

OMFC Fliteline

The Newsletter of
The Oakville Milton Flying Club
April 2011



An indoor flying marvel. A 4 gram rubber band powered Ornithopter....incredible.

March Meeting

Our President, John Pretty opened the meeting to about 45 Club members. We also had 3 or 4 potential new members/visitors in the audience.

John advised we had a busy night ahead so let's get to it. He reaffirmed that both field lease rentals had been paid and asked Jim Eichenberg, our Treasurer, to give us a brief run down on our financials.

Well, said Jim, for the month of March we have had about \$2,000 in and \$400 out. Year to date, we have received approximately \$16,000 in and \$8,500 out, so our bank balance at this time is a healthy \$8,300. Also, at this time, 104 members have signed up. He says he is aware that some stragglers will be paying up and renewing shortly.

Terry Sears advised that the Club has been the recipient of model planes, engines and equipment from Ian Ross. Some of the stuff will be auctioned off later tonight but he wanted to advise details of a season long raffle that will involve 2 Top Flite 60 size Warbird kits, namely a P.51 and P.47 [that's kits not ARF's....Brian Anderson will now go into shock!] One of the kits will include the engine. The draw for these items will be at the first Fall meeting and it is hoped that we can sell tickets all season and make some money for the Club. Thanks to Ian!

John reminded us that next month's meeting would be the Beauty Contest. It would seem that we are expecting some 8 or more self built aircraft, some 4 or 5 ARF's and 3 rebuilt/fixed up models [as you can imagine, there were lots of remarks flying around about fixer uppers and so on]..... So, there should be lots of activity at our last meeting until next Fall.

Brian Anderson, our CFI, advised that we were sending out a request to members asking for those that are seeking instruction this year to contact him so that he could ascertain numbers. Brian did advise that he had requests from non members to fly foamies or small electrics at the field and he has also been asked if we can train newbies to fly hand launched foamies and small airplanes. This is something OMFC will not do. For training purposes, an aircraft has to be able to take off and land on it's own wheels and be able to fly for a minimum of 10 minutes in sustained flight. John Pretty also said that we cannot allow non winged pilots to fly at our fields.

John advised that we had a big summer event schedule and that all these events are detailed in Fliteline. He pointed out that lots of help will be needed and reminded us all that it's our Club and we should support it.

John wanted to know if anyone had any items to discuss and relative new member Ron Barr advised that the Burlington Club has a campaign going to start some sort of "club link" concept [much like golf club links]. Pay 50% of their annual



fee scale and you can fly at their fields. You would still have to pay the normal fee to enter the park. Burlington's web page has more information on this idea. A question was raised about whether or not the Club was still looking for flying sites. The answer was yes. In fact, there will be some discussion about an area north where the Buffalo used to roam. Rodger Young wondered why the Club would be still looking and the answer was that one never knows what the future holds, so it's wise to keep options open. Why do we need 2 fields he asked; well advised North Field Manager Bill Funnell, when you consider that the North Field has 3 nights a week used for training and that this summer we have some 7 events planned for weekends, some events covering both days, members regular flying days get reduced quite a bit. Also, our South Field is under 90 day notice and we are on borrowed time with it anyway. Don't forget Burlington has 2 fields.

Jack Linghorne advised that the Bramalea Club had worked with the City of Bramalea to get their field and that the City works well with that Club. We pointed out that we work well with Milton, but Oakville is just not interested.

John Pretty then announced that the Club had received a letter from John McNicol in connection with his being made a life member of the Club and a copy of John's letter is attached at the end of Fliteline.

From here we moved to the raffle of more of Ian Ross' generously donated modeling "stuff". We had 4 aircraft and 2 had engines. Basically, a Taylorcraft, a Piper Cub, a Waco and a non descript sport model. We also had covering fabric, retract landing gear [2], control line equipment, engines, radios and so on! At the end of the night, everything had gone and the Club made over \$100 on those items, plus we will have the all summer long raffle on the 2 Warbird kits. Thanks again, Ian!!

Louis Csefko showed a key chain video camera. It can record for 1 hour, in HD!! All for \$18.00.

Following the coffee break it was time for Nicholas Jacobs to give his talk on "Electrics".

Nicholas talked and showed slides for about 40 minutes. His slide presentation follows on page 3 thru 12. It was virtually impossible to write notes and keep up with Nicholas and, therefore, he has agreed to provide some supplementary notes. In the meantime, if anyone has any questions on the material, please contact him by email @ <nicholas@limsoft.com>

Following Nichols's talk, Jack Linghorne advised that the EMFSO web site will allow people to access similar data and that every month they issue a publication/flyer known as AMPERE by Ken Myers....dial up the web site for further information.

John Pretty then thanked everyone for coming and Nicholas Jacobs for his very informative talk. The meeting was then closed.

Executive Meeting

- As the Club has announced previously, we are planning a Family Day Fun Fly and BBQ for Saturday, July 16th. Obviously, all Club members and their families are invited to enjoy a relaxed fun filled day. In order for the club to get a handle on potential numbers, can you please RSVP a reply on the email forwarding enclosure of Fliteline noting yes or no and if yes, how many people each of you will be bringing.
- The North Field Portolet will be arriving on May 6th for the season.
- To date, the local Food Bank has collected 14,695 lbs. of food at our annual Air Show and \$4,623!!!
- The raffle ticket cost for the two Ian Ross Warbird kits will be \$2.00 each or 3 for \$5.00. They will be on sale all season at our various events and meetings, and the two winning raffle tickets will be drawn at the October meeting.
- Brian Anderson has announced that the Club will be canceling it's training school night scheduled for Tuesday, May 3rd. All except one student, are returning students from last year and Brian Anderson will be addressing him individually.

Closing Comments

That's all for now.....Nicholas Jacob's slide presentation follows, plus a copy of John McNicol's letter following his appointment as a life member of OMFC.

John has since sadly passed away and we will pay our respects to him and his commitment to our hobby at a later date.

Configuring an Electric Motor Power System

Nicholas Jacobs
April 4, 2011

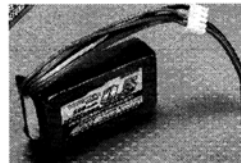
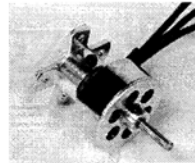
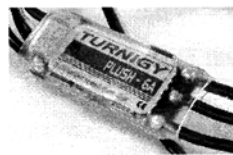
Apr 4, 2011

Configuring an Electric Motor
Power System

1

Main Components

- Motor
- Battery
- ESC
- Propeller
- Spark Arrestor
- Battery Charger
- 12V power supply



Apr 4, 2011

Configuring an Electric Motor
Power System

2

Components – Motor

- Brushless, 3 wires
- Outrunner style – normal airplanes
- Inrunner style – helicopter, ducted fans
- Parameter: “Kv” as R.P.M / Volt
 - Choose motor with a Kv rating which will yield expected RPM with a given battery Voltage
- Parameter: “g” as motor weight
 - 3 – 4 X motor weight in grams = safe power input in Watts
 - “M” Number – see power tests for confirmation

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Configuring an Electric Motor
Power System

3

Components – Battery (1 of 5)

- Powers *motor*, servos, radio rx
- Lithium Polymer is most common (best power/weight ratio for cost)
- Can infer capacity by measuring voltage
 - nominal 3.7v per cell. 3s = 11.1v
 - full charge: 4.2v per cell. 3s = 12.6v
 - min discharge: 3.0v per cell. 3s = 9.0v
- **NEVER** let it get below 3.0v per cell or it will be permanently damaged.
- Always use shortly after charging – or discharge battery to 50% capacity

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Configuring an Electric Motor
Power System

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Components – Battery (2 of 5)

- Storage charge: 40% - 60% full

Cell Count ↓	Voltage					
	0%	25%	50%	60%	75%	100%
1	3.2	3.5	3.7	3.8	4.0	4.2
2	6.4	6.9	7.4	7.6	7.9	8.4
3	9.6	10.4	11.1	11.4	11.9	12.6
4	12.8	13.8	14.8	15.2	15.8	16.8
5	16.0	17.3	18.5	19.0	19.8	21.0
6	19.2	20.7	22.2	22.8	23.7	25.2
7	22.4	24.2	25.9	26.6	27.7	29.4
8	25.6	27.6	29.6	30.4	31.6	33.6
9	28.8	31.1	33.3	34.2	35.6	37.8
10	32.0	34.5	37.0	38.0	39.5	42.0
11	35.2	38.0	40.7	41.8	43.5	46.2
12	38.4	41.4	44.4	45.6	47.4	50.4
			Storage Charge			

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Configuring an Electric Motor
Power System

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Components – Battery (3 of 5)

- Series vs parallel vs single battery
 - http://scriptasylum.com/rc_speed/lipo.html
- Single battery is less cabling
- Serial/parallel require making up additional cables
- Use spark arrestor for most applications (3s 2000mAh or higher)

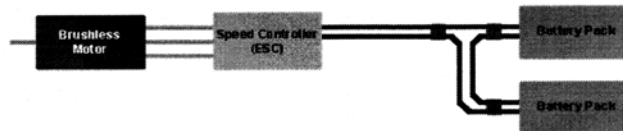
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Configuring an Electric Motor
Power System

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Components – Battery (4 of 5)

- Series: Always use sets of batteries with same capacity (mAh)
 - 3s5000mAh + 3s5000mAh = 6s5000mAh
 - 3s5000mAh + 6s5000mAh = 9s5000mAh
 - 3s5000mAh + 6s5000mAh + 3s5000mAh = 12s5000mAh



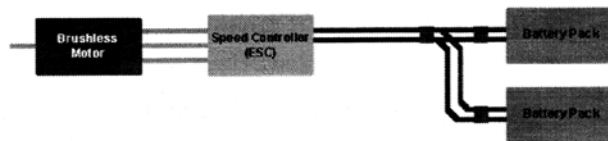
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Components – Battery (5 of 5)

- Parallel: Same voltage (3s, 4s, 6s etc)
 - 4s2200mAh + 4s2200mAh = 4s4400mAh
 - 4s2200mAh + 4s1000mAh = 4s3200mAh



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Configuring an Electric Motor
Power System

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Components - ESC

- controls motor speed using full power pulses
 - Longer on" pulse = faster motor speed (always at full power)
- provides 5V to servos, radio Rx
- two wire neg and pos to battery, 3 wires to brushless motor
- swap two of the 3 wires to reverse motor direction
- must be setup with programming card
 - never assume default settings are good for your application
- may have power on/off switch harness
- may auto shutdown when no Rx signal present

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Power System

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Components - Propeller

- Vary pitch and diameter to control power output for a given motor and battery
- Rule of thumb for best efficiency 2:1 ratio dia:pitch
 - Pitch should be *at least* 50% of dia
- Slow fly props for small/indoor applications
- APC Electric for sport applications
- Carbon Fibre / Wood sometimes used
- 3 bladed prop with same pitch and dia yields 10-15% more power

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Power System

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Components - Spark Arrestor

- Parallel circuit Y-harness with 1/2W, 10 Ohm (typical) resistor on one side of the Y
- Inserted between ESC and battery
- Resistor plug in first, then main plug after . The resistor limits how fast the capacitors in the ESC charge up, stopping sparking.
- When shutting down, resistor plug pulled first, then main plug

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Power System

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Components – Battery Charger

- Computerized charger
- Required to charge Lithium Polymer batteries
- Balancing connector keeps individual cells charged to the same voltage
- 10s charger can charge several batteries at once with adaptor cables
 - charge (3) 3s batteries or (2) 5s batteries or (1) 6s battery
- Runs off 12V car battery for field charging
- Runs off 12V (250W+) power supply for home charging
- Can discharge, fully charge and storage charge battery

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Power System

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Safety

- Metal box for battery storage
- Fire-retardent battery bags
- Spark Arrestor
- On/off switch (Some ESC's)
- 100% Throttle cut switch using transmitter P-MIX

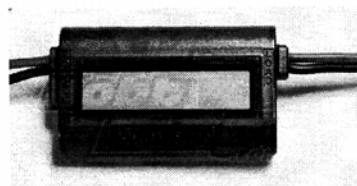
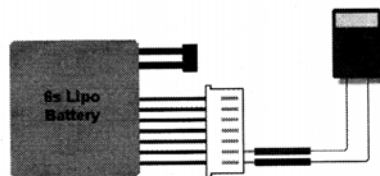
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Power System

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Essential Tools

- VTVM
- Tachometer
- Optical Thermometer
- ESC programming card
- Power meter (or “Watt” meter)



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Using the Power Meter (1 of 3)

Watts: Motor+Prop+Battery giving enough power

- Watts from EAS calculation
 - Change propeller pitch and/or dia
 - Change motor timing

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Power System

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Using the Power Meter (2 of 3)

Vmin: Battery drain not too much:

- Voltage >3V/cell (9.0V for 3s battery)
 - Increase mAh capacity
 - Reduce prop load (will yield less power)

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Power System

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Using the Power Meter (3 of 3)

Amperes: ESC sized correctly

- Amps should not exceed rating of ESC
- May exceed nominal rating to burst rating for a short burst (20 sec or so)
- Reaches max Amperes before desired power
 - use higher Amp capacity ESC
 - Reduce prop dia/pitch (to reduce power)

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Choosing a Power System

- Lawrie discussed last year using EAS
- Power required depends on aircraft weight and flying style

Flying type	Power Loading	
	W/ft	Column1 W/kg
Slow Flyer	50	110
Park Flyer	75	170
Sport Flyer	100	220
Sport Aerobatic	125	280
3D	150	330
Warmliner	175	390
Hotliner	225	500
F3A	200	450
Hot vertical	250	560
Ducted fan jet	300	670

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Power System

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Power test results

- motor, battery, ESC, prop, A, Vmin, Wp, A/V ratio, M number
- Example configurations:
 - 225g Nutball
 - 450g Shocky
 - 1500g Klipper
 - 2800g Escapade
 - 3400g Cap 580

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Power System

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Demo

- Connecting
- Programming ESC
- Power testing
- Using the Watt meter
- Interpreting results

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Power System

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A copy of John McNicol's letter received from the Club following the granting of life membership to him.

610 - 6521 Glen Erin Drive,
Mississauga, ON
L5N 2X2

April 2, 2011

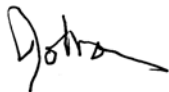
To - the O.M.F.C. Executive officers

Gentlemen,

Just a note to say how pleased and proud I was when John Pretty notified me that I had been granted a life membership in our club.

Our hobby/sport has given me great satisfaction over the years. Apart from the pleasure of building, flying and competing, the camaraderie and good-fellowship has been a joy.

Thank you for the honour.



John McNicol

OMFC 2011 Executive

President:	John Pretty	North Field Manager:	Bill Funnell
Vice President:	Terry Sears	South Field Manager:	Jody McConnell
Social Director:	Louis Csefko	Field Acquisition Mgr.:	Mike McDermott
Chief Flying Instructor:	Brian Anderson	Fliteline Editor:	Mike McDermott
Assistant CFI:	Mike McDermott		mike.mcdermott@sympatico.ca
Web Master:	Bert Armstrong bert@virtuhost.com		
Secretary Treasurer:	Jim Eichenberg 1316 Gainsborough Drive Oakville, Ontario L6H 2H5 Telephone: 905-849-9721		jeichen@idirect.com

OMFC Meeting Dates for 2011

<u>Date</u>	<u>Event</u>	<u>Contact Person</u>
Monday, May 2	Regular Meeting and Beauty Contest incl. "ARFS"	John Pretty

OMFC Event Dates for 2011

<u>Date</u>	<u>Event</u>	<u>Event Director</u>
Saturday, June 4	Electric Fun Fly	Jack Linghorne
Sunday, June 5	Rain Date — Electric Fun Fly	Jack Linghorne
Sunday, June 19	OMFC Air Show	TBA
Saturday, July 16th	Family BBQ and Fun Fly	Terry Sears
Sat / Sun, August 6&7	Glider Tow, South Field	Frank Pilih
Sat./ Sun. August 13/14	S.E. Zone Pattern Contest	Jim Eichenberg
Saturday, August 27	Helicopter Fun Fly, South Field	Jody McConnell
Saturday, September 24	Scale Fun Fly	Bill Funnell