The Comets Tail

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The Comets' Tale is the official newsletter and record of the Ventura Count Comets, AMA Chartered Club #173 and is published monthly at the Comets' Tale Airplane Fix-It Shop, in Camarillo, CA.
Editorial contributions are welcome.

March 2015

Next Meeting: Thursday, March 19, 2015 7:30 PM At the Oak View Community Center

Upcoming Events:

Apr 4 Simi-Valley Swap meet / fun fly and BBQ

Apr. 5 1st Sunday at Santa Paula Airport

Apr. 18 - Indoor Electric fly @ Simi Vally Rec Center - 5005 LA Ave. 7:30pm

Pres Sez:

In case you have not heard, The April Float Fly has been canceled. The low water level in the lake has moved our flying location too close to the Coyote Launch Ramp and the adjacent beach that is popular with fishermen. Contest Director George B. and company have determined that holding the Float fly would be too dangerous, especially with pilots like me!

Assistant Vice President, Marilyn, has e-mailed the non-club visiting pilots to let them know of the cancellation- that is if they have e-mail! If you know of anyone that does not have e-mail, give them a heads-up and let them know about the cancellation.

It was suggested, to have a Club Only Fun-Fly the same weekend as the float fly. We are looking into having the lunch catered by a local outfit. We will let you know more as the details are ironed out.

Have you paid your dues yet? Don't get left out in the cold, the combinations on the padlocks will be changed by April 1st!

Spring is upon us. George L. has mowed the grass. Thanks George!

How about that runway covering? Are the flappy flaps getting you? Chris re-glued the loose flaps for us. Thanks Chris!

– Dave Fishman

Meeting Minutes

The meeting was called to order at 7:30 by President Dave Fishman we had 18 members in attendance

The minutes Treasurer's report were approved and the Treasurer reported that we had 57 members. 50 of which paid. 7 get a free pass as they have been paying for so long, they don't have to anymore. IN other words they are "Lifetime Members".

The Safety officer reported no troubles. The Park Liaison commented on the progress of the Lake's new entry way. John says this should be done in two and a half months.

As a group we decided to cancel the April Float Fly in the name of safety. Let the members of other clubs know that the event is not happening.

The height of the grass next the the runway was brought up and a work party of TJ and George L was started.

The group discussed having a fun fly on the Float Fly weekend instead. It would be a low-key event, i.e. no big raffle. And we can't invite other clubs to participate as no it would be a public event meaning we need to define it as such and fill out forms for the AMA.

The meeting concluded with the usual raffle and some peopel won some nice stuff.

The meeting adjourned at 8:21.

Respectively submitted
- Alastair Brennan

Randumb Thots
by Jerry Deanda

Ya'll may have heard that Fifi the B-29 was in town, hosted by the Commemorative Air Force folks at Camarillo Airport. Dianne and I knew we didn't want to miss that, especially since they were offering visits to the cockpit for a mere $15. Rides started at, uh, $575 and went up from there, depending on which seat you buy. Too rich for us.

So, on Saturday Dianne and I saddled up Lola and we flew all the way from Santa Paula to Camarillo in one giant, 15 minute hop, with our buddy Andrew as wingman in his RV-6. It was fun arriving as a flight of two. Once we were parked, we walked to the bomber. It was not hard to find.

It's a big airplane alright, and amazingly modern for its era. It was the first pressurized bomber and had a sophisticated system for protecting itself from enemy fighters, with all remote controlled power turrets, and computer-assisted gunsights to help the gunners shoot straight. The engines on that thing displace 3350 cubic inches each, make something like 2500 horsepower and snort about 100 gallons of avgas per hour. Each. Yow, no wonder they want $15 just to visit the cockpit.

The fact this airplane was pressurized in a design that started in 1940 is amazing by itself, but what I found even more interesting is that the whole fuselage was not a pressure vessel. The cockpit was pressurized, as were the waist area and the tail gunner's position, but instead of pressurizing the whole thing, they connected the cock-

pit and waist areas with a tube, about 20-odd inches in diameter. If a crewman wanted to move between those spaces, they had to crawl thru the tunnel over the bomb bay. The tail gunner's position was pressurized, but the area between the waist and the tail gunner's spot was not. He could go forward but only when the airplane was unpressurized. I learned the reason for the cigar-shaped cockpit was that it was too hard to pressurize an area with the more normal-looking stepped windshield. Ah so.

It's an interesting cockpit, with the pilot's and copilot's seats more or less like you'd expect. The navigator's table is right behind the pilot, and the flight engineer sits behind the copilot, and he faces aft. Of course he has all the engine instruments and controls, with the pilots only having minimal controls and engine instruments. The bombardier/gunner's position is clearly visible below and forward of the pilots' positions. The bombardier had a gunsight on a swing-out mount so it would be out of the way when he was using the Norden bombsight.

All pretty impressive, and this isn't the only stuff that's interesting about this airplane, but I'm running out of space.

A nice surprise was that I bought the tickets from our own Andrew Carlson, who volunteers with the CAF. He told me he expected to make his first solo flight later that day, in a Piper Archer. I just learned it didn't happen as he had one more flight check. So Wednesday, 11 March is the new day. He'll do great.

We flew back home in formation again, this time Lola was the wingman. Great fun!

We were out flying around Sunday morning and saw Fifi flying up the coast. Just for the record, Lola can't catch Fifi. Oh well.

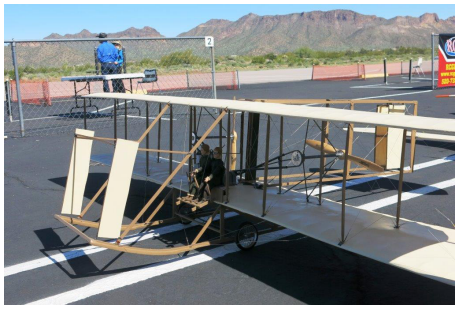
Root's Rambling
Bob Root

Several of us attended the 2015 Gunsmoke Scale Masters Qualifier which was held in Mesa Arizona February 27 thru March 1.The weather was cool with strong cross winds most of the weekend. In spite of the weather we had a great time. There were 32 contestants broken into five events. These included 7 in Expert (model built and flown by the entrant), 4 in Team (model built by builder and flown by team mate), 5 in Advanced (model doesn't have to be built by entrant but is judged the same as expert), 9 in ProAM Pro (ARFs allowed, 30 static points if picture is supplied), and 7 in ProAM Sport (like ProAM Pro but 25 points static and entrant must move up if he wins this event). Tom Wolf with TJ Moran's help won first in Expert and I won second in Expert with Don Ashworth's help. Did I say we had a great time?

I couldn't pass up this picture (1) from the parking lot. The clubs which put on this event did a great job. Pictures 2 and 3 show some of the entrants. Picture 2 shows Bob Root's WACO, Tom Wolf's Mosquito, Chris Spangenberg's Typhoon, and Brad Osborne's PT-19B. These models placed 1st, 2nd, 3rd, and 4th in Expert. Picture 3 shows one of 3 Spitfire Mk IX's entered plus Robert Wagner's Lavochkin LA=7, Tim Cardin's T-50 Cessna Bobcat (Sky King paint job), and the Stinson SR-5 entered by the team of pilot Curtiss Kitteringham and builder Ron Peterka.

The proud Ventura County Comets team is shown in picture 4. Tom's Mosquito which is being assembled in picture 5 was one of the largest models at the meet. Picture 6 shows the smallest model. It is a WW I Sopwith Camel built from a Gillows rubber band model airplane kit by John Cole. It is electric powered and flew great when the wind wasn't blowing (which was almost never).

Picture 7 shows the oldest and newest designs represented at this meet. The oldest is a 1909 Wright Flyer Model B flown by Rick Powers and built by Don Thompson. It couldn't handle the wind and was only able to fly a partial flight early Sunday morning. The second model in picture 7 is an F-16 entered by Steven Cole and powered by a small turbine engine. Both models sounded and flew like the full scale airplanes (super slow and super-fast!). Picture 8 shows the Wright Flyer in more detail.



The Fokker D VII shown in picture 9 (taking off from the sort of grass) was entered by Bill Adams and won the ProAm Pro event. One of the between the wars airplane was the Pietenpol Air Camper in picture 10 which was built by Paul Jarvis.

A couple of WW II airplanes are shown in pictures 11 and 12. The Hawker Hurricane was entered by Howard Kennedy in Advanced. The Ju 87 Stuka was entered by David Morales in ProAm Sport.

I was impressed with the Fairchild PT-19B shown in pictures 13 and 14. This model was built by Brad Osborne and placed 4th in Expert. Like many of the flyers he chose not to fly three official flights because of the high winds.

At this meet the winning contestants were those willing to risk their models in the wind We all need to get out and practice flying in the wind, especially in cross winds.

The LiPo "C" Rating Mystery
By Patrick Harris (edited by Ron Scott)

Let's analyze a typical 10 pound electric plane being used today. If you were to attempt to determine the amount of current we are drawing from our packs, a ton of variables come into play. Most of us will stick an ammeter on our planes when we first build them to determine the maximum amperage draw, but is this really the number we should be looking at in relation to our batteries?

The amount of amps we draw from our packs is a huge variable, but I can say that on average, most of us pull from 65 to 80 amps as our maximum average draw with larger planes. Flying Masters with a plane close to 11pounds gets me in the 75 amp range. For the sake of simplicity, let's use the 75 amp draw figure, which is probably pretty close for most of us. In our calculation, we determined that our 25 C battery can supply 125 amps and we only need 75, so we are good to go….right? The fact is, we are now just starting to understand LiPos and how to get the most from them. One of the most important and often misunderstood aspects of LiPos is "internal resistance". For simplicity sake, we can think of a LiPo cell as having a built in resister that impedes the flow of current. Technically LiPo cells don't have a true resister built in, but act close enough for our use. The biggest downside to a LiPo cell with a high resistance is the generation of heat. That heat being generated in our packs is energy not available for our use and can also be highly detrimental to the pack itself. Long story short, one of the most important measurements we can take from our batteries is "internal resistance", but how do we go about doing this? It's important to realize that internal resistance of a LiPo is extremely temperature dependent. In fact, so dependent, readings from other than a controlled environment should be suspect. Here is a web site with a tool for LiPo Performance Calculations: www.jj604.com/LiPoTool/.

Discharge Calculator | Small LiPo Calculator

Version 1.1 7-28-13 MRF

Lipoly Objective Performance Calculation Tool

Measured Cell IR =	5.6	<--- Enter cell measured internal resistance here. If multi-cell pack, use highest measured cell value
Cell Capacity =	2200	<--- Enter cell capacity in mAh units here
Figure of Merit (FOM) =	0.97	<--- Figure of Merit (FOM). To be used as basis of comparison to other packs and to track pack performance over time
Max. Current (A) =	49	<--- Maximum recommended average current draw to prevent pack damage

Notes:

1. To use calculator, simply insert the measured cell internal resistance and cell capacity in mAh into appropriate (green) cells.
To ensure highest possible accuracy of results, cell IR must be taken when cell has been allowed to settle at 72°F (22°C) for 1 hour minimum.

2. FOM = Figure of Merit. Figure of Merit is a calculation that uses measured cell internal resistance and normalizes it to cell capacity. It is very useful when comparing packs of different sizes and from different manufacturers. The larger the calculated FOM, the better. For more background information on FOM, go here: http://www.rcgroups.com/forums/showthread.php?t=1392662&page=1

3. Maximum recommended current draw is a conservative calculation of maximum average current that one should stay within to limit possibility of damage due to overheating during discharge. Use this value as an initial baseline and adjust if you find that temperature is within a reasonable value in your particular model. Recommended maximum temperature for best longevity is no greater than 140 degrees F (60°C).

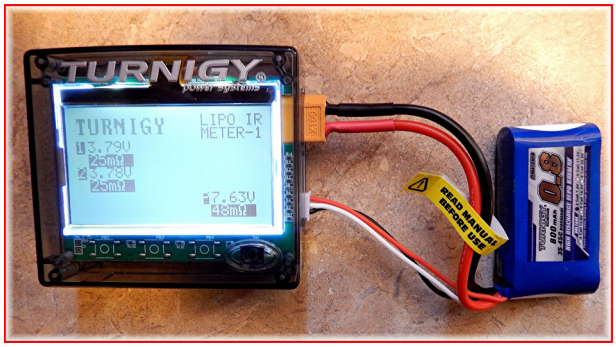
If you have some packs that have been evaluated using the tool be sure to share them on the data thread → Database

There is a discussion thread about this method of estimating a sensible maximum average current here → Discussion

Note that the display of "True C" that was in an earlier version of the tool has been removed as some people were misinterpreting its significance.
You can easily calculate an equivalent C value for the recommended maximum current by dividing that current by the pack capacity in Amp Hours.

Update | Print

At first glance the calculator looks pretty simple, but in fact some pretty serious number grinding is going on in the background. One thing you will note is to check the packs at 72 degrees for consistent readings. Packs should be kept at that temperature for at least an hour, preferably two before taking measurements. Trust me, it can make a major difference in your readings. OK, now back to our earlier example from above. Let's assume our 5,000 mah packs have a fair amount of use on them. Upon checking internal resistance we find most cells are running around 3.5 MΩ, but one cell is 6 MΩ. It's important to understand batteries in series like we use, act on the "weakest link" principle. Simply stated, forget the cells at 3.5. The only one that matters is the one at 6 MΩ (weakest link). So we now go to our on-line spread sheet and plug in 6 as our highest resistance reading cell along with 5,000 pack size. The spread sheet now shows us two values. The first being a "Figure of Merit", which is just a number to allow us to compare various packs. A FOM (Figure of Merit) number of "1" tells us we have a perfectly acceptable pack. A number below "1" is below par and above "1" is exceptional. The next piece of data on the spread sheet is "Maximum Current in Amps. This is the maximum average current draw on this pack to prevent damage. So you now see we have a FOM of .4 and a Maximum Current draw of 71 amps. What that tells us is we have a pretty borderline pack with a FOM of .4, but more importantly we can only draw 71 amps on average from this pack without damage, but remember in our above example, we need 75 amps. If we take the 71 amp figure and divide it by the pack size in amps (71 / 5), you have a result of 14.2 MΩ. Guess what boys and girls….that 14.2 is the true C rating of that pack! But it says 25C on the label! But we need to pull 75 amps and our pack can only supply 71. Well that's not quite true. We can likely pull 75 amps, but what happens to the battery if we pull more than 71amps. You guessed it…heat. Now here is the real problem as we pull more amps than the pack can safely support it creates deadly heat, which damages the cell and in turn raises the internal resistance of the offending cell, so it becomes a "snowball affect". As the pack heats, it can damage the cell, raising its internal resistance, which lowers the available amps, which creates more heat, which damages the cell, which…on and on and on…, until…poof. Ever notice how quick a pack can go once it starts downhill? Now you know why.



Using a good meter or charger that measures cell resistance gives us a great tool to manage our packs to the fullest. Most of us run several cells in series, so by staying on top of your batteries you can match up your best packs. A lot of times, one pack will show weakness before the other. So, are the readings from our chargers Or IR meters accurate? I will say, yes and no. I have checked my chargers and found the numbers to be pretty close, but every now and then I will get a reading of one or two cells that are way, way off. Another issue is temperature of the packs being charged. My chargers are in the garage and hardly close to a 72 degree con-

trolled environment. The Cell Pro chargers read internal resistance as they are being charged, which will change the temperature of the pack, which of course can affect an accurate IR measurement. So for my money, yes I think it's worth the few bucks to buy a Good Charger that measures internal resistance.

Winter Flying - When LiPo's are left in the cold winter temperatures, their internal resistance can go up drastically. What happens is we plug in our cold battery, push it by flying aggressively and damage it and we didn't even know it. What appears to be the reason is the very high internal resistance of a cold battery limits the available current draw. When we exceed that available draw, the pack heats quickly and is damaged. Interestingly, as the pack heats up, the internal resistance drops and all appears to be fine. It appears the damage is done in the early part of the draw. Common reasoning would say "no big deal, as the pack warms up from use it will be fine", but by then the damage is done.

Recently I checked the internal resistance of two packs in the house at a stable 72 degrees. We were experiencing unseasonably cold weather so I stuck the two packs in my truck overnight and checked them the next morning with a pack temperature of 45 degrees. Inside, the highest cell's internal resistance was around 4 MΩ. The next morning that same cell read over 9 MΩ. These were 4,500 mah packs and if you plug the info into the on-line spreadsheet you will see the Maximum average current draw to avoid damage is only 55 amps - that's a significant degradation. If we were to pull 70 to 80 amps from those packs, major damage is likely going to occur and what about the affective "C" rating of these packs? If we divide 55 (amps) by 4.5 we get a number of 12.22. At that temperature the true "C" rating of these packs is only 12.22 and they are labeled as 30 C packs. The result is, temperature is a major factor in determining true "C" rating. But we have all heard LiPos like to be cool. Yes they do, but only in storage, not when we first put them in our plane.

Bottom line is keep your packs warm in the winter before use (65 degrees or higher). I have one of those $35 infrared thermometers from Harbor Freight that does a good job checking packs. I now leave my packs inside the truck and get them out one at a time when I need them. If it's really cold, I leave the truck running and the heat blasting on full for a while to get them nice and toasty. Another trick is to toss in a couple of chemical hand warmers in your battery box. In our area we don't see the sun much in the winter, but for you that have that luxury, placing your packs in direct sunlight (usually the dash board) really helps warm them up. If you are so inclined, this link will detail some of the technical side to this issue.
http://forum.giantshark.co.uk/viewtopic.php?f=121&t=1280

From the "What Will They Think of Next" Department:

Javier brought his new Ugly Stick to the field the other weekend. Ugly Stick...You know...shoulder wing, circular vertical tail, iron crosses, no cowl. If you are like me you know these models don't look right with an electric motor on 'em. So someone at that place based in China, with the USA, UK, etc. warehouses made a plastic nitro motor and mounted a long shaft electric motor in it. The detail on the engine is surprising - A bolt and nut holding the muffler together, a throttle arm on the carb, real fuel lines for the carb and muffler. And the motor has a sheen of new motor just out of the box. I may have already said this but, "What will they think of next?"

Trimming a model may seem like a tedious task. In order to realize the full potential of any model it must be trimmed properly. Many models have been labeled as “dogs” because they were never trimmed properly.

Common Trim Problems

1. Wing incidence set too positive
a) The model tends to climb through right and left turns
b) When pulling out of a dive the model tends to zoom upward instead of returning to level flight
c) When full throttle is applied the craft tends to zoom upward

2. Wing incidence set too negative
a) The craft tends to dive through the complete flight
b) The model will react opposite to A/B/C above

3. Center of gravity too far forward
a) The nose tends to drop in steep left and right turns
b) Rolls will be barrel-type rather than axial

4. Center of gravity too far rearward
a) The tail tends to drop during turns
b) The controls will be too sensitive
c) Poor wind penetration
d) The model will tend to “balloon” when turned into the wind
e) The model lacks stability during flight

5. Too much engine down thrust
a) The model jumps up from straight and level flight when the engine is suddenly cut
b) The elevator has excessive up trim to maintain level flight

6. Not enough engine down thrust or slight engine up thrust
a) The model goes into a dive from level flight when the engine is suddenly cut
a) The elevator requires down trim for level flight

7. The craft may require engine right thrust A model aircraft should not require any left thrust.If it seems to need left thrust, look for some other problem
a) If during a steep climb the model tends to pull up to the left as it loses speed, add right thrust
b) If the model tends to pull to the left near the top of a loop, add right thrust. If it pulls right, reduce right thrust

8. One wing panel is too heavy
a) The heavy wing panel will tend to pull outward duing inside and outside loops
b) A heavy wing panel will cause the aileron to trim with one aileron up and the other down

9. Too much dihedral
a) The model will roll in the direction of the applied rudder
b) Rolls will be barrel-type rather than axial
c) The model will want to roll out of knife edge flight
d) Inverted maneuvers will be difficult

10. Too little dihedral
a) The model will roll in the opposite direction of the applied rudder
b) The wing wants to tuck under during knife edge flight
c) Poor tracking through inside loops
d) The model tends to lack stability during upright flight

11. The model won’t trim properly
a) Check all surfaces for warps
b) Aileron and elevator gaps should be sealed
c) Check model alignment
d) Check that both elevator halves move the same up and down - Check that they are in perfect alignment
e) Check for play in control linkages and servos
f) Check for poor servos that don’t center properly
g) Make sure the radio isn’t the problem - Does it work well in other aircraft?

AMA Charter Club #173

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