

The MACI Magazine for Model Flyers in Ireland



FlightLines

ISSUE 2 NOVEMBER 2017

plus

JET TALK WITH GEOFF GRICE

INSIDE F3A WITH SHANE ROBINSON

IN THIS
ISSUE:

MUNSTER CHAMPIONSHIPS

F3N - ROUND1 & 2 REPORTS

CL TRIPLE CROWN 2017

BARRETSTOWN EVENT REPORT



Eddie Kenny F4U Corsair - Powered by evolution 7 cylinder 77cc radial engine., photos by Geoff Grice

FROM THE EDITOR

Finally, Issue 2 of your now favorite RC magazine is in your hands, and I hope you like it! I believe this issue is packed with very high quality content, and of course, this would not go without thanking once again, all the contributors! On a side note, please, send me high resolution photos! If you want to be on the cover, or central poster, I need high resolution files.

So, what's in the mag? A lot of text first, as the AGM should be happening as you just received this magazine, please take time to read the proposal changes to our constitution.

In this issue, we will talk Jets with Geoff column number 2, and also F3A with a very good article about that little wing on top of a fuselage :) F3N are making its debut in the magazine also. Hope we see more of the rotary thing!

More Silent flights reports, Munster Championships and the original "fly by Wire" (control line) . Here you go, 28 pages of proper entertainment just for you.

The central poster is a success I believe, and although I always said it will be only be to show Irish models and modellers, I could not say no this fantastic shot from Geoff (yet again! Thanks Geoff!) of this 1/4 scale 104 he took back in October this year. And we go back to what I said above, send me high resolution photos of club action, and you might be next! :) I hope 2017 was a good season to you all, and as we are all going to migrate to our workshops for the winter, I am already looking forward to the new season and all these new projects seeing the light!

In the meantime, see you all at the AGM on the 25th of November!

As usual, any articles, comments etc etc should be sent to the usual FL editor's email address - FlightLinesEditor@maci.ie -Ed.

In this issue:

MACI NEWS - Page 4 - 5
Barretstown event report - Page 6 - 7
SILENTFLIGHT NEWS - Page 8 - 9
Inside F3A - Page 10 - 11
Munster Championship - Page 12 - 13
MACI Poster - Page 14 - 15
2.4GHZ DIY Radio Conversion - Page 14 - 15
CL Triple Crown 2017 - Page 16 - 17
Build Log - Extra 300 Depron - Page 18 - 19
F3N Round 1 & 2 - Page 20 - 21
JET TALK- Page 22 - 23
Control Line News- Page 24

On the cover: Munsters F3a Father and Son Jim and Jamie Howard



President

Chris Clarke, president@maci.ie

Chairman

Kevin Manning, chairman@maci.ie

Secretary General

Liam Butler, secretarygeneral@maci.ie

Flightlines Editor

Fred Marie, flightlineseditor@maci.ie

Treasurer

Rob Norton, treasurer@maci.ie

Webmaster

Liam Broderick, webmaster@maci.ie

Membership Secretary

Kevin Manning, membership@maci.ie

Safety Officer

Shaun Hourigan, safety@maci.ie

Helicopter Secretary

Barry Kennedy, helicopter@maci.ie

Control Lines Secretary

Ralph McCarthy, controlline@maci.ie

Jet Models Secretary

Andreas Balsinger, jets@maci.ie

Glider Secretary

Fred Marie, glider@maci.ie

Multicopter Secretary

Liam Broderick, multicopter@maci.ie

IMAC Secretary

Brian Foran, imac@maci.ie

Insurance Officer

Declan Heneghan, insurance@maci.ie

RC Aerobatic Secretary

Shane Robinson, aerobatics@maci.ie

The views expressed within are those of the individual contributors, and not necessarily those of the MACI Committee.
Web Page: www.maci.ie
e-mail: council@maci.ie



MACI NEWS

THE LATEST FROM OUR LEADERS

Proposals for Constitutional Changes for MACI AGM 25th November 2017

Appendix L.

Remove all references to exceeding the height limits as prescribed in S.I.563 of 2015 from the Code of Safe Practice:

(Delete) (is understood by MACI that models may occasionally have to fly above the estimated 400 ft. while transitioning through manoeuvres or completing turnaround parts of their flight. (Delete) be a small percentage of an overall flight and members adhere to all parts of this guidance material then members are acting in the best interests of MACI) And replace with:

(Insert) All MACI members will observe the AGL and VLOS limits as set out in S.I. 563 of 2015. The statutory limits prescribed within S.I. 563 of 2015 are maximum and not to be exceeded.

Proposed: Liam Butler. Seconded: Bill Thompson.

Reason: MACI is a National Governing Body and as such should never condone within its documentation any approval to contravening the statutory limits as prescribed by law.

Article 11. The officers elected at the AGM shall consist of Chairman, Honorary President, Secretary General, Treasurer, Discipline Secretaries for each discipline currently offered, and FlightLines Editor and up to ten other officers who shall fill such other positions as decided at the AGM (e.g. National Aero Club delegates, Membership Secretary, PRO etc.). No one person may fill more than two posts.

The term of office for the Chairman, Honorary President, Secretary General, Treasurer, and FlightLines Editor shall (Insert) initially be two years and thereafter a yearly appointment until a different Officer is elected to that Office. The term of office for all other officers shall be one year. (Delete) (For the purpose of continuity, the Hon President, Secretary General and Flightlines Editor shall be elected on even numbered years and the Chairman and Treasurer on odd numbered years.) Where an office is vacated, for any reason, in mid-term, a replacement shall be co-opted by the council, or if a co-option is not made before an AGM, a replacement shall be elected at the next AGM. In either case, the replacement officer will serve the remainder of the original term. No officer shall be entitled to waive any clause of this constitution or of any MACI flying rules or of any by-law, except for changes prescribed under Article 33 of this constitution.

Proposed: Liam Butler. Seconded: Bill Thompson

Reason: To allow an Official after a two year term the flexibility of not having to serve another two year term.

Article 12. The Council may co-opt not more than 3 other persons to itself to fill any other post it deems necessary (e.g. Advertising Manager, (Delete) (Membership Secretary), Minutes Secretary, Technical Secretary Etc.) (Insert) for a term or purpose as decided by the Council or until the next AGM when the need for the post/s will be reviewed.

Proposed: Liam Butler. Seconded: Bill Thompson.

Reason: Membership Secretary is already mentioned in Article 11. A time limit has to be set for such co-option.

Article 15. The quorum for a Council meeting shall be six, two of whom must be officers. Any officer who is absent from two consecutive council meetings, has not submitted an officer's report and an adequate explanation of absence, shall not be eligible to put his/her name forward for (Delete) (this same) (Insert) any position at the following Annual General Meeting. (Insert) After a period of one year his/her name can be resubmitted for any position. Non-attendance at a meeting shall be notified to the Hon Secretary in writing.

Proposed: Liam Butler. Seconded: William Bowles.

Reason: So that an Officer being removed from an Official position due to Article 15 cannot be elected to another Official position at the same AGM.

Article 20. All funds of MACI shall be lodged with a Bank or Banks in such account or accounts as shall be kept by the Council. Such accounts (Delete) (shall be drawn on, only by cheque and) (Insert) shall be operated so as to facilitate access to the accounts by nominated MACI Officers either in branch or online.

Such accounts shall be operated to make or receive payments by debit card, cheque, direct debit, standing order or online (EFT) subject to such limits as may be authorised by the Council. All cheques, withdrawals, EFT payments or MACI inter-account transfers above Council limits to be authorised or signed by any two of the following persons: Chairman, Hon Secretary, Hon Treasurer, or other officer nominated by the Council. (Insert) All Bank Mandate forms to be completed and returned to the Bank within 2 months of the AGM and certainly no later than the following Council meeting in January.

Proposed: Liam Butler. Seconded: Bill Thompson.

Reason: To bring MACI financial transactions more in line with modern practices.

Article 31. All MACI perpetual trophies shall be signed for by the recipients who shall be responsible for their safe keeping and return the following year (Insert) at the AGM in good condition. The Hon Treasurer shall be responsible for keeping a record of such signing (Insert) and their return.

Proposed: Liam Butler. Seconded: Bill Thompson.

Reason: To provide further clarification.

Article 33. Any part of this Constitution may be modified at an AGM or EGM summoned for the purpose and then only (Delete) (on a two-thirds) (Insert) after a debate on each proposal and simple majority of the eligible votes cast. Proposals for such changes must be submitted in writing by the proposer and seconded to the FlightLines Editor (Insert) and Hon Secretary before the first day in October preceding the AGM. (Insert) Proposals may not be modified during discussion, except in minor points at the discretion of the Chairman of the meeting. Publication of the proposals at least four weeks before the AGM in either FlightLines or on the MACI website notice board shall be deemed to be sufficient notice to members. In the case of an EGM (Insert) proposals for such changes must be submitted in writing to the Hon Secretary with the petition for an EGM. Proposals may not be modified during discussion, except in minor points at the discretion of the Chairman of the meeting. (Insert) Proposals successfully voted on at an AGM or EGM will come into force immediately and members will be notified, either by post or electronic mail or by publication in the FlightLines or by publication on the MACI website notice board.

Proposed: Liam Butler. Seconded: William Bowles.

Reason: To provide further clarification and to bring MACI more in line with modern practices.

Article 34. On a petition signed by 25 registered members the Hon Secretary shall call an Extraordinary General meeting of MACI giving at least four weeks' notice to members either by individual letter or a notification in FlightLines (Insert) or by electronic mail or publication on the MACI website notice board. Publication of the EGM notice and proposals at least four weeks before the EGM in either FlightLines or on the MACI website notice board shall be deemed to be sufficient notice to members. The reasons for calling the meeting must be stated and only items notified may be discussed.

Proposed: Liam Butler. Seconded: William Bowles.

Reason: To provide further clarification and to bring MACI more in line with modern practices.

 Model Aeronautics Council of Ireland



Remember that most information, latest news etc are available on the MACI Website and do not hesitate to give any feedbacks (bad or good!) you may have to our webmaster, Liam Broderick, using the contact form on the website, or directly by email at webmaster@maci.ie.

Proposal 1
Background:
There is now a big emphasis on proper behaviour of sporting organisations in Ireland. This includes data protection, correct procedures and controls, and possible conflicts of interest both perceived and actual. It follows a number of scandals and the Sports Council has already penalised some associations for breaches in governance and ethics. MACI is attempting to get back the recognition of the Sports Council which was lost some years ago. One of MACI's failures is the lack of an ethics policy. Not having an ethics policy may be bad enough but deliberately deciding not to have one would be looked at very badly by authorities. Therefore we propose MACI place an ethics policy in its constitution and the Council will be responsible for enforcing it as needed.
Proposal
Add the following new Article after Article 12 of the constitution and renumber articles 13 onward accordingly:
Article 13: All officers must within 1 month of election of co-option make an ethics declaration of interests to the council in a manner and covering such items as shall be decided by the council. This declaration shall be made again on subsequent re-election and also within one month where the circumstances in a previous declaration have changed.

Note this is proposed for reasons of ethics, as any person dealing with or requested to deal with, any government, regulatory, state or semi-state body, (local, national or international) should first declare: any connection he, or any member of his family, has with any person in the body, or associated or affiliated bodies, with whom the discussions are held all interests, no matter how small, in any business, which he or any member of his family has, which is related, or could be construed to be so related, to subject matter of the discussions all interests, no matter how small, which he, or any member of his family, has with any business which, anytime in the previous 10 years, has had dealings with the body involved or any associated body
Proposed: Finbar Constant, IRL 569
Seconded: Kevin Barry IRL 82

Proposal 2
Background:
MACI should not include any recommendation no matter how small, to breach legislation or regulations. Therefore In order to fully comply with IAA regulations we propose a very small change to the Code of Safe Practice.
Proposal
Amend the Code of Safe Practice section in Appendix L as follows: Delete the following two sentences as they recommend members to contravene Irish legislation:
"It is understood by MACI that models may occasionally have to fly above the estimated 400 ft. while transitioning through manoeuvres or completing turnaround parts of their flight:"
and:
"Given that any time spent above the estimated height will be only be a small percentage of an overall flight and members adhere to all parts of this guidance material then members are acting in the best interests of MACI!"

Constitution Article 8.
Amend the following Sentence in Article 8: "No change shall come into force until ratification and after the council have notified members, either by post, electronic mail or by publication in the Flight Lines."
Replace with the sentence: "No change shall come into force until ratification and after the council notice to members by one or all of the following; individual letter, individual email, a notification in Flight Lines or a notification on the MACI website."
Proposed: Declan Heneghan IRL4391
Seconded: Martin Sweeney IRL4212

Constitution Article 11.
Amend the following paragraph in Article 11: "The term of office for the Chairman, Honorary President, Secretary General, Treasurer, and Flight Lines Editor shall be two years and for all other officers shall be one year. For the purpose of continuity, the Hon President, Secretary General and Flight lines Editor shall be elected on even numbered years and the Chairman and Treasurer on odd numbered years."
Replace with the paragraph: "The term of office for all elected officers shall be one year."
Proposed: Brian Foran IRL2805
Seconded: Fergus O Reilly IRL2450

Constitution Article 18.
Amend the following Sentence in Article 18: "Publication of notices or competition results in Flight Lines shall be equivalent to individual notices sent in writing to members."
Replace with the sentence with: "Publication of notices or competition results in Flight Lines or on MACI website shall be equivalent to individual notices sent in writing to members."
Proposed: Gerry Keaveney IRL5588
Seconded: Brian Foran IRL2805

Constitution Article 20.
Amend the following paragraph in Article 20: "All funds of MACI shall be lodged with a Bank or Banks in such account or accounts as shall be kept by the Council. Such accounts shall be drawn on, only by cheque and signed by any two of the following persons: Chairman, Hon Secretary, Hon Treasurer, or other officer nominated by the Council."
Replace with the following paragraph in Article 20: "All funds of MACI shall be lodged with a Bank or Banks in such account or accounts as shall be kept by the Council. Such accounts may be drawn on by cheque and signed by any two of the following persons: Chairman, Hon Secretary, Hon Treasurer, or other officer nominated by the Council. The treasurer shall also operate electronic banking procedures including bank transfers and debit cards as agreed by the council."
Proposed: Declan Heneghan IRL4391
Seconded: Liam Broderick IRL921

Constitution Article 32.
Amend the following Article 32: "The AGM shall normally be held each year on the last Saturday in November or, where this is not practical, on any Saturday in October, November or December as decided by the Council. The venue of the AGM shall, wherever possible, rotate around Ireland as decided by the Council and tradition. At least four weeks' notice shall be given to members. All members of MACI shall be entitled to attend and vote at the AGM. Any member present may hold one proxy, in writing; from another member provided that member is not himself present."
Replace with the following wording: "The AGM shall normally be held each year on the last Saturday in November or, where this is not practical, on any Saturday in November or December as decided by the Council. The venue of the AGM shall, wherever possible, rotate around Ireland as decided by the Council and tradition. At least six weeks initial notice shall be given to members. A complete agenda with any proposals shall be published in flight lines or on the MACI website a minimum of 14 days before the AGM. All members of MACI shall be entitled to attend and vote at the AGM. Any member present may hold one proxy, in writing from another member provided that member is not himself present."
Proposed: Gerry Keaveney IRL5588
Seconded: Martin Sweeney IRL4212

Constitution Article 33.
Amend the following Article 33: "Any part of this Constitution may be modified at an AGM or EGM summoned for the purpose and then only on a two-thirds majority of the eligible votes cast. Proposals for such changes must be submitted in writing by the proposer and seconder to the Flight Lines Editor before the first day in October preceding the AGM or in the case of an EGM to the Hon Secretary with the petition for an EGM. Proposals may not be modified during discussion, except in minor points at the discretion of the Chairman of the meeting."
Replace with the following wording: Any part of this Constitution may be modified at an AGM or EGM summoned for the purpose and then only on a two-thirds majority of the eligible votes cast. Proposals for such changes must be submitted in post or email by the proposer and seconder to the Hon. Secretary at least one calendar month preceding the chosen date and in the case of an EGM to the Hon Secretary with the relevant petition. Proposals may not be modified during discussion, except in minor points at the discretion of the Chairman of the meeting.
Proposed: Brian Foran IRL2805
Seconded: Liam Broderick IRL921

Constitution Article 34.
Amend the following Article 34: "On a petition signed by 25 registered members the Hon Secretary shall call an Extraordinary General meeting of MACI giving at least four weeks' notice to members either by individual letter or a notification in Flight lines. The reasons for calling the meeting must be stated and only items notified may be discussed." Replace with the following wording: "On a petition signed by 25 registered members the Hon Secretary shall call an Extraordinary General meeting of MACI giving at least four weeks' notice to members by any one or all of the following; individual letter, individual email, a notification in Flight Lines or a notification on the MACI website. The reasons for calling the meeting must be stated and only items notified may be discussed."
Proposed: Liam Broderick IRL921
Seconded: Fergus O Reilly IRL2450

Public Demonstration of Aeromodelling for the Barretstown Camp Children's Charity - 2nd April 2017



BARRETSTOWN
a serious fun camp



The Royal County Aeromodellers club responded to a request from Barretstown Castle Charity Camp for Sick Children for a static and flying demonstration to augment their schedule of respite camps for children and their families. Myself and William Bowles met with their Program Manager in early March and agreed that the venue could support an indoor static exhibition, indoor flying exhibition in their gym and an outdoor flying exhibition under the rules and regulations as laid down by MACI for such events.

With that in mind, 15 club members assembled at the Potín Stil pub in Rathcoole around 7:40AM on a beautifully sunny Sunday, 2nd April and proceeded in convoy to the location. We were very enthusiastically greeted and looked after by the Camp volunteers. This began with them facilitating us with breakfast after which we quickly had both the static exhibition setup and the gym marked out for indoor electric flying. In total we had approx. 30 models exhibited indoors. Stu Holland and Eanna Healy proceeded to fly foam indoor models. William Sweeney had a full size R2D2 robot on display.

The outdoor flying display was set up about a quarter of a mile away from the main complex in a perimeter field which itself was cordoned off the road by a stout timber fence which acted as a natural barrier between the public, the pits area and the flith line. We had arranged that they would cut a simple flying strip for us which proved adequate. Our flying was essentially the same routines by various flyers rotated a number of times as people came and went to and from other activities. Angus Balfour was the star with a large IMAC Sukhoi equipped with an 85cc petrol engine but

Liam Butler was very much to the fore with his large Piper Cub and ¼ Scale Fokker Dr1 Triplane, again both petrol powered. Bill Thompson flew a Wot 4 and an eFlite VisionAire electric model. All flights went down very well to an excited and very interested audience. We had a running commentary over a PA system from Damian Roche who kept everyone well informed about our club, about MACI and the fact that there are in excess of 40 other clubs throughout the country. The entire audience of families were from all over the country. Our only incident was when Stu and Eanna took up their control line foam aerobatic models and proceeded to perform synchronised aerobatics. All was going very well until one model decided to get too close to the other and the inevitable happened in a shower of foam confetti!! Surprisingly this drew the largest reaction from the crowd!!!



Because the audience were on a schedule of events, our demos finished around midday and we continued to fly until around 1pm after which we packed up our cars and proceeded to the dining hall for a spot of lunch. Our post demonstration briefing with the Program Manager was very positive. They were very pleased with what we had provided and it was obvious that their clients, the children and their families, got a very positive experience from the demo. The reaction was so positive, we were asked back to repeat the event with some tweaks in the August/September time frame.

Overall, it was a very positive event from our club's point of view. It provided us with a window onto a lifestyle that people have which very few of us get to see, ie, to be living with a child with very serious or possibly life threatening conditions prevalent every single day of the week, month and year. It made us think that the odd crash of a model is not such a bad thing really. I would like to thank everyone from the club who made a tremendous effort on the day.

Bill Thompson - IRL-862
Secretary
Royal County Aeromodellers Club





SILENT FLIGHT NEWS

ONE CRAZY WEEK!

GLIDER SECRETARY

France – Ireland meeting April 2017 – Mount Leinster

Many thanks to our guests from France for this incredible week! 8 pilots with family representing 3 clubs from various parts of France (Paris, Bordeaux, Normandie) came over here to enjoy our beautiful slopes.

Good food, good drinks and slope soaring heaven (without mentioning the fantastic weather we had all week long! They even got sun burnt!) All this made it for a mad week with countless hours of flying! From slope soaring early in the morning till dark, to Aerotow at the Model County Aero club (many thanks again to Brian Carolan, and the club members for the very warm welcome, the food and top notch facilities, a credit to your club!) Hope the "show and tell" was appreciated by the MACI members (we counted about 15 coming to learn a little bit about this side of the sport that is aerotowing), and of course, pub nights, restaurants... And a little bit of tourism (just the minimal amount) I believe everybody experienced the "craic". And again, our meeting on Saturday/Sunday was very well attended (35 or 36 pilots, but cut short for me on Sunday as they were leaving... and I was knackered I have to say!!). Many thanks again to all of you who made this a fantastic week! Unfortunately for my liver, they want to come back next year! Stay tuned for more on this in the next edition.

This is the sort of event where you really have to be there! I hope the few photos will reflect a bit of the fun we all had, but as usual, more on gliderireland.net.

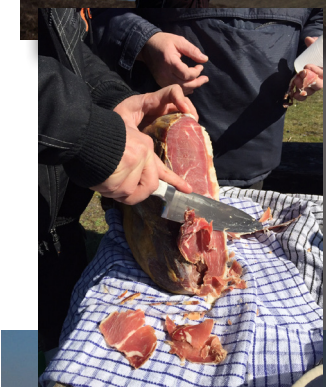
June 10th - Tountinna ISR meeting

June hosted the traditionnal Tountinna meeting. About 10 pilots travelled for the day from all over the country and enjoyed some good weather.. And strong winds! But you need way more than that to stop the guys from flying and having the usual fun!



July 8-9th - Cork Aerotow

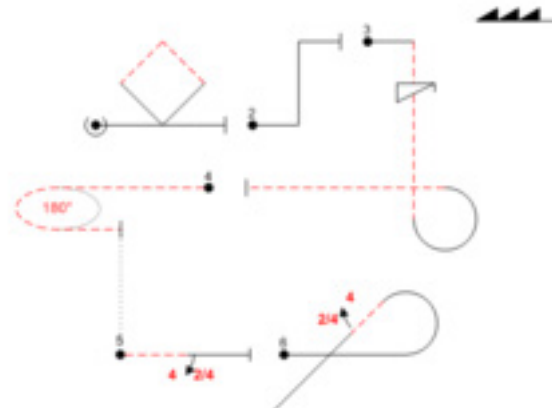
This year's Cork Aerotow was blessed with warm and windless weather, packed with thermals all over the place! Perfect conditions to have a great week end, and nice to fly without wearing 3 or 4 layers of clothing! About 10 or 12 pilots travelled for the event, and as usual, great welcome by the CMAC gang with the usual BBQ and craic!





INSIDE F3A

WITH SHANE ROBINSON



As an F3a Pilot what is the most frequent question I get asked?
What is the small wing on top for?
Well that small wing is called a *canaliser*.
It sits above the canopy and acts as an aerodynamic aid.

Where did it come from?

At the 2005 F3a World Championships in France the reigning world champion Christophe Paysant le Roux, CPLR (now 8 times F3a World champion) unveiled his latest design 'Oxalys' equipped with a small wing above the canopy. This drew a lot of attention in the F3a community. Around 2003 CPLR had been experimenting with a biplane called the "Suxess". The plane didn't fly well and became known as the "Suxess". CPLR never flew the Suxess in competition however he observed that the rudder authority increased dramatically on the addition of a top wing. He began experimenting with the addition of a smaller top wing which he called the "Canaliser" to see if he could take the benefits that he had experienced with the biplane and apply them to a monoplane. At around the same time F1 cars started mounting cameras above the airbox which also influenced the airflow over the F1 cars rear wing. I am sure there must have been a subconscious link?



What does it do?

Unlike today in 2005 the mix free pattern plane was only a dream. All models required radio mixing to compensate for undesired attitude shifts on application of rudder. Down elevator mix to rudder was used on all of my pattern planes, otherwise the plane would climb on rudder application. This radio mix band aid resulted in as many new problems as the one it was supposed to fix.

CPLR observed that the canaliser increased rudder authority which meant that he could use less rudder and consequently less rudder/elevator mix was required. The rear fuselage also had more lift leading to less tail drop during rolls which led to better roll presentation. This made linear rolling easier.

How does it work ? We need some science?

At the time (2005) CPLR felt that the canaliser would straighten airflow over the canopy thus increasing airflow over the rear of the fuselage and rudder. It wasn't until 2013 that Alex Voicu performed some airflow visualisation experiments using wool tufts on his fuselage and a small camera taped to the wingtip which gave real time footage of the air flow over the fuselage.

Looking at the photos below "Normal configuration" you can see that airflow tufts flow off the top of the fuselage and off the top of the rudder resulting in loss of lift over the top 10% of the fuselage and reduced rudder efficiency.

Looking at the "Canaliser test" photo you can see that the airflow tufts all stay straight. The canaliser is acting as an airflow fence preventing air from running off the fuselage and rudder. This provides 10% increase in fuselage lift and increases rudder authority. To read more about Alex's airflow visualisation experiments search RCUniverse Airflow Visualisation.





Trapping air between the fuselage and wings.

The effect of trapping air between fuselage and both wings must also increase the side on fuselage lift in Knife edge manoeuvres. This provides its best advantage in the more difficult Finals schedule sequences in F3a.

See example below of a knife edge manoeuvre in the current F-schedule.

Inverted top hat with ¼ roll, full roll, ¼ roll.

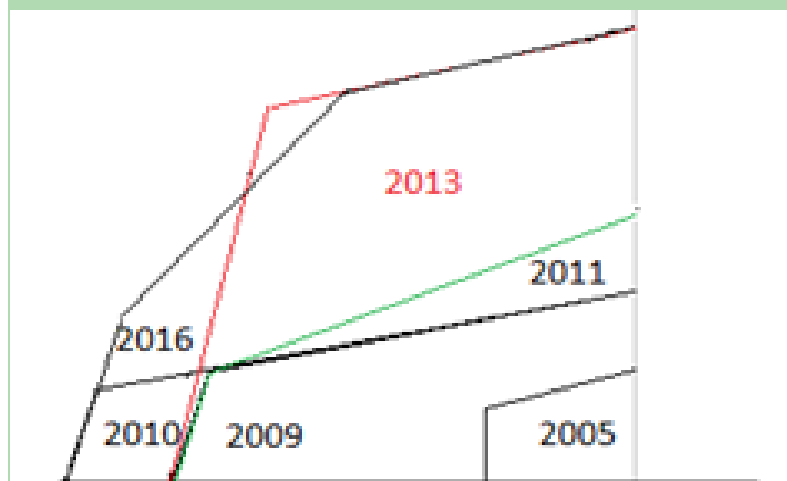
The bottom ¼ loop radii enter on the vertical down line knife edge..... If that doesn't tighten your butt cheeks, then I don't know what will.



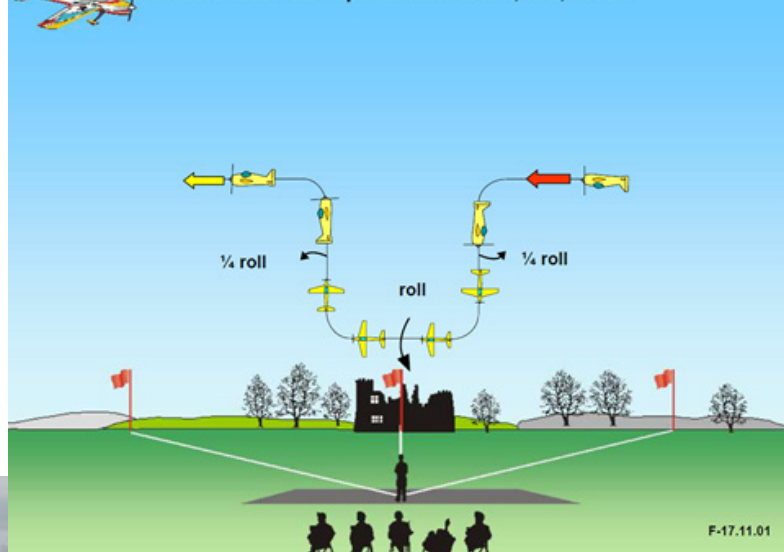
How has it evolved?

It has gotten bigger, bigger and then bigger again.

Oxalys (2005) 200mm,
Osmose (2007) 240mm
Axiome (2009) 600mm
Axiome+ (2011) 600mm
Galacktik(2013) 600mm
Galacktika (2016) 740x 315mm



F-17.11 Inverted Top Hat with ¼ roll, roll, ¼ roll



Canaliser Incidence

With the wing at +0.5o CPLR recommends a canaliser incidence of -0.5o Degrees. On this point there is deviation from CPLR's approach. The latest Trimming methods for zero mixing discovered by Bryan Hebert require that all surfaces should generate lift, therefore the Canaliser incidence should match the wing at +0.5o. I have been using the +0.5o setup for many years now with great success.

Nearly all of the current F3a monoplane designs have borrowed this innovation. The ones that haven't, have made the fuselage even larger to compensate for the loss in fuselage lift. The disadvantage to this in my opinion must be wind drift and difficult wind compensation.

So give one a try and see how you find it! If you want to see some challenging knife edge flight join us at the field or feel free to drop into any of our Pattern Competitions.

Until next time.

Shane Robinson - Aerobatic Secretary

Munster Championships (Brinny Co. Cork)



High winds on Saturday May 6th meant the Munster Aerobatics Championships were put back by a day to Sunday 7th. The day dawned bright and clear, a perfect day for flying at the Cork club's Brinny site. C.D. for the day Shane Robinson arrived early and, assisted by Eoin O Callaghan, began laying out chairs and putting down lines. The site was, as usual, in immaculate condition, a credit to greenkeeper Matt Quin and his team of dedicated volunteers.

By nine o'clock ten pilots had arrived. Three pilots entered the tier 1 F3A event, with five entering at tier 2 level. Two pilots were returning to competition after a significant break so Jim Howard and Eoin O Callaghan decided to enter the Masters event.

After a pilots briefing by the CD the flying began at 9.30. Flying would continue throughout the day. Four full rounds were flown with a break for lunch after round two. As always the food was tasty and very welcome. Special thanks must go to CMAC members Matt Quin, Rob Allen and Dave Duff for this most important part of any day's flying.

The flying in tier 1 was of a high standard. Shane Robinson came out on top winning all four rounds. Niall O Sullivan and Robert Telford fought for the minor placings with Robert eventually taking second place.

Tier 2 was very competitive. Jamie Howard was returning to F3A action and had been flying his current model for less than a week. He acquitted himself very well indeed. Ray Keane and Dave King fly well and managed the complicated schedule with competence and skill. However the real competition was at the top, with Paul Houlihan and Gordon James winning two rounds each. It all came down to a very small margin with Gordon just edging out Paul to take first place.



The Masters competition was equally close and although Eoin O Callaghan won all counting rounds, each was by a very fine margin. Indeed the difference in round four was only one point out of four hundred. Both Eoin and Jim expressed themselves satisfied with their return to competitive flying.

At the end of a long and satisfying day's flying Shane thanked all who had travelled to fly and all who had helped in any way to organise the event. It was indeed a pleasure to have the first competition of the year completed without weather mishap as has happened in recent years. On to Tipperary in two week's time!

Eoin O Callaghan (IRL 2857)







MODEL AERONAUT



TICS COUNCIL OF IRELAND



Michael Abraira's 1/4 scale F104 with Kingtech 210 turbine - Best in the West Jet rally 2017
- Photo by Geoff Grice

Control Line Triple Crown 2017



This year marked the 32nd anniversary of the Triple Crown Control Line Aerobatics competition. Each year the venue rotates between the 4 nations (Ireland, England, Scotland and Wales) with Ireland, in the form of the Fingal Model Flying Club, being this year's hosts at their site at the Ring Common Sports Centre.

This year only 3 of the 4 nations were represented, with Scotland being unable to field a team. Team members were:

| Ireland | England | Wales |
|-----------------------|--------------------------|------------------------|
| Kevin Barry (Captain) | Barry Robinson (Captain) | Kevin Morgan (Captain) |
| Ivan Bolton | Pete Tindal | Mervyn Jones |
| Stu Holland | Steve Smith | Mark Williams |



Judges for the event were Ray Lloyd (Wales) and John Molloy (Ireland), team England not fielding a judge this year.

Scoring at this event consists the total of each team member's best two scores from both contest days, so all teams are motivated to put flights in on both competition days if at all possible, especially as national pride is at stake.

The event kicked off on Friday evening with a meet and greet at the flying site, combined with a pilots briefing and the opportunity for some practice flights by any pilots feeling the urge. Both the Fingal Model Flying Club and Ring Common Sports Centre were delighted to welcome pilots and judges from England and Wales. The banter was good. It was great opportunity to renew friendships, and make new ones, between the local and visiting teams. There was much interest in the latest models, airfoils, power systems and finishes as well as discussions on some of the older competition models present and their construction methods.

In advance of the competition it appeared that most of the models would be electric, and that was borne out with 4 IC models in evidence, two of these being Yatshenko Classics, a Yatshenko Shark and a Thundergazer. All of these were powered by two stroke motors.

Unfortunately the forecast for Saturday morning was for rain, so the start time was delayed in the hope that it would have passed over early in the morning.

As expected Saturday dawned wet, but by the agreed start time conditions had improved enough to start the competition. Flying order was determined by placing in the previous year's competition, which meant the England flew first, followed by Ireland, with Wales taking up the rear. Mervyn Jones (Wales) performing the warmup flight for the judges. The first round was flown by the captains, who started a pattern that was to continue throughout the competition. The rain stayed away almost long enough to complete the first round, with Mark Williams (Wales) flying the last flight of round 1 in very wet conditions. The rain didn't seem to deter Mark and he set down a marker that he was to improve on over the course of the weekend.

As a result of the torrential rain, lunch was served in one of the newly constructed changing rooms adjacent to the pitches on which flying was taking place, and provided a great view of the rain as all present tucked into a lunch of soup and sandwiches. The soup certainly went down well for the day that was in it.

After a leisurely lunch the conditions had improved enough to attempt a second round, so round 2 kicked off. The scoring patterns established during round 1 were reinforced, and again, just as Mark was preparing to fly, the heavens opened. This did not dampen Marks enthusiasm and he put in another cracking flight. As all pilots had 2 scores packed away for day 1 it was decided to call a halt at this point in time and re-convene later in the Lambay Suite of the Waterside Hotel, Donabate, for dinner. The flyers and judges were joined for dinner by members of the Fingal Model Flying Club and Ring Common Sports Centre. This venue was chosen as most of the flyers were staying in this hotel, so only Team Ireland was looking for designated drivers and taxis after dinner. Typical for a flying competition, the rain had stopped completely by the time we all sat down for a delicious meal. Everything on the menu looked, smelled and tasted delicious. The venue provided fantastic views over Lambay, Irelands Eye and Howth Head, as far south as the Kish Lighthouse to aid ones digestion.

As the forecast for Sunday was good, the locals bid their adieu's and headed home relatively early, to be ready for the early kick off planned for Sunday.

Sunday dawned grey, but with perfect flying conditions – no rain and light winds. With minimum fuss Pete Tindal (England) performed the judges warm up flight and the competition kicked off into high gear.

The flying order from the previous day was maintained and flying was continuous until lunch time, allowing two full rounds to be flown before lunch. The scoring patterns established on Saturday remained, with the ultimate placings becoming evident early in the day.

Lunch was a BBQ, provided by the Ring Common Sports Centre, and it certainly seemed to steady the nerves of both pilots and judges. Sundays scores were in general better than Saturdays, the scores tending to improve over the course of Sunday, with both Steve Smith (England) and Mark Williams (Wales) putting in some very impressive flights. The final round was flown after lunch on Sunday, producing the best scores of the weekend. The computerised tabulation system used meant that the final score was available immediately the final flight was over, so almost as soon as Mark had rolled up his lines the prize giving began.

This year John Hamilton (Belfast Model Flying Club), kindly agreed to present the prizes. John, together with the late Bill Draper, were the brains behind this competition, and it was great to have John present the "Cool" trophy to Kevin Morgan, captain of Team Wales at this historic prize giving, Wales winning first place for the first time ever in the competitions 32 year history.

Many thanks to the pilots and judges for making this event a success. I would also like to thank the members of the Fingal Model Flying Club, in particular Ivan Bolton for his work in the lead up to the competition and Jim Fitzpatrick, Anthony Horrigan and Laszlo Penzes for their help on the day. I would especially like to thank Ring Common Sports Centre for their support and the use of their fabulous facility for what was a very enjoyable event. Further thanks are due to to Jim Fitzpatrick for the photos.

Chris Gilbert (IRL-1638)
CL Secretary,
Fingal Model Flying Club



Pete Tindall prepares his Yatshenko Shark for competition whilst Barry Robinson and Steve Smith look on.



Barry Robinson (England) prepares his model for competition



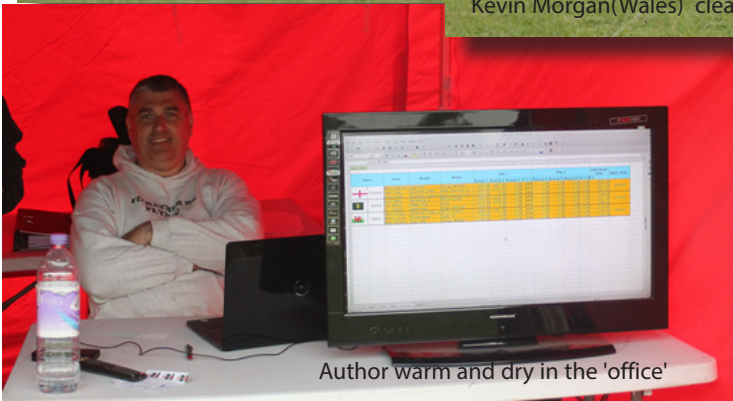
Mark Williams (Wales) struts his stuff



Kevin Morgan (Wales) cleans his lines



< The jubilant Welsh captain. Kevin Morgan with the "Cool" Trophy



Author warm and dry in the 'office'



TOP: The winning team after being presented with their medals.
L to R: Mark Williams. Kevin Morgan, Mervyn Jones and John Hamilton



A breeding pair of Dago Reds.

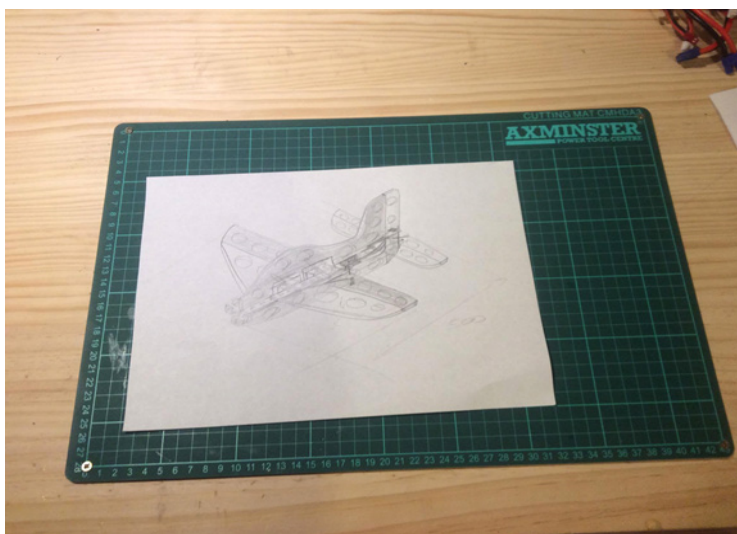
| Team | Pilot | Model | Motor | Day 1 | Day 2 | Individual Total | Team Total |
|------|---------|----------------|---------------------|--------------------|-------------|------------------|------------|
| | | | | Best 2 of 3 | Best 2 of 3 | | |
| | England | Barry Robinson | Dago Red | Turnigy Aerostar | 3822.00 | 3990.00 | 7812.00 |
| | | Pete Tindal | Yatshenko Shark | Retro Discovery 61 | 3671.00 | 3918.00 | 7589.00 |
| | | Steve Smith | Yatshenko Classic 2 | Retro Discovery 68 | 3763.00 | 4134.00 | 7897.00 |
| | Ireland | Kevin Barry | Northwind 12 | MVVS 8.0/950 | 3168.00 | 3241.00 | 6409.00 |
| | | Ivan Bolton | Happy Hour | E max | 3147.00 | 3597.00 | 6744.00 |
| | | Stu Holland | Lekkie Hour | E max 2826 920 | 3586.00 | 4002.00 | 7588.00 |
| | Wales | Kevin Morgan | Yatshenko Classic 3 | MVVS 6.5/910 | 3745.00 | 4031.00 | 7776.00 |
| | | Mervyn Jones | Thundegazer | Rojett 65 | 3714.00 | 4031.00 | 7745.00 |
| | | Mark Williams | Dago Red | Turnigy Aerostar | 4142.00 | 4560.00 | 8702.00 |

EXTRA 300 DEPRON EP

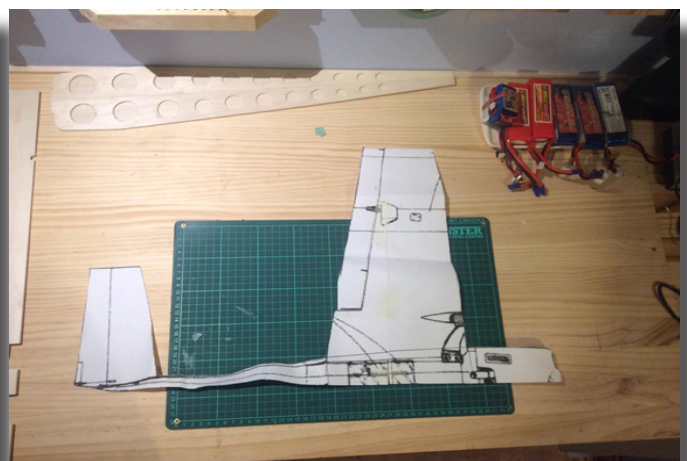


DERMOT GANNON - LAOIS CLUB

Having flown a number of foamie models, it came time to design and build one to my own needs and specs. As an avid scale flyer and not big into 3D, the control surfaces on the standard foam models were wasted on me. So I set out to build a foamie model of one of the nicest aerobatic planes the Extra 300 with scale outlines and surfaces to test fit could still do manoeuvres of the real thing. Here is how this unfolded.



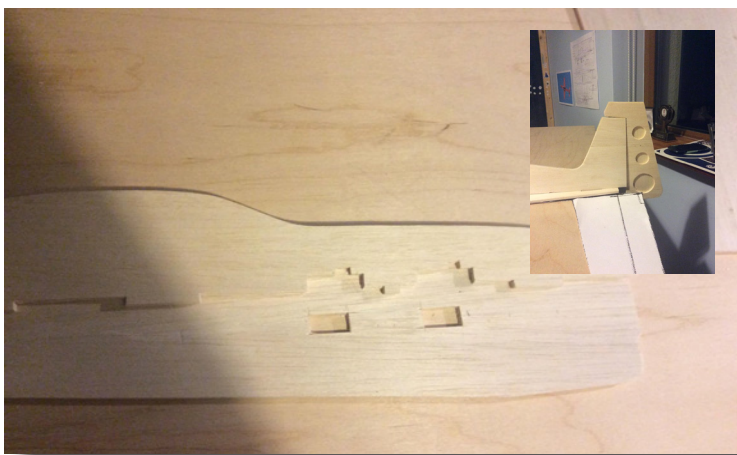
Firstly, some sketches were made of the approximate placing of all electronics and surfaces based loosely on models I had flown indoor with Mikey Blake and outdoors at Laois Model Club.



Next up was a trip to google images and print off a scale outline of the Extra 300. I had decided to make the model around 900 mm span as I had a very nice plane of similar size called a Techone Venus which died on contact with the neighbors washing line. So there were some spare parts available from that plane for the new design.



I thought it a good idea to make balsa/ply templates to use for any future rebuilds of the Extra so I next made some lightweight templates directly traced from the photocopied Extra plans. These template would form the basis of a dummy prototype to test fit servos and motor to eliminate waste at foam cutting time.



I proceeded to cover the balsa formers in heat film (Oracover) to stiffen them and to test the weight of the model as a check against the foam later. It was 50% heavier than the foam so any ideas of making Balsa examples died there.



Here we can see all the components ready for installation and setup. Batteries are 450mah lipos and I used a T Motor with cheap 9gr servos. A spectrum 4 channel rx completes the gear. Of course the gear needed testing and no better man than Colm (4) to put it through its paces. If a 4year old can't break it and can use it, it must be given the all clear to fly.



Finally I cut out a few stars, sprayed some details to aid flying orientation and aesthetics. The result is very pleasing to the eye, COG was easily reached with his battery fully forward on the nose. I set up all surfaces and expos similar to past models and awaited a fine calm day to maiden the Extra 300... That day came on May 1st, where the plane took to the air at Laois model club. It flew well, very predictable and landed very softly. It was a great feeling to see a plane from concept to design to build and to fly...

Happy days.

F3N Round 1 Waterford Model Flying Club



W.M.F.C. Waterford Model Flying Club hosted this year's first round of F3N on Sunday May the 2nd. The weather forecast was good for the day and it lived up to its expectations with superb flying conditions all day. Thanks to Club members for arriving early to prepare the site for the event. As the pilots arrived and set up their Helicopters the flying area was marked out by Barry and George. Pilots entered in three categories: F3N Expert, F3N Intermediate and F3N Novice. CD. for the day was Barry Kennedy and Judging was performed by Jamie Hourigan, Pawel Plesniak, Noel Campion, George Ryan and Barry Kennedy. The Flying order was drawn and a calibration flight was carried out. The CD gave his pilots briefing the event got under way with F3N set maneuvers first.



Photo Shows: Pawel Plesniak, Barry Kennedy, Jamie Hourigan and Noel Campion.

F3N Expert sets were followed by Intermediate and Novice sets, Expert, Intermediate and Novice freestyle. Flying conditions were very good with no wind and blue skies. After a welcomed food break the competition completed with Expert second round sets and Music round. Results and Presentation of Medals were given by Club Chairman Richie Price. Flying off the peg continued late into the evening. The Next rounds of F3N are on in Cork on June the 11th and in Boora on July the 2nd with the Nationals following up in Carron Co. Tipperary September the 24th. Thanks to all for making the event a success to those involved in the event preparation, field preparation, CD, Pilots, Judges, Food and Scorekeeping.

W.M.F.C.

Results Round 1

| Expert | | |
|--------|--------------|------|
| 1st | Noel Campion | 3000 |
| 2nd | Donal Leahy | 2581 |
| 3rd | George Ryan | 2413 |

| Intermediate | | |
|--------------|----------------|------|
| 1st | Pawel Plesniak | 2000 |
| 2nd | Donal Cullitan | 1438 |

| Novice | | |
|--------|----------------|------|
| 1st | Brendan Morris | 2000 |



Results Round 2

| Expert | | |
|--------|---------------|--|
| 1st | Noel Campion | |
| 2nd | Barry Kennedy | |
| 3rd | George Ryan | |

| Intermediate | | |
|--------------|----------------|--|
| 1st | Pawel Plesniak | |
| 2nd | Donal Cullitan | |



F3N Round 2 - CMAC

The second round of this year's 2017 F3N competitions was held at the Cork Model Aero Club in the Brinny site on June 25th. Unfortunately, due to a death in the club of our landlords father Herbert, the competition had to be postponed for two weeks. Thankfully, the weather was dry – mostly – and winds were kind – enough to allow for a great days flying despite small numbers competing.

That morning we registered 6 pilots, three in the experts and three in inters. The Contest Director for the day gave the pilots briefing going over what the day would entail and safety protocols and site specific directions. This followed by a calibration flight from George Ryan to get all the judges scoring evenly. The judges on the day for F3N experts were Jamie Hourican, Pawel Plesniak and Christian Moulder. For Intermediates was Jamie, Christian and Barry Kennedy. Unfortunately, and testing a newly built machine one of the Inter pilots had a mechanical malfunction and the resulting crash caused him to pull out of the competition. Thankfully, that didn't spoil the day and we got on with the competition.

The running order was drawn and first round begun with experts set manoeuvre round one. It was obviously going to be a great competition with all the pilots picking super high K. factor manoeuvres but the wind picked up and didn't help scores. Next we swapped judges for intermediates sets with Pawel taking to the sticks and doing very well after not flying for two weeks. He made excuses about getting married - priorities Pawel!

We then had the F3N experts' freestyle round where precision and difficulty provide the biggest gains for scoring. George Ryan gave us a display that made it obvious he had been practicing in preparation for this year's F3N World Championships in Poland in July.

At this stage Noel had won the first sets round and freestyle with 1000 points in each and in inters Pawel was ahead of the posse with 1000 points so it was all to fly for.

We were all starving so we broke for lunch with plenty of pasta bolognaise and loads of tea and coffee consumed we were ready for experts set manoeuvres round two where all the pilots seemed to have polished their manoeuvres just a little bit more. This was followed by inters freestyle round where you could see a vast improvement in Donal's flying from the Waterford competition.

Lastly, we were treated to a super display of skills with the experts' music freestyle. Here harmony and creativity are the highest scoring categories.



Pictures above show Waterford Model Flying Club presentation to Winners by Richie Price club chairman, and group photo.



JET TALK

WITH GEOFF GRICE

Before writing this article I read my last article and would like to complement the point I made about fire extinguishers. CO2 extinguishers are the preferred type for dealing with 'hot start' type fires. If you are unfortunate enough to suffer a high speed crash and burn scenario, your best option is to extinguish any resulting fire with foam or powder. These type of extinguishers can treat a larger burn radius than CO2 and also protect against 'flare ups' where pools of fuel are sitting in a hot zone that may re-ignite after initial extinguishment. Another potential issue with CO2 is that the rush of gas can spread burning objects around like leaves being blown in the autumn time. In my view though having any type of extinguisher is better than nothing so be prepared folks!



Photo credit: Humberto Rodrigues (source: Facebook)

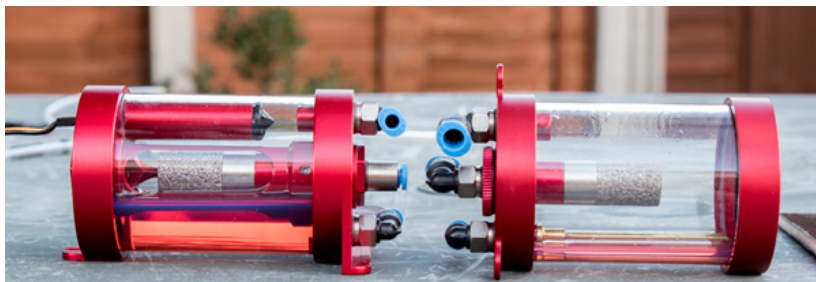
By the time you are reading this, the Weston Park RC show (UK) will have been and gone and I'll have some photos for you in my next article. One thing I expect to see at the show is the influx of GIANT jets whereby last years big (3m) wingspan Leonardo, Rebel Pro and Tomahawk XL Futura have now been surpassed by the gigantic size HAVOC by Elite Aerosports, 4m Redwings Leonardo and Tomahawk XXXL L39. While I can't imagine ever owning (or storing/transporting) one I am looking forward to seeing some of these models up close and in the air. They

do seem to have quite ingenious design where they break down in to smaller more manageable components that can be constructed at the flying site. And another interesting advantage of the bigger models is that our bumpy grass runways upset them less, and they can handle a stiff breeze or crosswind a lot better. My largest jet is the Pirotti Rebel at 2m wingspan and I find this to be very good with ground and wind handling. I wouldn't rule out going one size larger in the future but due to the required trailer/hanger needed for even bigger I can't see myself going for a HAVOC etc without a lotto win first!

Super sized XXXL Tomahawk L39 - Pilot Marc Petrak at Jetpower 2016 >

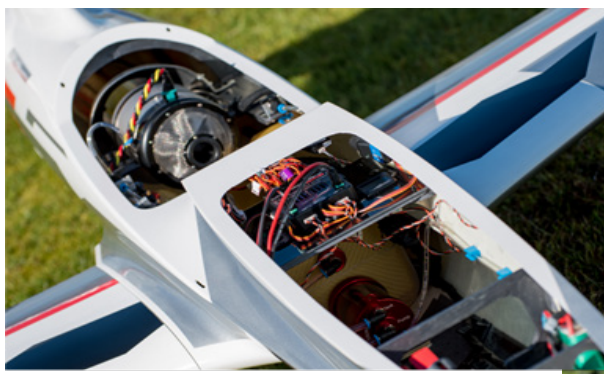


I've been quite busy for the last month flying and tweaking my jets, one very interesting advancement in technology has been the development of the 'telemetry bubble trap' or iTrap by Intairco. You



iTrap on the left with pressure sensor seen at the top. Standard Intairco super trap on the right fittings are interchangeable

may or many not be aware but large bubbles in the fuel line are the enemy of the jet pilot, some engines are more finicky than others but on the whole even just a few small bubbles directly in to the turbine can create a flame out scenario and accompanying dead stick landing. For years Jet pilots have countered this by installing bubble traps (or header tanks as we called them in the glow heli days) to try and ensure our turbines will run smoothly and consistently. They achieve this by always having the bubble trap full of fuel and working as a buffer before the fuel pump. But alas, if you are unlucky enough to have a poor seal on an upstream connector, or perform just one too many aerobatic manoeuvres, or are having too much fun and don't watch your run timer then your bubble trap can take on air without the pilot knowing this and problems can arise...



Bubble trap fed from fuel tank and supplies kero to fuel pump before turbine.

as that. The iTrap is compatible with Futaba, Jeti, JR, Multiplex and my favourite Spektrum radio systems that are equipped with telemetry receivers. More information is available at www.intairco.net

For those that prefer electrics to Kero, Sebart have released some interesting EDF options in the past few months - their Mini Avanti 70 & 80mm foam option are an attractive price and promise impressive performance, as is the part composite Avanti XS which can be configured with in either electric or turbine setup. I have

been really impressed with the flying characteristics of my own Mini Avanti turbine and the quality of the included retracts and wood (where used) is just excellent. Well worth a look!

Well that's all from me this month, don't forget if you're interested in branching out in to jets and need some help reach out to me on Facebook and I will try and put you in touch with someone an experienced jet flyer in your part of the country. Until the next issue, wishing you many happy landings!

~ Geoff



Avanti comes in several sizes and colours – the whole range fly great!



Geoff Grice with Rebel etron – Photo courtesy Jason Cleary

CONTROL LINE NEWS



Irish Nationals Saturday 9th July at Ringcommon Sports grounds

For the second year in a row Ringcommon was the agreed site for the Irish C/L National Championships, a move from the Brinny site in Cork. The competition had been confirmed weather-wise the previous Thursday. The forecast was for light winds and cloudy sunshine all day and for once it was dead accurate.

Entries were down this year as Kevin Barry could not make it and Chris Gilbert opted not to fly due to lack of opportunity to practice and to test fly his model. Maurice Doyle and Peter Bradshaw travelled from Northern Ireland. Ivan Bolton and Stuart Holland travelled a very much shorter distance! John Molloy kindly agreed to judge the event. It was decided to fly the usual 3 rounds in F2B best 2 to count and 2 rounds in Classic with the single best score to count.

Maurice having done the flight for the Judge the competition began in a timely manner at 10.45. Peter Bradshaw starting the flying with his ST 51 powered Blue Pearl with his ST 51 purring beautifully. Then followed by Ivan Bolton (Electric Stiletto), Stu Holland (electric Cardinal profile) and Maurice Doyle with his venerable ST60 powered Aquilla with again as usual a beautiful engine run.

The only serious problem encountered was that, what wind there was kept shifting. It was very hard to decide where to ask the judge to sit and poor John Molloy would have needed wheels on his seat as he was asked to move repeatedly when each pilot struggled to judge the wind for his flight. Most of us encountered what breeze there was coming from a less than favourable direction at some point during our flights, despite the aforementioned careful positioning of the judge at the beginning. Also the grass on the football pitch was a little long, making take offs a little tricky. In round 2 Ivan Bolton broke the wooden prop when his Stiletto tipped up on take off. An attempt was called and he then opted to fly his Shark 45 in the round due to lack of a spare prop for the Stiletto.

The last two rounds were flown after lunch by which time the wind had settled to a gentle southerly breeze. The standard of flying, as usual, improved as the rounds progressed. Stu Holland at last edged ahead of Maurice Doyle, having been nipping at his heels for years, to win the competition with Maurice a close second, Ivan Bolton was third and Peter Bradshaw fourth.

The two rounds of classic were flown with Maurice flying his venerable Warbuton designed U2 with ST46 for power. Stu Holland was flying his Fox 35 powered Smoothie and Ivan Bolton flew his Shark 45 powered by a Saito 56. Both Stu and Ivan had over runs: the record was set by Ivan at 9 minutes, instead of the regulation 7 minutes. Results of the Classic were in the order above.

So ended a truly great day's flying. The Ringcommon site is ideal for control-line and earlier this year impressed our UK visitors when the Home International was held there. Thanks to Chris Gilbert for handling the score-sheets and calculating the results on his dedicated spreadsheet program.

Photos below : 1 Maurice Doyle's Venerable U2 which won the Classic competition 2. the pit area. 3. Ivan Bolton releases Chris Gilbert's Happy Hour as he attempts a test flight. 4. Classic results and scores 5. F2B results and scores



| Competitor | Pilot | Model | Motor | Round 1 | Round 2 | Round 3 | Best 2 | Placing |
|------------|---------------|-----------------|----------|---------|---------|---------|---------|---------|
| 1 | Maurice Doyle | Warbuton U2 | ST46 | 913.00 | 909.00 | 0.00 | 1822.00 | 1 |
| 2 | Stu Holland | Palmer Smoothie | Fox 35 | 719.00 | 898.00 | 0.00 | 1617.00 | 2 |
| 3 | Ivan Bolton | Shark | Saito 56 | 747.00 | 722.00 | 0.00 | 1469.00 | 3 |

| Competitor | Pilot | Model | Motor | Round 1 | Round 2 | Round 3 | Best 2 | Placing |
|------------|----------------|-------------|-------|---------|---------|---------|---------|---------|
| 1 | Maurice Doyle | Aquilla | ST 60 | 883.00 | 890.00 | 903.00 | 1793.00 | 2 |
| 2 | Stu Holland | Lekkie Hour | E-max | 882.00 | 871.00 | 927.00 | 1809.00 | 1 |
| 3 | Ivan Bolton | Stiletto | E-max | 783.00 | 875.00 | 842.00 | 1717.00 | 3 |
| 4 | Peter Bradshaw | Blue Pearl | ST51 | 720.00 | 743.00 | 846.00 | 1589.00 | 4 |





The 9 French pilots (spot the Irish!) that enjoyed Slope Soaring for a week in our beautiful slopes back in April



Taborca ready for launch - NhalyN Yve - Mt Leinster - April 2017



1/3 Scale Grunau Baby IIb being launched at Mount Leinster - Co. Wexford - April 2017



Munsters F3a Shanes Axiome taking off