



Great Britain Radio Control Aerobatic Association

AEROBATICS



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Aerobatics Editorial

GBRCAA Home Page Address: <http://www.samhwood.demon.co.uk>

E-mail to newsletter: Keith@gbrcanewsletter.freemove.co.uk

Front Cover

shows the participants of the first comp of the season; anything but icy as blue skies allowed the sun to shine down bringing forth the first suntan cream of the season. Day was only marred by having to fly the PO1!

Scottish Centralised confirmed

The fifth centralised has now been confirmed to take place alongside the Scottish Nationals on 12th and 13th August in Glenrothes, just above Edinburgh. This superb flying site is based at a full size airport (Fife) which will be closed for the weekend so that the NATs can take place. Those of you making the trek north will need to send your entries direct to Elliot Balfour whose new telephone number is: 0141-584-9608.

New Display Team Coordinator

Following a request for a display team coordinator last issue, I am pleased to announce that Paul Hepworth has volunteered for the task. I know that he has been particularly busy chasing event CD's up and down the UK so please support his efforts and the association. We need you to represent the GBRCAA to the public. People often comment on how little the GBRCAA is represented at public events. Well now's your chance to do something about it. Remember how successful the lunch time displays were at last years Nationals? Paul may be contacted on 01642 645762.

Ron Newman phoned a while back

to let me know that the event at Woodham Ferrers in East Anglia was wrongly named by myself in last months issue (along with many other mistakes... sorry to all concerned). Apologies for that Ron. He really phoned to say that he would accept Sportsman's entries from local club flyers to make up the numbers in the event of a shortfall. This is a great idea and is a perfect way to introduce your club mates to aerobatics. I started out that way with a Chilli Breeze years ago, (it seems like years ago!) and was hooked after one event. Something for all you CD's out there to consider...

In the absence of our RC Power Tech committee representative Peter Brett,

our UK team manager attended the FAI Aeromodelling Commission's plenary meeting in Lausanne recently. Efficient as ever, his report arrived soon after arriving back and is pasted below.

And finally,

the Newsletter Editor position will be vacant next year not because it's a difficult job, but simply that two years is enough for anyone. The role has become significantly less stressful thanks to the printing job being taken out of the equation (thanks Alan) and recent investment in new software and equipment. Please give serious thought to whether you would be willing to take on this role and don't leave your decision to the last moment as happened in previous AGM's.

Keith Jackson
28th March 2000

FAI Aeromodelling Commission's plenary meeting in Lausanne

I've just returned from the FAI Aeromodelling Commission's plenary meeting in Lausanne. Filling in for Peter Brett at short notice, which is becoming a bit of a habit. Our kind newsletter editor agreed to relax his deadline especially for me because I have brought back some interesting bits of news for you.

First, the venue for the 2001 World Championships has been confirmed as Ireland, the 2002 Continental Championships will be in Spain and, with a close vote against Canada, Poland has been selected to host the World Championships in 2003 (good news for Keith Jackson!).

We are being encouraged, especially with the World Air Games (WAG) coming up in 2001, to set about giving

aeromodelling a more attractive image for audiences and the media. Quite how we achieve that in F3A without using larger models and doing it topless to music I don't know, all suggestions will be seriously considered. A new class, F5A, was approved though not (yet) as a WC event - electric aerobatics. The electric limitations on duration and/or vertical performance have been overcome by specifying a shorter schedule with a predominance of rolling manoeuvres. Although the rules still require a box, there are no set turnaround manoeuvres, all being pilots options but in the box and separated from the centre manoeuvres by at least 10 metres. The interesting bit is that only half of the marks come from manoeuvre precision. The other half come from judgment of attractiveness, originality, harmony, rhythm and gracefulness. For the finals of each competition the pilot selects his own schedule from a published list of options, hands in a cassette, and does it to music.

Personally, I think it's a shame that the electric enthusiasts have had to set up their own class, but being uncompetitive against IC powered models I do have respect for what they are trying to achieve and wish them success with this imaginative initiative. Get out those old airframes and see how many batteries you can squeeze in! If anyone is interested in seeing a set of rules for this contest class give me a call.

Belgium's Gui Manesse and Alex Goossens reported on progress towards the 2000 European championships and seems to be on track. So far they have 54 entries (with a 60 pilot cutoff, only one flightline), Germany and Switzerland have yet to throw their hats into the ring. Visit their website at <http://gallery.uunet.be/KBAC-ACRB/EC2000>.

An amusing presentation was made by Joe Dible who was representing Ireland's WC2001 bid. Basically the message was - be prepared to fly in light drizzle! ("if you can see the hills it's been raining, if you can't see the hills, it is raining").

The F3A sub-committee chairman, Ron Chidgey, led a discussion on the future of World Championships. Entries are now so large, which is good but, because it is taking four days of flying to get each pilot seen by each judge panel, we have to wait four days for normalised scores. Also, quite understandably, the judges find it difficult to hold their standard over four days especially if there is variation in the weather. The idea is to seed the pilots into four equal groups and have each fly a round each day taking their turn with each panel of judges. A normalised score could then be published daily. The top ten from each group would go into head-to-head semi- and final rounds. It needs working on but sounds promising.

Ron Chidgey mentioned that he was aware of some misinterpretation of new manoeuvres, particularly non-symmetrical centre figures specifically 4 in PO1, 10 in PO3, 14 in FO1 and 8 in FO3 where entry and exit should be symmetrically disposed about the centreline which means that the junction between the two elements is not necessarily on the centreline. I have to admit that this was news to me. Ron has decided to step down from chairing the F3A sub-committee and was replaced by Bob Skinner, the popular South African judge and WC 1999 Jury member. Ron has done a fine job over the years but I believe that Bob will be a worthy replacement. I know he is a regular reader of Aerobatic News and hope you will all join me, through these pages, in wishing Bob the very best of luck and all the support he deserves in this important new post.

The Sandown Challenge and Fund Raising

Although I have received a few pledges I'm still seeking more help with looking after the GBRCAA stand at Sandown Park and helping to run the Sandown Challenge announced in the January issue. I need another six members, each willing to give two hours of their time, then I'll put a rota together. You don't need to worry about missing Christophe, I'll sacrifice myself to looking after things while he's performing. Incidentally, our slot is 1.40 - 2.00 on both days and we will be followed immediately by one of Christophe's slots. If, when offering your services, you specify a time when you would prefer to be doing stand duty I'll do my best to ensure your wishes are met.

This event has the potential to be one of the best shop windows and fund raising opportunities we have ever had. Put with Paul Hepworth's plans (see Promoting Aerobatics elsewhere in this issue) together, we can all help to raise the profile of aerobatics to quite dizzy heights this year.

Incidentally, you may remember that second prize in last years fund raising draw was a weekend break in our cottage. The winners, Mr & Mrs Howard Taylor who bought their winning ticket from Mike Lumb, have just left after claiming their prize. They have had some bad luck this last year and it was really nice to see the prize going to someone who needed a good break. Maybe I'll ask Keith to put their picture in the next issue of aerobatic news if Boots don't lose the film - afraid I haven't gone digital yet.

Regards,

David Tappin
UK F3A Team Manager

13th annual R/C Aerobatics Forum, Ontario, Canada

The 13th annual R/C Aerobatics Forum is now in the history books. As in all previous years this event was held the last Saturday of January and this year we were really lucky with the weather. As you can imagine the weather here in Southwestern Ontario can get pretty bad this time of year. However, this past weekend we had mild temperatures with blue skies and calm winds. Many people thought it was a pity that we didn't have outdoor flight demo's as well.

13 years ago this event was started with the idea of getting people from the Pattern community together during the off season to learn from each other and to show off their projects in various stages of construction.

I think the first time we got together we had 10-15 people and it has grown steadily ever since to the size it is today. From last year to this year we are up 30% in attendance with 267 paid entries. We had 11 exhibitors and 25+ airplanes on display as well as a swap shop.

Last year was the first year that we expanded the show to include the IMAC and giant scale aerobatic type planes. This move has proven to be a great success as the two groups fit well together with the interest focused on *R/C aerobatics*.

The Royal Canadian Legion in Guelph Ontario was the venue for the event. This is a great place for such an event with lots of free parking and plenty of room for model display as well as vendors and room to grow. We plan to be back here again next year.

Many beautiful pattern and IMAC airplanes were on display. Below left is Steve Johnson from Mississauga, Ont. with his two Carden Aircraft models, in the foreground is the new 40% G-300 and behind that we can see Steve's 40% Cap 232. The third airplane belongs to Helmut Schmitter of Burlington, Ont. It also is a 40% Carden Aircraft Cap 232.



The one above right belongs to Jeff Stevens from Millbrook Ontario. A Typhoon 2+2, Jeff just finished this plane and he did a great job, looks like he will be ready for the pattern circuit this coming season.

In the last number of years we have tried to get more vendors involved with this show. I believe, for this show to continue to grow and be successful in the future, we need to get as many vendors as we can accommodate to participate.

My long time friend and fellow modeler, Mr. Jim Cline, of Cline & Associates with his wife Ruby came from Xenia, Ohio to display their line of engines and the very popular pressure regulator Jim manufactures.

Jack Price of Duralite Canada was busy at work in his booth selling this new line of batteries. He was ably assisted by two of his pattern buddies, Bill Kent and Dave Reaville, who travelled with him from Victoria BC.

As in other years we featured two "how to" seminars. Bob Noll from Vestal, NY. came to our show for many years. Bob is retired from IBM and is now a professional model builder. He has dazzled us with his superb model building techniques and has been a cornerstone of the show for years.

In addition to the seminars Bob also sells a "how to" video tape as well as some measuring devices for model setup.

Also this year we had the good fortune of getting Frank Noll (no relation to Bob Noll) from Dayton, Ohio to come to the show to put on a seminar on 3-D type flying. Frank is very well known for his outstanding ability to "put on a show" with a giant scale aerobatic airplane and make it do aerobatic maneuvers that an airplane is not suppose to be able to do.

There is no doubt that this is the best show so far. We had people travelling from as far away as Victoria, BC. as well as from Montreal, New York, Michigan and quite a number from the Dayton, Ohio area.

If we had an award for the most outstanding model at the event, it would almost certainly go to Dave Birk of Kitchener, Ontario.

The engine Dave is holding is a Kinner K5, a 100cc 5 cyl. radial 4 stroke gas engine on spark ignition. It took Dave 3 years to build 2 of these engines from scratch and the first one shown here is now complete and ready for a test run.



This show could not happen without the help of a lot of people. Harry Ells and Tony Kreg, my co-hosts for this years event, did a lot of work to help make the show a success. Many other people were involved and I would like to extend my personal thanks and appreciation to them. We could not have done it without you.

We have had quite a few favourable comments on this show both during and via e-mail since. We are told that the location is great and that it is a good time of the year to have an event such as this. We appreciate these comments as they give us encouragement to continue with the show. We plan to have it again next year at the same time and location. An announcement about that will be made later. For more pictures click below.

Ivan Kristensen.

This article was snaffeld from the Ivan Kristensen site at <http://tor-pw1.netcom.ca/~ivankris/index1.html>. Ed.

Starting out

A couple of years ago I wrote an article for the SAA magazine AIRTIME, in which I attempted to set out combinations of model, motor, exhaust system and prop which if followed, would give new entrants to the aerobatic world a flyable model straight off. This was just prior to the 2m x 2m rule which also opened up the engine displacement and so for the first time there really was a choice other than a Hanno or a YS 1.20. I think this strategy is still valid today especially with the demise of one of the cheaper sources of aerobatic hardware (come back Dave all is forgiven- at least most of it!) So here it is again with some updates and some deletions where the equipment is no longer made, although some models notably from the Dave Smith stable have been left in as several used examples are still around. Incidentally, rumour has it that someone is still operating the business part time. Please note that this isn't meant to be a comprehensive list just some combinations that work, so if you have another combination that works or if you are a vendor I have missed - my apologies.

RECIPE FOR SUCCESS

Some of the aerobatic brigade were talking the other day about why there appears to be yet another aerobatic doldrums and how long it's going to last.

We came to the conclusion that a lot of people just don't know the recipe for success - especially with the new rule changes in force this year and the inevitable indecision this brings. I remarked that my Chili Breeze had flown and that it had ballistic performance and was more than capable of flying the full FAI schedule. Which just proves what I've said before that you don't have to spend a fortune on an aerobatic model and motor as long as you select the right combination. We decided that in order to help anyone on the verge of taking the plunge into aerobatics, that a quick listing of what combinations work in various size categories may help you. Here goes!

TINY MODELS

Chilli Breeze (RCM&E Plan) with Irvine 36, standard silencer & APC 10 x 6. Add matching tuned pipe and increase prop size to 10 x 8 for even better (and quieter performance).

Incidentally, all prop recommendations will be APC as they are the most efficient and quietest props around unless you wish to pay megabucks for carbon types.

Ditto with OS 32SX & either Irvine or small Hatori pipe. 10 x 8 prop.

Any of the mini Pilot EeZee ARTF aerobatic models with the above motors.

SMALL MODELS

Aerostar 62 (built light) with SuperTigre GS45 ABC or G51, Bolly EQ45, Hatori 400 or ST40 pipe. 11 x 7, 11 x 8

Ditto with OS 46SX - OS, Bolly or Hattori pipe and props as above.

Ditto with ST G61K ABC no pipe, large expansion box silencer, 11 x 8, 11 x 10 prop

Chili Wind (RCM&E Plan) - Same motors etc.

Excelsior 163 - Same motors etc.

Loaded Dice 40 - Same motors etc.

EZEE Topline 40, Beat On or any of the mid sized ARTF aerobatic not funflyish models - Same motor etc.

Or if 4 stroke power is your bag - OS91FS with 13x9 in any of the above.

MEDIUM SIZE MODELS

Challenger (RCM&E Plan) - Super Tigre G90K with Bolly EQ62, Hatori 700 or ST pipe. 13 x 12

Ditto with YS 91FS 13.5 x 10 prop.

Aerostar 69 - Same motors etc. as above.

Chilli Wind 60 (Plan) - As above.

Summit III - As above.

Excelsior 177 - As above.

Loaded Dice - As above.

Illusion (Plan) - As above.

LARGISH MODELS

Excelsior 188 with YS120 any aerobatic manifold/muffler system - 15 x 12 prop.

Ditto with Webra 120LS and matching pipe - 16 x14, 16 x 16 prop.

New Solution - Motors etc. as above.

2 METER MODELS

Any of the modern Glass/Foam kits with YS140L + Hyde mount or YS140LM. Any of the current manifold/muffler systems and 15 x 12, 15 x 13, 15 x12W, 15.5 x 12 or 15.5 x 12W prop.

There are many more combinations which work well but these are a good start. If I had to make one recommendation for a beginner it would be for a 60 size model with the ST90 motor. Relatively cheap, easy to sort and cheap to run on 5% nitro fuel. The thing to do is come along to a comp. and ask for advice. Remember that aerobatic models make really excellent club flying machines and their vice free performance means that they usually last a long time.

PLUG PREDICAMENT

For most people the glow plug is just the bit that fills up the hole in the top of the engine. If you have the right plug and it is in good condition this is really all there is to it. If it is wrong or damaged at best the motors performance will suffer and at worst it may stop unpredictably or even be damaged. The purpose

of the glow plug is to ignite the fuel air mixture in the cylinder at the correct point in the cycle so that the expanding gasses impart the maximum momentum to the descending piston. So how can this be achieved?

Firstly we need to understand how the glow plug works and as usual my explanation does not claim to be 100% technically correct but hopefully will illustrate the important points. The element of the plug consists of a coil of fine wire made from an alloy containing elements such as platinum, iridium and rhodium. The alloy has catalytic properties - a catalyst being a substance which assists a chemical reaction without in itself taking part in or changing as a result of the reaction. In this case the chemical reaction is the burning of the fuel mixture. When the element is connected across a voltage source the resultant current flow causes the element to glow. The glowing element initiates ignition in the cylinder when the motor is rotated and even after the the power source is removed, the increased temperature in the cylinder is sufficient to keep the element catalytically active enough for subsequent ignitions. It is unlikely that the element continues to glow visibly once the power source is removed but as I have never been able to view the interior of a running engine I cannot confirm this point! Unlike spark ignition which is timed to occur at a specific point in the rotation of the engine, glow ignition will occur when the combination of cylinder pressure, temperature and catalytic activity of the plug initiates the reaction. Increasing any of these variables advances the ignition point, conversely decreasing them retards the ignition. The cylinder pressure is determined by the compression ratio of the motor and the temperature by the fuel mixture (needle setting). The catalytic activity is a function of the plug and is altered by the manufacturer by changing such things as the composition of the alloy used in the element, the thickness of the wire and the diameter and number of coils. This means that by changing the activity of the plug, we have some control over the ignition timing of our motor. Unfortunately we don't rate plugs according to their catalytic activity but no doubt due to their American origin, their heat.

A cool plug is one of low activity, a hot plug one of high activity. Until recently most plug manufacturers made a limited range of plugs and designated these cool, medium and hot. In addition they didn't agree on the heat ratings so that a cool plug from one manufacturer might equate with a medium from another. More recently the range of plugs available has extended with many manufacturers having extra cold, cold, medium, warm, hot and extra hot plugs available. there have even been attempts to enable comparisons across ranges with the adoption of a Standard Heat Rating scale by some manufacturers. There is an additional type of glow plug which is available and that is a dedicated 4 stroke plug. Bearing in mind that the plug must stay active during the non firing stages of the operating cycle, a 4 stroke motor has a much longer time between firings due to the fact that it fires once every two revolutions and usually at lower revs than its equivalent 2 stroke. The 4 stroke plug is therefore much hotter than most 2 stroke plugs to retain sufficient activity between the desired firing points. What follows refers to 2 stroke plug selection. With my 4 stroke motors I have always used the OS 4 stroke plug with no problems.

So now that we understand a little of how a glow plug works lets select the correct one for our purpose. The size of the motor, the nitro content of the fuel and the expected revs it will be operating at all affect the plug heat. Small motors (less than 0.15 cu.in) and large motors (greater than 0.90 cu.in) tend to need hotter plugs, the former due to the small cylinder volume to surface area ratio causing it to cool rapidly and the latter due to lower compression ratio. Nitro content in excess of 10% usually needs a cooler plug. Assuming you are running a motor in the "normal" displacement range with 5-10% nitro fuel, fit a medium plug. Start the motor at idle and open the throttle a very small amount. Remove the plug lead and note whether the revs drop. Open the throttle slowly to full power and tune the needle for maximum revs. Note whether the motor breaks into a clean 2 stroke well below the maximum revs point or whether it

just reaches the point of 2 stroking and maximum revs simultaneously. It may also be reluctant to 2 stroke at all before stopping lean. Condition 1 is acceptable but may also indicate that the timing is a little over advanced and that a slightly colder plug is required. Condition 2 indicates a slightly retarded ignition condition and a slightly warmer plug is required. Condition 3 indicates severe retardation and a hotter plug is required. Having adjusted the needle, stop the motor and restart. A persistent drop in revs when the plug lead is removed confirms the plug is too cold.

Run the motor up to full power and check the throttling. If all is well we can proceed to flight testing but if the motor is reluctant to pick up from a prolonged idle and the mixture has been checked by squeezing the fuel supply tube (slight increase in speed before stopping), the plug may be too cool.

Now fly the model and listen to the exhaust note. A motor that 2 strokes cleanly on the ground but persistently drops to a 4 stroke in the air despite leaning the mixture needs a hotter plug. A motor which refuses to open up from idle in the air but which does so on the ground needs a hotter plug. A sound like tearing fabric or pulling parcel tape from a roll indicates an over advanced or pre-ignition condition and a cooler plug is required.

From the above you can see that selection of the correct plug is a subtle art depending upon a number of interrelated symptoms. Even if you setup suffers from none of them it is still worth experimenting with different plugs against a rev counter to obtain the best performance. Finally, a few points to watch. Examine the element after a run. Any distortion of the coil may indicate pre-ignition and the need for a cooler plug. A frosted appearance to the element has the same cause although you need to be careful as a well used element has the same appearance and indicates its time to change it. Be very suspicious if your motor starts blowing plugs as this often indicates wear debris from the motor is impinging on the element causing mechanical damage. Keep your plugs clean preferably in the manufacturer's packaging. Avoid the temptation to keep old plugs unless they have only done a few minutes running - their performance doesn't improve in the box and a used one will let you down at the most inopportune moment!

NOTHING NEW UNDER THE SUN

On a recent business trip I accompanied an equally fanatical colleague to a large archery emporium in the Midlands. We went into a large but sparsely appointed showroom in which, displayed on stands, were hundreds of bows made from materials ranging from wood to carbon/kevlar composites. On one wall was a peg board covered in small packets each containing some esoteric gadget or accessory necessary to the sport. In the corner was a locked glass case filled with more expensive items such as sights and stabilisers. Behind the counter was a fairly scruffy individual wearing an advertising sweat shirt, struggling to assemble a bow while his equally scruffy customer and his cronies looked on, each offering unwanted and unheeded advice. In front of the counter was a box containing arrow making materials which included wooden dowel, aluminium and carbon tubing. I felt immediately at home! While my colleague spent half an hour searching for the bits they didn't have and finally settled on something that would nearly do, I browsed the stock and found several bits that could be used in our hobby, mainly as control runs or in linkages. The moral is that it is worth looking further afield for materials and ideas and you can bet you won't feel out of place.

Malcolm Harris
Scottish Aeromodellers Association

Thanks Malcolm. Ed.

1999 F3A WORLD CHAMPIONSHIPS

Ever been close to a Grade 4 hurricane? Believe me, you don't want to be! I recently returned from the F3A World Aerobatics Championships held at Pensacola, Florida. (Airfield 2 miles from Gulf of Mexico). The next 3 articles will focus on what it was like to be in attendance.

To begin, what is a World Championship like in anything? – One word, PRESSURE! The first official day began with the flyers bringing their planes in to be weight and measured. No plane can be heavier than 5 kgs or bigger than 2 meters by 2 meters in size per FAI regulations. Now this is an all day affair, considering there is 34 countries attending with 90 plus flyers, and each flyer having 2 planes to get checked out. The difference in quality of planes between some of the countries was a significant. The top range of models (from Japan, France etc.) were worth about \$ 5000 US each. The bottom end planes were about \$ 1500 coming from some of the third world countries. This gave the top teams a technology edge, which would show itself throughout the week of flying. Some planes failed, just too heavy or long or wide. The team members could be seen in the parking lot outside replacing heavier parts with lighter ones etc. and then going back in for a retest. (You didn't want to be doing that right then –enough pressure already on the pilots without having to worry about the planes) .

Round 1 of 4, Preliminaries started the next morning after the plane check-ins (FAI "D" schedule). When I got to the rental car that first morning, I noticed the moisture dripping, the overnight temperature had cooled to a nice 78 F @ 97% humidity. The winds seemed to have picked up (Hurricane Floyd coming) somewhat to a nice 20 mph. During my 30-minute drive that morning to the airfield, I wondered how much difference there is in motor and airfoil performance between a model plane flown at sea level versus one at a City in Western Canada with it's elevation, temperature and humidity. Most teams had spent the week before flying at the 3-practice fields available to them. They used this time wisely to adjust carb mixtures; plane trims and just generally gets conditioned to the high temperature & humidity conditions. All indicated that the motors pulled (more rpm) better at the sea level conditions and their planes appeared to have better damping while flying.

The Official Contest Flying field was held at the Navarre Military Airstrip, four flight lines were used. Flight lines A & B were used till noon, and then flight lines C & D became active. This was done to prevent the Sun from having an impact on the flyers & judges. I almost forgot the judges, there were approximately 24 – only 1 from any one country was allowed. (Karl Mueller represented Canada) This sure helped to prevent any group politics or block scoring which now seems to show up in events like figure skating etc.

Back to flying – many of the participants were at their first (probably last) Worlds – the pressure was evident, the outside portables were busy and the flyer's wobbly knees at the flight line showed. The wind often reached a 25-mph (40 km/h) at about 45 degrees to the runway in the afternoons. I was nervous too; there I was with a \$10,000 loaned digital video camera trying to figure out what & how to film this event. (I got 7 hours of unedited footage, edited tapes available in December). If you are standing beside the likes of USA's Chip Hyde, France's Christophe Pasant Le Roux and Japan's Giichi Naruke the present World Champ for the last 4 years running what do you say? The flight judges had no trouble that first day separating the flyers- the individual scores were well spread out. How many local flyers do you have flying at the field in a 40-kph crosswind? For the bottom 30 flyers, the 1999 F3A World's was basically over after the first round! Some of them had traveled thousands of miles to attend, only to realize that fate (Hurricane Floyd now 300 miles away) would punish them for not practicing diligently in windy conditions.

Where it hurt! – if their plane's wing loading ratio was higher than 21 oz./sq.ft., it appeared the flyer had no change of holding both a STEADY line and CONSTANT airspeed on the long verticals. Remembering that the pilot has to hold in a lot of constant rudder – elevator surface to correct for the strong crosswind as he is doing the maneuver, (with most vertical legs having half or full rolls along the way), now that's a lot of correction & maneuver drag to overcome! In practical terms, if his plane did not have a YS 140 or OS 140 engine (or other motor of similar power) and the planes overall wing loading was above 21 oz/lb. (1100 sq.in./10 lbs.) any chance of getting a score to place in the top rungs is over, a very cruel reality check! (To my knowledge not one engine below 1.2 c.c. in size! was used)

In 1987 at the World Championships in Avignon, France, the F3A pattern world went into new era for judging criteria, the turnaround format. Compliance with the 150-meter outer boundary rule and staying within the 60 degree box limits were strictly enforced. For a plane to stay within the "box limits", it

would need lower airspeeds, lower wing loading and different engine – propeller set-ups. When you factored in a strong wind, as mentioned in my first article, it becomes a lot harder to stay closer. What helped the transition over the years were such things as more efficient propellers (APC), stronger 4 stroke motors (YS) and significant improvements in building materials and technology. These started the evolution of a new generation of aircraft designs, the results of which were evident at the 99 Worlds. Oh, by the way, Hanno Prettner placed first in 1987– he flew in close and had outstanding framing and technical execution of the different maneuvers to win the World Title.

The 1987 World's was a "watershed" year for F3A and general pattern, 1999 could also be viewed in a similar way as the patterns for the 2001 World's have been changed dramatically. It is my feeling that a number of the existing aircraft designs will no longer be competitive at the world class level for the upcoming 2001 contest.

I have detailed out some of the models used over the years by six of the top fifteen flyers so as to give one a better "feeling" for what showed up at these Worlds.

Our new World Champion from France Christophe Le Roux

- 1985 Ultra Manchot
- 1986 Manchot I
- 1987 Manchot II New Wing Design
- 1988 Manchot III Polyester Fuse
- 1989 Manchot IV New Stab/Rudder
- 1991 Manchot S Austr. 17th place
- 1993 Manchot S Austria 15th place
- 1994 Manchot Kevlar Fuse
- 1995 Topline S Japan 3rd place
- 1997 Topline S Poland 2nd place
- 1999 Alliance M USA 1st place

These planes are all designed by Christophe, but usually built by someone else. Christophe still likes brown paper covered wings with a carbon-kevlar body. Although, the wings on his plane appear smooth from a distance, when you run your hand across the surfaces they have a slight ripple texture. The new Alliance is a fatter Topline with its size matching very closely to the "Larimar" design by Wolfgang Matt. (My upcoming video has a 10 minute technical interview with Christophe looking at the Alliance, filmed one day before he became World Champ).

Other designs from France at these Worlds included;

- Caprise Christophe L built by ZN at www.znline.com
- Fashion Laurent Lombard L
- Twister Arnaud Poyet XL
- Akuma Arnaud Poyet M
- Tornando Patrick Lemmonier L built by PL at www.plprod.fr
- Excellence Patrick Lemmonier L
- Alise Patrick Lemmonier M

The planes from France were in most cases built of carbon-kevlar bodies. A kit can be ordered in fiberglass for the smaller designs. I was told there is about a 6-ounce weight saving using CK materials. It was indicated by some of the flyers, the more important reason for going to the CK is the rigidity of the body. During snaps, the plane's body undergoes tremendous force resulting in twisting and therefore unwanted stab/rudder movements, evidently a plane constructed of CK material twists significantly less than a fiberglass model. Kevlar has about 50% more tensile strength and about 35% more stiffness than glass cloth. So by combining Carbon fiber which is probably the strongest and stiffest of the readily available exotic materials with Kevlar, one gets a body structure very resistant to fatigue or twisting. Another very nice feature seen in a lot of these planes from France was the glass honeycomb (nomex)

formers and servo mounting plates, very light and strong. The engine mounting plates were constructed of carbon fibre honeycomb material with small pieces of plywood or aluminum inserted in at the bolt crush points. Generally, the only wood used anywhere on some of these planes is on the wings!

The 2nd. Place finisher and former World Champ - Giichi Naruke from Japan;

- 1987 Silent France 5th place
- 1989 Silent USA 5th place
- 1991 ?
- 1993 ?
- 1995 Aurum Japan 1st place
- 1997 Austar X Poland 1st place
- 1999 Narlar M USA 2nd place

As you can see, I don't have much data for Giichi's planes.

Other designs from Japan at the Worlds included;

- Beat-On Yoichiro Akiba M
- Explorer Hajime Hatta M
- Chance-TR Giichi N. M

Hatta's plane the "Explorer" had vertical mounted body drag flaps that would extend during low throttle conditions, one on each side of the fuse. (About 2" by 2" in size) and he was one of the few pilots that used a two stroke motor.

The 3rd. Place finisher and also a former World Champ – Chip Hyde from USA

- 1985 Dalotel 60 Hanno Prettner
- 1987 Aurora Giichi Naruke
- 1989 Jekyll Hyde USA 4th place
- 1991 Jekyll Australia. 1st place
- 1993 Jekyll Austria 2nd place
- 1995
- 1997
- 1999 Hyde-Out Hyde M USA 3rd place

In most cases, Chip or his father Merle Hyde has designed the planes Chip has flown throughout his career. It appears most of the top flyers have their own designs which are matched with the individual styles they fly.

Other designs from USA at the Worlds included;

- Typhoon 2000 Ron Chidgey M USA Star Dave Von Linsowe S
- Typhoon 2 + 2 Ron Chidgey S Giles 202YT Ron Chidgey M
- Fascination Chris Lakin M Ariel Dave Stewart S
- Patriot Brian Hebert S
- Storm EX Brian Hebert S
- Prophecy Dave Geurin S

The 5th and 9th place finishers were Roland and Wolfgang Matt. Since Hanno Prettner has pretty well retired from the international scene, Wolfgang (if he wasn't already) is the "godfather" of the sport. At these World's he even acted like it – very reserved and always waiting for the other party to make the first moves. And I suppose if a person had won the number of championships he has over the last 33 years, well you would want a little respect too!

- 1967 Corsika 6th place

- 1969 Germany 6th place
- 1971 Superstar II USA 2nd place
- 1973 Superstar III Italy 2nd place
- 1975 Superstar III Switzerland 1st place
- 1977 Atlas USA 3rd place
- 1979 Arrow South Africa 1st place
- 1981 Arrow Mexico 3rd place
- 1983 Arrow USA 5th place
- 1985 Joker I Holland 2nd place
- 1987 Joker II (angled wing tips & stretched tail) France 2nd place
- 1989 Saphir ? USA 2nd place
- 1991 Saphir ? Australia 7th place
- 1993 Rubin Austria 3rd place
- 1995 Opel Japan 2nd place
- 1997 Diamant M Poland 3rd place
- 1999 Larimar M USA 9th place

Wolfgang is another flyer who designs his own planes. In some cases others build them, the “Diamant” by a Japanese builder and his latest design the “Larimar” by Patrick Lemmonier co-owner of PL Products of France. His new plane has a very evident double tapered wing, and actually if one looks at the front cover of October issue of the American Aerobatics Newsletter the “K-Factor”. You will see the same sort of taper on the Hyde-out & Prophecy planes held up by Chip Hyde and Kirk Gray. (The new Larimar is reviewed with Roland on my upcoming video) All the Matt planes used electric retracts instead of servo driven mechanical or pneumatic units. They are manufactured in Switzerland by Giezen-danner and although there is no weight saving, lack of linkages, air-tubing etc. makes them quite attractive to use. They had 4 of these models at the contest, during the Saturday check-ins the average weights were 4.2 to 4.3 kgs. (9lbs-4 oz to 9lbs-9lbs-8oz). This is an outstanding weight considering the planes have 1075 sq. in wings with YS-140 LM engines.

To finish 10th in the World’s is no small feat, especially when flying against competitors half your age or less! Canada’s own Ivan Kristensen has proven to be one of the most resilient and enduring F3A competitors on the “Tour”. Ivan has had to fly against the likes of Hanno Pretter and Wolfgang Matt for the first couple of decades and has done extremely well. Now it’s Christophe, who many say will be a Hanno the 2nd ! (Not far behind are Jason Shulman, Roland Matt and Sean McMurty).

- 1977 Saturn USA 4th place .
- 1979 Saturn SE South Africa 5th place
- 1981 ?
- 1983 Citation USA 4th place
- 1985 Summit I Holland 5th place
- 1987 Summit II
- 1989 Summit III USA 3rd place
- 1991 Summit III Austr. 4th place
- 1993 ?
- 1995 ?
- 1997 ? (Did not go to Poland)
- 1999 Angels Shadow V. Kozlowski USA 10th place

The latest plane that Ivan is flying is designed and built in Russia. The first time I saw the plane was at the Canadian F3A Teams trials last June in Moose Jaw, Saskatchewan. The body and wings are constructed of a fiberglass sandwich, which comes out of the mould with its surface already painted. Very spectacular looking finish! I understand that the mould is waxed internally and then sprayed with the

colors selected. Once the paint is dry inside the mould, the composite structure is built up inside the mould as would normally be done. (My video also has a 10-minute technical interview with Ivan) Contest weigh-in weight was around 4.8kgs (10lbs-8 oz) this plane is about a half pound too heavy for my liking and I believe Ivan had his mitts full flying it in the strong crosswinds at the Worlds. The plane didn't appear to roll as smoothly as the other models and I don't believe this is not at all due to Ivan's flying abilities – if anything, he made the plane fly a lot better than it should have.

Here a summary of the top 12 most common planes found;

1. 8 Fashion
2. 3 Prophecy
3. 2 Diamant
4. 7 Caprise
5. 3 Larimar
6. 2 Topline
7. 3 Typhoon 2+2
8. 2 Desafio
9. 2 Torando
10. 2 Typhoon 2000
11. 2 Angel Shadow
12. 2 Explorer

Now the fun part, here is my personal rankings for how these planes performed. And just to qualify myself a little – after one has watched the same models for 4 days of doing schedule “D” in the preliminary rounds and then another 2 days of schedule “E” all in one week, you do kind of develop a natural basis for judging. And yes, I do believe that anyone of the top 15 flyers could take a real “turkey” of a design and make it fly just wonderfully at a local pattern meet. But that won't happen here at the F3A Worlds – not with a 25 mph crosswind!

Every flyer wants his plane to look well in the air, but with this he also wants better scores! The chances of better scores are greatly enhanced by a lighter, slower, tighter maneuvering model. From what I could observe, the plane designers used different approaches to reach that constant speed objective. The three most observable ideas were, high drag areas on the airframes, very light construction and prop drag. To achieve outstanding vertical ascent and descent a plane will need to have a combination of all three. I observed three fairly distinct groups of planes – performance/presentation wise.

GROUP A

BETTER PRESENTATION IN AIR -SPEED CONSISTENCY-SNAPS/ROLLS

1. Fashion Explorer
2. Caprise Hyde-out
3. Alliance Beat-on
4. Larimar Narlar

GROUP B

1. Angels Shadow Prophecy
2. Typhoon 2000 Twister
3. Giles 202 YT Tornado
4. Diamant Alise

GROUP C

1. Typhoon 2 + 2 Patriot
2. USA Star Ariel
3. Fascination Storm EX
4. Topline Akuma
5. Chance-TR Desafio

When I first looked at these planes parked on the asphalt – I saw quality workmanship and \$\$\$ dollars spent on quality materials –equipment. Plane flying surface and control surface element alignments were dead on – no evident of any surface slop or distortion. A big surprise to me was the lack of flyers using JR equipment! Sean McMurty, the US team alternate was one of the few flyers with a JR set. Futaba radio sets were used by about 65% of the flyers. Some digital servos were in use already, although with most having the analog units still.

Engines, that's another surprise. The 4 stroke to 2-stroke battle did not exist at these Worlds. YS engines (Yamada) were in probably 80% of the planes. The "OS" factory boys were there – they gave out great stickers. But more than that, they were quite friendly (in Japanese). With the help of an interpreter they indicated that a new OS 140 two stroke will be released in February 2000. The engine will have a computerized fuel injection system that will be adjustable in flight! Initially it will be setup to work with a Futaba 9ZAP system (throttle curve). I believe Hatta's "Explorer " had such a unit – this should make the preflight sound testing interesting. If you richen your engine slightly during testing the noise level will no doubt drop enough to easily pass, once in flight lean her out for max. power ! (My video has a interview with Frank Lens of Belgium reviewing his 140 OS powered Fashion).

Most of the European planes used the YS140LM motor with the mount integrally cast into the crankcase. This version of the motor is not available in North America. A couple of the European flyers indicated that after trying the LM Yamada mount and also the Hyde mount, they preferred the LM mount. There is no noticeable difference in vibration levels but the LM mount is almost 2 ounces lighter once total installation is complete over the Hyde mount with the associated nose ring. The LM mounts on a horizontal carbon honeycomb plate that was said to be a better way of allowing vibrations to pass into the airframe versus the vertical firewall used by the hyde mount (surely this is to be avoided to reduce airframe noise? Ed). Also, they liked the ability to easily change motor thrust angles by loosening the 4 mount bolts and then shifting the motor. Both mounts appear to work quite well, so the deciding factor is probably the plane's nose mounting configuration.

The retract versus fixed gear discussion was another non-event. The ratio was about 5 to 1 retract to fixed gear on the different models. Flying wise, I could detect no difference in the performance of the planes.

In summary, my view is that North American kit builders are generally about 18 months behind the Europeans in materials use and model presentation in the air. Airfoils are a tossup and will change every year regardless.

On this design issue, I believe in most cases plane design improvements are a hit and miss affair. It seems every time I see a new "prototype" model and its stated related new advantage one wonders if what is stated is the real reason for the model performing better in the first place!

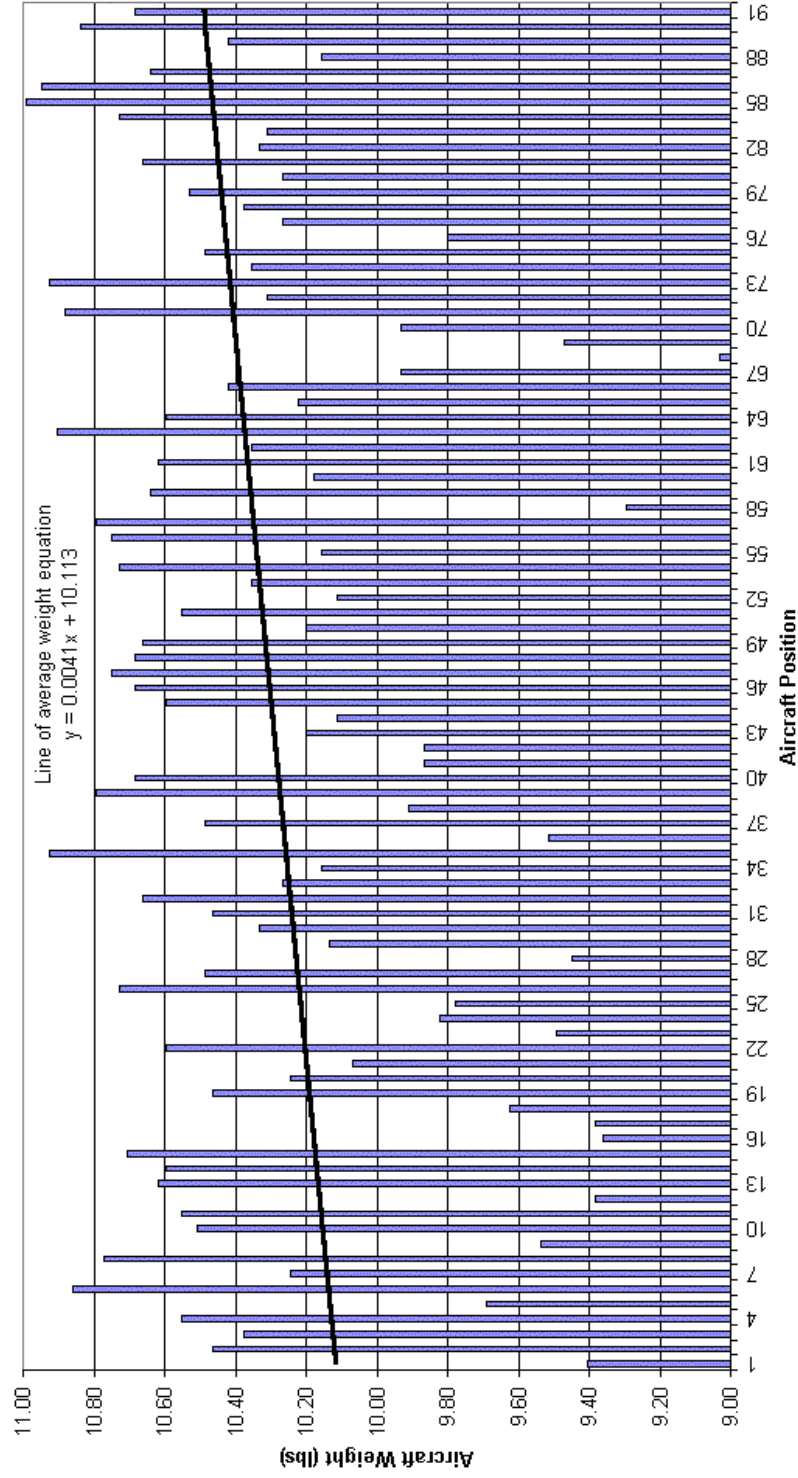
Here's a flashback for you – 20 years ago at the 1979 World's, who represented USA? and the runners-ups?

- Dave Brown Tiporare (Copy of Hanno Prettnner's Curare)
- Mark Radcliff Phoenix VII
- Dean Koger EU-1 (a plane 15 years ahead of its time)
- Don Lowe (manager)

The other contestants included Steve Helms, Jim Kimbro, Ron Chidgey, Tony Bonetti, Jim Oddino, Don Weitz and Don Lowe.

Hans Mausolf

Aircraft Weight vs. Position



Promoting Aerobatics

I am very keen to increase interest of the GBRCAA. So I have volunteered to be the display coordinator to promote our selves to your average modeler.

I believe that the modelers sees use as highly skilled naturals who spend about two-three thousand pounds on our models. This is only true in master's class at the main events that your average modeler reads in the magazine. It is not noticed that there are three simpler classes before masters that prevents throwing new competitors in the deep end (I would call this progressive learning).

The way to increase interest/member is to promote the following:

- 1) We should explain that new pilots would start with simple loops, rolls, inverted flight and stall turns (the same maneuvers that are in the B test but with turn round maneuvers).
- 2) You can use any sport model under eleven pounds and that does not exceed the two meter rule i.e. Acrowot, Chilli Wind, Wot 4's and Saphir 40 (if the model can fly straight, inverted and go up vertically it is perfect). The first model I used to fly standard class was a Sig Kurgar.
- 3) You can use any standard 40 size engine with no pipes.
- 4) There is no need for computer radio because mixing is not that important.
- 5) Aerobatics improves your flying skills, challenges your self and is **FUN**.

I am asking for volunteers to put on talks and demonstrations at some of their local clubs and to coach them for the day and invite them to our comps. For this I will be putting together a small booklet to hand out and to use to prepare your talk. I will be traveling myself to model clubs in the North East to put on these talks, demonstration flights with my New Kyosho Majestic powered by a ST51 and to coach modelers there to fly the sportsman schedule at a comp I will be organizing.

I also need volunteers to help me with public displays. I would like people to volunteer to do some flying and this can be any F3A model; it is up to the pilot to do what they want to do, one of our schedules or a free style. Both passes to the display and camping would be free and possibly more expenses to be paid for.

I have also consulted with display organizers so that we get free trade stands at these events so I need help on manning the stand, selling drew tickets and talking to the pupil as well as the flying. I might be struggling at some events with space in my Nissan Micra to fit a tent, my Fashion line and my Kyosho Majestic with all the rest of the gear. So if you can provide a tent suitable for a trade stand it would be a big help.

Jun 10-11 Traplet Scale Weekend, Old Warden
Jun 10-11 Blackburn & DMAC Midsummer Rally
Jun 17-18 Telford Model Show, Weston Park Nr Shifal - No Trade Stand
Jun 24-25 Southern Model Air Show 2000, Nr Purley Surrey
Jul 1-2 Woodspring Wings 2000 Air show, Nr Bristol
Jul 8-9 Wings & Wheels Model Spectacular, North Weald Airfield - No Trade Stand
Jul 22-23 Traplet Model Flight Festival, Old Warden
Sep 9-10 Model Would 2000 Air Show, Middle Wallop

If you are interested in any of these events or if you have any more ideas or points of view please contact me on (01642 862343). This is be an impossible task on my own so please help if you can.

I think these ideas will work and the number of new members we gained at the BMFA Nationals proved this point. And this is just one event, what about more with larger crowd?

Paul Hepworth

G.B.R/C.A.A. COMPETITION ENTRY FORM 2000

Comp. Venue and date:

Name & Address

.....

Tel. No. BMFA No.

Car Reg. No. **Make** **Colour**

Names of passengers

Class (please tick box)

Standard/Sportsman	£8.00	<input type="checkbox"/>	Senior	£12.00	<input type="checkbox"/>
Master - domestic	£15.00	<input type="checkbox"/>	Master .91 class	£15.00	<input type="checkbox"/>
Centralised (FAI)	£16.00	<input type="checkbox"/>			

Frequency (odd only)..... **Alt.** (must be specified)

Send the form and the following to the C.D. for the event not less than 3 weeks prior to the event:

1. Cheque made payable to the GBRCAA , dated the same date as the comp. (if entering more than 1 comp send separate cheques for each event.)
2. Stamped addressed envelope.

Note—pre entry is a requirement of all GBRCAA competitions. If you wish to submit a late entry, contact the CD first. If the CD is willing to accept your entry on the day, double fees are payable. If you are unable to attend, please contact the CD as soon as you can as he may well have a reserve list for the event.

C.D to return this part to entrant

Your entry forcomp is accepted/ not accepted

Your frequency is

Remarks.....

.....

.....

SignedC.D. Date

2000 GBRCAA Competition Calendar - Issue 2 24th March 2000

	Weekend 1	Weekend 2	Weekend 3	Weekend 4	Weekend 5
March	5	12	19	26 Ice Breaker Elvington, N Yorks Std Sen Mast-FAI (PO1) CD: Bob Reid	Weekend 5
April	2	9	16	23	Glenrothes, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour
May	7	14	21	27 & 28 GBRCAA Centralised Middle Wallop, Hamps 2 days - Double entry fee Std Sen Mast-FAI (PO1) CD: Tom Shore Entry to: Bill Harrop	Sat 29 th GBRCAA Committee Meeting
June	4	10 & 11	18	24 & 25	Lowland Cup Scampton, Lincs. CD: Bob Reid / Daryl Foster
					24th June (Saturday) East Fortune, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour
July	2	8 & 9	16	23	30
		Triple Crown East Fortune, Scotland	3rd Centralised Mini Nats Barkston Heath . Lincs	Corsairs Field, Doncaster Std Sen	GBRCAA Open Comp. Std Sen

August	<p>6th Centralised Cashmoor , Dorset FAI (PO1) CD: D Tappin Entry to: Bill Harrop</p> <p>Brian Brotherton Memorial Trophy Cambridgeshire Std Sen Mast-FAI (PO-1) CD: George Drever</p>	<p>Triple Crown East Fortune, Scotland Team Event CD: Ellito Balfour</p> <p>Cashmoor Std Sen Mast-FAI (PO1) CD: Alan Hilton</p> <p>Baldock, Hertfordshire Saturday 8th Std Sen Mast-FAI (PO1) CD: Greg Butterworth</p>	<p>3rd Centralised Mini Nats Barkston Heath , Lincs FAI (PO1) CD: B. Ransley Entry to: Bill Harrop</p>	<p>Corsairs Field, Doncaster Std Sen Max 15 Competitors CD: Steve Dunning</p> <p>Warboys Std Sen Mast-FAI (PO1) CD: Clive Whitwood</p>	<p>GBRCAA Open Comp. Std Sen Mast-FAI (PO1) CD: John Mee</p> <p>Barrow in Furness Std Sen Mast-FAI (PO1) Sport. CD: Bert Caton</p> <p>Cumbernauld, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour</p>
September	<p>3 Alloa, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour</p>	<p>12 & 13 5th Centralised / SAA Nats Glenrothes Airport, Scotland FAI (PO1) CD: E. Balfour Entry to: E. Balfour Details to follow</p>	<p>20</p>	<p>26, 27 & 28 BMFA Nationals Barkston Heath, Lincs 3 days Std Sen Mast-FAI (PO1) CD: Stuart Mellor Entry to: BMFA Entry form from: BMFA</p>	
October	<p>1 Warrax, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour</p>	<p>3 -10 European Champs Belgium</p>	<p>17 Mansfield, Notts Std Sen Mast-FAI (PO1) CD: Trevor Plumbe Cashmoor Std Sen Mast-FAI (PO1) CD: Alan Hilton</p>	<p>24 Maidstone, Kent Std Sen Mast-FAI (PO1) CD: Mike LeMimon</p>	<p>29</p>
		<p>8 Hastings Std Sen Mast-FAI (PO1) CD: Alan Hilton</p>	<p>15 Glenrothes, Scotland Sportsman Mast-FAI (PO1) CD: Elliot Balfour</p>	<p>22</p>	

Sport

Sportsman Schedule

Std

Standard Schedule

Sen

Senior Schedule

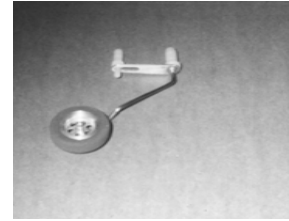
Mast-FAI (*)

Master * indicates FAI schedule(s)

NB: Centralised competitions are open to all classes; with **all classes** flying the FAI schedule indicated.

Send entries to the Contest Director (CD) using the Competition Entry Form from Aerobatics News unless otherwise noted

M. A PRODUCTS



Price List

Exhaust manifolds

made to order from £22:00

Alloy wheels £17:00

Tail wheel to match £ 5:00

Steerable assembly £15.00

Prop nuts £ 6:00

Exhaust deflectors £ 7:50

Tuned pipe brackets £ 7:50

Please make cheques payable to:-

M. Aldous, Romila, Hilders Lane,

Edenbridge, Kent TN8 6JU

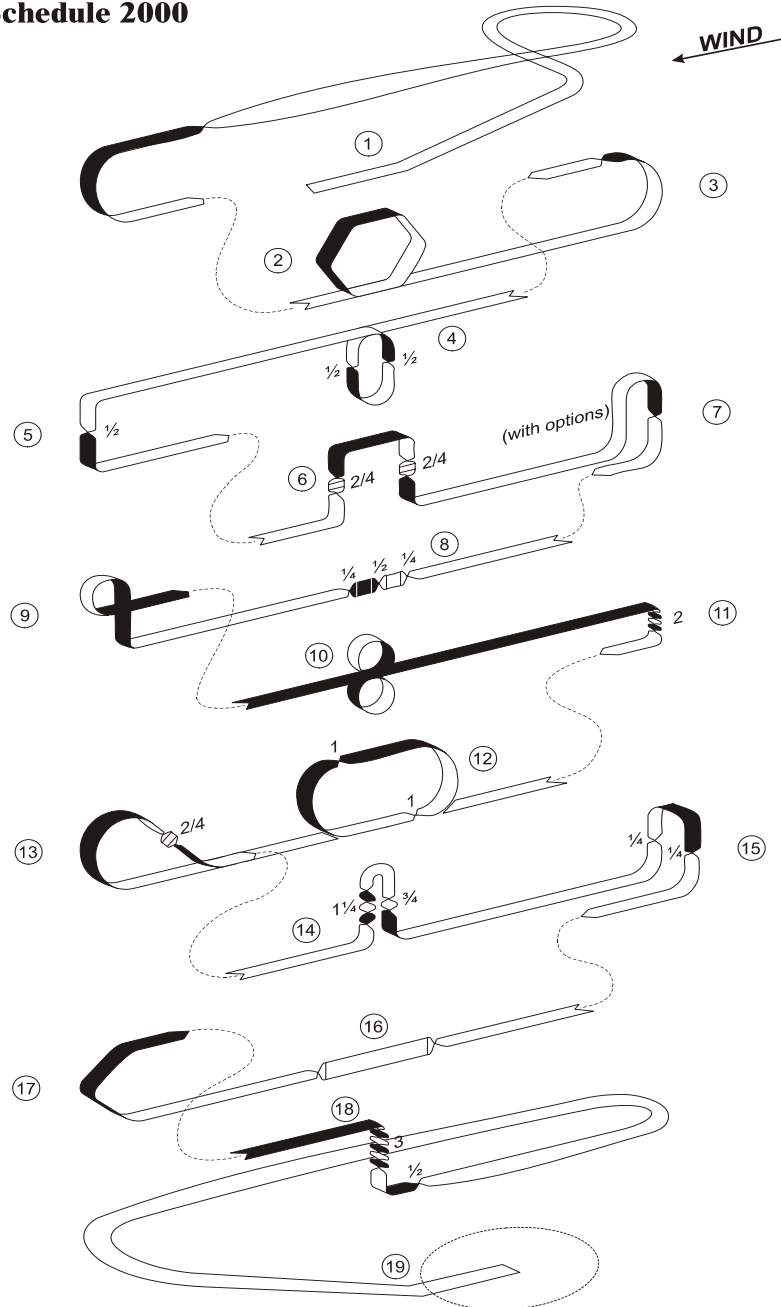
Tel. 01732 865113

Revised drawing of Senior 2000 & PO1 Schedule

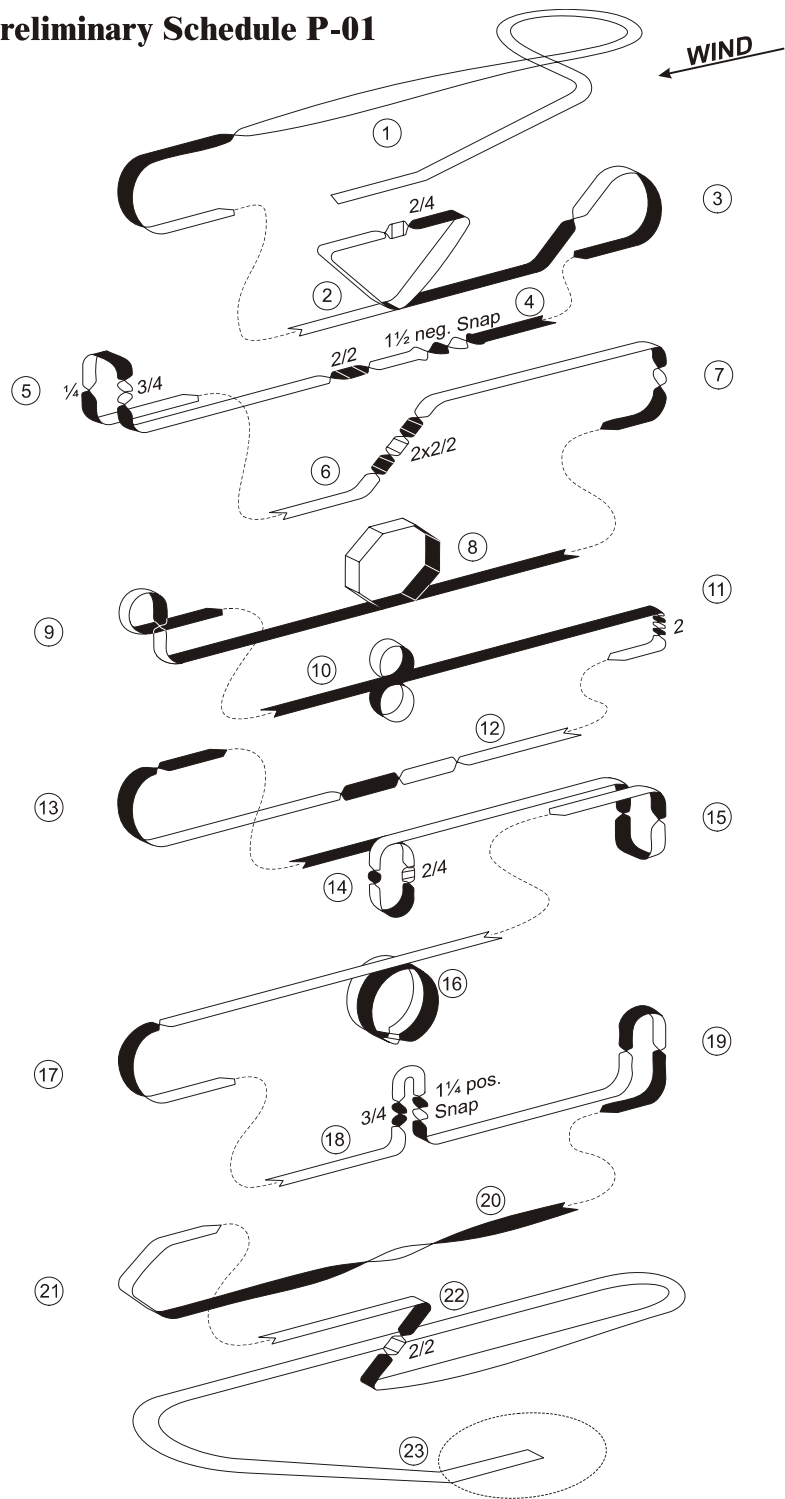
Our intrepid printer, Alan Simmonds informed me of a mistake of the previously published Senior 2000 and PO1 ribbon drawings. Here are the correct versions; can you spot the difference ?

Ed.

Senior Schedule 2000

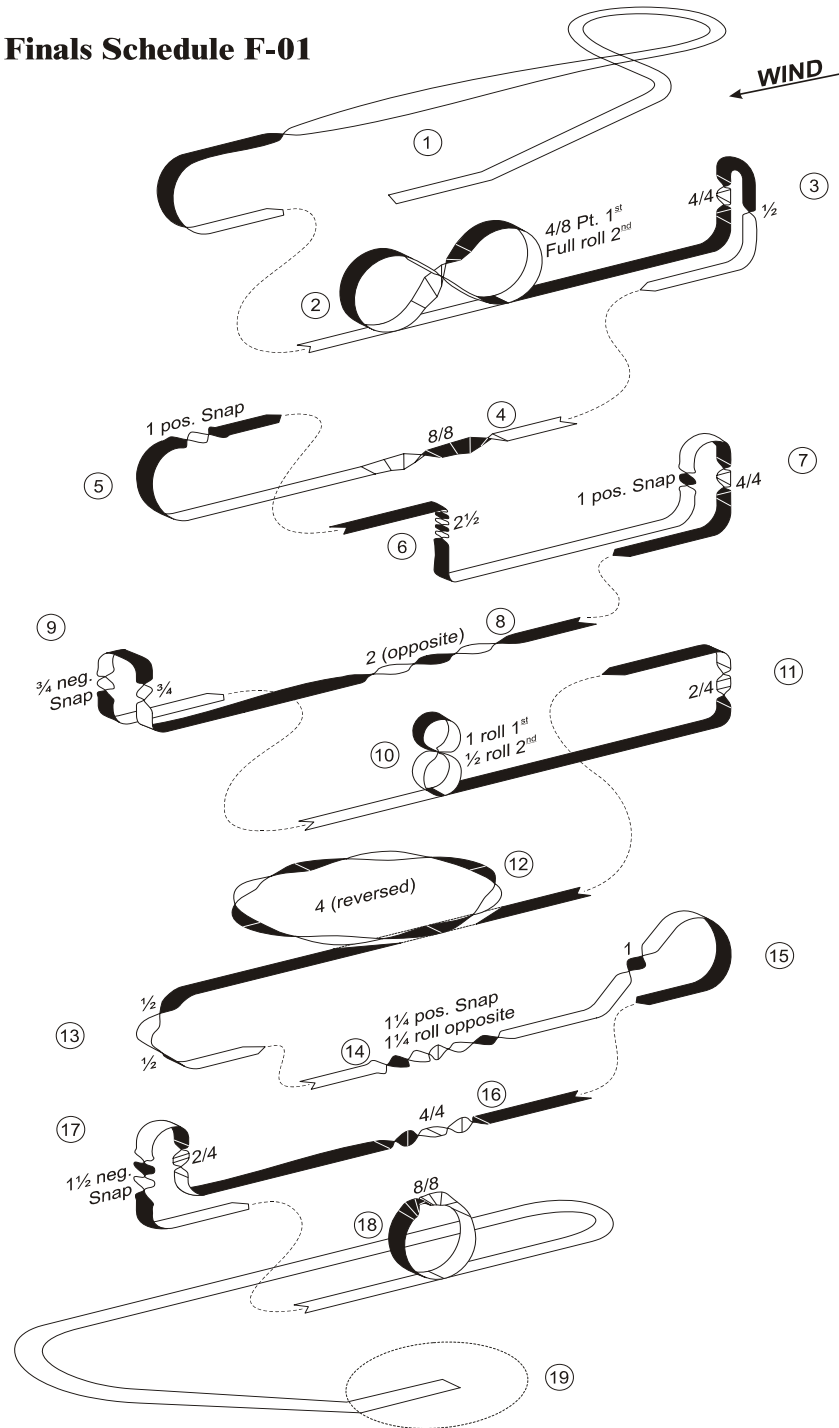


FBI Preliminary Schedule P-01



There's no problem with this diagram of the FO1 schedule, other than it existing! Don't forget to lobby your NAT's CD if you want to see this flown at this year's nationals. See September 1999 Newsletter for a score sheet for this schedule. Thanks to Alan Simmonds for the drawings.
Ed.

FAI Finals Schedule F-01



Engine Tips: YS Home Page

With many pilots choosing to use YS engines, I thought and hope this article will help insonify the workings of the YS carburetion system. This article was taken from <http://home.att.net/~YSDoctor/ys.htm> and *refers to engines prior to the FZ140 but the ideas presented should be applicaple.* Ed

Understanding the fuel system on all YS 4 Cycle engines, FZ53 ~ FZ140.

As you know the YS 4 cycle engines work with a pressurized fuel system. This system is what delivers the fuel from the tank to the engine. I will start with the pressure coming from the engine to the tank first. How the engine produces pressure will be another topic.

As the engine turns, it will develop pressure. Part of this pressure is fed into the tank via the (return line, or pressure line, or tank overflow line). This is where the check valve is located. The job of the check valve is not to let pressure return back into the engine and keep pressure in the tank. The amount of pressure an engine develops is between 6~9 lbs. at full throttle. Now that we have a tank full of fuel and pressure, we need to control it before it floods out the engine. This is done with the fuel regulator. The regulator is just an open or closed valve that is like a gardening hose sprayer, on or off That's it. The regulator does not control tank pressure or any air pressure at all.

Controlling when the regulator opens and closes is the next thing. If you take off the regulator assembly, you will see a cavity in the engine case with two holes "Except for the FZ140". The center hole is where the pressure comes in from the crankshaft. The hole that is drilled at an angle is for the pressure going to the tank. As you turn the crankshaft, you will notice the center hole will open up. This is when the crankcase pressure will push on the diaphragm. At that moment the plunger will open and fuel will pass throw the regulator and into the carburettor. As the crankshaft's hole passes the opening, this will drop the pressure in the cavity and the regulator plunger will close stopping fuel from passing to the carburettor. *(In the case of the FZ140 and 140 L (M), the diaphragm will be actuated by pressure fed from the crankcase via a piece of fuel tube. Ed.)*

Most common fuel system problems:

Cracked fuel tank:	Split at a seam
Clunk line hitting back of tank:	As fuel line gets older it will stretch and go soft.
Fuel line and Fuel line "T"s:	Not holding pressure.
Silicone Rubber:	I have found many engines plugged up with bits of silicone.
Diaphragm:	Check for cracks or torn around the edges.
Regulator Gasket:	Plugging up holes for fuel and or pressure.
Dirt in Carb:	Yes even if you have fuel filters....

Using in-line fuel filters is a good way to prevent junk from getting into the carburettor but remember, anything that can go into the carburettor can make it's way to the fuel regulator. I have seen the following stuck in regulators and inside engines:

- Grass
- Paint chips
- Mud
- Balsa wood
- 4/40 belly pan bolt (Roy S.) in a 91AC.
- Silicone Rubber
- ??? And to this day I still can not describe it but it was in there.

Detonation:

I have heard, listened, talked about and even shock my head from side to side hearing some of the methods on how to set carburetors on model airplane engines. All I can say is WOW. For the most part, I think some people really don't know what Pre-detonation is or what it sounds like. Let me tell you that IT IS BAD.....

Detonation is when the piston is coming up on the compression stroke, the fuel will explode and the expanding gases will push down on the piston. This explosion will happen around 42 degrees before top dead center. This means that the fuel is starting to burn before the piston reaches the top. Pre-detonation is when the fuel is starting to burn before 42 degrees or way too soon. This is when the engine will start working against it's self. If the explosion is too soon, the piston has to work harder to reach the top. The sound you hear is a pinging or rattling type noise usually just before the spinner and prop start to fly off.

YS Carburetor Setup

Yes the YS engines are fuel injected but it is a different story when the engine is at idle. The fuel system changes from injected to sucking the fuel. When you first fire up your engine you always want to run it rich..... But after break-in you start to lean out the top end to the max rpm,. Hopefully you are not exceeding 9,000 rpm ????? That is for the 140,120 and 91. The 53's like to run at 11,000 rpm. Next you want to bring your engine to an idle. The proper idle is 2,000 rpm's. Not 22 or 25 or 3000, set at 2,000. This is when the engine starts to suck the fuel Via vacuum. Above 2,000 it will start to inject the fuel.

TOP END

After you warm it up and slowly bring the engine up to full throttle, set the top end to it's max rpm's and back off or richen up the needle 3~4 clicks.

LOW END

After top end is set, bring it to an idle 2,000rpm. From full throttle set your trim so it will hit 2,000 instantly not drop slowly like 35,30,25,22, 2,000. NO it has to hit 2,000 BANG.....After about 3 seconds, the engine will start to let you know if it is to lean or rich.

If the mixture is to rich, the rpm's will start to slow down 2,000 19,18,17. Lean the low end.

If the mixture is to lean, the rpm's will start to speed up 2,000 21,22,23. Richen up the low end.

Remember, after you adjust the low end, always bring it back to full throttle and back to an idle to test your adjustments. DO NOT CHASE THE MIXTURE. make the adjustment within 5 seconds when you hit idle, Do not let it idle for 10, 20 seconds and try to adjust again. You must bring it to full first and back down to check the adjustment. After adjusting the low end, it should idle at 2,000 consistently for about 20 seconds. After the 20 seconds, bring it back up to full throttle by rolling the throttle stick up. DO NOT NAIL IT TO FULL !!!!! THROT-TLE..... Roll it. It should take you just over 1 second to go from idle to full.

Another trick to test if the mixture is correct is to pull off the fuel line at the carburetor at idle. There should not be any fuel coming out of the fuel line. If you do, you are still to rich. This is best done on the bench and not on the plane.

With this last test, many other factors can cause fuel to come out of the fuel line at idle.

- Bad Check Valve
- Piston ring worn out causing to much blow-by
- Leaking intake valve

Rick Mattie

PHIL WILLIAMS PROBUILD

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THE HOME OF YS ENGINES IN THE UK

YS .53 FOUR-STROKE	£195.00
YS.91 FOUR-STROKE	£237.00
NEW ! YS1.20FZ	£399.00
YS1.40L FOUR-STROKE	£465.00
YS1.40LM FOUR-STROKE	£520.00

ENGINE MOUNTS

DAVE BROWN BEAM MOUNT	£36.95
GATOR SOFT & SAFE	£37.95
HYDE 1.20 SOFT MOUNT	£105.00
HYDE 1.40 SOFT MOUNT	£110.00
YS 1.40 ENGINE MOUNT	£145.00
HYDE COMPACT LITE .20 - .30	£19.95
HYDE COMPACT LITE .40 - .50	£24.95
HYDE COMPACT LITE .60 - .70	£29.95

FOUR-STROKE MANIFOLDS

JOHNSON INSIDE YS.91	£38.50
JOHNSON INSIDE YS1.20/40	£39.50
HATORI INSIDE YS1.20/40	£40.50
HATORI COPPER WASHERS PACK OF 2	£1.10
AAP POWER MANIFOLD	£45.00
SPARE HEADER TUBE	£15.95
AAP SUPPORT BRACKET FOR POWER MANIFOLD	£11.95

APC PROPS.

TWO BLADE APC PROPS.	
14*12 APC PROP	£9.72
14*13 APC PROP	£9.72
14.4*13 APC PROP	£9.72
14*13.5 APC PROP	£9.72
15*11 APC PROP	£9.72
15*12 APC PROP	£9.72
15*13 N APC PROP	£9.72
15* 14 N APC PROP	£9.72
15.5 *13N APC PROP	£9.72
16*8 APC PROP	£9.72
16*10 APC PROP	£9.72
16*11 APC PROP	£9.72
16*12.5 APC PROP	£9.72
16*13N APC PROP	£9.72
16*16 APC PROP	£9.72
16*12 APC PROP	£9.72
17*12 APC PROP	£12.72

THREE BLADE APC PROPS	
13.4*13.5 APC PROP	£19.50

FOUR BLADE APC PROPS	
13.8*10 APC PROP	£19.50
14.5*11 APC PROP	£19.50
14.5*12 APC PROP	£19.50
15.5*12 APC PROP	£19.50

FUEL TANKS.	
TETTRA 14OZ	£10.95
TETTRA 16OZ	£11.95
TETTRA 18OZ (BLADDER TANK)	£21.95
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5/8" TO 5/8" EXHAUST COUPLER	£19.95
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15MM TO 15MM EXHAUST COUPLER	£19.95
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CFE EXHAUST COUPLERS HAVE FOUR VITON "O" RINGS PER UNIT TO GIVE A LEAK FREE JOINT. (THE BEST)	

OS "F" PLUGS	£5.00
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PROBUILD 1.20/40 LONG ALLOY PIPE	£41.50

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DUB362 6-32 TAP & DRILL	£4.40
DUB391 4-40 THREAD INSERTS	£1.40
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DUB135 4-40 BLIND NUTS	£0.69
DUB 315 SOK HD 6-32 BY 1"	£0.79
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● BIG TOC CAP - READY BUILT, READY TO COVER	£1100.88
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● ALLIANCE CARBON/KEVLAR	£400.00
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● CAP 232, GLASS. 2.38M LONG & A SPAN OF 2.2M. FOR 60CC ENGINES UPWARDS WITH Balsa SKINNED FOAM PANELS	£581.11
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(FIRM) ISO DAMP RIBBED GROMMETS	£5.95
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	£18.95

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3MM NOMEK PANELS WITH CARBON SKINS 300MM BY 300MM	£23.00

ALL PANELS ARE VAC BAGGED DURING MANUFACTURE TO ENSURE BEST ADHESION OF THE SKINS TO THE CORE MATERIAL.

180ML COTTON MICRO FIBRES	£2.20	LIGHTWEIGHT GLASS CLOTH	£10.50
180ML KEVLAR PULP	£4.75	40 GRAM GLASS CLOTH (PER-METER)	£5.00
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180 ML FAIRING COMPOUND	£2.20	100 GRAM GLASS CLOTH (PER-METER)	£5.00
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9204 SERVO(4.8V)	£60.40
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9450 8KG@.10 OF A SECOND 6V	£76.50

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VOLTAGE REGULATOR TO 4.8V	£29.95

ALL PRICES IN THIS CATALOGUE ARE CORRECT AT THE TIME OF PRINTING. DUE TO ECONOMIC CONDITIONS PRICES MAY VARY, DOWN AS WELL AS UP !!!!!!!!!

ProBuild

PROBUILD PL PROD KITS

K

<u>MODEL</u> KC = Kevlar/Carbon FV = Glass Fibre	BASE KIT	BASE KIT ALL FOAM PANELS IN COMPETI- TION GRADE Balsa	AS PREVIOUS COL- UMN WITH AILER- ONS, ELEVATORS AND RETRACTS FITTED
EXCELLENCE FV	377.77	511.11	611.11
EXCELLENCE KC	466.66	600.00	700.00
TORNADO FV	377.77	511.11	611.11
TORNADO KC	466.66	600.00	700.00
LARIMAR KC	466.66	600.00	700.00
LARIMAR FV	377.77	511.11	611.11
ALIZE KC	388.88	522.22	622.22
ALIZE FV	322.22	455.55	555.55
EXTRA 300 S FV		872.22	972.22
EXTRA 300 S KC		1044.44	1144.44
SMARAGD KC	466.66	511.11	611.11

SHADOW KIT FROM PROBUILD.

The shadow, further development from the world famous Desafio S, the model features plug in wing & Stab, one piece full length underbelly with access to radio installation via a carbon panel. The foam wing, tail are cut from low density foam with the CNC foam cutter for accuracy. The fuselage is a glass cloth with carbon fibre, with reinforcing panels in the rear of the fuz as well as the fin. Motor requirement is for a YS1.20AC up to the new 1.40 LM. Fuselage comes ready sprayed in a white gel coat.

Base kit

Glass fuz & underbelly, foam wing & tail cores with tube holes cut, plan, wing & tail joiner tubes.

Deluxe kit

Includes all above as well as the wings & tail skinned in contest grade balsa, with integral spar system. Ailerons & elevator lined & hinged with kevlar full length system, retract & servo wells cut & lined.

Hi Tec kit

Includes all above but with all formers cut from Nomex glass & fitted into the fuz, motor installation completed. Wing & tail fitted with incidence adjusters.

Base kit. £295.00
Hi tec kit £775.00

Deluxe kit. £525.00

ProBuild

USA ITEMS

Alloy ballraced tail wheel assembly, complete with fitting kit & alloy tail wheel.	£21.00
24" carbon Fibre rods with 4-40 titanium fittings for direct servo connections to control surfaces	£15.95
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36" length Carbon rods (2 off per pack) 3/16" dia with 4 Titanium end fittings	£16.50

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• 2 1/2" FAI	£23.25
• 2 1/2" FAI, LIGHT BACK PLATE	£30.72
• 2 3/4" FAI	£26.96
• 2 3/4" FAI, LIGHT BACK PLATE	£34.46

ZN SPINNERS

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• PL PROD ANODISED ALLOY CONTROL HORNS (PURPLE)	£7.50
• PL PROD SPRING LOADED CATCHES (PAIR)	£6.00
• PL PROD PULL-PULL WHEEL, ALLOY ANODISED (PURPLE)	£7.50
• TACK CLOTH	£1.17
• PILOT FURRED MYLAR HINGES, 20 PER PACK	£3.75
• MULTIPLEX FIELD BOX. FOUR SHELVES COMPARTMENT, TOP COMPARTMENT.	£55.00
• FINE LINE TAPE, 2.5MM THICK, 66 METRES LONG	£2.75
• HIGH PERFORMANCE 5/8" EXHAUST TUBE	£6.75
• JB WELD, 24 HOUR TWO PART GLUE, SUPER STRONG	£3.60
• CRC DEFLECTION THROW METER	£18.95
• OS PLUG WRENCH WITH KEEPER, IDEAL FOR YS COWLED MODELS	£5.20
• EXTRA STRONG HAIR GELL FOR PATTERN FLIERS	£45.00

Synergy for 2000 as detailed on November Newsletter front cover, designed by Malcolm Harris & Steve Burgess. The kit consists of a white pigment gel Carbon/Kevlar fuselage, with computer generated & cut foam panels, for 140 YS power. Plug in wing & tail. Std kit. Fuz, underbelly, canopy, foam wing, tail & rudder panel's. Wing & tail joining tubes.
£400.00

ProBuild

Bully 1.20 LS

This article was re-printed from the Prairie Pattern Page for all you two-strokomaniacs! Ed.

This is my review of the Bully 1.20 LS (long stroke) engine, distributed by UAV, Inc. of Bend, Oregon. I have found the folks at UAV to be very friendly and helpful, and parts are just a phone call away. I like that. Anyway, here is the story of how I got into the 2-stroke business.

Last August, I crashed my YS 1.40FZ powered Storm EX at the Omaha, NE, contest. That left me without a pattern plane for the remainder of the season. My friend Orland McKee was selling his primary 1998 plane called an OMS, which is similar to a Nice Try. He's quite a craftsman, the plane was beautiful, and it flew well, so I bought it. The only unusual thing about it was that it was set up for a Bully 1.45 2-stroke engine. Orland had bragged about the dependability and low maintenance of the Bully, but my plan was to retrofit it with my 9-flight-old YS 1.40FZ.

Well, it didn't take much inspection to determine that the retrofit would require some major surgery to the nose and cowl of the OMS, not to mention moving the throttle servo to the other side of the plane. I'd been wanting to try one of the big 2-stroke engines ever since I saw the first ads for the OS 1.40RX, so I started looking around. Lo and behold, one of my friends had a Bully 1.20 LS sitting in his shop gathering dust. He offered to loan it to me to try out, so I took him up on his offer. The Bully 1.45 and 1.20LS share the same crankcase and are interchangeable. The only difference between the two is that the 1.20LS is a long stroke design and the 1.45 is bored out square (bore = stroke). Most guys run the 1.45 on a muffler and the 1.20 on a pipe. I bought a Macs header and a Bolly EQ120R pipe to match the engine, adjusted the pipe length according to UAV's directions, and installed everything in the OMS.

It took a bit of fiddling to get the carburetor set correctly, mostly because I was using the wrong glow plugs. Yes, I said plugs-- it takes two. I first tried using K&B 1Ls as recommended by UAV, but experienced lots of trouble with mid-range richness and poor idle transition. Consulting with my East Coast friends who have been flying the OS 1.40, they recommended using the OS-F 4-stroke plugs. I tried the OS plugs, and the difference was immediate and dramatic. No more mid-range richness and the transition from idle was instantaneous.

I checked the engine rpm with my trusty Hobbico digital Mini-Tach. I got 8,200 rpm static with an APC 16x12 prop and Magnum 15% fuel. Not bad for a low time engine at 1,300 feet above sea level. The proof would be in the flying.

Flight test day rolled around, I checked and double checked everything on the plane, and ran out of excuses not to fly it. The engine started right up and idled perfectly. A friend carried the plane to the runway, I did a final run-up, and it was time to aviate. I eased the throttle full forward and the plane shot down the runway like a bullet. I normally do an FAI-style takeoff sequence, and the Bully came into full song just about at the end of the Procedure Turn. Reminded me of the OS 61 RF-P I used to run in my LA-1 back in the late 80's. The plane was picking up speed so quickly that I had to throttle back to half stick just to keep it in the state! A few passes, a few clicks of trim, and it was time to see what this engine could do.

I pulled the plane vertical from level flight at half throttle, shoved the throttle stick to the full power, and my 10 ½ pound OMS fairly jumped to the top of the box. Whoa, this was power such as I'd never experienced with any YS. It was immediately obvious that extensive throttle management would be needed. I flew through the entire Masters pattern on the first flight. Cuban 8s were performed at half throttle, and I needed full power only on extended vertical maneuvers like the Square Loop with Half Rolls. The Bully performed flawlessly, even after lengthy periods of idling, such as on the spins. I landed and was most pleased to see that over half a tank of fuel remained. I have since discovered that it is possible to fly two complete Masters or FAI patterns on a 16 oz. tank and still have about an ounce left over. This is due, of course, to the fact that you seldom need full throttle.

Further flights have shown the Bully to be friendly and reliable. One of my favorite things about the engine is the starting procedure. Starts consist of simply flipping it backward against compression once or twice. It jumps to life immediately and idles beautifully - again reminiscent of my old OS 61. It needs to be noted that you need a good, hot 12-volt battery if you are using an electric starter. These big 2-strokes have a bunch of compression when they are cold and dry. Just turn the engine over by hand to get

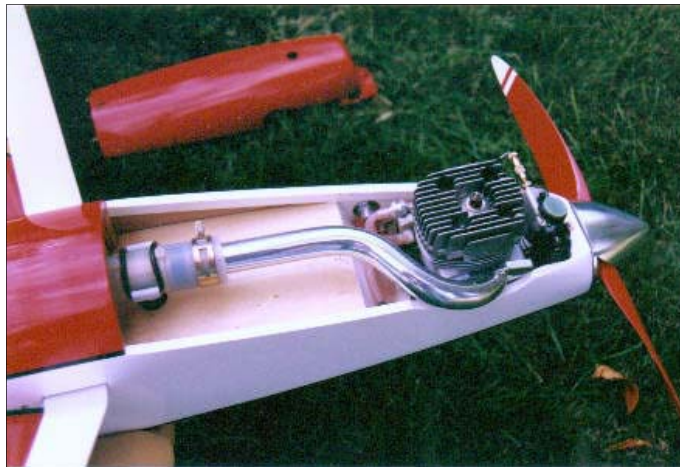
a little fuel into it, and your starter will do the rest. I have found that I seldom use my starter except for running the engine dry at the end of the day. I use Eric Henderson's favorite after-run oil, Mobil 1, religiously.

I like this engine very much. However, just to hedge my bets, my new Prophecy will be use the YS 1.40 FZ, and I'll compare them over the next season. I'll make a judgement on which way I'll go at that time. Right now, it looks like the 2-stroke by a nose. I'm also testing the Super Tigre 2300 2-stroke engine. See the Super Tigre 2300 Review for more details.

Everyone asks how much speed the plane picks up in a long vertical downline. My observation has been that if you couldn't hear the engine winding up a bit, you'd never notice the speed increase. I plan to try both an APC 16x13 wide blade prop, as well as a 15.5x11 4-blader soon. I'll keep you posted.

Jim Johns
Prairie Pattern Page.
<http://home.ksccable.com/ppp/>

I think this engine is available from Just Engines. See the mags. Ed.



Yes, those discerning engine watchers will identify this engine as the ST2300, or as Mick (I'm easy going) Wiltshire would stress, the G20-23. The header however is of interest and available from the States. Looks like a neat job compared to some I've seen in the UK. Ed.



Brian Brotherton Memorial Trophy

Almost a perfect day for the competition on August 15th at Newmarket Model Flying Club. A slight wind was blowing the models a little off line but it would be boring if it was easy. Almost a full house of competitors including Masters, Seniors and Standard pilots showed up bright and early ready for aerial battle for the trophy. Briefing was delayed from 9-15 to 9-50am as one competitor had not arrived. Three rounds were flown by each class making sure of a full day of good fun and great flying. Jerry Carter (Newmarket club secretary) was at hand with his ever popular bar-b-que and with his own recipe sauce which was worth coming for alone. The food was all free and I do not believe that there was much left at the end of the day.

It was nice to see Lee Shelly return to try to retain the trophy that he won two years ago. Unfortunately his New Solution had a minor problem with a servo just before the big day so he brought his second model. Still, a third place was a great result.

Keith Jackson won the Masters competition and then after the calculations were made he also walked off with the trophy, well done Keith.

Adrian Harrison had three consistent flights to win a very competitive senior class. Things were looking good for Mel Broad after round 2, Engine problem in the third round stopped his progress up the score board.

In standard Keith Reil flying a Moki 210 powered Large Supra came second. (not bad considering he had never flown the schedule before) Chris Broad won the class and gained his second promotion score.

Thanks to every one who came and made the day the success it was. There are not many rules at Newmarket other than common sense but they were all followed and the day ran smoothly all by itself. We were worried for a while as the competition was not advertised until late, but as a mental note for next year, keep a weekend free so we can do it all over again.

Finally my thanks to the judges Kevin Caton and Eddy Hodge for their hard work. I think every one would agree that they were both very fair and consistent with their marking. Also Kevin Caton and Brian Ball's better half's with the scores sheets.

George Drever

BRIAN BROTHERTON MEMORIAL TROPHY 15th AUGUST

MASTERS	ROUND 1	ROUND 2	ROUND 3	TOTAL	POSITION
KEITH JACKSON	411	428.5	414	842.5	1
STEVE RUTHERFORD	380.5	394.5	380.5	775	2
LEE SHELLEY	332.5	365.5	353	718.5	3
MIKE LE-MMON	339	365	335	704	4
BRIAN BALL	338	335	353.5	691.5	5
SENIOR					
ADRIAN HARRISON	274.5	269.5	273.5	548	1
RICHARD CHRISTOPHER	246.5	271	253.5	524.5	2
MEL BROAD	213.5	270.5	46.5	484	3
STANDARD					
CHRIS BROAD	135	131.5	119	266.5	1
KEITH REIL	125.5	129	115.5	254.5	2
RUSSEL AISBITT	14	123.5	117.5	241	3
ALAN CONNELLY	65.5	113.5	113	226.5	4



Adrian Harrison's Desafio S / YS 140 FZ combination.

Cashmoor. 10th October 1999

Standard	Round 1	Round 2	Round 3	Total	Position
Paul Metcalf	125.5*	100	133.5*	259	2
Russel Asbitt	145.5*	138.5	140*	285.5	1
Senior					
Martin Canton	246	260*	265.5*	525.5	5
Steve Haughty	289*	288	313*	602	2
Steve Hartley	235	263.5*	286.5*	550	3
Richard Christopher	289	310*	316.5*	626.5	1
Alan Hilton	231	245.5*	286*	531.5	4
Masters					
Dave Owen	182*	207*	-	389	7
Keith Jackson	488*	491*	-	979	1
Mark Waterman	385*	392*	-	777	3
Mac	343*	338*	-	681	5
Clive Weller	286*	306*	-	592	6
Colin Shearing	349*	283*	-	732	4
Phil Williams	418*	408*	-	826	2

* Denotes score used

Wanted !

Your articles, pictures, kit reviews, engine problems, tips, engine running statistics (rpm, plug, prop, etc), competition reports, ideas for running the association.... Please respond by 15th May 2000.

This list can go on and on. Please do not think you have nothing to contribute. If you wish this newsletter to continue in its present form, lets hear from you.

Ed.



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