Radio Controlled Soaring Digest

December 2008 Vol. 25, No. 12

CONTENTS

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Front cover: Richard Cascignani performs a fly-by with his Airbus A388 at the Eastern Thermal Busters PSS Fest at Tamatieberg slope near Volksrust, South Africa. Event coverage starts on page 19 of this issue. The A388 is produced by Windrider and has a span of six feet and is designed for slope soaring. Photo by Derek Marusich. Canon EOS 400D, ISO 100, 1/2000 sec., f5.6, 300mm

Back cover: "Which bird is mine?" Gordy Stahl's Eagle is accompanied by a young Red Tail Hawk. Photo by Tony Utley. Canon EOS 40D, ISO 400, 1/1600 sec., f6.3, 98mm

R/C Soaring Digest

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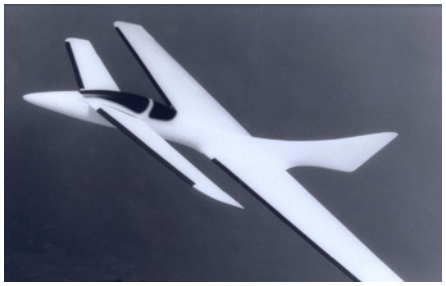
In the Air

Several news items of interest to *RCSD* readers have crossed our desk since the last issue.



Richard Jarel of Jade Design and J.A.D.E. (Jarel Aircraft Design & Engineering), has decided to reintroduce the Telos, a canard sloper. More information is at <http://www.rcgroups.com/forums/showthread.php?t=955809>. Richard is also planning to produce a new design, the DaVinci, which will have a span of 1.5m.

FAI has ratified two record claims by Gary Fogel. Both of these are Subclass F8 Open (Aeroplane, electric motor, rechargeable sources of current) of the F8 Class (Autonomous flight). The first record is N°914, Duration, and is 31min 12sec. The second is N°915, Distance in a straight line, 12.72km. There were no previous F8 records set, and the F8 Subclass is now retired, so both records were granted and then immediately retired.

Vincent Labrouve, France, has filed a record claim for F5 Open (Aeroplane, Electric motor, rechargeable sources of current) radio controlled, N°171, Duration, with a performance of 12h 36min 46sec, on July 30 of this year. If ratified, this will eclipse the current record of 12h 21min 40sec currently held by Thomas Hays.

Time to build another sailplane!

Wihok 60

a plank flying wing

Grégory Pinaud, pinaud.gregory@hotmail.fr

Dear plank aficionados and other conventional gliderists,

I'm going to present to you the birth of a 60" slope plank flying wing that has potential for pylon racing.

The specificity of this plane apart from its aerodynamic performance is the radio controlled Center Of Gravity (COG) moving device which is mounted on the fuselage and which allows in-flight modification of the static margin and consequently stability.

But I will give more details how and when to use it in a future article after I complete the whole flight test campaign. Until now it is yet very promising...

At a low cost and with only minimal tools (simple bow hotwire) we can build a wing which has amazing flying qualities and which could convince all the sceptics.

After many years spent on flying swept flying wings like the one to the right, I decided to enter into the world of plank wing.

During winter 2007 I had some time to establish the requirements, to design some specific airfoils and a wing platform.

I finally converged on a main design and stopped the numerical analysis in June 2008 (see Figure 2). The first prototype (only a prototype, so I didn't care much about the last coating) was built in a couple of weeks, and I made the maiden flight in August 2008. The next one may be built with hollow moulded technique if I have enough time to prepare the CAD.

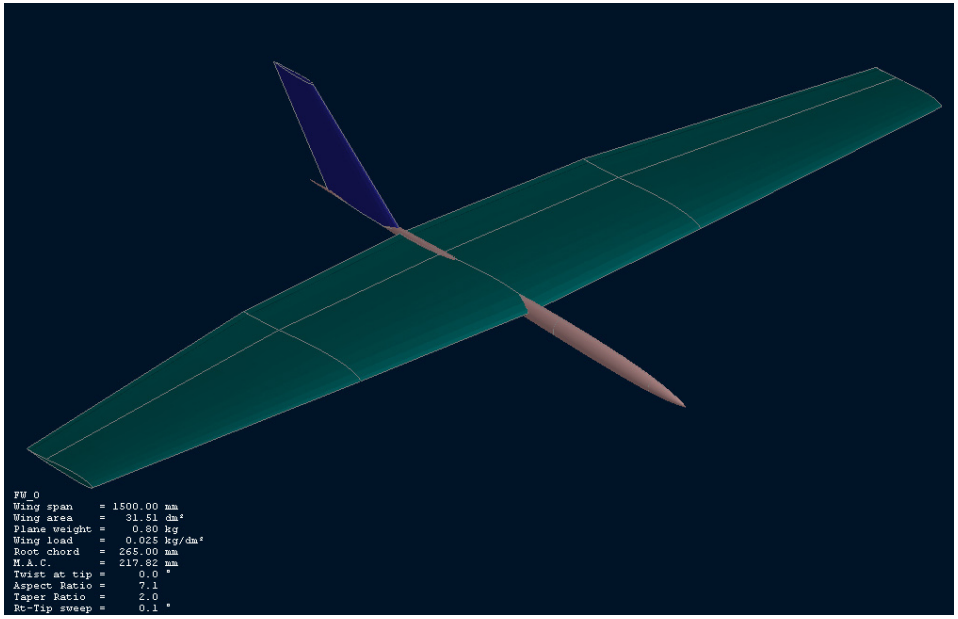


Figure 2

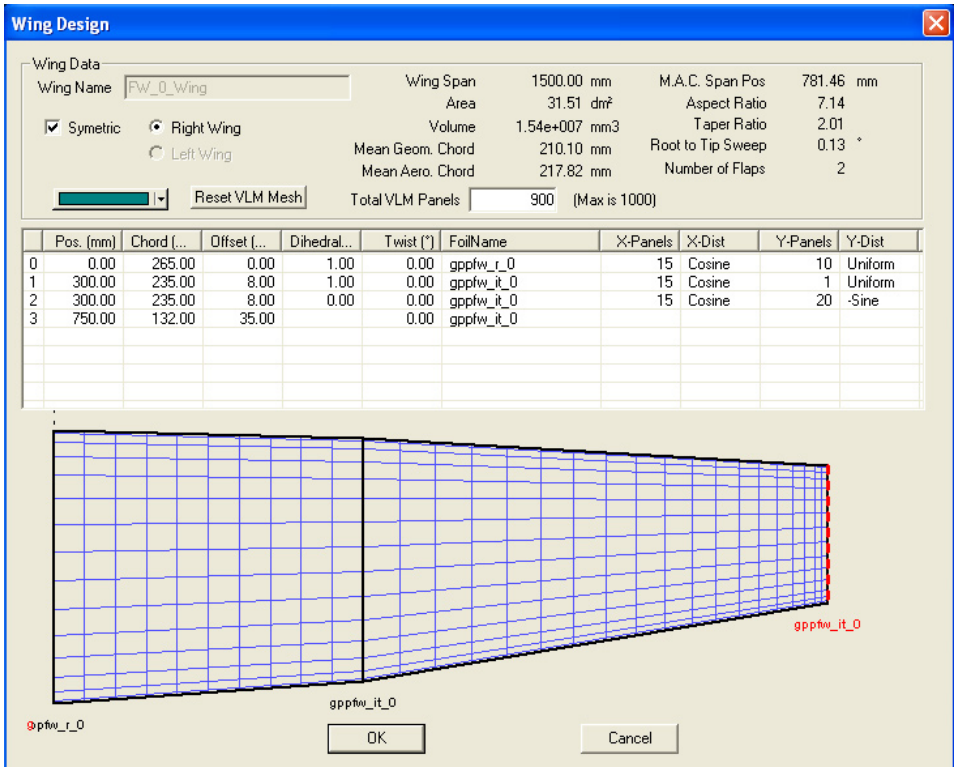


Figure 3

I was looking for a wing that would be easy to pilot (enough pitch stability over a wide range of angle of attack and speed), but also very maneuverable, had good performance (L/D ratio) in straight flight path, very fast and competitive for 60" racing, especially in tight turn.

Time and easiness to build was not forgotten, either.

The wing shape:

The half wing platform is made of two trapezoid panels with a backward swept leading edge and an inverse swept trailing edge with the goal to approach the same aspect ratio and loading of the equivalent elliptic wing.

Figure 3 is the XFLR5 input characteristics of the half wing.

The inner panel of the wing has 1° dihedral angle to increase the yaw stiffness, while the external is flat. Why 1° dihedral angle ? It's simply the best compromise between yaw stability effect and controllability, building aspect (due to the maximum thickness of the foam core) and minimization of the transversal contamination and perturbation of the flow.

Indeed, the whole wing is equipped with four flaps: the two inner flaps will be used as a V-tail elevator and are also electronically mixed with the external flaps to have at the same time a kind of full span elevator or aileron.

And since the wing platform cannot be separate from the airfoil, I tried to develop two “nearly” reflexed profiles.

The airfoils:

The flying qualities being mainly dictated by the airfoil characteristics, these have a slightly positive or null pitching moment coefficient (Cm) over a wide range of speed (Reynolds number) and angle of attack to avoid any “rodeo” trajectory and any inopportune change of elevator trim when speed is changing. The airfoils should also have as low as possible drag (CD) at low lift (CL) and a high lift when request for “high g” turn without hindering the speed.

They are designed for a flap hinge located at 30% of the chord, but there is not much difference for a hinge located at 25%. At this location we have maximum CL and Cm efficiency for the minimum flap deflection without increasing the drag too much.

The intermediate and tip airfoils are derived from the root one. The main difference lies on a decreased thickness and camber.

The polar of the root airfoil is compared with the famous PW51 (from Peter Wick) in Figures 4, 5, and 6 via XFOIL computation at different Reynolds numbers.

A fast comparison of the two airfoils show:

From Reynolds number 50K to 300K and low angle of attack (< 5°) GPPFW

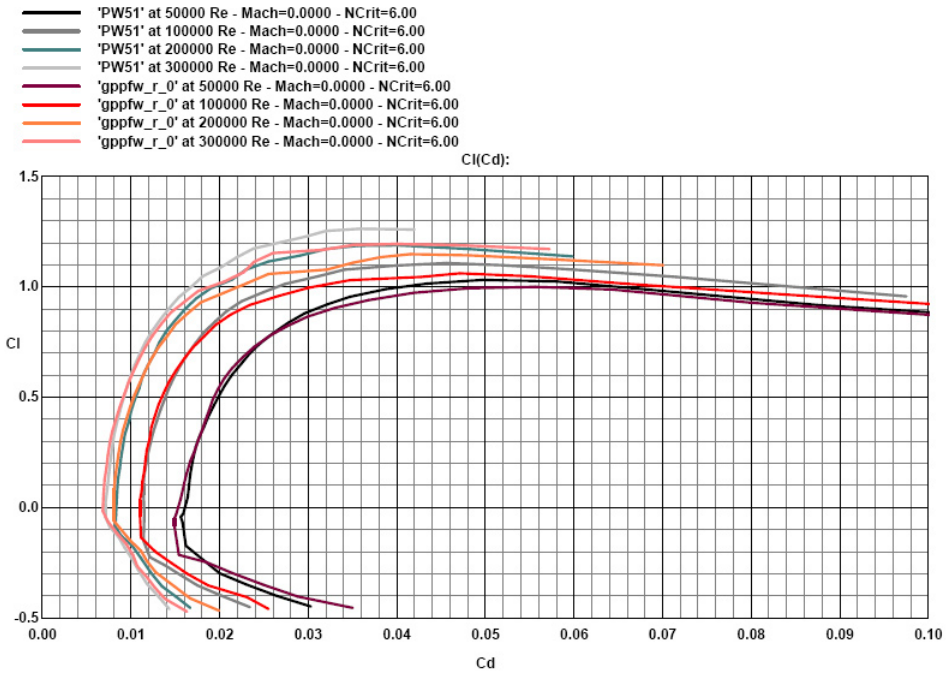


Figure 4

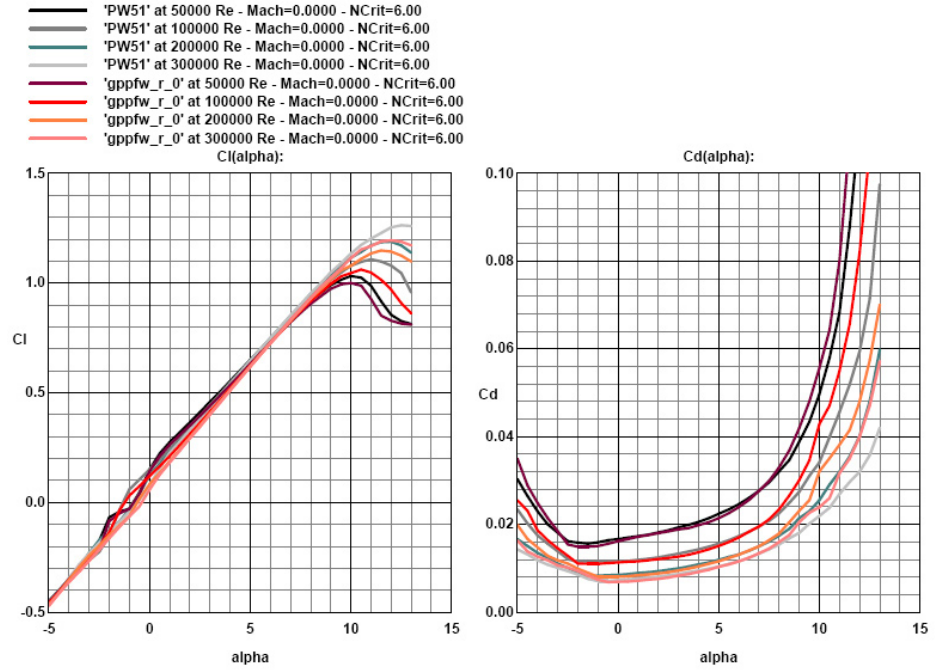


Figure 5

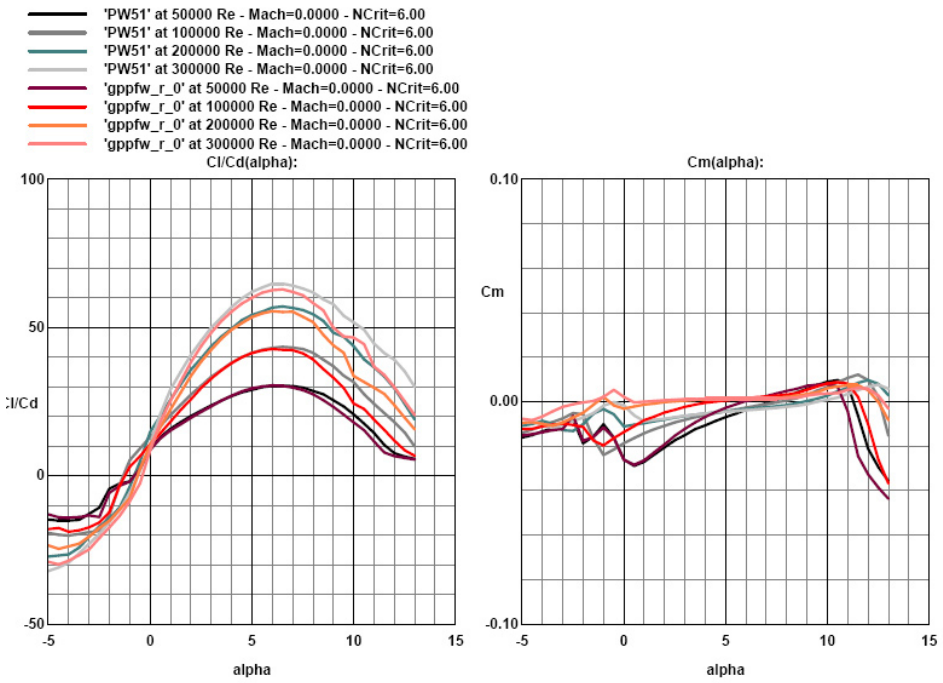


Figure 6

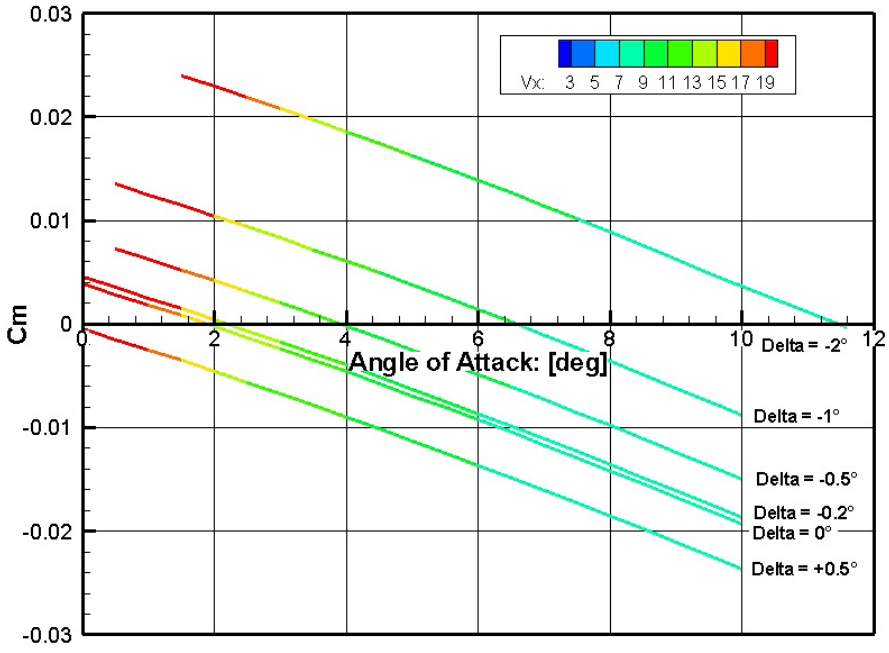


Figure 7

has slightly less drag than PW, but this advantage disappears at higher angles of attack. At higher angles of attack PW definitely has more lift than GPPFW.

CL/CD max is bigger for PW than for GP-PFW and is reached at an angle of attack 1° or 2° (depends on Re) more than for GPPFW.

For negative angles of attack GPPFW CL/CD is better than PW. Inverted flight is not really interesting for racing only, but can be useful for voltige (aerobatics).

The CM evolution is more constant for the GPPFW airfoil at high Reynolds numbers. The CM of the GPPFW is often near zero while the CM for PW is slightly negative which may lead to a need to trim by negative flap deflection causing a decrease of performance of the airfoil.

The flight test (I will write more later in this article) shows that with a 3% static margin the wing is quite stable, the flight path doesn't show any "rodeo" trajectory without adding artificial reflexed camber.

Consequently, those designed airfoils will have enough "natural" pitching moment without flap deflection. And, at a trimmed angle of attack the airfoil will be very clean and will work in the optimal conditions to reach the expected performance of the slick configuration.

Global computed performances

XFLR5 is a good tool to investigate the stability and performance of a 3D wing.

The different features are then extracted from this programme.

The evolution of the moment coefficient versus angle of attack for different flap deflection angles (delta) is given (see Figure 7).

These curves are obtained for a fixed center of gravity, and for one weight (28 gr/dm2) which is near the final wing loading I reached with the necessary trimming lead. The color scale represents the horizontal trim speed.

Moreover, on each of these curves there is only one point which can be reached by the wing in a static and steady configuration at full equilibrium (force and momentum) when the CM is null.

We can obviously notice that a negative flap deflection (upward) leads to a larger trimmed angle of attack and a lower equilibrium speed.

The stability criteria (dCm/dα: slope of the curves) is quite the same for each flap deflection, guaranteeing similar behavior and stability whatever will be the trim angle of attack.

Figure 8 shows the effect of a flap deflection (delta) on the CL/CD ratio at steady speed only. The color scale represents the angle of attack at which the steady speed is reach.

Figure 9 shows the CL/CD ratio including at the same time the speed equilibrium and the moment equilibrium. According to XFLR5, the maximum CL/CD ratio is

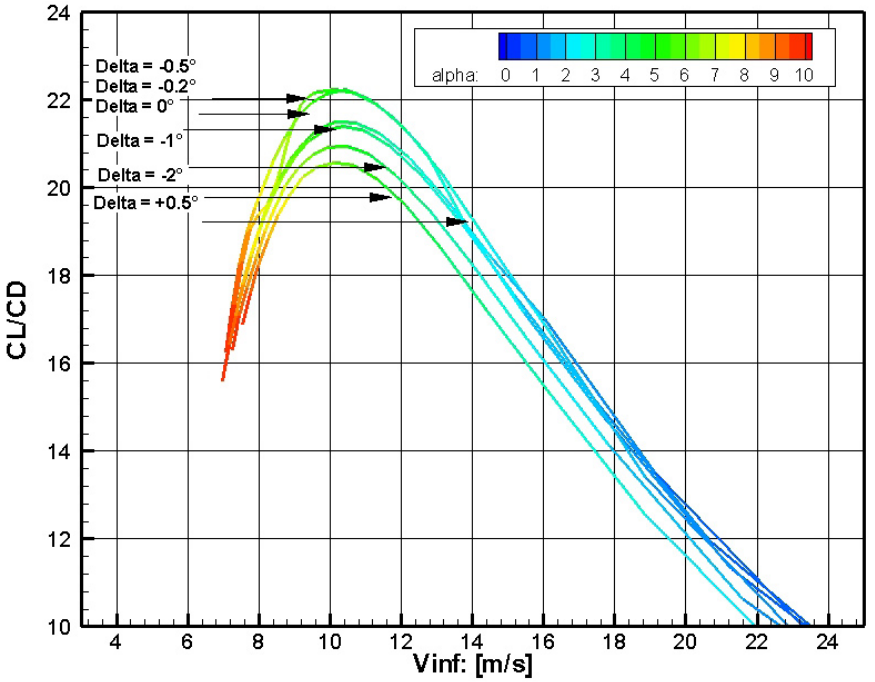


Figure 8

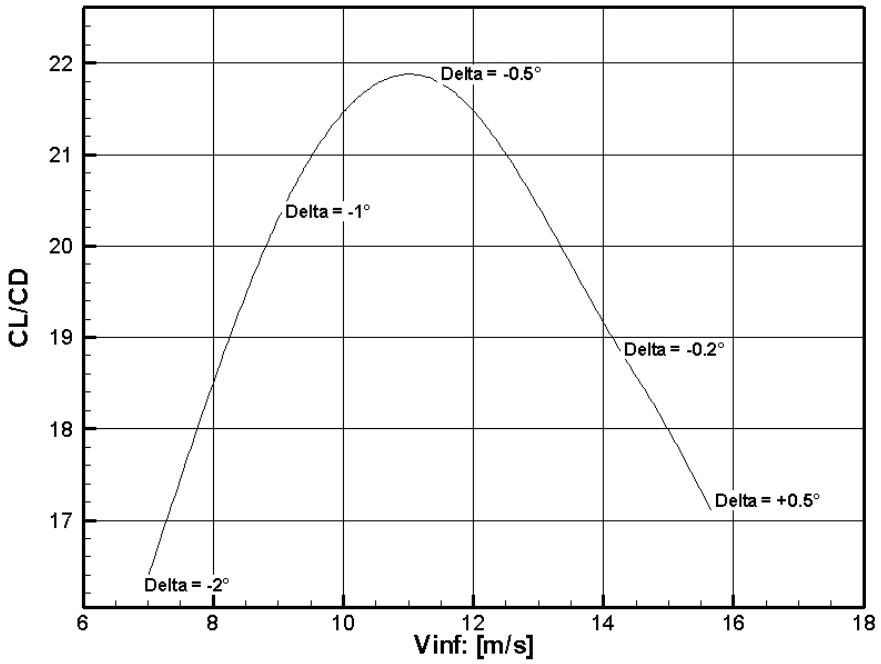


Figure 9

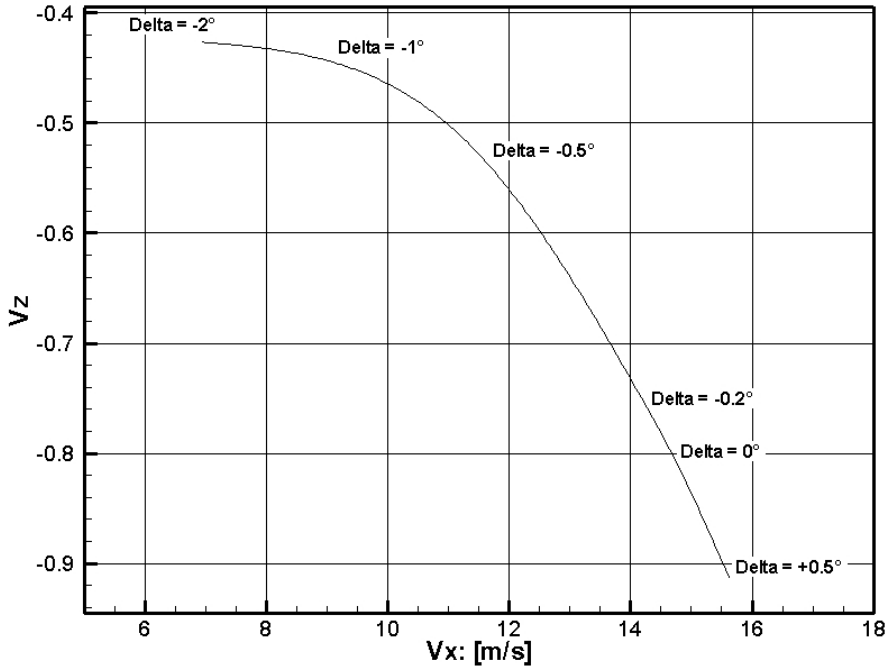
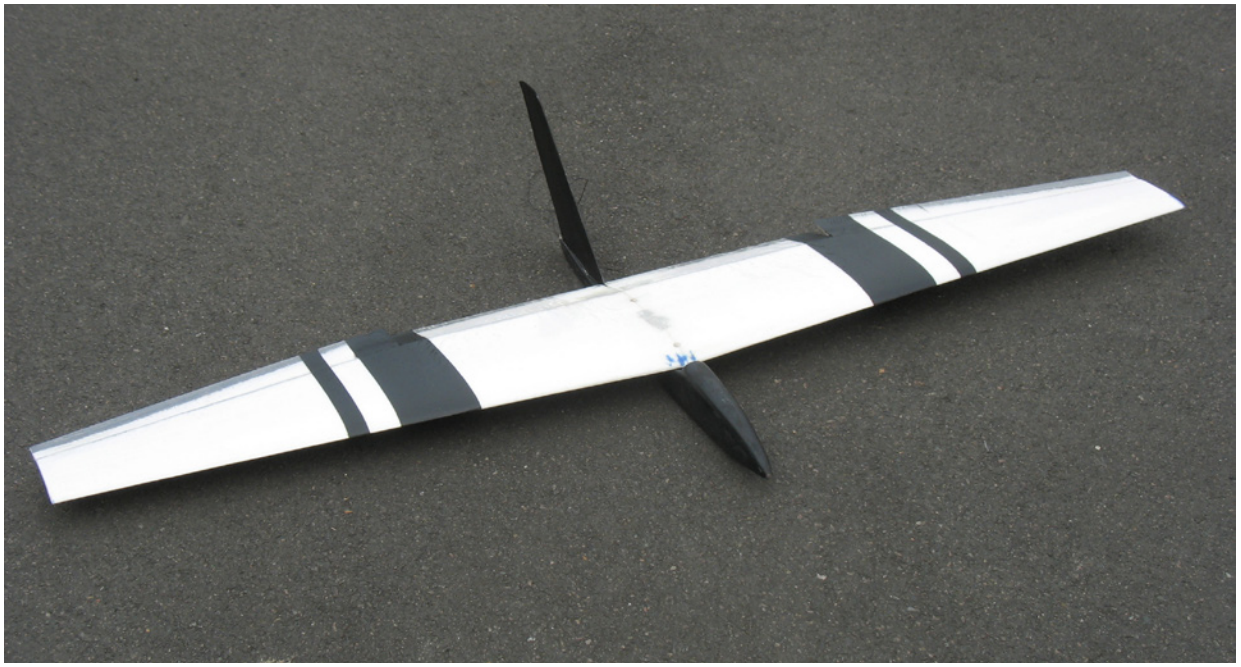


Figure 10



reached at 11 m/s for this wing loading and is around 22.

The wing can fly a wide range of speed (between 6 and 18 m/s) with only minimal flap deflection (less than 3°). And we can understand now why a flying wing aileron linkage must be, more than other conventional airplane, perfect and free from any end float. Of course to move dynamically from one to another equilibrium it needs more aileron deflection.

Figure 10 shows the corresponding polar speed. The minimum sink speed is around 0.4 m/s and is obtained at the maximum negative (upward) flap deflection. The maximum sink rate is around 1 m/s for positive (downward) flap deflection.

In flight

As I wrote previously, the flight tests are still on progress since I didn't manage to gather time, weather, winds... but the maiden flight proved that calculations (especially position of neutral center of gravity) were very good.

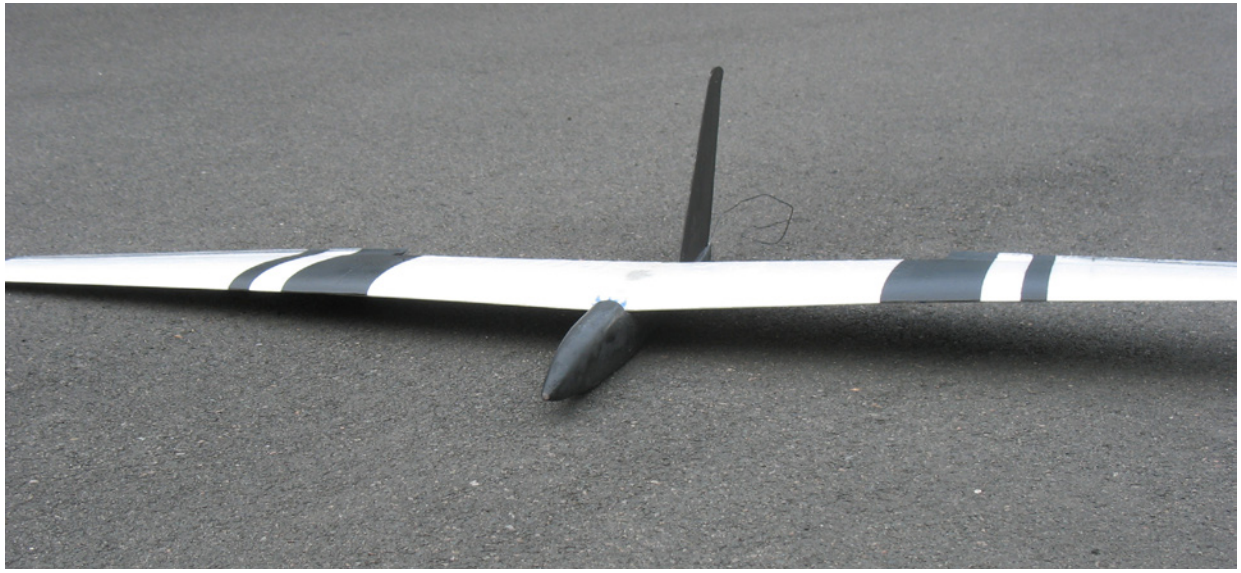
The speed is quite astonishing, as is energy retention even with a relatively low wing loading. I also have to explore higher wing loadings by ballasting.

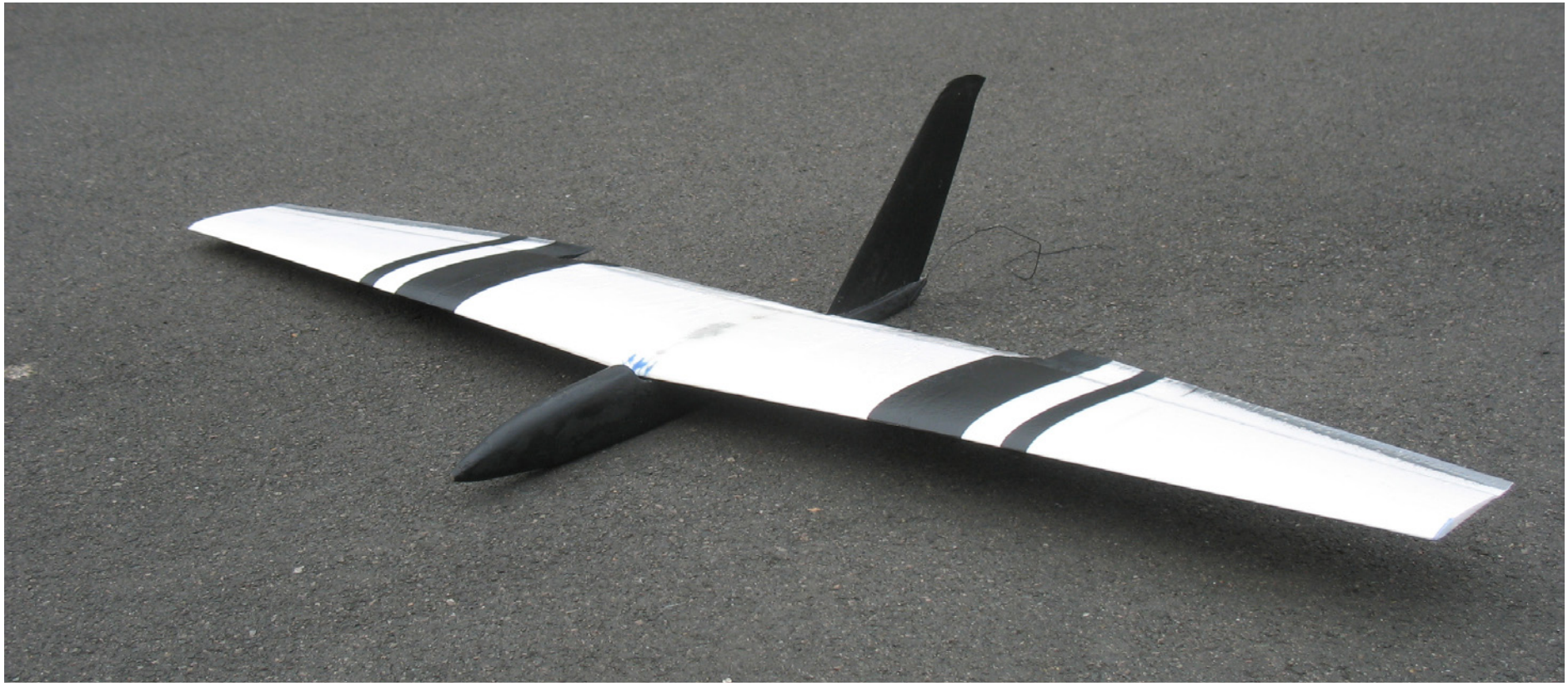
The behavior at very low speed is also incredible. With full upward flap deflection the wing is still maneuverable, and doesn't show any stall or instability. I also tried crocodile braking with success (a large amount of downward inner flap

deflection (>30°) can be indeed compensated by the outboard flap upward deflection).

The turns are a bit large for racing, but things may be improved by the use of the COG moving device mixed with accurate inner flap deflection. As soon as I explore the potential of this device, I will give more details in a future article.

So, I can simply conclude that well designed planks are not a critical platform and on the contrary it's worth it to fly them.





The 42nd Annual
SOAR for FUN
Cumberland, Maryland

By Peter Carr, wb3bqo@localnet.com

The Cumberland slope event was held on November 8th and 9th 2008 at Old Knobbly Hill.

The coordinator for the event, as for the past quarter century, was Skip Schow of the CASA club. He does the event announcement, checks with the landowner and arranges for the winch (?), "free lunch" table and frequency control board among other things. He also arranges for the access gate to be open on Friday for some unofficial flying.

The SOAR for FUN is a casual event designed to provide an excellent site for people who want to experience the best in slope conditions while enjoying the fall foliage. The outing this year was a little past prime for the leaves, but still gave everyone a great view of the terrain.

It is also a venue that can offer those people working on LSF tasks a great place to fly and plenty of witnesses to sign off on their flights. There was talk about doing a springtime 2009 event with the idea of giving the LSF achievers another chance at the site.

The hilltop location is backed by a line of trees with another line of low scrub bushes about 300 feet down the slope. This lower line of scrub makes hand launching a real challenge since it boils off a lot of turbulence. There were several hi-starts laid out as well as a regular thermal winch. All a pilot needed was about 50 feet of height at launch to get clear of the boiling air. From then on you could fly until either your hands froze or the ship ran out of batteries.

The site holds many memories for me.

My son Jeff and I flew there the year Dr. Walt Good and Don Clark were trimming out a Paragon with a newfangled full flying stab!

Upper left: A really big Zagi flying wing. This ship was also launched from a hi-start which isn't easy! It had a ball in the good air and was easy to land.

Above: An ASW-25 scale sailplane. This ship was absolutely beautiful in the air. It could be ground launched by winch using the dolly that did double duty holding it down between flights.

Left: A Stratos electric sailplane that had a ball out in the lift. It could range out into the valley while relying on the motor to get it home if the lift sagged.

Upper left: A very well built balsa RES ship with electric power pod.

Above: Meyer Gutman flew his Alpina.

Left: Doug Barry, Carl Luft and Skip Schow with Dougs ION electric sailplane.

Above: A ducted fan screamer. These small and agile ships would launch and then shut off the power. Their small size wouldn't let them range out but they had fun with aerobatics closer in.

Upper right: Meyer Gutmans' Alpina. The ship is equipped with pop-up spoilers that are very effective at landing.

Right: Two F3B class ships.

The FCC has mandated that analog TV channels will change to digital next February and our R/C bands of 72/75 MHz are right between TV channels 4 and 5.

We wondered if these frequencies were going to go away since the 2.4 GHz is gaining popularity. There is a lot of gear out there on 72 and 75 that would be useless if that situation develops.

The opposite hilltop has a considerable number of radio towers. The announcement sheet indicated that channels 17, 18, 23, 24, 28, 31 and 32 were not to be used due to interference from these towers. That may be the reason that about half the aircraft at the event were flown on 2.4 GHz.

Some of the pilots told me that the new A-123 batteries are a better choice for electrics.

The site holds many memories for me. It was at the event that an organizational meeting was held to form the East Coast Soaring Society back in the ’60s. It was also at Cumberland that the Eastern Soaring League was formed some years later. My son Jeff and I flew there the year Dr. Walt Good and Don Clark were trimming out a Paragon with a newfangled full flying stab! I can still see those two legends, huddled against a stiff and chilly breeze, tweaking the stab on that grand old design.

The event this year was not quite as well attended as in 2007. With gas prices down considerably I had thought that more pilots would have been there. Still, the quality of the aircraft and the flying were in top form.

I had a nice chat with Meyer Gutman who brought along a very pristine Alpina sailplane. This ship has wing tip extensions for thermals, but Meyer decided to fly without them in the good lift. There was also an ASW-25 of about four meter span that looked absolutely scale at altitude.

The great majority of larger ships were electric powered. It was easy for them to get past the scrub turbulence on launch and even easier to land. I watched several ships hit the power to stretch the glide while landing in unexpectedly choppy air.

I talked to some of the pilots who told me that the new A-123 batteries are a better choice for electrics. It appears that the cells can be recharged a greater number of times before needing replacement than Li-Pos. They are also much safer. These packs still need a balancer when charging.

Batteries, their care and feeding were the second most popular topic of conversation after 2.4 GHz radios.

I talked to Doug Barry about the cells in his Ion electric “warmliner.” He said

An F3B class ship is launched from the winch. Because of the good landing area Cumberland is one of the few sites where these complex and expensive ships can be flown on the slope safely.

Upper right: The pilots cabin with large Plexiglas windows. Duration task pilots can sit inside near the propane heater and coffee pot while working the lift.

Right: Launch of a F3B ship from a hi-start! Yes, it was a very stout hi-start. The ship only needed about 50 feet of height to get out into the lift.

that the ship used to be considered a "hotliner," but technology has passed it up.

He mentioned that the use of carbon fiber around a 2.4 GHz radio would certainly spell trouble. Ships like the Ion which has no carbon do just fine on the new band.

Bruce Musser from the Harrisburg Pennsylvania area is also a ham operator, so we spent time chatting about R/C receivers. The FCC has mandated that analog TV channels will change to digital next February and our R/C bands of 72/75 MHz are right between TV channels 4 and 5. We wondered if these frequencies were going to go away since the 2.4 GHz is gaining popularity. There is a lot of gear out there on 72 and 75 that would be useless if that situation develops.

There were a very wide variety of sailplanes at the event of both balsa and composite construction. One pilot had a very nice poly ship with an electric power pod built above the fuselage. He could dismount the pod and fly off slope or from a hi-start. He used the pod at Cumberland to get clear of the turbulence on launch, then shut it down and fly the lift.

I also had a nice chat with Carl Luft. I first met Carl at the AMA Nats many years ago when he ran the computerized scoring operation. Carl is one of those guys that work hard behind the scenes to give the rest of us a good time. It was great to see him.

Skip Schow had given me an old ProLine transmitter at the event several years ago. It had sat in his shop bench drawer for over 30 years and he asked if I wanted to rebuild it. The restoration was interrupted by a trip to Afghanistan, but I finally finished it. The transmitter is married to an old ACE Silver Seven receiver and installed in a Gaggler sailplane that was designed in 1970 by Carl Lorber. The transmitter and vintage sailplane look right at home together. The radio link has "OOS" range on AM in the 53.xx MHz band. I brought the ship and the transmitter to the event to show to Skip. He was amazed that it turned out to look nearly brand new.

The MP8K group on Yahoo Groups has a lot of material on these old radios for anyone who has the interest. Many of these people are not hams but enjoy radio restoration just the same. Lately there have been a lot of threads about converting old rigs to 2.4 GHz using the readily available transmitter RF modules with the new receivers. It's all good for those of us that "feed our geek side."

I flew the Kestrel 3, a 12 foot span sailplane which is a blown up version of the 100 inch kit from Northeast Sailplanes. It's configured for the LSF 8-hour and also the 10K Goal & Return tasks with a Don Clark Thermal Sniffler and large batteries. It was fun to spec it out while making different trim settings on the transmitter.

I also flew a Thermic from Art Hobbies. It's a Vee-tail slope ship of 100 inch span with added flaps. The ship weighs about 30 ounces ready to fly and is extremely agile in the sky. It's also about four years old which is very ancient for a sloper!

Unfortunately, I was only able to attend the Saturday edition of the event. The word was that Sunday would have several people flying LSF tasks, including the venerable 8-hours. Daylight is only about 10 hours long at Cumberland at this time of year so the window of opportunity for the 8-hours would be limited. I hope they were successful.

In mid afternoon the temperature started to drop as a weather front came in from the west. I decided to pack it up for the 3-hour drive home.

As I pulled out I took a last long look at the activity still going strong out in the lift. Those guys would not quit until it was too dark to see their planes.

I wished them well and resolved to come back again in 2009.

by Izak Theron, fuzzchucker@gmail.com

Photos courtesy of Tanya Carnall, John Godwin, Piet Rheeders & Izak Theron

It all started a few months ago. The idea of the PSS event was the brainchild of Paul Carnall, chairman of Eastern Thermal Busters, a gliding club in Gauteng, South Africa.

Once a date was firmed up most of the eventual participants started planning in earnest to have at least one new model to fly at the event and the more industrious amongst us, like Mike May, even two or three models.

The event was planned for the weekend of 11-12 October at one of South Africa's top slope soaring meccas, Tamatieberg, just outside of Volksrust in the Mpumalanga province.

Richard Cascignani's A388 takes flight.

I decided from the onset that building time would probably be in short supply and hoped that keeping the size down to about 1.2m would mean a quick build. As it turned out I made it with one evening to spare. The subject choice was almost predetermined as I previously owned a scratch-built F18 Hornet that I inherited from Paul and I enjoyed flying it for an all too short time when a midair decommissioned it. A big plus was that Paul still had the templates for it. Picking the colour scheme was even easier. I have an unexplainable affinity for blue and yellow in the colour schemes of my planes, so the choice was obvious; it just had to be the Blue Angels.

In the weeks leading up to the event, interest started growing and the entry list quickly expanded to more than 30 entrants. Build threads and progress reports appeared on the club blogs of ETB <http://easternthermalbusters.blogspot.com> and BERG <http://berg-gliders.blogspot.com>. This activity was instrumental in creating awareness and interest in the event. Slow builders were prodded on by an eager web audience to speed up the building and posting.

The weather gods started teasing us with good winds weeks before the event, and the forecasts were also looking good. As organizers of this inaugural event we decided to be a little relaxed about it and allow non PSS aircraft to be flown as well. Sort of a general slope meet with PSS as its main theme. We secretly allowed this relaxation in the rules for two reasons. Firstly, because we know from years of experience at this venue that although you are almost guaranteed flyable conditions on every outing, it can also be highly unpredictable. Secondly,

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Left: Models lined up and ready to fly.

Opposite page —
Upper: Dennis Bird and his Me-109
Lower: Dion Liebenberg and his Hurricane.


USAF
U.S. AIR FORCE

This page —
A collection of F-86 models, clockwise from above: Chris Adrian, Jacques Pretorius, Johan Bruwer.

Opposite page —

Clockwise from upper left: Paul Carnall shows off his Cessna T-37 Dragonfly. Mike May and his A-10 Warthog. F-18s by Izak Theron.

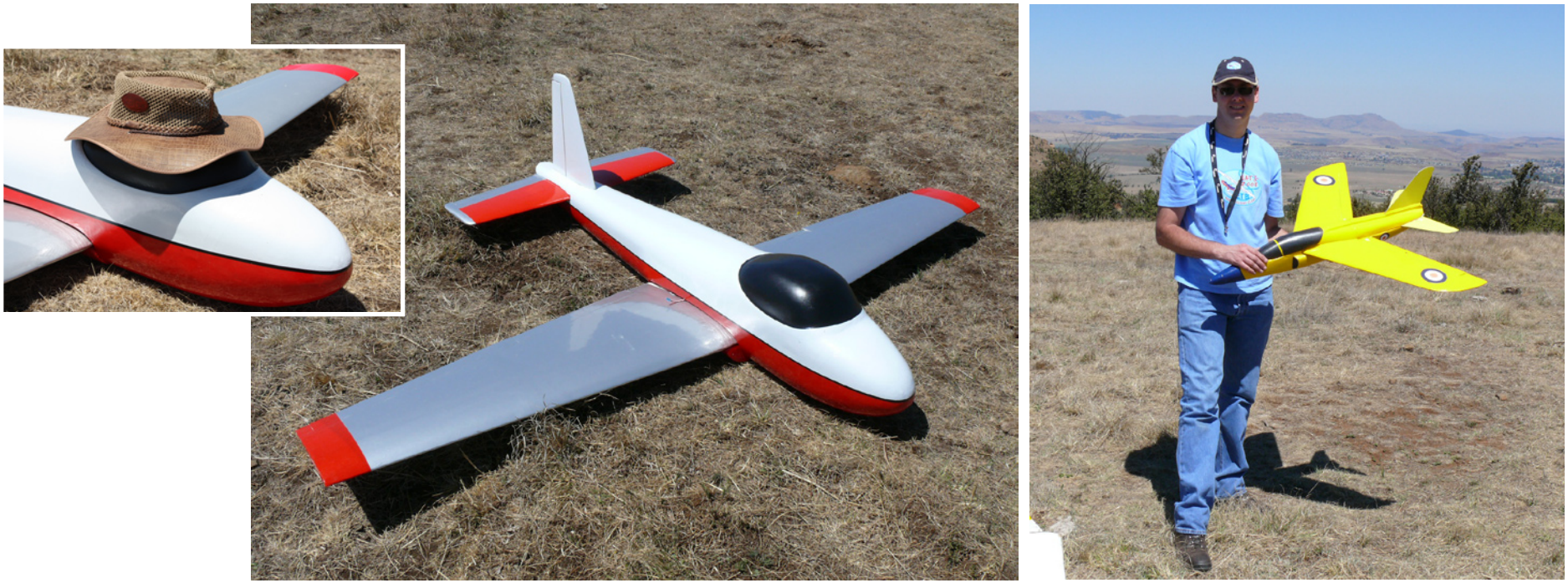
This page —
Left: Pete Milne carries his Martin-Baker MB5
Middle upper: Piet Rheeders sets up the display landing gear on his Aerocommander.
Middle lower: Rudy King and his powered Cessna.
Right: Norbert Rudolph holds his F-5

Opposite page —
Clockwise from upper left: Richard Cascignani's P-51 Mustang. Philip Otto and his huge Hughes H1. Richard Cascignani's BD-5. Dion Liebenberg's BAE Hawk.


Airliner
A380


NX 258Y


RC PILOT



A BAC Provost by Herman Weber, and Paul Carnall with his brilliantly colored Gnat.

these aircraft invariably have high wing loadings (i.e. they thermal as well as their full size cousins) and would need winds of quite some substance. It turned out to be a good decision, but let's not get ahead of ourselves.

A few of the guys managed to sneak away from work early on the Friday and squeezed in some flying on the Friday afternoon. Saturday morning arrived with clear skies and not a breath of wind at home, but then I wasn't worried as the slope is 260km and a 2½ hour drive away. That's what being an optimistic "homoslopian" means, isn't it? It was only as I approached Volksrust that I was starting to think we may just be dealt a crappy hand by Mother Nature for the day. Arriving at the slope there were already a couple of people about and..., wait for it, yes you guessed it, no wind!

Nevertheless, after greeting and chatting to some old and some new faces, the PSS ammo was unpacked and ever optimistically put together. A quick tour followed, checking out all the other models already on display. It was evident that the guys spent long hours on some of the projects and the planes ranged

Opposite page —

A collection of Aermacchi MB-326 Impala. Clockwise from upper left: Glen Pyle, Johan Bruwer, a pair of Impala on the ground, and Rudi King.

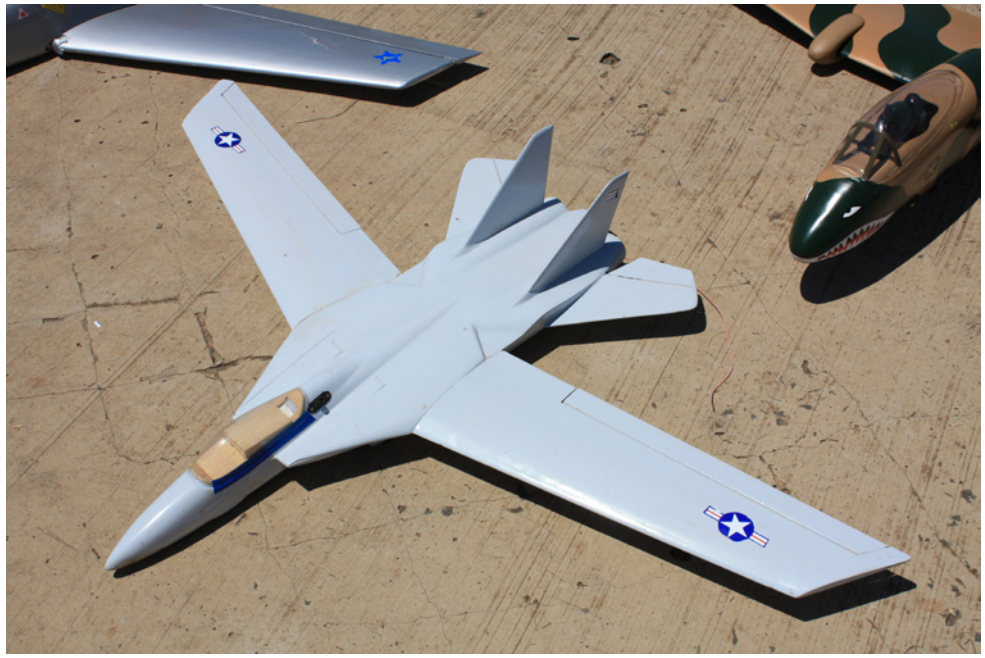

S.A. AIR FORCE
1234


PSS FEST OCT 2008
3:1

from the inevitable imported EPP models (I wonder why not a single local hobby shop sells these…?), to the local standard of glass over foam construction, to some very nice looking fiberglass molded Impalas (Aermacchi MB339) and F86 Sabres from Anton Benning Models <http://www.abmodels.co.za>. This must have been the biggest collection of PSS models in one place ever in South Africa! It was hard not to drool all over some of the models.

A quick pilots' briefing followed around midday. Frequency control was sorted out and it was explained how the judging was going to work. The pilots were each handed a voting slip on which he had to indicate, in order of preference, his top three choices of planes, with the only two rules being that the plane must have flown during some point over the weekend (there's that optimism again...) and that you obviously cannot vote for yourself. The criteria were left up to the voter to determine. The votes would be collected the next day after everyone had some time to look at the opposition.

Early morning "slermal" activities saw the vast majority of the PSS fleet grounded and the electrics and thermal ships were put to good use. For those un-initiated amongst us, "slermals" are those dreaded slope thermals Mother Nature generates to come and spoil our fun when she does not feel like blessing us with some decent winds!



This page —
Upper: An F-14 Tomcat owned by Evan Shaw.
Lower: Blake May holds a colorful L-39 Albatros.

Opposite page —
Jason Weber watches the action with a resting P-51 at his knee. One of the beautiful PSS Fest trophies.

Norbert Rudolph, fearless as ever, patiently waited for the right window of opportunity to launch his DG600 and was soon carving up the sky. Young Devon Mooiman and his electric assist EPP Fox had a ball of a time and he must have managed to put in the most hours of all the pilots on the Saturday with his various other electric craft, including a well worn ducted fan F16 Eagle and a nippy little Mustang. A few other pilots with their EPP craft like Zagis and Bats were also taking the opportunity to get in some stick time and Cobus Visser joined in the fun with his light-as-a-feather (285 gram) own-design EPP plank. It wasn't long before some light duty combat ensued when the lift picked up sufficiently between the dreaded sink periods.

Although the wind started swinging around from the northwestern slope to the southern slope, which generally produces more consistent lift, sadly conditions didn't improve enough by the time most of the pilots decided to retire to Louis' farm to watch the very important Currie Cup semi-final between the Bulls and the Cheetahs! Between Phillip Otto and Piet Rheeders they had even organized a portable big screen and satellite dish so as not to miss any of the action. Pity the reception was too poor to get a picture. We had to settle for listening to the match on radio. But then being a Bulls fan I never had any doubt that they would emerge victorious... A handful of dedicated slope addicts stuck around a little longer and managed some half decent late afternoon flying on the eastern slope.

The customary evening braai, followed with the big screen now being put to good use viewing everyone's photos of the day. As a fitting touch to the evening entertainment, Cobus brought his PSS Masters DVD from Radio Carbon Art along, which was about the closest most of us were going to get to PSS'ing for the weekend... After a week of late evenings trying to get the F18 done on time, I was pretty whacked and decided to retire early.

Conditions looked fairly promising early the next morning and after getting some sustenance in the shape of a decent farmhouse breakfast it was off to the slope for an early start. It appeared the previous day's lack of wind had its toll on the pilot numbers. A good number of guys weren't there on Sunday. A pity, as one of my personal favorites was the immaculate MB5 of 85 year old PSS veteran, Pete Milne, who would surely have placed in the top three.

Without decent wind, the PSS 'ships were grounded, but a few "slermals" allowed Norbert Rudolph's DG-600 to carve up the sky for a while.

Paul Carnall's A-37 Super Tweet. His Folland Gnat rests in the background.

As it turned out, the wind was once again mostly thermal driven and as a result we had to strike the “model must have flown” rule for the voting process as it would have eliminated the vast majority of the models. The models were lined up for display and ballot papers collected. We kept the scoring system simple. Points of 3, 2 or 1 were awarded respectively for 1st, 2nd and 3rd positions each ballot slip. Tanya Carnall did the honors of tallying the votes. A well deserved and convincing first with 31 points went to Piet Rheeders and his 40-day build Rockwell Aero Commander, inspired by Bob Hoover. Mike May on 17 points took second with his A10 Thunderbolt, closely followed in third with 13 points by Herman Weber and his Provost. Paul ended up in the top three with his Dragonfly (he would not disclose his total), but graciously withdrew as organizer, and that after all the effort of making the stunning little trophies. Good on you, Paul!

With the prize-giving done and the wind once again not playing along, the guys started hitting the long road home around noon. Some brave souls like Johan Bruwer and Rudi King ventured a launch or two with their Impalas in the iffy conditions, both of which ended up in some vigorous climbing activities. Johan’s plane sustained some minor damage, the most being done to his pride, and Rudi’s Impala seemingly came out unscathed. I lingered around until about 3pm, ever hopeful that conditions would improve, but to no avail.

The weekend may not have delivered on our expectations, but the camaraderie alone makes the trip worthwhile and if ogling all these beautifully finished models doesn’t inspire you to go home and start planning your next PSS model, nothing else will!

That optimistic streak exhibited itself again when, on the way home I discovered that the distance from home was directly proportional to the remaining level of disappointment. By the time I got home I was ready to turn around and hit the slope again!

Roll on ETB PSS Fest 2009!!!

Eight Hour Slope Flight at Soar Utah 2008

By Clarence Ashcraft - Sandy, Utah
Photos by Dave Garwood

Clarence Ashcraft's MM Glider Tech Marauder flies over the topography looking south from the Point of the Mountain. Inset - The Man himself, Clarence Ashcraft, photographed during his LSF eight hour flight on Aug 30, 2008.

This year was the year for Soar Utah 2008 and I decided it was a great time to do my LSF slope task of eight hours. The Point of the Mountain, where our club flies, is actually just a small part of the slope. We normally share with the hang gliders and paragliders, but this year the State of Utah Parks Department made an unprecedented decision to grant exclusive use of the entire slope to IMSF for four full days. That meant no hang gliders or paragliders to compete for air space during our event dates and times and the sky could be filled with R/C planes alone.

For those who have not visited this particular slope before, put into your mind a big sand bar about π of a mile long and about 500 feet above the valley floor. It has a beautiful view of the surrounding mountains and valleys. You need to visit this site to truly appreciate how great it is.

One of the things that helps to make the Point of the Mountain such a great inland soaring site is the constant smooth wind that flows. Almost every morning you can count on a wind from the South and if there is no storm front approaching it will change to a northerly direction in the afternoon. The flow from the North will allow you to fly well into the evening.

The Point of the Mountain is a great place to do an eight hour LSF slope task especially with an approaching storm front. You can have two or three days of non-stop lift in one main direction. When I started to plan my flight I was scheduled for Friday August 29, the first day of Soar Utah. Unfortunately the winds did not look like they would continue the whole day and I did not want to get seven hours into the task and then have to try again. George Joy and I decided to go out to the areo-tow instead to enjoy the day.

Two years ago, areo-tow was added to the Soar Utah event schedule and it looks like it has become another big part of our event. The lake bed for this event is extremely large which allows the tows and landings to be from almost any direction. If there is a wind shift or if someone miscalculates they still have more opportunities to land safely. There were so many planes going out on tow

Right: LSF eight hour flight takeoff and landing location at the west end of the Point of the Mountain slope flying site in Sandy, Utah.

Clarence Ashcraft's MM Glider Tech Marauder flown for more than eight hours.

from that dry lake bed that I hated to see it come to a close. It was a great day of soaring for all.

For me, Saturday morning August 30 arrived way before sun up and it was filled with putting my plane together, doing pre-flight checks and making sure that I had everything I needed, including my two witnesses. The reason I wanted to get started so early was to ensure that I would finish the eight hours before a change could take place with the wind direction. The weather forecast was for an approaching storm front so the wind from the south was not expected to change direction but I didn't want to take a chance on it.

As the sun was just starting to outline the mountain ridges, the time had come to send my plane out for the task. It was still dark enough that we could see the stars in Orion,s belt, but I could see my plane and that is all that mattered so with a toss out the plane went with eight hours to go.

During my flight I took the opportunity to walk to the other end of the slope. I was able to visit with many new pilots and friends that I had not seen since the last Soar Utah event. My walk along the slope used up a large chunk of the time, but I needed to get back down to the other end of the slope to ensure that I was out of the way of the pilots that came to fly at the event.

Before my flight I had set some goals for myself to work on during the eight hours. I wanted to get to know my plane better and to practice turning it in smooth flat circles. I,m hoping to benefit from this practice when I head out to the thermal field. It seems that some of the practice this year has paid off. I had one of my best finishes at the Visalia Fall Fest, but that is a story for another time.

As with all things, my time in the air had passed and I landed with 8:03:58 on the clock. It felt good to remove both hands from my transmitter and to let my neck relax back to normal. It also felt great to have accomplished what I had set out to do that weekend.

I would like to take this chance, once again, to thank Mark Howard and George Joy for sharing their time and for being my witnesses on my LSF slope flight. Also a big thank you goes to Merrill Brady (MM Glider Tech) for helping me get my Marauder set-up and for continuing to urge me to go forward with my LSF program.

THINGS I LEARNED

- Choose a good RES plane like the Marauder (big, stable and performs well)

- Know how much power you will need for your plane. I used 4000 mAh sub C cells and I had only used 1800 mAh for the entire flight

- Choose a 2.4 ghz radio system. I used an Airtronics RDS8000 FHSS with a 1800 mAh 3 cell lipo for power. I used a little over 1500 mAh for 8 hours.

- Set some flight goals to work on during the flight

- Prepare for the flight (pre-flight). Don't leave anything to chance.

RESOURCES:

Airtronics
www.airtronics.net

League of Silent Flight
www.silentflight.org

MM Glider Tech
www.mmglidertech.com

Opposite page:

Left: George Joy, LSF witness, photographs Clarence's Marauder on final approach at the successful conclusion of his LSF eight hour flight.

Upper right: Mark Howard, LSF witness, and Clarence Ashcraft both seem to have a spring in their step at the conclusion of Clarence's LSF eight hour flight.

Lower right: Three accomplished RC sailplane pilots, George Joy (Gilbert Arizona), Clarence Ashcraft (Sandy, Utah) and Mark Howard (Golden, Colorado) after the successful conclusion of Clarence's LSF eight hour flight.

International Morelli Club

Morelli M-100 S N88981

walk-around by Mark Nankivil, nankivil@covad.com

M-100 Background

In January 1956 the Italian Aero-Club, in order to increase the number of sailplanes for the Italian gliding clubs, announced a competition among all Italian sailplane designers and manufacturers to select a modern single seat glider. According to the announcement of the competition, the sailplane should have been first of all low cost, strong and easy to repair and inspect, with characteristics for both sport activities and training for the achievement of C pilot licence. The quotation was requested for a single prototype and for a series of ten sailplanes.

On the 14th of April 1956 Alberto and Piero Morelli sent their proposal enclosing the drawing of a sailplane named M-100. That proposal was well accepted by the Aero Club who immediately placed the order for the prototype which was built by the company Nicolotti & Figli, specializing in woodwork.

To keep the cost down, the Morellis limited the size of the sailplane, but fixed as a target a glide ratio of 30 and a wing loading of 20 Kg/m^2.

As the wing load varies with the wing span and the aspect ratio, they chose a wing span of 14m which resulted in a low weight and also in a low cost.

The fuselage cross section was designed following the experience of the Veltro with a reclined seat.

The tailplane was also designed based on the experience of the Veltro to reduce the damage in case of an out landing, but the rudder surface was increased passing over the elevator to provide a great aerodynamic compensation surface.

The M-100 was built under the supervision of the members of CVT in only six month per terms of the contract, but actually the time was not enough to thoroughly fix the performance of the sailplane.

Advent of the FAI Standard Class

When the M-100 was finished it was sent to the airfield in Rieti, where the test pilot Quirino Scano performed several tests which revealed a number of problems which were fixed by Alberto Morelli during 1957.

The most significant improvements were:

- the ailerons were modified from the usual hinged type to a slotted type to improve their efficiency at small deflections

- the rudder size was reduced by eliminating the part aft of the elevator to reduce excessive aerodynamic compensation.

- the spoilers were replaced by two pairs of counter-rotating plates made of fiberglass and polyester resin to prevent suction at high speeds.

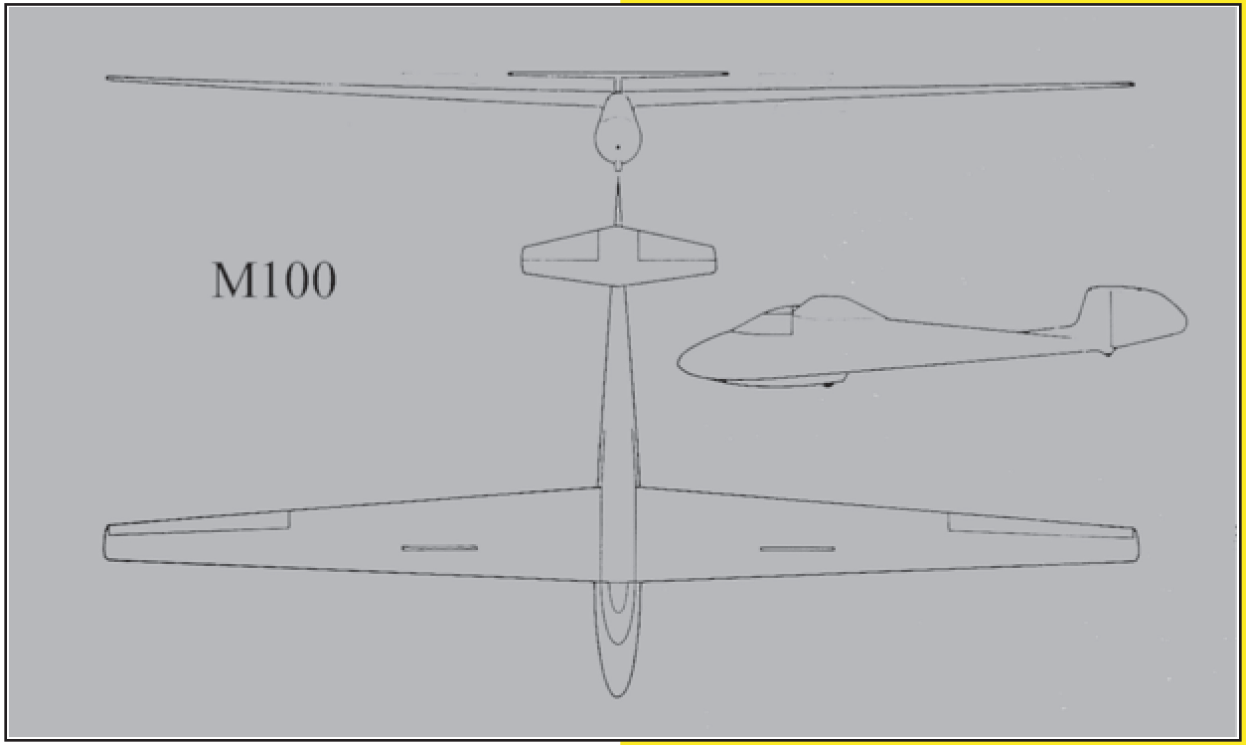
Besides these changes, the control cables were replaced by push-pull rods and the solid rubber landing wheel was replaced by a pneumatic tire.

One year after the publication of the Aero Club competition, when the M-100 was almost completed, the FAI, through their "Commission International de Vol sans Moteur," introduced the Standard Class and released the specification based on the OSTIV proposal:

- Wing span not exceeding 15 metres
- Flap not acceptable
- Fix undercarriage with 300 mm wheel
- No radio on board
- Powerful airbrakes

The Standard Class was expected to take part in the World Championship in 1958 at Leszno in Poland, so the Italian Aero Club requested that the M-100 be mass produced have modifications to meet the Standard Class specifications. Under these circumstances the M-100 S (with "S" standing for Standard) was designed with 15m wing span and the wing root section thickened from 14% to 18%.

The airbrakes were increased from two to three pairs of counter-rotating plates and they were very successful, allowing the M-100 S to land in a very short space, a very important feature in case



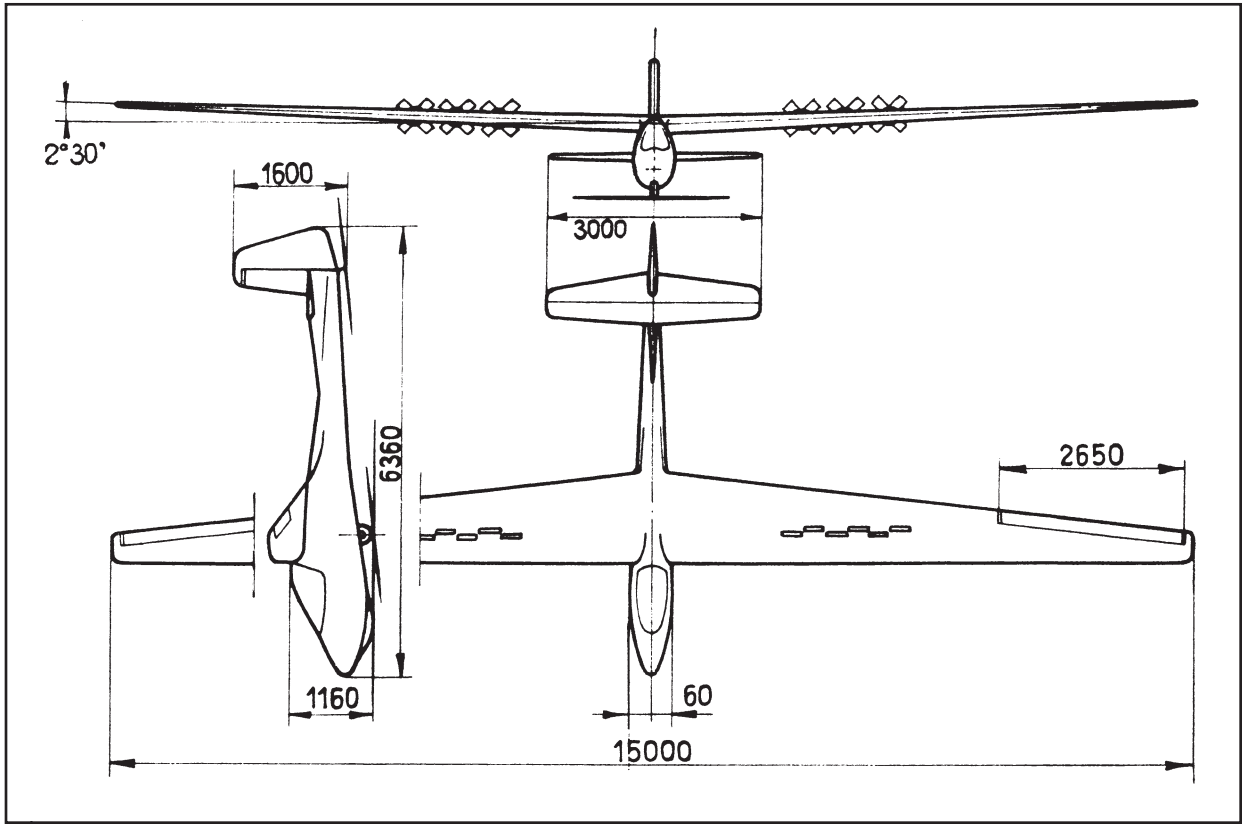
Design of the M-100 S

of out landing. The tailplane was also completely redesigned. As a result the M-100 S became a completely different sailplane.

The first prototype was built in Trento by the company Aeromere and tested with great satisfaction by Alberto Morelli on the Aeritalia airport on the 23rd of January, 1960.

The second prototype was made ready on the 14th of May of the same year and tested by Captain Ferruccio Vignoli, an experienced test pilot, who performed the severe FAI airbrake test. The M-100 S, registered I-VELB, was brought to a safe altitude and put into a dive with the air brake open. It did not exceed 200 Km/hour for 1600m (FAI requested only 1000 meter). As to the question of why he dove for 1600m instead of the prescribed 1000m, Captain Vignoli answered, ”I wanted to have a good margin for the result of the test!”

Production began at Aeromere and Avionautica Rio, and a total of 83 sailplanes were produced in Italy. Later, the M-100 S was produced in France



N88981

by the company CARMAM of Moulins, which changed the name to “Mésange” and produced over 120 units in a little more than ten years. A total of at least 180 units were produced by several manufacturers.

(All above information from the Experimental Soaring Centre of the Turin Institute of Technology)

This particular M-100 S was manufactured in 1963 by Aer Pegaso, serial number 041. Its current certification was issued on the 15th of February, 2008.

Dave Schuur came across N88981 while trying to find a trailer for his Ka 6e. He bought the trailer and put the M-100 S inside. Dave convinced several others to help make it airworthy (help pay expenses, work), and the International Morelli Club was formed as a result.

Water damage from a leaky trailer was found, but the main problem was possible rust on the root fittings and bolts of the wing. There was also possible de-lamination of wood and glue joints of the built up plywood box spar at the root. The delamination and glue proved to not be a problem, but bolts needed to be replaced and required FAA approval with the typical FAA inspections and approvals. The glider was stripped down and recovered using Stits covering. This took about six months.

The group is still looking for a replacement canopy to finish the project.

Generally, this M-100 S flies nicely, and the dive brakes are very effective. It does tend to feel like sitting on a beach ball when thermalling slowly. It is necessary to keep the speed up to maintain control while circling. It will drop a wing when stalling. Maintaining speed on approach is very much a necessity. Otherwise, just a fun plane to fly.

Our sincere thanks to Dave Schuur for providing information on N88981.

Morelli M-100 S

WING			
Span	15m	Area	13.1m^2
Root chord	1.30m	Aspect ratio	17.1
Tip chord	0.45m	Dihedral	2.5 degrees
Wing section, root	NACA 63-618 mod.	1/4 chord sweep	-1.1 degrees
Wing section, tip	NACA 63-615 mod.	Aero, twist r>t	-3 degrees
Construction	Single spar, wood, ribs spaced 30cm, with leading edge torsion box. Fabric covering over rear 45 %.		

AILERONS

Span	2.65m (each)	Type	Slotted
Mean chord	0.20m	Area	1.08m^2
Max deflection	+/-30 degrees	Construction	Fabric covered wood, ribs spaced 30cm
Mass balance	100%, distributed		

HORIZONTAL TAIL

Span	3.00m	Total area	1.6m^2
Elev. max deflection	30° up, 20° down	Airfoil	NACA 64010 mod.
Elevator trim method	Tension spring on stick	Tail arm	3.52m
Construction	Wood, ply covered tailplane. Fabric covered elevator. Ribs spaced 28cm.		

VERTICAL TAIL

Total area	0.98m^2	Aspect ratio	2.3
Tail arm	3.86m	Max. deflection	30 degrees
Airfoil	NACA 64010 mod.	Mass balance	Shielded horn
Structure	Wood. Ply covered fin. Fabric covered rudder.		

FUSELAGE

Max. width	0.60m	Max. height	1.16m
Wetted area	10m^2	Undercarriage	Fixed unsprung wheel, rubber-mounted skid
Structure		Ply monocoque. Molded veneer nose cap. Side opening blown perspex canopy.	

DRAG PRODUCING DEVICES

Type, location	Rotating plates, projecting from upper and lower surfaces. Located at 42% chord.

WEIGHTS

Wing: 124 kg	Fuselage: 67 kg	Tailplane & elevator: 7 kg	
Empty weight: 198 kg	Equip'd weight: 218 kg	Lying weight: 315 kg	Wing loading: 24 kg/m^2

PERFORMANCE

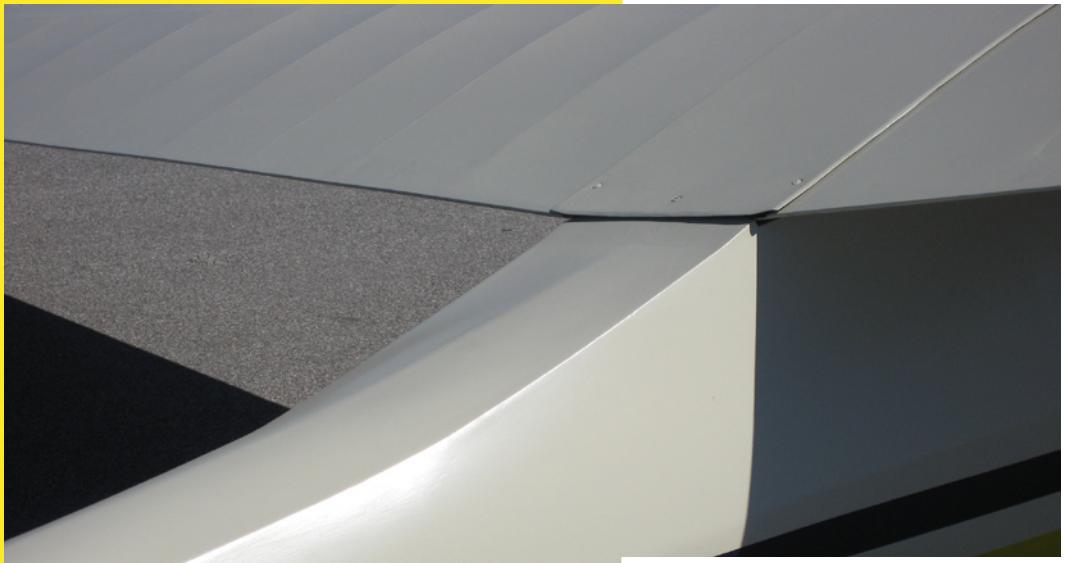
Vmax smooth air	230 km/h	Vmax gusty conditions	140 km/h
Min sink	0.62 m/s @ 67 km/h	Max L/D	32 @ 77 km/h

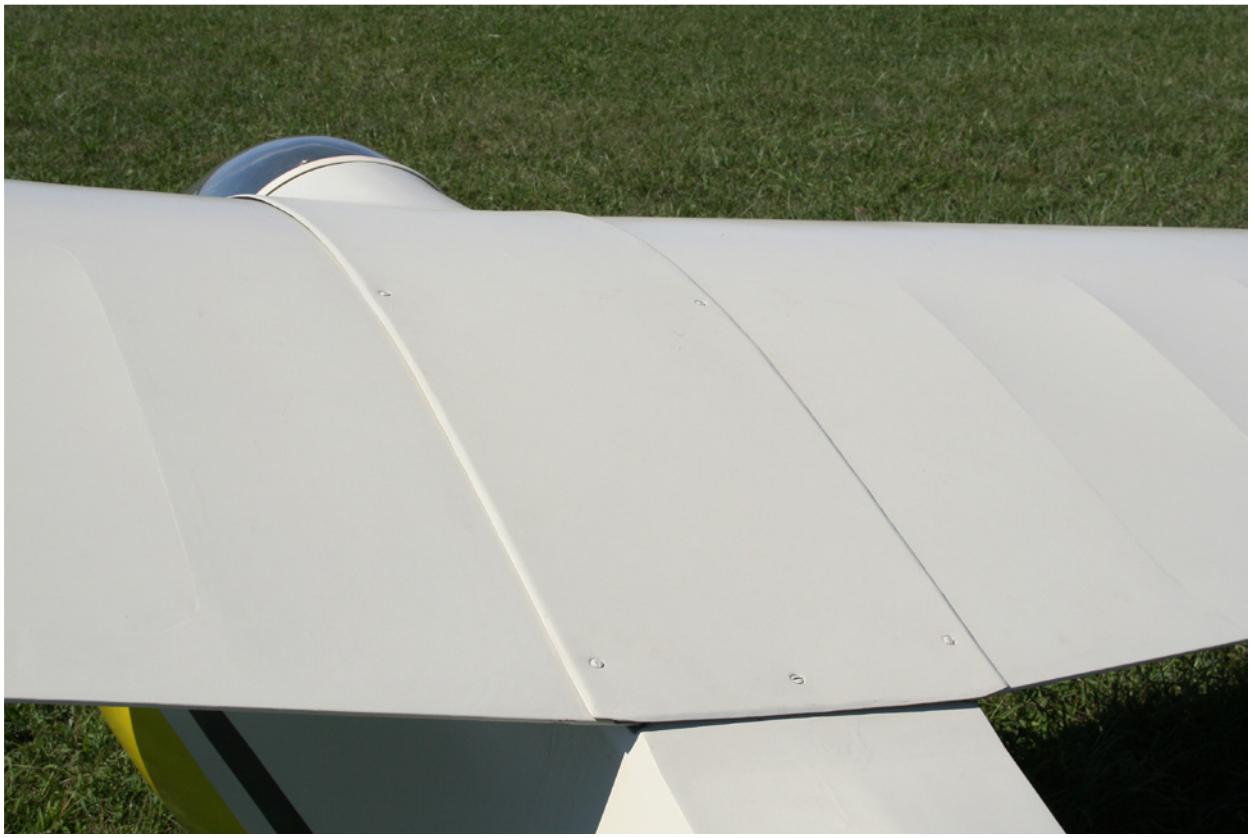
Data from
The World's Sailplanes
OSTIV, 1963


N7714
AD
N88981


N88981


N8898I






N88981


N88981

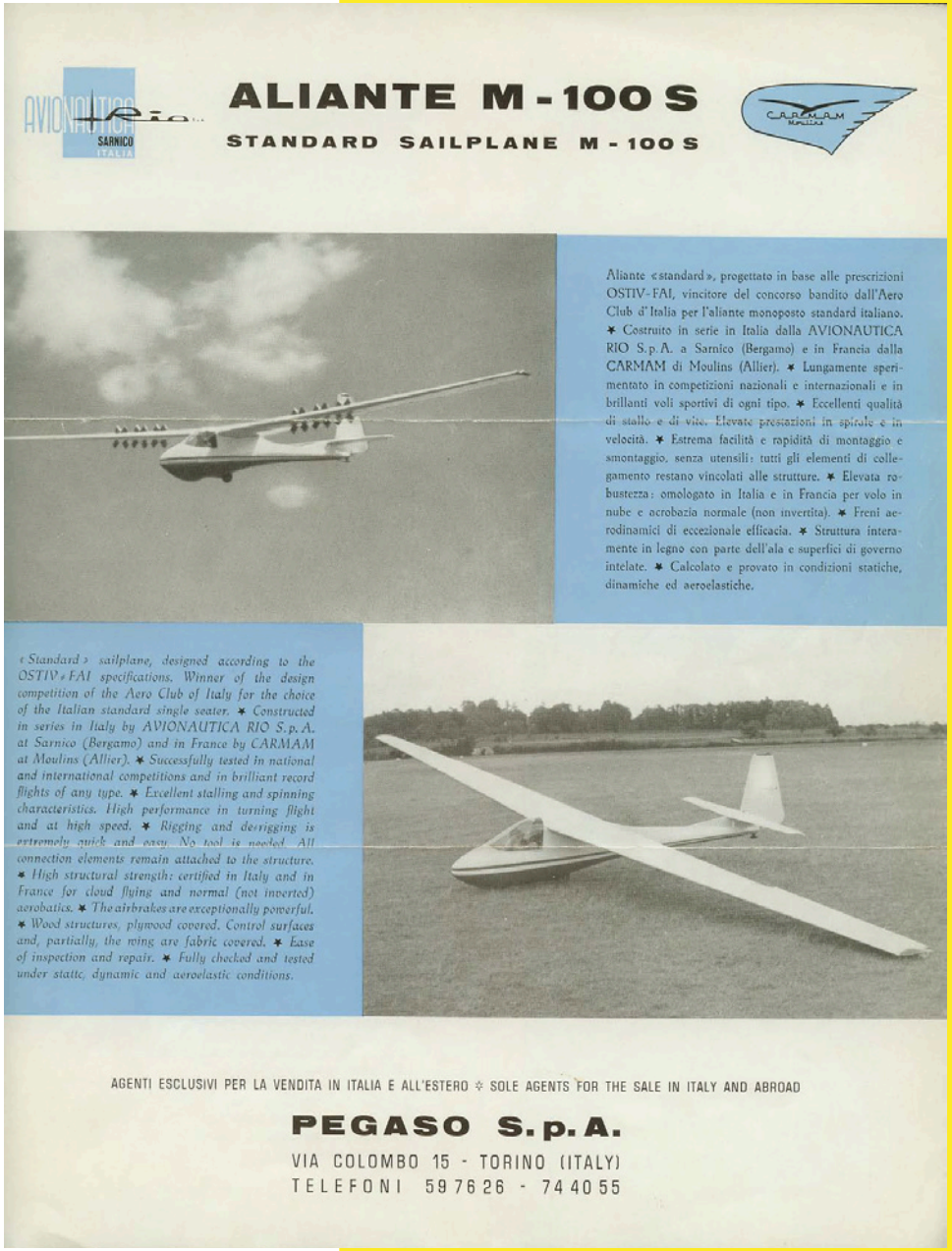

N8


81


38 MPH
42 MPH
MAX. SPEED: STILL AIR 124 KTS-143 MPH
MAX. SPEED: STILL AIR; AIRBRAKES EXTENDED 108 KTS-124 MPH
MAX. SPEED: ROUGH AIR; AIRBRAKES EXT. OR CLOSED 81 MPH
MAX. SPEED, AERO TOW 81 KTS-93 MPH
PERMITTED ACROBATICS:
LOOPING ENTRY SPEED-79 KTS-90 MPH
CHANDELLE ENTRY SPEED-70 KTS-81 MPH
SPIN ENTRY SPEED-32 KTS-37 MPH
TIGHT TURNS, MAX. 3.5 G
ALL OTHER ACROBATICS ARE PROHIBITED
NIGHT FLYING IS PROHIBITED
AUTO/WINCH TOW IS PROHIBITED
MAX. ALLOWABLE WEIGHT OF PILOT 307 LBS. 205/MAX. CROSS WT.
MIN. ALLOWABLE WEIGHT OF PILOT-102.6 LBS.
IF NECESSARY ADD WEIGHT IN SEAT
N 88981


N88981


N88981



AVIONAUTICA SARNICO ITALIA

ALIANTE M-100 S

STANDARD SAILPLANE M-100 S

CARMAM Moulins

Aliante «standard», progettato in base alle prescrizioni OSTIV-FAI, vincitore del concorso bandito dall'Aero Club d'Italia per l'aliante monoposto standard italiano. * Costruito in serie in Italia dalla AVIONAUTICA RIO S.p.A. a Sarnico (Bergamo) e in Francia dalla CARMAM di Moulins (Allier). * Lungamente sperimentato in competizioni nazionali e internazionali e in brillanti voli sportivi di ogni tipo. * Eccellenti qualità di stallo e di vite. Elevate prestazioni in spirale e in velocità. * Estrema facilità e rapidità di montaggio e smontaggio, senza utensili: tutti gli elementi di collegamento restano vincolati alle strutture. * Elevata robustezza: omologato in Italia e in Francia per volo in nube e acrobazia normale (non invertita). * Freni aerodinamici di eccezionale efficacia. * Struttura interamente in legno con parte dell'ala e superfici di governo intelate. * Calcolato e provato in condizioni statiche, dinamiche ed aeroelastiche.

*«Standard» sailplane, designed according to the OSTIV-FAI specifications. Winner of the design competition of the Aero Club of Italy for the choice of the Italian standard single seater. * Constructed in series in Italy by AVIONAUTICA RIO S.p.A. at Sarnico (Bergamo) and in France by CARMAM at Moulins (Allier). * Successfully tested in national and international competitions and in brilliant record flights of any type. * Excellent stalling and spinning characteristics. High performance in turning flight and at high speed. * Rigging and derigging is extremely quick and easy. No tool is needed. All connection elements remain attached to the structure. * High structural strength: certified in Italy and in France for cloud flying and normal (not inverted) aerobatics. * The airbrakes are exceptionally powerful. * Wood structures, plywood covered. Control surfaces and, partially, the wing are fabric covered. * Ease of inspection and repair. * Fully checked and tested under statte, dynamic and aeroelastic conditions.*

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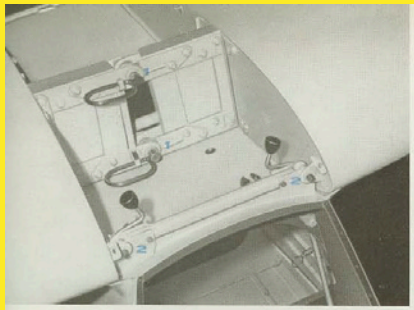
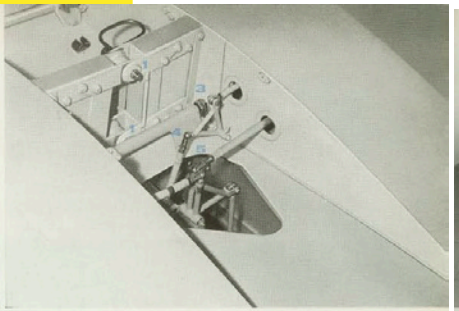
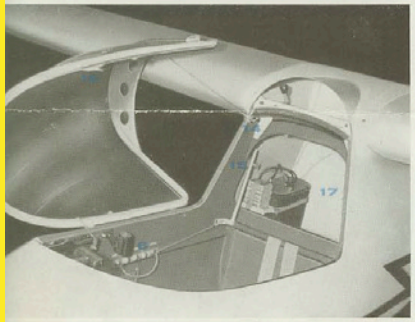
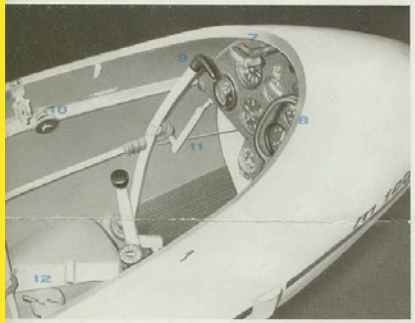
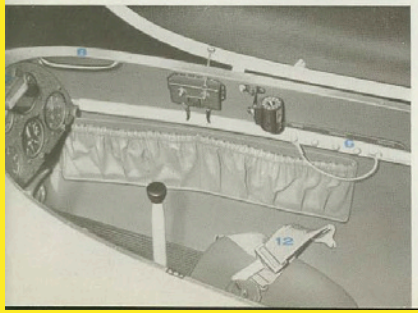










ALA monolongherone a sbalzo, con bordo d'attacco resistente a torsione. Longherone in faggio migliorato. Profili laminari NACA 63- modificati.

FUSOLIERA struttura mista a guscio e 4 correnti. Cabina spaziosa, adatta anche per piloti di grande taglia. Amplissima visibilità. Ruota fissa di atterraggio diam. 300 mm., molto sporgente, per assicurare un'adeguata protezione delle strutture negli atterraggi fuori campo. Pattino anteriore molleggiato, con riempimento continuo in gomma. Pattino di coda su tampone di gomma.

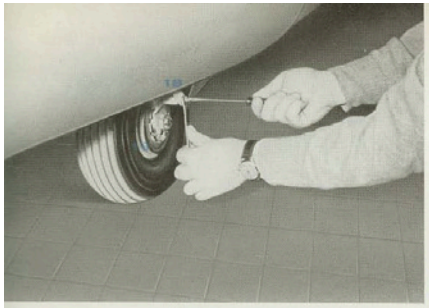
IMPENNAGGI di tipo e struttura classica. Impennaggio orizzontale sopraelevato su pinna antivite.

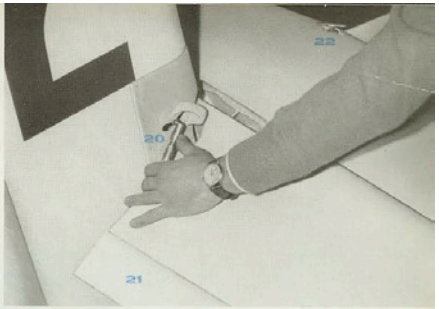
COMANDI E SUPERFICI DI GOVERNO trasmissioni rigide in tubi di acciaio dei comandi equilibratore, alettoni e freni aerodinamici. Comandi timone a cavi. Alettoni a fessura, aerodinamicamente e dinamicamente equilibrati. Timone dinamicamente equilibrato. Aletta correttrice (trim) comandata dalla cabina. L'aliante può essere « trimmato » a tutte le velocità di utilizzazione.

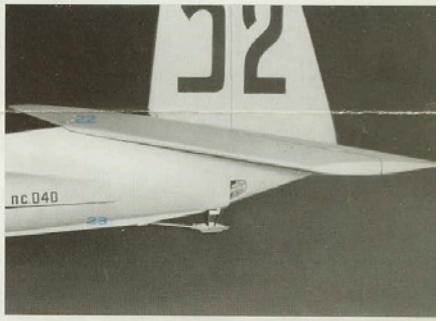
FRENI AERODINAMICI di tipo originale, costituiti da tre coppie di piastre rotanti in poliestere rinforzato, per ogni semiala.

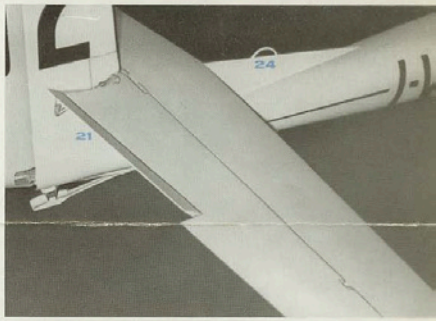
CRUSCOTTO ribaltabile per facilitare l'ispezione e la connessione degli strumenti. Può ospitare comodamente 7 strumenti diam. 80 mm (p. es.: 1 anemometro, 3 variometri, 1 altimetro, 1 virosbandometro, 1 bussola).

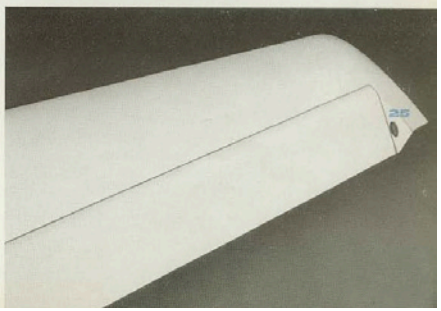
1 *Attacchi principali semiali con frenatura automatica*
2 *Attacchi anteriori ala-fusoliera con frenatura automatica*
3 *Attacchi posteriori ala-fusoliera*
4 *Innesto rapido comando aerofreni con frenatura automatica*
5 *Innesto rapido comando alettoni con frenatura automatica*
6 *Regolazione longitudinale schienale*
7 *Comando sgancio*
8 *Maniglia appoggio pilota*
9 *Comando aerofreni*
10 *Comando trim*
11 *Compasso regolazione trasmissione freno ruote*
12 *Imbragatura pilota a 4 tiranti*
13 *Chiusura cappottina*
14 *Svincolo rapido cappottina*
15 *Regolazione verticale schienale*
16 *Portello regolabile aerazione cabina*
17 *Bagagliaio: largh. 52 x prof. 33 x alt. 50 cm — 0,086 mc*
18 *Vite regolazione freno a disco*
19 *Disco freno*
20 *Innesto rapido astina comando trim*
21 *Aletta correttrice (trim)*
22 *Dispositivo attacco anteriore stabilizzatore con frenatura automatica*
23 *Chiglia protezione fondo fusoliera*
24 *Maniglia per manovra al suolo*
25 *Pattino estremità alare*











WING *single spar, cantilever wing with leading edge torsion box. Modified NACA 63- airfoils.*

FUSELAGE *shell structure, reinforced by 4 stringers. Spacious cockpit, suitable for pilots of any size. One piece perspex canopy. Fixed landing wheel 12" dia. Shock absorbing front and tail skid.*

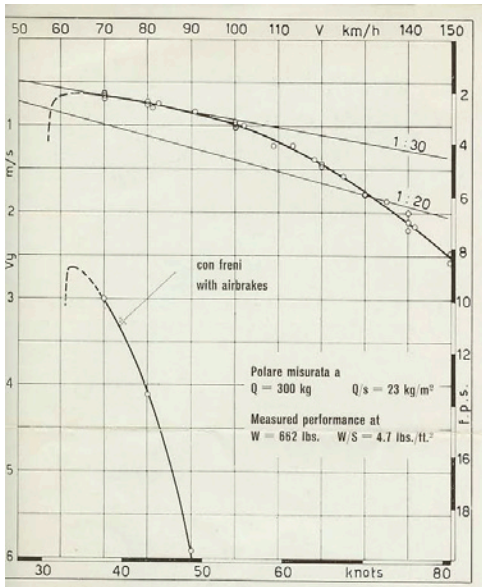
TAIL *structure of classical type. Horizontal tail is superposed to an anti-spinning dorsal fin.*

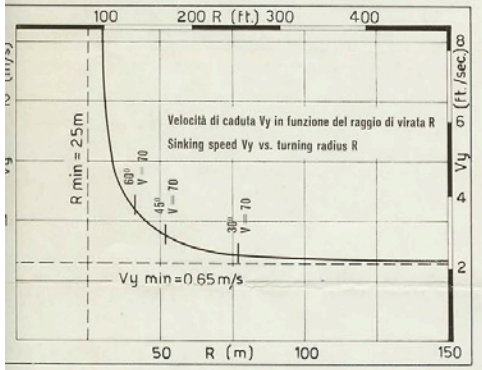
CONTROLS AND CONTROL SURFACES *elevator, ailerons and airbrakes transmissions are rigid, made of steel tubes. Rudder control by steel cable. Slotted ailerons, aerodynamically and dynamically balanced. Dynamically balanced rudder. Trim tab acted from the cockpit. Trimming is possible on the whole speed range.*

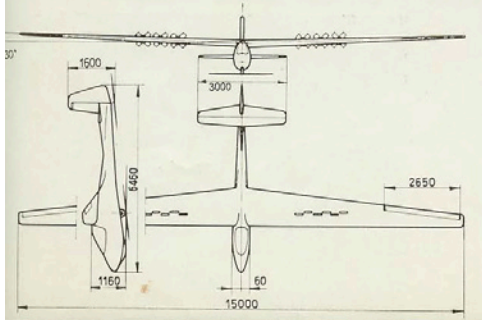
AIRBRAKES *of original type, consisting of three couples of rotating plates, made of reinforced polyesther, on each wing.*

INSTRUMENT PANEL *can be rotated about a hinge line on the lower side, for ease of inspection and connection of the instruments. Can contain 7 instruments 80 mm dia. (e.g., 1 A.S.I., 3 variometers, 1 altimeter, 1 turn and slip indicator, 1 compass).*

1 *Wing connection with automatic locking*
2 *Forward wing-fuselage connection*
3 *Aft wing-fuselage connection*
4 *Quick connection of airbrakes control*
5 *Quick connection of aileron control*
6 *Longitudinal adjustment of seat-back*
7 *Release control*
8 *Hand grip for pilot*
9 *Airbrakes control lever*
10 *Trim control*
11 *Adjustment of wheel brake transmission*
12 *4-strip pilot harness*
13 *Canopy lock*
14 *Quick release of canopy*
15 *Vertical adjustment of seat-back*
16 *Adjustable shutter for cabin ventilation*
17 *Baggage compartment: width 20" x depth 13" x height 20" — 5 cubic ft.*
18 *Screw for wheel disc brake adjustment*
19 *Disc brake*
20 *Quick connection of trim tab control*
21 *Trim tab*
22 *Tailplane forward connection device with automatic locking*
23 *Hardwood external stringer for protection of lower surface of aft fuselage*
24 *Hand grip for ground handling*
25 *Wing tip skid*





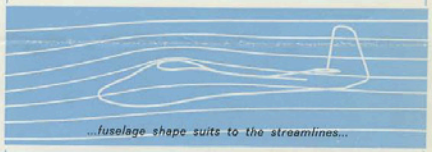


CARATTERISTICHE PRINCIPALI

Apertura alare	15	m
Superficie alare	13,1	m²
Allungamento alare	17,1	
Lunghezza totale	6,45	m
Peso a vuoto	200	kg
Carico utile max	115	kg
Peso totale max	315	kg
Carico alare max	24	kg/m²
Coefficiente di robustezza	10	
Velocità max senza freni	230	km/h
Velocità max con freni	200	km/h
Velocità max per apertura freni	200	km/h
Velocità max per chiusura freni	150	km/h
Velocità max a traino aereo	150	km/h
Velocità max in severa turbolenza	130	km/h

MAIN DATA

Wing span	49' 2"	
Wing area	141	sq. ft.
Wing aspect ratio	17,1	
Length	20' 10"	
Empty weight	441	lbs.
Max useful load	253	lbs.
Max total weight	694	lbs.
Max wing loading	4.9	lbs./sq.ft.
Ultimate load factor	10	
Max I.A.S. without airbrakes	124	knots
Max I.A.S. with airbrakes	108	knots
Max I.A.S. for opening airbrakes	108	knots
Max I.A.S. for retracting airbrakes	81	knots
Max I.A.S. in aero tow	81	knots
Max I.A.S. in severe turbulence	70	knots



...fuselage shape suits to the streamlines...

Le descrizioni, illustrazioni e dati contenuti in questa pubblicazione si intendono non impegnativi per la Pegaso S.p.A. Ferme restando le caratteristiche essenziali del tipo qui descritto, potranno essere apportate modifiche di organi, dettagli o accessori, che si ritengano convenienti per scopo di miglioramento o per esigenze di carattere costruttivo.

Descriptions, illustrations and data herein contained are to be considered not binding for Pegaso S.p.A. The essential characteristics of the type herein described remaining unchanged, eventual modifications of parts, details or accessories, as may be required for improvement or for construction reasons, will not necessarily imply a corresponding modification of the present publication.

Building an Electric Bubble Dancer

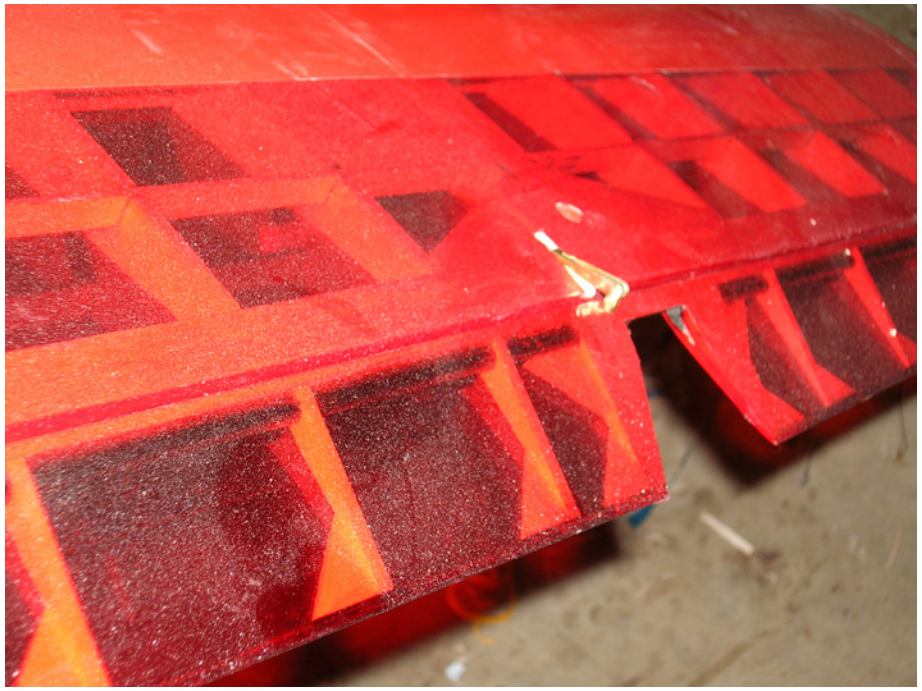
Greg Potter, mrgregpotter@hotmail.com

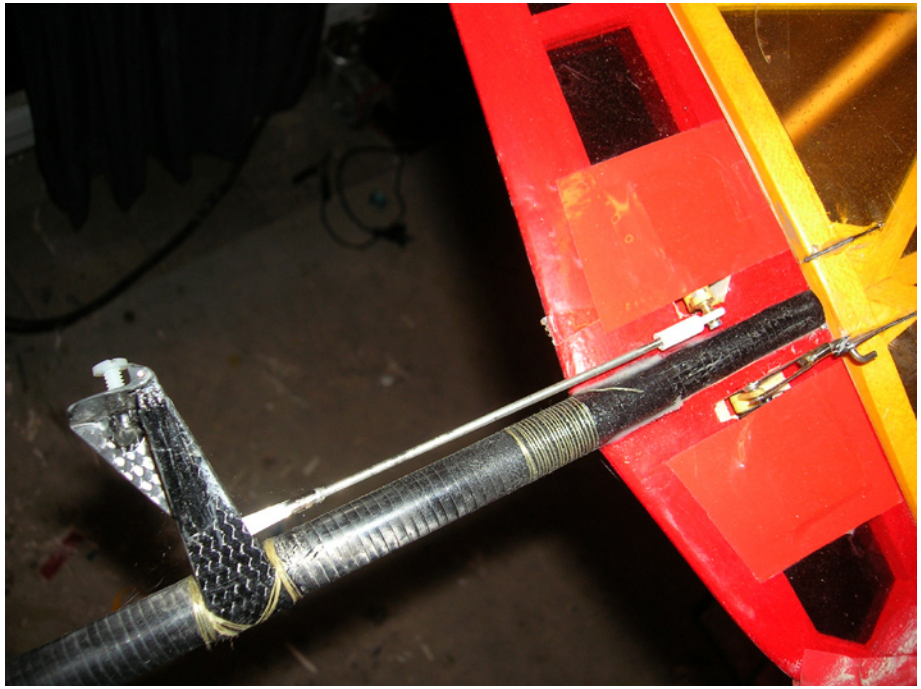
When I decided to build an electric Bubble Dancer for F5J I made a few changes.

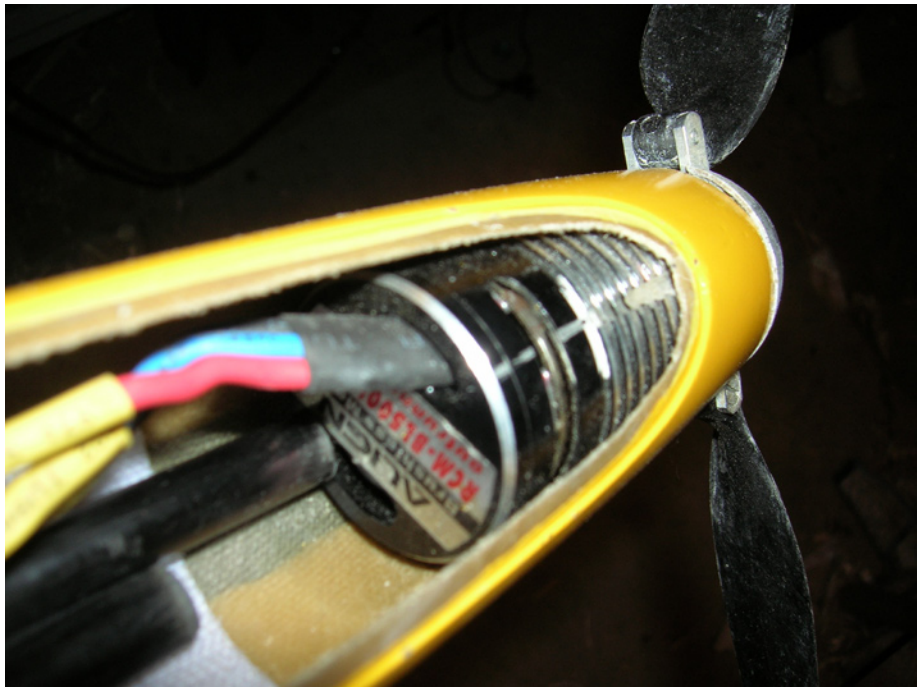
I decided on a full length flap for the centre panel instead of the spoiler This was not a good decision as the flap is far less effective than the spoiler but because landing points for F5J are less important than for RES it worked out OK.

Another change was to simplify the wing mounting as there are not the same stresses in launching, and for the same reason I reduced the spar strength by using spruce caps with some carbon laminated to it. I also reduced the thickness of the balsa D-box sheeting.

Because I expected the nose to be heavier due to the motor and prop and battery pack, I mounted two Dymond D60 servos in the fin to drive the rudder and elevator. Also, there was no room up front to fit two servos as well as the other gear required, such as the receiver and receiver battery pack which take up most of the room under the wing mount.







Then there was the issue of the motor, a problem because I chose to use the standard Bubble Dancer fuselage pod from Bud Elder. This fuselage pod is very narrow at the front, not allowing the use of a 600 sized outrunner. The motor would fit, but because the three power wires come from the front of the motor instead of the rear, there has to be enough clearance in the fuselage to allow them to reach the ESC without fouling the rotating case.

Searching the web I found an Align 500 size enclosed outrunner designed for use in helicopters. This is an outrunner configuration with a can over the outside and the power wires exiting from the rear of the can. It had suitable specs for a direct drive using a 3S lipo and a reasonable size prop. Usually helicopter motors have a Kv that is too high for direct drive, therefore requiring a gearbox. I'm not a fan of using gearboxes unless I have to. Perfect!

The finished model is slightly heavier than the thermal version but flies with the same characteristics, very slow but fast enough to fly upwind when required and easy to circle with no tendency to stall.

Whilst the flap is not as effective as the spoiler, it is effective enough for controlled landings near the spot.

For F5J I chose a 3S 1200mah 50C lipo pack. It can handle the 45A current draw, it has enough capacity for five full-power climbs, but it is not heavy. Why carry a 2200 or 3200 pack when you don't need to? You can always squeeze some ballast under the wing if required. With the pack as far forward as it can go, the model balances without the need for any extra weight in the nose. The CG is just forward of neutral.

I am really looking forward to flying it in an F5J comp soon.

Again, if anyone wants to build one of these I'm happy to help.