

# Radio Controlled Soaring Digest

January 2012

Vol. 29, No. 1





**Front cover:** Mike May's Su-35 PSS is captured during its maiden flight by Piet Rheeders. Construction details and maiden flight experiences begin on page 4 of this issue.  
Nikon D90, 1/2000 sec., f5.6, 300mm

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Text by Jim Dolly with Cumberland Aerotow 2011 photos by Dave Garwood.

**Willow F3F 94**

Ian Mason takes a slope racer from concept to retail reality.

**Back cover:** "A buddy and I were out Saturday morning flying and taking pictures. A couple turned out fairly well. The sailplane is my home designed 100" span woodie."

— Tony Beck

Photo by Tom Cassem at Johns Island SC  
Nikon D70 with Nikon 70-150 and doubler, ISO 100, 1/250, f16



# R/C Soaring Digest

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B<sup>2</sup> Kuhlman

Contact

rcsdigest@centurytel.net  
<http://www.rcsoaringdigest.com>  
Yahoo! group: RCSoaringDigest

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## In the Air

Another exciting issue of *RC Soaring Digest*! We've had a great time putting this one together for you.

Mike May starts things off with a well detailed photographic journal covering the construction of his Su-35 Super Flanker PSS. A few photos of Mike's creation appeared in the last issue (December 2011), and more in-flight images are included this time, thanks to Piet Rheeders.

Gordy Stahl expounds on timers, callers, and instructors and which of those you need, want or desire during a contest. Scott Campbell cut the nose off his Bob Dodgson Windsong and installed an electric motor and a Lipo battery for near vertical climbs to altitude.

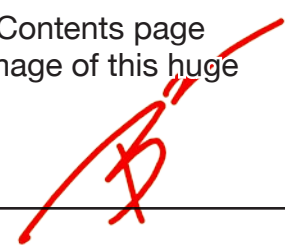
Martin Pilný took his camera to the Czech F3B Championships and came away with some truly astounding and artistic images of the event, and the collaborative efforts of Dave Griffin, Scott Chisholm, John Shaw, Kevin Botherway, Shane Kennington, and Paul Taylor produced the exceptional coverage of the Southern Fling 2011 New Zealand DLG Contest.

Dave Garwood attended the Cumberland Aerotow 2011 event and supplied the photos which accompany Jim Dolly's presentation on the HighPoint Aviation Airfield.

The final article in this month's issue follows Ian Mason's journey as he creates a high performance F3F 'ship and takes it to market. A must read for anyone contemplating a similar project.

Thanks to Steve Holmes for providing the Contents page background this month. Steve captured the image of this huge lenticular cloud while flying over Greenland.

Time to build another sailplane!





# SU-35 Super Flanker

Mike May, [mike\\_datapath@yahoo.com](mailto:mike_datapath@yahoo.com)



Hi Guys,

Once a year we have a PSS fest, last time I entered a few years back I built a A10-WARTHOG and it flew well, even in lightish lift, this year I decided to take on something a bit more ambitious.

Lots of searching on the internet revealed little similar builds for PSS but quite a few smaller EDF projects, so with little to compare with it was time to make a start.

A nice 3-view was printed out on A4 paper and when checking the scale of my 3-view all dimensions were multiplied by 10 to give me a scale somewhere around 1/6th.



# Russian Thunder

The plane was to be mostly molded epoxy/glass and I decided I did not want to do a lost foam fuselage, so something new here.

The wing was to be one piece as I did not want joiners and the tail feathers also needed to come off for transport.

I had an old canopy from a Multiplex DG500 this was also to be part of the build.

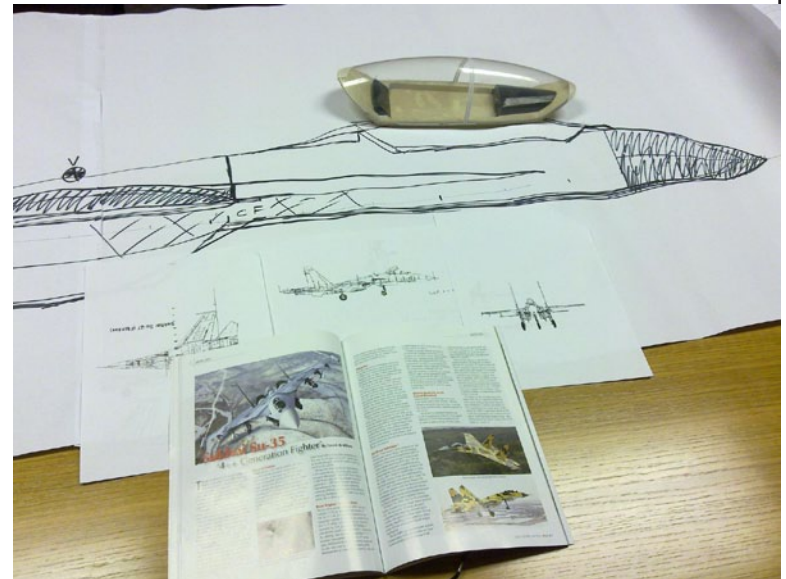
This is, as scratch building goes in my workshop (Ratel works), the closest thing to a Skunkworks we have, but way tougher.

As stated, I wanted to mold most of the parts and then join it all together to make a plane.

The wingspan according to the scale diagram is 1.4 m but I will stretch it slightly as is common practice on PSS jets with short wings.

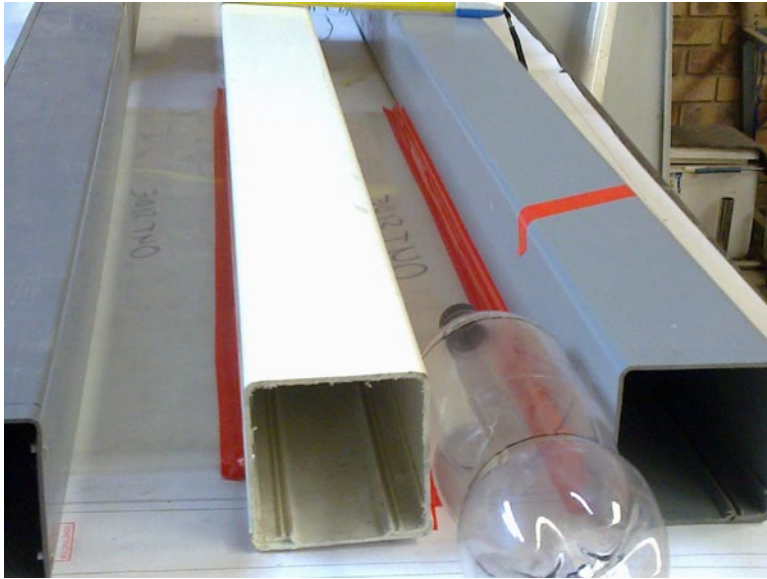
The weight I am shooting for is about 3-3.5kgs empty.

*1. Su-27 3-view, the old canopy, and some drawing on a big sheet of paper.*

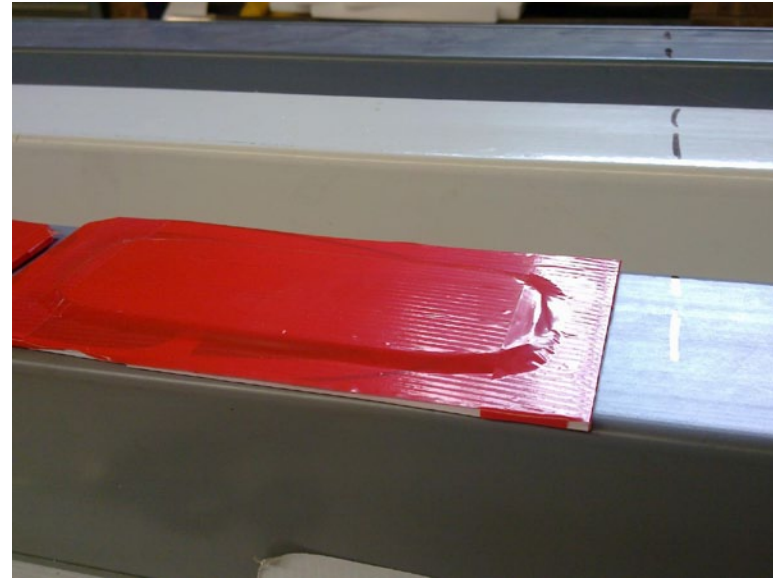


*2. The materials - the expanded polystyrene was found in a skip near my office, the plastic bottles... also free.*

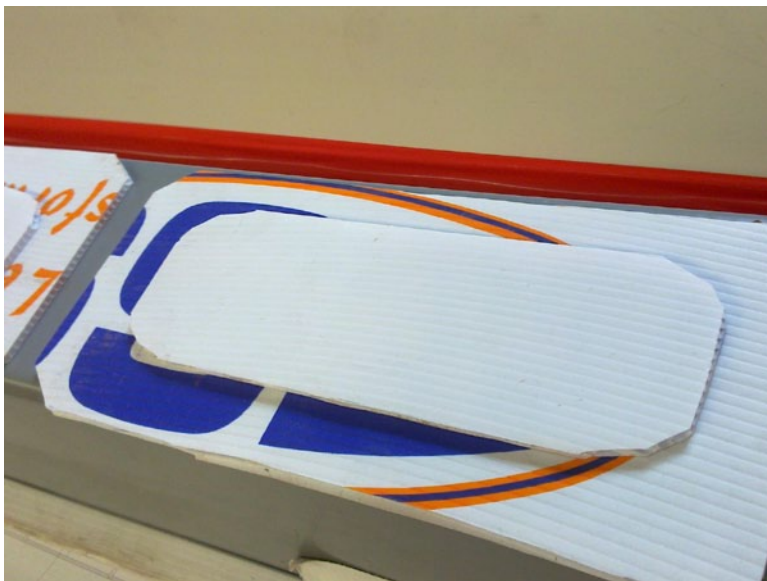




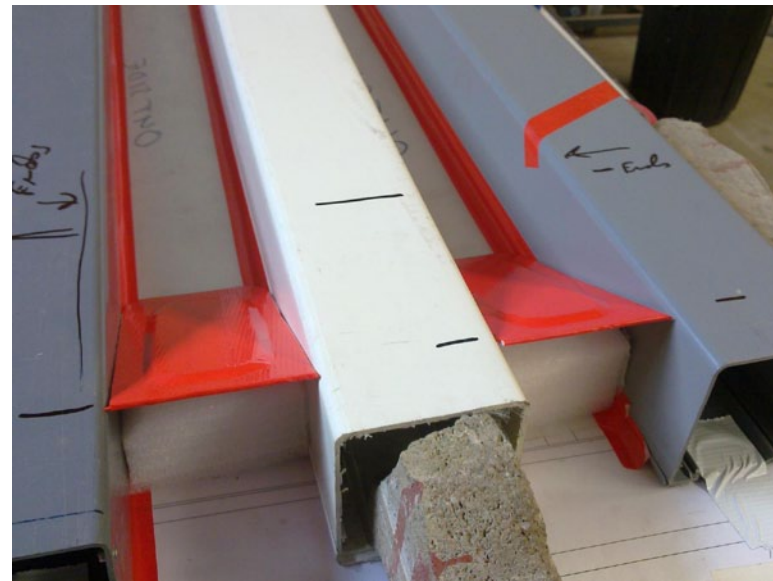
3. I start with two pieces of 100 x 100 mm PVC trunking lengths stuck down on some mylar with red plastic tape.



5. This piece is taped down and will create a lip which when glassed will add strength. This is the jet inlets.



4. Correx from some old advertising boards is cut to shape.



6. The inlet pieces are taped into the trunking channels at an angle.





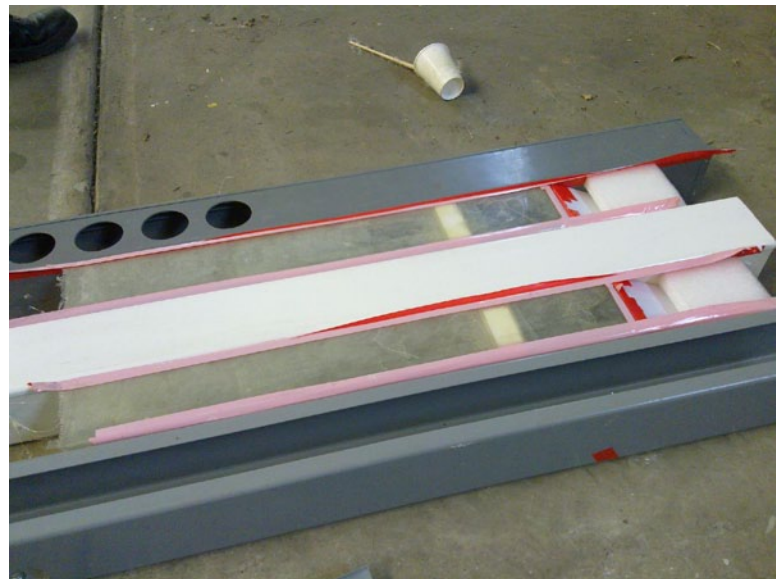
7. Time for release wax.



9. I have decided to glass in two temporary foam inserts to box and stiffen things.



8. Lots of glass cut-offs from previous projects will go into this plane. I cut them to usable sizes.



10. How it looks from underneath.



11. The first molding popped out and awaiting trimming. The jet motor intakes basically form the foundation.



12. A nicely tapered oval shaped yogurt container and a sprakling water bottle.

After explaining to one of my staff members that I was not in fact building a catamaran boat, it was time to start with some other small bits.



13. Two 2 liter Coke bottles. Look at them carefully.





14. I cut off the container base and fitted a green cold drink bottle. All taped together.



15. Waxed my plastic bottles and laid up some glass inside. Out popped some shapes.



16. A yogurt container lid was used as a template and two end plates of Correx made with a mylar oval tube taped in place.



17. Meanwhile the Coke bottle moldings are attached to the jet channels base by taping mylar and glassing. I managed to go from square to round.



18. The fuselage tube molding which now matches the nose cone. All epoxy is cured with fast hardener and left overnight.

The “boat” with its half tailpipes are put aside and it’s on to the wings... I have not built a wing like this before and decided to use my own design airfoils using the TLAR principle. At this stage I decided the expanded bead polystyrene was rubbish, which it actually was if you follow, and bought a sheet of extruded Isoboard to cut the cores from.

I hand cut the cores with my bow using the marks on the root and tip templates, both divided into ten, a bit of hand eye co-ordination and a reasonable set of cores. A bit of block sanding and dusting off, again not wanting to make things difficult, I decided not to vacuum bag the skins but lay them on directly to the foam.

A pair of spruce strips were laid into a groove from the underneath of the cores but not through, vertically like a shear web. Important note: a 1.5 degree washout was built into the wing when cutting the cores.



19. Wing block patterns. True scale was 1.4 m, I moved the tips out 15 cm each side giving a span of 1.7 m.



20. The raw cores joined with 5 minute epoxy prior to some sanding with a block.





21. The spruce strips to stiffen up the wing.



23. Important to record the exact positions of the spars shears as I want the servos between them.



22. The spruce bonded into the slots with a resin and flox mix. I also added balsa strips to the leading edge.



24. Tail feathers utilize a symmetrical section with "aerodynamic" leading and trailing edge, the middle is flat.

The basic wing core was carefully sanded to match the balsa leading edges and I laid on a strip of 85gr light cloth over the balsa leading edge and let it cure.

Next up I slotted the tailfins and tailplanes and bonded in a hard balsa strip to give these surfaces some backbone.

Glassing the wing I do one side at a time. I added a little cabosil to the resin on the last layer of cloth to give a harder finish. The layup was 1 x 163 g inner and 106 g fine weave outer.

Wing tips of balsa will be added later and sanded to shape, once everything is trimmed to final outline.



26. The under side blown dust free and cloth resined in place with a little overlap. Old plastic credit card spread epoxy.



25. The wing is cut flat across the front at the width of the fuselage. Balsa piece glued to open edge.



27. Now the top is glassed with cabosil in the resin. Rich shiny surface will be cut back before primer.





28. The smaller tail feathers are laid up with two layers of 104 g cloth with resin/cabosil mix on outer layer.



29. In this picture you can make out the 3/4 span balsa spine.

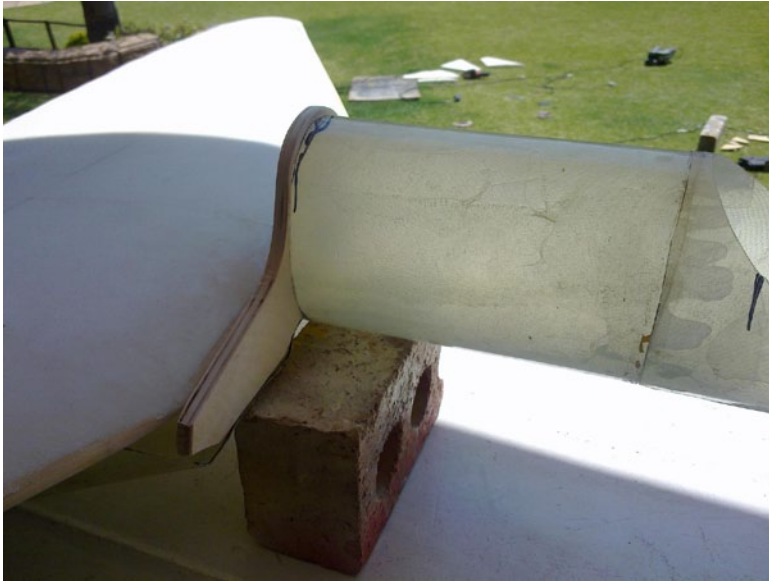


30. Back to the fuselage...Here you see the rough canopy position, the fiberglass tube and nose, and the wing.



31. In front of the flat section of the wing will come this strong plywood former. The holes are for servo leads and access.





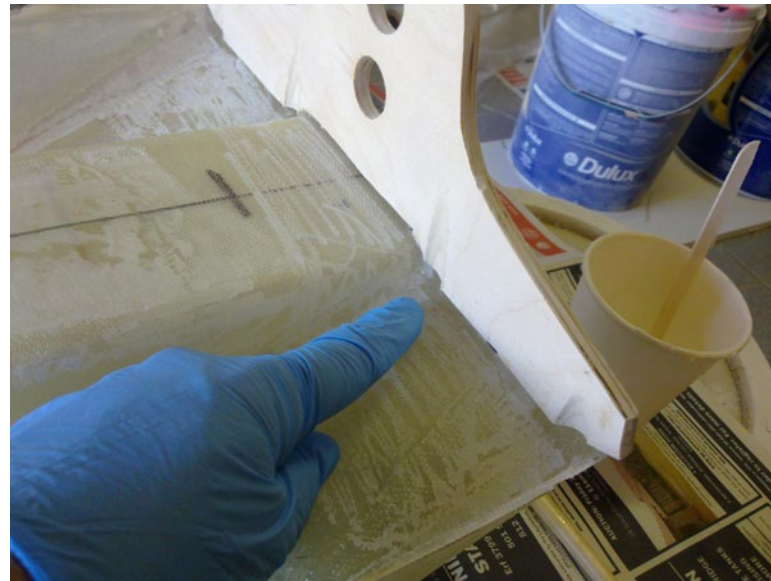
32. The fuselage tube will attach to the plywood former.



34. The plywood former is carefully sanded to match the glass shape and tack epoxied in place.



33. Looking from the tail end toward the front. The “jet intakes” can be seen in the molding. Temporary supports still in place.



35. The plywood had some concave grooves sanded in with my Dremel sander. These match the hollows in the glass molding alongside the jet intakes.





36. Some flox and resin in the joint hollows, then 48k carbon tows are laid in wet.



38. The temporary supports are removed and the wing base is made up of a foam sheet and epoxied in.



37. Still wet, two layers of 200 g carbon cloth is glassed in. I was concerned this might be a weak spot with a one piece wing.



39. How it looks from underneath, just in case you were wondering. Nice boat!





40. Adding tows and shaping the fuselage tube.



41. Glassing the tube to the plywood former. Two 200 g carbon again for strength, tacked and aligned with 5 minute epoxy first.



42. Two weeks into the build and I can see where this is going at last.



At this point the basic foundation is done; from here on it's more art than science.

Referring back to the big 3-view, it is time to start blending in my canopy with the lines of the SU-35 as closely as possible.

Some pieces of foam are tacked on and then some basic shaping is done. All focus is now on the front area around the canopy and wing shoulder.

Lots of shaping and fitting bigger pieces with foam, sanding and then some epoxy micro balloons as the shape becomes more defined. You know... a little sanding here, eyeball from a few angles, a little filler there, etc., etc.



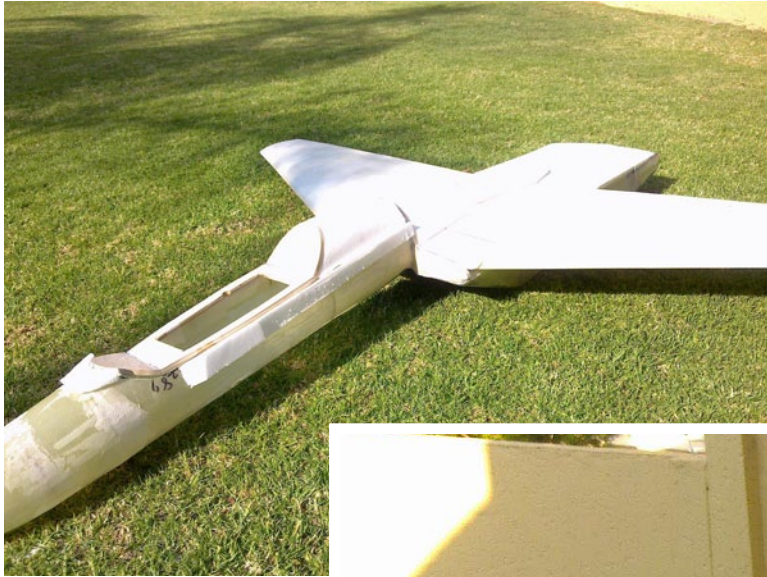
43. Some plywood blocks epoxied onto the top of the wing outside of the spars. These will be drilled and captive threaded nuts installed.



44. The correct foam infill behind the canopy and starting the foam on the fuselage section of the wing. Hollow for wiring.



45. Added the web "strakes" and more to the fuselage ridge. Blocks smooth the entry up to the wing center section.

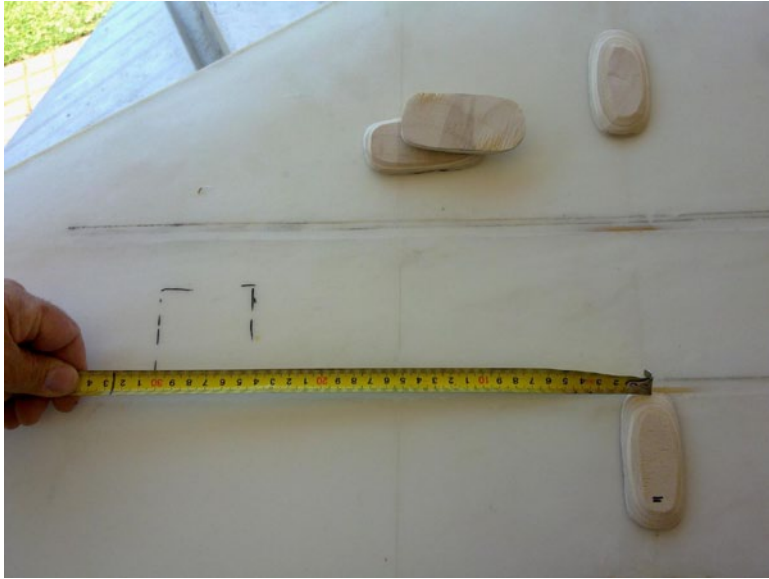


46. Filling around the canopy. Foam will be glassed over later.



47. Some basic sanding of the foam and things are starting to shape up.





48. Some plywood blocks epoxied onto the top of the wing outside of the spars. Captive threaded nuts to be installed.



50. Finer sanding and some more filling around the canopy base.



49. The hollow fuselage foam ridge is glued on. Provides wiring access. Captive nuts are inside.



51. Using mylar on the split line. Micro balloons and flox mixed with epoxy is used to fill both sides to the break.





52. The front of the canopy is faired into the nose.



54. Foam back from the trailing edge. Sanded to shape, slopes slightly downward. Carbon where tail feathers attach.



53. Front view. Starting to look mean.

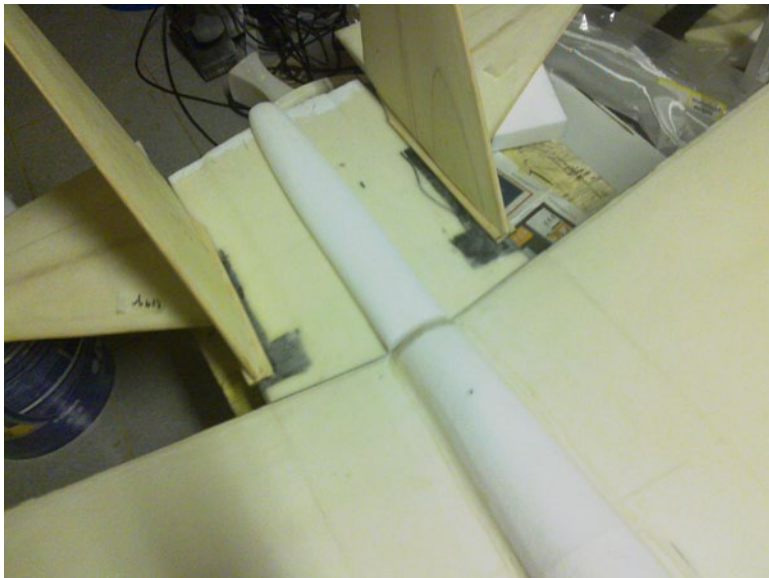


55. The "canard web" gets a carbon tow edge and is glassed.





56. The two plywood bolt holes are reinforced and the edges all filled with micro balloons mix and then glassed.



57. The fuselage ridge is shaped for the area between the engines.

The upfront pointy part of the fuselage looks good, so attention now shifts to the tail end. I need to work out a way to attach the tail fins and tailplane.

The jet motors also need some work. I was tempted to glass the vertical fins on permanently, but then transporting again becomes an issue. I would also like to be able to adjust positions if required.

I do build fast but at this point in construction I was near the end of week 3 and really enjoying how this was coming together. The greatest concern was the weight build up. This is a big machine so although I was building as carefully as possible, strength was not to be compromised. At this time 3kgs had been reached and there was still plenty to do.

I again started searching the internet for something similar, in glass, to see what sort of flying weight I could get away with, and had some positive input from John in Ireland who is experienced with PSS builds and busy with a big Tomcat. He seemed to think weight on this size ship was not that big an issue and stressed that it was better to maiden nose heavy than nose light. This is really good advice if you know where the CG is supposed to be.

Really close to the end of construction now, every time I mix up some epoxy/balloons I fill any hollows dents etc. The ends of the fins, stabs and wing tips have all been filled and sanded. Where ever the filler is used, like on the tail fin/stab gusset, I also add some glass floc to the mix so it adds strength to the structure. Lots of sanding going on, mostly with my trusty mouse sander.

After initially drilling two mounting holes on the side of the fuselage for the tails, this was found to be very weak and floppy, so I added a 3rd attachment point, on top and that worked great, things will be held on with hi-tensile cap bolts and wingnuts on the inside. I quickly found out that I can only fit my left arm inside the fuselage via the jet outlets.



58. The plywood base which can move forward or backward on the square fuselage sides.



59. The pieces glued together at 90 degrees.



60. The tailfins epoxied on with strong epoxy. Note also that the tips have now been cut and shaped to scale.



61. The tailplanes attached with 200 g carbon. The wing is at  $0^\circ$  incidence on the fuselage and the stabilizers are set to  $2.5^\circ$  as in "up" elevator.





62. The Coke bottle jet exhaust molding and the green bottle nose cone molding.



64. The foam is cut to the cone shape.



63. The conical molding is cut in half.



65. The jet outlets and cowls tacked in place.





66. Some epoxy balloons to bond things in place and fill gaps.



68. I need a third anchor point, so added a plywood foot.



67. The twin tailpipes.



69. Sanded, the plywood clears the engine. This made the tail assembly stable. A piece of carbon cloth will add rigidity.





70. Added another piece of carbon cloth just ahead of the engine for the third attachment point and glassed on a piece of plywood to the fuselage sides.



71. Started final filling which is epoxy/microballoons and some cabosil for a harder finish.



72. Tail end sort of together. The elevators need to be cut back slightly to clear the jet outlets.

At this stage of the build, the structure was finished and sanded. However, once a coat of 2k primer is applied, some hollows, dings, etc. are sure to show up. These will then be sorted out.

The beige primer flashes off very quickly and gives a matte finish. It does tend to fill pin holes and light hollows, but is heavy so most will be sanded off.

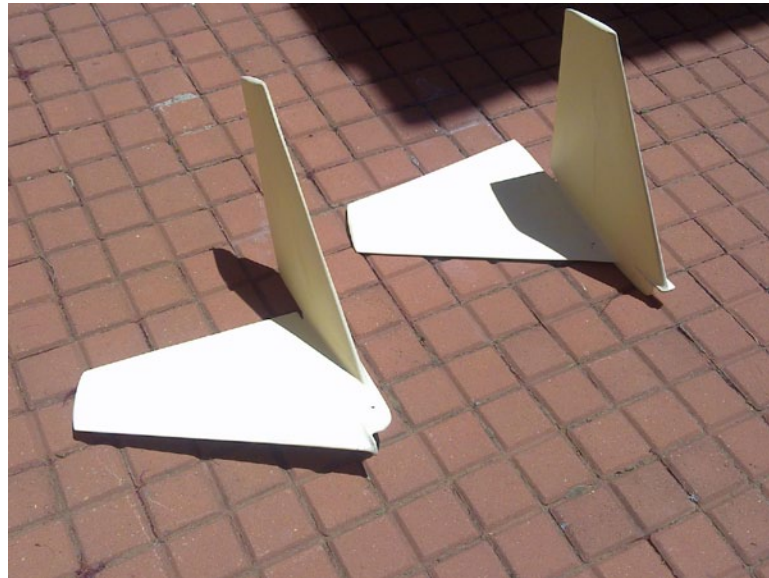
This sanding will be with 220 and 320 grit paper, but dry, no water.



74. The fuselage primed.

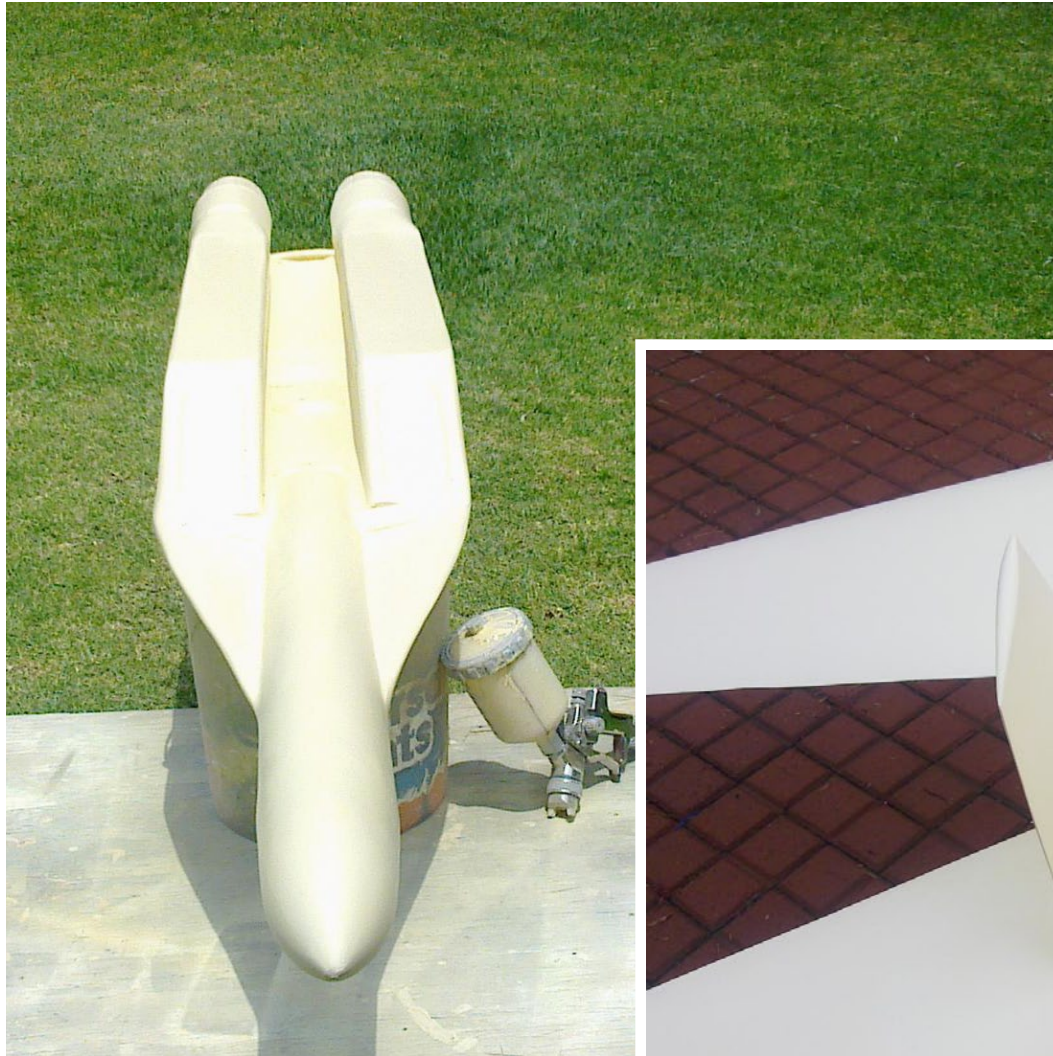


73. The wing primed.

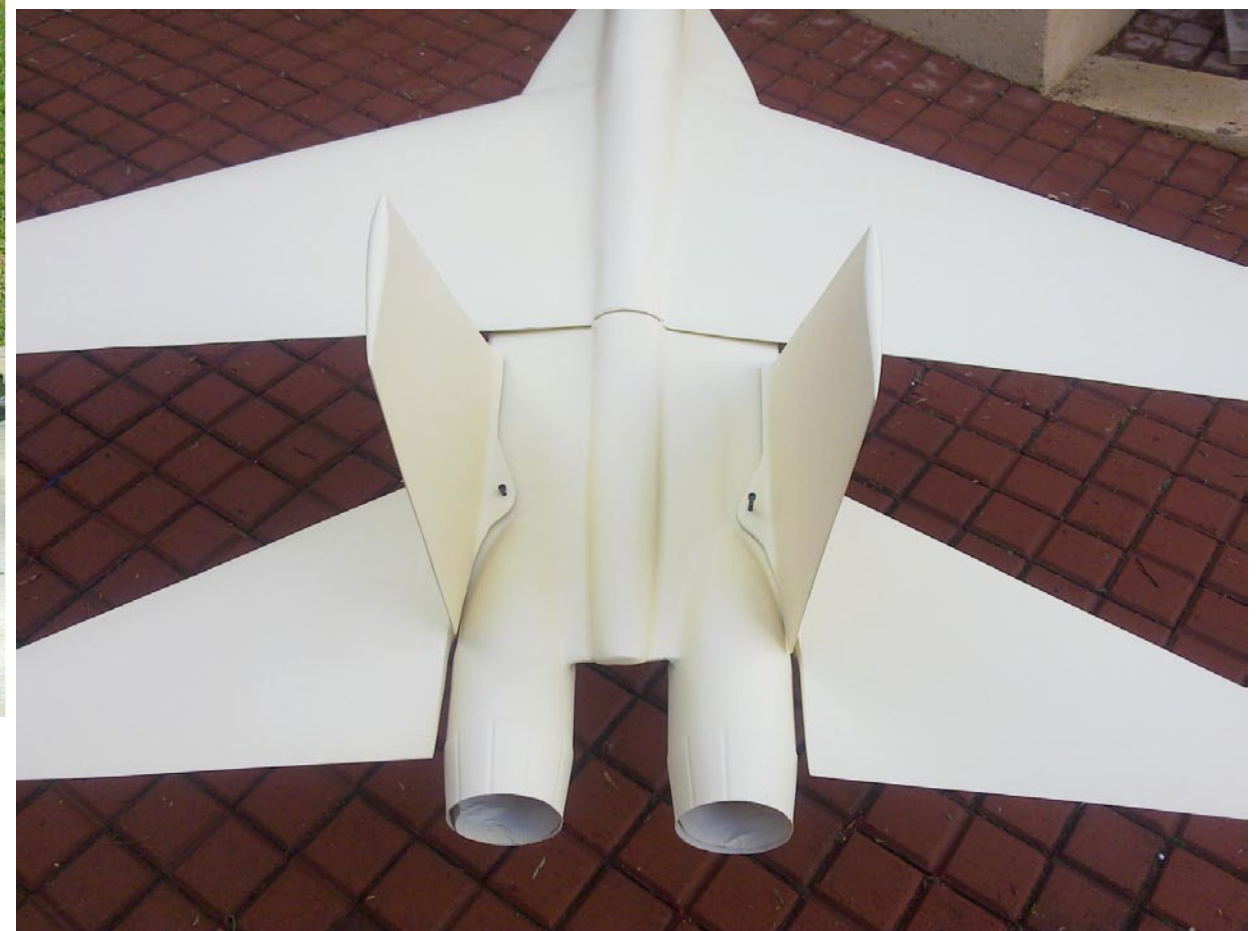


75. The tail feathers primed.





76. I used about 0.5 liter of primer which means 500 g more weight.  
No stopping now!



77. I put the pieces together for a bit of bench flying.



The two Su-35 Flankers that are widely shown in pictures and in youtube videos are numbers 901 and 902.

Number 901 has an almost yellow base with green and brown camouflage scheme, number 902 has a winter camouflage scheme of light grey, white and dark grey with a straight line pattern.

I liked the letter for two reasons: first, if I outland I can find it in our terrain, and secondly I can mix up all the shades with white and black, two colours I had in stock.

So number 902 it is.



79. I leave this 2k at least a day outside before masking.



78. The lighter shade of pale grey looks slightly blue in some light.

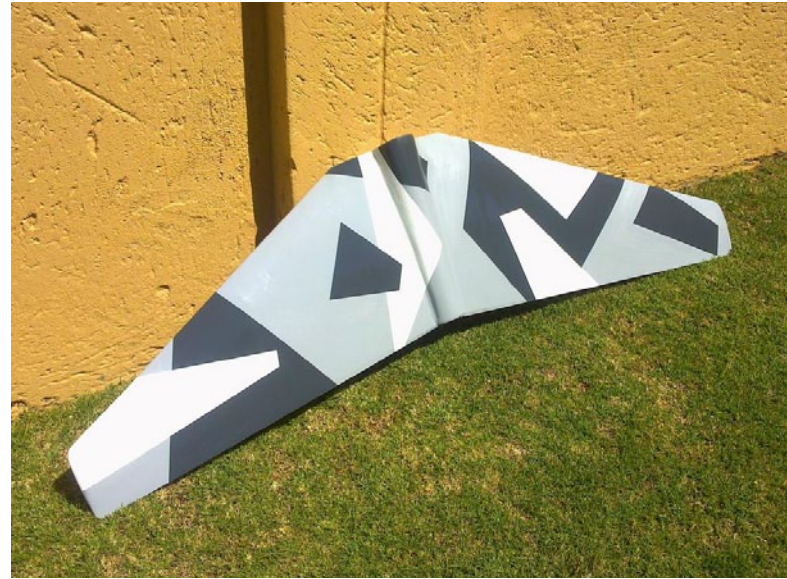


80. The whole aircraft is masked except for the white panels, trying to emulate the original closely.





81. Grey base and white panels.



83. Was there a cubist art school in Russia?



82. Mix up some dark grey paint and once happy with the shade mask again and spray.



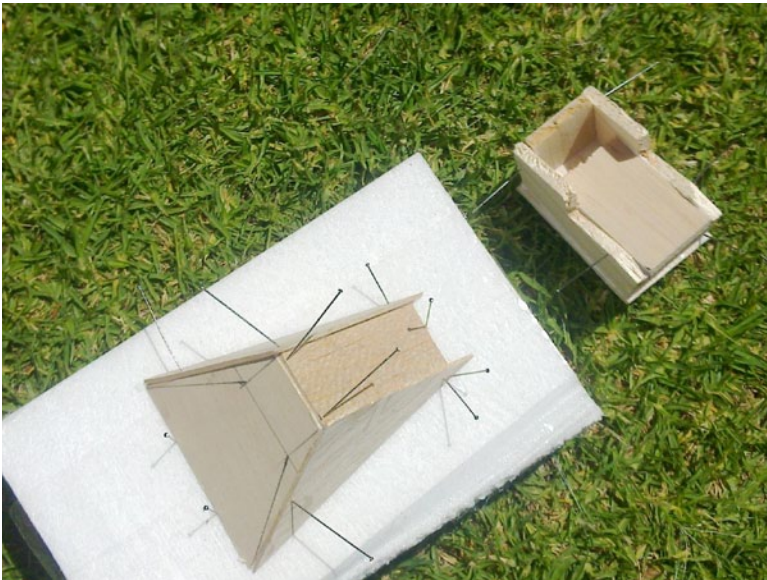
84. After four days of painting it was time for some low level garden flying.



Moving right along, it's time for lots of small steps to get to a level of detail so this ship looks convincing in the air. As a PSS project it is not nearly true scale, but you knew that.



86. Removed the single white stripe in the middle of the canopy and sprayed on the Su-35 black stripes.



85. Made up an instrument panel and seat backrest out of some light balsa and sanded it to shape.



87. More hardener, no thinners, and spraying from a distance gave the normal 2k gloss a matte black finish for the tailpipes.





88. The Coke bottles turned into black fluted engine outlets. Rear radar pod off for maintenance.



90. The instruments are mostly screen types as per the full size and look good.



89. Intakes are painted. Someone asked about cutting them out and letting the air through, but that would increase drag.



91. The 1/6th scale fighter pilot looks comfy in his office. In the Sukhoi video the pilot wears a blue flight suit and white helmet.



Time to bolt is all together and work out the elevator controls. Two choices: servos bolted into the fuselage sides and direct drive to the elevators or fit the servos up front and use red snakes/pushrods to move things.

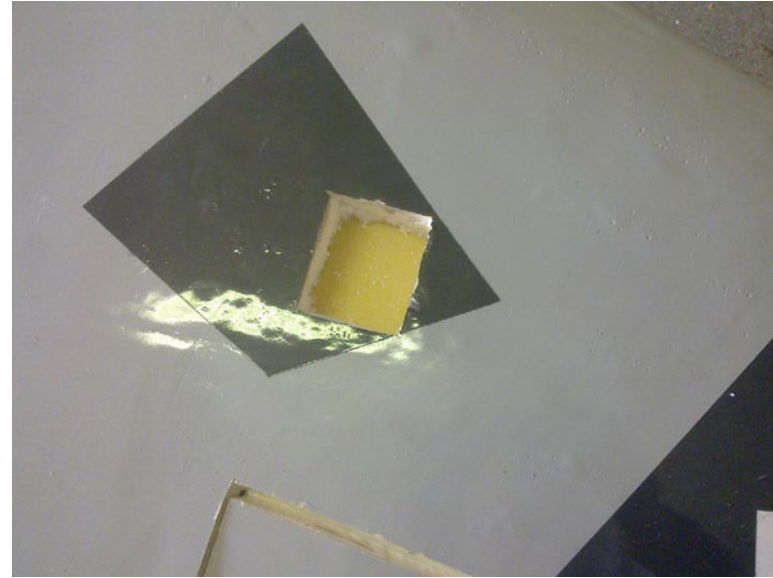
After careful consideration the first choice had too many potential problems. The servos could get damaged on landing, the weight was rearward, and I had no clear area on the fuselage because of the tail attachment plywood.

Up front for these 6.0 kg torque 29 g digital metal gear Turnigy servos from our friends at HK, and 15.0 kg torque composite digital metal gear Turnigy servos for the wings provide plenty power all round and were really reasonably priced. I use of them a lot.

The weight's now approaching 5 kg!



92. Control surfaces are cut out, the foam sanded back, and the edge V-shaped for movement. The dge has a layer of epoxy/flox scraped across it to the skins and there's a plywood insert for the horn.



93. The wing servo bay is nice and deep. A liteply base and plywood blocks are epoxied in. The servo is screwed to the blocks and easily replaced.

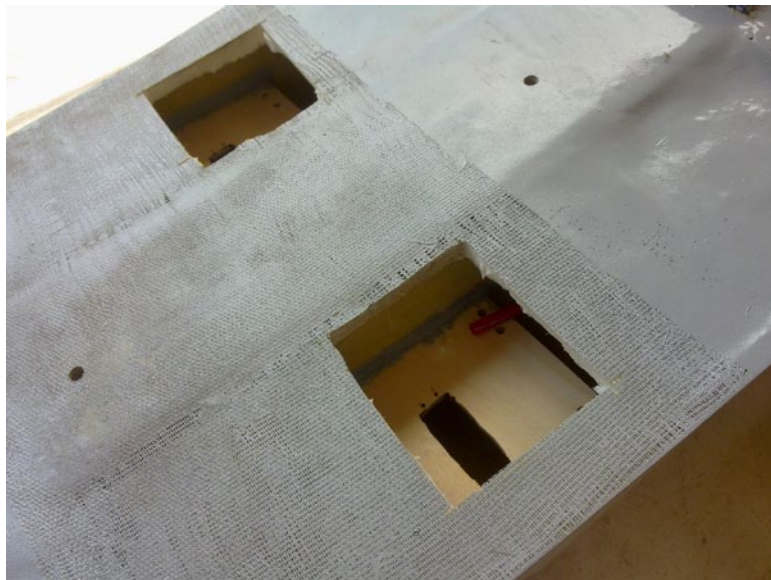


94. Control surfaces use a silicone hinge.

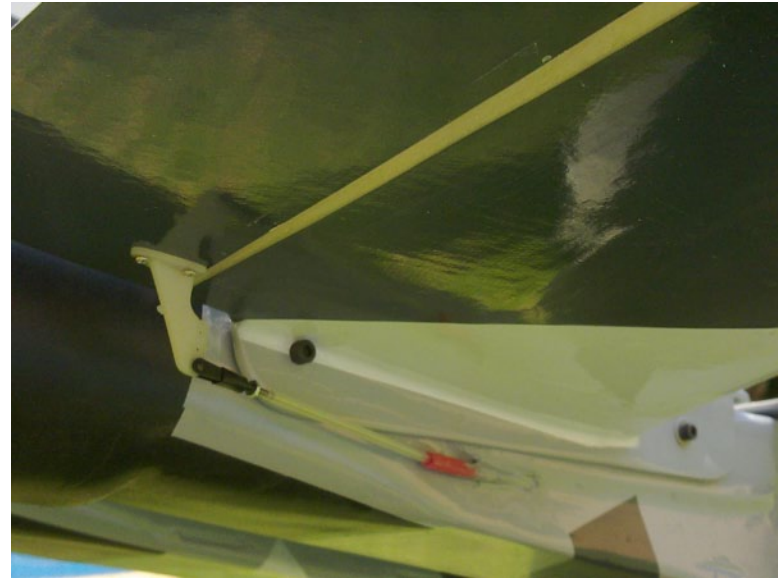




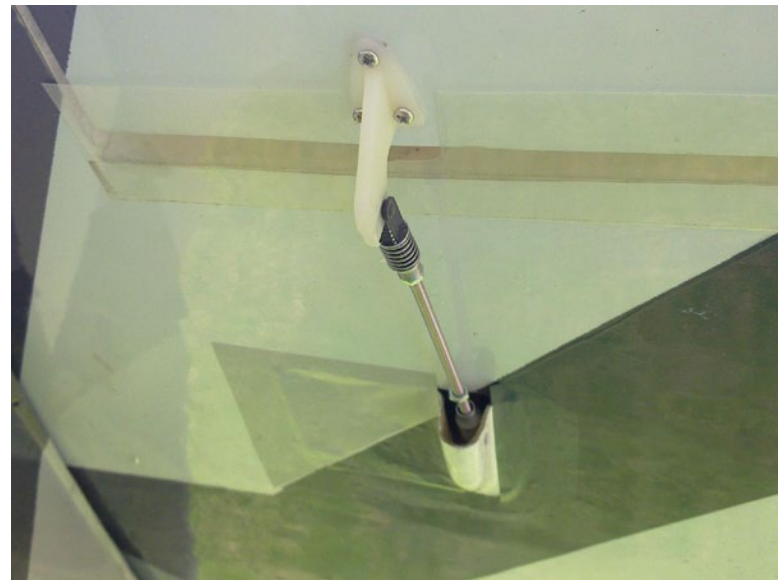
95. A hole is cut through to the fuselage tunnel. Masked spar position now clearly visible. Round hole is the top skin.



96. The foam cut through on the fuselage under the wing. Plywood pieces are for elevator servos.



97. The snakes in place, touch up paint later. Exposed section of yellow pushrod has stiffening wire inside. Huge elevators.



98. Wing servos use 4-40 metal connectors and steel rod. Servo cover held in place with matching vinyl.





99. Some smaller features and markings.



101. Front view.



100. The red stars look good and there is plenty of elevator surface.



102. Looks good from all angles.









Piet Rheeders

So early in November we got up real early and headed off on the three hour drive down to Volksrust in the Drakensberg mountains.

About 15 pilots had entered this PSS social event and wind predictions looked good for Saturday, with gusts up to 40 km/hr on the better northwestern slope.

A stop in Standerton at the Wimpy for a nice farmhouse breakfast and coffee and another hour saw us pull up on top of the hill. 10:00 exactly.

A couple of even earlier starters were already testing the air with foamy flying wings and the wind was already strong. A walk around and greet, especially the guys who had driven up from the coast, from Durban; they'd come 4.5 hours to get there.

Slowly the planes were assembled and the Su-35 started attracting attention as no one had any idea I had built it.

A welcome and pilots briefing done and flying got underway.

I know the theme was PSS, but being a casual affair I decided to check out the air with my 3m ASW 27. The lift was awesome, but the rotor was awesomer and I snapped the fuselage in the downdraft landing. Not a good start.

At about 14:00 hrs most guys had had at least a couple of flights, and the sky was not too busy,. The wind had dropped slightly and was cycling with some big thermals coming through.

Time to maiden the Su-35. Batteries topped up and controls checked again.

The whole event kind of stopped as camera wielding slopies followed Norbert and me down to the steep part of the slope with the lip.

Lots of discussion followed, Norbert held the plane into the wind, I asked him "Does it feel like it will fly?" (He is a very experienced pilot on the slope.), "I don't know, we will have to chuck it..." Not a helpful answer. Between us we decided to go full 100 percent rates — if I needed control authority, scrambling to find switches could be costly.

"When you are ready throw..." and he did.

Initially it wobbled slightly left as in the smoke picture, three seconds into the flight, then slightly right and then started a build up of speed and it smoothed out and climbed up into the lift.

It's tense when you are maidenizing something unknown. I almost always pick





Piet Rheeders









Photos by Piet Rheeders





Piet Rheeders

a time when most people have already flown, often this window of opportunity is at lunch time or thereabouts.

In the case of the Su-35 only one pilot was in the air and he landed soon after he realised I was flying. He is an experienced competition pilot.

Two clicks of down initially and these taken back out again once on the step, I did fly with the nose slightly down, so that the glider was always keeping its speed up.

I was absolutely on edge during the flight. A couple of people around me asked how it was going. I just nodded and smiled. My mouth was so dry I didn't want to try talking. I become extremely focused almost with tunnel vision and thought at these moments... just how it is with that adreneline rush stuff.

As the glider settled down I relaxed a little, but not much, as if the lift died I was mostly at horizon height, not enough to go around and land.

It tracks straight and really grooves in the turns. Obviously keeping the speed up, it responds to passing thermals and balloons up nicely in the lift.

No tip stalls and a smooth stall which is flat at the top. It starts flying again fairly quickly as the speed comes back on.

Something I noticed or rather didn't notice is any sound. Granted, the wind was pumping, but it is very quiet with no





Piet Rheeders



whistle like my two scale ships I flew the same day.

Overall it's an incredibly smooth and easy machine to fly, not anything at all like I expected.

I don't do build threads for what people say, I do them because one of my school teachers once said the best way to learn is to teach; because if your student asks a question and you don't know the answer, you have to go find out.

Another reason I did this thread is that a lot of builders go fanatical with lift and drag polars, graphs, airfoil selection, and complex maths about predicted performance, etc.

While I understand some of this, it is often discouraging newcomers from trying stuff because they believe if it is not complicated it won't work.

I am all for thinking outside the box (or Coke bottle) and keeping things basic and simple, and surprisingly getting reasonable results. My last 30 or so gliders have all flown, some better than others.

So why do build threads? That's simple. To encourage others to at least give it a try, if it flies you will feel very rewarded.

My greatest reward is seeing that creation soar skywards.

### The vital statistics for the Su-35 as flown:

#### Dimensions

Span	1.7 mt
Wing Area	51 dm <sup>2</sup>
Wing Loading	117.57 g/dm <sup>2</sup>
Weight (AUW)	5996 g
Aspect Ratio	5.67
Average Chord	354.17 mm
MAC (Chord)	325 mm
MAC Distance	97.50 mm

#### Weights

Wing	1798 g
Fuselage	3006 g
Right Tail Group	453 g
Left Tail Group	476 g
Canopy/Pilot	263 g
Total	5996 g

The wing loading is huge. Even my big sailplanes are around 70gr/dm<sup>2</sup>. But the fuselage and the big tail surfaces, as well as the LERX (Leading Edge Root eXtensions), probably all have some lifting effect.







## Gordy's Travels

# TIMER? - CALLER? - INSTRUCTOR?

*“Give a sailplane pilot a thermal and he wins for today.*

*Teach a sailplane pilot to find his own and he can win often — on his own.”*

Gordy Stahl, GordySoar@aol.com

“Hey Gang - I attended the Tangerine contest, in Orlando FL, this year. We flew seeded man on man, with designated timers. The “forced” timer for you was the person two rows below you. Being without a buddy for the weekend, this was wonderful for me. Never a question who was timing for whom.”

The above was paraphrased from a thread in one of the soaring groups about scoring and timers. It's clearly a topic of interest because the thread continued in discussion, and a topic that is often discussed at contests. It inspired me to ramble on the topic some based on my observations during travels and my LSF Task journey.

The ultimate system would assign the top score pilots to the bottom score pilots,

and the reverse. One of the biggest factors in new pilots' and experienced contest pilots' personal growth is the “caller effect”; pilots become semi-puppets to their callers, relying on the “call” instead of their own intuition.

Chris Lee (newest LSF5) wrote an excellent article about the subject on the St. Louis Club website. In short, he was flying F3J at the Nats (already LSF5, and multi-contest winner). His timer/caller was USA F3J team member Rich Burnowski.

Here's the link and a copy of a comment I made after reading it:

<[http://www.mvsaclub.com/mvsa/Flying\\_Reports/Entries/2011/7/17\\_Nats\\_F3J.html](http://www.mvsaclub.com/mvsa/Flying_Reports/Entries/2011/7/17_Nats_F3J.html)>

“Up to LSF3, you need and you benefit from having a skilled pilot call air for you. But when you hit LSF4, it's time to make your own decisions and take your lumps. That's if you want to move to that next level.

“Chris learned one of the most valuable lessons about why the top guys are the top guys. Rich put him into great air, air that Rich would have had no trouble using (emphasis Rich). Chris is one of the country's best young thumbs, but like any game there's no short cut to the top. That air information didn't translate to Chris because Rich is at a different experience and skill level.



“If you are at LSF4 or 5, don’t let your best friend “help” you ever again, if for no other reason than because you want every flight to be “your” fault, not your friend’s.”

Because of Rich’s world class pilot status AND F3J experience, Chris found himself deferring to Rich’s “calls” instead of his own piloting, and this led to a frustrating experience.

It wasn’t due to “bad” information, but because Chris didn’t see what Rich saw. Chris had his brain locked into Rich’s information instead of the data his experience and every previous second of the flight would have provided him had he been reading the flight himself. Reading the flight himself would have led him into a completely different circumstance.

Often a pilot flying a flight based on the caller will get in a tight spot that he’d normally have no trouble correcting, but, because the flight was based on outside information, he’s not able to shift to his own abilities mid-flight.



Pilots who rely on callers are doomed to the calls of that flight’s caller. Pilots who rely on themselves earn their scores.

Look back... If you have won a contest and your timer was a skilled pilot/caller, was the win your win? Do you remember thanking your timer for some bit of information that made or saved a flight? Were the other pilots flying against you or your team?

Have you been flying Man on Man or team on team?

There is a time for “instruction” where a skilled caller/pilot should be ‘co-flying’ for a less experienced pilot, even during contests, but never in the last round.

There is never a time when an experienced pilot should accept anything more than the time and information about the other sailplanes, information that any person off the street would provide if asked.

I tried to be very careful during my LSF Tasks that my witnesses/timers were not skilled pilots or did not offer anything more than I asked. I had realized the “caller effect” early on in my contest soaring as I had witnessed “team” flying and its effects during my extensive soaring travels. In my opinion, no good came of it other than flying buddies spent yet another day flying with each other.

The result was a kind of incest that has led to the retarded or stunted growth of most pilots, and the continuation of the same pilots always excelling.

*Instructor/Timer (the author and Lee Atchinson)*

*The timer is a talented pilot and air caller, in this mode he is there to insure the safety of the model, provide the time for the pilot and offer air reading and piloting tips. The goal is not to have the Instructor help the pilot win a round, but instead to help the pilot improve his Tasks piloting and air reading skills.*



Pilots who gained from the “team” or were held back because of the lack of a “good” caller, and pilots who were only as good as the “timer” they ended up with for that flight, as opposed to pilots who learned by relying on their own study/practice/mistakes.

Give a pilot a thermal and he wins for today, teach a pilot to thermal and he has a chance to win often — on his own.

Look at the top two or three guys in our contest soaring history and you’ll find guys who for the most part didn’t have a partner around to time for them. They had to learn to be self sufficient. They had to learn the questions to ask of whom ever their timer was. Their scores wouldn’t be different if it were your mom timing for them, or your grandma.

Teaming is fun, and often necessary, but being aware of the pitfalls and the truth of its result in a contest is a personal decision. It’s not “cheating” in the context of contests, but it does cheat the pilot of the reward of his piloting.

Some clubs made it mandatory that a timer could only provide the time. The drawback was that it cheated the less skilled pilots of the instruction only

#### Timer and Instructor

*This is where a pilot has a timer that is not a talented pilot or air caller and wants some instruction or advice during the flight. The goal is the same as Instructor/Timer; not to help him win, but rather to use the contest flight to help him improve his piloting skills. The instructor has to be very careful so that he is not “co-piloting” the flight and affecting the outcome of the contest. If I am in this position and my pilot is in winning shape, I explain that I will only provide time during the last round. The flight must be his only.*



possible during a contest flight, as well as some of the social aspects of task soaring.

I have often told my less skilled pilots that as a timer/instructor I would help them fly until the last round, then it was going to only be the time. The result was always a very nervous last flight - because they hadn't had to rely on their own learned skills in the flights before. It was one way that I could insure that I didn't help a non-deserving pilot beat the

other pilots who hadn't had the benefit of a skilled timer/caller.

Teams are not "bad." In the case of husband/wife, for instance, it allows a couple to share the hobby experience. But we should be aware of the cost/ effect to our piloting skills and the contest results.

Most of us have benefited from the instructions of a great caller, but as Chris Lee found it's a double edged sword.

Without the help of a skilled instructor, we are somewhat doomed to repeat our mistakes. Without the help of a skilled caller during a contest flight you end up with the score you earn.

In the beginning it's often a short flight and a low landing score, but its a flight you can build on.

Again, there is nothing "wrong" with having help, but, kept in context, it can also not be "right."

*The Timer (the author and John Lutke)*  
*While a very talented competition pilot can be the timer, he only provides time and information asked for by the pilot. He should not be co-piloting the flight.*

*The Timer/Caller (Co-Piloting)*  
*This is too often the case. Pilots flying as "teams." A piloting team is when two good pilots fly the flight, with both reading air and the Timer offering detailed piloting instructions in order to improve the pilot's flight score. Many pilots have accepted trophies when in fact it should have been given to the pilot and his caller "co-pilot." This situation has been unfair to the other pilots who didn't have the help of a second set of talented eyes and experiences to provide an edge. It's legal, however, and so "okay." Most don't even realize that they did it, or benefited from it.*







# WINDSONG *Electric* CONVERSION

Scott Campbell, [misc@stny.rr.com](mailto:misc@stny.rr.com)

As my old body (51 years young) couldn't take dealing with winches anymore, I converted my fleet over to electric.

I will say it really hurt to cut the noses off – but when I looked at what I had flown the last five years, they were all electric.

While one could argue that using a winch is “electric,” it is not the same.

I used to spend an extra 15 minutes loading the winch, 15 minutes unloading the winch, setting it up, etc., when I flew the gliders. At end of day another 15-20 minutes tearing it down, checking for frays and putting it back in the car. Let's not forget the line snags, snaps, drum jams, etc that take even more precious time while launching. These are the reason I stopped flying pure sailplanes.

Did I tell you I actually fly converted sailplanes so much more now that I don't have to fiddle with winches or winch lines or knotted drums?

I consider it like a hybrid car - the deep cycle battery and winch motor on the ground is replaced by a motor/battery that generally replaces all the nose weight/lead!

Many of my planes have “sat” in the cellar for years as I was just pressed for time and did not want to bother with the winch. Now I spend time flying (or talking) rather than winch prep.

## The Plane and Some Numbers

I use Motocalc (and love it) to analyze (predict) plane performance. Motocalc shows climbs of 1600 feet per minute for the Windsong and it is quite rapid and far more than necessary to get up to starting altitude.

I have not verified it, but it has to be pretty close to the prediction (pretty much vertical climb and rockets up there and can make the wings flex at the climb speed). I also get a pretty good motor run – I am now designing for about 2+ minutes in my planes.

Stop and think about that - 20 seconds of motor gets you higher than any winch I used to use - and no matter how I set up the winch, I was always launching downwind.

In case you can't tell - I am highly enthusiastic about my conversions... Legend, Sagitta, Gentle lady, Viking Mk2 and my own version of a Bubble Dancer I call Lead Dancer is hopefully going to fly next year.

On the next page is a spreadsheet with the parameters after modification - you can see how much electric hurt the plane! A total of 1.53 oz increase! All the parts are listed here.

## General Motor Comments

The motors I use are a whopping \$16.24 plus shipping and they are available

through US sellers on eBay for \$23 including shipping. (Shipping took 4 days from day of purchase.)

I had to widen the nose of my Sagitta to fit this one, but the 99" Sagitta is a very narrow bird. I fit the same motor into my 112" Legend and 134" Windsong with no issues.

I typically swap the orientation of the motor around, but that's up to you. It requires driving shaft through motor with a vise (don't pound) and removal of the C-clips but replacement with a wheel collar. If you are not familiar with the process get local help or use stock mount if fuselage is wide enough.

On my Windsong, I did not change the orientation as seen by the photo. The motor mount is actually on the front lip of the fuselage.

## Motor Selection

There is a reason I recommend the 35-48 800KV outrunner motor with 14x8 (or 7) prop... Here is why. You can run 3 or 4-cell depending upon your vertical climb desire and I like BIG props that swing at low RPM for less noise. I have this in my 99" Sagitta with 3-cell and it climbs at about 1100 fpm (~30A) with a 14x8 on 1300 mAh packs, 1900 fpm vertical 90 degree climb with 4-cell.

By the way, the real maker of this motor is “EMP” and it is sold under a TON of names. They are available with 4 mm and



## Windsong electric conversion

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	Glider		Electric			oz/ft <sup>2</sup>
	oz	gr	gr	oz	lb	
Fuselage Weight (no battery, stab, cover)	45.00	1275.75	1319.00	46.53	2.91	
Battery (500 mAh 4-cell nicad for baseline)	100.00	269.00	9.49	0.59		
			switched to	2200mAh		
Wing Weight (est)	30.00	850.50	850.50	30.00	1.88	
Total Weight	75.00	2126.25	2169.50	76.53	4.78	10.25
Delta between glider and electric			43.3	1.53	0.10	

Fuse lightly painted Krylon white

### Installed components

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Motor	TR35-48C-800 motor
ESC	Hobbywing 60A 3A switching BEC speed controller
Battery	2200mAh 4-cell or 4000mAh 4-cell
14x8 Prop now installed	Draws 51A on 4-cell
Wing Area	1075 in <sup>2</sup>
Spinner 45mm	
<hr/>	
Duration of Motor Run	
Max Amp	51A (peak), 45A (Motocalc predicted vertical climb at 44 A)
Voltage	16.8V
Power in	856.8 Watt
Battery	2200mAh
Duration	2.6 Minutes



Front end of the converted Windsong.

5 mm shafts. I only have experience with 4 mm shafts, I standardized on that one. 5 mm might be better?

One thing I can say is that when taking them apart, check that the windings are tight. I used CA glue to stabilize them. Some of the new Turnigy motors seem to have no issues and have reportedly tighter windings – which is a good thing. A note on Motocalc – it is a very good product and is mostly limited by the accuracy of the data it is given.

Real world tolerances will drive some variation – so no matter what you choose, you MUST measure the installed current to ensure you are within specifications of the components you are using. You don't want to fry a battery or ESC in the air!

I have purchased from both of the following places and in fact I have five of these motors.



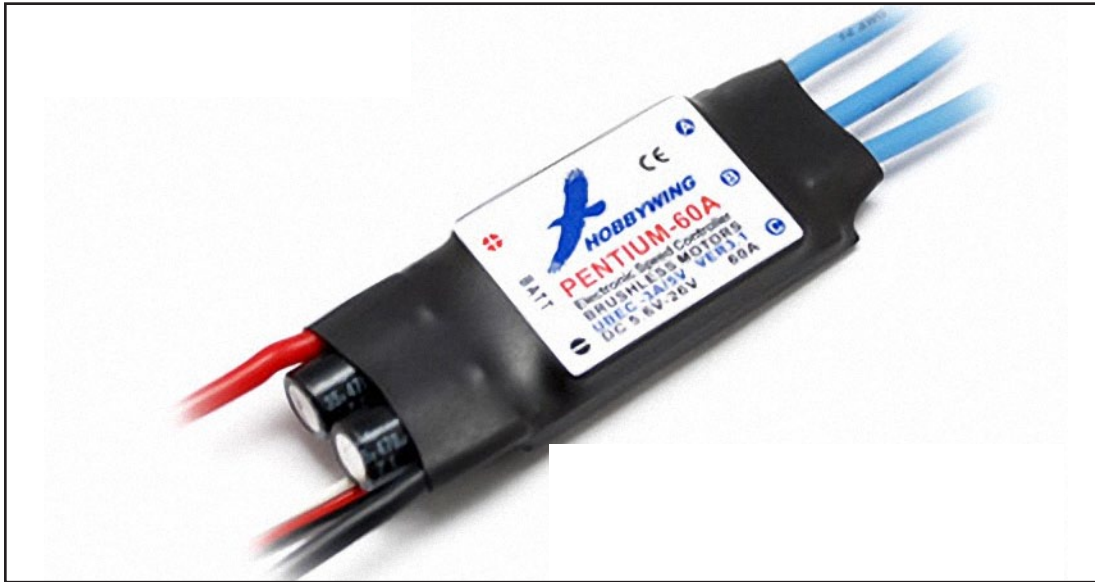
<<http://www.leaderhobby.com/product.asp?ID=9394001224136>>

Motor Source(s):

Leaders Hobby  
<<http://www.leaderhobby.com/product.asp?ID=9394001224136>>

or HobbyKing, but they don't typically have them in stock  
<<http://www.hobbyking.com/hobbyking/s...dProduct=18236>>





<<http://www.targethobby.com/hobbywing-pentium-60a-electronic-speed-controller-p-4162001.html>>



<[http://www.hobbyking.com/hobbyking/store/uh\\_viewItem.asp?idProduct=5565](http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=5565)>

### Speed Controller with BEC

Get a 60A (or 40A if you are so inclined and depending on your prop selection) Hobbywing controller. It has a 3A Switching BEC. I use them and swear by them.

The 60A, while quite heavy, can handle sustained current at that level. My unit peaks at 51A on full charge. Both the Hobbywing 40A and 60A have 3A switching, as opposed to linear regulator, 5V Battery Eliminator Circuits which are awesome.

A linear regulator HAS to convert Lipo voltage to the 5V level through the generation of heat – not a great way to do it but it has worked for years. Just don't try to use 4-cell with a linear BEC. The higher the pack voltage, the more heat it has to dissipate! For this reason I strongly suggest using an ESC with a switching BEC, Battery Elimination Circuit, for your receiver and servos.

By the way, I suspect that some of the Hobbywing units I purchased over the past year are actually “clones” of a Hobbywing. The unit works fine but the prices are just so much lower, they must

be fake so be forewarned and use your judgment.

Of further note, there appears to be two real Electronic Speed Controller manufacturers in China – Hobbywing is one, ZTW is the other. Here is a link for your reading pleasure:

<<http://www.rcgroups.com/forums/showthread.php?t=1333719&highlight=hobbywing>>.

There a lot of places to buy ESC's. Read the above and you will find that there are many good choices. Like I said, I have had good luck with those that have

switching BEC's for sailplane applications with up to six servos. What I can say is that I have not tested them in a full crowd dive to see if it causes the BEC to overheat. I don't fly my planes that hard.

My latest source is the following - mine came with the HobbyWing certification label on the bag - but use your own judgment as I have not flown these yet:

<<http://www.hobbypartz.com/07e06-proton-60a.html>>

theory, handle 39A (1.3A \* 30C), a 40C battery can handle (1.3A \* 40) or 51A. A 2200 mAh 30C can handle 66 Amps, 2200 mAh 40C – 88Amps and so forth.

Use the battery size to offset any lead in the nose and make sure the C rating is more than adequate NO MATTER WHAT.

I assume manufacturers are optimistic and ensure that I over specify the ratings on what I use.

I am now back to 2200 mAh for most of my 3 meter planes and will use the 4000 mAh in powered planes if that even makes any sense these days. Let's say Edge 540 50" with same motor, by the way.

### Spinner Selection

Spinner and prop selection I found to be very confusing at first, so hopefully this will help those starting out.

## **My 3 meter sailplanes use 2200 mAh or larger batteries, good for over two minutes of power... a lot of run time when you climb at 1500+ fpm.**

### Battery Selection

Select a 3 or 4-cell battery. I really suggest going 40C, as it will pull more current better and have less chance of heating up, for smaller batteries, like 2200 or less. The internal resistance appears to be much lower in these higher C batteries – a good thing.

For those not familiar with Lipo C rating, a 1300 mAh 30C battery can, in

All of my 3 meter sailplanes use 2200 mAh or larger which is good for over two minutes of motor at the currents I run at, which is a lot of run time when you climb at 1500+ fpm. I will say that I went from 2200 mAh 3-cell to 4000 mAh 4-cell and that 4000 mAh was just way too much battery to carry around and you generally don't need that much motor run time; so now I bring two batteries to the field.

I use spinners that clamp on to the shaft via a split collet clamping mechanism. Make sure you wipe any oil off the shaft prior to installation. I have yet to find any, but you want it clean for a good fit. Tighten the fitting very tight. And what ever you do, don't stand in front of the spinner or even to the sides of the spinner/blades until you are VERY confident that all is working appropriately.





The Aeronaut 14x8 prop I use. <<http://www.espritmodel.com/aeronaut-cam-folding-propellers-rudi-freudenthaler.aspx>>

I have never had to balance ANY of the parts I use, but others may feel the need. I have had spinners come off at the field – let me tell you, it is exciting. You don't want it happening in say a closed room. Do it outside and point it away from you. These motors are putting out serious power. The blades take all that power and they are pulling with 3- 5 lbs of force depending on your selection of battery, motor, and prop.

You can get the spinner at Hobby King (or Value Hobby, it's faster to the US).

There are the 38 mm spinners with an opening for air or others. Measure the width of your plane's nose to see how it will fit when you cut the nose off.

Some of the motors are 4 mm shaft, some are 5 mm. As I said before, I have standardized on the 4 mm. Make sure you get the right one for whatever motor you choose.

The Windsong as I modified it took a 45 mm spinner. The ones I provide links to are decent quality and have positive retention on the blades using a bolt/nut.

Some of the spinners you find, especially the ones that come with props attached, are simply crap and won't handle this much power, which means you may not only get hurt, but also lose your plane.

Many of these come with two washers. I typically use one of the washers as I want plenty of threads through that nut. I also Loctite mine once I am comfortable I have the right prop.

<[http://www.hobbyking.com/hobbyking/store/uh\\_viewItem.asp?idProduct=5565](http://www.hobbyking.com/hobbyking/store/uh_viewItem.asp?idProduct=5565)>

Here is the Value Hobby (a US supplier and the SAME part – at least when I received mine) link:

<<http://www.valuehobby.com/accessories-1/spinners-prop-adapters/30-2mm-rc-spinner-folding-prop-9.html>>

## Prop Selection

Here is the prop I use... I should mention there is a LOT of confusion - maybe it was just me, but sure seemed like Greek - of what size props go in what size spinners. The sellers don't usually give you all the dimensions such as blade shoulder size (where the blade attaches to the spinner).

The standard I stick with is an 8 mm shoulder. Graupner makes 4 mm, 5 mm, 6 mm and 8 mm shoulder blades and these work if you get the "right" ones. This variability really sucks in my opinion, but I stick with what I know.

The Aeronauts all are 8 mm shoulder which eliminates one more variable. Note – the prop should be able to flop back and forth so be careful when tightening the hardware you see in the spinner picture.

Again, I Locktite mine once I am happy. You also may need to either sand the prop at the shoulder (slightly and keep square) or open the “tabs” on the spinner slightly.

Here is the Aeronaut 14x8 prop I use:

<<http://www.espritmodel.com/aeronaut-cam-folding-propellers-rudi-freudenthaler.aspx>>

One last thought...

In addition to the fact I am too old to bother with a winch, I was having difficulty seeing my planes – well mostly the 99" Sagitta due to its small size. So I recovered it with Ultracote transparent fluorescent red AND yellow.

I have NO issue flying this plane over 1000 feet, on a sunny day of course, and my eyes are pretty bad - I can only see out of one eye at a time and have -10 diopter lens correction – i.e.; thick.

The above is an unedited picture (actually I did remove people’s faces) – this covering literally glows when the Sun hits it. The other plane is a 3M scooter covered in the same material (red only)!



*The above is an unedited picture (actually I did remove people’s faces) – this covering literally glows when the Sun hits it. The other plane is a 3M scooter covered in the same material (red only)! My Windsong is getting the solid fluorescent red version. The inner part of of wing near the fuselage will be white. I can’t wait to see how this works.*

My Windsong is getting the solid fluorescent red version. The inner part of of wing near the fuselage will be white. I can’t wait to see how this works for my limited vision.

Oh yes, I have converted to 2.4 GHz and for the past year have used Fly Dream. It worked fine but has some range limitations when flying electric.

Now I am using FrSky with telemetry. The transmitter is a FlySky 9x with Eraz software, but that is another story....

P.S.: My sailplane harem has been converted to electric. The first one really hurt cutting off that beautiful nose - but I am too old to fool with winch or highstart.

The important thing is these planes now fly on a regular basis.

More importantly, flying time truly is flying time!





Joe Nave's Zenith 3.7 on landing approach after a nice flight over Kapaa Quarry Road model field in Kailua (Honolulu), Hawaii. Photo by Fred Olsen. Stitched, overlapped panoramic photo using a Sony SLT-A55V, f/4.5, 1/1,250 sec., 26mm





# MČR F3B - Mladá Boleslav 2011

## *photo album*

Martin Pilný, pina1971@gmail.com

Last Saturday I dusted off my Nikon and after a year break went to take pictures of F3B at Mladá Boleslav, where Pavel Marek held a slick championship.

When I learned about this year's Championship F3B at the airport at Mlada Boleslav, there was me going to see how F3B has changed since my last photo shoot.

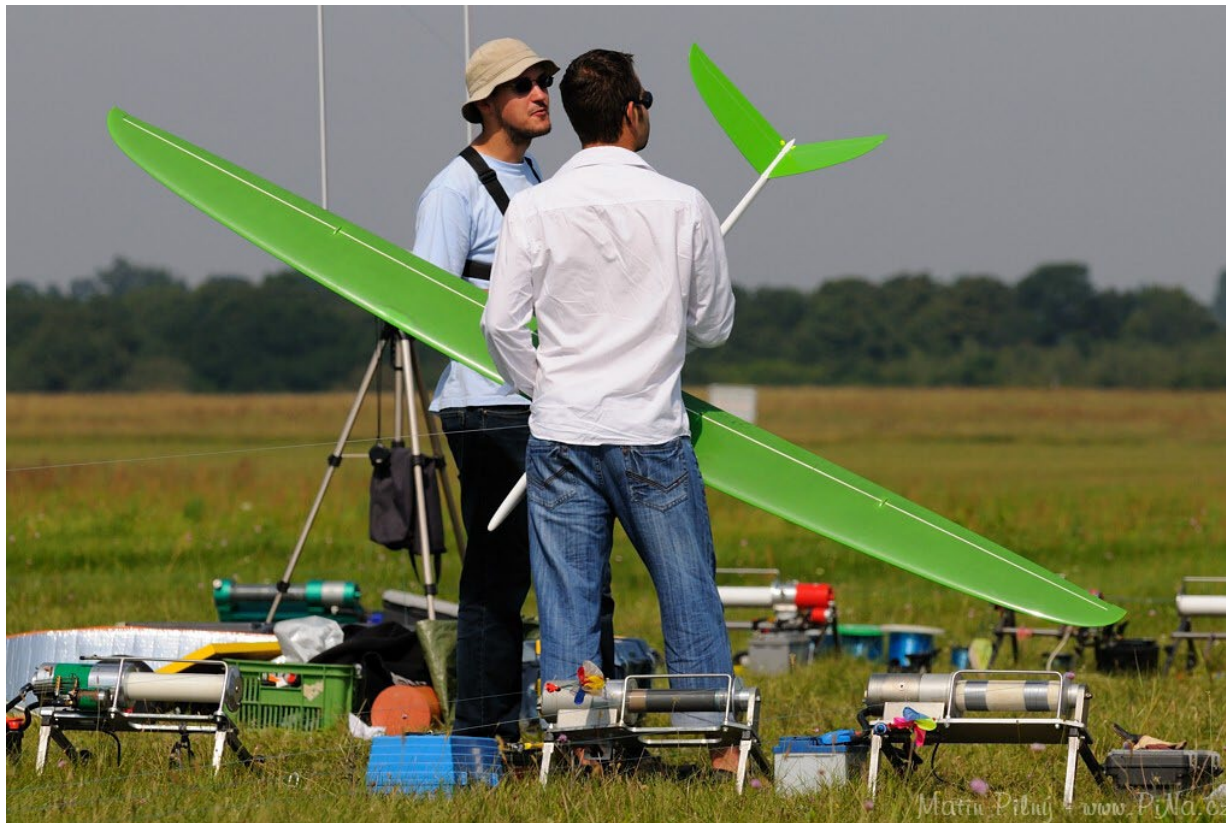
The aircraft still lack engines and fly three tasks. With a few exceptions, pilots are still the same and when viewed from the outside it is still the same environment.

Surprise, of course, took place.

Usually at F3B competitions I fill both 8GB memory cards to the brim, but this time it simply was not possible. When I returned to Prague in the afternoon, more than half the space was left on the first memory card.

Even so, I think that the category F3B is still one of the most rewarding photographically. The interesting moments abound. You only need to look carefully around to find them.

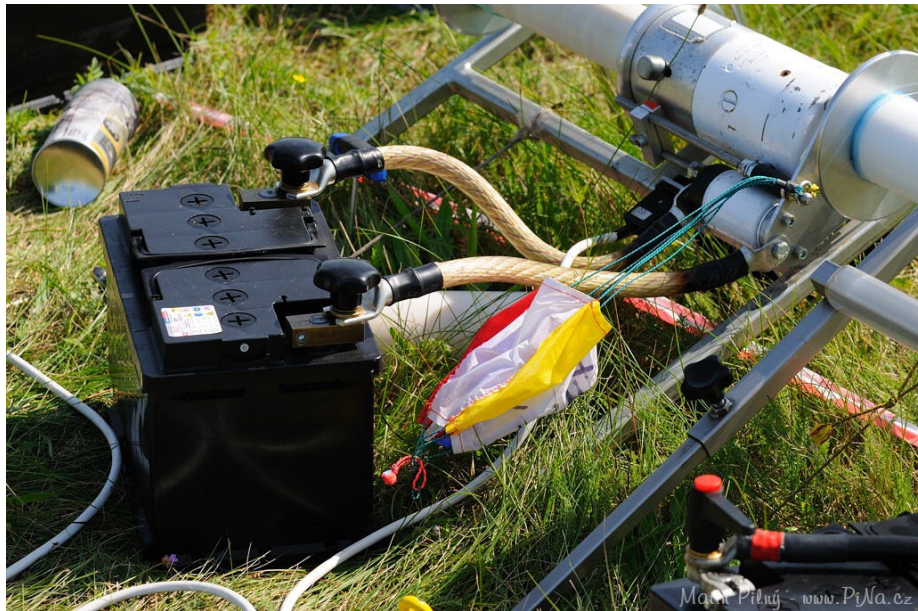
I usually put captured photos through Nikon Capture NX2, and other software to enhance images and generate a photo gallery. On some of these images, there was not time for special treatment.































Matin Pilný - www.PiNa.cz



Matin Pilný - www.PiNa.cz





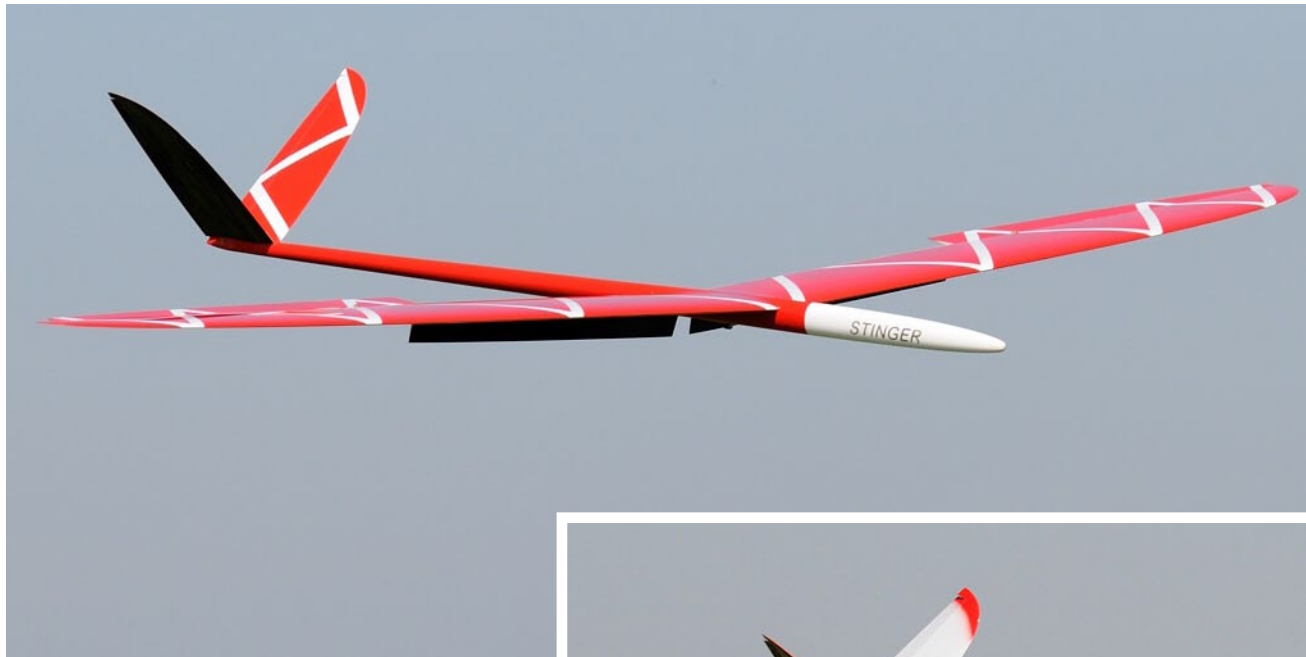








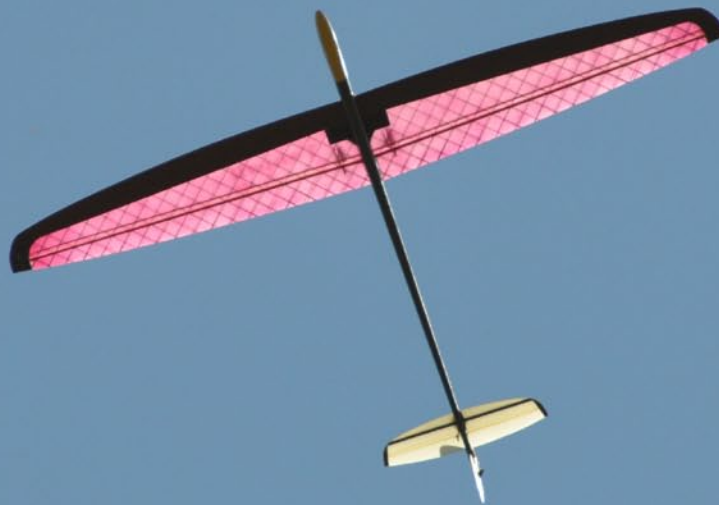






# Southern Fling 2011

## *New Zealand DLG Contest*



by Dave Griffin, Scott Chisholm and John Shaw  
with photos by Kevin Botherway, Dave Griffin, Shane Kennington, and Paul Taylor

The weekend of November 4th, 5th, and 6th saw the very first “Southern Fling” Discuss Launched Glider (F3K) contest taking place at the Christchurch Model Aero Club field at the Willows near Christchurch in the South Island of New Zealand. Christchurch has featured a lot in world news over the last 18 months following a devastating string of earthquakes.

Our world is settling down now, fortunately - although we did treat our guests to one loud and rocking earthquake during the weekend. It was nice to have this event to look forward to enjoy after the emotional strain of the quakes and their toll, damage to homes and recovery mode. Something different!

The Southern Fling is the biggest glider competition flown for many years in New Zealand. Twenty-seven fliers came from all over New Zealand and Australia. It was particularly good to see the Australians make the trip over and we hope they and others will come again.

An amazing two plus days of flying, friendship and hospitality was enjoyed by all, with excellent weather, pilots and minimal damage to models or pilots.

The past 18 months have seen a good growth in F3K in the South Island. Here in Christchurch we have seen our numbers go from 3-6 pilots up to 10-12 pilots at any local F3K session.



*Dave Pratleu, Peter France and Peter Williams. Paul Taylor photo*

*Title page photo: “Transparency,” by Paul Taylor*





*Above: Peter France launching his Blaster 3  
Paul Taylor photo*



*Right: Dave Pratleu launching. Paul Taylor photo*



For many the Southern Fling was their first attempt at an F3K competition. Models are now much more readily available, new and secondhand, helping beginners into their first hand launch and with a little help from more experienced pilots we're now seeing the benefits of a growing sport.

The event...

Friday's practice and training flying was cancelled due to a strong northwest wind blowing. Many made the most of the opportunity to try the local Dynamic Soaring sites on Christchurch's Port Hills.

The Southern Fling event was setup in two classes, Expert and Sportsman. The organising committee planned a low key relaxed approach with each task explained at the start of each round for the new guys and the experts timing and calling for the Sportsman classes to further aid their education.

Saturday morning saw the weather settle into the southwest at about 8 knots with some small lift patches coming through on a light breeze.

*Right: Dave Griffin and his Blaster constructed from the parts bin. Photo by Kevin Botherway*

*Far right, upper: Joe Wurts calling for Dave Griffin. Shane Kennington photo*

*Far right, lower: Lauren Nell with Joe Wurts calling. Dave Griffin photo*











Pilots found it a challenge as the breeze built through the day with the thermals moving faster and the tops being knocked off causing people to really push their boundaries.

Many people found themselves needing to carry maximum ballast to travel home from thermals chased down wind. In one round the wind won the battle with at least four pilots and their callers seen heading off downwind towards a pine forest to collect models that hadn't made it home. This made for a good sight as they reappeared out of the trees with their recovered models. Lucky none had serious damage and were all able to carry on with their day's flying.

The battle at the top was tight with Joe Wurts (F3K World Champion), Alex Hewson (new to DLG!) and Peter Williams (NZ F3K World Championship team member) heading the pack, closely followed by Kevin Botherway (NZ F3K World Championships team member), Scott Chisholm and Australian Jon Day. At the end of Day 1, seven rounds had been flown with one dropout.

Saturday night we had beer and pizzas at the Wigram Airbase ATC rooms and this was followed by Joe talking about the Kiwi F3K team's experience at the Worlds. He also gave lots of good hints and tips into the way thermals work and how to find them. This was great for the new guys to take onboard and to help grow the interest and knowledge levels.

Sunday dawned even better than Saturday's weather, with little to no wind for the best part of the day.

Launch height really became important in achieving a good flight score. If you didn't hook up, then you missed out.

It was great to see a lot of the Sportsman fliers achieving their times which tended to put a smile on their faces. This also



*Opposite page: "Blue on blue," photo by Paul Taylor*

*Right: Models and flyers. Kevin Botherway photo*

meant Sunday saw people moving up and down the score board quite a bit.

Peter Williams was on his game on Sunday putting some good scores in and moving up the score board.

Young new comer Alex Hewson flying his new Blaster 3 flew well all weekend just messing up the end of one flight, reaching to catch his model he touched it, missed the catch and it landed out of the box, which saw him drop points to other competitors and moving from second to fourth place. Alex showed he can sure launch his model well, he will be one to watch for the future of New Zealand soaring.

In the Expert class, Joe lead the way all weekend, as you would expect of the current World Champion, and in the process showed the newcomers how it is done. Peter Williams was second and Jon Day (Australia) third.

It was great to see Ashley Glubb, 70 plus in age take out the sportsman class flying a Blaster 2 and Taboo GT. Ashley proved age isn't a barrier. When he gets his new toys together he will be a real contender next year in Expert. There will be no more claims for old age handicaps now with that result, young man! Second

*Blaster 3. Paul Taylor photo*







*Right upper: Peter France and John Atkinson discuss the scores. Paul Taylor photo*

*Right below: "Rowdy," AKA Kevin Botherway, carries his toys back to the pits. Dave Griffin photo*



place went to Aneil Patel and Sean McCurry was third.

Models flown included, Stobel 2's & 3's, Salpeters, Concepts, Blaster 1, 2 & 3's, Vipers, Taboo GT, Mini Top Skies, and a few home designed models. Dave Pratley of Australia's "Daves Toys for Boys" came over with a few spare models which were snapped up leaving Dave to travel home light.

The future for F3K in New Zealand is looking great. The southern region appears to be leading the way with many new pilots on the scene. New Zealand is seeing some good young talent coming through with the likes of Conrad Klintworth, Sharn Davies and Alex Hewson, all launching high and flying well.

Our huge thanks go out to the event sponsors, JR International, Airsail, Daves Toys for Boys, Canterbury Sailplanes and Top Sky for offering up an awesome range of prizes. The prize table was full of some great products that were really appreciated by the competitors. JR were very kind to gift their latest XG8 transmitter. This was drawn in a lucky dip by Joe, the lucky winner was Aneil Patel from Auckland.

At the end of the competition on Sunday, people were treated to some aero towing by father and son team Alex and Peter Hewson. Joe took the time to fly people's models and give informal thermal lessons, which was appreciated by all.



*Above: Joe Wurts' Saturday evening presentation.  
Dave Griffin photo*

We look forward to hosting this event in Christchurch again next year (tentative date is 2nd, 3rd & 4th November 2012), as John, Scott and Dave plan to make it even bigger and better.







*Shane Kennington photo*

Lastly, thanks to everyone who helped out, from cooking the BBQ (Dale, good job!), to all the pilots, time keepers and helpers. At the end of the day, we were all winners because of the great people, great advice and sportsmanship. May thermals be with you and we'll see you all again in 2012.

*Right: Prize winners John Atkinson, Sean McCurry, and Lauren Nell.  
Shane Kennington photo*

*Below: Sean McCurry launching. Shane Kennington photo*







*Blaster 3 in flight. Paul Taylor photo*







*Launch time! Paul Taylor photo*





# R/C SOARING





# in the Appalachian Mountains near Cumberland, Maryland

Text by Jim Dolly, admin@highpoint-aviation.org

*with photos from the Cumberland Aerotow 2011*

by Dave Garwood, dgarwood518@gmail.com

The west facing field atop Knobley Mountain, about three miles south of Cumberland, MD in Short Gap West Virginia has been the site of R/C soaring for forty-five years.

Back in the fall of 1967, Maynard Hill and a group of soaring enthusiasts from the DCRC Club joined with members of the Cumberland Aircraft Model Society (CAMS) and made the trek to the top of Knobley for an altitude record attempt by Maynard. Although he did not achieve his goal, all agreed that the adventure was worth repeating, so plans were made to return the following fall.

And so, the Cumberland Soar for Fun began in 1967 and has continued as an annual event every year now for forty-five consecutive years!

*View of the HighPoint flying field looking southwest. Aircraft in the picture are a 2.64m AMR Trainer 50 tow plane and a 4.5 m TopModel Discus 2c sailplane.*



*Jim Dolly (Cumberland, MD) with his 3.37m TopModel Pilatus PC-6 Porter tow plane.*









*Above: Tom Pack's (Mechanicsville, VA) ASH-26 on tow at the Cumberland Fall Aerotow Event*

*Opposite page: Jim Dolly (Cumberland, MD) on landing approach with 3.37m TopModel Pilatus PC-6 Porter tow plane.*



*Tom Pack  
(Mechanicsville, VA)  
makes a perfect  
approach to landing  
with his 4m Multiplex  
ASH-26. The plane is  
over 15 years old and  
still flying strong!*



Jim Dolly was seventeen when he joined with his fellow CAMS members to witness that first event atop Knobley. He was so taken with the view that he made the promise to himself that if it were ever possible, he would buy the property.

That dream came true in 1992, and he has continued to make the field available for the Soar for Fun event. Jim has attended all but three of the annual events, missing only those that occurred while he was away at college.

Being a full-scale and R/C pilot since 1966, and growing up in Cumberland watching the activity of the Cumberland Soaring Group <<http://www.cumberlandsoaring.org>>, Jim always had a desire to try R/C aerotowing.

Scale and R/C were difficult partners back in the day and the best he ever did was to tow several of the open class rudder/elevator polyhedral winged sailplane designs of the time with a Sr. Telemaster powered by a 2-stroke .60 size glow engine.





*Alex Breirkreutz (Mount Joy, PA) holding Gotz Unger's (E. Greenville, PA) 5.3m ASW-22.*



*Butch Browning starts the DA-85 engine as Jim Dolly holds his 3.37m TopModel Pilatus PC-6 Porter tow plane.*

This was copied from the trailblazing work by Dick Miller, Bob Riggs and several other CAMS members. See page 12: <<http://www.rcsoaringdigest.com/pdfs/RCSD-1986/RCSD-1986-06.pdf>>.

Over the years, various attempts were made to try aerotowing at the Soar for Fun with mixed results. There was enough success to keep pressing forward, but not the kind of all out embrace of giant scale aerotowing like what was emerging on the west coast.

By the 1990's, Dick Miller had moved to Hollister California and was having considerable success. Jim still has video that Dick sent him in the early 1990's.

Around 2007, Alex Breirkreutz came to Cumberland for the Soar for Fun. He had an amazing flight on a semi-scale sailplane and was hooked on the big sky lift at the Cumberland event. The following year, he brought an electric powered Sr. Telemaster that he had set up as a tow plane.

Several of his fellow soaring partners from the Lancaster Area Soaring Society (LASS) group had become fairly proficient at









*Above: Bob Krutz's (Leola, PA) TopModel 4.5m Discus 2c on tow.*

*Left: Dave Darr's (Uniontown, PA) 4.5m TopModel Ventus 2cx sailplane on tow behind Jim Dolly's (Cumberland, MD) 3.37m TopModel Pilatus PC-6 Porter tow plane.*



*Butch Browning (Fort Ashby, WV)*

aerotowing behind Alex's Telemaster tow plane. See page 35: <http://www.rcsoaringdigest.com/pdfs/RCSD-2009/RCSD-2009-04.pdf>.

Jim decided to revisit aerotowing and built a new Telemaster 40 tow plane and brought it to the 2009 Soar for Fun. As it turned out, three people brought sailplanes equipped with tow releases that were a good match for the Telemaster. Two Multiplex Easy Glider Pro models and one 2.5m scale ASW-28 model. Many, many successful tows were done over the next three days and Jim was totally hooked on aerotowing.

2009 also brought other big things (literally) to the Soar for Fun. Alex invited his friend Len Buffinton to the event and Len brought his trailer full of absolutely beautiful giant scale sailplanes and his 3.2m Pilatus PC-6 Porter tow plane.

Alex piloted the Porter for most of the event while Len handled the sailplanes. The two of them put on a first class "how to"

aerotow air show. It was obvious to all who witnessed the flying that R/C soaring and giant scale R/C soaring in particular had moved to a higher level. Soaring on the east coast would not be the same.

Jim decided that it was time to open the field on Knobley Mountain for additional events. To organize this and to open lines of communication with the loose confederation of Soar for Fun pilots, he started a website/forum at <http://www.highpoint-aviation.org> and named his field HighPoint Aviation Airfield after the name of the general area on this part of Knobley Mountain known as High Point Acres.

The first annual Spring Soar for Fun was held at HighPoint Aviation Airfield in March, 2010 and was repeated in March 2011.

With R/C aerotowing gaining momentum, Len Buffinton and a group of collaborators launched <http://www.rcaerotowing.com> at the Saturday evening banquet in Cumberland during the March 2011 Soar for Fun event. A core group within the local CAMS club started an aerotowing team and has been instructing newcomers to the sport.

At least two large gas tow planes are now in regular service at the HighPoint Aviation Airfield along with half a dozen or so smaller tow planes with both glow and electric power. With the availability of tow planes in the local club, the stable of towable sailplanes and giant scale sailplanes has grown exponentially in 2011.

The aerotowing contingent within the local CAMS group held several aerotowing clinics through the summer and fall with the most ambitious event running October 13-17, 2011, less than one month prior to the 45th Annual Cumberland Soar for Fun.

Dave Garwood made the trip to Cumberland for the October aerotow event at the HighPoint Aviation Airfield and has provided some wonderful photo documentation.





*Above: Tom Pack's (Mechanicsville, VA) 4m Multiplex ASH-26 in the clear blue sky over the HighPoint Aviation Airfield*



*Right: Dave Darr, Jim Dolly, Alex Breitreutz, and Joe Nelson look toward the planes in the sky as Bob Kurtz readies his 4.5m TopModel Discus 2c.*

## Setting out

The first ever QFI magazine I read contained a series of articles by Mark Passingham on rolling your own F3F model. I was totally enthralled but soon realised Mark's building was way out of my league.

The seed was sown and in 2010, after returning from the slope with the bits

This left the obvious question of just how was I going to turn the ideas in my mind's eye into a flying model. My original home brew was to have pressed foam wings and a glass fuselage.

I have an idea to mold a fuselage. CNC milling of aluminium negative molds is the current way to go with top of the range models; the molds themselves are a work of art but such techniques come

resin for stiffness. After being masked off, epoxy and fairing compound was applied liberally to the appropriate bits of the plugs and sanded to shape. In this way a more complete "plug" was produced before being polished up.

The wing was cut from foam using a series of CNC templates from Mike Francies. An almost forgotten RC guru, Mike supplies CNC cut template which

# WILLOW

# F3F

Ian Mason, [Ian.Mason@sbdinc.com](mailto:Ian.Mason@sbdinc.com)

of what used to be an expensive F3F model, I decided to take the plunge and produce my own. The aim — a good value, tough and fun model that would have me smiling on the way home from a day's soaring.

Despite years of flying, talking about and ultimately selling a few moldies as <[sloperacer.co.uk](http://sloperacer.co.uk)>, my knowledge of making them is by no means world class. What my experience has provided me with is a number of knowledgeable friends to provide encouragement and a pretty good idea of what I like an F3F model to look like.

with a healthy price tag. A more manual method would be needed for the Willow. I decided to make a series of positive "plugs" from which the final molds could be made.

The model in my mind's eye had a fuselage with a nose cone and a substantial servo tray. To mold this fuselage design three pieces would be needed; the main fuselage body (with wing and tail mounts), the inner nose cone and the outer nose.

Making each fuselage piece used a similar process of making a solid plug built up and finally glassed/soaked in

allow you to foam cut the perfect shapes of any size and any section. Mike's experience and helpfulness also means that even a novice will end up with what you want.

The section was finished and glassed by hand, the advantage of setting out to make a "plug" rather than a wing that will take to the air is that you are allowed to be less weight conscious. You do, however, need to be smooth and very happy with what you produce — there are going to be a few of them about!

I soon managed to come up with a combination of parts which individually







*Mike Francie's wing templates are an excellent way of making wings. You can see the fuselage parts with the same profile.*

seemed to be correct and when combined looked as an F3F model looks in my mind's eye.

Before I had chance to mess up the molding myself I was contacted by a friendly manufacturer who was looking for a new model design. The opportunity was too good to miss and so more in hope than expectation the plugs were packed off.

Although now this feels like a perfect combination of right person — right time,

back then with an unproven bag of bits it didn't feel quite so simple.

## A practical philosophy

What followed was over a year of questions, issues and ultimately solutions in order to produce what would become the Willow. With so many questions to solve, a project like this can go in any number of ways. Simple practical solutions were chosen throughout the process, focusing on producing a practical model, tough enough to take on

the harshest of UK slopes as well as F3F races.

The build process was not totally smooth. After flying the original model and realising I'd stumbled on a winner, it was clear the finish of the wing had to be improved to make it of commercial quality.

A carbon prototype wing was used as a second plug and the time spent getting this right was an object lesson in getting it right first time.

I know how critical performance is, but also practice, confidence, and slope side practicality.

At the front end, the inner nose needs fitting by the builder along with the plywood servo tray. It's an easy job to get your elbows in there and make sure your servos fit nicely. Once slotted together, the radio tray, main fuselage and inner nose combine to make a very tough front end with no carbon to shield 2.4 gig receivers. The ballast is in an easily accessible ballast tube rather than tucked away in the wings and joiners — less fashionable in F3x models but capable of carrying 1.5kg of lead and a whole lot easier to change on the slope.

The 2-piece highly tapered wings reflect the Willow's philosophy — the carbon spar can be seen stretching all the way to the wing tip resulting in a very stiff, strong wing. Having a fuselage-mounted ballast tube also meant that the wing





*Out of the box.*

joiner became a simple Willow solution, too — one solid chunk of carbon, strong and effective.

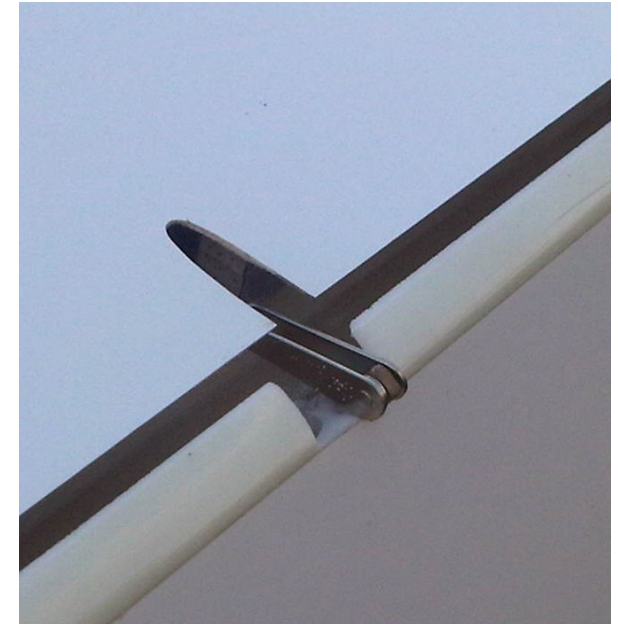
The wing section chosen does not require the latest expensive servos. I know that a model's servo choice can add £100 to £200 to a build. My prototype flew really well using just HS85's. The Willow's bottom hinged flaps and ailerons come with pre-fitted horns and boast both wood and carbon shear webs to ensure their stiffness and stop control fade at high speed. Gale force tested!

## The good bit

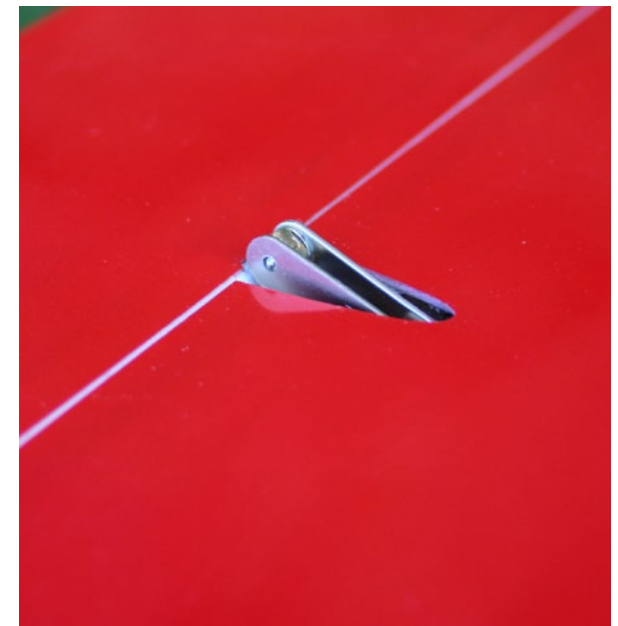
Maiden launches are always a nervy moment or two, but believe me, maidenizing your first prototype is something like going for an exam on Christmas day.

The back of the Wrecker, on the Saturday before a race, was the first opportunity if a daunting location. Just like every other time, the Willow's launch was a total anticlimax.

This is a predictable model. Those tapered tips and long boom mean she will fly right out of your hand in just about



*Above and below: Neat! Simple and effective horns come pre-fitted.*







*Plenty of room for servos in the wing.*



*A simple, strong fuselage with ballast tube.*

all conditions and eat up the sky. I didn't think about much whilst flying the Willow, except as I calmed down just how easy it was to "feel" and react to the air as well as put the nose down for some fun.

## Home flying

Thanks to my location on the south coast, a good proportion of my flying is over the sea, and launching a new model towards water does require a certain "confidence."

Perhaps my favorite site is a cliff just 25 m high which generates a focused lift band. Get the turns right to put your model in the compression and you can

really build the energy/speed. The Willow delivers here with ease and gives you the confidence to launch in some very marginal conditions.

In bigger air and on bigger slopes, the Willow really comes alive, just eating up the sky and it can be opened up into some huge vertical moves.

Having the confidence to put the Willow just where you want her on the slopes really helps when you decide to do some practise F3F runs. One of the Willow's strengths is the way it carries its energy through a turn, but more importantly it does it very easily. Up and over, bank

and yank, full reversal. Those stiff old wings have the Willow coming back at you just as fast as it was leaving.

## Second Maiden

I was having a ball with my one and only Willow. Building your own model and liking it is a great feeling. However, in producing a moldie I have put myself in a position where I had to hope that other people would like the way she flies, too. I decided to pass two of the early "Beta" kits over to a couple of modelling mates to see what they thought.

I think I was even more nervous to hear what they thought than I was opening







that first box or at that first launch. With no sign of rose tinted spectacles the feedback would be painfully honest.

I was delighted to hear it was broadly positive- almost anti climactic 'Just like my other F3F models'. The feedback gained from handing out those first models helped to produce the last few tweaks to the Willow.

Building went with very little comment from either pilot. With Adam Richardson completing his in double quick time the days of their maidens soon arrived. I took "Specked it out and tried to break it but I couldn't get those wings to bend" as a positive endorsement of the Willow's strength. I know that comparing one model and pilot combo to another is a dangerous game to play but "I was at least as fast as the Vikos" was good to hear.

What has become clear from discussing the different set-ups used by each pilot is just how differently you can set up the Willow and still be happy with the performance. Definitely a lesson in not sticking with set-up sheets too fervently!

### Summary

Well, I said I was biased when it came to the Willow. I feel that the aims of a tough competitive design have been achieved, but she looks stunning too!

With the Carbon D-box "Standard" model costing just over the £500 mark, we have shown that a model can be competitive on a budget.

Producing a model like the Willow is not a static process, there's an on-going round of development and tweaks.

Comparing the first models to the current one it's clear just how far it's come, but in a lot of small steps.

The process of clearly thinking and understanding what characteristics I like, how to achieve them and communicate this to my builder partner has been hugely rewarding.

Although a little different to the more traditional "roll your own" process it has captured many elements of the old home build process. Realising a long term ambition and having a physical outcome from it has me loving every flying session even more.

My aim from the start was to produce my own model. Much of the process and many of the methods used are equally applicable to making your own foam/composite model. It's different to making a "woodie" but not impossible.

If you have that itch I definitely recommend you have a go yourself.





