



Great Britain Radio Control Aerobatic Association

AEROBATICS

NEWS

Newsletter of the Great Britain Radio Control Aerobatic Association



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G.B.R/C.A.A. COMMITTEE 2002



Aerobatics News is the official publication of the Great Britain Radio Control Aerobatic Association.

The content is determined by the Editor, hence any opinions expressed, except by way of official minutes of a meeting, do not necessarily reflect the opinion of the Association or its officers.

All contributions to the newsletter are gratefully received. Any artwork, photographs, computer disks, etc. which require return should be made clear by the sender. However the editor cannot be held responsible for loss or damage to such items.

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Aerobatics Editorial

Front cover

shows the finalists at the Torni de Champagne, which took place in Romily Sur Seine, France earlier this year. Nine pilots from the UK attended and seven of these made the top 30 cut-off for the fly off's. In addition, two pilots from the Irish Republic Shane Robinson and Hamish Galloway also attended for the first time. It is hoped to do photo report on this event for the next edition, that is if some one sends me some photo's!

Models which were evident included the usual candidates ZNLine Alliance, Synergy and Evolis variants, PL Smaragds, TWO Angels Shadows which included one with a prototype new wing (shorter span, more tapered, thinner tip section) which allowed it to snap very axially. Power wise many YS Dingo's were present and all performed very, very well sounding smooth, quiet and dragging models all around the sky without effort. Also present were OS F1 engines (used by Patrick Lemmonier to perform 4 consecutive vertical snaps and still carry on upwards with his Smaragd Z design).

Landing points were implemented for the first time at the recent Cashmoor event.

Myself and Richard Christopher were the judges in place for the Senior and Standard pilots who attended this event. I must say that it did feel quite odd to be watching the model all the way through the flight. However I can report that take off's seemed to be much more controlled and really gave for a much better presentation generally.

I have to admit however that since this was first implementation of take-off / landing points I wasn't really able to judge them that accurately according to the downgrades listed in the March newsletter (and also on the web page http://spinmail.com/gbrcaa/scoring_of_take_off.htm). I basically concentrated on the takeoff tracking straight with no bouncing, wings level, climb out not to steep etc, then a clear 90° turn out followed by a clear 270° turn downwind, all with out wing wobbling etc. Any tracking errors were dealt with using the 15° rule.

For landing I immediately looked for the level or descending turn following the last manoeuvre, straight approach without any wing wobbling and a smooth landing without bouncing. I have to admit to not realising to penalise any diving and climbing on the downwind leg, but I'll catch it next time. On average scores ranged between 4 and 9 with a k-factor of 2 and of course the promotion points were increased by 12 points to accommodate this.

Generally although somewhat unsure of how this would turn out, I think this aspect of the scoring the flights performed its task very well and really cleaned up the landing and take-off's that I saw that day.

Lack of local events

This phenomenon continues to haunt the GBRCAA this year. However even when events have been run, some poor attendances have resulted (Cashmoor: 9 pilots, Brian Brotherton Memorial: cancelled due to too few entrants). I simply cannot understand what is going on here and no one seems willing to suggest why. One problem reported by a number of CD's has been the lack of available judges as comments suggest in some of the competition reports included in this issue. I put this problem to our Chief judge Bob Ailles to which he replied:

"So far this year I have had one phone call asking for judges for a club comp and this was five days before the comp and on the same day as a Centralised, and after the CD had phoned all the judges in his area. I need more than 5 days to find judges, two weeks or more is preferred, as judges do like to spend some with their families at weekends.

I have not been asked myself to judge a single club comp this year, yet I hear competitions are being cancelled for lack of judges and pilots. In previous years I have been asked to judge as many as 10 club competitions in a year. I am not the only judge who has not been approached, so what's going on this year? If CD's would like a copy of the judging list and their telephone numbers please contact me as soon as you decide to hold a competition, this way we might be able to find your judges for you".

Well personally I can't grasp why with so few competitions available this year why they are not max'd out with entries. If you know, please forward your comments to any committee member and we'll do our best to rectify this situation.

League tables

I have for the first time included the GBRCAA league tables in this issue for the first five events of the season. A problem has however arisen in the way competition scores are calculated by CD's before being forwarded to me and this affects the points gained in the league table. In fact its possible for one pilot to win the event on normalised round points with another winning it on raw points! Essentially local competitions are scored in two ways, either raw scores are totted up after dropping the lowest round and the winner is then the pilot with most raw points, or in the other method, each round is normalised to 1000 and then the lowest normalised round dropped before summation. When processing these data I have been normalising the results to 1000 for the winner of each class. However this only works if all competitions are scored in the same way and unfortunately this has not been the case so far. The result is that some pilots lose out in either method and I'm sure that this is going to lead to some discontentment.

To deal with this problem I suggest that from now on, we score all local competitions in the same manner and for simplicity I further suggest that we stick to the addition of raw points with the lowest raw point round being dropped (i.e. 2 of 3 or 3 of 4 rounds counting). When the CD forwards those raw scores to me I will use the super powerful GBRCAA newsletter computer to calculate the normalised scores and add these into the league table. I know normalising each round is in principal a fairer method but most CD's do not have PC's / printers with them and this method would just serve to encumber them further. Next year we may decide to score all competitions using the normalising route but for this year I strongly suggest we stick to the raw score method.

New Stuff

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Fuel is pressurized from 2 to 12 P.S.I. in the fuel tank by a one-way check valve with the pressure from the crankcase of a two-cycle engine or from the exhaust of a four-cycle engine. This forces the fuel to the controller under that P.S.I.

The controller is mounted either beside or directly behind the engine.

The carburetor's fuel line suction acts on the diaphragm in the controller causing it to open the fuel valve in the controller. It is a demand controller; thus as the carburetor's fuel line suction increases, the amount of fuel the controller passes increases. When the engine is stopped, no fuel can enter the carburetor.

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The FiberClassics Revolution Pro is a revolutionary design made from Total Area Vacuum Sandwich Composites (TAVS-Technology). High strength and minimum weight are the characteristics of this new production technology. All surface area is molded vacuum sandwich. Not one structural part is a simple fiberglass layup. This results in the strongest and lightest parts your money can buy. On top of this the complete aircraft is painted in the molds, so that no additional paint (weight) is necessary. The aircraft comes completely built. There is no "kit" available, as the light weight design should be set up and aligned in the factory to guarantee the top performance. Landing gear, servo and engine mounts are preinstalled and the use of certain servos and engines is strongly recommended in the manual. This is to guarantee the perfect flying characteristics. With a FiberClassics Revolution Pro you own one of the top notch contest tools available around the world. And this is what FiberClassics stands for, since the latest FiberClassics TOC-Aircrafts showed up. We developed and refined our manufacturing methods to offer you world leading composite work for a still affordable price. Of course not "cheap". But valuable

Specifications:

- Span: 199 cm (78.3")
- Length: 199.5 cm (78.5")
- Weight: 4300 g (<9.5 lb)
- Engines: OS 140, YS 140
- UC: Fixed or retracts
- Paint Job: variable schemes

Fuselage: TAVS-Technology, hatch and canopy mount installed, mounts for engine, fuel tank, servos installed, wing tube and stab tube aligned and installed. Hatch with laminar air intake and well designed exhaust and cooling air outlets, TAVS-Technology. Canopy frame with mounts, clear canopy installed. A firewall and a horizontal engine former are preinstalled as well, ready to accept any soft mount of your engine.

Wings: TAVS-Technology, carbon sandwich spar, optional retract mounts, aileron skin hinged, control horns and servo mount installed. Wing fillet molded into the wings' root area, a 30 mm seamless carbon wing tube is included. Wing incidence can be adjusted and modified upon personal preferences.



Stab: TAVS-Technology, mini servo mounts in root rib preinstalled, but a single fuselage mounted servo can be used as well. Carbon tubes are preinstalled and aligned, the fillets are molded into the root rib area, so that the incidence is adjustable. Elevator is skin hinged, control horns are installed. Additionally available are **3D-Freestyle wings and stabs**. These wings and stabs have huge control surfaces with high rate deflections. Pattern wings and 3D wings are immediately interchangeable.

A molded carbon fibre **landing gear** (retracts optional), a molded spinner and an owners manual with setup hints complete the airplane. All accessories like wheels, wheel pants, linkages are included and/or installed.

Engines:

The aircraft is well suited for all common pattern engines, as there are OS 140 FI, OS 160 FI, and the range of pattern four stroke engines of OS and YAMADA.

Accessories:

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UK dealer: Alan's (Whitley) Model Shop, Tony Cook Phone: 0191 253 3682 Sales@alansmodels.com

New Webra 145

The ideal motor for your F3A aerobatic model - tested and proven at World Championships level. A lightweight motor in its class, its overall design produces a dynamic, high-power motor which offers excellent "pull" through all manoeuvres - the two-stroke motor with the characteristics of a four-stroke. The Webra AAR*) piston/liner makes this a powerful, smooth-running motor which requires little nitro-methane in the fuel. This motor also features the proven integral Webra membrane fuel pump.



Continued from page 3

GBRCAA Championships

These will take place on October 5th and 6th and will hopefully serve as the highlight of the year for GBRCAA pilots of all classes / judges / supporters. Good weather is always the case for this time of year at the Middle Wallop site so please come along and make this the fantastic event that it deserves to be. Rumour has it that a round of Artistic Aerobatics might also be included. Finally this event will serve as a double score for all classes in the League Table so as the winners of the league will receive some recognition at the AGM this year it is well worth you coming along. Entries to Kevin Caton please at the address on the in page.

And finally

I have to ask for a volunteer to continue in the role of Newsletter editor as after four years I am standing down from this position at this year's AGM. It is not really a decision I wanted to take but for various personal and professional reasons I cannot continue to perform this role to my liking and I'm sure that there must be someone in the GBRCAA who can continue to produce the newsletter to a similar if not much better standard.

Hope you see you all at the Nationals and then the Champs.

Keith Jackson
GBRCAA Newsletter Editor

Chairmans Page

At the time of writing Summer seems to have arrived, after a long wait. Although the Centralised events have enjoyed reasonable weather, the Triple Crown at Maidstone was unfortunately cut short due to low cloud on the Sunday. This was a real shame for the Maidstone Club who had put so much effort into organising the event, and for the competitors, especially those who travelled from Ireland and Scotland.

We finally held a Committee Meeting in June and sorted out some long overdue items. The Masters Schedule is finally approved for use. This took longer than it should have done and I know this has caused some frustration. I was keen that we got this one right and on balance I felt that it was better to take more time to get a schedule that would be successful, than it was to get a schedule approved quickly with the risk that it would not gain acceptance from the pilots. I hope you think that the wait has been justified and I look forward to seeing the schedule being flown.

Preparations for the Nationals are well in hand. CD Brian Hoare has planned the event around the single flight line that we have this year. This will mean fewer flights for each competitor but will enable the judges to take breaks during the weekend. Please remember that the emphasis should be on quality rather than quantity. Fewer flights make each flight more important so see it as an opportunity to make each flight your best effort.

As I have said before, there have not been as many local competitions this year as in previous years. While there is little I can do directly to change this situation this year, I hope there is sufficient interest to make the GBR/CAA Championships a success. There are potentially five classes to be flown at this event and I would like to see the event as a 'finale' to the flying season. I shall be the CD for this event so please send your entries to me at the address above.

I have just finished cleaning off my building board ready to start my Evolis when I return from holiday. This will be my first 'full build' since my first Fashion in 1999. I just hope I haven't forgotten how to build. There is something quite satisfying about getting the workbench cleared of all the clutter that accumulates from maintaining your planes in flying condition. I thought it would be best to clean the bench just before going away so that I can have no excuse for putting off the start of building when I get back. Let's hope I'm right!

Watch out for an update on building progress in the next Newsletter. Until then, good flying and I hope to see you at the Nationals.

Kevin Caton
Chairman GBRCAA

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Team Manager's Report

First, the Triple Crown.

No doubt there will be full report elsewhere in this issue but it's nice to know that the RCM&E Trophy is back in England. Scotland were second, International third and Ireland fourth. Individually, Brandon Ransley - England won the top pilot award and Angus Balfour - Scotland was second (both UK team members - just in case you didn't know). However, only two rounds on the fine and warm Saturday with day two a wash/grey out with first rain then low cloud and only 5 schedules flown before the competition had to be abandoned. Bad luck on the Scots who were lying a close second with all to play for in the surrendered rounds three and four

Brandon flew a super practice F03 and made me full of hope for Zamora. Angus admitted that he was concentrating on P03 because he is looking for 2003 WC team selection but, after the 4th Centralised there will be no more team selection events until we return from Spain so he will soon be getting in some F03 practice. Angus put on a very nice artistic display to music, don't ask me what the tunes were. No criticism of Angus' skills but for some reason John Harrop calls this event autistic aerobatics - I suppose, as a musician, he should know!

The Committee and members of the Maidstone Club put on a fine event, their site lends itself well to this kind of do with plenty of good B&B in the area and room on the site for quite a bit of camping too. They even laid on loos, thanks chaps. We had a very friendly time at the Saturday evening banquet which took place at a local golf club following which we all slept very well. Special words of thanks are due to CD and chief judge Bob Ailles (who, only days after surgery, kept going against all the odds), Assistant co-ordinator Mike Le'Mmon and Field Manager Mel Broad and their respective families who kept us fed and watered throughout the weekend.

Nexus (RCM&E) not only provide the trophy but were also major sponsors donating the very fine medals as well as printing the informative souvenir programme. The GBRCAA also supplied financial support as did Pro-Build plus about ten programme advertisers. Unless you attend or read a programme you don't realise how much effort goes into hosting one of these events. Just goes to prove how wrong all those Jonahs who complain about "the others" are.

Now, where next? Ah yes, the fourth centralised at Wroughton. See a full report for all the results, this is just a taster but it must have been one of the best flying days of the year, hardly a breath of wind, strong sun all day, great company and non stop flying. Wroughton is the Science Museum's storage depot and an ex WWII field hospital, a wonderful site where all disciplines co exist in perfect harmony. Wroughton has been unavailable to us for a few years, now, thanks to the efforts of Dave Owens and a change of administration at senior level, we were welcomed back. A minor setback is that of noise restrictions which limit flying to the hours between 10.00am and 6.00pm. The competition started at 10.03 and the last pilot in round three landed at 5.58pm, it was touch and go to squeeze it all in, with three very tired judges after 45 flights. We barely had time to swallow a sandwich! The result was close with only about 7.5% of normalised scores separating the first 6 all of whom were either current or past UK Team Members. Brandon Ransley won rounds one and two and Dave Matthias won the third so that was them first and second with Keith Jackson third.

I now mount my hobby horse to respectfully inform you that nobody listens to me. Except you of course, otherwise you wouldn't be reading this. So you obviously aren't one of the many pilots who throw away huge chunks of their scores by failing to make their verticals symmetrical. This is really sore thumb stuff for the judges so if they see that bit of straight after the rolling element and before the pull out radius particularly on downlines you will get a better score, that's a guarantee. That doesn't mean tightening the radius, it just requires the straight before the roll to be less exaggerated to give you a bit more time to fit in the rest of the manoeuvre.

I've just seen a report on the World Scale Champs in Canada, where the top placed brit was Mick Reeves whose ubiquitous Sopwith Strutter was 6th. Things would possibly have been different if Pete McDermott hadn't had to scratch after his horrendous starting-up accident. There's a lesson for us all there if even the world's most meticulous modeller can make such a mistake. If you're interested in the "finer arts" you can see all about the Scale WC, with some great pictures, at:- www.rcmodelgraphics.com/worlds. Anyway, getting to the point, it was just to tell you that it doesn't only happen in F3A. To quote the report "The scales were a mystery, 5 of us were 100gm overweight, I and other's including the World champion had weighed most carefully at home. Lhuti did find that his model was 50 gm heavier in the afternoon so it must have been moisture absorption." There you are you see, you don't just soak up knowledge on the internet.

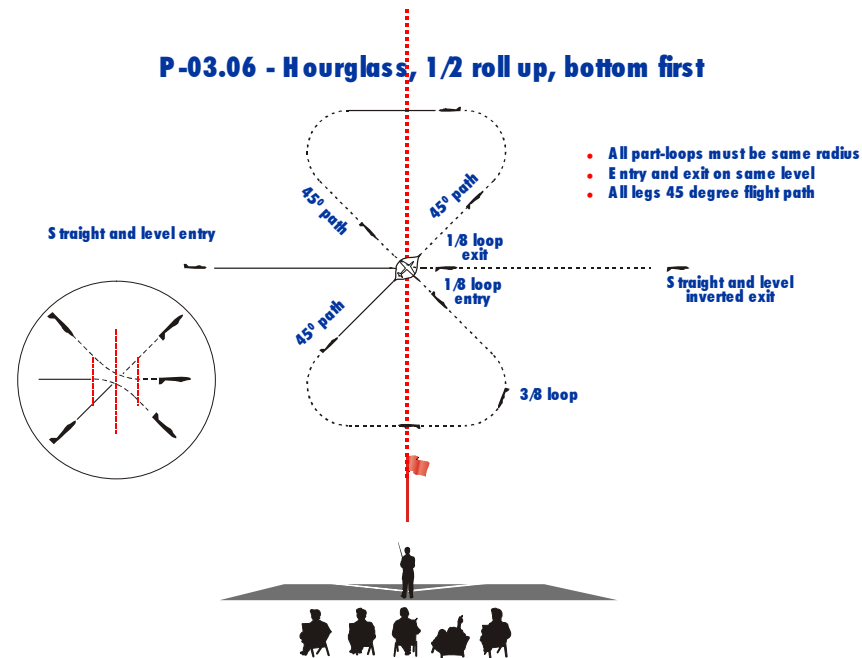
The next time I address you through the good offices of Aerobatic News we will be back from sunny Spain and the 11th European F3A Championships at Zamora which takes from 31st August to 7th September. With a bit of luck daily details will appear on the organisers website at <www.caz.helcom.es> under the heading Campeonato de Europa. The direct access is www.ec2002-f3a.helcom.es/indice.htm. You should also be able to see some interesting information on the Flying Colours website at design@telemole.com or by clicking on the Flying Colours logo on the GBRCAA Homepage. If you don't know about Flying Colours yet, well now you know where to go to improve your knowledge.

Regards,
David Tappin - UK F3A Team Manager

Tricky Manoeuvres in PO3

This article is just highlighting some of the points raised at Bob Skinners excellent presentation at the judging seminar in March.

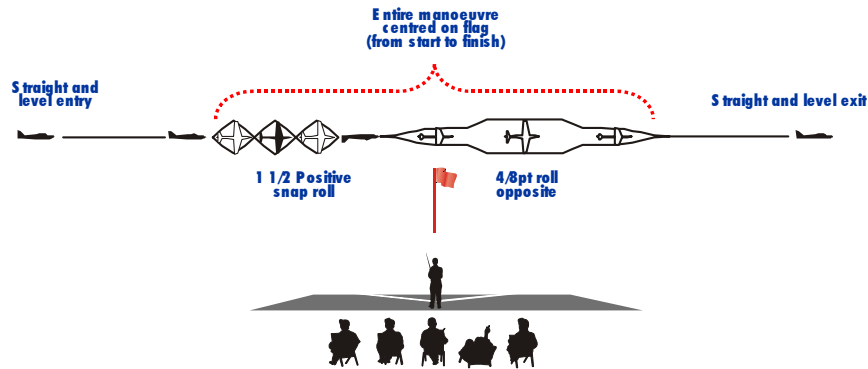
Firstly we have the hour glass and the subtle point here was first raised by the ever attentive Mike Wood who asked the question “when do you push to start this manoeuvre?”. This apparently obvious question is not at all obvious when you consider the geometry of the figure. It can be seen clearly that the point at which down elevator is applied is NOT on the centre point of the box, but slightly before it and this is a requirement to allow radii on the start and finish points whilst having the 45° legs in line with each other. I wonder how many pilots do this intentionally ...?



The second conundrum is, but should not really be problematic, but it is clear that after talking to a number of pilots and judges that confusion exists with the judged length of this manoeuvre and where the centre point should be judged to be. The most common statement is that the snap should be close to or on the centre point. However using the criteria from the seminar, the whole manoeuvre should be centred and this then is a function of the roll rates of the snap and 4/8 point roll, and the speed of the model in combination with the delay just after the snap. The centre point is obvious when the figure below is considered. Thus it appears that the roll rates can be as slow or as fast as the pilot desires as long as the manoeuvre is centred and that the criteria of smoothness and gracefulness is not compromised. This implies that the manoeuvre can be made as short or as long as possible. This being the case it should be possible to do the snap some way off centre and fill the rest of the length with a suitably slow 4/8 point roll.

P-03.10 - 1½ positive snap, 4/8pt roll opposite

- Snap roll must be positive
- Entire manoeuvre centred over centre flag
- 4/8pt roll must be opposite
- Roll rate same
- Points of equal duration



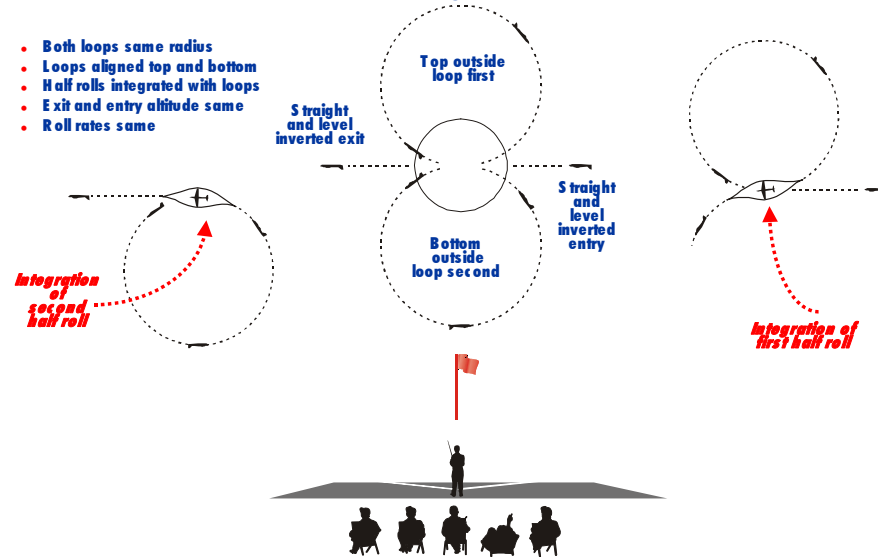
The last odd manoeuvre is the figure 8 with two half rolls and really there is nothing particularly odd about this except that the integrated second half roll has its first quarter along a radius and its second quarter along a straight section of flight. Tricky, I'd say and I've yet to see this convincingly flown, even by CPLR !

Well I'd be grateful for comments regarding these points, so please write in. Thanks to Bob Skinner for the illustrations.

Keith Jackson
GBRCAA Newsletter Editor

P-03.20 - Rolling 8, 1/2 rolls on middle, exit inverted

- Both loops same radius
- Loops aligned top and bottom
- Half rolls integrated with loops
- Exit and entry altitude same
- Roll rates same



Reply to Tricky Manoeuvres in P03 article

Before publishing this newsletter I forwarded the last article to Bob Ailles for his comments. Here is his reply. Ed

The question asked by Mike Wood concerning the Hourglass

“When do you push to start this manoeuvre?”

Well you should start to push just before the centre line, and the 1/8 radius should be pushed quiet tight to gain the right angle for your first 45-degree down line. This line sets up all the line lengths in this manoeuvre and although the first 45-degree line and the bottom line are not downgraded the rest are, because they have part loops and rolls in them.

The next important parts are the 3/8 loops, these should not be flown too big, and they need to be tighter than in a normal loop to keep the shape of the manoeuvre. Now we come to the entry and exit both 1/8 part loops should be of the same radius, and entry and exit at the same altitude. Where some pilots go wrong with this manoeuvre, is the first push down is fine and the 45-degree down line ok, 3/8 loop ok, straight and level on base line starts to drop off, the next 3/8 loop is pushed too tight, which means the 45 degree up line is too shallow and the roll is not in the centre of the line nor over the centre marker when in knife edge flight. A lot of flyers do drop off the line after the roll. Now the 45-degree up line is now even shallower so the next 3/8 loop is pushed even tighter and the whole shape of the manoeuvre has been compromised! We still have four more parts of this manoeuvre to fly, the top line which tends to drop off, the 3/8 loop which is under pushed and the last 45-degree down line is too steep and the last part of all, the 1/8 loop which is made too big. I must say that most of the top pilots are flying this complex manoeuvre well and receiving good marks, but more marks can be gained with a bit more grace and precision.

Question two P.03.10 1 ½ positive snap, 4/8 pt roll opposite.

Well Keith this is when all pilots need to read the rulebook about positioning of manoeuvres 5 B .4.5. but I will try to answer the question as best I can. If you read the rulebook for the judging criteria on this manoeuvre, there should only be a brief hesitation between the snap roll and 4/8 pt roll. When centring this manoeuvre you have to include the straight and level flight before and after the manoeuvre

Where do you start your snap roll, well that depends on you and if you like to snap fast, You might think you have to snap closer to the centre, this may not be the case as you still have the 4/8pt roll to fly, the 4/8 pt roll can be flown as long or short as the pilot wishes but must show all points in the roll. They must have the same time delay on all points to gain good marks, read the rulebook, 5B.4.3.3 rolls (d).

Some pilots like to snap slower and fly the 4/8pt roll at the same speed of the snap. This might score higher than a fast snap because it has more precision and grace as did Brandon Ransley when his snaps rolls scored higher marks than CPLR in most rounds in Romily this year. Is there some thing to be gained from this? Yes the way he snaps makes it easier to judge because it looks more like a snap when flown right and more graceful. I think this manoeuvre is the hardest to position for a pilot and for judges to judge

How do you define a snap roll well it's in the rulebook 5B.4.3.5. A snap roll is rapid autorotative roll where the model aircraft is in a stalled attitude. This means the aircraft MUST pitch positive or neg (to initiate a stalled condition in both wings) and immediately yaw (to keep one wing unstalled) at the entry to the manoeuvre- this is essential. The initial nod and yaw should be followed immediately by rapidly accelerating autorotation. After the correct angle of rotation the roll should cease abruptly without any aileron roll correction, and the aircraft should continue along an axis closely parallel to the extended pre-roll axis.

Question Three: Important points regarding the Rolling Eight.

What's odd about this manoeuvre, not a thing but the placement off the two half rolls!

The first rolls must be integrated into both loops and the model must be in knife-edge over the centre marker. The first part off the second roll is integrated with the loop until the model in knife edge over the centre, and from this point the roll is completed to straight and level flight.

Both loops must be of the same radius, and the entry and exit must be at the same altitude. It's easy to say, but not so easy to fly, how many straight lines can you put in two loops.

Common mistakes made in the Rolling 8.

What stands out the most in this manoeuvre are the size and shape off the loops and the number of straight lines in them. The top loop is always bigger than the bottom loop and the entry and exits are at a different altitude's, the

rolls are very close to the centre and well integrated into the loops. Is it that we are flying this manoeuvre too big to keep the shape and lose points for precision and grace.

The 15-degree rule

A few days ago I received an e-mail from a pilot regarding this rule, (5B.4.2. The 1 Point /15 Degree Rule). This basic rule provides a general guide for downgrading deviations from defined manoeuvre geometry. One point must be subtracted for each approximate 15 degree deviation. In general, lines can and must be judged more critically than deviations in yaw or roll.

The way he reads it is from 0 to say 14 degrees you don't lose anything but at 15 degrees off you lose 1 point, at 30 degrees you lose 2 points. If it is 25 degrees off you still lose only 1 point. I think this all a little vague and is open to misinterpretation. So I e-mailed Bob Skinner on this point and also on the top hat and the slow roll, and he very kindly replied to my e-mail regarding these points Thank you Bob for your quick reply.

My question to Bob was "am I right in thinking that you lose a point from zero to 15-degrees and 15 to 30 you lose one more point, and so on until you have reached when it becomes a zero, or is the pilot right in the way he reads the rules on this point". The reply from Bob Skinner was "you are quite correct when you say one point is for anything off the defined manoeuvre geometry. So, any deviation up 15 degrees earns a downgrade of one, and so on".

My next question to Bob was about the slow roll, as I have been asked of late is how long a slow roll should take in time, my answer to the question was it should be of equal length with side of centre, and should be no longer than 5 seconds. Am I correct in my appraisal of this manoeuvre as there is not any description in the current rulebook regarding slow rolls.

The reply was "slow rolls do not have a time limit, but anything less than 5 seconds would not be smooth and graceful". Obviously those which are too long run the risk of having no straight and level entry and exit from the previous and into the next manoeuvre.

Last question to Bob

"Lately I have been having some debate on the reverse top hat with ¼ rolls. As I remember at the Judging Seminar we talked of this manoeuvre that the radius of the ¼ loops could be tighter than normal as long as they were all the same in radius. But unfortunately we did not talk about if the manoeuvre was rounded at the bottom, should it only be severely downgraded or zeroed. I think it should receive a severe downgrade, as it is only one part of the manoeuvre. Which is incorrect with straight inverted line across the bottom. Do you agree?"

Bob Skinner's reply

"The top is sometimes an inconvenience, especially if the flier is exactly on the line that he wants to be. He is now forced to use this cross-box manoeuvre to displace his model aircraft. In these cases, tighter radii would be acceptable, provided they are all the same. This will ensure that the cross-box horizontal flight is kept short enough to avoid a huge displacement. If there is a complete absence of a straight line, a severe downgrade is in order, but if it blatantly obvious that a reverse humpty bump was performed, a zero is justified".

And finally...How we pick our team.

Are we sending our best-prepared team to European and world championships?

I don't think so, as we only fly the P.O.3, when we should be flying F.O.3, as well as an unknown schedule.

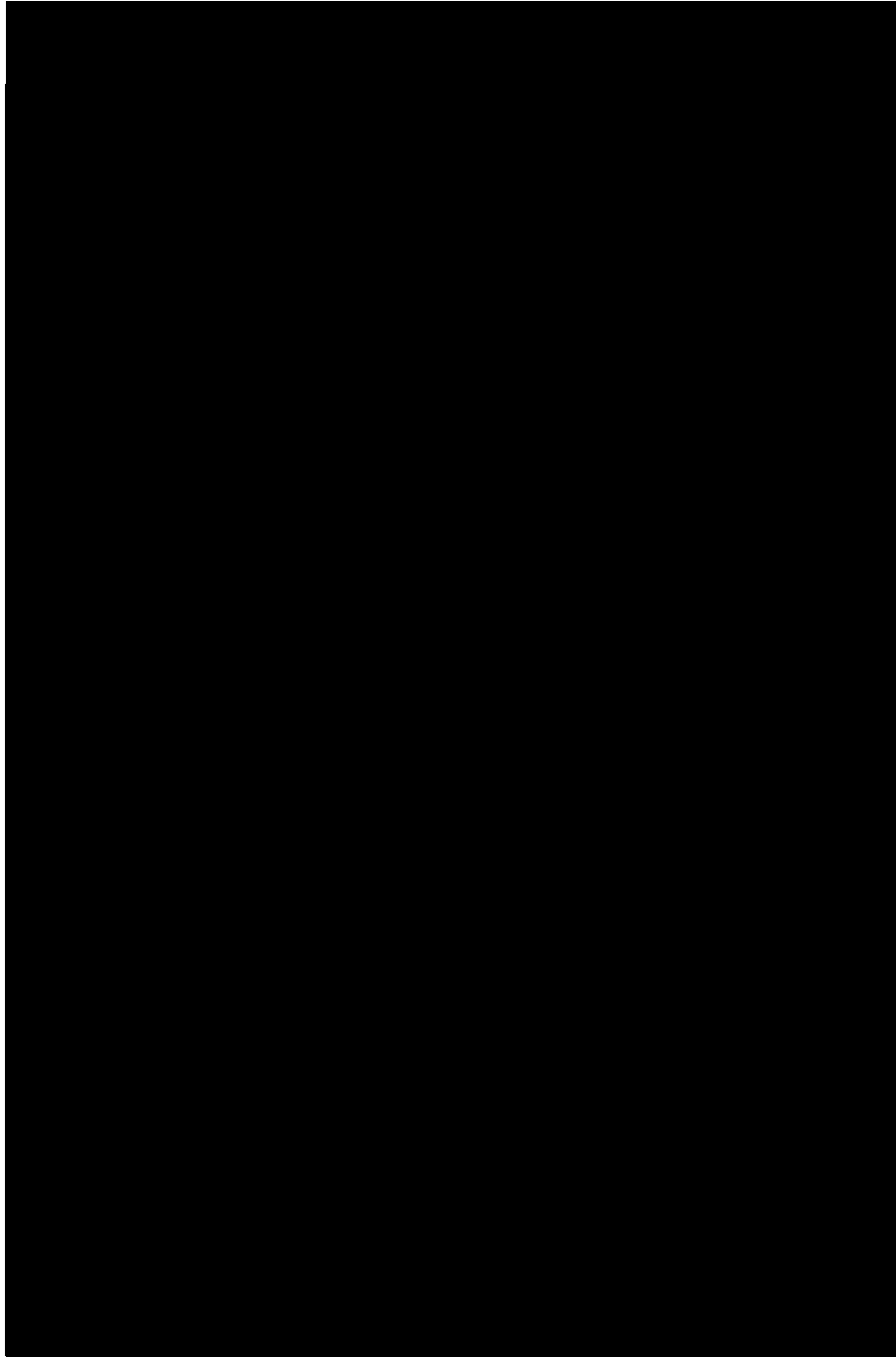
We currently fly 5 centralised events with 3 from 5 to count, with the top 3 pilots going forward as the team. These pilots having only flown the P.O.3 now going off to represent the U.K in a European or world championships without flying or having been judged on the F.O.3. Over the past months we have had one pilot get into the next round at the world championships in Ireland, and happily all but two made the cut in Romily in June with the top 30 going through to a fly off. Ok, in Romily they still flew the P.O.3 in the fly off but what would have happen if they had flown F.O.3 would our top flyer still have been in fifth place, I'm not sure, it depends on whether he practiced the F.O.3 or not, if not then no.

It is for this reason alone we should adopt a two-day team trial with all the competitors from the first 3 centralised events competing and flying three rounds of P.O.3 on the Saturday, and the top ten on the Sunday flying two rounds of the F.O.3 and the top six flying one round off an unknown schedule.

The pilots that did not make the cut would be asked to help with judging and running the event. If we adopted this method pilots and judges would gain from the experience. And possibly flying and judge standards would then improve.

Bob Ailles
GBRCAA Chief Judge

Results from Tournoi de Champagne 2002
Romily Sur Seine
France



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For Sale

* **Wanted- Urgent:** OS Hanno Special Tuned Pipe (the later version, the long-chamber or broadband one)to buy, in good useable condition. Contact Bill Michie at (01279) 504595 or email at michifam@globalnet.co.uk

* **Excelsior 188** with Gator soft mount and EZ retracts tank etc. No servos. Finished in Pink, White and Blue, Two pack
Painted Fuselage, Pro-film on Wing and Tailplane. Price £220.00 ono.
Contact: John Mee email: johnmee@compuserve.com Tel: 0116 237 4792

* **ZN Topline 2**, built by Phil Williams, full set of Futaba servos. AAP pipe, manifold and Hyde mount also supplied. Supra DX retracts. MK ball-raced T-bar. Excellent condition. £600 ono.
Contact: David Balfour on 0141 584 9608

* **Alliance** – 2m F3A model designed by Christophe Paysant Le Roux. This model was professionally built by ZN Line and is finished in White, red yellow & blue - as seen in several pictures in the modelling press. This has been my No.1 model since mid 2001 and was used to gain 2nd place in the Nationals that year. The bare airframe ready to fit your equipment is offered at **£1400**, or I am willing to sell in ready to fly condition with motor & radio, or any condition between, with the price negotiable to match. It is built for a YS140L on a Hyde mount with Hatori header & pipe. The radio is Futaba with 9102 servos on ailerons & 9204s on elevator & rudder, 9601 on throttle and S136G on retracts. All MK fittings on the control surfaces. The airframe is in first class condition. This model will be available immediately following the BMFA Nationals. Photos available on request.

* **Fashion** – 2m F3A model professionally built by ZN Line. White, red, yellow & blue finish (same as the Alliance above) – as pictured in the modelling press. This model was my No.1 during 2000 and was flown in the European Championships that year. I'm offering it for sale complete with YS 140L on the YS soft mount, Hatori header & pipe. Also all airborne radio with Futaba 9102 servos on ailerons & 9204 on rudder & elevator, 3102 mini on throttle and S136G on retract. Retracts, prop, ZN aluminium spinner and all MK accessories included. This plane is in excellent condition and is absolutely ready to fly –just add fuel (and a transmitter of your choice!). **£1800 ready to fly** or I am willing to split if you only want the airframe or any combination of the bits listed. Photos available on request

* **Odyssey** – 2m F3A model. US design professionally built by Sam Turner USA & finished by myself. Plug in wings & tail & epoxy glass fuselage. White, purple blue & yellow finish. Fitted with Hyde soft mount. This was my No.1 model in 1998 and was used to win the Nationals that year. Very tidy condition **£500**

* **Hatori 4 stroke pipe & header** for Odyssey - **£50**

* **Futaba 9ZAP transmitter & carry case** - Six years old but is in absolutely mint (and I mean mint) condition with new stick pots, NiCd & aerial fitted in 2000. Includes switch harness & airborne NiCd. This transmitter has been used very little in the last year as I bought its replacement last August! **£300**

* **YS140L engines** (2 off) with new YS pistons last year. Both engines have low running hours. **£250 each**

Also several **Futaba 9102 servos** – fair wear & tear (ie a little gear slop but no more than a brand new 148!) but quite suitable for aerobatic use and more than suitable for anyone just starting aerobatics. **£15 each**

I also have a Goldberg Ultimate kit, which I have been "preparing to build" since I bought it in 1992 (!). The kit also comes with a fibreglass cowl and spats and must be good value for an enthusiastic builder at £60.

Contact Kevin Caton at kevin.caton@btopenworld.com or call 01986 874767

* **Sebino Staudacher kit** for sale. Untouched in box, accept £150 or near offer. Will discuss postage or delivery.

* **Webra 120 side exhaust**, new in box. £150 ONO
Contact Steve Dunning 01302 886279 or dunnhome2@tinyworld.co.uk

Exhaust mounting

Personally I used to find mounting exhaust systems quite frustrating with the YS140 engines. High temperatures coupled with high vibration amplitudes meant that even the best commercial exhaust mounts always failed after some period of time. A typical good looking commercial system is seen in the picture below as two white PTFE sockets of which the smaller “plug” fits on the pipe end and the larger socket fits onto the manifold; one plugs into the other and voila a perfect seal results and all looks neat and dandy. That is for a month or two depending on how frequently you fly and on what nitro you use. After some time the PTFE will flow and stretch and that perfect seal soon disappears allowing all the exhaust muck to spread inside your model. To be fair most other commercial systems fail after a period of time mainly due to the reasons mentioned. Some people try to use silicon tubing to joint the manifold / pipe and whilst this seals

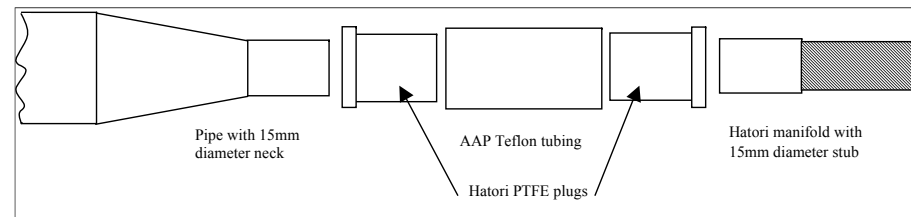


well, it will eventually fail as it simply cannot tolerate the temperatures, pressures and strain components due to the engine moving on its flexible mount. Now at this point I can almost hear some of you saying “well I use silicon or whatever and that never fails”, and to this I can only say that this is my experience as someone who flies a lot, or at least used to before this year. So if you have such a system and it works then fine, don't read any further. However if like me your pristine wood work acquired that dirty black streaky look due to burnt fuel residue then please read on!

The functions that an exhaust system must perform are:

- Must seal manifold to pipe
- Must quieten engine noise without undue restriction.
- Must not pass on vibration from engine to airframe, thereby generating extra noise.

So there you are three apparently simple functions. Dealing with the sealing issue first, quite definitely the best method I have used in five years of harsh competition flying involves the use of Teflon tubing as supplied with the AAP power manifold. This tubing is white, translucent and can withstand very high temperatures without splitting and has a bore of $\sim 5/8$ " (15.875mm). This is available from Probuild UK at a price of £14.45 for a 6" length and includes two spring clips. Now depending on the manifold and pipe you use you will need to purchase the Hatori PTFE plugs as shown in the picture above, also available separately from Probuild at a cost of £4.48 each. These have a bore of 15mm and will fit tightly on Hatori, Grieve and other 15mm diameter pipes as well as onto the Hatori YS manifold. To do this it will be necessary to warm the plugs gently with a flame from a gas cooker or blow torch, after which the plugs will be soft enough to allow a push fit onto manifold / pipe. Then heat the teflon tube similarly and push over each plug in turn as shown in the drawing above. The length of the teflon tubing should allow a small gap to exist between the



two plugs when both in position. Once cooled pull off one end of the tube and fit two spring retaining clips, one over each plug position to clamp the tube / plug assemblies before refitting the tube. The resulting joint will be gas tight and rugged enough to last through many flights.

A note of caution however when using 30% or more nitro. Due to the very high temperatures involved the PTFE plugs can stretch over time and flow over the orifice of the pipe / manifold partially blocking it.

To prevent this make sure to periodically inspect the inside of the plugs and trim off any PTFE with a sharp scalpel where necessary.

A further development is to replace the spring clip on the pipe side with a stainless steel band (made from a large jubilee clip) like the one pictured below and use this to mount the front end of the pipe to the fuselage floor. The rubber strip is similar to the ones used in the Dave Brown engine mount although any similar piece of rubber could be used. This then has the benefit of saving the weight of an extra clip, small but it all adds up.

The second requirement is to prevent the transmission of vibration from the engine to the fuselage via the pipe mounts. Again the need for this mounting system to be rugged and durable is paramount if the system is to last the course of a season. Also the mounts must not be too stiff so that vibration is transmitted and not be too floppy that the exhaust bangs against the fuselage sides.



Front exhaust mounting combined with sealing clip.

Theoretically this can be explained as follows: The dynamics of the exhaust system can be viewed simplistically as a mass m (kg) supported by a spring of stiffness k (N/m), as shown in the drawing below. The units of stiffness are N/m. For small amplitude displacements the resonant frequency f_0 (Hz) of this system is given by

$$f_0 = 1/2\pi \cdot \sqrt{(k/m)} \quad (\text{Hz})$$

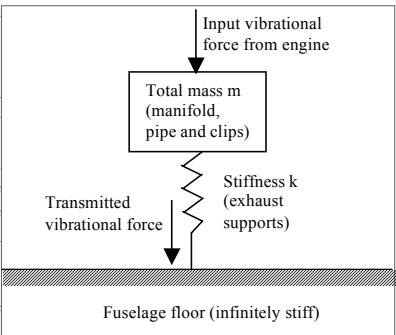
Thus for a system weighing 200g with a spring of stiffness 1000N/m, the system would exhibit a fundamental resonance of 11.3Hz. Reference to the diagram shows a vertical downward force on the mass moving the spring in an axial manner. However the dominant motion in our exhaust systems is rotational, i.e. if the mass was to move from side to side. Mathematically though very similar expressions for the resonant frequency result so we can use this simple model with confidence.

Next we'll consider the speed range of the engine which provides the forcing component causing the exhaust to oscillate. Typical engine speeds range from 2200rpm - 8600rpm for a YS140L turning a 15" x 13" propeller which transpires to a frequency of 36.6Hz -143.3Hz. However since a fourstroke engine fires once every two revolutions then the forcing frequency is halved giving a frequency range between 18.3Hz -71.6Hz.

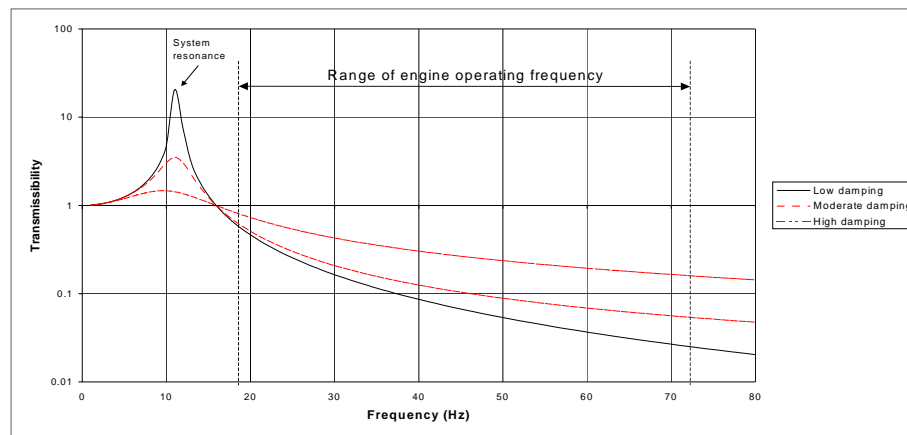
Now it is necessary to define a term which describes the transmitted force from the exhaust system into the fuselage. This is

$$\text{Transmissibility } T = \frac{\text{Transmitted force}}{\text{Input force}}$$

Thus there is no transmitted force in the case of an ideal isolation system, and this occurs when $T = 0$. For values of T between 0-1 a degree of isolation is achieved. However for $T > 1$ vibration is amplified and extra noise will eventually result. The transmissibility of the above system is shown in the plot below for some fictional values of "frictional damping". Damping which is a property of the spring material that tends to dissipate vibrational energy in the form of heat and can be thought of as a property that tends to oppose motion. It can be seen that with very little damping a sharp resonance occurs at 11.3Hz and in this condition $T \sim 22$ which implies that a very large force is being transmitted from exhaust system to the fuselage. In this case the transmitted vibration would cause a great deal of panel vibration at certain points in the fuselage and would thus radiate a great deal of noise. As the damping is increased, it can be seen that the transmissibility decreases at the resonance frequency. However looking at frequencies well above resonance it can be seen



Mathematical model of simple mass spring system without any damping included.



Plot 1. Transmissibility of a general system weighing 200g with a spring of stiffness 1000N/m, exhibiting a fundamental resonance at 11.3Hz.

that the minimum transmissibility occurs with least damping. So a compromise is sought where a small amount is used to reduce the effects of system resonance whilst maintaining good isolation (i.e. small T) at frequencies above resonance. In practice material damping is difficult to avoid completely and is inherent in materials like the rubber we use in engine mounts, so realistically we have to accept that we cannot change this property easily and have to accept whatever rubber we can source.

What we can change however is the stiffness of the rubber used in the mount and we can use this to set the resonant frequency of the system below the operational frequency of the engine so that during the normal course of running our engines we never hit the system resonance and always achieve a degree of isolation. This is the basic principal of all vibration isolation systems. In practice the engine moves through system resonance we we start the things and that was the cause of all those broken cowlings a few years ago when the engines kicked during start up, particularly with the early soft mounts.

Well I'll give more specific information about choosing components to achieve good isolation and how to install them next edition. To finish I've included a picture of my latest trial exhaust system which features the mounts and the sealing method previously mentioned on a modified ES carbon pipe. This pipe was damaged when I lost my Evolis last year and the front section was replaced by an aluminium part by Probuild UK.

Happy resonating

Keith Jackson



Rear exhaust mount as used on my Angels Shadow. Retaining clip made from a large Hose clip, with a cylindrical rubber mount obtained from RS components. Sandpaper is glued inside of clip to grip the carbon pipe without crushing it.



Whole exhaust system used on my Angels Shadow.



GBRCAA Competition Entry Form 2002

Comp. Venue and date:

Name		Frequencies 1. <input type="text"/> 2. <input type="text"/> You must specify an alternative frequency. ODD frequencies only allowed.
Address Tel No	BMFA Number	
	GBR/CAA Number	

Your Car Details:	Reg. No.	Make	Colour	Names of Passengers

Competition Entry Fees—Please tick Sportsman/Standard £10.00 Senior / Masters £14.00 FAI £16.00	Completed entry form, entry fee and a self addressed stamped envelope must be sent to the contest director not less than three weeks prior to the contest date. <u>Cheques should be made payable to the GBRCAA and dated for the date of the competition.</u>
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Important Notice to all Competitors and Contest Directors

Pre entry is a requirement of all GBRCAA competitions. If you wish to submit a late entry for a GBRCAA competition, contact the CD. If the CD is willing to accept your late entry you will have to pay double fees for the competition. If you have pre entered and fail to turn up on the day, no refunds will be given.

CD to return this part to entrant

Your entry foris accepted/rejected

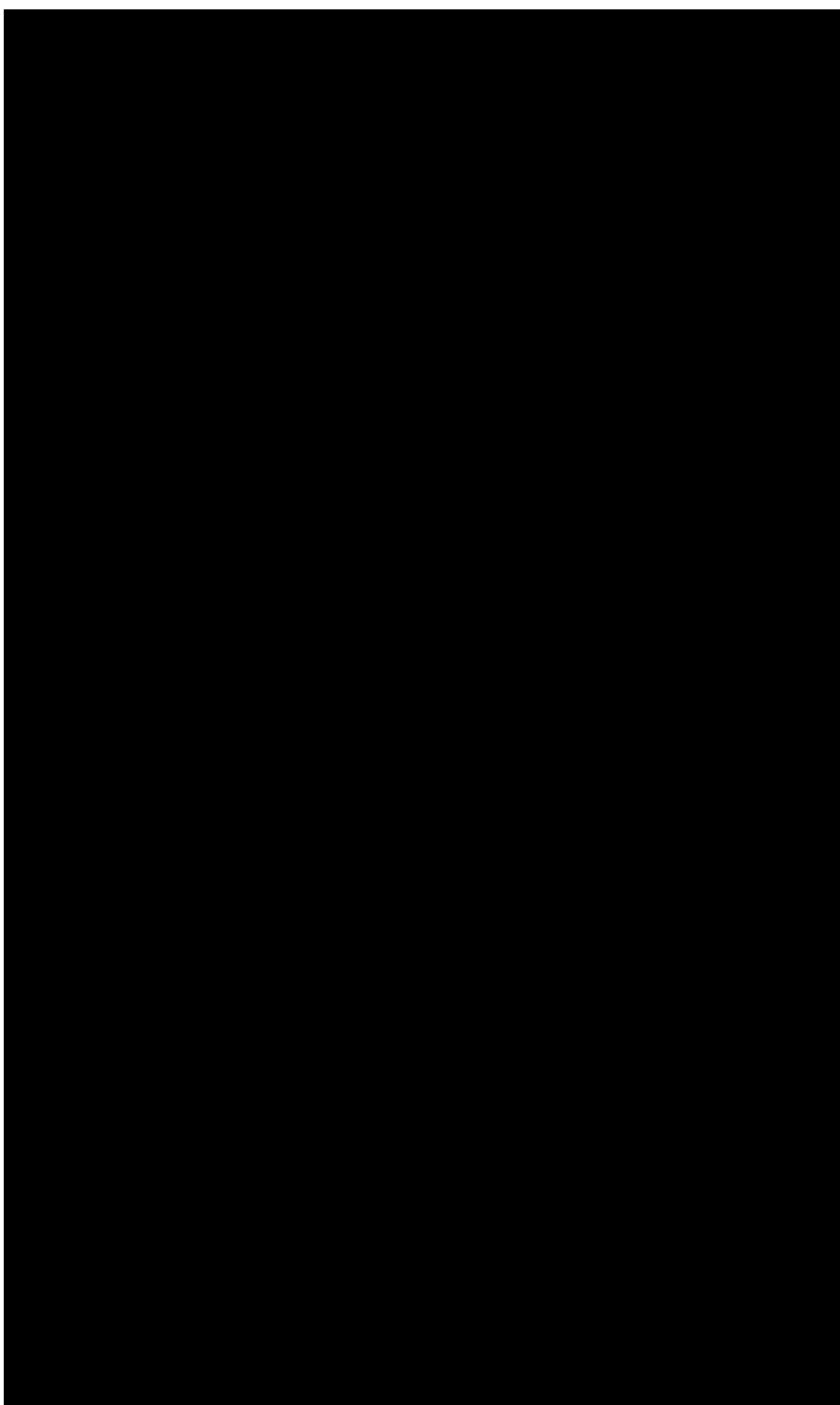
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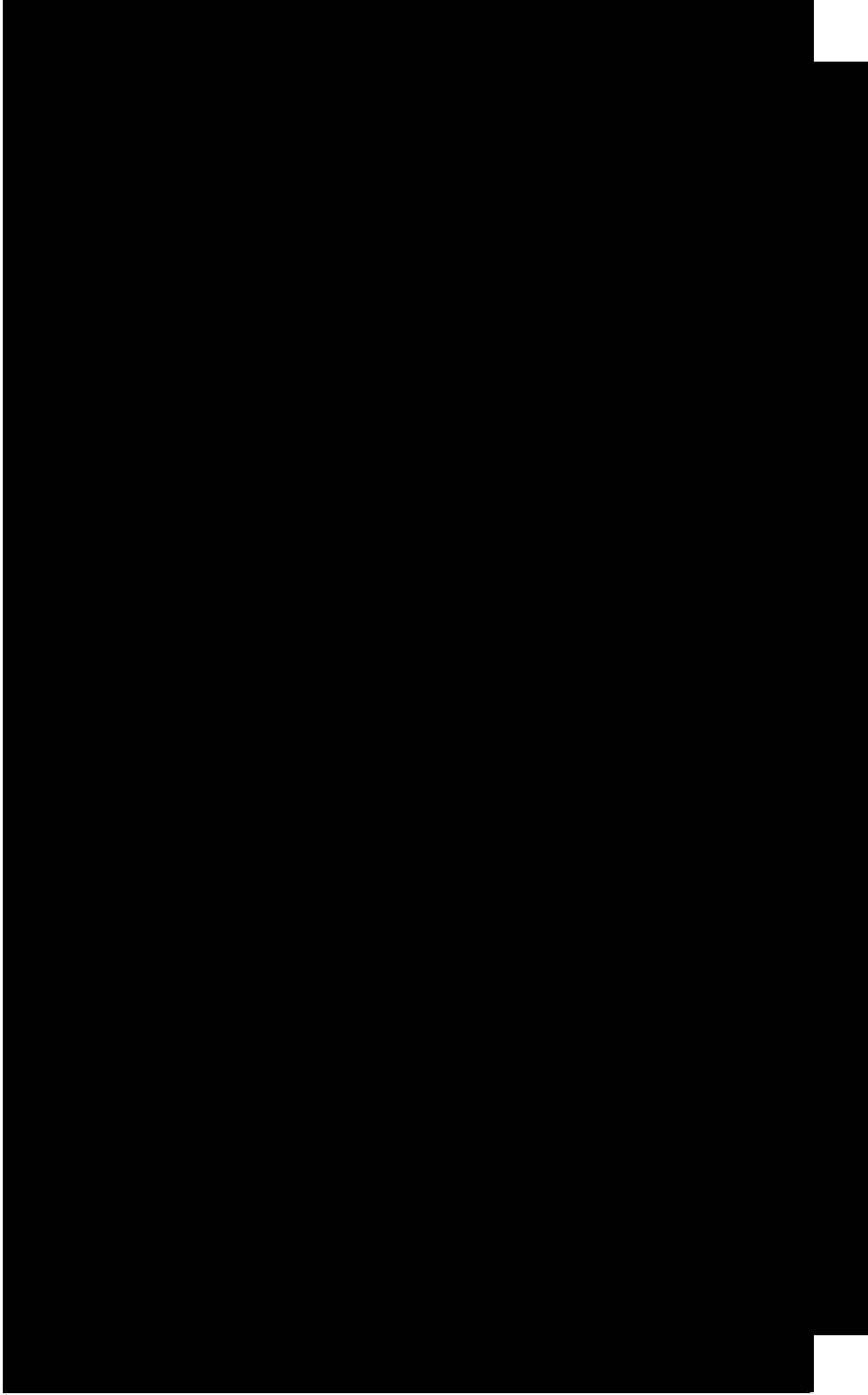
Remarks :

SignedCD. Date

Important note for MOD sites:
 You must bring some means of identification (Driving Licence, Passport etc) on the day.

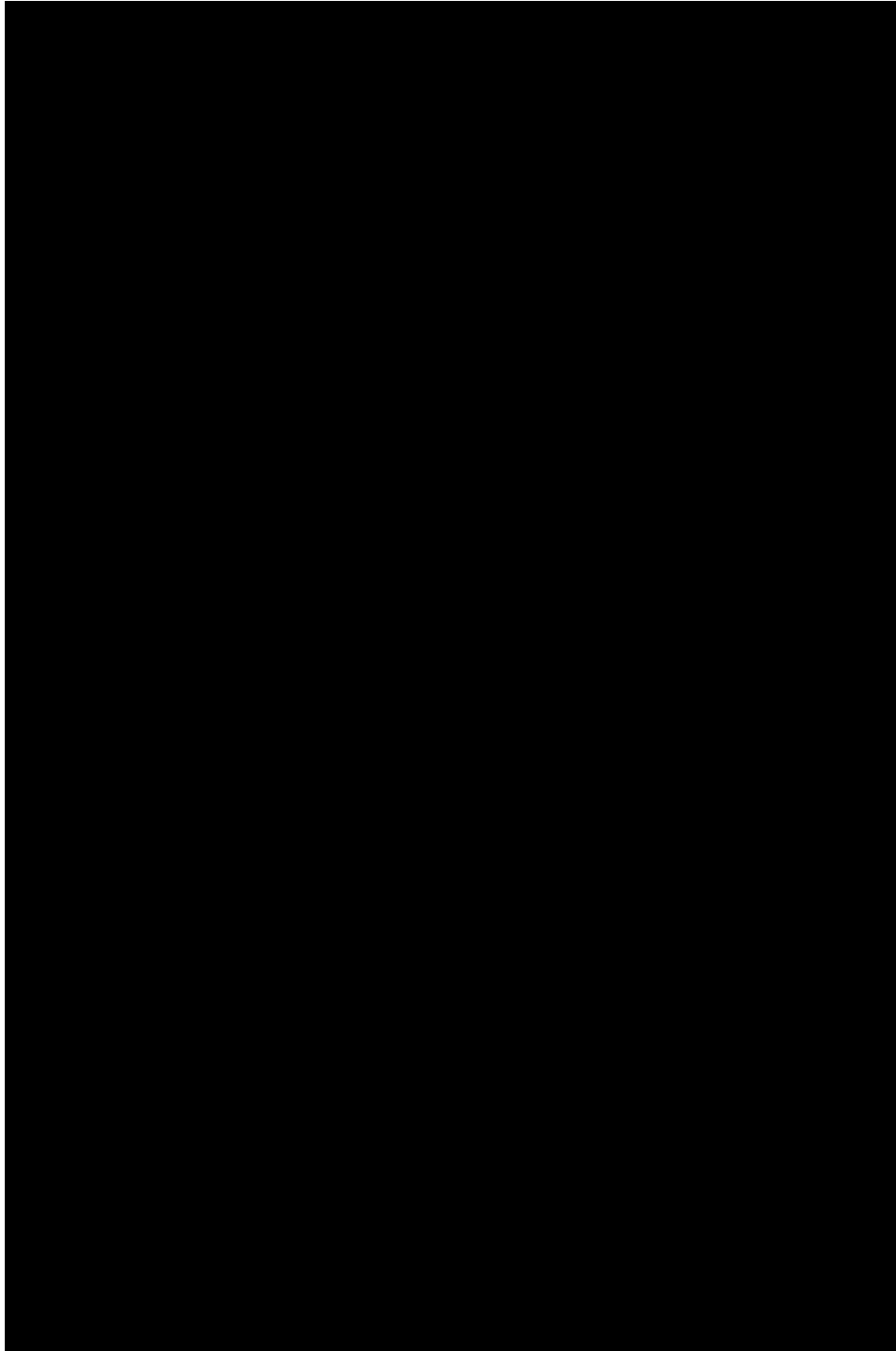
GBRCAA Competition Calendar - Issue 4 July 2002





**NB: Centralised competitions are flying the FAI schedule indicated.
Send entries to the Contest Director (CD) using the Competition Entry Form from Aerobatics News unless otherwise noted**

Contest Directors



GBRCAA League Table 2002

- Individual competition scores based on total raw score dropping lowest score (i.e. best 3 of 4 etc) and then normalising the final raw score to 1000 points, (except Bedford #1 where declared results were based on normalised rounds)
- Scores calculated as best four events during entire season.
- Prizes to be awarded to finalists of each class
- GBRCAA Championships will count as a qualifying event, currently to count as a double competition score, (i.e. winner of each class will receive score of 2000 normalised points for this event).
- More events might be added yet !
- Ed.

Skellbrooke Competition 14th April 2002

Where have all the 'normal' competitions gone? That was the question that I asked myself when I saw the contest calendar for the year. I know that since then Bedford has been added on two occasions but overall there is certainly a down turn in competitions for the lower classes. We always seem to have AGM's where we look at Association numbers and wonder why we do not get any more members. If we do not deliver what they are joining for i.e. the chance to compete, how do we hope to hang on to them in future years, particularly when you compare our membership fee to that of other associations. One final gripe, I put my comps in for publication in good time. From the accounts last year, comps helped to keep the Association afloat. Why then is another competition going ahead on the same day later in the year? Surely people would have seen this in the original Diary in the first newsletter of the year? Anyway, I've had my annual moan so I'd better get on with the report.

Before anybody gripes about it clashing with the first Masters competition, I knew that this would happen but if the response was the same as the number of Masters entries I have got for the June comp then it would not make any difference anyway. Only two entries in Masters so far for June and this is at the end of May!!

Ten entries were received, five in Standard and five in Seniors giving a nicely balanced display for the judges.

Ashley Hoyland kicked off the proceedings using an Excelsior 2000 powered by an OS 140 two stroke. A good opening flight ensued, with Ashley scoring 192.5.

I have often said in my articles that flyers in the lower classes can buy very good equipment off the more experienced flyers as they improve their models and engines. So this was the case for Barry Macleod who was using an ex-John Harrop Fashion bought off him complete with engine. This suited Barry who pipped Ashley for the 1st place slot in round 1 with a 196.5.

Ged Lawson was flying in his first competition and was certainly feeling the nerves. He said after this flight that he would never call people who flew in front of judges again. This showed in his score which was 113, but this was to improve with all subsequent flights. Having wiped out his Elation by catching the edge of the strip at Skelbrooke a couple of weeks earlier, Ged was reduced to using my old Excelsior which he had now re-engined with a second hand YS140 FZ.

Martyn Uttley had engine problems in this round and was unable to rectify them for the latter rounds and so had to withdraw. A shame this as Martyn had travelled all the way from Cumbria to compete. His only consolation was that he was able to start off earlier on the long journey home.

Seniors saw a fairly experienced set of flyers with newcomer to the class, Matthew Hoyland flying his extremely well finished Majestic in competition for the first time. Matthews' first round flight was disappointing but this was to improve over the following rounds.

Two flyers broke through the 300 point barrier on the first round, Brian Hoare was back to his usual form after a disappointing Nationals for him and Nigel Clayton using his well flown Loaded Dice.

Yours truly was flying his Loaded Dice 3 with another second hand YS140 FZ. There is a lot of good equipment out there for flyers to purchase as those further up look to buying the latest gear.

A further three rounds were flown with flyers, in general, improving their scores as the day progressed. Nigel Clayton had engine problems as well and eventually withdrew from flying after the third round.

When the scores were totalled, Barry Macleod took Standard with Brian Hoare taking the Senior class.

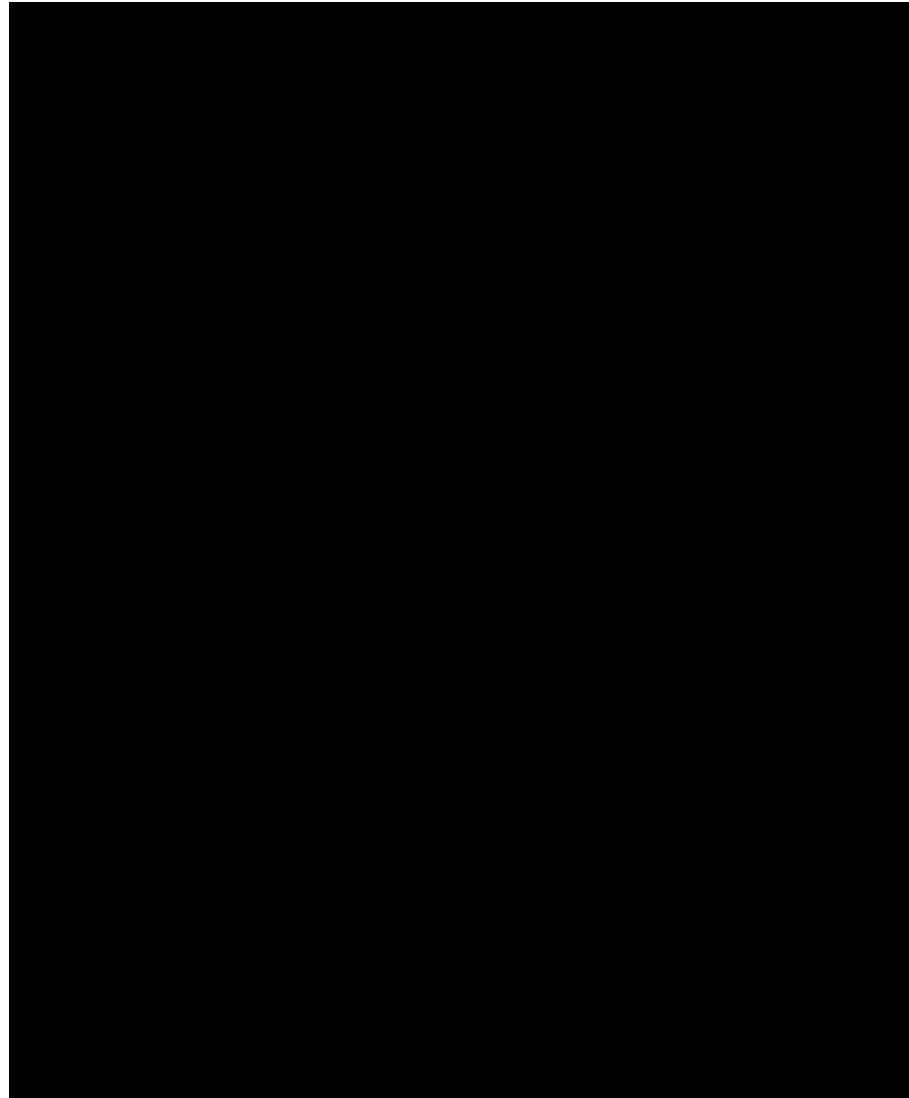
The judging team was what has become the 'norm' for Skelbrooke with Pete Cappleman and Dave Scoles making the journey from opposite sides of the country. Thanks again lads, without you there would be no competitions.

The prize-giving was conducted by Richard McEwan, the farm manger and all the flyers appreciated what had been done in the way of certificates. Instead of using the official ones for first place, I had produced

my own for 1st, 2nd and 3rd places. In order to make the 1st place a bit more special, I had mounted these in 'frameless' frames, which really set them off and were well received amongst the competitors. So, after 4 rounds the competition broke up at around 4.15pm and everyone had an early ride home. It can be done in a relaxed way and I feel that this is what needs to be done for the majority of flyers in the Association that probably realise that they are not, either through time constraints or natural ability, going to be pushing for a team place in the future but just simply wish to compete amongst flyers of a similar inclination.

In response to my initial comments, if you have never run a competition, give it a try. It is not difficult and there is plenty of advice available if you want it. Don't think that somebody else will do it all the time. You know what they say about a willing horse, it drops down dead. Don't let the GBRCAA die. Support it in any way you can, every little helps and I did say Association!!

Steve Dunning CD



Mansfield 5th May 2002

The day appeared to have a good start, blue skies, small amounts of cloud but a stiff breeze from the north-west, this soon changed however to a strong blustery wind veering from the north i.e. straight across the strip. Unfortunately due to the layout of the field there are no other options for the single flight line.

This wind caused quite a few headaches for the pilots, not least myself. In the first round of my first competition I re-kitted my Loaded Dice in a BIG way, not a good start to my season! Oh well, I could now concentrate on line control.

Starting with Seniors, Brian Hoare led from the start gaining promotion points along the way, well done Brian especially in the conditions. Mathew Hoyland finished 2nd with Nigel Clayton in third place. Ken Moss suffered an engine cut in round 2 fortunately only resulting in a broken 4 blade prop

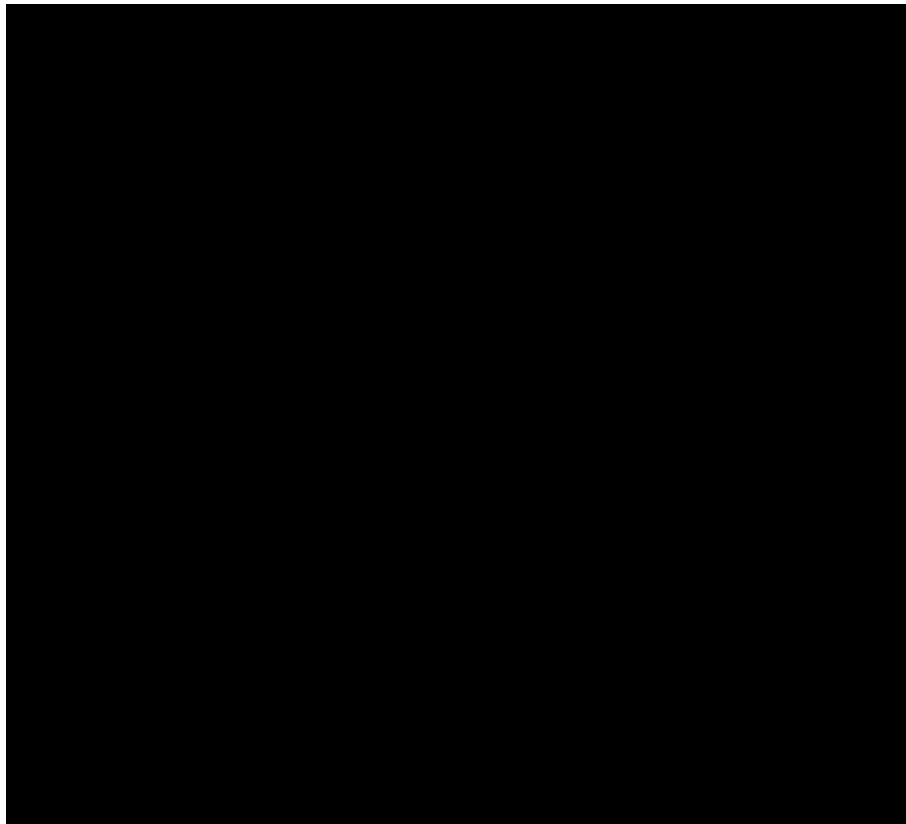
In Standard, Barry Macleod came first followed by Ashley Hoyland with Martyn Uttely in third place with a temperamental YS 120 in a Probuild Shadow.

In Sportsman the turnout was splendid with all but one entrant from the Mansfield Club, well done lads, especially as more than one was heard to say if it was a normal Sunday afternoon they would have gone home, the wind was so strong. Terry Jessop came first with Chris Bond coming second and junior member Tom Bootyman in third place. All pilots in this class were flying in their first competition and they all went home smiling!

Sam Wragg had Masters (FAI) all to himself but still appeared to be enjoying himself with some relaxed flying. As Sam was the only competitor (I usually have at least 7 entrants) is this a sign of things to come until the "new" Intermediate Master schedule is introduced?

My thanks go to Stuart Mellor who carried out the scoring using the new GBR/CAA laptop/Excel program, the (very cold) judges John Howarth, Richard Howarth and Bob Reid, also to Steve Dunning who, at the eleventh hour, produced all the certificates (1st, 2nd and 3rd) for all the classes. Last but not least, I would like to thank the Mansfield & District R/C Model Club for the use of the field for the day.

Trevor Plumbe – C.D.



Skelbrooke Competition 30th June 2002

The competitions held at Skelbrooke are becoming popular with competitors. Eventually, eighteen took the plunge including two who were entering their first ever competition, Paul Furze having accompanied Martyn Uttley back in April just to watch. The phone call I had from Paul at 9pm that night confirmed that he had enjoyed the experience immensely. Obviously the message had got through both through my articles and from what he had seen earlier in the year.

A good spread of competitors throughout the classes, nice to see some masters entering comps outside the Centralised circle.

In order to enable flying to continue throughout the day, Alan Simmonds and Sam Wragg volunteered to judge the 'middle' round of Standard and Sportsman flyers, thus giving the judges a break.

The results tell their own story, suffice to say that Ged and myself were cursing the potato crop in the next field. Not very forgiving on fuselage mounted U/C.

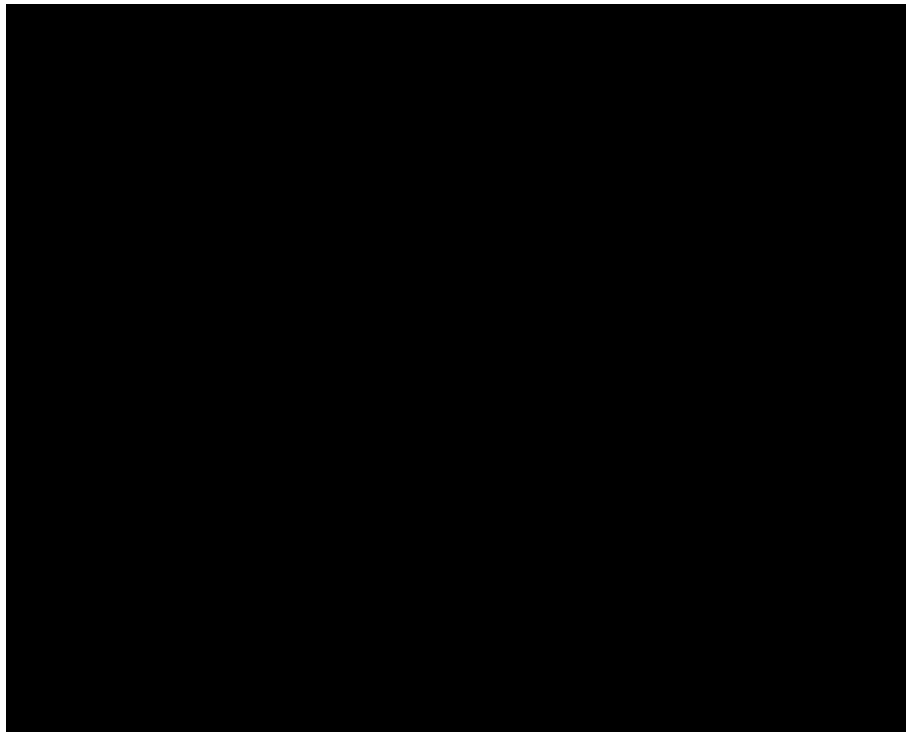
Thanks have to go to the usual judging team for this comp. , Pete Cappleman and Dave Scoles, who kept going for longer than normal until they got their break. Also the two gentlemen from Cumbria who assisted with the scoring for the first two rounds, thanks again.

The rain eventually set towards the end of the third round and John Brown and the Sportsman flyers decided to call it a day.

The prize giving was held in pouring rain but all had once again enjoyed the day.

Roll on for the 8th September!!!!

Steve Dunning CD



3rd Centralised , Glenrothes, Scotland

A very personal view

The weekend of the 23rd June was the date for the 3rd centralised competition to be held at Glenrothes, Scotland. Which if you have not been before is to the right and slightly to the north of Edinburgh, just off the A9 I had been asked to judge the competition, which being a Scotaholic (I really do love it up there) I was only too pleased to do. It was a bit of a journey though, nearly 300 miles each way, which for me was too far to do there and back as some of the younger members of the fraternity do. Some travel even further. As far away as Gosport and come from “down sowf” For the Scottish contingent it was a mere cabers throw away although I think most of them had to travel some way to get to the site..

I met some of the others at the local Travel Inn which is a couple of minutes away from the site. On my arrival I booked in and then went to find the site.

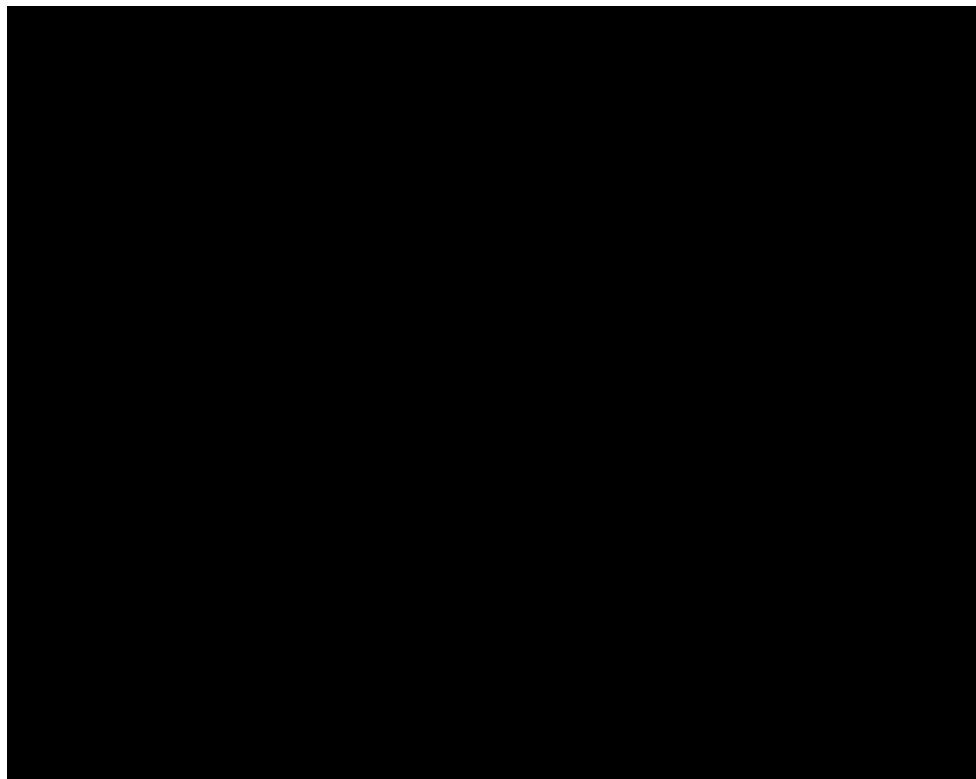
I had kindly been supplied with a map by Allison Harrop, which was invaluable although the site was NOT difficult to find. It was a sight for sore eyes. A whole field on closely mown grass better than some lawns I have seen, and not an inhabited building within some considerable distance although there is a restriction on flying before 9 am but that would not bother us. I knew that provided the weather did its part there was a good days flying to be had. And those of you who didn't come missed a great site and a good days flying! And also the beautiful Scottish scenery on the journey north. As well as the Scottish hospitality.

The Sunday turned out to be bright but still quite windy but the it looked as though the wind would keep the rain off, which it did. The wind was proving to be quite a handful so as to speak causing most of the pilots there some degree of a problem . It was obviously going to cause problems if the plane lacked power as a lot of the manoeuvres do demand power to execute them. It did however stay bright although somewhat chilly with an air temperature of about 14°C The Contest Director Elliot Balfour decided that 3 rounds were the order of the day and there were five Judges Two from over the border in England the rest coming from locally recruited volunteers. A shortage of scribes meant that every one of the flyers and helpers had to do a session or two. The scoring coming under the auspices of Mrs Balfour and Mrs Howarth using a computer and printer supplied by Bill Allison

The first two rounds went of very well with very few incidents to report the only one of any real note was Dave Matthias loosing an undercarriage leg on his final approach after his first flight, other than that it was an uneventful day. The third leg was flown after we had all eaten a hearty lunch of burgers and sausages which had been provided by the competition director and cooked on the Bar-B-Q under the supervision of Steve Underwood, who through a faulty servo was forced to retire after the first rounds flight. Everyone enjoyed burgers and sausages and then had to undergo the gauntlet of settling down to fly another round. It certainly had not got any warmer but we all survived. The results are no doubt published elsewhere in the magazine/newsletter so I will not put them in here, but it certainly was a very close run thing with only a few marks covering the top four or five flyers.

In conclusion.. Would I do it again next year if asked most probably, and hope that more of you attend. It is an excellent site in a very nice location, and perhaps next year I'll try and tie it in with a visit to the West Coast.

David Richards
GBRCAA Judge





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All PL Prod kits come with all flying surfaces, covered with contest grade balsa (servo and retract holes cut).

SMARAGD

Carbon / kevlar £530.00

EXCELLENCE

Carbon / kevlar £530.00

LARIMAR

Carbon / kevlar £530.00

TORNADO

Carbon / kevlar £530.00

EXTRA 330s

Carbon / kevlar, 3m span ,engine capacity 150(D/A150) £1,145.00

**OPTIONAL FIXED GEAR
AVAILABLE**

FIBER CLASSICS

EXTRA 330 TOC

Ready painted in Fiber Classics own colour scheme £2,350.00
(Custom designed option available).

GILES 202 TOC

Ready painted in Fiber Classics own colour scheme £1,950.00
(Custom designed option available).

ENGINES

YS

NEW !! YS 140 DINGO £490.00

(Available soon)

YS 140L £395.00

YS 91 £260.00

YS 63 £208.00

NEW!! YS 140 FZ 2 £365.00 **NEW!!**

OS

OS 140F1 £850.00

WEBRA

145R £315.50

D/A PETROL ENGINES

D/A 150 £1,145.00

D/A 100 £895.00

<u>ENGINE MOUNTS</u>		<u>HATORI</u>	
Gator soft & safe	£40.97	Silicon tail pipe	£7.95
Hyde 140	£118.00		
Hyde 140ARI	£150.00	<u>CFE</u>	
NEW!!		nose ring	£9.95
PL mount for YS 140	£150.00	OS 140 nose ring	£10.95
NEW!!		YS 140 air filter	£19.50
ZN mount for YS 140	£150.00		
		<u>RETRACTS</u>	
<u>MANIFOLDS</u>		Supra DX 60	£41.90
Hatori YS 120/140	£37.40	Supra DX 200	
AAP power manifold	£50.00	(Titanium legs)	£99.50
AAP header tube	£9.50	Giezendanner	£139.95
AAP support bracket	£10.45	3/16 titanium legs	£19.75
		3/16 DX legs	£10.95
		<u>ZN</u>	
<u>PIPES</u>		Annodised horns(L)	£11.50
Hatori 693	£125.50	Annodised horns(M)	£11.50
F3AUK pipe 4 stroke	£60.00	Annodised horns(S)	£11.50
F3AUK pipe 2 stroke	£60.00	Pull-pull wheel	£15.00
		70mm spinner	£38.50
		76mm spinner	£42.10
		82mm spinner	£42.10
<u>TETTRA</u>		98mm spin.carbon	£62.50
14oz tank	£8.80	113mm spin.carbon	£68.00
16oz tank	£9.90	127mm spin.carbon	£74.50
20oz tank	£11.00	152mm spin.carbon	£92.95
Fuel t's	£4.10		
Fuel dots	£4.50	<u>PL</u>	
Switch bracket	£7.35	Annodised horns(L)	£11.50
Black 55mm wheel	£14.27 each	Annodised horns(S)	£11.50
Red 55mm wheel	£14.27 each	85mm spin.carbon	£47.50
Angle push-rod	£3.00		
Straight push-rod	£4.00		

APC

14 x13	£9.07
15x11	£9.07
15x12	£9.07
15X14	£9.07
15X14N	£9.07
15.5X13N	£9.07
16X10	£9.07
16X11	£9.07
16X13	£9.07
16X14	£9.07
16X16	£11.00
17X12	£11.00
14.5X12F/B	£19.95
15.5X12F/B	£19.95

MK

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Suspension axels	£44.50
Tail wheel	£13.50
Dual coupler(S)	£24.99
Dual coupler(L)	£24.99
55mm wheels	£8.95
2.5mmBB servo-ends	£6.39
2.5mmBB horn ends	£6.39
3 mm BB servo-ends	£6.39
3 mm BB horn ends	£6.39
YS header mount	£21.95
OS header mount	£25.95
Alloy horns	
Plastic base(S)	£5.50
Alloy horns	
Plastic base(M)	£5.50
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Remote glow plug set	£13.70

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T-style horns (L)	£4.95

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300mm x 300mm end grain-carbon	
balsa	£ 21.00
300mm x 300mm nomex Panel	
(glass skin)	£ 15.00
300mm x 300mm nomex panel	
(carbon skin)	£ 23.00

LEAK FREE GASKET

YS 140	£ 15.95
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9202 servo	£44.00
9402 servo	£58.50
9204 servo	£58.50
136G servo	£34.50
3101 servo	£21.50

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- ZN Line Hyde Away
- Asano carbon pipes for 2 and 4 stroke(very light)
- Asano flexible manifold for YS
- Asano flexible manifold for OS
- **Jamara** ARTF KITS - £ 149.95
- Swallow 90, Edge 540, Giles 120, and Cap 232

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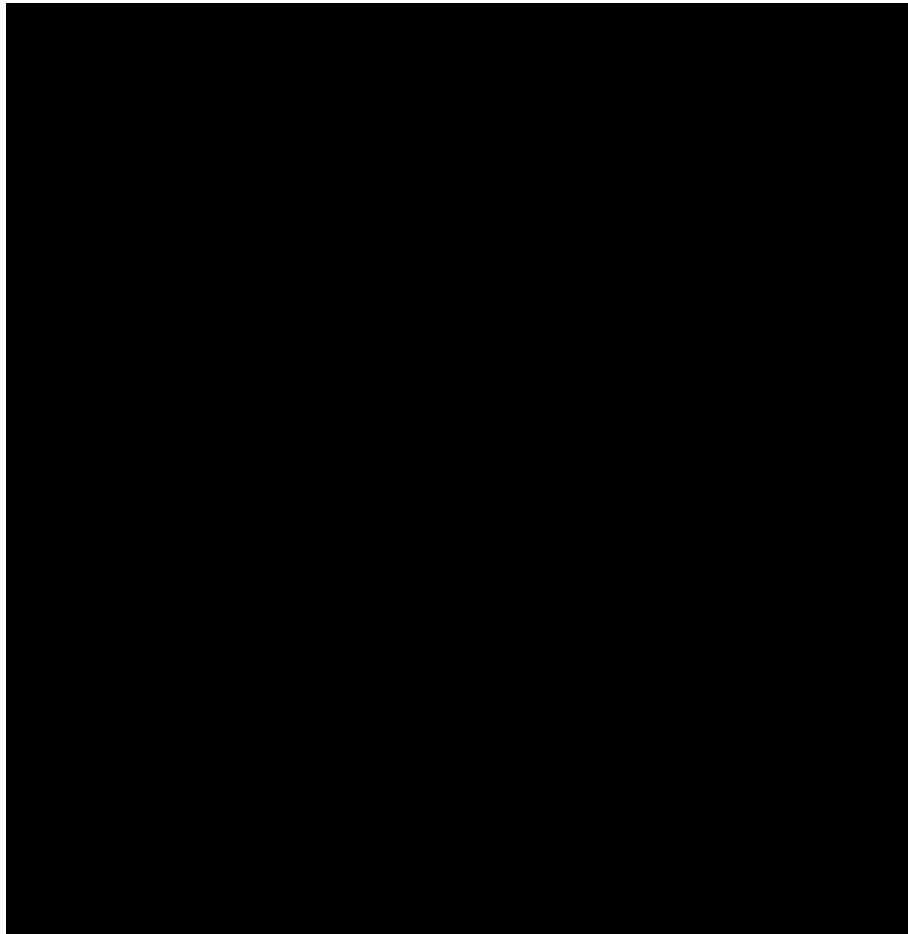
Bedford. 14th July 2002

Despite the lack of judges and the lower than usual entries, we all enjoyed the competition at Bedford on July 14th. The weather was kind to us, warm with light winds and there was only one slight mishap in Standard class flying.

In FAI George Drever narrowly beat Steve Birchall with Alan Wild taking third position. In Senior's Adrian Harrison was the clear winner with Brian Hoare second and Ken Moss third. In Standard class, Doug Brittain achieved first place with promotion points, Alan Connely second and Ross Thurlow third. Brian Hoare and Ross Thurlow also achieved promotion points.

Finally my thanks to Ron Newman for coming all the way from Leigh on Sea to judge; without him the competition could not have gone ahead.

Brian Ball
CD.



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