid using low C-rated packs for high discharge rates. This may cause packs to overheat which will reduce the pack's lifespan and may cause them to produce gas internally making them swell. Severe swelling can cause mechanical stress in packs constructed of several cells and in the worst case can cause cell damage or internal shorts which can lead to a fire. For that reason, packs that show notable swelling must be disposed of.

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“Safety & Usage Procedures for Lithium Polymer Batteries.”

From NPS Publication (Continued from Page 4)

LiPo batteries do not demonstrate cell memory (hysteresis) effects like NiCd batteries do. Internal current is extremely low in LiPo batteries so storage of them is simple, provided that the batteries are not stored at voltages near the minimum 3.2 V per cell or maximum 4.2 V per cell. Most manufacturers recommend storing batteries at 3.8 to 3.9 V per cell (50% charge), which they refer to as a “storage charge.” Many modern chargers have a storage-charge/discharge function to make sure batteries are at an appropriate voltage before extended inactivity.

1.2 Safety Considerations

While having proven to be safe and reliable under proper operating conditions, Lithium Polymer batteries do present significant safety challenges if mishandled.

The batteries have the potential, because of their chemistry, to ignite through a process known as thermal runaway. This can occur if the battery has taken physical damage that ruptures internal components of a cell, enabling a catalytic reaction to occur involving the cathode and the absorbed Lithium.

Although quite rare, ignition can occur as a direct result of physical damage alone. This will usually occur within fifteen minutes of the damaging incident. If the battery does not ignite in this time span and is not charged or used after such damage has occurred, then the damaged cell or cells will simply swell as out-gassing occurs from internal reactions, and ignition will usually not occur. The exception is multi-cell packs where internal swelling can mechanically damage internal connections potentially causing an internal short. Because of this risk, packs that show signs of swelling should be disposed of immediately. Proper procedures for handling and storing LiPo batteries can effectively mitigate this risk.

Ignition can result from charging using improper equipment such as chargers not specifically designed for LiPo batteries, miss-use of chargers that are intended for Lithium chemistry packs, or from charging damaged battery packs. Strict adherence to inspection and charging procedures can very effectively mitigate this risk.

Ignition can result from shorting a LiPo battery pack. Care must be taken when soldering battery connectors onto the battery leads to ensure that the battery is NEVER shorted in the process. Proper handling and maintenance of the packs can effectively mitigate this risk.

Another risk is over-discharging the battery pack. If the pack is discharged below 3.2 V per cell, cell damage or reversal can occur. In such cases the battery should be considered unusable and disposed of. Careful monitoring of pack voltages, use of proper equipment, and strict adherence to inspection and storage procedures can very effectively mitigate this risk. NOTE: some modern chargers will enter a “low voltage” charge cycle if a battery below 3.2 V per cell is attached. Even though the charger may successfully revive the pack, this procedure is discouraged, as the probability of internal damage to the pack exists. The cost of a replacement pack does not warrant the risk to the asset, the battery, or potential injury to humans that may not be aware of the battery’s history. A low-voltage reading MUST be recorded in the log.

1.3 Disposal Procedure

Contact your Department’s Hazardous Material (HM) Representative for proper procedures for turning in used batteries. If NPS OSHE/Safety Office-approved manufacturer core return programs are available, this purchase pathway can be considered as the first option.

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Calendar of Events

October

- 3-5 Float Fly (Cancelled)
- 6 Board Meeting
- 11 Electric Powered Event
- 25 RudderGate (final of the year) & Membership Meeting

November

- 1 Board Meeting
- 11 Veteran's Day—REMEMBER OUR VETERANS
- 27 HAVE A VERY THANKFUL THANKSGIVING DAY

December

- 1 Board Meeting
- 6 Toys For Tots Fly In
- 7 Christmas Dinner / Annual Meeting
- 25 Merry Christmas

January 2015

- 1 Happy New Year
- 5 Board Meeting
- 28 Membership Meeting at the Landing Zone
(Come early and have dinner)

February 2015

- 2 Board Meeting
- 25 Membership Meeting at the Landing Zone

Club Contact Information

2014 SAM Officers

Dennis Stanley, President
(831) 422-3474 jsdenny@razzolink.com

Jim St John, Vice President
(831) 422-5050 tigger1000@att.net

Gary Mallett, Secretary
(831) 757-1940 gmallett@redshift.com

Bob McGregor, Treasurer
(831) 595-3681 xpilotwon@gmail.com
2013 SAM Board of Governors:

Randy Bonetti, Board
(831) 206-5619 rbonetti46@yahoo.com

Malcolm Beety, Board
(831) 272-6810 lowflyer8@yahoo.com

Chuck Bosso, Board
(831) 659-4303 chbosso@gmail.com

To send any submissions to the newsletter editor:

newsletter@salinasareamodelers.org

This includes pictures. The email above is checked regularly, so any submission will not go unnoticed.

Submissions for the newsletter of any kind (this includes opinions) are welcome and will be used on a space available basis. The newsletter editor retains editorial rights to any submission solely for the purpose of correcting spelling, grammar, etc., but not to alter the intent.

PLEASE NOTE!

The October RudderGate and Club Meeting will be held Saturday October 25, 2014. At that time we will be presenting the slate of nominees as submitted by the nominating committee (see page 8). If you have someone you want to nominate at the meeting, please be sure in advance that the person you want to nominate is willing to serve. The nominations will be closed at the end of the meeting. Ballots will be sent out early November along with the invitation to the Annual Meeting/Christmas Dinner. The meeting part is very short, but legally required to primarily announce the results of the election.

“Safety & Usage Procedures for Lithium Polymer Batteries.”

From NPS Publication (Continued from Page 2)

If a battery must be disposed of as HW drain the packs to 3.8 V per cell or lower, and place tape or other secure electrical insulation over any exposed leads before handing them off to your HM rep. If the pack is damaged to the point where discharge is impossible, notify the HM Rep. to ensure the information is disseminated prior to turn in.

Many LiPo manufacturers recommend disposal of the packs by draining them to the lowest possible voltage you can get at a discharge rate of C/10 or less, then puncturing the cells and dropping them into a saltwater mix in a non-metallic container. However, if the cells are not sufficiently drained, the act of puncturing the cells can cause ignition. Because of this, most manufacturers no longer recommend this disposal technique, and it is not authorized for NPS users.

Next month the section entitled *Quality Control Procedures* will be published.



Tristan Williams and his GeeBee



Greta and her flying wing.



Yes, I did put on the other half of the wing, and yes, I did tighten the wing attached nuts!

Uhm.....Augie, what's wrong with this picture?



Nominees for Club officers 2015

- President**
Dennis Stanley (Incumbent)
- Vice President**
Jim St.John (Incumbent)
- Treasurer**
Bob McGregor (Incumbent)
- Secretary**
Gary Mallot (Incumbent)
- Board Members**
- Chuck Bosso (Incumbent)
- Howard Power



WOW! A one wheel landing, no less!! Augie, was that just before it went on its back??

John Lam-mers and his nice E-Flite silhouette Cap 232. Understand it flies great.

