

FLYING

Newsletter of the
Oakville (Milton) Model Flying Club

www.omfc.org



January, 2020

Happy New Year



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SWAP MEET

Sunday, February 2nd., 2020
Doors open for Vendor setup at 8am,
and general public at 9am - Noon

Featured:

Frank Pilih's - E-Flite F-18 Hornet
NEW Q&A

Our next club meeting is:

Monday, Feb. 3rd.
at 7:30 pm

Unit 13, 785 Pacific Rd. Oakville

January Club Meeting Summary

The first meeting of this new year on January 6th had 20 members in attendance and Denis Loo, our new President, welcomed everyone and asked for reports from various events.

Harvey Slaght reported on the FFF which had about 31 people come out, including Nancy Eichenberg and one son. It was nice to see them, especially considering this event had been run by Jim Eichenberg over the past many years. It was always a fun time!

The field was snow covered with some very wet sections, and one contestant (competing for the honour of first flight of the year) Kim Vasiliadis, even shoveled the field to prepare a runway for easier takeoff!



The brave souls who showed up for this years Frozen Finger Fly. It was cool and windy but at least not raining or snowing.



Paul Miller (student pilot) came with his plane, but of course needed an instructor so Mike McDermott helped out. So who really is the pilot in this situation to qualify as the first flight? Kim started his engine prior to noon - so there were calls for disqualification - but since no other competitor complained, no foul! Kim got his Ugly Stick off the ground first (easy with a warm engine eh!) and did a circuit and was ready to land, but Mike and Paul were still trying to get airborne so the field was occupied and he had to circle several times. But wouldn't you know it, while still circling he had a flame out and had to make a dead stick

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landing in rather a hurry. He did a remarkable job to get it down on the field well away from crew still trying to take off. It wasn't pretty but it was down in one piece.

Mike finally got Paul's trainer airborne, and then transferred control to Paul, problem was he did not seem to have control and Mike had to take over. So, since it was Paul's plane, but he did not control it, does anyone qualify for the event? They still deserve an honorable mention for coming out with a plane - where are all the other competitors? Anyway, Kim and his crew helper Yuri Zhigalov, claim the first flight of the year again (he won last year too).



Frank Pilih brought a rather large amount of old balsa and plywood scraps for the fire - glad to get that out of the basement!

Aldo Agostini brought a float plane and had a flight or two afterwards, but since it was electric it does not qualify for the FFF. With all the electrics in the club, maybe we need to start a new category!



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Mike reported on the directors and officers (D&O) insurance mentioned at last months meeting being offered by MAAC. It is far less expensive to purchase through the offer MAAC is trying to arrange, but there was some indication that not enough clubs had expressed interest for it to be viable - we are still waiting on a response from MAAC.

Denis mentioned about the club name and the fact that we had incorporated the word "Milton" in place of "Model" (so that the acronym OMFC still works) a few years ago, to better show the affiliation with the town of Milton, on whose lands our field is using. This has caused some problems with the club being identified as a full size flying club. In addition, the legal name of the club is still "The Oakville Model Flying Club Inc." and using a different name on club documents could result in some legal wows down the line. It was felt that if the form "Oakville (Milton) Model Flying Club" were used, that it would not only satisfy any possible legal issues, but clarify the clubs function. The website should be modified to reflect this and also deter anyone searching for a "flying" club, rather than a "model" club from being misinformed.

The executive had reviewed the fabric runway issue again after receiving some new information suggesting that no under fabric preparation was required. This would obviously decrease the costs, but after further discussion in that review it seemed to suggest that in our circumstance, with such an uneven field, that this would not be the case and the idea is again shelved for now.

The "Chase the Ace" draw is only half way through the cards with no winner and as the pot grows larger I (as your Sec/Treas) wondered if we might want to have an extra draw each meeting since this game has been going on for a couple of years now. The consensus was to leave as is - the pot is now at \$243.60, with no winner again this meeting.

Terry Sears (swap meet organizer) noted that all the tables are sold out - perhaps we need to consider an increase to the table charge as the tables are sold out for the event so fast each year - seems to be a popular event, that is for sure.

Denis also asked the members for their suggestions for future club meetings - what guests or topic they might be interested in having. With that Mike briefly showed the progress of his Folland Gnat, shown in last months issue of the Fliteline. We look forward to the finished product Mike.



Frank Pilih then proceeded to talk about his E-Flite F-18 Hornet EPO Foam ARF. The model is based on the F/A-18D two-seat variant with color scheme taken from the US Marine All-Weather Fighter Attack Squadron 242 (the Bats) based in Iwakuni, Japan. It features many scale details including removable ordnance and tanks, LED lights, main and nose gear doors.

The stock model comes with an 80mm brushless inrunner EDF (3270 2000Kv), 100amp ESC and is designed to run on 6S (22.2V) 4000-8000mAh 30C LiPo with the smaller size giving 3 minute flight times. The ten stock 13g servos all have metal gears.

Frank made many modifications to the model, including dividing up the servo inputs to allow for independent servo adjustment. This resulted in the default 6 channel becoming 14 channels - using a Multiplex transmitter. He also removed all "Y" harnesses and soldered on new leads to most servos. He replaced the standard "stabilator" servos to highspeed digital. He

...F-18 continued

repositioned the battery tray to allow a current sensor to be added, which also helps for a better CG location. He installed sensors for GPS, voltage and current. The GPS monitors speed, max speed, heading, distance from pilot and total distance. Frank strengthened the main landing gear “shocks” with two different strength springs in each strut with the intention to help in the absorption of poor landings.

Frank had quite a few ideas on how to make the stock set-up better, some of which were found online, but many of these were required in his opinion to make this a good flying model. As I cannot possibly remember all the detailed changes and set-ups he referred to in his “live” performance, he is pleased to answer specific questions if anyone has any.



Q & A

We are going to try a new item with this issue that the executive hopes might be of help to club members. It will be a question and answer format. Members with questions send them to me (the fliteline editor) and I will put them out with the next issue, and those members who have expertise in the areas covered can then respond with an answer to be printed in the next issue.

The way I see this going is I will send any pertinent response direct to the questioners (so they do not have to wait until the next issue for an answer), but still post in the following issue for the benefit of all. If you do not want your name associated with the question, let me know, likewise with anyone giving answers.

This started with a question from Mike McDermott and an answer from Denis Loo. Some members have quite an extensive knowledge in the hobby or even with associated subjects because of their work experience or education and can often give really clear and concise answers that would benefit all readers. So to start off, here is the inaugural question and in-depth answer (don't expect all answers to be so thorough!);

Q: I am building a small EDF jet with an FMS 20mm power unit with 650 grams of thrust. The specs call for a 40 amp ESC and a 3 cell 2200+ mAh Lipo. The small print in the article suggests 30 to 35C. I have one battery which is rated at 3S 2100mAh. It notes continuous discharge at 18C/37.8amps and a burst discharge of 24C/50amps for a max. 10 seconds. Would this battery work well enough??? I have another battery (also 3S) rated at 2480mAh. It notes continuous discharge at 10.5C/26amps and a burst discharge of 14C/35amps for 5-10 seconds. Would this battery work well enough??? The flying information says the plane will fly at scale speeds at half throttle.

A: When a model calls for using a particular size or max current rating of electronic speed control, the indicated current rating on the ESC is the continuous figure. If specified, a 'burst' current rating would indicate a higher maximum current rating that it can handle occasionally with proper cooling for a short time (i.e 15 seconds). A well designed 40A ESC can thus typically handle a 55A max 'burst' current for a max of 15 seconds.

While a model may fly adequately or 'scale' at half throttle (20A), taking off and maneuvers requiring acceleration or vertical up-lines are often occasions to exercise higher or full available throttle. Since each elapsed duration is often less than 15 seconds with some time in between, the ESC has enough time to cool down and recover from these transient excursions.

The max continuous and burst discharge rating of a battery is dictated by the internal resistance. The lower the internal resistance, the lower the resistive losses and the higher the output current possible before eventual overheating occurs. Higher 'C' rated batteries are therefore larger and heavier to incorporate the thicker anode and cathodes metal foils and wiring in efforts to reduce internal resistance and increase current supply capability without excessive resistive losses. Also as a battery ages, its internal resistance increases so it can be interpreted as a measure of the remaining useful life of the battery. Increasing temperature also results in an increase in resistance for materials used in battery construction so it is a self-propagating scenario. A rating of 30C to 35C means that the battery can continuously supply a maximum current equal to 30x to 35x the Ah capacity of the battery. So a 1000mAh battery continuously rated to 25C would be safely capable of supplying 1 Ah x 25 = 25A. However since the capacity is only 1000mAh or 1A for 1 hr., it could only do this continuously for 1/25 of an hour or 2.4 minutes before you completely drain (and permanently damage) the battery. For safety and longevity you should not drain the battery to less than about 25% remaining capacity which equals about 3.7v/cell. Thus the recommended safe time at max continuous current for the 1000mAh 25C battery would only be about 3/4 of 2.4 minutes or 1.8 minutes per 1000mAh. Li-Po batteries have no actual inherent hard limits on discharge rates but exceeding rated limits will cause excessive internal temperature escalations which will shorten the expected usable life.

Q & A continued

The recommendation of a 40A ESC, with a 30-35C 2200mAh battery provides 1650mAh of useful capacity. At an average demand of 20A (half throttle), this results in a safe flight time of about 5 minutes. This battery would be capable of also safely delivering 66-77amps continuously for up to 1.3-1.5 minutes, if so demanded, so the limiting factor would be the recommended ESC that I assume is sized with some margin for the intended EDF unit.

Assuming that on average you expect to fly at half throttle equating to about 20A; The first battery with 2100 mAh and has a continuous rating of 18C and leaving 25% remaining capacity in the battery at the end of the flight, gives you 1575mAh of usable capacity and you can expect a max. avg. safe flight time of about $1.575/20 \text{ hrs} = 4.7 \text{ minutes}$. At max throttle, however, assuming the EDF demands a max of 40A, this exceeds the max. the battery can handle continuously but you should still have no problems if you don't do this for extended periods and keep an eye on battery temperature.

With the same assumption of half-throttle, on average, the second battery with 2480mAh with a continuous rating of only 10.5C or 26A and leaving 25% remaining capacity at the end of the flight, gives you 1860mAh of usable capacity and you can expect a max. average safe flight time of about $1.860/20 \text{ hrs} = 5.6 \text{ minutes}$. At max. throttle however, assuming the EDF demands a max. of 40A, this battery will be overtaxed and can handle this for only about 1-2 seconds before overheating, so this depends on your comfort level with this limitation. Also since maximum continuous discharge current is only 26A, this battery would only be capable of safely providing a maximum continuous throttle of about 15% above half.

Well done Denis, a very complete and detailed response that everyone should be able to understand - even the electrically challenged of us!

So send in your questions and see what kind of answer it initiates. Hopefully this will be the start of an informative series of questions and answers. The format may change as we see how this takes off so any suggestions are welcome. *Ed.*

OMFC 2020 Executive

President:	Denis Loo	denis.loo@omfc.org	
Vice-President:	Harvey Slaght		
Past President:	Terry Sears		
Field Manager:	Bill Funnell		
Social Director:	Rick Wilson		
Fliteline Editor:	Steve Goldring	flitelineeditor@omfc.org	
Secretary/Treasurer:	Steve Goldring	sec-treas@omfc.org	
	20 Mineola Road E., U32 Mississauga, Ont. L5G 4N9 Telephone: 416-346-0401		
Chief Flying Instructor:	Ron Birchall	wigan@cogeco.ca	905-632-6538
Webmaster:	Bert Armstrong	bert@virtuhost.com	
Municipalities Liaison:	Mike McDermott		

OMFC Meeting Dates for 2020

<u>Date</u>	<u>Agenda</u>
Feb. 3 (Monday)	Show & Tell/ Dave Platt Video (continued if time)
Mar. 2 (Monday)	Tentative - Speaker on 3D Printing & a B-25 project
Apr. 6 (Monday)	-
May. 4 (Monday)	Beauty Contest

OMFC Event Dates for 2020

<u>Date</u>	<u>Event</u>	<u>Event Contact</u>
Feb. 01 (Saturday)	Swap Meet Setup (Union Hall)	Terry/Denis
Feb. 02 (Sunday)	Swap Meet (Union Hall)	Terry/Denis
May 12 (Tuesday)	Flight School Start (OMFC Field)	Ron Birchall
Jun. 13 (Saturday)	Milton Street Display (Milton)	Bill Funnell
Jun. 21 (Sunday)	OMFC Air Show (OMFC Field)	Exec.
Jul. 25/26 (Saturday)	Prec. Aero. Contest (OMFC Field)	Paul Brine
Aug. 15 (Saturday)	Electric Fun Fly (OMFC Field)	Denis Loo
Aug. 29 (Saturday)	Family Fun Fly (OMFC Field)	Aldo Agostini