Radio Controlled
Soaring Digest
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Front cover: Elia Passerini's Bowlus BA-100 "Baby Albatross" in repose following its maiden flight. Elia shares the design, building and flying of this model starting on page 44 of this issue.
Nikon D100

Back cover: Marcel van der Vaart launches his Scimitar 2m slope racer. The Scimitar sports foam core and carbon/glass wings. Marcel builds some absolute demons of machines, both powered and slope that go like the blazes and the build quality is just immaculate. Photo by Kevin Farr
Apple iPhone 5, ISO 50, 1/1100 sec., f2.4, 33 mm (equivalent)

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Managing Editors, Publishers — B[2] Kuhlman

Contact — bsquared@rcsoaringdigest.com
rcsdigest@centurytel.net
http://www.rcsoaringdigest.com
Yahoo! group: RCSoaringDigest
FaceBook: https://www.facebook.com/RCSoaringDigest

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In the Air

Two build projects are featured this month, both from Italian modelers.

M.R. Martigoni has built a scale model of a little known Italian motor glider designed by Camillo Silva for the Bonomi company in the 1930s. Built to 1:10 scale, the model has a span of just under 50 inches. As only a single photograph of the original aircraft survives, and that is a black and white image, Mr. Martigoni has colored his model to suit his own imagination.

The other project featured in this issue is a Bowlus B-100 "Baby Albatross" scale model by Elia Passerini. Modelled in 1:3 scale, Elia's Baby Albatross started with a fuselage pod mould and eventuated in a three year project which included building specialized fixtures for accurate construction of the tail surfaces. With documentation from the National Soaring Museum in Elmira, New York, Elia's model is so visually appealing that it graces the cover of this issue. In keeping with the oft quoted "If it looks good it will fly good," this Baby Albatross has shown itself to be an exceptional flyer.

These two projects have been so exciting that they have served to strenuously motivate us to get back to the building board and finish off our own projects, a couple of which have been languishing without any substantial work for a number of years. Some time ago we read a very simple statement which made a very strong impression... "You can always find the time to spend just 15 minutes each day at the building board." That's nearly two hours per week, and a lot of work can be accomplished in that amount of time.

Time to ~~build~~ finish another sailplane!

How to ballast in a TD competition

Application to F3J and F5J

Marc Pujol, marc.pujol1@free.fr

Photo 1: The Genoma² was created for F5J. This plane empty weight could be from 17g/dm² to 45 g/dm². During two of the three F5J local contests made during a year, the plane finished at the third and at the second place. Don't think the pilot is good! The plane is better.

After few articles on yawing studies and yawing stabilities (RCSD Nov 2011), I created the Genoma family planes. The new F5J category allows me to improve my first design into a new and optimized plane for this category (RCSD Nov and Dec 2012).

After a year of F5J practices, this was time to make a first assessment and to talk about how to get in altitude in F5J (RCSD Oct 2012). It is time now to go a bit further: Do you know how to ballast a plane in a Thermal Duration (TD) contest. Very few modelers know how to do it and why. Very few articles were published on the subject. Same on the net: Very few tricks! So, what else?

I'm very interested in F5J categories. As already said, the Genoma² had been specifically designed for it. And it flies pretty well! In my personal opinion, better than the other planes and for sure, better than the pilot I am.

Unfortunately, at the time I created it, I didn't have any rationale for ballasting. I only made room for 1 kg steel. So I flew it at 20 to 30g/dm² where the other planes flew at 30g/dm² and over. And my results were not so bad. So, where is the truth?

In F3J categories, but also in F3K or F3B, ballasting is something quite current. But once again, very few data are available. Is it something quite secret, or quite too complex?

Well, I needed to establish a rationale to put accurate lead in the plane. I started by very simple rational.

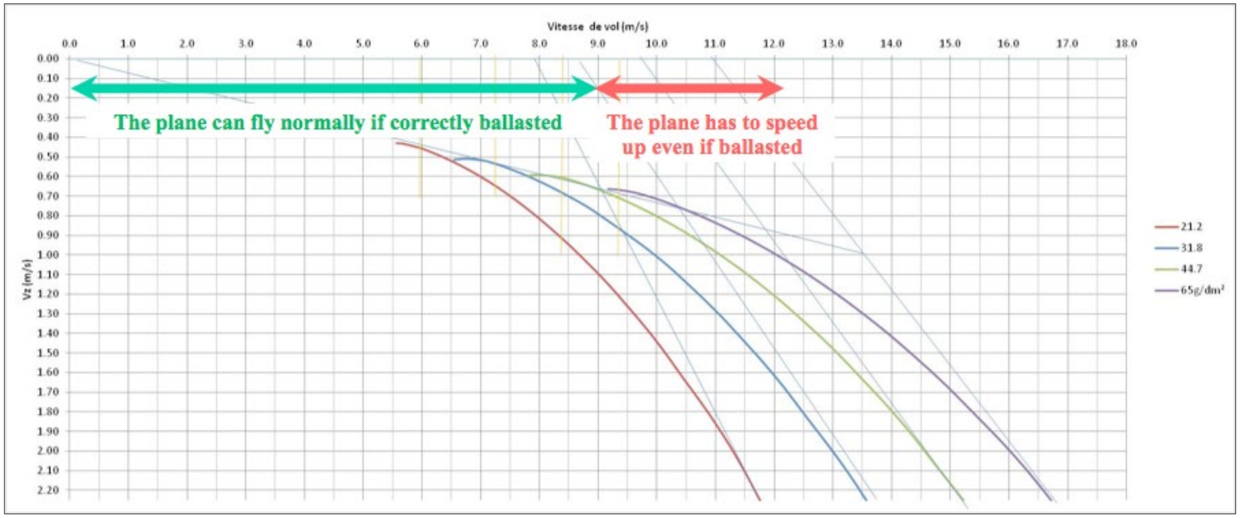


Figure 1: Up to 9m/s wind, a plane can be ballasted as per FAI regulation and flew in a standard way. It is possible to fly at minimum sinking rate… Over 9m/s, this is no more true, and even if fully ballasted (at 75g/dm² as allowed), the plane has to speed up to go upwind. This then requires a specific trimming (pitching) for such occasion.

Do we need to ballast in order to fly upwind?

The flight speed is defined as followed:

$$V = 4 * \text{racine} (Ch / Cz).$$

Where "Ch" is the wing load in Kg/dm², "Cz" is the lift coefficient of the plane, and of course "V" is the speed in m/s.

Since the lift coefficient is to be constant in order to be always at the same flying point (ex: max gliding ratio, minimum sinking rate…), the only way to go faster is to increase the wing loading.

So, starting at the minimum wing loading (ex: for the Genoma², it may be 15g/dm²), the minimum speed is about 5m/s. At the maximum wing load of 75g/dm² the minimum speed is 10.5m/s.

It is then not possible to fly at minimum sinking rate with the maximum wing loading in a wind greater than 10m/s. And the FAI maximum wind is 12m/s.

So ballasting is not made in order to fly "as usual" in the wind.

See Figure 1.

Do we need to ballast in order to transit without much sinking rate?

Sinking rate is defined by the following formula:

$$Vz = V * Cx / Cz$$

Where Cx is the total drag of the plane associated to the plane Cz (lift coefficient).

As we can see, if you multiply by 4 the wing load, you multiply by a factor of 2 the speed and the sinking rate.

The general polar of a light plane and a heavy one is then a bit different.

See Figure 2.

A very light plane could not fly at a speed of 10m/s without sinking drastically (over 2m/s). A heavy plane could go over 20m/s for the same sinking rate.

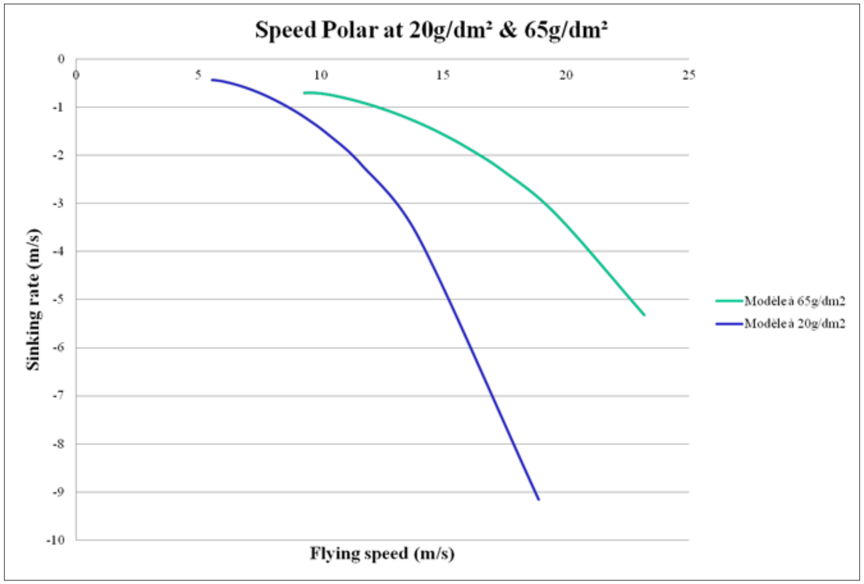


Figure 2: Light plane and heavy plane polars are different.

As a consequence, the light plane will never come back upwind in a wind greater that 9m/s. But a heavy one will do it very easily.

See Figure 2.

As a consequence, we can start to establish a rationale based on the sinking rate and the flying speed. But this do not provide us with enough rationale. We need to go a bit further.

See Figure 3.

What is the influence of the wing load in circling ability in a thermal?

To appreciate this topic, we need to define the circling radius:

$$\text{Rvirage} = 1.63 * \frac{\text{Ch}}{\text{Cz} * \sin(\mathit{incl})}$$

Where "Rvirage" is the circling radius in m and "incl" is the bank angle in radian.

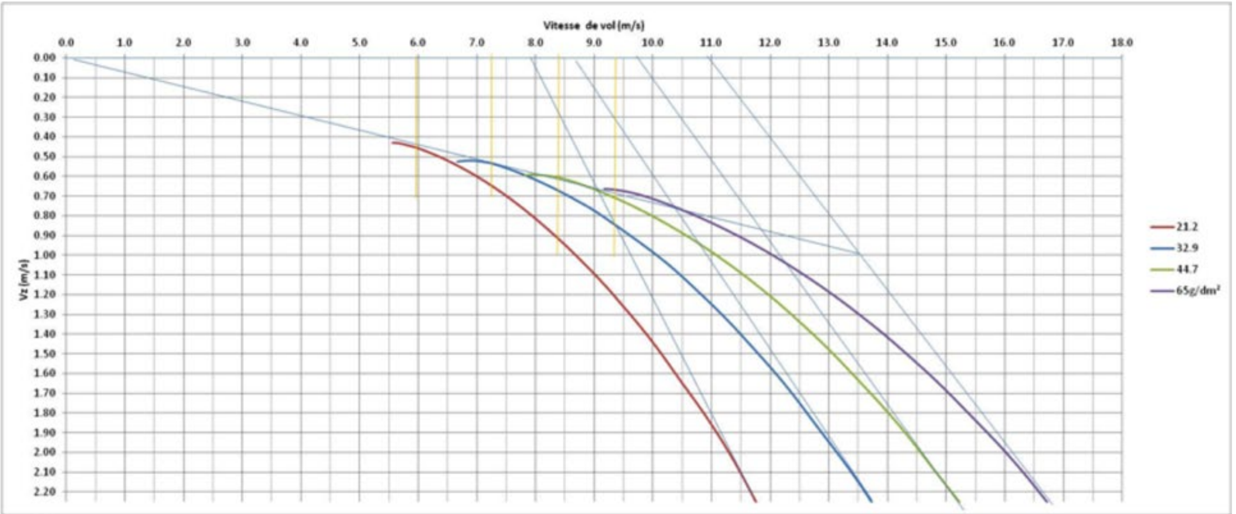


Figure 3: Sinking rate = f(speed) of the Genoma² plane for different wing load. If you know a polar for one wing load, you can deduct the others ones for any wing load by changing it in the speed and sinking rate formulas. The error made by not taking into account the Reynolds variation effect will not be so important.

Photo 2: A way to transform a F3J plane into a F5J one: Take a standard 4m F3J wing (here a Xplorer 4000) and install it on a Genoma² fuselage. This works pretty well specially for the circling ability. Of course, the minimum wing load is increased.

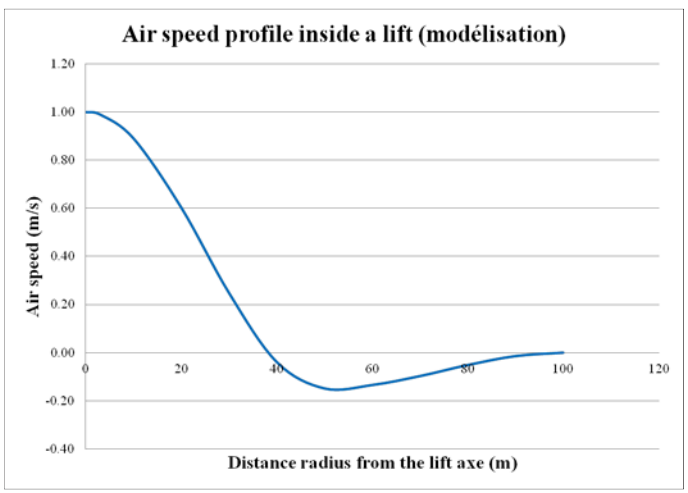


Figure 4: Cross-section of a thermal showing vertical air speed versus radius from center.

A thermal is a sort of tube where the air is going up at the center and going down all around. We can make a rough estimation of a thermal using some cosines formulas (a function used for lots of physical phenomena). See Figure 4 and the small complement at the end of this article for more technical details.

We then see that there is a certain interest to circle in the center of the thermal. For the moment, we all agree on that, don't we?

The minimum circling radius is then to be obtained. But the more the plane circles tight, the more it sinks… Is there a sort of optimum?

Let's make additional graphics presenting the sinking rate and the circling radius. See Figure 5.

As we can see, the circling radius is not decreasing so much over a defined sinking rate.

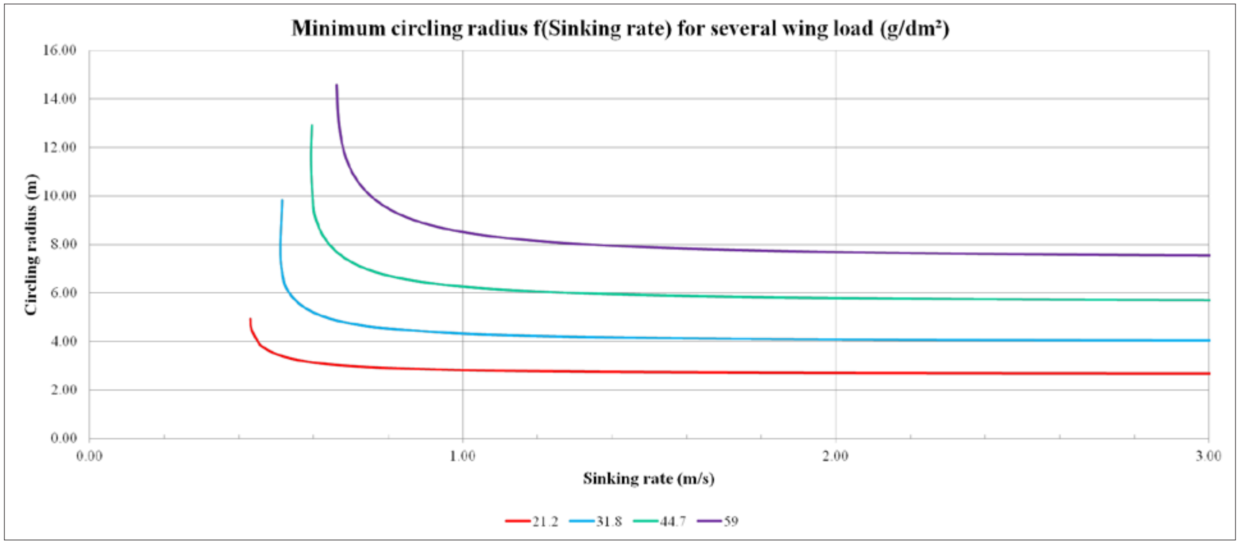


Figure 5: Circling radius for a defined flying speed when circling. All is expressed for different wing loading.

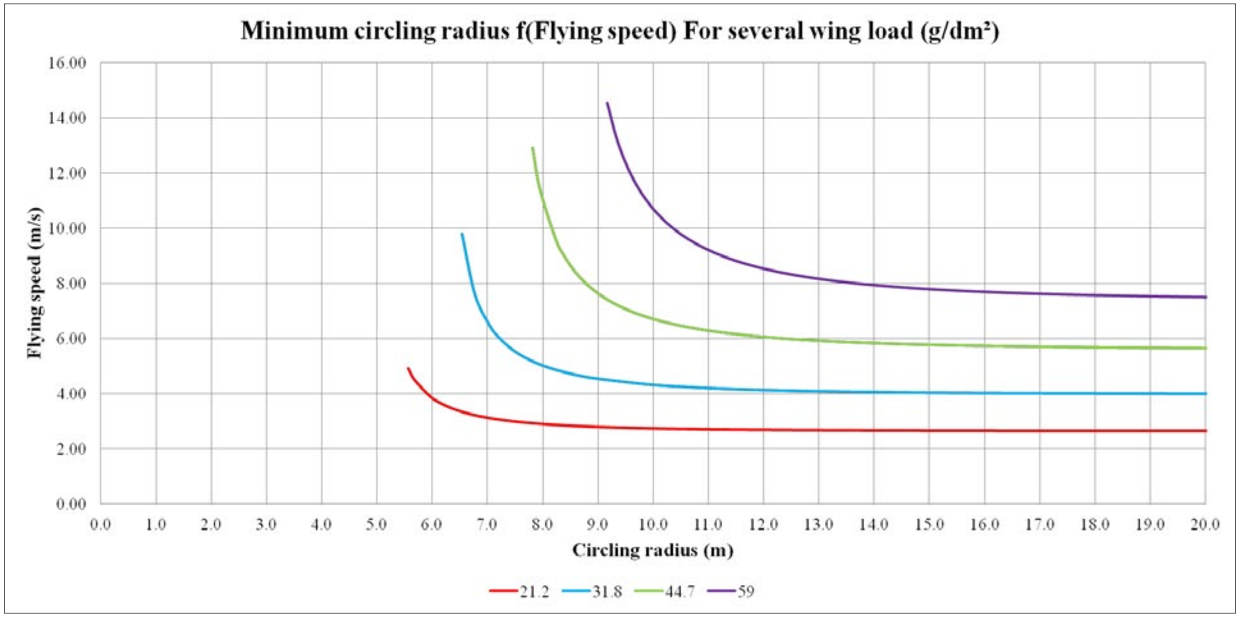


Figure 6: Circling radius for a defined flying speed when circling. All is expressed for different wing loading.

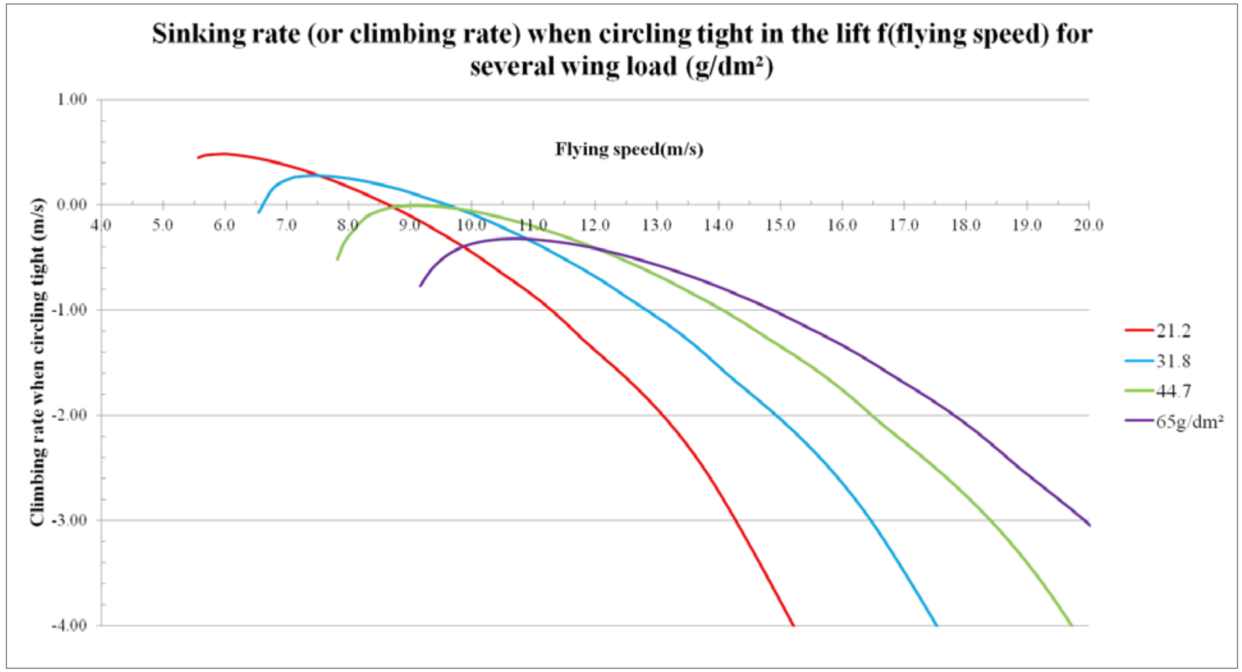


Figure 7: Example of a plane circling in the same thermal when more or less ballasted. It may take the lift of sink…

And if we trace the circling radius as a function of the speed, we find the same type of graphic.

See Figure 6.

This means that there is no requirement to go too fast to have a tight circling radius.

There is then an optimum speed to circle tight and to optimize the lifting rate in a thermal. This speed is at a flying point just over the best gliding ratio speed. Something about V+0.5m/s to 1m/s.

OK! We have a part of the things. Let's now integrate the wing load in this…

Then we see that we really have to be careful. If 150 g has a very small effect on the sinking rate (about 2cm/s) in a small thermal, this difference may appear to be something about 4cm/s. This is then no longer negligible.

A light plane may take a small thermal where a heavy one may sink in it and where another one may stay at iso-altitude.

See Figure 7.

As a consequence, our TD planes must be as light as possible to take the smallest lift encountered and as heavy as possible to return from downwind.

A compromise must be reached. Which one?

Go back to the category rules

First of all, we need to analyze the TD category you want to fly.

An F5J plane has 30 seconds to find the lift and a real advantage to take it at the lowest altitude as possible. You can see that in some fly-offs, the motor is regularly cut at an altitude of 10 m directly in the lift! Here the thermals are very narrow and light. Planes must be as light as possible.

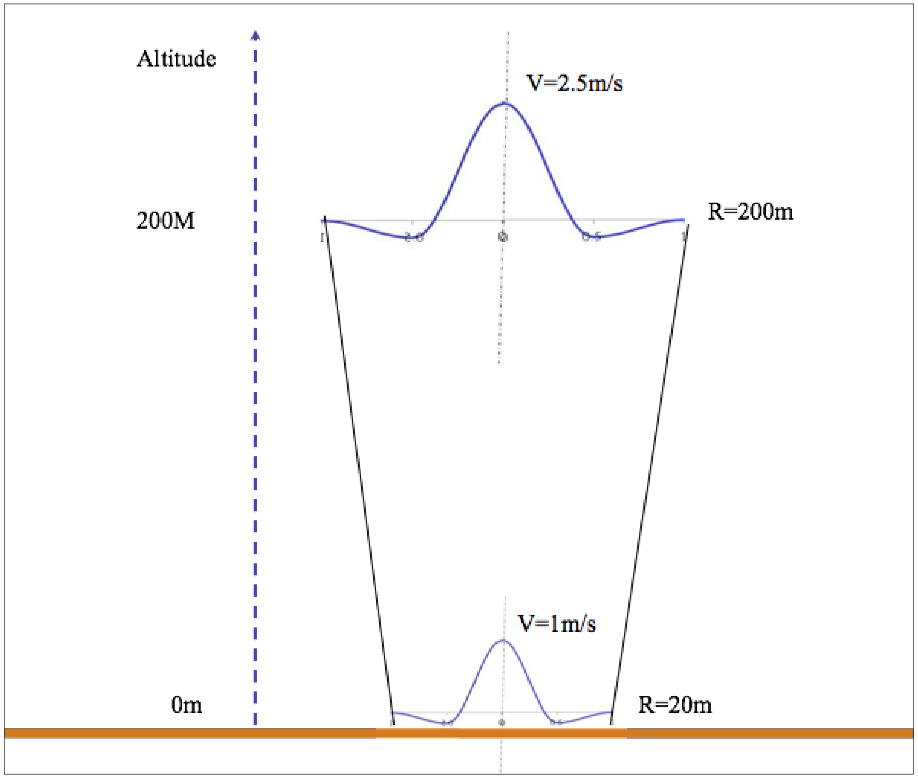


Figure 8: A graphical "definition" of a thermal.

The F3J planes will launch at the highest speed possible in order to reduce the launch phase and to reach the highest altitude possible. They normally reach an altitude of 100m and over. Here the thermals are more strong and large! But planes have then to transit to catch the thermal. So transition is far much important for this category. And planes must be heavier up to a certain point.

We then foresee that there is not a unique way to ballast, but several that depend upon the category being flown.

A wing loading for a defined thermal

To take the lift, the plane must have an accurate wing loading that allows it to increase altitude in an optimum way. So let's define what "a standard thermal" is.

See Figure 8.

I live in an "oceanic western Europe" area where wind is most of the time between 5 and 9m/s and thermals are quite smooth. Planes get to altitude at a speed that is usually between 0.4 and 1 m/s.

When the wind is low, thermals can be caught between 10 and 50 m altitude if the plane is able to circle inside a 10 to 20 m radius. With high wind we normally have to reach 200 m and over, but the plane has to circle in 80 m radius.

Most of the time the catching altitude is 100 to 150 m and the circling radius is about 40 m. That's then what I call a standard lift.

If the thermal is narrow and not very strong as it is close to the ground, the plane must be as light as possible. In a lift near the ground or at 50 m altitude, the plane must circle tight. A wing loading of 10 to 20g/dm² is the way to do it. You see what type of an F5J plane we must have… At 100 m of altitude, the plane can circle in a bigger volume. And a wing load of 30g/dm² or even a bit more is quite standard.

Over 200 m altitude, the plane has to be in a 80 m circle radius. Any type of plane can do it. Circling is then no more an issue. The issue is to transit. You can then see what type of F3J or F3B plane we can have.

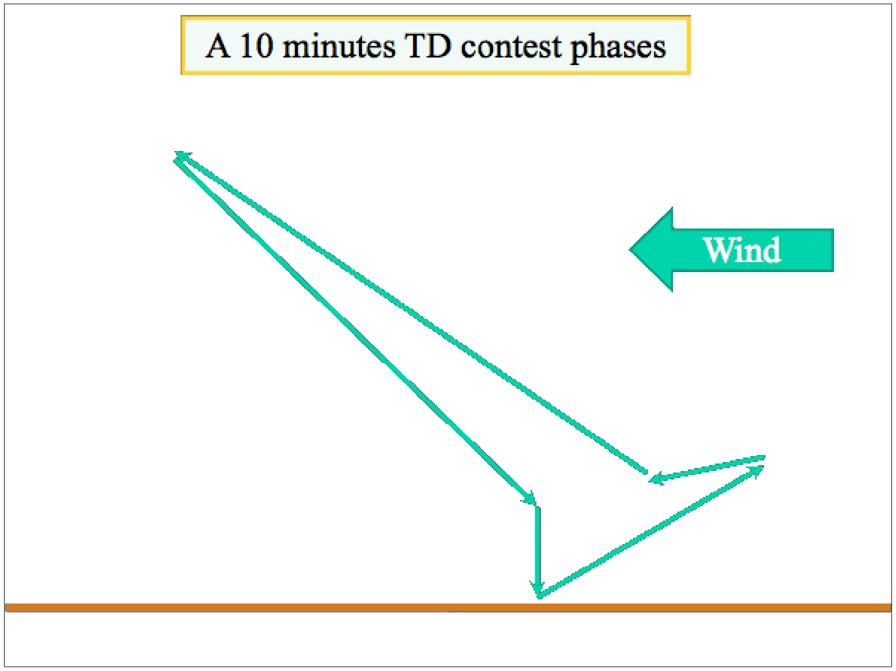


Figure 9: To succeed at a TD flight, a plane needs to reach altitude, find a thermal, take it for as long as required to finish a 10 min flight, and return home for landing with an altitude margin. For high wind, this requires going very far downwind (up to 2 km) and reaching a very high altitude (600 to 700m).

The "Go in the lift and return home" policy

A compromise between circling ability and high transition speed ability has to be reached.

Planes should not only be able to take the lift or to transit from downwind. They must take the lift and return home to land. This is what we can call the "go in the lift and return home" policy. It must be launched to a defined altitude and position (generally upwind). Then the plane has to transit to get the lift and get altitude while following the thermal downwind. At a precise time, the plane should come back for landing. The flight is a success if the pilot has remaining altitude and time over the field to end the flight and prepare the landing phase accurately.

See Figure 9.

We then can compute this, mixing all formulas available to predict the best wing loading we have to adopt. It is a bit complex, but it works…

We then obtain a graph made for the Genoma² (F5J rules) and for the Supra (F3J rules). See Figure 10.

For a wind lower than 5m/s, an F5J plane that is launched inside the lift should be at a wing loading lower than $20g/dm^2$. The plane should then be "as light as possible." I do not believe that a 4 m wing span plane can be lighter than $11g/dm^2$. 15 to $17g/dm^2$ is still very difficult to obtain for an F5J plane. That's why I limit the curve to this "still unrealistic" F5J wing loading. But who knows…

You can understand why producers are creating such light planes. Of course, if the pilot is not able to launch inside the lift, the plane should be capable of a better transition ability and then to have a higher wing loading. It may then be ballasted as an F3J plane or close to. The more the plane will pass time in search of the thermal, the more it will have to be ballasted.

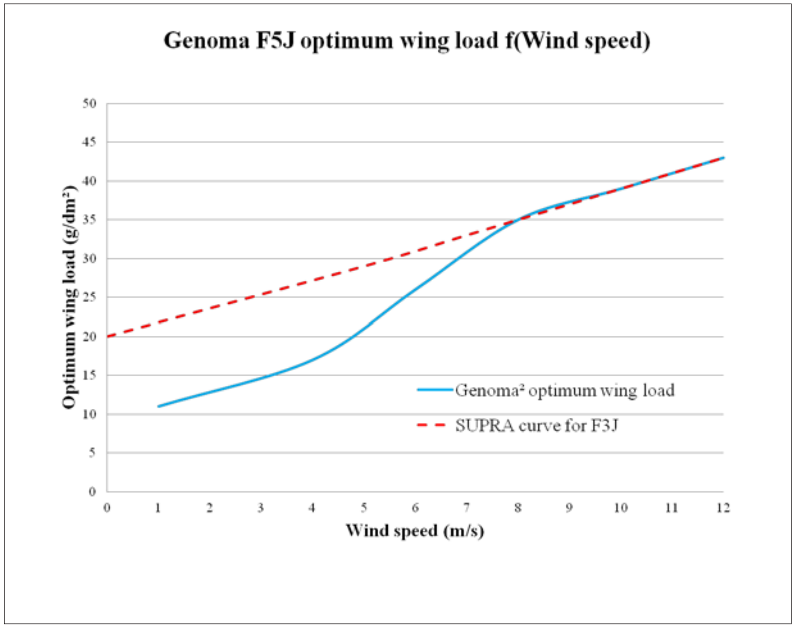


Figure 10: The best wing load for the Genoma² (F5J rules) and for the Supra (F3J rules).

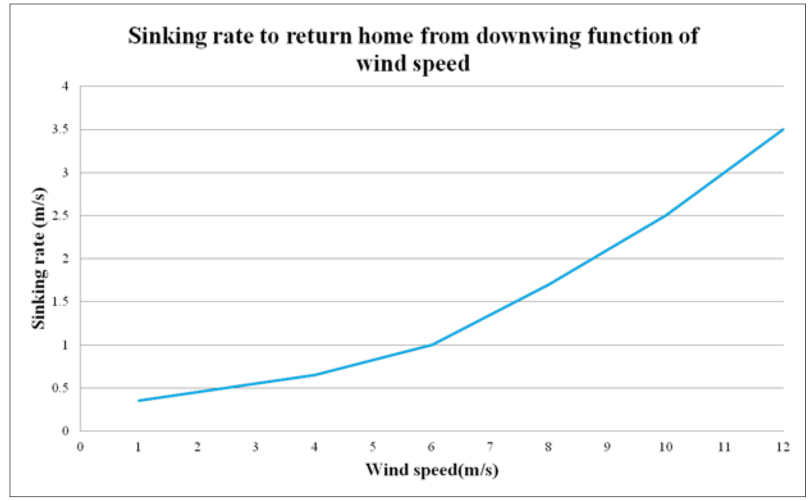


Figure 11: If a plane can return home flying "as usual" in a light wind condition, in strong wind, the plane must "dive". That's not easy to do and need lots of practices in such heavy conditions.

For a wind between 5 and 8m/s, a light F5J plane could not return home from downwind with an acceptable sinking rate. Here, the transition speed is more and more important and requires weight. F5J and F3J categories become closer.

Over 8m/s of wind, a plane that would like to make the 10 minutes flight should take only heavy thermals (the ones that provide a 1.5 to 2.5 m/s climbing rate and even more). Circling is no more so important. Here, the important thing is to return from far from downwind. F5J and F3J planes follow the same curves.

Of course, all such data are to be taken as a basis. Things can change a bit from one plane to another… But this is what I think is a start of a rationale.

If you try to predict the sinking rate a plane should adopt to return from downwind with the predicted optimized wing loading, then we can see that the more the wind is strong and the more the plane has to sink. If with very low wind a plane can fly and return home at a reasonable speed and sinking rate, in a high wind, the pilot really has to "push on the stick" (for an up to 15 degree dive in "calm condition").

See Figure 11.

Photo 3: After a successful flight, the landing phase. Do not forget it. An accurate ballasting policy is important but not sufficient…

I try to see if such ballasting result is something that can be correlated to the reality.

The F3J category is quite mature and we can say that the curve provided is something that makes sense. At least for the Supra.

F5J is a younger category and limited experiences are available. However, some Eastern Europe countries are more experienced than we are in France. They fly unballasted. But wind conditions are totally different from the oceanic Western Europe. Wind is generally lower than 7m/s. So… not so bad is it?

See Photo 3.

Conclusion

Ballasting for a TD competition requires quite a complex rationale to be established.

No need to reach the maximum authorized FAI wing loading of 75g/dm^2 for the maximum wind speed of 12m/s. Something about 45g/dm^2 is enough.

There is not a single way to ballast and each category should conduct to its own way.

Ballasting has to integrate the following factors:

- Wind force
- Thermal characteristic (minimum altitude to take it, radius, force)
- Launching rules of the category
- Thermal searching phase duration
- Lift slipping speed
- Launching distance upwind and associated launching altitude
- …

Ballasting may be similar for some categories like F3J and F5J for heavy wind conditions where the transition phase becomes more important than circling tightly.

For light conditions, F3J and F5J launching categories rules provide different answers for ballasting. An F5J plane will be as light as possible providing that the pilot reaches the thermal during the launching phase. An F3J plane will be more ballasted in order to reach, in an optimum manner, the thermal the pilot knows it is.

Finally, one may try to state the “standard” minimum altitude to take a lift as a function of wind (as a very rough estimation of course). And of course, if it is not the reality, you may say that this is my fault!

See Figure 12.

So, at your flight, steady, ballast!

Supplement: How to model a thermal

I read a book called “Radio Control Thermal Gliding” by Markus Lisken and Ulf Gerber (The Modeller’s World Series, Traplet, 2007, ISBN 1900371383) that explains the method presented hereafter. Note that this book has many other interests. I recommend the readers to buy it as I did if it is still possible:

Let’s consider that a thermal, as for lots of physical other phenomena, can be represented with “cosines” functions.

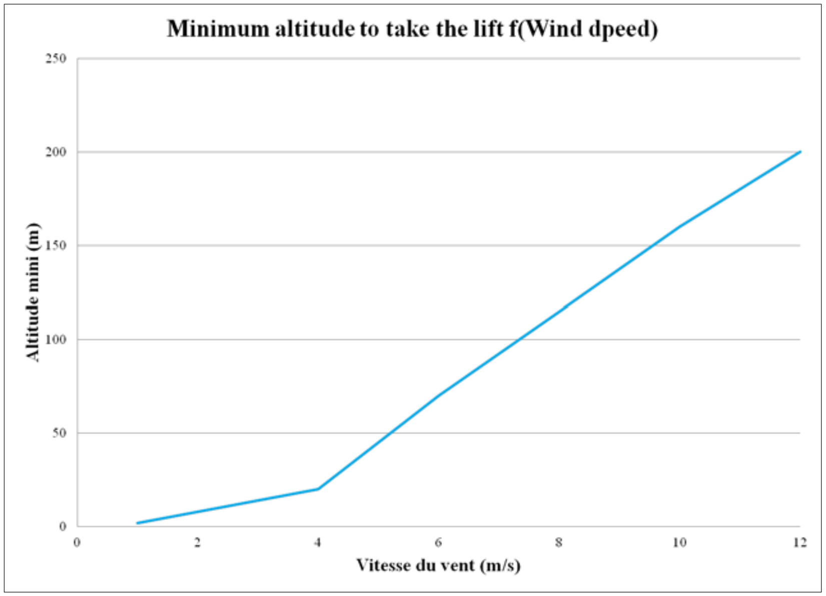


Figure 12: In F5J more than in any other category, the minimum altitude a plane can take a lift is very important. A rough estimation is provided here. This has to be tailored by lots of things such as humidity, pressure, temperature, ground aspects… and also the pilot and plane ability to circle tight. If this doesn’t work, just say that this estimation is rubbish or that it is the Author’s fault…

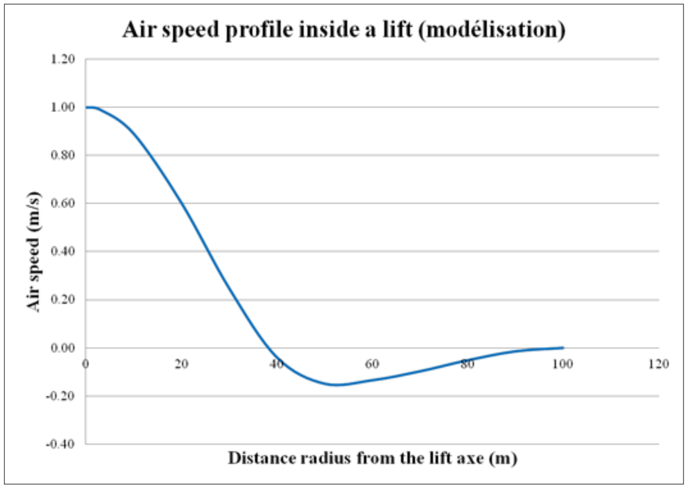


Figure 13: Modeling a thermal is something that is quiet useful. Of course this is only a simplified model and reality is a bit more complex. But for a first order of magnitude, this is not so stupid.

Let's take one for the lift and one for the sink.

The core of the lift is climbing, and the external area is sinking. Because Nature doesn't like "holes" and "strong variation" (any variations are "smooth"), we can state that there is as much air that climbs that air that sinks; that in the center, the air has a maximum speed with a regular variation at the center; that at the external side, the air is calm (no sink and no lift); and there is continuity between the two phenomena (sink and lift).

Let's then take a representation of the lifting air (you then can do the same rationale for the sinking air) with the following formula:

$$Vasc = A0 + A1 * \cos(A2 * r).$$

"A0", "A1" and "A2" are coefficients to de defined, "Vasc" the air speed and "r" is the radius. Of course we all want to have a radius in meters and an air speed in m/s. So, for a radius between 0 and 0.5R, with R the total radius of the phenomena, the formula is then the following:

$$Vasc = A0 * Vmax + A1 * Vmax * \cos(A2 * r/R)$$

Where Vmax is the maximum velocity of the lift (in the core).

For r >0.5*R, we also have:

$$Vasc = B0 * Vmax + B1 * Vmax * \cos(B2 * r/R)$$

All the external conditions here presented allow computing the six coefficients:

A0	0.4256	B0	-0.0743
A1	0.5743	B1	0.0743
A2	6.28318531	B2	6.28318531

This may appear a bit complicated but with a small Excel sheet, you can trace a very nice graphic and make lots of further calculations…

One can ask the question about the representativity of such model. I then try to see the lift of a plane circling in the thermal and the sinking rate when escaping from the lift. My measures show me that most of the time and for a standard 3m to 4m plane and standard thermaling conditions, the lifting speed and sinking speed are more or less equal. Then, for a standard lift that provides 1m/s climbing rate circling, I verified that the sinking rate is also more or less the same value… So…

And as we say in France "faute de grives, on mange les merles"!

F3J Future

Electronic devices pose a tricky threat to aeromodelling's future

by Sydney Lenssen, sydney.lenssen@virgin.net

Original PDF at <http://www.f3x.no/f3j/gossip/F3J future.pdf> and <http://www.rcsoaringdigest.com/pdfs/F3J_future.pdf>

One obscure item on CIAM's agenda for its Plenary meeting in Lausanne, 10-12 April 2014, deals with what to do about electronic devices which help control models in international contests. Unless FAI gets to grips with this issue in all forms of model flying, some delegates see the latest gadgets, easily fitted into all types of model aircraft, as posing a threat to the future aeromodelling as we know it today.

The chances are that the meeting will debate a proposal put forward by the German national aero club - DAC e.V - and proposed by Gerhard Woebbeking, one of CIAM's vice-presidents. He wants to see rules which specifically prohibit any electronic device in a model aircraft which automatically stabilises the model or allows it to be flown automatically to a selected location.

The Sporting Code and official rules for F3B, F3J, F3F and the F5B/J classes limit themselves to stating that the model must be controlled by the competitor on the ground using radio control. Then they add, any technological device used to aid in supplying data of the air's condition or direct feedback of the model's flight status is prohibited during the flight. The single and only matter which is allowed by telemetry is the signal strength of the receiver and the state of the receiver battery, presumably on the grounds of safety. Not that many pilots take advantage of this permit.

So what is there to be worried about?

The wise men in Lausanne recognise that CIAM does not have full control of aeromodelling even though it does set the rules for competitions and records. They also recognise that times change. Not so long ago, the FAI used to insist that contestants must build their models for themselves and then fly them.That rule was abandoned when prefabricated and moulded models with superior performance and reliability could be bought off the shelf by competitors.

It used to be that if your freeflight model had to come down after a specified flight time, a dethermaliser was triggered by a slow burning wick or a clockwork device. These are still used today, but nowadays the pilot can actuate a radio device which dethermals the plane. All serious freeflight competition models are crammed full of technology and electronic devices such as tracker assistance. They too along with F3B/J/F/K models are candidates for autonomous electronic aids.

The big fear is that no matter what is said in the rules, more and more pilots are going to start playing with "enhanced electronic control systems" - EECS - because they find them enjoyable and challenging. This applies particularly to younger people, highly computer literate and eager to solve the many algorithms required and put them into practice.

In many classes of competition including F3B/J and F, nothing in the rules specifically forbids the use of automatic reacting electronic aids to control the model, and real advantages can be gained by exploiting this omission.

The halfway house to EECS which has been around for many years is the simple rate gyro. The technology of rate gyros, like the rest of the electronic world, has allowed a steady reduction in size and weight and the gyro can be easily switched off and on from the transmitter. Not so long ago in the early days of F3K, some pilots used them to help control yaw with the discuss throw. Uniquely for the Fclasses, words were put into the rules to ban them. Still to this day many RC helicopters have rate gyros to help with stability and control problems.

Future F3J contest scenario

Take a look at what the future might hold in an F3J contest.

Five seconds to the start buzzer, twiddle the sticks, check the launch switch, a bit more towline tension and off and away. The model swings gently to the left in the side wind and corrects itself, small dip and off with a zoom. Level off just before the top and swing left again across the side wind. Settles happily and switch into cruise - cruise with "EECS" to be correct. What is EECS? The computer transmitter and receiver's enhanced electronic control systems, full bells and whistles.

Nine minutes thirty seconds later, glider is over the next field at a comfortable height in a gentle thermal which keeps it level. With fifteen seconds to go the model's nose drops, it speeds up coming in with barely a waver, slows a little to avoid the next door pilot, then into the spot. There's a tuft of grass standing proud in the rough field. The nose stops at 98 landing points. Dammit! Time - 9:55.

Walking down with the scores to the control tent, the pilot finds that everyone with EECS fitted has done better. Only two pilots are still flying without electronic aids and one of those has a better score, the other is a minute adrift. Two pilots have won the 1,000 points, both on 9:57 and 100 landing points.

What does EECS do?

The "latest" version of EECS has gyros to maintain stability in roll, pitch and yaw, an accurate timer, it has sensors which can identify other models and takes avoiding action if they threaten to collide, it has thermal recognition sensors which detect vertical air movements and the direction from which they come, then sending signals to ailerons, rudder and elevator to centre the thermal.

In our F3J contest, when the thermal is strong, then the flaps and ailerons with EECS will drop a degree or two into thermal mode; when it's too weak, then back to cruise or even distance mode with the flaps and ailerons up a little to search again for the core of lift.

At the appropriate time according to how far from the launch point the glider has travelled and the predicted wind speeds for the return flight, the model will leave its thermal, head for home, correcting its flight as it goes to arrive at the field with fifteen seconds to go.

You know the rest. It usually hits the landing spot unless it hits an unseen tuft of grass. The pilot, he has done nothing except launch his model and he can get help with that too. At no time, unless the pilot suspects that his EECS has gone wrong, does the pilot touch the transmitter controls or switches.

If his model is capable of flying for 10 minutes from a 200 metre height launch, the glider will always fly out the slot. If there is lift anywhere within a mile from launch, then the model will find it and fly out the slot. Exciting? What do you think?

One example of this type of technology in action was the recent flight, organised and televised starring James May and a helicopter launched ugly glider, from Ilfracombe to Lundy Island. The glider carried the GPS coordinates of its landing site and it flew and landed autonomously to that site. Eye catching as it was, it was not in the same league as the FAI approved record by Joe Wurts of a 120 mile flight cross country pre-designated point to point flight.

By flying with EECS it is not too difficult to give Joe Wurts, Benedikt Feigl, Philip Kolb or Daryl Perkins - and others - a run for their money. But all those contestants who rely wholly and only on their piloting skills and ability to read and utilise air, as per the FAI's Sporting Code, will surely have dropped out from international contests by this stage. They don't see the point in competing with electronic gadgetry for that is not "sporting".

Or perhaps we shall see two categories of contest in all the present classes, one for fuddy duddy and traditional pilots following the Sporting Code and one for the EECS fanatics with no holds barred.

Is that the future for F3 contests and if so when? It could be at any time in the near future. The EECS equipment is all available today, you can buy it easily on the internet and most components are pretty cheap and likely to get cheaper. As far as I know, it hasn't all been put together yet, programmed and trimmed out, but I would not be surprised to hear someone claiming to have done it after this article.

F3F flyers have been debating the possible benefit of rate gyros which would certainly help in the landing approach when coming through severe roll over turbulence on some slopes. However the F3F contest group also recognise that gyros are the thin end of the wedge, and they definitely take an element of control out of the pilot's fingers. Regardless of the commercial viability and potential benefits, it can be seen that other forms of instrumentation and associated algorithms could remove more direct control from the pilot.

The attraction of competition to develop various forms of EECS is real and can be seen from various computer forum exchanges. Many computer savvy enthusiasts are happy to have a go!

So far we are describing mainly F3J, but the same imminent prospect applies to all forms of radio controlled model aircaft competitions, and some forms of free flight contests especially the F1A/B/C classes.

Of course, at this time, the principle for any FAI competition is that the pilot must control the model at all times during the whole flight, and that is embodied in the Sporting Code. It is worth repeating that in the FAI rules of many classes including F3B/J/F, nothing is stated which prevents pilots from using automatic electronic devices to help control the model.The reality is that competitors making use of such devices can gain significant advantages. The only allowable exceptions so far are devices which measure the height of launch and/or duration of motor run for certain electric motor powered competitions. F5J relies on the the motor/height to be controlled, measured and logged and is vital to make the competition work.

Is this future inevitable?

The big fear is that no matter what is said or might soon be written into the rules, more and more pilots are going to start playing with these EECS systems because they find it enjoyable and challenging. This applies particularly to younger people, highly computer literate and eager to solve the many algorithms required and put them into practice. It is impossible to "uninvent" things and as King Canute found, it's impossible to hold back the tide.

When they get together to exchange ideas and experience, then surely they will organise contests. The very people who all countries are trying to encourage to join into existing classes to swell competition numbers are those most likely to be attracted to these newer challenges. Forget your iPad and computer games, model aeroplanes with EECS are really fun, and you get out into the fresh open air even when it is raining and windy!

The FAI/CIAM position today

Changes and new developments in aeromodelling will happen. That is a vital part of why most of us enjoy and are dedicated to the hobby/sport. Now is the time for CIAM to look long term and find the best way to embrace these changes without changing the ethos of our flying events.

A few of the National Aero Clubs around the world have discussed the situation with their aeromodelling bodies and for the most part, as in Britain, the national aero clubs have delegated responsibility to recognised aeromodelling bodies, BMFA in the UK.

For FPV - ‘first person view” - there is one basic rule: the model of limited size and weight should be kept in visual line of sight with bare eyes. In the UK this means that a model being flown by a pilot using headset goggles or screen should be kept in sight by a helper close by. Relations between CAA and BMFA are harmonius, and in March this year, the mass of fixed wing and rotary craft will be increased to 3.5 kg and the height limit permitted from 400ft to 1,000ft.

Early days so far, and what sort of control is there on who does what? Indeed at the same time as these legal limits are about to be raised, the potential technology of FPV together with higher transmission power than is currently legal will allow flights well beyond the line of sight. The temptation to push the boundaries ever further will be a welcome challenge to many FPV flyers and others. How many pilots are there today flying by themselves far beyond the line of sight, and the very nature of FPV is the thrill of this ability.

The Times this weekend reported that Nans Thomas, aged 18, has been charged by the French police in Nancy for flying a drone plus camera without authorisation to video his city. On YouTube “Nancy vu du Ciel” went viral with 400,000 views in two weeks, and it is artistic and breathtaking. The police say there was a danger of a crash and the flights showed no respect for people’s private lives. The potential penalty is 12 months in prison and a 15,000 Euro fine. M. Thomas bought his drone on the internet and says he had no idea that he needed any permit.

So far CIAM has defined three categories: **FPV**, “first person view” where the model is carrying a video camera transmitting to a headset goggle worn by the pilot or to a screen close to his transmitter. These systems are already in widespread use in gliders, powered and pure, and far more commonly helicopters and quadricopters.

Autopilot systems where the controlling pilot activates or deactivates programmable automatic systems to stabilise the model aircraft or to initiate a programmed flight path. The system are capable of returning the aircraft to a selected location when the radio link is lost.

The third is **small Unmanned Aeronautical Systems**, sUAS, which are small models with programmable autonomous controls which are mission orientated or to be flown beyond visual line of sight and computer controlled for nearly the entire flight. These aeroplanes of all sizes are commonly known as “drones” at this time, and some are capable of flying around the world, to my mind often on highly questionable missions.

Substantial funds are being spent

by countries, also around the world, developing sUAS, and these will lead to more robust data and video links than the simplex systems with their potential for single point failures currently available for FPV type flying. Miniturisation of electronic devices and the creation of tiny sensor packages for this type of sUAV will progress rapidly and the boundaries between sUAVs and model aircraft used solely for recreational sport will blur.

More and more frequently the benefits of these technologies can be seen by all of us in all sorts of harmless and and cost beneficial applications. A friend of mine in Canada surveyed a piece of land in an almost inaccessible location with a laptop controlled drone taking photographs every second, a one day job which would have taken months, perhaps forever, if the forest jungle had to be accessed on foot. One small and peaceful example.

The major risk is that the “pilot controlled” aeromodelling activities are likely to be affected. Irresponsible sUAV or FPV flying, and how can anyone police or prevent this from happening, could trigger massive public pressure to restrict model flying.

The National Aero Clubs in most of the countries contacted in an FAI questionnaire in 2013 replied that they would like CIAM to take these sUAV activities under its aeromodelling responsibilities, and that CIAM should make and require all countries to follow rules.

CIAM has been aware of electronic device problems for some time. In 2008 a working group deliberated and decided that UAVs and autonomous flight have no place in model aircraft flying within CIAM. This was unanimously approved. Last year, CIAM looked at what is essentially the same as this year’s proposal but could not come to any decision because most of the delegates did not see or understand what or where the problem was or is.

This year’s Plenary Meeting in Lausanne is unlikely to recognise or solve all the problems raised by EECS for the future. It is not a simple matter of rules. The situation calls for strong Statesmen with vision.

Writing this article I have consulted several friends for suggestions and some have provided additional information previously unknown to me. Grateful thanks to them. Responsibility for what is written is mine.

Any comments and suggestions? Please e-mail to <sydney.lenssen@virgin.net>.

Soaring Café

SSA2014
A WWII Glider in the Buff!

by Rand Baldwin

Our video tour of the SSA 2014 exhibit hall included a short clip of the beautiful, naked Laister-Kauffman TG-4 glider on display there. We were wowed by the craftsmanship and elegant handiwork that went into creating this classic World War II trainer. And so, we decided to feature it here in all its glory.

The L-K TG-4 was designed as a trainer for pilots who would fly large cargo gliders. The one pictured here is serial number 151, built in 1943.

<http://soaringcafe.com/2014/03/ssa2014-a-wwii-glider-in-the-buff/>

Fédération
Aéronautique
Internationale

Agenda

of the Plenary Meeting of the
FAI Aeromodelling Commission

[Items related to RC soaring]

To be held in Lausanne, Switzerland
on 11 & 12 April 2014
Issue 1

Maison du Sport International
Av. de Rhodanie 54
CH-1007 Lausanne
(Switzerland)
Tél. +41 (0)21 345 10 70
Fax +41 (0)21 345 10 77
E-mail: sec@fai.org
Web: www.fai.org

15.8 Section 4C Volume F3 - RC Soaring

F3F

a) 5.8.2 Characteristics of Radio Controlled Slope Gliders **Czech Republic**

Add the following paragraph as the final paragraph.

Paragraph B.3.1 a) of Section 4B (Builder of the Model aircraft) is not applicable to class F3F.

Reason: It is necessary to adjust the wording of Sporting Code to the reality. At present, with composite models, most of the building is done by the manufacturer, so the paragraph B.3.1 makes no sense. All other RC soaring classes contain such exemption, only in F3F rules the authors forgot to include it.

b) 5.8.2 Characteristics of Radio Controlled Slope Gliders **Czech Republic**

Amend the 6th paragraph as follows:

... ~~Variation of geometry or area is allowed only if it is actuated at distance by radio control.~~ **The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.**

Any technological device...

Reason: The present wording of the paragraph 5.8.2 is not sufficiently clear concerning electronic stabilisation systems. The proposed sentence would help to remove any doubt.

c) 5.8.2. Characteristics of Radio Controlled Slope Gliders **USA**

Add a new 4th paragraph as follows:

Maximum surface area .... 150 dm^2
Maximum flying mass . ... 5 kg
Loading .... less than 75 g/dm^2
The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.
Minimum radius of fuselage nose 7.5 mm in all orientations (see template below).

Reason: Although the general rules state the model must be directly controlled by the competitor, this addition makes the rules absolutely clear gyros and other types of on board automation are not permitted in F3F.

d) 5.8.6. Cancellation of a Flight: **Norway**

Technical Secretary's Note: this is a consequential change if proposal e) is approved.

Add a new sub-paragraph: at i) to the end paragraph 5.8.6 as follows:

A flight is official when an attempt is carried out, whatever result is obtained.
A flight is official but gets a zero score if:

a) the competitor … h) … exiting the course.
i) the pilot fails to present the model to the line judge when entering the speed course

Reason: See proposal e).

e) 5.8.8. The Flying Task: Norway

Technical Secretary's Note: there will be a consequential change to Agenda proposal d) "5.8.6. Cancellation of a Flight..

Add a new final paragraph as follows:

The flying task is to fly 10 legs on a closed speed course of 100 meters in the shortest possible time from the moment the model first crosses Base A in the direction of Base B. If some irremovable obstacles do not allow 100 meters the course may be shorter but not less then 80 meters. This exception does not apply for world or continental championships.

The competitor is responsible to present the model to the line judges.

Reason: This change will highly improve safety. Organizer will be able to set up the sighting device in a safe distance to the edge eliminating judges close to the edge.

It is simple; the pilot must make sure that the line judge can see his model while flying near the bases.

A correct time is not possible to record if the pilot fails to present the model while entering the speed course.

f) 5.8.9 The Speed Course Norway

Amend the 1st paragraph as follows:

The speed course is laid out along the edge of the slope and is marked at both ends with two clearly visible flags. The organizer must ensure that the two turning planes are mutually parallel and perpendicular to the slope. **To ensure accuracy the sighting device should be made like "A-frames".** Depending on the circumstances, the two planes are marked respectively Base A and Base B.

Base A is the official starting plane. At Base A and Base B, an Official announces the passing of the model (ie any part of the model aircraft) with a sound signal when the model is flying out of the speed course. Furthermore, in the case of Base A, a signal announces the first time the model is crossing Base A in the direction of Base B.

Reason: This change is to clarify and to make sure that competitors can expect accuracy wherever they choose to compete. Still today many Organizers use pole or poles. F3B type sighting device is

g) 5.8.10 Safety Norway

Add a sentence to the beginning of the paragraph.

Whenever possible, the sighting device used for judging the turns must be placed in a safe distance from the slope edge.

The organizer must clearly mark a safety line representing a vertical plane which separates the speed course from the area where judges, other officials, competitors and spectators stay.

Crossing the safety line by any part of the model aircraft during the measured flight will be penalized by 100 points subtracted from the sum after conversion, the penalty not being discarded with the result of the round. The organizer must appoint one judge to observe, using an optical sighting device, any crossing of the safety line.

Reason: This change is to clarify and to make sure that competitors can expect accuracy wherever they choose to compete. Still today many Organizers use pole or poles. F3B type sighting device is

h) 5.8.12 Scoring Slovakia

Technical Secretary's Note: this is a consequential change if proposal i) is approved.

Amend the paragraph as follows:

5.8.12 Scoring: The result of the flight is stated as the time in seconds and hundredths of seconds obtained by each competitor. For the purpose of calculating the result of the round, the competitor's result is converted this way:

$$\frac{1000 \times Pw}{P}$$

where Pw is the best result in the round **or group (see paragraph 5.8.16)** and P is the competitor's result.

Reason: See proposal i).

i) 5.8.16. Interruptions Slovakia

Technical Secretary's Note: there will be a consequential change to 5.8.12 Scoring (proposal h) in this agenda).

Amend the paragraph as follows:

A round in progress must temporarily be interrupted if:

a) the wind speed constantly is below 3 m/sec or more than 25 m/sec.

b) the direction of the wind constantly deviates more than 45° from a line perpendicular to the main direction of the speed course.

If these conditions arise during the flight the competitor is entitled to a re-flight. ~~A round in progress is to be cancelled if~~

~~a) the interruption lasts more than thirty minutes;~~

~~b) fewer than 50% of the competitors have been able to perform the task caused by marginal conditions. Without the condition "constantly" (i.e. 20 seconds) have been met and thus caused re-flights.~~

Constantly means that the conditions are at least 20 seconds aabove or be low the limit.

If the interruption lasts more than thirty minutes then the starting list of the round is to be divided into groups and the scores (see paragraph 5.8.12) a re computed within the groups. The results of an incomplete group are to be cancelled and this group have to fly from the beginning.

The groups must be of equal size (+- 1 competitor); the minimum competitors in one group is 10; the division of the starting list must be announced before the start of the round.

The round may continue if the conditions are again constantly within the limits.

Reason: The proposed change may allow using the periods with good wind more effectively. Such procedure was already used at the F3F WCh 2012 and F3F ECh 2013 as local rules.

j) 5.8.16 Interruptions **Norway**

Amend rule as follows:

5.8.16. Interruptions: A round in progress must temporarily be interrupted if:-

a) the ~~wind speed constantly is below 3 m/sec or more than 25 m/sec.~~ **average wind speed is below 3m/sec or more than 25m/sec during the timed flight**

b) ~~the direction of the wind constantly deviates more than 45° from a line perpendicular to the main direction of the speed course.~~ **the average direction of the wind is more than 45degrees from a line perpendicular to the main direction of the speed course during the timed flight**

If these conditions arise during the flight the competitor is entitled to a re-flight.

A round in progress is to be cancelled if:

a) the interruption lasts more than thirty minutes;

b) fewer than 50% of the competitors have been able to perform the task caused by marginal conditions ~~Without the condition "constantly" (i.e. 20 seconds) have been met~~ and thus caused re-flights

Reason: By using a weather station the CD and organizers will be given a tool to make much more accurate decisions. The weather station will constantly measure the average wind and direction so it will be easy to see if it is possible to fly.

It is very well known that low wind conditions often are mixed with thermal activity. The pilot should be given the possibility to use the thermal and not be told to wait until the wind speed and or direction is back to legal values.

After using the weather station over several years we have found out that pilots are very happy with the system. There are no more discussions and it seems to be as close to fair as you can get. Clearly no system or instrument can make conditions 100% fair when you talk about an outdoor sport.

A bonus effect of using the weather station is that the data can be collected and logged. The weather data can also be published together with the time of the flight.

There is already several timing gear with weather stations around in different countries that can do such measurements.

It is also possible to ask someone in the community to make this for sale or to make a manual on how to do it.

F3J

k) 5.6.1.1. Definition of Radio Controlled Glider **Czech Republic**

Amend the paragraph as follows:

... ~~Any variation of geometry or area must be actuated at distance by radio.~~ **The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.**

Reason: The present wording of the paragraph 5.6.1.1 is not sufficiently clear concerning electronic stabilisation systems. The proposed sentence would help to remove any doubt.

l) 5.6.1.1 Definition of a Radio Controlled Glider **USA**

Amend the paragraph as follows:

A model aircraft which is not provided with a propulsion device and in which lift is generated by aerodynamic forces acting on surfaces remaining fixed. Model aircraft with variable geometry or area must comply with the specification when the surfaces are in maximum and minimum extended mode. The model aircraft must be controlled by the competitor on the ground using radio control. Any variation of geometry or area must be actuated at distance by radio. **The use of any onboard-sensed data to automatically move the control surfaces or to modify the aircraft geometry is prohibited.**

Reason: Although the general rules state the model must be directly controlled by the competitor, this addition makes the rules absolutely clear gyros and other types of on board automation are not permitted in F3J.

m) 5.6.1.3 Characteristics of Radio Control Gliders (C) **USA**

Amend the paragraph as follows:

c) Any technological device used to aid in supplying data of the air's condition or direct feedback of the model's flight status is prohibited during the flight. These devices include any transmission or receiving devices not used to directly control the model aircraft (telephones, walkie-talkies, telemetry of airspeed and altitude etc), temperature detecting devices (thermal imaging cameras, thermometers etc), optical aids (such as binoculars, telescopes etc), and distance/altitude measuring devices (GPS, laser range finders etc). Telemetry of signal strength at the aircraft receiver, and state of the receiver battery **and GPS location data that is not displayed in any form to the pilot or helpers during a flight, and not used for aircraft control** is permitted. Use of corrective eyeglasses and sunglasses are permitted. If an infringement of this rule occurs, the pilot will be disqualified from the contest.

Reason: At several of the WC events and often in club events models are lost and not recovered. Having the GPS coordinates available to locate a downed model could save thousands of dollars in lost aircraft. There is almost no value in the use of GPS coordinates during a flight. Even the altitude data in GPS data is unreliable enough to be useful. Since this rules change specifically requires that the data not be displayed or used in any form during a flight it precludes usage of the data. Enforcement is quite simple – if a pilot was to be receiving and using data it would have to be displayed or transmitted to a pilot or helper and that would be quite obvious that they were using that information. Similarly to enforcing that a vario is not in use it would be obvious from the pilot's actions.

n) 5.6.2. Flying site **Germany**

Amend paragraphs a) and b) as follows:

5.6.2.2.

a) The flying site shall include a marked launch corridor of 6 metres width with a central launch line. The launch~~ing~~ corridor shall be arranged crosswind and ~~shall~~ **must** include launch marks on the central launch line at least 15 metres apart, one for each competitor of a group.

b) The flying site ~~shall~~ **must** include landing spots, one for each competitor in a group. Each landing spot will correspond to one of the launch~~ing~~ marks and will be arranged at least 30 metres downwind of the launching corridor.

Reason: Clarification to avoid discussions during the competition.

o) 5.6.4. Re-flights **Germany**

Amend paragraph 4, 1st sub-paragraph as follows:

1`. in an incomplete group, or in a complete group on additional launching/landing spots, **if there is no member of his team in this group.**

Reason: In paragraph 2. is written: "…..if the frequency (not more relevant nowadays) or the team membership of the drawn competitor does not fit or the competitor will not fly, the draw is repeated."

Here it is clearly stated, that there should be no competitor with the same team membership in this group.

This makes sense especially for small teams.

If this is not possible paragraph 3. can be used.

p) 5.6.7 Control of Transmitters **United Kingdom**

Amend the paragraph by deleting entirely sub-paragraphs a) and c); inserting new sub-paragraphs a), b), c) & d); moving existing sub-paragraphs b) and c) to become bullet points in the new sub-paragraph b).

~~5.6.7.1. a) The Contest Director will not start the contest until all competitors have handed over all transmitters to the organisers.~~

a) Competitors using 2.4ghz spread spectrum transmitters may retain their transmitters during the competition. Transmitters using other frequencies may be impounded at the discretion of the Contest Director. (See also ABR B.11.2; B.11.3 & B.11.4.)

b) If a transmitter pound has to be used for am/fm transmitters then:

- Failure to hand in a transmitter before the official starting time of the contest may result in the competitor forfeiting his first round flight.
- The competitor must hand over his transmitter to the designated official (usually the timekeeper) immediately after finishing his flight.

~~c) Any test transmission during the contest without permission of the Contest Director is forbidden and will result in disqualification.~~

c) The only permitted flying during the competition hours are the official competition flights. Other than for ground testing of equipment using 2.4 GHz spread spectrum, any other transmission or any flight shall only take place with the permission of the Contest Director.

d) A penalty of 300 points shall be applied to any competitor making an unauthorised transmission or flight without the permission of the Contest Director. If this transmission or flight results in injury to personnel or damage to property, then the competitor will be. disqualified from the whole competition.

Reason: This is an urgent clarification. The current rule does not take into account the latest changes in transmitter technology and has been widely ignored for several years. When transmitters are retained, 'test' flying has sometimes taken place during the competition which the CD has then had to stop.

The amendment gives parity between 2.4 GHz and am/fm transmitters.

Retention of transmitters can also raise the possibility of the competitor making a

Agenda of the 2014 CIAM Plenary Meeting – issue 1

mistake and flying in the wrong slot then, and then, when the mistake is discovered, flying again in the correct slot. The new rule would apply a penalty to a mistake of this sort, but stops short of the harsh penalty of disqualification which applies under the present rule.

The proposed penalty of 300 points or disqualification is consistent with the penalty applicable to landing in the F3J safety corridor.

q) 5.6.8.1. Launching **Germany**

Amend the paragraph as follows:

5.6.8.1. ~~At all times, the models must be launched upwind~~. **The contest director defines the start direction. The start should be executed as far as possible against the wind** in**side of** the marked launch corridor (5.6.2.2). An attempt is annulled and recorded as zero if the model aircraft is launched outside the launching corridor.

Reason: Clarification to avoid discussions during the competition.

r) 5.6.11 Final Classification **Bulgaria**

Amend paragraph 5.6.11.1 as follows:

a) If ~~seven (7)~~ **five (5)** or fewer qualifying rounds are flown, the aggregate score achieved by the competitor will be the sum of these scores for all rounds flown. If more than ~~seven~~ **five** rounds are flown, then the lowest score will be discarded before determining the aggregate score.

Reason: ALL of F3J WC and international competitions with more than 40 competitors proceed 6 to 7 rounds. 8 rounds rule punish top pilots with bad luck in only one round (mostly pop up because of crossing or cutting lines...) and lot of best pilots cannot earn flyoff because of this rule. This rule discourages all pilots with bad flight to continue competition. There is lot of pilots with 0 because of fare landing end flying in competition because of 8 rounds rule.

I lot of pilots hate 8 rounds rule and this will move more of them to F5J. We will lose lot of competitors in near future because of this rule. We already lost juniors in F3J.

Supporting data: F3J is going down, F3J juniors are not more than 3-5 in WC events. 8 round rule is one of main Reason to move out from F3J. At least 95% of F3J pilots prefer 6 round rule.

F3Q

s) 5.Q.2.2.1 Definition of a speed task **France**

d) Replace the drawing.
See Agenda Annex K for the new drawing.

Reason: Safety limit (as represented by a red flag on a stake) is placed 10 metres in front of the base B. The timekeepers are then secure.

Volume F3 Helicopter begins overleaf.

TOSS AEROBATIC EVENT 2014

Kevin Farr, kevin@fvdv.co.za

Steve Meusel joins the fray.

Malcolm Riley's Toucan II.

For a second year in a row we managed with the help of nature to pull off a three scoring round event. One of the standout features of this event is the manner in which all participants are there to help, assist and call, for one another, even though they are competing against one another. This credo forms the core spirit of slope soaring, as all and sundry can be reduced to a long drop out and fetch at the whims of nature, and this was to prove once again true.

Round 1: Enter the Red Hill arena

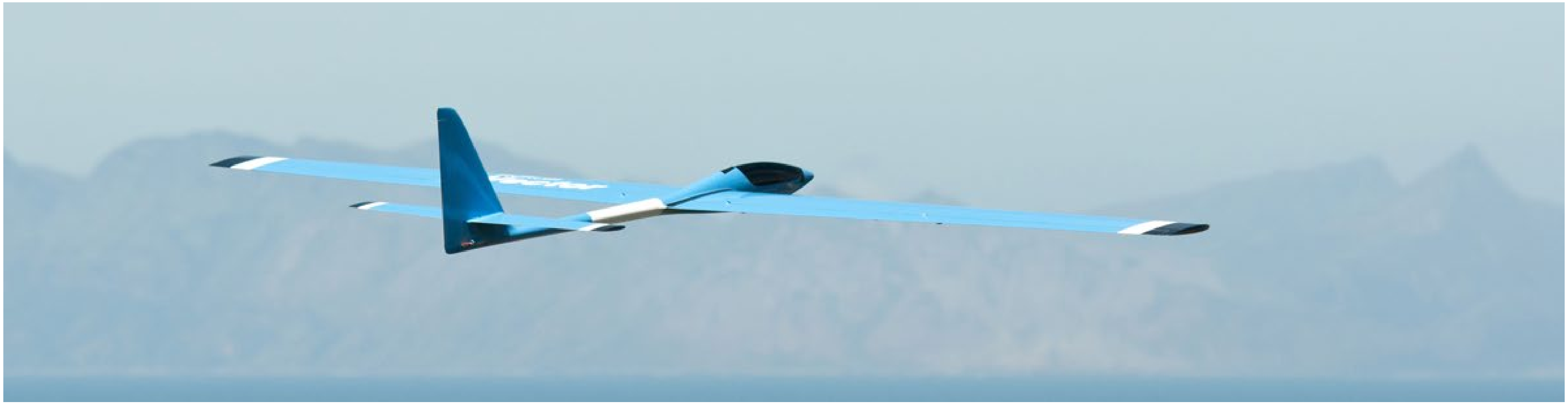
Saturday delivered great South East conditions and the event was called for Red Hill above Simonstown. An address by Chairman Tim Watkins Baker and the Competition Director Jeff Steffen and the event was under way.

The first round for the Sportsman Class took place in light but ever improving conditions and we were witness to a vast improvement in level of aerobatics over last year.

True to the competitive edge, some of the pilots gave into the nerves and delivered less than their best in the round, but that's the nature of the beast.

Straight into battle went the Expert class

The heart-in-the-throat Saturday afternoon launch.



Noel Cochius's Vector 111 in its element.

lads and true to form the competition was epic between the whole class and as they say, practice makes perfect and the near perfect conditions aided that achievement.

Notables in the first round were Alan Ball and Hans van Kamp in the Sportsman class and Marc Wolfe and Christo le Roux in the expert class.

Round 2 : Battling the sink

And so we rolled quickly into the second round with barely a gap allowed for the consumption of tasty burgers and cool drinks between the rounds.

Sportsman's class hit the slopes again and by now the engine was well oiled and running smoothly, allowing the class to complete extremely well and finish off quickly.

And so we moved to the second round of the expert class, but were worried about the predicted South wind switch – a death knell for Red Hill as it quickly becomes cross slope and entirely lift free.

Decision made to proceed and so we threw the Expert class to the lions with the first three quarters of the round getting the best lift. Christo le Roux and Malcolm Riley pulling out all the stops gained some very valuable points.

But as predicted, the wind changed and the lift quickly changed as well, to really bumpy, full of holes and unreliable.

With three competitors left we sat and waited out the wind switch hoping to get it to come back on. 45 minutes later and still we waited with time nearly out and the round about to be cancelled.

An attempt at a launch was given with the trusty Vector 111, but there was that "hole in the pit of the stomach moment" when the glider loses 30 feet in split seconds in the sink, but a steady nerve

Two Oceans Slope Soarers

Loius Genade's Aresti gets the hoof.

Red Hill glory shot.

Tim Blegenhouts Toucan gets a launch.

Marc Wolfe's launch.

and a dead stick glide to the south slope allowed the glider to stay alive.

The three remaining competitors to the round, Marc Wolfe, Kevin Farr and Steve Meusel were left with the decision to cancel the round or fly it in really insanely poor lift.

Off to battle they went, all launching at the same time, scrambling to get sufficient lift to perform a move and then their callers yelling like a banshee as they came through and completed the manoeuvre to the best of their abilities in utterly awful lift. Then a run back to the south slope, a hurried hunt for lift, all circling in a 5 yard radius, and then back to the box for the manoeuvre. Manic would be an understatement as all this took place in front of the judges.

As the final manoeuvres were being hastily completed, the lift died entirely and a rash of hasty landings had to be made while Marc Wolfe attempted to stay alive in no lift situation. The result was a long winded slow decent of the slope, landing on the silver boardwalk of the sewerage farm at the base of the Red Hill.

At this point with all manoeuvres completed, the round was called and Marc made a headlong dash down the hill to fetch the glider, patch it up overnight and get it ready for the next morning's round.

Gus Thomas's Voltij gets the launch.

Out to battle.

Steve Meusel joins the fray.

Competition nerves well settled in.

Alan Ball and Malcolm Riley.

Jeff Steffen, Contest Director.

Andrew Anderson, Head Judge.

Two Oceans Slope Soarers

Dave Greer's Le Coquillaj.

Louis and Christo in the hot seat.

On the front line.

Red Hill Saturday morning.

Perfection.

Marc's old dependable Primerius after Saturday night repairs. (See lower left photo on opposite page.)

Round 3 : Winner takes all

Sunday delivered near perfect conditions at Red Hill once again and so the third round of Expert was run with the wind getting stronger all the time. It soon became apparent that the third round of Sportsman Class was not going to happen due to blow back and the landing area becoming more and more hazardous.

So the competition was called complete and all and sundry headed to Dixie's for a well earned beer and the awards presentation.

It was felt that this was as close a competition as had been run in any of the years, and so Alan Ball took the Sportsman's Class from the evergreen Durbanite Dave Greer, and Ryan Matchett.

In the highly contested Expert Class our TOSS member Christo le Roux beat Marc Wolfe and Louis Genade to the post, and took the first TOSS win since Steve Meusel took the first place in the inaugural event. Once more it was proved that these slope lads are tough, uncompromising and yet friendly as hell in this, the best slope aerobatics contest in the world - in front of the toughest judges we know.

And so a big old thanks to our judges, Andrew Anderson and Stuart Nix for their time commitment and enthusiasm to the slope aerobatics, which without their expertise would never have been able to prosper the way it has.

Marc's Primerius down in the farm desperately needing a fix.

The Vector makes it back up the hill.

Two Oceans Slope Soarers

A great thanks must once again go to the awesome sponsors who make this event worth entering even if just to win the hampers.

In alphabetical order:

AB Models <http://abmodels.co.za/>

AMT <http://www.amtcomposites.co.za/>

Cape Sailplanes <http://www.capesailplanes.com/>

Chris Leale

Dixie’s Restaurant <http://www.dixiesrestaurant.co.za/>

Hobby Land <http://hobbyland.co.za/>

Hobby Mania <http://hobbymania.co.za/>

Hobby Warehouse, Lansdowne Rd,
7700 Claremont, Cape Town

Intermet <http://www.intermetafrica.co.za>

iHeal <http://www.iheal.co.za/>

Micton Hobbies <http://www.mictonhobbies.co.za/>

RC Hobby Shop <http://rchobbyshop.co.za/>

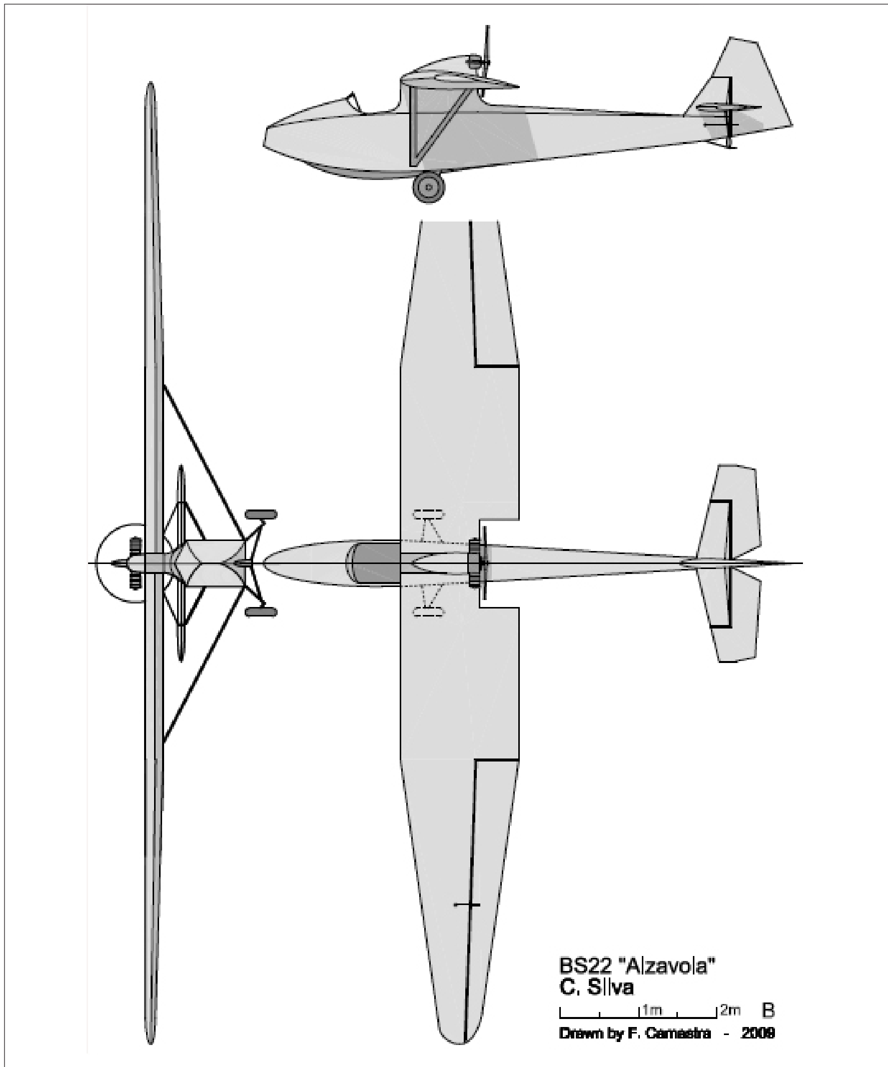
Loads of thanks to Jeff Steffen (CD), Bill Dewey (safety), George Lerm and David and Sharon Semple (Scores) and any others that helped to make this one-of-a-kind event happen so well every year. See you next year!

Christo le Roux - Expert Class winner.

Alan Ball - Sportsman class winner.

BS-22 “Alzavola” vintage motor glider in 1:10 scale

M.R. Martignoni, m.r.martignoni@gmail.com



Wing span	12.43 m
Length	6.80 m
Wing area	15.00 sqm
Aspect ratio	10.30
Wing loading	19 kg/sqm
Empty weight	180 kg
Total weight	295 kg
Vmax	100 km/h
Vmin.	50 km/h

3-view, photo and data from
“Italian Vintage Sailplanes” by Vincenzo Pedrielli

The skeleton ready for covering. At 1:10 scale, the wing spans 1243 mm, 49", and the fuselage length is 680 mm, 26.75".

For a long time I wished to build a model of an Italian vintage glider. At the beginning of 2013, looking at the book "Italian Vintage Sailplanes," written by my friend Vincenzo Pedrielli, my attention was attracted to the motor glider Bonomi/Silva BS-22 "Alzavola" (Teal).

So, I decided to build this motor glider in 1:10 scale, for two reasons: the first because this model is going to have an electric motor and so no need to be towed, the second one, because the designer of this glider is Camillo Silva, the uncle of a friend of mine, who designed many sailplanes in the 1930s for the company Bonomi in Cantù (Como).

All the Bonomi/Silva gliders are described with pictures and drawings in the same above mentioned book. The BS22 Alzavola was a powered version of the BS-15 "Bigiarella" glider.

As the original drawings are not existing any longer, I redesigned the 3-view drawing with a CAD system and I obtained all details concerning the fuselage formers and the wing and tailplane structures.

My poor skill in model building was compensated by having worked a long time at an important aircraft company, plus the recent experience in restoring a full size Zögling, and so I could successfully assemble my BS22 Alzavola.

The fuselage and the D-box have been skinned with 1mm balsa wood and the rest of the wing and the tail-plane covered with Japanese paper.

As the only photographs of the original is a single black and white image (see the title page), the color scheme and registration numbers are an artistic interpretation.

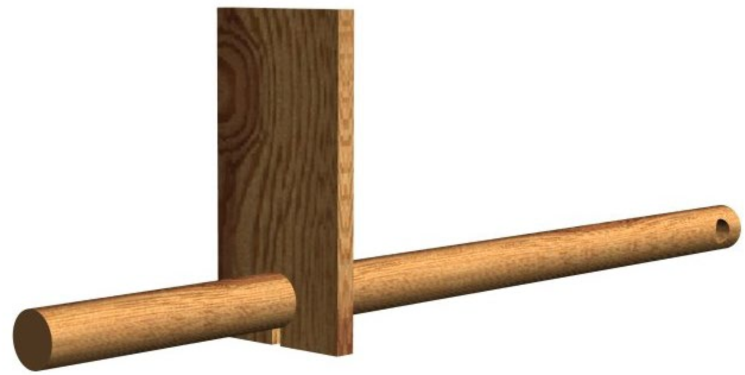
The final painting is just my free interpretation, because for the BS-22 there is only a single black and white photo from which it is hard to understand the color scheme.

Winter will be over soon, so we will test fly the BS-22 Alzavola in the airfield of Calcinate del Pesce, near Varese. All static tests and motor tests have been carried out successfully, so I am sure I will enjoy good RC flights.

Tom's Tips

A very simple CG marker

Tom Broeski, T&G Innovations LLC, tom@adesigner.com



I have always been measuring the CG on my planes with a ruler. Never could get it just right with the curved wing surface. Soooo... I made a simple cg marker.

Materials:

(1) Dowel (1/2" for pencil or 5/8" for both pencil and Sharpie) 8" to 12"+ long. Some of my scale planes need the longer dowel.

(1) 1.5" x 3" x 1/4" +/- block of wood

Photo 1 The first one I made was for a pencil, so I used a 1/2" dowel and drilled a 9/32" diameter hole in the block.

I then decided I wanted one that would do both a pencil and a Sharpie. I used a 5/8" dowel and drilled one end 9/32" for a pencil and the other 13/32" for a felt-tipped marker.

Photo 2 I drilled a 5/8" hole in the block. I also cut a notch to the hole to prevent end splitting. Not much to it. About 15 min including sanding and finishing.

The dark marker for light surfaces and the light one for dark colored surfaces.

Photo 3 Next, you simply measure from the face of the block to the tip of your pencil or marker.

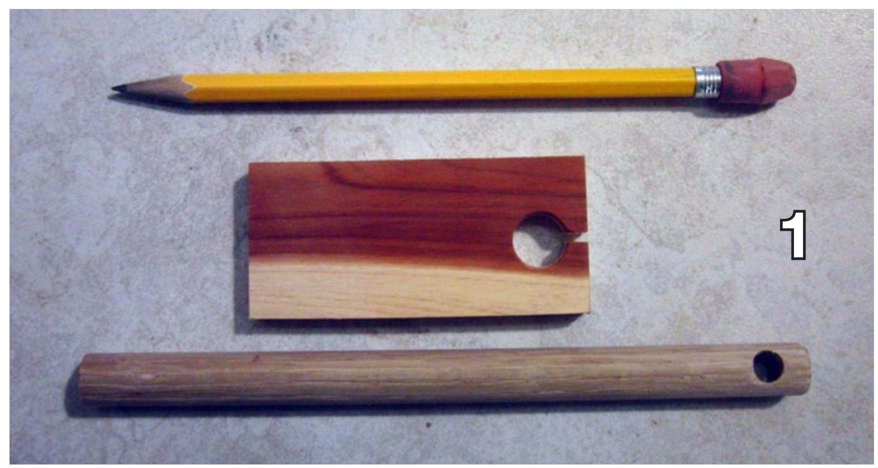
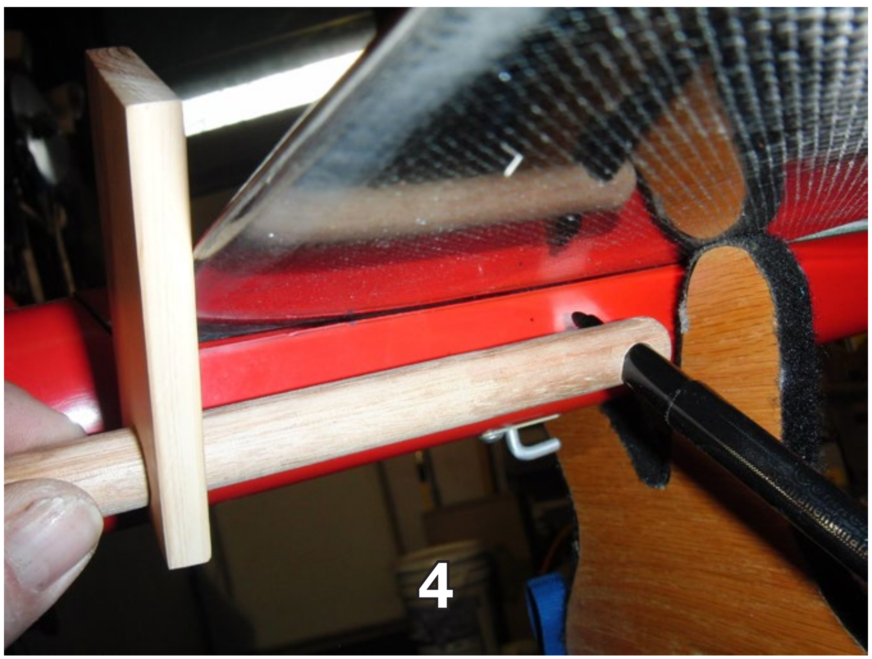


Photo 4 The block goes at the front of the wing at the root and the marker marks the spot.

Photo 5 Here's how much I was off with hand measuring. The dot is by hand and the line is with gauge.

As always... have at it and let me know if you have a need to do something but don't have the tool to do it.



Bowlus BA-100 “Baby Albatross”

Building a scale model

Elia Passerini, eliapasserini@valdelsa.net

It is now three years since I started building this model aircraft: the Baby Albatross.

I believe that every one of us has in mind the models we want to reproduce, according to our own personal taste. At the time, I had already started building an ASW 24, and at the same time I was redesigning in 1:3 scale, from original documents, a truly interesting glider, the Rhönbussard.

But all that changed when, by pure chance, I happened upon the mould for the fuselage of the Baby Albatross. (Photo 1) It was a mould of enormous dimensions which required some touch ups; yet, it was an invitation to create a model aircraft with a unique shape.

Based on the original design, the model was to be constructed almost entirely in wood with frames, balsa and plywood cladding, and only one aluminium tube to reach the tailplanes.

Yet, all this could have been made as a single fiberglass piece; surely a significant saving on working time.

However the wings, the tailplanes, the wing rib stringers, and the undercarriage all had to be constructed and, due to its unique shape, the problem of the climb / dive controls and rudder had to be solved.

Photo 1: The Baby Albatross fuselage mould that was the impetus for this project.

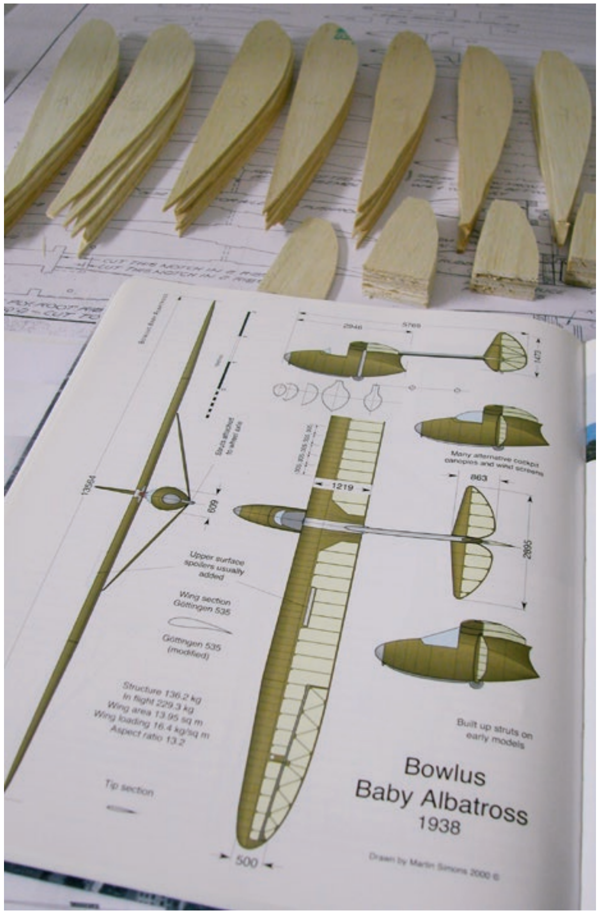


Photo 2: Martin Simons' "Sailplanes - 1920-1945" served as a resource.

At the same time, I also began searching for photographic documentation, available on the website of the National Soaring Museum of Elmira, USA <http://www.soaringmuseum.org>, which was fundamental for the model to be as faithful a reproduction as possible.

Having chosen the aerofoil, GO 539 for the central part, and NACA 0009 for the ends with 2° washout, the actual work could start.

I do not know why, but I always start building a model from the tailplanes. So I made a plywood mould to bend the

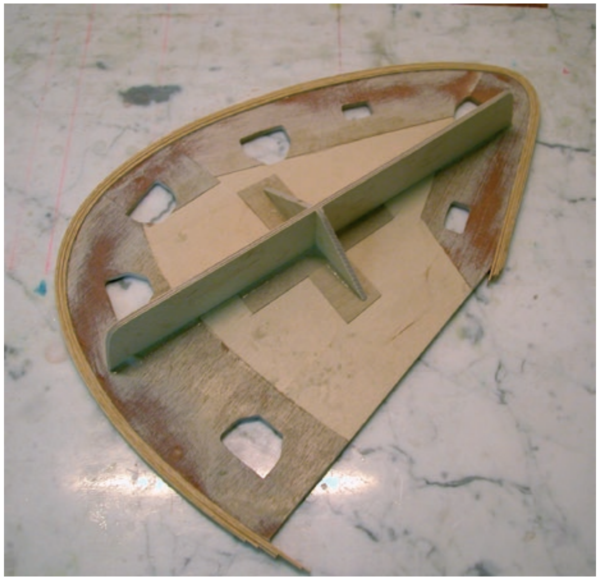


Photo 3: The rudder mould.

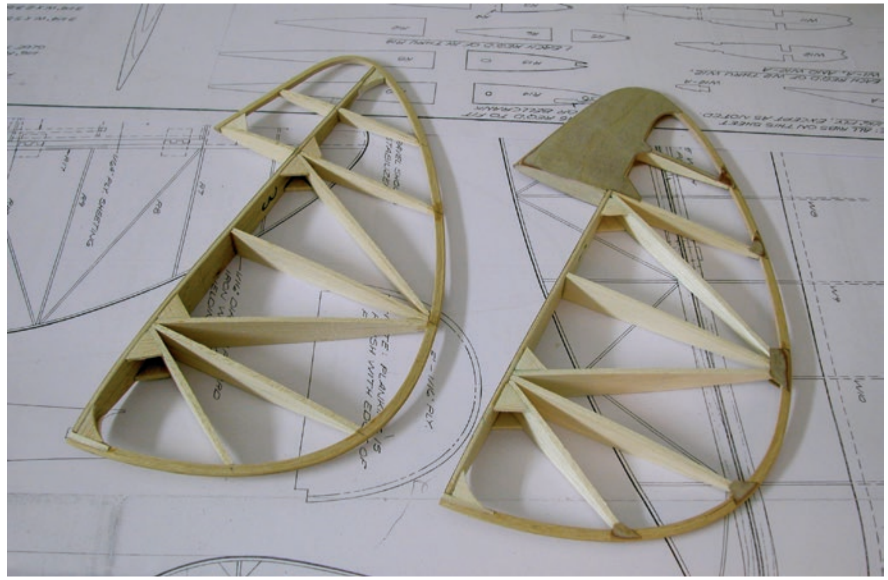


Photo 4: Finished parts from the mould.

strips of the leading and trailing edges in the right shape, using five layers of 0.5 mm veneer, glued on the mould described above and clamped until dry. (See Photo 3)

For the construction of the wings, I used balsa ribs as in the drawing, pinewood spars, and cladding for the front part made from 0.4 mm thick birch plywood.

For the assembly of these parts, it was essential to create a polystyrene mould, with which I was able to create the wing twist and dihedral. The ribs were all shaped together from 3 mm balsa.

At the beginning the assembly was fairly simple and smooth, with the usual problems to be solved in anticipation of all those things that would probably be useful towards the end of the work: the bayonet and the subsequent locking of the wings, the air brakes, the space for the servos, the alignment of the ribs on the ailerons, the attachments for the struts, the pushrods, etc., and finally the cladding of the D-box, in 0.4 mm birch plywood.

Perhaps many would disagree with this choice of mine, but this thin plywood, that I really like for its beautiful grain, in this case proved very useful; it was stained mahogany and varnished with clear gloss. For all the other parts that

Photo 5: The left wing panel showing spar, ribs and spoiler bay cut-out.

Photo 6: One of the ribbed struts.

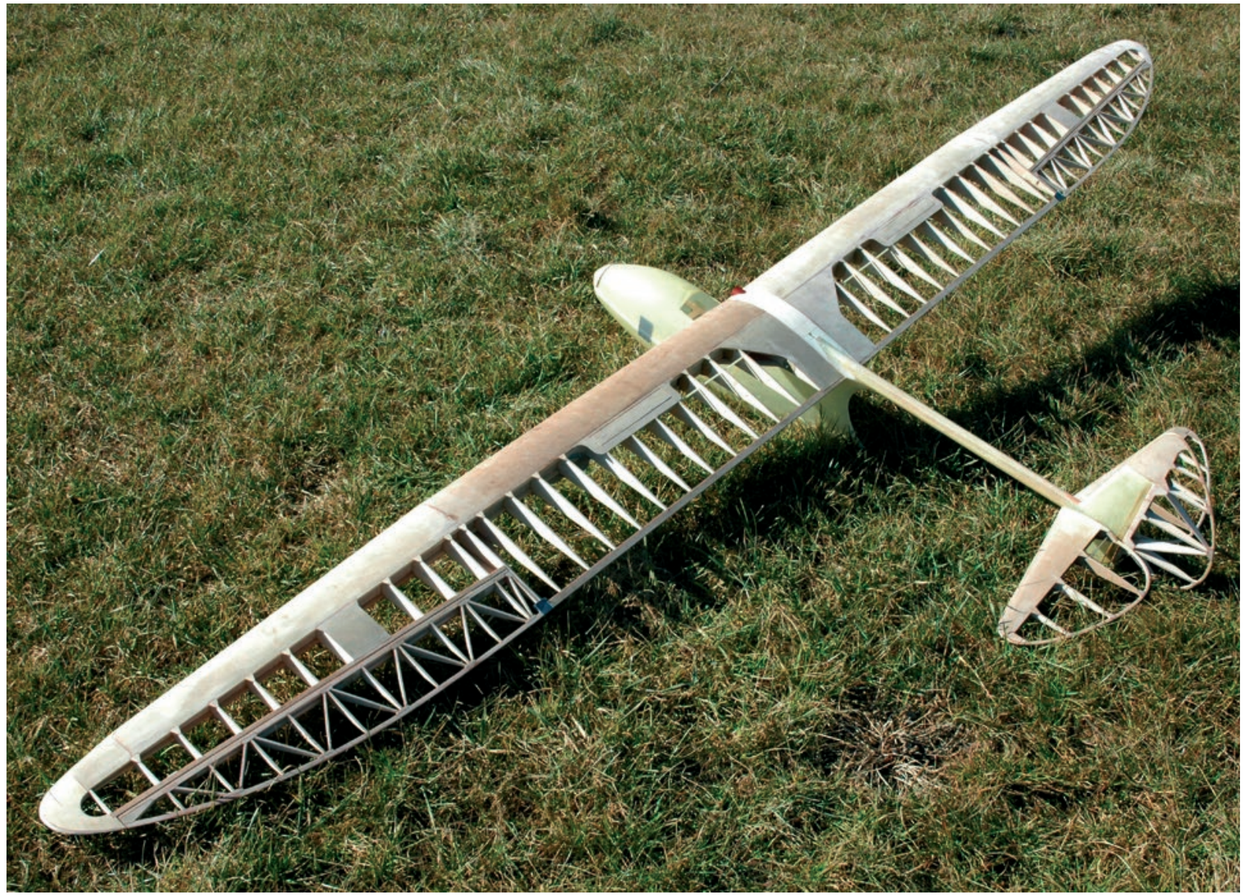


Photo 7: The finished framework ready for covering and painting.

needed to be coated, I used Sig Coveral, a synthetic fabric which is slightly thermoformable.

The little gems of this model are the ribbed struts, as in some versions of the real glider. Preparing and gluing well-aligned 3 x 0.6 cm ribs, hiding metal rods inside for the wing/fuselage connection, cladding, and varnishing took a month's work.

I positioned the servos of the tailplanes on a central frame, which served to house the bayonet at the top, and to reinforce and support the undercarriage at the bottom. The pushrods are steel cables. They slide within the tube/fuselage up to the frame described above; here, four small pulleys change their direction towards the servos that are arranged vertically.

The whole model is painted with high-coverage epoxy paints (guaranteed little additional weight). Once it was assembled and finished, with centre of

Photo 8, right: The fiberglass moulded fuselage pod has been painted and an artist's wooden "pilot" has been placed.

Photo 9, below: Compare the wing attachment in this photo with similar images in Mark Nankivil's walk-around of Jeff Byard's Baby.

Photo 10, right: The pilot is strapped in and has hands on the control wheel. The windscreen is held in place with metal bracketing attached with screws.

Photo 11: A custom cradle holds all of the parts for transport.

Photo 12: Assembled and ready to get into the air.

Photo 13, right: Elia holding his Baby Albatross.

Photo 14: On tow, the start of the maiden flight.

Photo 15: In flight, with the sun coming through the covering, Elia's handiwork is clearly visible.

Photo 16: Coming in for a landing at the end of a highy successful maiden flight.

gravity and radio programme checked, and with everything in good working order, all there was left to do was to fly it.

To transport it by car, I built a sort of container in which all the components are blocked without any contact between them.

Experienced hands (thumbs) have made it fly using a tow plane. With a beautiful take-off, once detached from the towline, it was a real pleasure to see it fly: a fine image of the backlight on the structure, some turns in thermals, and finally the landing with the air brakes unlocked. The test was a true success; it was worth building it.

For fear of not having everything under control, I have flown it myself only for a few minutes on its second flight, but I am sure that in the future it will give me great satisfaction.

The photos can certainly explain all the stages of construction better than I.

Bowlus BA-100 "Baby Albatross"

NX-1266N, Serial 134, owned by Jeff Byard

Walk-around by Mark Nankivil, nankivil@charter.net

Specifications:

Structure: 1-strut-braced wood/fabric wings, wood/fabric all-moving tail surfaces, metal tail boom, wood pod.
Span: 13.56 m, 44.5'
Area: 13.93 m^2, 150 ft^2
Aspect ratio: 13.2
Airfoil: Go 535 (mod)
Empty weight: 136 kg, 300 lb
Payload: 93 kg, 205 lb
Gross weight: 229 kg, 505 lb
Wing loading: 16.44 kg/m^2, 3.3 lb/ ft^2
L/D max.: 20
Min. sink: 0.69 m/s, 2.25 fps


NX-1266N


NX-1266N


ASK-18


In Loving
Pamela


NX-1266N


"On the Wings of an Albatross"
B
BOWLUS
SAN FERNANDO~CA.

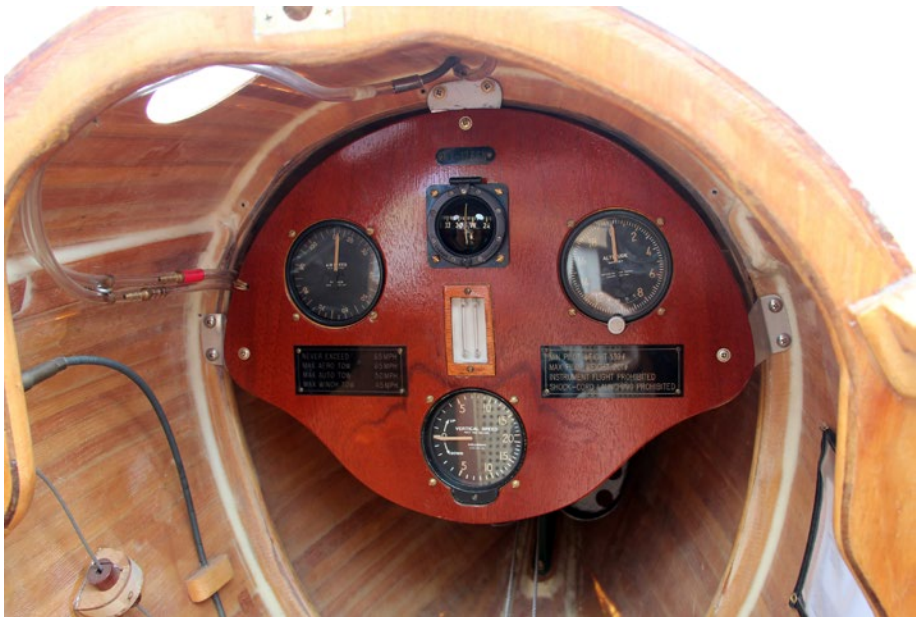

"On the Wings of an Albatross"
B
BOWLUS
SAN FERNANDO~CA.


NX-1266N
BOWLUS

NX-1266N


BOWLUS


BOWLUS

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