



Radi- C- ntr- lled
**Soaring
Digest**

December 2010

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Front cover: Strapped in at the front of a scale primary glider, this realistic pilot moved along with the stick and rudder pedals in unison with the control surface servos. Photo taken at the Cumberland Soar-for-Fun by Pete Carr. See Pete's article starting on page 18 for coverage of the event and more photos of this model.

Sony DSC-P73i, ISO 100, 1/125 sec., f/5.6

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The Swiss Moswey II participated in the Rhon World Competition 1937. Vincenzo Pedrielli relates the story of a 1:3 scale reproduction by Ruedi Straub and Lukas Schaub.

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A rapid-fire digital camera mounted on a tripod and a bit of software tinkering leads to some very impressive photo composites. By Joe Nave

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Leonidas Castello shows how to modify this well known ARF into a potent electric launch sailplane.

A Swept Wing Saga 38

Drawn by the elegance of the planform and its unque flying qualities, Paul Westrup relates his love affair with swept wings and his successful use of flaps on his 2 meter design.

MiG-7 PSS 47

Derived from the MiG-3, the MiG-7 has a larger wing and is an ideal candidate for engine powered combat... and PSS. Dave West's freely downloadable plans for a coroplast and plywood model are the basis of Izak Theron's conversion.

Back Cover: Phil Tolfree is a member of the White Sheet Radio Soaring Club and captured this brooding image at the club flying site during a January Scale Day event. Canon EOS 450D, ISO 200, 1/500 sec., f14, 20mm

R/C Soaring Digest

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In the Air

There's snow on the ground, the outside temperature as we write this is under 28°F and falling, high winds last night have left us with no electricity today, and we're composing this editorial on our MacBook Pro running off an inverter plugged into our winch battery. Makes us somewhat envious of you folks in the southern hemisphere where the weather is likely to be more pleasant.

Speaking of the southern hemisphere, Izak Theron, author of the MiG-7 PSS article, is a member of the Greenfields Eastern Model Soarers (GEMS) of South Africa.

<<http://gems-gc.blogspot.com>>

GEMS has its origins in the old Eeastern Thermal Busters (ETB) club and was formed in November 2009. We are situated about 5km from Bapsfontein on the R25.

25° 59' 44.51" S 28° 21' 59.89" E

Although our members also dabble in electric models we fly thermal planes exclusively at this venue. We have a healthy core of competitive pilots and will be the hosts for the 2012 FAI F3J World Championships.

For details on joining Greenfields Eastern Model Soarers, contact Paul Carnall at 083 702 7958 or Izak Theron at 082 859 3453.

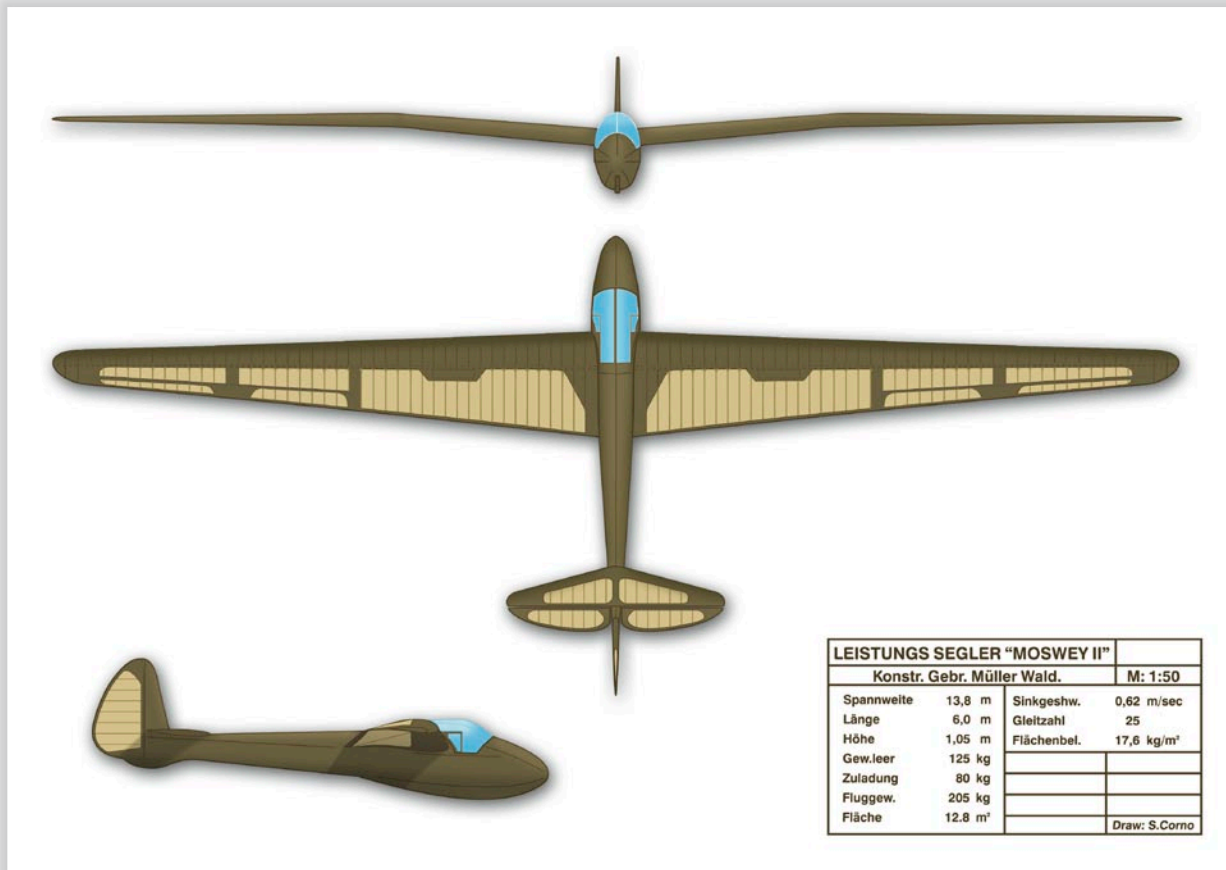
Those participating in the 2012 F3J World Chamionships, may want to take a look at the GEMS flying site at 25° 59' 44.51" S 28° 21' 59.89" E

Time to build another sailplane!

1:3 scale

Moswey II HB-204

Vincenzo Pedrielli, vincenzopedrielli@gmail.com



There are different categories of model builders. Today some of them should be named just model flyers. They buy a ready to fly model and start flying. Opposite to that there are true model builders who want to build a scale model exactly as the original. They start first with studying the history of the machine they want to reproduce, chase original drawings or at least a good three view drawing. The more photos they can find the better, to replicate even the least detail. This type of scale model builder exists in every part of the world. I did meet some of them on almost all continents. The average age of these fellows is around 50 years.

Recently I received some photographs of the model of the famous Swiss glider Moswey II prototype from Lukas Schaub, a Swiss friend of mine. This model in 1:3 scale has been built by Lukas Schaub and Ruedi Straub.



HB-204 at the Rhon World Competition 1937. Photo courtesy of Verkehrshaus der Schweiz, Luzern

At first glance I did not understand whether it was a real glider or a model. Even the pilot inside the cockpit was looking like an actual man. Skilled model builders pay great attention to reproduce any detail. Also from the picture in flight I could hardly say whether it was a full size glider or a model.

The reason why these friends selected the Moswey II prototype was due to the success this glider obtained participating with the Swiss pilot Georg Müller in the International Rhön Competition at Wasserkuppe in 1937, together with other famous Swiss gliders such as the Spalinger S18 Chuka and Spyr III.

The Moswey II, designed by Heinrich Müller in 1935, was conceived as a high performance aerobatic sailplane. The wooden framed cantilever wing was straight tapered in plan. It had a gull dihedral and was skinned with plywood from the leading edge to the main spar, forming a torsion resistant D-box, while the rest of the wing was fabric covered. Spoilers were fitted on the upper surface of the wing.

The fuselage had a hexagonal cross section gradually transformed to near diamond at the tail and was skinned with plywood. The cockpit was large and extra room was obtained by opening the wing roots. The canopy was not moulded in a single piece, as this technique was not so popular in those days, but was built with a few Plexiglas strips. The

The scale reproduction of vintage gliders is becoming popular in many parts of the world. Sometimes model builders may reproduce sailplanes which today do not exist any longer, but due to their great passion for the vintage gliders and their history, they bring these beautiful machines again to the air to commemorate their historical designers and builders.

rudder pedals were adjusted both on the ground and in flight. The tailplane was traditional with a fixed fin with hinged rudder and elevator, both unbalanced. A wooden skid with rubber shock absorber was fitted for landing.

The Moswey II prototype registered HB-204, is still existing in non flyable conditions, owned by Fritz Zbinden, a member of the Swiss OSV Club. It is a bit damaged, but Fritz has a plan to restore it one day and bring it to the vintage glider meetings. We are all looking forward to seeing it, as the Moswey II is a true rare vintage machine

Now let's go back to the model of Lukas Schaub and Ruedi Straub, which was perfectly built as the original. To scratch build this model they spent the whole 2009 winter, working about 300 hours in spare time. The maiden flight took place last June 2010 in a small field in the Basel outskirts, aero towed by a model power aircraft type Sportsman (Fliegerland), built and piloted by Fredi Gass. It was a spectacular flight of 20 minutes with a smooth landing near the feet of Lukas.

The Moswey II in scale 1:3 has a wing span of 4,6m, length 2m, weight 9,8kg, wing loading of 72gr/dm², with E209 airfoil at the root, tapering to E205 at the tips. All details have been respected including the special canopy and the instrument board. Great job Lukas and Ruedi!

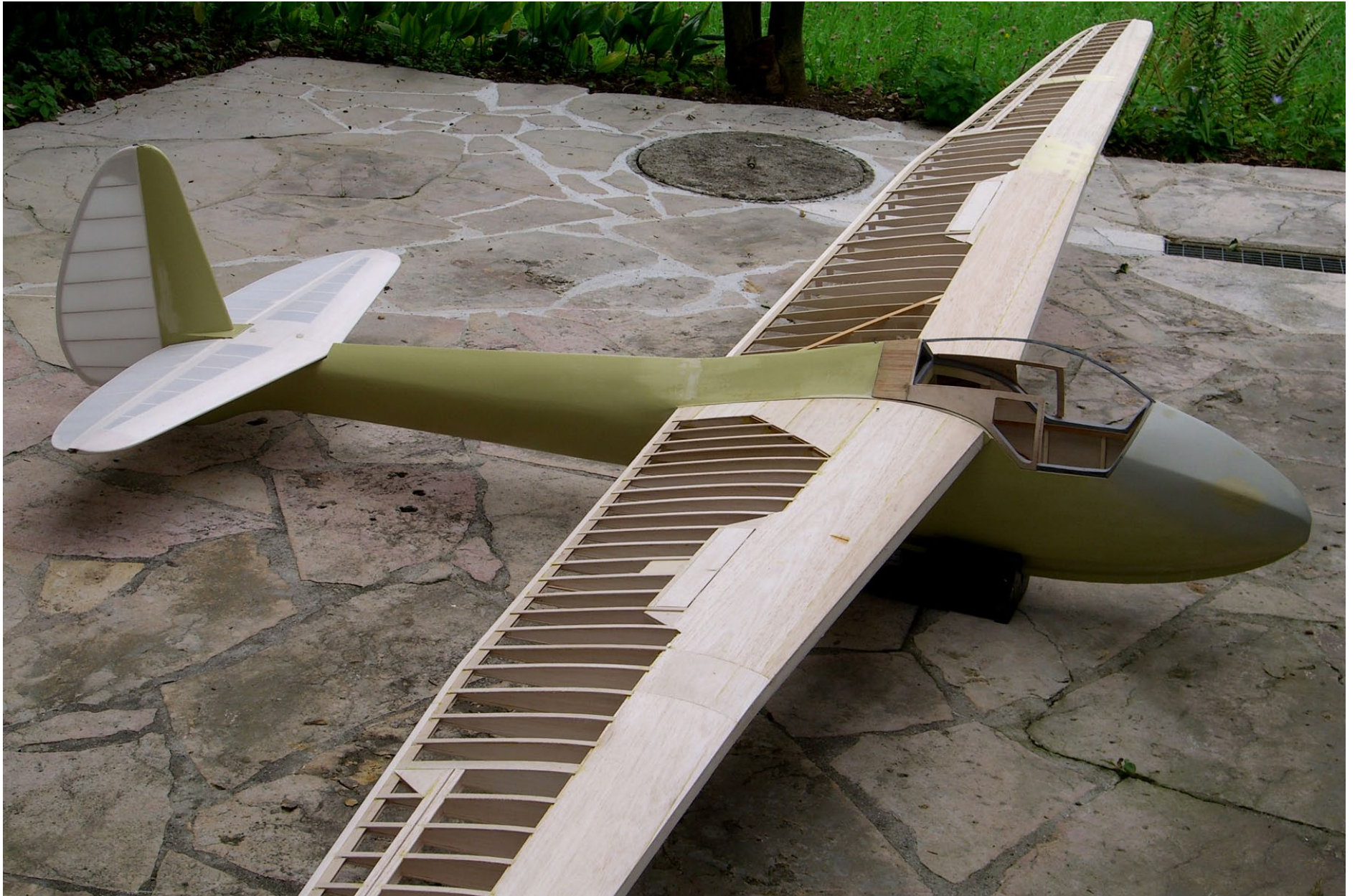
Right: HB-204 at the Rhon World Competition 1937. Photo courtesy of Verkehrshaus der Schweiz, Luzern



Below: Georg Müller in the cockpit of the Moswey II. Photo courtesy of Verkehrshaus der Schweiz, Luzern

Below right: HB-204 prototype today.





Lukas Schaub and Ruedi Straub's 1:3 scale Moswey II under construction.



Above: The canopy is constructed of clear plastic strips, just as the original.

Below: A realistic pilot and colorful markings.



Above: Complete and ready to fly!

Below: The pilot's hand is on the stick and the instrument panel is well detailed.





On tow.

The 1:3 scale Moswey II sits on the ground, ready to fly.



The builders, (L) Ruedi Straub, (R) Lukas Schaub, and their creation. At 1:3 scale this is a large model.



Spoilers up and coming in. Simply beautiful!



ACTION COMPOSITE PHOTOS

Joe Nave, soaring@rcsoaring.com

The process of creating these photos is fairly simple.

First, a set of photos is shot using the rapid-fire “Sport” mode on a camera using a tripod. Ensure that the camera does not move.

Using Photoshop, an initial photo is chosen as the base photo (or base layer).

Next, another photo is loaded into a second layer on top of the base layer and aligned exactly to the first layer.

Then carefully erase around the plane and everything on the base layer will be revealed.

Repeat these steps until all photos have been overlaid.

Once complete, use the “Flatten Layers” option and save your creation.



Art Chmielewski - Visalia Fall Festival



Above: Arend Borst - Soaring Masters

Opposite page: (Left) Art Chmielewski - Visalia Fall Festival
(Right) Connor Laurel - Visalia Fall Festival







Above: Joe Wurts - Soaring Masters

Opposite page: (Left) Mass launch - Soaring Masters
(Right) Mike Verzuh - Soaring Masters



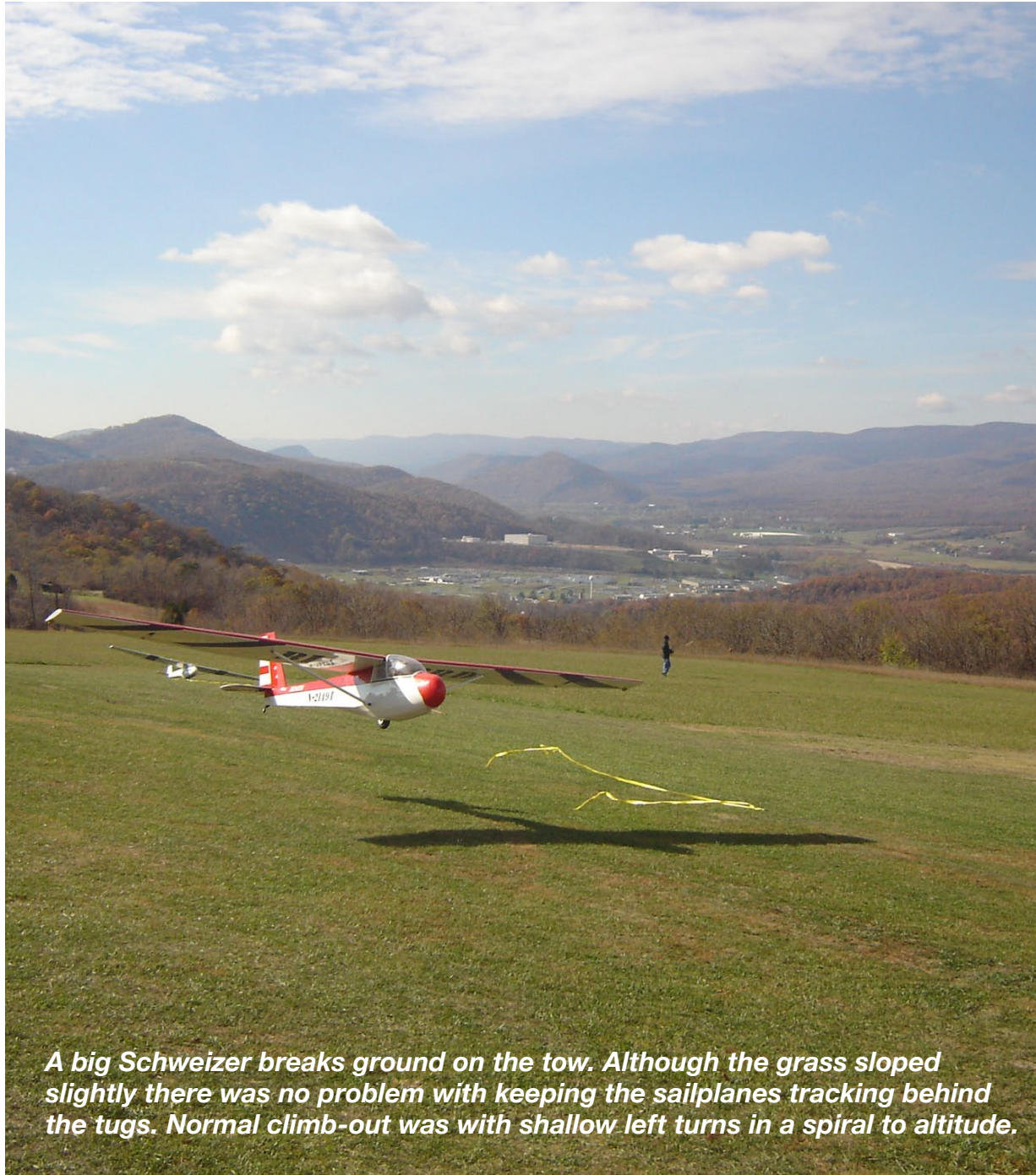
THE 44TH ANNUAL SOAR-FOR-FUN

Cumberland, Maryland

November 6/7 2010

Pete Carr, wb3bqo@yahoo.com





A big Schweizer breaks ground on the tow. Although the grass sloped slightly there was no problem with keeping the sailplanes tracking behind the tugs. Normal climb-out was with shallow left turns in a spiral to altitude.

The weather forecast for the site on Saturday, November 6th was cold, cloudy and winds from the north across the slope. I decided to go on Sunday when the weather was decidedly better. On arrival I went into the small building perched at the treeline of the meadow to sign up and pay the ten dollar “landing fee”. There were a large number of sailplanes already flying and I mentioned that it looked like a good turnout. The very nice fellow who was handling the paperwork said, “Oh, if you think this is good you should have been here yesterday!” It just showed that glider people are like fishermen. They can always stretch the story!

I had a chat with Don Harris. He and his wife had come from the Columbus Ohio area. Don is a thermal dude who has flown many an AMA Nats event over the years and is a superb pilot. I also talked to Carl Luft about the possible scheduling of a Spring 2011 event at the Cumberland site. The fall event is run so late in the season that there is barely 10 hours of daylight available. The conditions are so good that those pilots looking for the LSF 8-hour slope task could make it there if there was more daylight. The local sailplane club is the CAMS group and Carl indicated that information about a Spring event would be posted there.

The flight line was jammed with large trailers all packed tight with



This self-launched sailplane was an excellent performer both on the ground and in the air. It would climb out at 45 degrees with the electric power system and handled the lift on the slope in wonderful fashion.

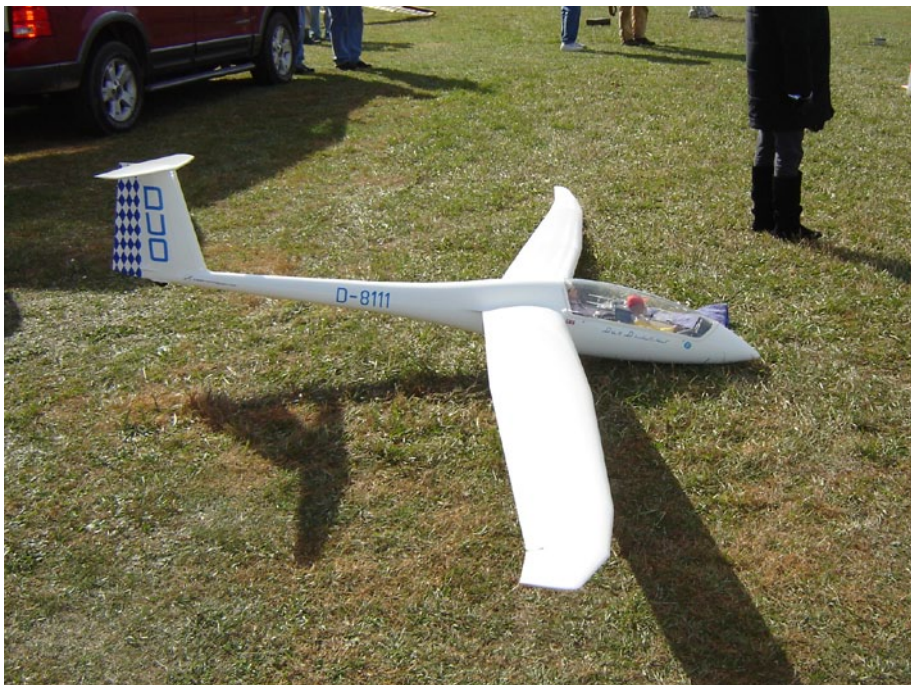


Above: The window to the rear of the canopy on this Schweizer 2-33 is functional and is used for inspecting the joiner of the wing panels. The sailplane owner also mentioned that the nose was totally filled with lead to make the ship balance!

Upper right: The cockpit of the Schweizer 2-33. It looks as if the pilot figure is giving thanks for another safe landing! The radio and battery are just visible in front of the canopy brace.

Right: The tail feathers of the Schweizer are controlled by pull-pull cables. The hinge line of the rudder was especially well done as were the cable exits on the fuselage.





A Duo Discus waits for a tow on the grass. It had a full cockpit and pilot figure and a retract belly wheel. The distinctive leading edge made it stand out in the crowd in the lift.



This sailplane was another smaller ship that was towed by the Hanger 9 Cub tug. The charging equipment next to it was especially interesting since it was a complete system for the on-board equipment rather than the usual rag-tag collection of cables and wires.

scale sailplanes. These fell into two basic categories. There were several enormous molded modern sailplanes with amazing performance to match. The remainder were vintage models of balsa construction with stunning scale details. They were all towed to altitude by two glider tugs that performed flawlessly all day long. The skills of the tow pilots were amazing since they would tow a 22 foot span ship on one flight and then a 100" span glider on the next. The larger tug was a Decathalon, complete with wheel fairings that towed that 22 foot monster effortlessly. The smaller tug was a Hanger 9 Piper Cub using electric power. It flew very nicely and had no trouble towing the smaller scale sailplanes. Some of the smaller ships used a variety of wheeled dolly's for takeoff and it was funny to watch them tumble down the grass after the glider rose free. There were no incidents of takeoff aborts while I was there.

Many of the vintage ships were covered with Solartex fabric. The stuff is wonderfully translucent and resembles linen covering. There was a Primary Trainer that had the wing and tail covered with it and also a Granau Baby. I talked to the builder of the Baby about its covering and he said that it never developed wrinkles like Monokote. The material has an adhesive backing and is applied much like Monokote. There may be a small weight penalty with the fabric but these scale ships are more about

looks and strength than absolute weight savings. We also discussed the effect of the fabric weave for turbulating the airfoil but, again, the interest was in looks and strength rather than performance. The view from the ground as these scale ships climb away behind the tow is quite striking. The framework showing through the covering adds to the feeling that you are watching the real thing.

In contrast to the scale ships were the electrics and hotliners that screamed around the sky. It was rather unnerving to have one of these blindingly fast electric gliders light off the motor overhead. A Stratus that I saw was easily capable of climbing vertically out of sight with an awesome noise from the front end. While their performance is amazing it was, nevertheless, a distraction from the tone of the day.

Early in the morning several hand launched glider people showed off their ships and their style. Back in the days of 6-volt winches many of us would have been thrilled with launch height that these guys are getting with their arms! Once level these DLG ships could range out over the valley in extremely light air and still make it home to a hand-catch. Near the end of the day I talked to Carl Lorber. Carl is the designer of such wonderful ships as the Gaggler, Thermal Queen and the Easterner from the '70s. His transmitter was a Multiplex with the top of the right stick modified for a



This V-tailed sailplane, a Schleicher Ka 3, had a span of about 120 inches. It was towed very easily by the Hanger 9 Piper Cub electric tug. It had a fixed belly wheel and made easy takeoffs from the short grass.

Carl Lorber, of Gagler and Thermal Queen fame, flies an electric sailplane. His Multiplex transmitter uses a marble on top of the right stick to accommodate his flying style. It was a challenge for us “dumb-thumb” pilots!



This Nimbus had a span of 22 feet and carried a video camera mounted to the top of the fuselage at the wing trailing edge.



In this shot the two pilot figures are very nicely done. The red knob at the front of the cockpit is the tow release. Pitot tubes extend from the top of the nose ahead of the canopy.

The scale Schweizer sailplane awaits a chance to tow. It was Monokote covered and very light for its size. The electric Cub had no trouble getting it to altitude.





This is the interior of the 22 foot span Nimbus sailplane that was the largest ship at the event. The cockpit and pilot figure were especially impressive as was the 2.4 GHz flight guidance system. Here, the system is tested and adjusted by an LCD panel that reads out the status of the electronics. The instrument panel covers everything when the canopy is closed.



The Nimbus 22 foot span sailplane carried a video camera out over the valley. Let's hope that the video is posted somewhere for us to enjoy!

marble! Carl uses his two fingers rather than his thumb for steering so found the marble a comfortable fit for his hand. He'd been up for just over an hour when I approached him. He handed me the transmitter for some stick time and my thumb kept slipping off the marble. After he took the transmitter back to save the ship(!) he mentioned that the 144 inch span Thermal Queen wanted 3 degrees of wing incidence which was not called out on the plans. Since I have one of these beauties on the bench now for a build, that was good information. The rib kit came from SkyBench Aerotech (Ray Hayes) and the parts are a joy to work with. If I use the Solartex covering the ship should be impressive.

The radio frequency situation was about the same as last year. Most all the scale sailplanes were flown with 2.4 GHz radios while many of the others used 72 MHz. It appears that the combination of very experienced pilots and these modern radios make for very reliable flying. Some of the more expensive ships used redundant equipment, such as receivers and batteries, but the vast majority were content with the standard single setups. In truth, I saw or heard of no crashes over the day. The only misfortune was a ship that flew away because the pilot locked his eye onto the wrong ship and didn't discover the error in time. For those people who are not used to flying in a group of 20+ sailplanes this can be an easy mistake.

The fuselage of the unassembled Granau Baby. The very narrow wing pylon and massive wing rod hole are evident. Wing struts are functional with this sailplane!



These are the wing panels of a Granau Baby sailplane. It's amazing how thick and under cambered the airfoil is. The covering material is painted Solartex.







This page: The primary Trainer doesn't have much fuselage so uses a combination of wires and struts to secure the stab and vertical fin. It showed no flexing on tow. It had functional flying wires that took a long time to assemble. The control stick in the pilots hands would move with the radio. The wings and tail were covered in Solartex material and gave a very "scale" appearance in the air. The controls for the elevator and rudder were by wires as in the full scale ship. The craftsmanship of the entire sailplane was exceptional.

Opposite page: The red Decathalon taxis back to the start line after landing. Light winds were mostly from the northwest during the day so takeoffs were not bothered by crosswinds. Later in the day the tug lost a wheel pant but continued as if nothing had happened. The Hanger 9 Cub, in traditional yellow, used electric power and handled the lighter sailplanes quite well. The line attachment point is visible just behind the cabin on top. The scale engine is also a very nice touch.





This Schweizer 2233 scale sailplane was towed to the launch area with a strap by its pilot. It was of balsa construction with Monokote covering. Its pilot figure wore a cowboy hat, which is a nice contrast to the usual white sailor hat.

The temperature only got to 50 degrees and started downward soon after lunch. Many of the scale people packed up their equipment and headed off the hill. Some were headed home while other would be back the next day for more fun. The Monday forecast was for warmer conditions but light winds. I'm sure that the aerotows-to-altitude would make for very satisfying flights, even without much slope lift.

Skip Schow of the Washington CASA Club was not at the hill on Sunday. Skip has been an organizer of the event for many years and is the primary reason for its success. I always look forward to sharing some conversation with him each year and the fun of the trip was diminished by his absence.

Resources:

<http://www.solartex.co.uk> — Solartex products, application and trimming.

<http://www.skybench.com> — Ray Hayes' company which markets sailplane kits and parts.

<http://www.soarcasa.org> — The CASA soaring group of Washington, DC.

<http://www.highpoint-aviation.org> — The CAMS club of Cumberland Maryland.

<http://www.hangtimes.com> — 1/4 scale Schweizer 2-33 scale sailplane with balsa wing construction, and batteries for RC applications.



This scale-like ARF Alpina flew several times during the day. It had pop-up spoilers that were very effective on landing. It also tracked well on tow.

Electric **SPIRIT ELITE™**

Leonidas Castello Jr, leocastello@uol.com.br

I like sailplanes because they post a challenge in creativity. I have flown them since 1948 when I built my first free flight glider from an English kit. I was eight years old then and the glider name was FROG. Launching those freeflighters was simple: all one needed was a line and good running legs.

When RC came into the scene things became more sophisticated, so did the launching methods to reach higher and faster. Then, recently, the electric motors appeared. I thought they would simplify the RC glider launching, but what I saw in the market were new electric gliders departing from the thoroughbreds in concept. I wanted an electrified classic, a thoroughbred with an electric motor to do the high start job. So I purchased a Spirit Elite and started a project to add an electric motor without modifying the original glider, except where mandatory.





Cut off the nose. Shaft angle points 7-10 degrees down and 2 degrees right. This is the only critical operation. Mark the cut with a thin felt pen. Canopy must be in place. Use a sharp razor saw to cut through the fiber.

RC Soaring Digest had a couple of articles on the electrification of the Bird of Time (January 2007 and December 2007 issues). It was a good starting point. I noticed that the electric equipment (motor & battery) was somewhat heavy for what I was looking for. So I did some MotoCalc <<http://www.motocalc.com>> runs and homed in on a Hacker A20-20L motor running a Graupner CAM 9-5 folder prop and powered by a 2100 mAh 3S LiPo.

The equipment arrangement in the fuselage had to be modified. Starting from the nose to the tail, the order is as follows: 1) motor, 2) battery in the fuselage body and speed control in the canopy above the battery, 3) servos, 4)

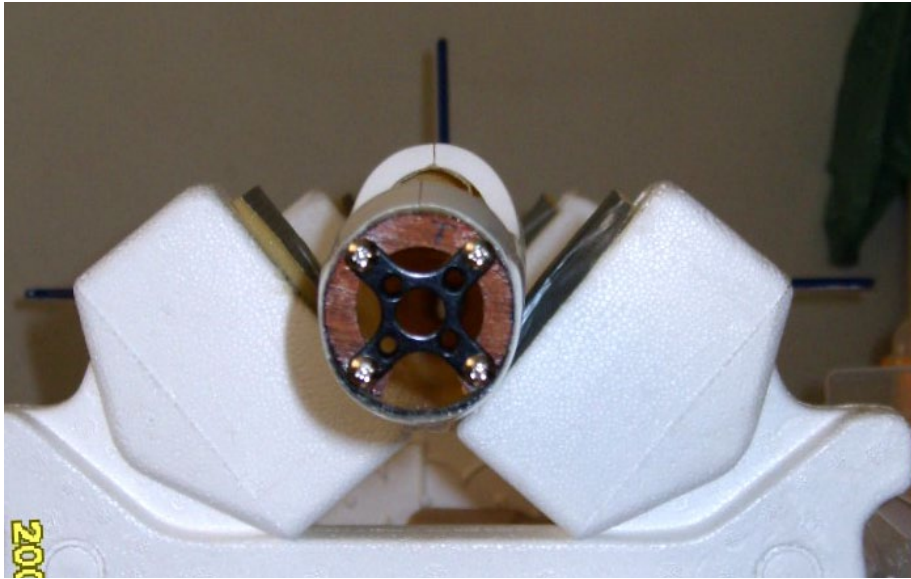
receiver (Hitec Optima 7). The antenna runs inside a plastic tube aft of the receiver on the bottom of the fuse.

Cooling is very important for the motor, the speed control, the battery and the 2.4 GHz receiver. The Spirit fuselage has an opening at the aft end that allows air to flow out. I made a small hole on the fuselage side by the receiver and I made perforations through the canopy forward end to assure enough cooling for the speed control. I trimmed the top rear end of the canopy so that there is an opening between the canopy and the wing to suck air out in flight.

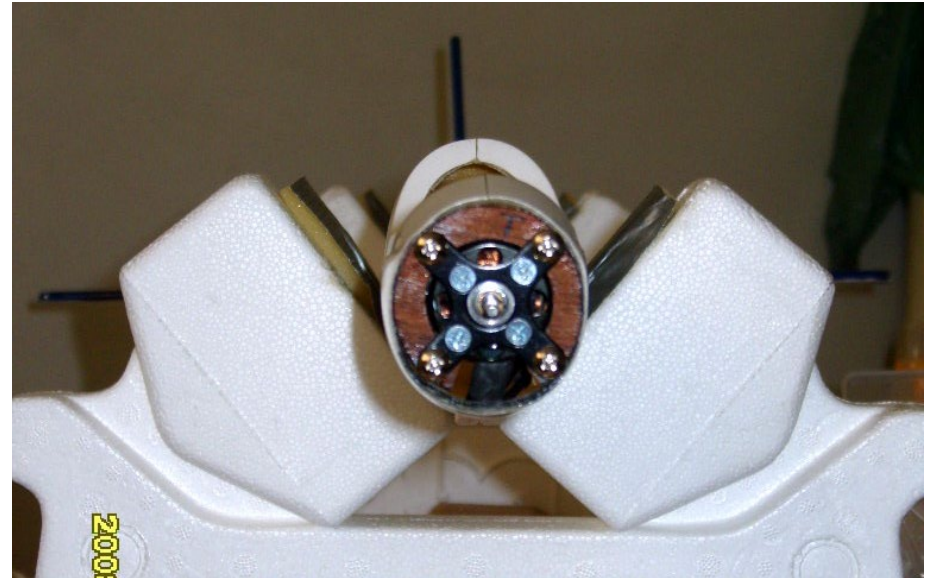
The concept here was to get the glider to a 100 - 150m height with a minimum

added equipment weight. The result was very successful in practice. Up to now I have logged more than 30 flights with very good duration and in varied conditions. The Electric Spirit will negotiate weather from sunny calm mornings to windy cold fronts with ease. The penetration ability of this model is remarkable.

I have just purchased a couple of CAMs (Competition Altimeter for Models) from Soaring Circuits <<http://www.soaringcircuits.com>>. I intend to add a launching height control similar to that provided by a capable high start, and I expect to evaluate the climbing time. At this point my Spirit Elite Project will be fully operational.



Add a horseshoe shaped plywood firewall. Motor mount externally assembled. Motor aligns with screw holes from inside the fuselage.



Add the electric motor. The motor wires fill the bottom space in the horseshoe firewall.



The Hacker A20-20L motor in place. Please note the carbon fiber reinforcement inside of the wall on the forward end of the nose. This is to avoid cracks due to hard landings.



Equipment arrangement: motor, battery and speed controller, servos, receiver and antenna. All in sequence from nose to tail.



The speed controller is mounted in the canopy with the wiring guided through the lightening holes. Easily accessible.

Cooling is important! Motor, speed controller and battery all need good ventilation. In addition to these air inlets, there are air outlets. The Spirit fuselage has an opening at the aft end that allows air to flow out. The top rear end of the canopy was also trimmed so that there is an opening between the canopy and the wing to suck air out in flight.



Below: Skid made of two Japanese bamboo chopsticks side by side. It prevents nosing in on landing and acts as a fuselage reinforcement. The smaller third piece was added after field tests. Skid reinforcement is 123mm from cut nose.

Below right: Tail skid made of two pieces cut from chopsticks.



*Electrification complete!
Rudder, elevator, ailerons, flaps, and a
throttled powerplant up front.*



*On the flying field and ready to get into
the air. Up to now the electrified Spirit
Elite has logged more than 30 flights
with very good duration and in varied
conditions. The penetration ability of this
model is remarkable.*

*The addition of a launching height control
will make the electrified Spirit Elite
Project fully operational.*





My 100" wing on a low pass after a dive to film high speed flutter.

A Swept Wing Saga

Paul Westrup, pw@paulwestrup.com

It seems for most slope soaring enthusiasts, the aesthetic qualities of their models are very important. There are few designs that polarise the hill-side community quite as starkly as the swept flying wing. They are most definitely a "Marmite" model; people either love 'em or hate 'em.

The ubiquitous Zagi and its multitude of spin offs have exposed many to a coarser example of the breed, and these foamies serve their intended purpose incredibly well. For anything other than combat though, it seems the



Launching the 2 meter wing. Photo by Steve Hunt

'wing remains a rare beast. However, a well designed swept 'wing will possess unique qualities. It will circle and climb effortlessly in thermals at quite extraordinary angles of bank. It will also be very stall resistant, and compared to a similar spanned and loaded plane, a 'wing will tend to be quicker. Also to my eye they just look so damn elegant, which I guess is why I just can't stop building them!

A few years back I found myself living a fair distance from my favourite slope, but had a playing field nearby that I could fly from. I decided to build a 'wing with an electric motor setup for flat field thermaling. I selected a thick EH wing section, the cores came out fine (using pink foam) so I made an attempt to bag them using wax paper. Unfortunately the finish was less than impressive with numerous air bubbles in the lay-up. I threw the whole lot in the back of the garage and left them there to sulk.

A year later I moved house and they moved with me, but sat in the shed for another year. Then a few weeks ago I stumbled across the cores again and made an impromptu decision to sling them together as a rough and ready light

The 2 meter wing, flaps deployed coming in.
Photo by Steve Hunt





The 2 meter wing makes a low pass. Photo by Steve Hunt



wind slope machine. I fully expected them to go straight in the bin after the first flight.

How wrong could I have been! I maiden'd the model with "that looks about right" control throws. From the outset it instilled confidence, feeling solid in flight, happily scratching around in the 4 mph draft. Since the maiden it has proven to be a versatile machine, comfortably flying in a 20mph breeze.

This success pushed me on. Because of the rough finish, it seemed logical to use the model as a test bed so I decided to try out some flaps. I'd made an attempt at them on a 100" wing, but lack of knowledge about sizing and placement meant when deployed, they gave an uncontrollable pitch up. The flaps extended too far inboard, so a downward deflection (ahead of the pitch axis) had the effect of up elevator. As down elevon at the tips produces a nose down reaction, I concluded that there must be a flap size where there is no pitch effect when deployed.

I needed the input of greater minds than mine to resolve this one, so I posted on RC Groups with a request for design help. Norman Masters came

The 100" wing pre-maiden. This wing is very light but suffers from flutter at speed. This was the model that I built with the unsuccessful flap placement.

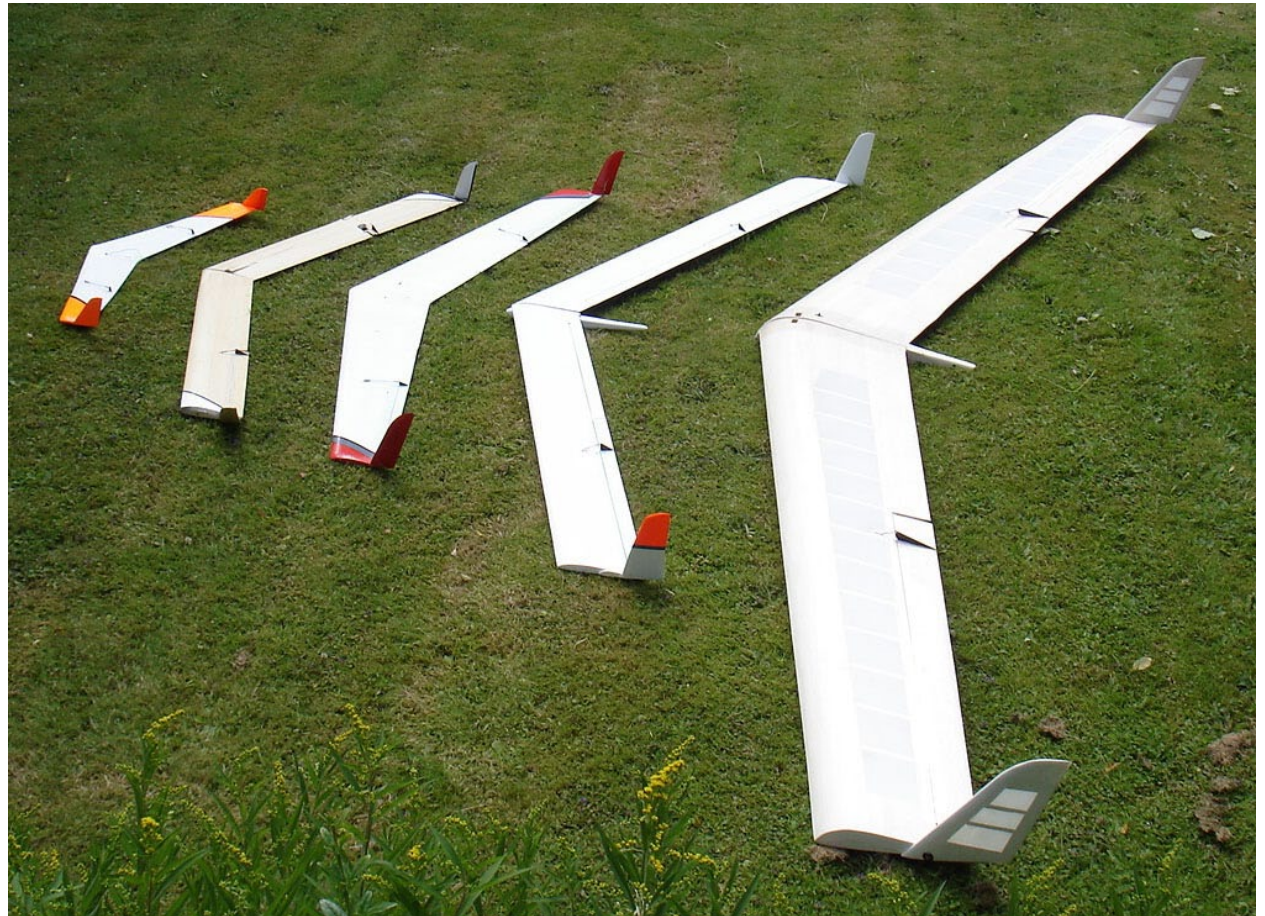
to my rescue and quickly posted a dimensioned plan for the flaps. This saved me from a protracted session of slope side trial and error, and with a few hours work I had the flaps ready for testing.

The next day presented itself with an ideal wind, so I gave up on home improvements, and headed out to my local coastal site. When I arrived the wind was 10mph straight on the hill-perfect!

I launched off and gained a decent height, pushing out from the hill. I eased in full flap deflection smoothly and slowly, the 'wing took on a nose down attitude as it slowed up. This was easily compensated for with a little up elevon.

I then flew for another 20 minutes or so testing the flaps at lower altitudes and getting used to parking the model in the air. I finally landed the model without any issues, the flaps making the whole process a lot more precise.

The wind then eased off to between 3 and 4 mph so I re-launched and cruised around firstly with the wing "clean," and then with about 5 degrees of flap deployed. The model climbed to a higher ceiling with the flaps on, though I had to dial in some up trim. I then tried full flaps, but needed to pull in full up to hold the model stationary. It was only in this state that I had any marked reduction in roll authority.



Some of my previous wings, from left to right:

- 38" slope wing with MH45 section. A great little fun flyer.
- 60" two piece slope wing, built for easy transport, again MH45 section.
- 70" heavy weight slope wing, scaled up version of the 38" wing built with slightly less washout. This made it twitchy to launch and fly.
- 100" thermal slope wing with HS522 section. Lovely flyer in marginal conditions and in winds up to about 10mph.
- 4m Swift built from Vern Hunt's plans, based on the rigid wing hang glider. Simple to build, it thermals well from the slope.



A Vern Hunt designed 4m Swift. Mine came out very light at 5.5lbs (Vern's original was 8lb). I think this restricted the conditions in which it would fly, the thick wing section probably needed the extra weight of the prototype.

So the flaps have been a complete success, they allow me to control the speed and glide path of the model, and make hand catches a regular event. All credit to Norm, without whom I'd have been chopping away at my trailing edges for quite some time!

This 'wing is certainly one of the best I've built, it seems that sometimes you hit an ideal combination of wing section, washout, weight and sweep and get a model which fulfils it's role perfectly.

Now, what to build next.....

Web links:

Flying the 2m wing before addition of flaps: <http://www.youtube.com/watch?v=bHnWQ332eVs>

Flaps ground test: <http://www.youtube.com/watch?v=zX6jMoSagOQ>

2 meter wing in-flight flap testing: <http://www.youtube.com/watch?v=PMhQ8TyYFOM>

A selection of my 'wings: <http://www.youtube.com/watch?v=fUzNUR7nVuA>

Web site detailing some of my wings: <http://flyingwinggliders.blogspot.com/>



The 2 meter wing overhead. Photo by Steve Hunt



The 2 metre wing in a low pass against the setting sun. Photo by Robert Radford



MiG-7 PSS



Izak Theron, izaktheron@absamail.co.za



This MiG-7 build is based on the 1/12 scale R/C combat design of Dave West, Winged Shadow Systems <<http://westaero.wingedshadow.com/>>.

Full size plans in tiled PDF and DXF formats can be downloaded at no charge from <<http://westaero.wingedshadow.com/Mig7.zip>>

Corrugated plastic, known by the trade name Coroplast®, is the primary construction material. The plans show installation of a powerplant (.25 size glow engine) for flying combat events, so a PSS version does require modification to some of the included patterns.

Numerous PSS versions of Dave's MiG-7 design, including one with a span of 3 meters, have been built by modelers around the world with great success.

From the GEMS blog
<<http://gems-gc.blogspot.com>>

Part 1, 30 October 2010

With the GEMS 2010 PSS Fest just two weeks away and really wanting to have something else to fly apart from the F18, it does not leave one with enough time to take on a huge project to complete.

Scratching around on my computer I came across the plans for a correx MiG-7 (which you can find here) and Gert Nieuwoudt has mentioned that he is taking his along again. According to him it builds in less than a week, so it seemed like a do-able project, even with my slower-than-others building skills. So Friday I printed out the plans and with Maizey's Plastics

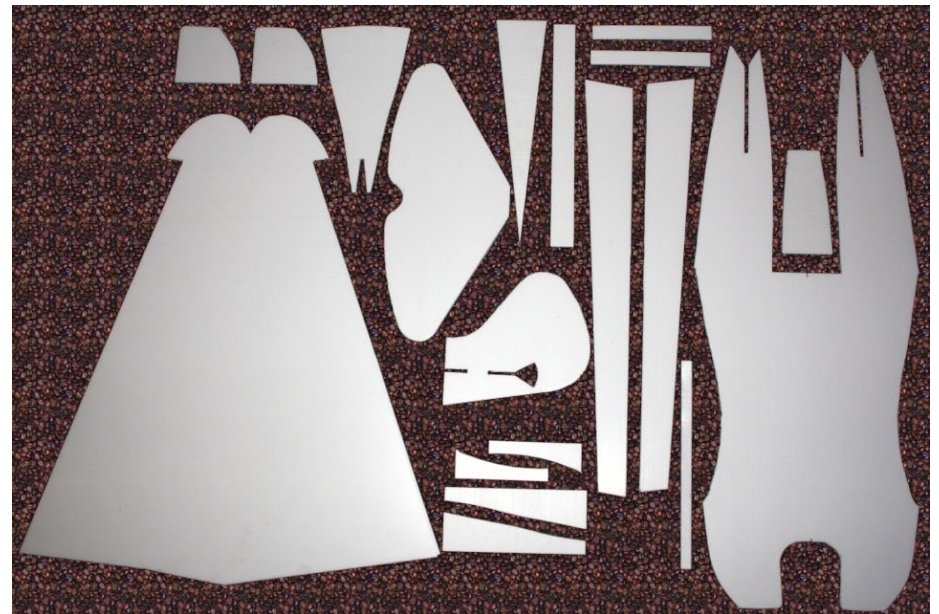
in Edenvale conveniently close, collected a sheet each of 2mm and 3mm white correx. I really wanted it in yellow as I had a yellow and blue scheme in mind, but the 2mm they only do in white.

Quite incidentally, while speaking to Emma, the sales lady

there, I learned that Maizey's intend to discontinue the straight fluted correx in favour of the s-waved version. The reason being that the latter version is stronger in both axis which is better for the bulk of their customers that use it for advertising boards and the like.

This is a real pity, as it is exactly the straight fluted version that we need, especially when utilising the flute as a hinge line. Apparently the s-wave stuff is also really horrible to work with... Emma couldn't say how much longer they would have the straight flute stock around so if you have any correx projects in mind in the foreseeable future you had better go stock up on some correx.

Yesterday I cut and stuck the tiled templates together and marked it out on

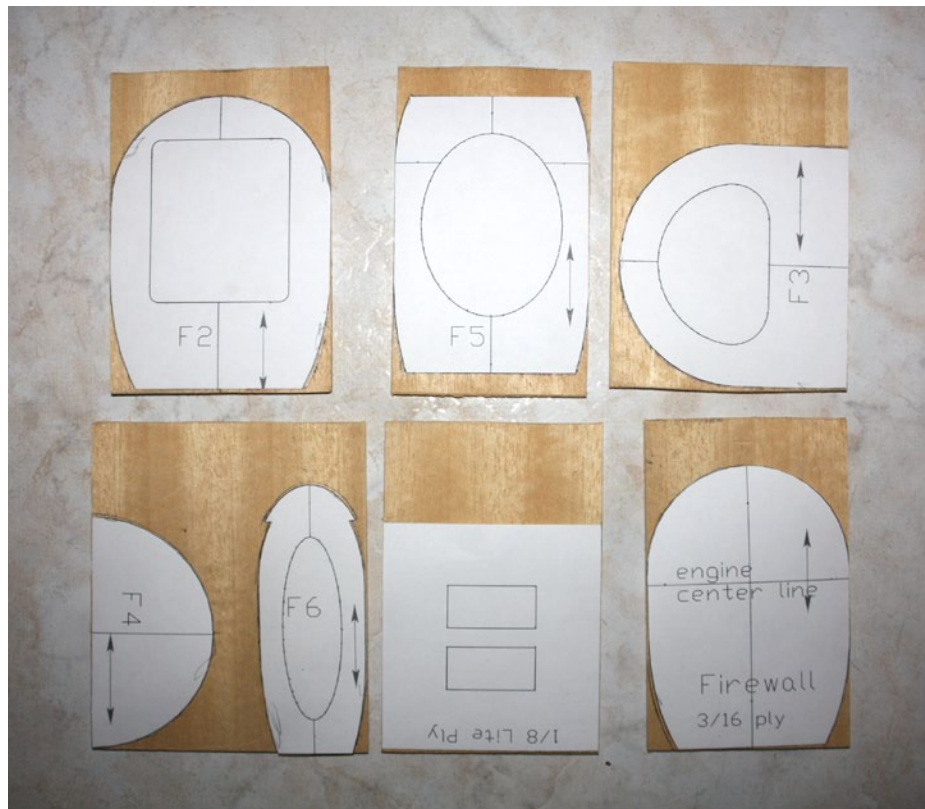


the corex. Today I got around to cutting out the various parts and the fruits of my labour are shown on the opposite page.

Next step is to mark and cut out all the 3mm plywood formers. Time to get dusty.

Part 2, 02 November 2010

I had forgotten what plywood dust smells like! The wife wasn't too happy when I tackled the making of the formers on the lounge floor last night while catching up on some of my favourite "crime soaps".



She deflated a little this morning after seeing that I had removed all evidence of my activities last night.

After first having to scratch around for the liteply I knew I had but couldn't find in the mess I call a workshop, the templates were marked out on the wood and using a pin, the position where all the cut-outs are supposed to go were marked.

I finally figured out how to convince the wife to start buying me the proper tools I need... It is bad for your wellbeing using improper tools! Losing digits to slipping exacto blades will seriously shorten your model building career...

After much cussing and cramping fingers I called it quits after getting the wood cut into appropriately sized rectangles and decided to quietly slip into the workshop at work today to finish off the final shaping.

Former F1 calls for 3/16" (5mm) ply, I think primarily to be able to bolt a

motor/engine to, so I substituted it with liteply as well as this model is meant for the slope. Should be OK...I hope....

Only a couple of balsa formers remain to be cut and tonight I'll hack out all the cut-outs in the ply formers.

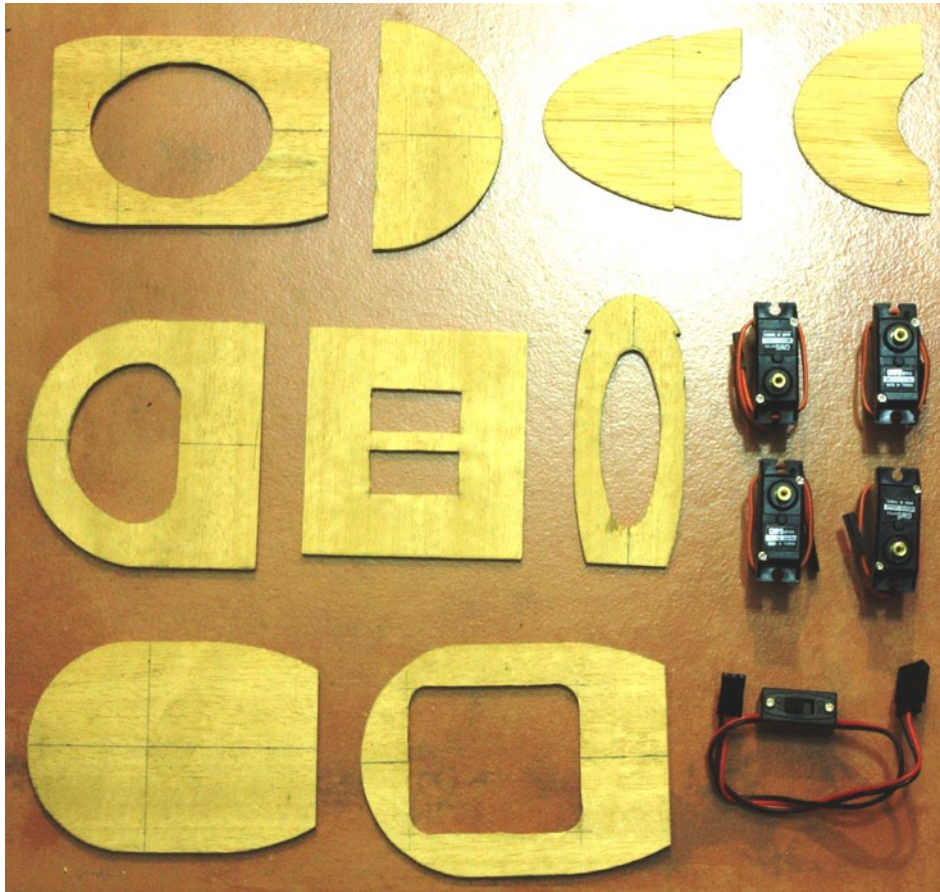
Note to self: Stop by the hardware shop for some contact adhesive today.

Part 3, 03 November 2010

More dust! After doing some "on the sly" outline shaping on a bench grinder at work yesterday (yes, I know it's not the right tool for the job...) all that remained on the formers was to finish the cut-outs. Drilling big access holes first allowed the sanding drum on the dremel to make short work of this task.

Now the dihedral ply braces for the spars remain to be made. Only thing is, I couldn't find any damn plywood stock, although I'm sure I had some...The liteply used for the formers won't be up to the task. Just the right excuse to visit the hobby shop today I guess.

The main spar also calls for a 5mm yardstick to be used, something you don't find in hardware shops anymore. I also don't look forward to cutting this from a hard wood so started thinking about other options. Speaking to Paul Carnall he suggested making a spruce capped vertical grained balsa shear web spar, so the shopping list for the hobby shop grows.



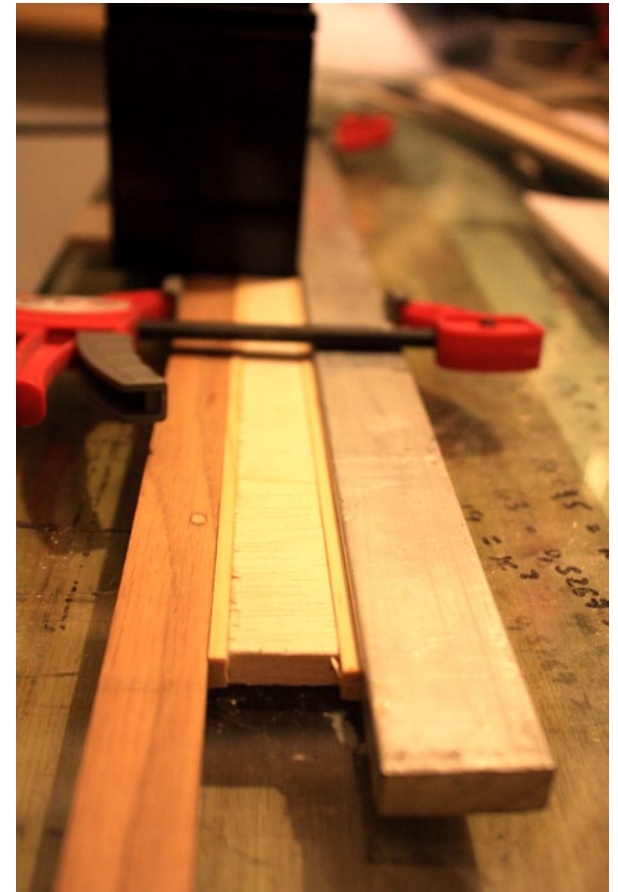
The above pic shows the fruit of last night's labour and the GWS 2BBMG metal gear servos I'll be using on this project. They're pretty noisy from what I recall but their ruggedness makes for ideal use in a slope soarer bound to have some rough landings.

Part 4, 05 November 2010

Part four got underway night before

last but about 10 minutes in to my soul cleansing activities our dear Eskom decided that it's bed time for me F#and\$%!!!. Working in the proximity to sharp tools by candle light didn't appeal to me.

I managed to find some 8x3mm spruce (very scarce to find) and a sheet of 6mm AAA grade balsa from Airborne Passion at a princely sum. I must admit that at least it is very good quality wood, not



the usual crooked and wavy stuff some hobby shops stock.

The shear webs were made by gluing 35mm strips of cross grain balsa end to end and then cutting the tapered profiles from this strip.

The spruce was glued with polyurethane wood glue and clamped to prevent distortion. Formers F5A and B were then glued in position on F5 as per the instructions.

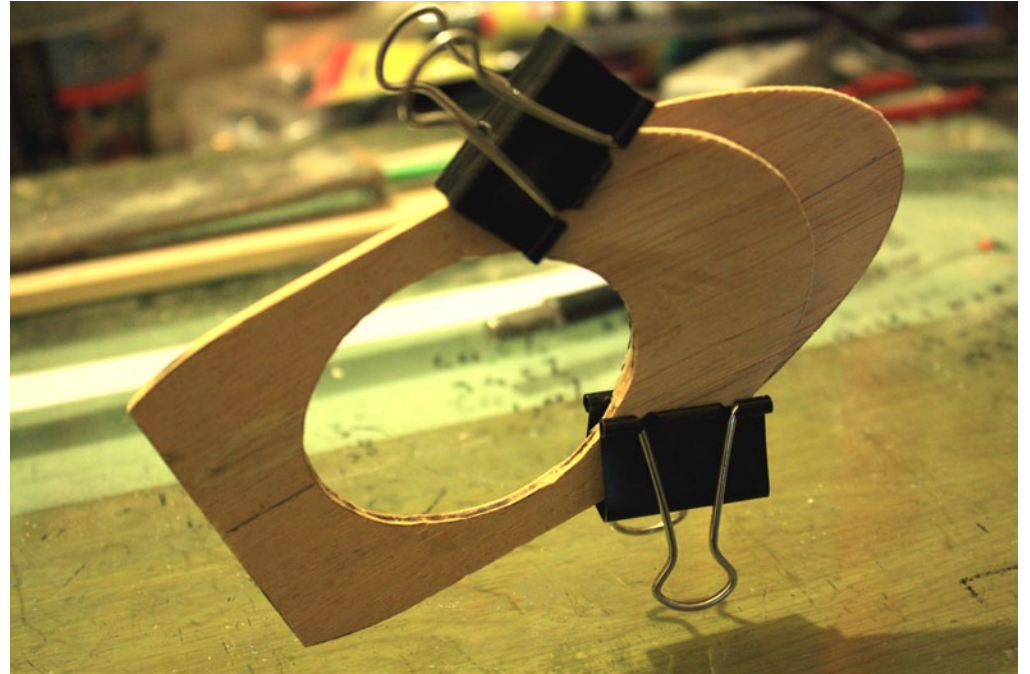


Next up will be the making of the dihedral braces and I should be ready to start assembly then.

I'm starting to think I may have to sacrifice my flying this weekend just to be sure the project is completed on time. Rather safe than sorry.

Part 5, 08 November 2010

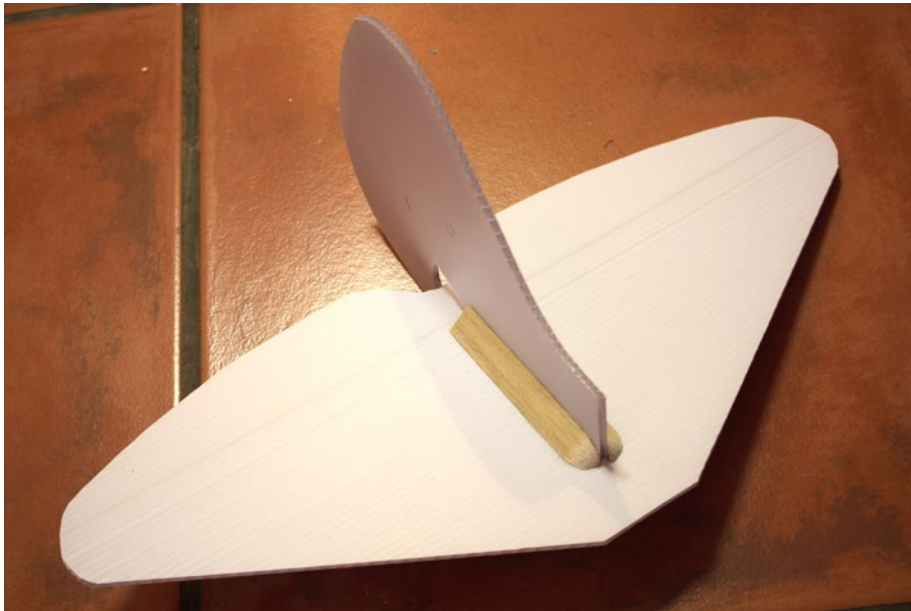
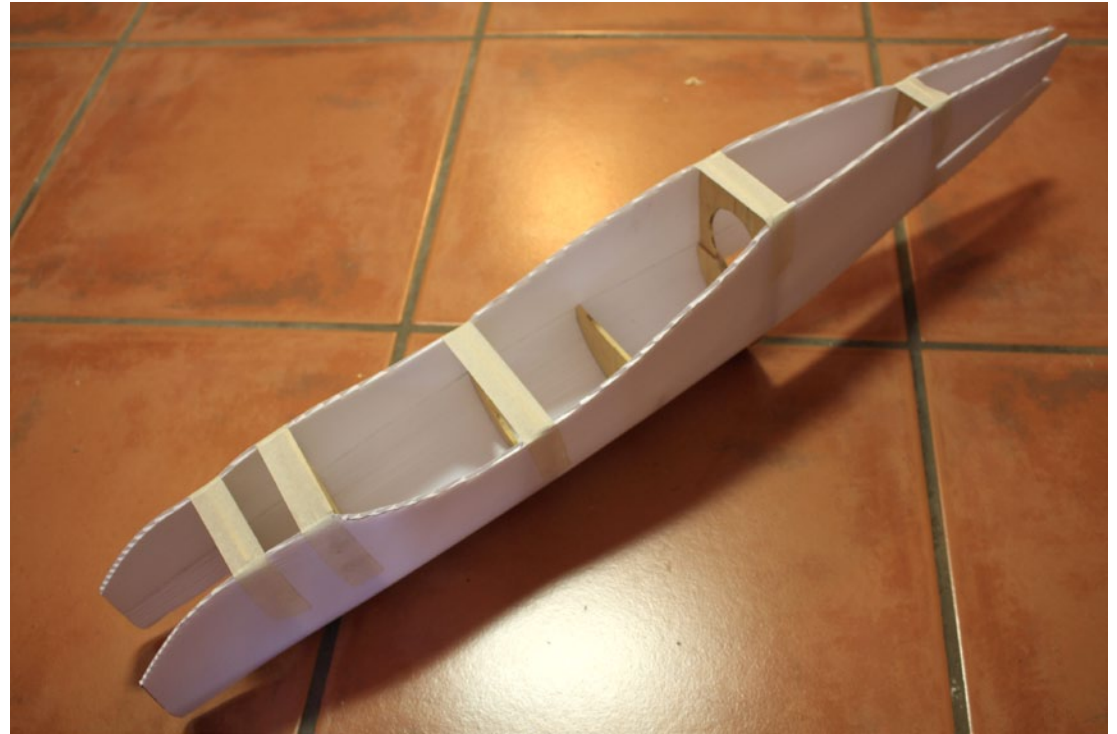
Although I didn't get as far as I had hoped I would over the weekend, the MiG has progressed quite nicely. I'm running out of time though as there are still two other



models that need some reconstructive surgery before the weekend... And the trusty old Zagi is still naked after I had stripped it of its tattered pajamas.

Putting the tailfeathers together is straight forward and the only deviation from the plans was to add the balsa triangle stock to keep everything square and give the glue more surface area to take on. See the photo directly below.

The formers have been glued in here and the fuselage sides pulled in. Masking tape holds everything in place while the contact glue takes time to take hold. See the photo to the right. I still found the ends of the correx was lifting afterwards and tacked them in place with cyano.

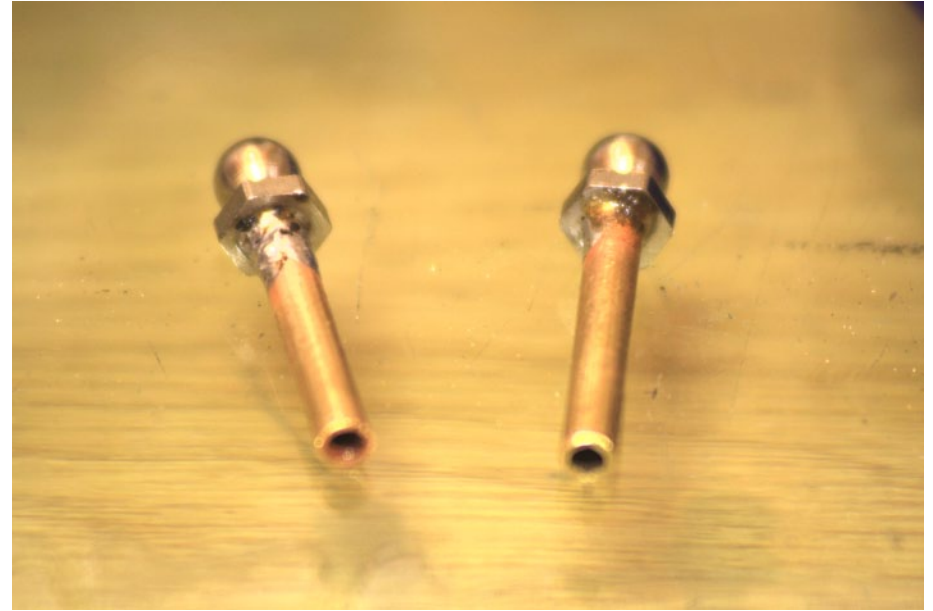
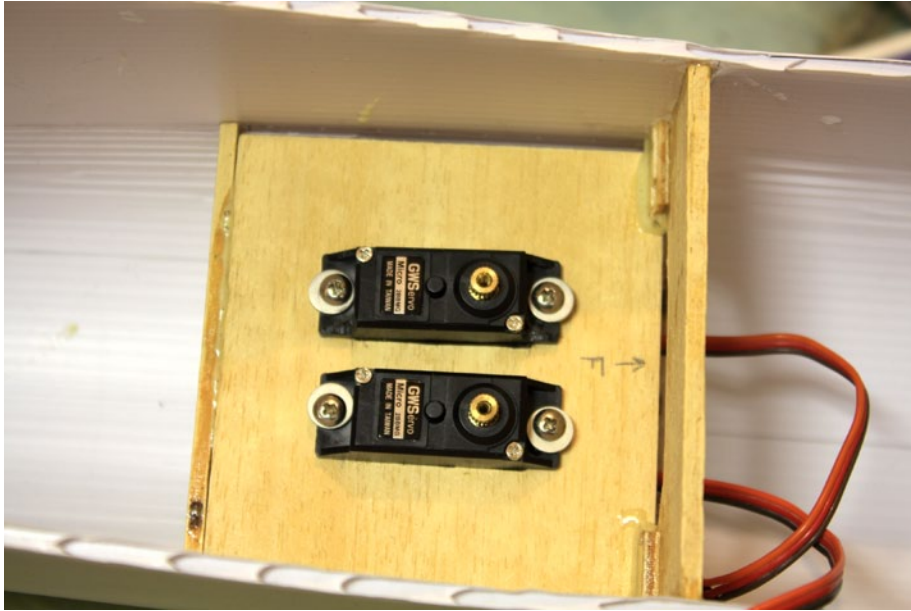


The original plans are for a gas model and had this cut-out up front to allow for engine installation. I blindly traced and cut the template and only afterwards realised that it isn't required. So I decided to utilize it as the battery bay and made a little cover for it. See the photo at the bottom right of the previous page. Makes for a convenient location for lead should I need to add any to adjust the CG.

In the photo to the right, the spar has been glued to the bottom of the wing. The leading edge fold needs to be creased only (not cut) and when the wife wasn't looking I nicked her rotary pizza cutter for the job... Worked a charm!

And who can resist the mockup when the parts start taking shape?





Above, the servos installed and the tray in position. There is a LOT of space in this fuselage... Next to go in are the push rods, switch harness and receiver.

Part 6, 09 November 2010

One would have thought after 15 years of marriage I would have learned some skills from my highly organized wife by now, especially her planning skills! If I did then I would have had the right parts for last night's build, i.e. the correct length bicycle spokes for the aileron torque rods.

So the bulk of last night's available building time was spent scratching my head and eventually manufacturing my own torque rods with some wire, brass

tube and ball links. The only other option would have been to mount the servos further outboard with direct push rods but I don't like the idea sticking unwanted bits in the airflow and creating weak spots in the wings where the cut-outs for the servos would have been.

For the inboard end of the torque rods I made use of some ball links lying around which were soldered to a short section of brass tube. Photo above right.

The other end was soldered to the inboard 90° bend of the torque rod. These will be connected to the servos via small pushrods.

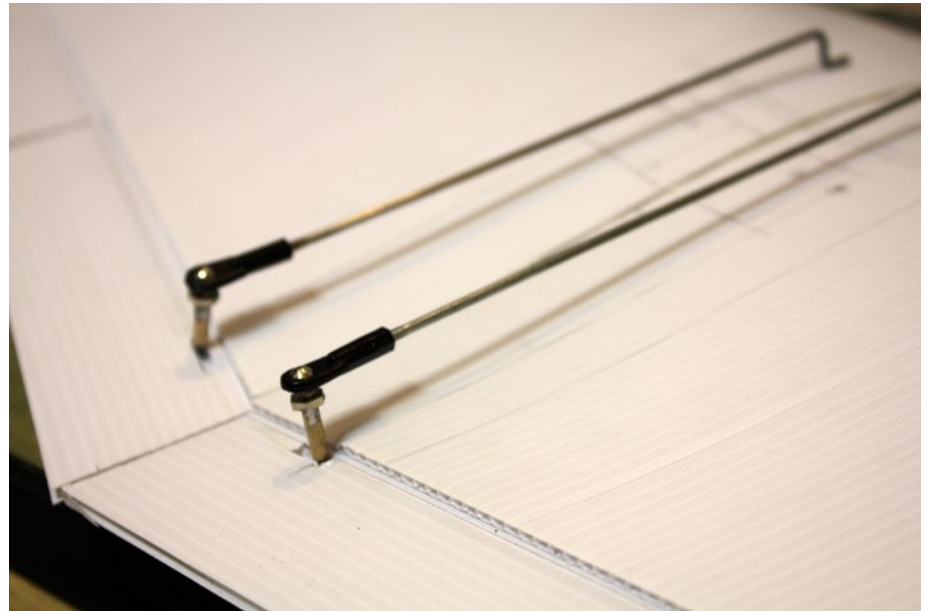
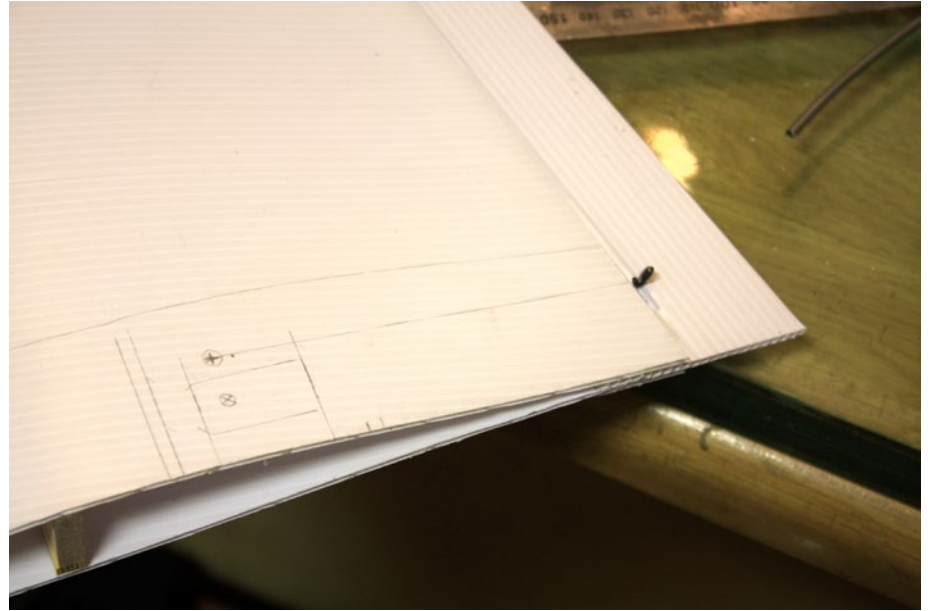
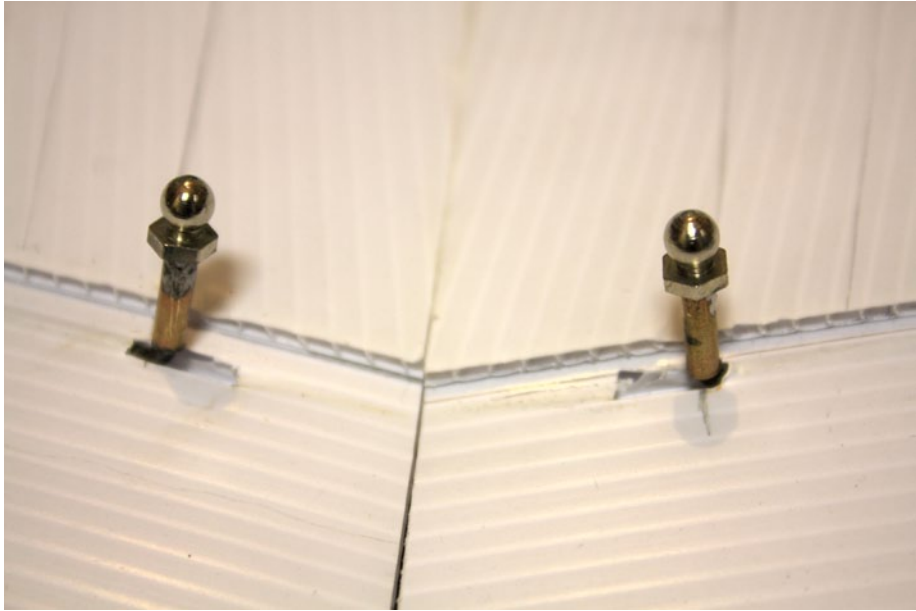
The hardest and most delicate part of making the torque rod was putting the outboard bend in it without ripping the

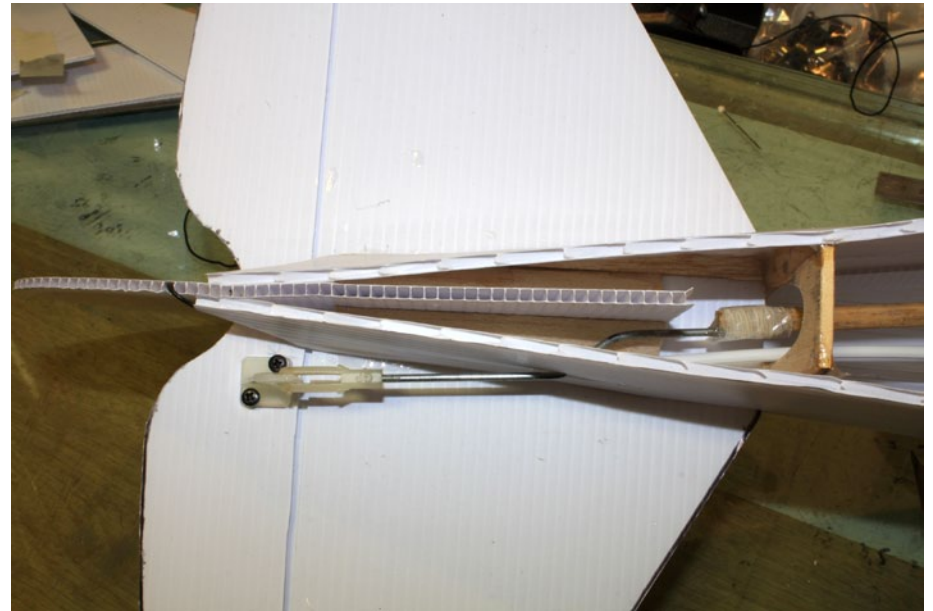
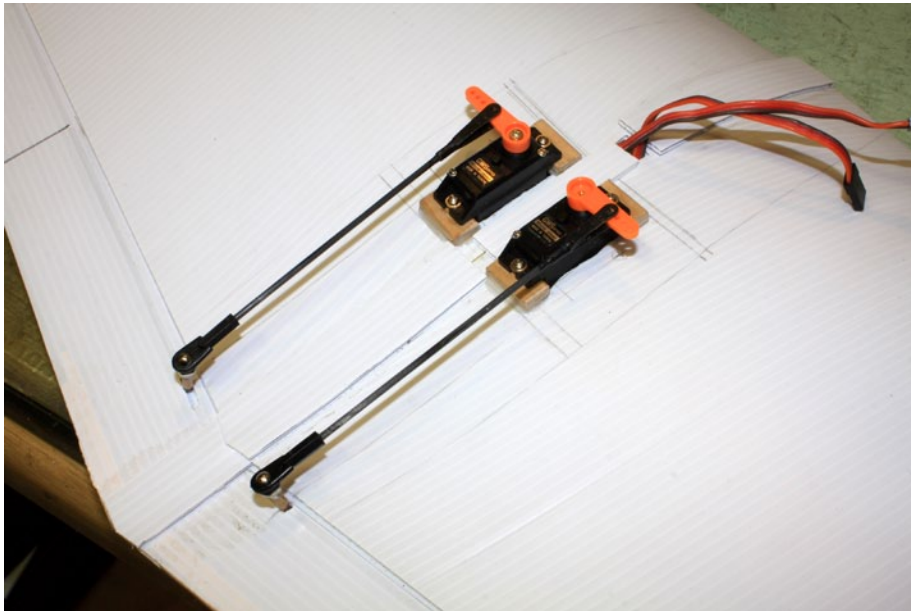
wing apart. This because it has to be done with the torque rod already installed and the wire I had is as hard as hell!!

This bend fits into a second piece of brass tubing that was inserted into the flute of the aileron.

The section of torque rod inside of the wing is supported on both ends by a 25mm section of plastic tube inserted into the flute to take up the slop. In the end I was extremely satisfied as the whole setup resulted in ZERO slop on the ailerons.

The two servo slots in the servo tray and the plan's lack of indicating the rudder position had me puzzled once more. After speaking to my "consulting engineer" on the project, Gert



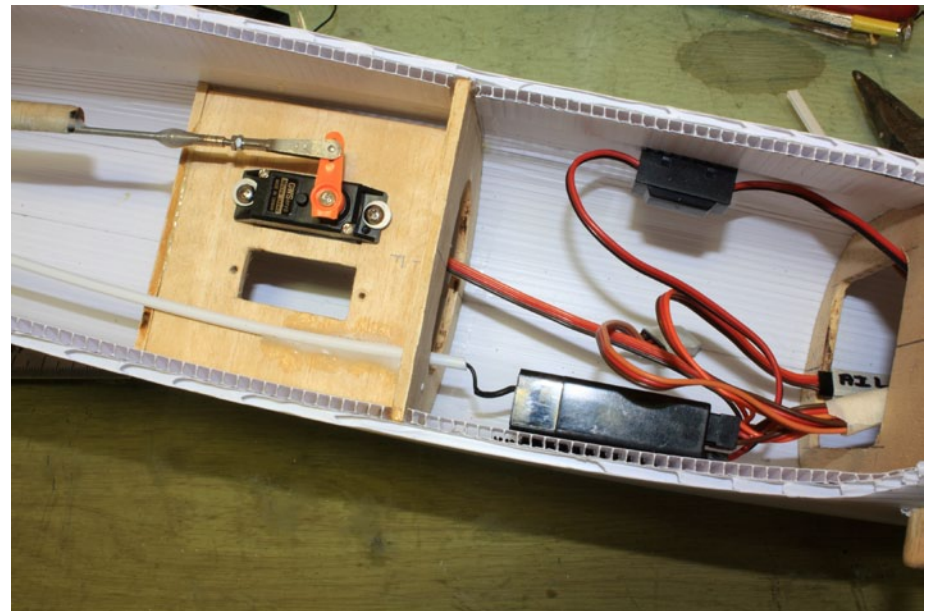


Nieuwoudt, I decided to not add a rudder on the model as it would only complicate matters of where to route and exit the push rod for the rudder, possibly weakening the fin and as Gert pointed out the model has a very short tail so the rudder would probably not have been as effective as I would have liked. Only after our conversation it dawned on me again that as this model was originally designed as a power combat plane the second servo position in the tray was for the throttle... DOH!

Part 7, 11 November 2010

Over the past two nights I picked up the pace on the build and spent less time taking pics throughout the process.

It went something like this: finish torque rods, join wings, work on Corsair repair while waiting for glue to dry, add hard wood bearers for servos, make cutouts, install servos, make carbon push rods, check setup and throws on radio, take picture, go to sleep and come back next evening to admire handy work. The end result is very satisfactory.



As can be seen in the lower photo on the previous page, if you are used to the tight spaces typical of F3J/F3B models this fuselage is simply cavernous, swallowing up all the necessary bits and pieces with plenty of room to spare. This model should be the perfect platform for an electric power plant....

Hmmm, a Turnigy Park 480 should do nicely and I see they are only R185.00 from WiFly <<http://www.wifly.co.za/products/7503-turnigy-park480-brushless-outrunner-1020kv.aspx>>.

The wing seat on the fuselage and the wing centre line join also received some doublers as reinforcement.

Next up on the to-do list was the elevator push rod. Nothing out of the ordinary here. Not being a fan of z-bends I opted for some decent clevises instead. Some wire and a 6mm dowel completed the setup.

Whilst trying to test the elevator I found the servo was dead....? I could have sworn I bought all four the GWS 2BBMG servos together but on closer inspection this one looked used and felt hot to the touch after leaving it on for a minute or so. Ah well, fortunately I won't be needing a throttle servo...

All that remains to do now is to close up the aft fuselage bottom, balance the model and add a splash of colour. Oh, and a spinner to round off that square nose.

The spinner has already been crafted from some polystyrene. Paul Carnall suggested I try using a drill as a lathe, sticking a block of foam on a dowel and shaping it with some coarse sand paper. It worked like a charm. The secret is to use as high a speed as your drill can deliver and light pressure while sanding. And if you value the peace at home, DO IT OUTSIDE!!!

Part 8, 12 November 2010

Yet another photo finish! These last minute slope projects are turning into a bad habit. But then I do work better under pressure...

Last night was occupied with most the remaining odd tasks to finish up this model and the repairs to the GWS Corsair and Blue Angels F18.

I had to finish half a 2 litre Coke in a hurry to obtain the material for the canopy but once again I'm chuffed with the end





Evan Shaw launches Izak's freshly completed MiG-7 at the GEMS PSS 2010 event.

result. Pity I didn't have a little bust figure to occupy it. Initially I had a black and yellow scheme in mind but previous experience with the black vinyl lifting as soon as it caught a whiff of sunlight made me settle on my signature blue and yellow. I'll add some black trim tape for flair. Covering the fuselage is as far as I got before I ran out of time and imagination...Time won't allow another build update here before this baby hits the slope but I'll make sure to take plenty before and after pics and report back next week.



